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SHORT CUTS TO BIG MONEY

by

G. V. DOWDING

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CHAPTER I

OPPORTUNITIES FOR MILLIONS

Unlimited scope for new ideas. No age limits. Specialised knowledge not essential. Models not always necessary. People who invent without realising it. Wasted opportunities. The grand adventure of inventing. Inspiring words from a famous inventor

So long as there is competition in industry, there will be a wide horizon for the inventor to explore. For inventions are ideas, and ideas form the backbone of every successful commercial undertaking.

The company which lacks ideas for new products, ideas for the new use of old products and ideas for creating new forms of public demand, or new ways for making the public want more of existing things, is bound to lose ground.

Therefore, every industry is an inexhaustible receptacle for new ideas, and it is those men and women who know the kind of ideas which are wanted, who are making big money at inventing.

There are a million and one improvements and novelties waiting round the corner to be invented, each one of which will be worth something; perhaps only five pounds, perhaps fifty thousand pounds. And anyone, man or woman, old or young, can be an inventor. There are no age limits and no essential educational qualifications are required. It is true that, for example, a young fellow with no knowledge at all of chemistry is unlikely to contribute anything fundamental to the new and quickly expanding plastics industry; but original ideas for the use of plastics are just as likely to come from people outside as they are from those in the inner technical and industrial circles. In fact, from the inventor's point of view, it isn't always an advantage to be steeped in knowledge of a subject. The old saying about not seeing the wood for the trees often applies to inventing. Now and then there is a revolutionary invention or discovery. Sometimes it is the result of a lucky mischance, as with Bell and the telephone; he was experimenting with a telegraph and suddenly a musical sound came through it instead of the expected clicks. But just as often the great discovery is made by an inventor who strays outside the defined tracks of conventional knowledge and is so "ignorant" of the subject as to try something the learned scientists would say was quite impossible!

The question of facilities for the development of an invention may worry many would-be inventors. But it needn't. Any kitchen table is a potential experimental laboratory and workshop for the mechanically minded. Baird's first television apparatus was built up in a sitting-room from biscuit tins, pieces of cardboard and the like. Often, as I shall explain later, all that may stand between an inventor and a nice fat cheque is a pen, a buff form and some ordinary stationery.

No model building or other such work may be needed at all. The last invention I sold Marconi's Wireless Telegraph Co. never existed, except on paper, until after they had paid me a nice cheque . . . then it was the buyer's privilege to do the work! Recently, I sold a patented television idea which was worked out in my mind and a patent applied for the same day. I didn't do a single other thing about it—except sell it for seven hundred and fifty pounds. But I still think it was quite cheap!

The tragedy is that so many invent without realising it. Tens upon tens of thousands of little improvisations and gadgets, made to facilitate some household or other operation, remain as merely personal things because their inventors have no appreciation of the commercial possibilities of such ideas.

A lad in an office or his father in the Civil Service has as much chance of inventing a useful device or process as a young man in an engineering works . . . if he knows how to order his mind in the right direction. Many saleable inventions have come from just such surroundings.

That there is an ever-growing demand in industry for new inventions is proved by the advertisements you see in newspapers asking for them. Advertisements from large, reputable organisations which, despite their vast experimental development and design departments, realise that as good a brainwave may arrive from some unknown person in an entirely different trade or industry as from a member of their own highly expert staffs.

There is a popular notion that the big firms are all rapacious swindlers out to grab all they can for the least possible payment. Well, there have been unsavoury episodes in the past. But there is legal protection for those inventors who know how to obtain it. And, anyway, it is generally realised these days that it is bad business for a big company to resort to dishonest methods of dealing with inventors. Every large firm wants new ideas. And, merely as an investment, they are prepared to pay well for them. Not that you can expect to get really big money poured into your lap without asking for it. That would be equally bad business. Most firms will try to bargain to some extent with an inventor. It is up to the inventor to ask for and get as much money as he can. He is the seller.

It is very hard to assess the value of a new invention; it may be just as hard for a buying firm to do so as it is for the

inventor. But that is a part of the grand adventure of inventing. Any one invention might be worth almost anything . . . or nothing.

Now for a personal note. This book is bound to introduce an autobiographical flavour now and then. How otherwise could I make my arguments convincing or give my advice any real authority? As it happens, I have had years of varied experience in the fields of invention. I have drafted dozens of my own patent specifications and negotiated scores of my own patents. Leading patent agents, such as Messrs Dicker, Pollack, Mercer, Tench and Meyer have acted for me in securing world-wide patent protection for my inventions; I have consulted expert Patents Counsel of the calibre of the famous Mr. Mould on behalf of purchasers of my inventions. I have attended Patent Office hearings and given evidence before formidable expert committees as a more or less free-lance representative of important commercial and industrial interests. I have even been commissioned by leading British companies to assess the value of inventions and give opinions as to their patent possibilities.

Altogether, I have patented in my own name about one hundred and fifty inventions. They range from a card game for children, sold under royalty by Messrs John Waddington, Ltd., to somewhat advanced radio, electrical and mechanical inventions sold to Marconi's, Igranic Electric, Aeronautical and General Instruments, Ltd., and other large concerns.

To illustrate various points, I will tell you more about these and others in due course. In the meantime, bear this in mind. Generally speaking, the most successful inventor is he or she who can rise to the greatest heights of enthusiasm, but is undaunted by set-backs. And, from my own experience, I can say that success brings further success. An invention successfully sold makes it easier to sell subsequent inventions; an idea brought to practical fruition stimulates the mind for the production of further ideas.

Persistence and patience and faith in one's own ideas are essential qualities in inventors. But so is commonsense, without which it is easy for an inventor to become cranky.

It is obvious that some helpful words from one who has gone through all the adventures of inventing can be a lighthouse to point the way past the rocks. If only I could have enjoyed earlier the benefit of the experience I now possess . . .? However, I can at least pass on the benefits of that experience to others. I cannot pass on the excitement, the sense of achievement . . . and the fun I have had and am still having as an inventor. You must find your own. And if you have enough imagination and sense of humour (very important) to be a successful inventor, that will not prove difficult!

Finally, here are some inspiring words said in a letter to me

by Sir Ambrose Fleming, the inventor of the wireless valve.

"All predictions as to certain things being impossible are likely to be falsified by history. My connection with inventions now goes back for fifty years. I remember when General Post Office officials of high rank said the telephone was only a toy, and would never be of any use. Yet two years after they were using all the power of the law to prove that a telephone was a telegraph within the meaning of the act. I remember when gas engineers snorted with contempt at the idea of electric lamps replacing gas. The cable companies ridiculed wireless telegraphy in 1899 . . . So much for scientific prophecy. I am not a prophet, and I do not venture to say what cannot be done by inventors." ✓

CHAPTER II

HOW TO THINK OF NEW IDEAS

Developing an inventive mind. Simple training for the imagination. Sources of inspiration. How to know an invention. The essential critical faculty. A guide to original thought. Visualising applications. Practical considerations. Ideas which lead to further ideas. How to avoid one-track thinking and dead-end trains of thought. Constructive and wasteful thinking. How to select and reject embryo ideas.

INVENTING is generally regarded as something that is sporadic and haphazard, probably because there is no form of organised study in connection with it that is accessible to the ordinary citizen. You can attend classes in plumbing, electrical engineering, philosophy, painting, literature and hundreds of other arts and crafts, sciences and trades; but there is no opportunity for the ordinary man or woman to learn to invent.

Yet it is something that can be learnt. Thousands of young people in research and development laboratories attached to large industrial organisations are learning how to invent. But it isn't called that officially. And even when they do invent something of practical value, the invention generally becomes the property of their employers. Thousands of patents are applied for every year by big companies to protect the ideas **originated** by the staffs of their research laboratories. That is fair enough. The members of those staffs are paid good wages to carry out laboratory investigations and devise modifications and improvements in the products manufactured by their firms. And the firms provide the equipment and materials necessary.

It is hardly surprising that more new inventions are discovered by paid research workers than by any others; their minds are

being continually directed towards original work. Even so, many important industrial inventions come from people not connected with industry.

The classical example is that of Dr. Edmund Cartwright, inventor of the power loom principle, which is the basis of all modern weaving machines.

He was a clergyman and had absolutely no technical knowledge of weaving. He had never even seen a weaver at work on a loom. Yet, in the quiet seclusion of a country vicarage, he devised a very original and quite practical machine. Not until he had perfected this loom, did he trouble to make any study of contemporary methods of weaving. Then he was surprised to find how simple they were in comparison with his own!

So he proceeded to simplify his apparatus and to improve the essential features of his inventions, which made it an advance on existing practice. Two years after he applied for another patent, and this one brought him a fortune.

We know why this country clergyman turned his attention to weaving; it was because he had heard about the big money prizes that were being offered for a loom that would work to a greater capacity than those then in use. But how did he hit upon the great idea that eluded thousands of others?

Some of these inventions seem to be the result of mere luck, as though some deity distributes money-making brainwaves with impish disregard as to the needs of those who receive them. Sir Oliver Lodge, already rich and famous, was having lunch in a London restaurant. Suddenly he stopped talking to his companion, sat perfectly still for a few seconds of intense concentration, and then with a laugh relaxed. "I've thought of an idea," he said casually. Within a week that idea was patented; a month later it became a commercial proposition. I know that is a true story for I helped Sir Oliver to develop the idea. Hence the inscription on an autographed photograph he gave me shortly afterwards: "With thanks for friendly aid.—Oliver Lodge."

An American bank clerk named Simons had the first big idea of his life in an ambulance on the way to hospital to have an operation. It was nothing to do with money or safes, but a simple invention of great originality concerned with the printing of fabrics in colour.

One of my oldest friends, Dr. J. H. T. Roberts, a man of great wealth and a financial genius behind a number of important industrial concerns, thinks of an idea for keeping glass clear in mist and rain and patents it. It becomes the father of most of the methods employed for military, naval and air purposes.

There may be some element of luck about these inventions. But it is significant that one seldom finds a successful inventor to be the dreamy, unpractical type he is supposed to be in

order to conform with the popular notion. All the more successful inventors I have met as casual adviser and investigator for such firms as Messrs Laurence, Scott and Electromotors. Ltd. have seemed very normal sort of individuals. But it has always been apparent that they are the kind of people who use their imagination, are fairly sensitive, and who take a wide interest in the people and things around them.

Inventors are thinkers. Often their "brainwaves" are climaxes of continuous mental activity which may have been to some extent unordered thought. Sometimes, as in the case of Marconi, mental activity of a specialised nature directed to definite ends results in a continuous stream of related inventions.

All human beings have imaginative powers, though some exercise them more than others. Given reasonable intelligence, any one can develop a lively imagination. Not all will do so, however much they might appreciate the benefits of such a quality. They are mentally lazy. I am not addressing myself to such folk. My interest lies with those who are prepared to devote thought and time, and yet more thought and time to improve themselves. And I can assure you that that is the inevitable result of any form of mind training. Even those who fail immediately to succeed as inventors will have gained in mental alertness if they follow the simple rules of inventive mind training. And, incidentally, mental alertness is a key to the keener appreciation of the things that matter in life, and the first necessity for advancement in any career.

Now the best training for the mind is to use the mind and to keep on using it. Never be afraid of thinking. So long as thoughts are not morbid, thinking can never do any harm. Indeed, the way to avoid morbid, introspective thought is to keep the mind occupied in the pursuit of new trains of thought about matters external to oneself.

You may meet with a feeling of frustration now and then; there will be irritation when fruitful trains of thought seem elusive. But an important part of the necessary mind training for a would-be inventor is to practice the art of thinking in new directions when existing ones seem abortive.

A useful exercise for developing inventive ability is to take any article, the first one to hand, and try to visualise alternative forms of construction for it. And, however absurdly impracticable your first idea may be, follow it up. I will give a few examples just as they occur to me, and record my own thoughts so that you can see what I mean.

A fountain pen: It has a little rubber bag to hold the ink. Rubber perishes. Why not a simple glass or metal container with a cork in the top? That's going back. Fountain pens used to be made like that; they had to sell little squirt affairs with them so that the ink could be put in. Good invention, the

self-filling fountain pen. But what about removable ink containers? You always have a filled one in hand. When the pen runs dry in the middle of a letter or something else you are writing, you quickly pull out the empty container and slip in the full one. Wonder if that could be combined with the self-filling scheme? Might be something in the idea!

A scrubbing-brush: Flat sort of thing; can't be very easy to hold for long periods; glad I'm not called on to use one. Must always mean a wet hand as you dip it in the water and smack it about. Why not a blacking-brush kind of handle with a shield to stop the water splashing on to the hand? Bit Heath-Robinsonish! Still, worth making a note about it.

Do you follow me? Constructive thought, with a touch of the destructive, is what is required. Thinking around ways and means of improving an article's design. But don't run away with the notion that invention is this and nothing more. I am merely giving you a useful exercise that will aid you in developing an inventive mind.

The successful inventor is thinking in the above sort of way every day of his life. Not always consciously. But the flashes of inspiration which come to him, the "brainwaves," are the result of his mind being conditioned for invention. To some, this may be almost a natural condition; others need to cultivate it. It can be cultivated; I state that as a proved fact.

Success may come quickly to some; for others, weeks and months, and even years will pass to try their qualities of persistence before any ideas that bring in money are engendered. If you find that a continuous endeavour to think of inventions gets a trifle monotonous, give it a rest; break away into other trains of creative thought for a time. Everything that enforces a creative use of the mind is an obviously useful mental training for the would-be inventor.

Crossword and other literary competitions are excellent mind exercises. Incidentally, you may win prizes. Very often I have broken away from a long, arduous period of concentration on some invention to indulge in the light relief of competitions. And I have won dozens of prizes ranging from half a guinea to a freehold house, as another reward for an exercise of the mind!

Then there is writing; that is creative; it necessitates the employment of original thought. Articles for the popular periodicals and newspapers; short stories. That it is not only a valuable exercise for the mind, but is practice in the use of words which will be of value to the inventor when the time comes for writing specifications and descriptions of his invention. And you might get some pleasant surprises in the form of cheques. But be prepared for the worst; many write but few are printed!

Now you will find the most prolific sources of inspiration for

inventions (or. articles for that matter) among those subjects in which you are most interested. It is interest more than detailed knowledge that counts as a broad requirement.

The reason is that your thinking will be freer and more pleasant than if you attempt to drive it in the direction of things which are less interesting to you. And from this it follows that the wider your interests the greater your chances.

A question which many may well ask at this point is, how can one recognise the seed of an invention in some thought that flashes on to the inner screens of the mind?

Well, eventually, it will become intuitive. But at first it is difficult. There are so many border-line cases. As you read this book, you will learn the tests that can be applied to determine whether or not an apparently "bright idea" does in fact constitute an invention in embryo. There are definite guides, and the first one is to be found in the question, has anyone done this thing or made such an article before?

Originality, then, is the first essential. But don't be turned away from what you think is a good idea because you are doubtful as to its originality. Your doubt may spring from the further thought that the idea is so obvious that someone simply must have thought of it before. The old saying, "There is nothing new under the sun," has probably made many people ignore ideas because they could not credit themselves with being the first to think of something.

That old saying just is not true. New things are being discovered and invented every day. What about the Zip fastener? Or Radar? Or the crimped hair-pin? The Greeks had no names for these things! What about Mr. Victor Grant Jones of Seattle who had the idea of a safety-pin that would spring shut instead of, as with the ordinary safety-pin, of springing open? Obvious? But no one seems to have thought of it previously, or of applying the principle in such an effective, simple manner. Mr. Jones' idea of a safety-pin that is really safe hasn't had time to sweep the world and make him a millionaire yet; it will.

A lively imagination capable of conceiving original ideas is not the only mental quality needed by an inventor. He or she must also possess a keen critical faculty. It is the fault of only too many inventors that they allow their enthusiasm to blind them to the necessity of self-criticism.

The more objectively one can view one's own ideas the more likely they are to develop as worth-while ideas. In other words, the inventor should search for snags in his ideas as well as merits.

But here a note of warning is necessary. A critical faculty is always liable to develop to an extent that it becomes a hindrance, unless it is kept well in hand. It is all very well being a fierce critic of one's own ideas. Up to a point it is not only useful,

but quite essential. It anticipates the impartial criticisms of others. And there is always a great deal of that to face when one endeavours to exploit an invention. It starts at the Patent Office and increases in severity as the stages of negotiation develop.

Yet one must avoid the kind of Doubting Thomas state of mind to which I have already referred. Indeed, anything which tends to dull an inventor's enthusiasm for his ideas is harmful. Striking a nice balance between enthusiasm and self-criticism is the vital mental formula for invention.

It is a frequent experience for a would-be inventor to think of an idea, and it may be quite a good idea, and then meet with difficulty in developing it so that it becomes a mature mental construction. It stagnates as the merest shadow and, however much it is mentally struggled with, it just will not assume any fullness of shape.

In such a case, the idea is best pushed to the back of the mind while other trains of thought are pursued. An idea is never entirely lost, so long as you are able to tap your subconscious mind. It may even continue to develop in those deeper recesses of your mind.

You can bring the idea forward again by glancing through a notebook in which, when it was first thought of, you made a careful note about it. And you may be surprised how often such an idea has gained by being left in that incubating centre of the brain, the subconscious mind. It is, of course, from this that arises those flashes of inspiration called brainwaves. They are not spontaneously conceived ideas.

Many great scientists and engineers have noticed how the solution of problems frequently flash into consciousness on first awakening in the morning. The reason for such an experience is that the border-line between the subconscious and the conscious becomes very narrow at the moment when sleep departs.

Many inventors have discovered the value of having a notebook and pencil under the pillow, so that awakening thoughts can at once be recorded, for such thoughts are more elusive and are quick to slip back into the subconscious; yet they are often the most valuable thoughts of all.

Do not trust to your memory at any time, particularly in regard to half-developed ideas which you are shelving in favour of those which seem more practical. During the course of the months and the years you will, if you decide that this invention business is worth-while, and go the right way about it, think of many ideas. Any one, however absurd or trivial it may at first seem, might have in it a germ of value. That value could possibly be a latent value not to be brought out until the idea is associated with another idea not thought of until some other time after.

Running through an ideas notebook at intervals often results

in unexpectedly fruitful associations. One of the card games I invented is an example. Some time ago the idea occurred to me of having a kind of Jig-Saw puzzle on the backs of cards. But it remained just an idea recorded in my notebook.

A long while after, the idea of a card game came to my mind.

I worked on that for a few days and had nearly perfected it when I remembered that Jig-Saw idea. No, I can't say that a notebook reminded me, but it did provide some details which I might well not have remembered.

The two ideas were combined and a patent applied for. The combination of the two ideas resulted in a most attractive novelty. No difficulties were encountered in negotiating it, and, within a few months, half a million packs had been made and sold and a royalty paid on each one.

An idea has direct value only in so far as it can be developed so as to be practical. Therefore, one must right at the beginning give major consideration to its application; that is, to the practical aspects of the process or article that the idea suggests.

The most intrinsically useless thing in the realm of invention is an idea that has no solid basis of practical value. But how can one know whether or not it has any such basis when it is only an embryo idea?

The test is to try and visualise possible applications in a straightforward, commonsense manner. Supposing the idea were to be of a motor-car with wheels which could all be turned a full ninety degrees? That is a fascinating idea. For manoeuvrability in traffic, it might seem most convenient for a car to be able to travel sideways at will. There certainly seems to be a practical application for the idea. But one must go further; would the complication in design make the scheme a practical proposition? If you cannot answer such a question, the idea might just as well be put into cold storage. For you, at any rate, the idea isn't worth following up. Further intense thought about it is hardly likely to be fruitful. Try and think of something else that you can criticise from that angle. To keep doggedly on the track of an idea that is fundamentally beyond you to assess in all its practical aspects is wasteful thinking. Most probably it will lead to nothing else but an unproductive dead end.

There are dead-ends of another kind. There can be an excellent idea with obvious advantages, but, however much thought is given to it, one cannot quite round it off. Should one persist? I don't think there can be any doubt at all about that. There should be no thought of defeat. Put the idea aside when the mental battle becomes tiring, but never jettison it. The way to successful invention is paved with apparent dead-ends of this kind. Persistence and patience are necessary for breaking through such dead-ends.

Nevertheless, do not concentrate indefinitely on that one idea or you will tend to develop a one-track mind that will exclude all other ideas. It may be a noble thing to devote one's whole life to an attempt to solve a single problem, and if, in the end, the reward is success, how much sweeter that success. But not only may you miss an even greater success by closing your mind to all other ideas, there is no certainty that the solution will be found. Further, as I have said, temporarily shelving an idea and striking out on new lines of thought may, in the end, prove a quicker means of perfecting it than unbroken concentration.

Finally, don't forget that there is often a great gap between an idea and its practical expression. Here, for example, is a good idea. Why not design an electrical apparatus which would be capable of negating the force of gravity? A kind of large coil through which electrical current passes, and which, when built into the fuselage of an aeroplane, would eliminate all gravitational pull on the machine.

Well, it would be an extremely valuable piece of apparatus and would reduce the cost and risk of air travel enormously. But would it be possible for you to devise such apparatus?

Obviously, it would not be possible if you knew nothing at all about electricity and physics. At least, it would be a most miraculous thing if you stumbled upon the solution by accident without possessing such knowledge. Still, that kind of thing does happen. Inventing is a tremendously exciting thing for that reason. However, you must not bank on such possibilities. It generally pays to confine your attention to things you know something about. And, after all, most of us know a little about something!

CHAPTER III

WHAT IS A PRACTICAL INVENTION?

A word about cranky inventors. The practical outlook. The three requirements of a practical invention. Facing up to snags. Provisional protection for ideas. Inventions which are too early.

It must be admitted that those traditional jests and caricatures about inventors are to some extent based on truth. There have been long-haired, unwashed individuals who have invented the most absurd things. Plenty of them. I have met scores. Some of their so-called inventions have been almost incredibly funny. I remember one in particular. It was a device for shoeing a horse while moving.

A horse pulling, for instance, a milk cart, sheds a shoe. No need to stop the cart; no need for the poor horse to proceed

shoeless. Pull a lever and a large mechanical hand swoops down and grips the affected leg and lifts it up; simultaneously, a wheel drops to the ground to take its place. While the horse happily (?) continues on its way on three legs, the driver takes his shoeing apparatus along a platform to where the lifted hoof is clutched in the wonderful mechanism and fits a new shoe.

"But where," I asked the enthusiastic inventor as we leaned over his crude drawings, "but where is the control to take the place of the driver; you will want that, or the horse and its three legs might run away while the shoeing is going on? Perhaps you ought to have a further device to do the shoeing automatically."

The inventor glared at me suspiciously for a moment, then rolled up his plans and dashed away. Whether or not he was rushing off to scheme up this improvement, I wouldn't know; I never saw him again.

Another inventor had a perpetual motion idea. Water was supposed to pour down a pipe from an elevated tank and drive a water turbine coupled to an electric generator. The generator supplied current to break the water into oxygen and hydrogen by electrolysis. The gases were used to drive an internal combustion engine coupled to a pump that returned the water to the elevated tank. Of course, the gases became water again after being used in the engine, and this water, too, was pumped back to the tank.

Is that funny?

To the practical inventor, it is very funny, indeed. Such an elaborate scheme to achieve . . . what? Perpetual motion! Power for nothing! But that is all I am going to say about the one-time subject of a million inventors' dreams. It is a myth that by now has been almost completely dissipated. Only the extremely cranky inventor to-day chases the mirage of perpetual motion.

The best antidote for crankiness in invention is the cultivation of a practical outlook. But here again, beware of extremes. An inventor must always preserve something of the visionary if he is to achieve the greatest heights of success.

Now what are the essentials of a practical invention? First and foremost, it must be an original something that has a definite and well-defined purpose.

Supposing you thought of a simple and novel way of making wood transparent. That might be interesting, even spectacular . . . as an effect. But would the process have a well-defined purpose? Maybe you would think the idea such a good one that it would be worth trying very hard to think of some way of applying it to some definite purpose. The point is, some purpose there must be, otherwise you would have nothing but an interesting phenomenon to sell . . . and there isn't

much of a market for anything like that!

The late Sir Ambrose Fleming discovered an interesting phenomenon in 1883; it wasn't until twenty-one years had elapsed that he found a practical application for it. Radio had to be invented and come into use before it was found a purpose. The Fleming phenomenon, extremely interesting and something to show your learned friends, then emerged as the vitally practical wireless valve . . . one of the century's greatest inventions.

The second practical requirement is that an invention must enable something to be done better or easier or cheaper than any other process or device of a similar nature. There is no potential value in an invention that merely duplicates something already in existence but has inferior qualities. It could be more complicated, if its other qualities overweighed this disadvantage; or more expensive, if it had a proportionately greater efficiency than any previously known thing of a similar type.

In short, on balance, it must have superior intrinsic value. If it can be superior from every point of view, then indeed it would be on the way to being a great invention.

The third requirement of a practical invention is that its production should not present any undue difficulties. If it has relatively great value in its application, reasonable difficulties would be gladly met. But a comparatively trivial invention having debatable sales possibilities would have no chance at all if its manufacture entailed costly adjustments to the production lines of a factory. On the other hand, it is surprising what even big companies will take a chance on, if it is merely a question of feeding a design straight into the workshop.

You will have gathered that the usefulness and possibilities of an invention are assessed by weighing up carefully the three requirements I have outlined. Unfortunately, very few inventors are able to make a completely accurate evaluation themselves. Not that that need worry one unduly; there will be plenty of experts on the scene if and when the time comes to negotiate with potential buyers!

But it is as well to face up to any known snags in an honest manner. The attitude of hoping that they will be overlooked or can be glossed over is quite a hopeless one. You may think that there is a chance some minor fault will pass by until you have fixed up to have the invention commercially developed, after which all the brains at the disposal of the purchaser will be at your command to help to eliminate the snag. If you think that, you under-rate the intelligence of the people with whom you will be negotiating, and that is a foolish thing to do.

Honestly facing up to a snag is the way to perfect an invention.

Trying to rush by with a half-baked scheme may mean the loss of a lot of money. Here is an example.

About fifteen years ago I conceived the idea of a visual radiator signal for motor-cars. You may remember that many cars were at that period fitted with devices which indicated the level of water in their radiators. My idea, purely a novelty, was to have a small model of a railway signal. When the water level fell dangerously, the arm went up. That meant what it suggested. The car should be stopped immediately for more water to be put in. The patentable part of the invention was a simple hydraulic action to move the signal arm.

The snag was that this arm waggled as the car bumped along and I couldn't easily overcome the fault and still retain a positive action. The point is, I could, and in fact did, demonstrate the novelty quite successfully on a stationary car. But I held it back; I wasn't happy about that little fault.

Then one day came a further brainwave. This was to make the device in the form of a policeman whose right arm was raised as the water level fell. The slight jiggling about of the arm as the car moved gave added life to the figure. It became a combined radiator indicator and radiator mascot with a strong novelty appeal. You may have seen it, though it had its best sale on the continent. Anyway, it made a nice sum of money for me before it petered out with the technical improvement of popular cars, and the need for anxiety about radiator water levels disappeared.

Making haste slowly is a good principle for the inventor. Mind you, it is sometimes hard to do that. There is, perhaps, the feeling that others may simultaneously have thought of the same idea, and that these others must be beaten at all costs in a race to perfect the idea. Or there may be that natural desire to profit by the idea as soon as possible.

Well, it is difficult to generalise about this point, for circumstances alter cases. But it should be remembered that an idea, even one rather vague in form, can be provisionally protected at the Patent Office, while the invention is developed at leisure. That is the reason for provisional protection. An idea must be developed. A partially developed idea that requires considerable polishing up, even if it is covered by a patent, is worth only a fraction of one that has been carefully thought out in all its final details and leaves nothing for a potential buyer to do in the way of development.

Of course, there are ideas that are so simple and clear cut that they are almost completely formed in the first brainwave. A good example is the crimped hair-pin. Once the idea occurred to the inventor of making kinks in the wire so that it gripped the hair better than a straight hair-pin, there was little else to do but patent the notion and fix up commercial rights. Which

the inventor did ; and made a fortune.

But rushing off to the Patent Office or to a patent agent determined at all costs to be there first and firing off letters to manufacturers just as soon as a provisional patent has been obtained is, generally speaking, quite the wrong way to go about it.

If you believe that you have an important idea, think around it, and keep on thinking around it even beyond the stages of drawings or successful models. Always allow a period during which you keep on thinking of every possible improvement and use of the idea. In that way you may avoid that tragedy of an inventor's life of overlooking vital and most remunerative developments of the idea which someone else nips in and patents over your head.

Those of you who already know something about the framing of patents may say that a patent agent can safeguard one against that by framing very wide claims. But it is dangerous to leave it all to the patent agent, for he can draw up claims only round the idea as expressed by you. It is true that some patent agents contribute a great deal to inventions by broadening specifications and claims, but they must not be expected as a matter of course to invent for you. You are the inventor, the patent agent is your expert in protecting the invention, not an associate inventor.

Sometimes, quite often in fact, an invention is in advance of the art to which it has been designed to contribute. I have had several. One in particular I will mention to illustrate an important point.

Over twenty years ago I thought of a radio idea. This was to apply reaction to a detector valve by means of a coupling between its anode circuit and its filament circuit. This was made possible by raising the filament (cathode) of the valve above the negative line with low resistance coils in the filament leads. The anode coil was coupled to one of these coils.

I styled the circuit the "Filadyne." It was well received at the time and a good many wireless receiving sets using the principle were manufactured and sold. But its efficiency was not so much greater than that of any ordinary method of the time that it had much more than a novelty value. I suppose I made about five hundred pounds in royalties before the "Filadyne" faded out.

Quite satisfied by this return for what I considered to be a minor invention, I allowed the patent to lapse and the principle embodied in it became common property.

Now those of you who have followed the technical developments of wireless closely will realise what I had done. I had let slip out of my hands what was a master patent. When in due course the superheterodyne receiving system came along, it was almost inevitable that the above form of coupling should find valuable uses in the first detector and mixer valve stage.

Most of the portable wireless sets used by the British Army (the "Walky Talkies") embody that invention of mine. It pops up in Radar and all sorts of radio gear. Probably I should have obtained an extension on the patent in view of the fact that the principles covered by it were not fully exploited in the early years of its life. But I stopped paying the renewal fees and the patent rights were lost for ever.

Annoying . . . but there is no case for any justifiable grievance. The invention was before its time. If, as was the case with me, one has dozens of patents running, the payment of renewal fees becomes a considerable yearly charge. So those not earning royalties to offset their renewal fees, and which one thinks have no further value, are just lapsed. And I have lapsed many more that were in fact of no further value than those which, having been lapsed, were later proved to have possessed additional money-earning possibilities.

I shall return to this point later from a different angle when I discuss the selling of inventions in detail. In the meantime, it is to be noted that it has often happened that an idea has become public property before the most valuable practical applications of it have been discovered. The history of invention is full of such instances. That was unfortunate for the inventors who failed to reap a full reward, but, as I have explained, it is the practical application which evaluates an invention, not its theoretical virtues.

CHAPTER IV

WHAT TO INVENT

Definition of "invention." Advice that is misleading. Making money from ideas which cannot be patented. Inventing to order. Where to search for ideas. A word of warning. Motto for inventors.

Most people consider that anything original is an invention. Well, that may be a correct definition in the general sense. An original dance step or a new method of organising a production line in a factory might reasonably be called an invention. One has even seen a system of shorthand similarly described. But none of these things conforms to the legal definition of the word. This is that an invention is any new manufacture that is the subject of letter patent.

Therefore, it is the Patent Office which determines whether or not the word invention can, in the legal sense, be applied to an article, because it is from the Patent Office that letters patent are issued. And this authority is not nowadays lightly wielded.

But although an idea cannot be protected by a patent, for the

reason that it does not conform with the official interpretation of the legal definition of the word invention, it may still be an idea that has monetary value to the originator.

Therefore, the advice often given by those who think only in terms of patentable ideas, may sometimes be misleading. I have had such words said to me as, "Yes, I think this is all very sound, but you won't get a patent for it, so it is not worth spending any more time on it." Earlier in my career as an inventor a statement like that from, perhaps, a patent agent or an expert in the line under discussion, might have made me abandon the notion. In fact, on one occasion I allowed a valuable idea to be freely publicised because I was told by a firm of patent agents (I have not mentioned their name in this book) that it was hopeless to attempt to obtain patent protection.

So, in order to make at least a few pounds from the idea, I wrote an article about it for a weekly periodical. Not until that article was published and the scheme presented gratuitously to all who might be interested, was it pointed out to me by someone else that a Registered Design would have provided a measure of protection. At any rate, that, plus the registration of the rather attractive name I had coined, would have given the whole thing some intrinsic trading value. Incidentally, I should emphasise at this point that your rights as an "inventor" of a name are not automatically established merely by you publicising the fact that you were the first to think of it. Another error of my early inventing years taught me that.

I invented a special kind of wireless receiver and coined the name "Unidyne" for it. The invention received a considerable amount of publicity. I had no difficulty in securing patent protection, and, soon after getting an all clear from the British Patent Office, I had fixed for Messrs. Bower Electric, Ltd., to manufacture the sets under royalty, and for the Thorpe Radio Valve Co. to make the special valves, also on a royalty basis. It may interest readers having some knowledge of radio to know that these were the first four-electrode valves to be used in the country.

Thousands of "Unidyne" sets and tens of thousands of Thorpe K4 valves were made and sold; and first hundreds and then thousands of more pounds began to accumulate to my credit at the bank.

Then the bombshell fell. Messrs. Bower Electric's application for a registration of the trade mark "Unidyne" was rejected. Someone else had nipped in very early and secured it as their own trade mark. And that someone else had had nothing to do with the invention. Although solicitors and counsel were consulted, it appeared that neither the firm which had been advertising and selling "Unidynes" nor I who had coined the word, could do anything about it. Fortunately, the astute individual

who had collared the registration never insisted on his rights. Yes, I knew who it was, and it might even be a name familiar to many readers. He taught me a lesson . . . and was kind enough not to make it a financially painful lesson, as he could have done.

The ethics of the matter do not concern us ; if there is protection available for the inventor or those who commercialise his invention, it is up to all concerned to take full advantage of any such protection. If they don't, then the invention has that much less value.

An idea that is not patentable and cannot be covered by any other form of protection, may not be worth as much as one that can be fenced round by such means. Nevertheless, it can still be saleable.

There is the case of a scheme I devised just before the Second World War. It was a sales promotion idea based on premium coupons rather similar in principle to National Savings Stamps. I outlined its advantages and attractions, but gave only a few of the working details, to a firm which I thought might be interested. I asked them how much they would give me for a full description.

The reply took the form of an invitation to go along and discuss the matter with their Sales Director. At first he offered me a position with the firm at a quite good salary. When I politely refused that, he suggested that he "might be prepared to pay me a couple of hundred guineas or so" to organise the scheme for them.

I again said thanks very much, but added that for half the sum he had mentioned I would give him a complete description of the whole thing and he could then do what he liked with it. There was some further discussion, but, to cut the story short, he agreed to this proposal. Whereupon I pulled an exercise book from my pocket, laid it on the desk, and said, "Here it is ; I'll take the cheque with me, and save you the postage."

A young man I knew very well, his name was Alan Biner, once earned a five pound note by suggesting to a "Radio Times" advertiser that if their advertisement could be transferred to a certain page it would have an increased pulling power. Every week on that same page appeared details of a weekly broadcast which lined up well with the advertised product.

Alan Biner had nothing to sell in the way of an idea that could be protected. But the suggestion was adopted and a little cheque sent in grateful acknowledgement. True, they might just have said, "Thank you very much," and left it at that. It's taking a long chance to reckon on payment for what is merely a suggestion, however good it is. I mention the case only as an extreme example and as a pointer.

Ideas are worth money. But the more protection the law

offers to a particular idea, the more likely is some of that money to go into the inventor's pocket. Ideas are also of indirect value, as I have already explained; the more ideas the mind develops, the more there will be to follow. If they do not seem to be of any value to you in terms of patentable inventions or copyright designs, pass them on to where they may be of value. They may be long shots . . . but they sometimes bring something back to you. Alan Biner received five pounds for his "Radio Times" idea; he made much more than that from some of his others. All from a sick bed; he was a permanent invalid.

I once had an idea for a new periodical, but I didn't see how I could make any money from the notion. At the time I was in no position to finance a new periodical, and I hadn't the journalistic experience to warrant me asking someone else to provide the necessary financial backing. So I sent a brief outline of the idea to what I then believed and now know to be the biggest periodical publishing house in the country, the Amalgamated Press.

The result was that, despite my youth and lack of journalistic experience, I was almost at once offered an editorial position with that vast organisation at a salary far in excess of that which I was then earning. Yes, I accepted it, and, within a comparatively few years, was Managing Editor of a group of journals . . . all because of a little idea sent into the blue. Some of my other ideas were not always as successful . . . ! However, ideas of that type I have been discussing can hardly cause loss of money to their originators if they pass them on to others; they may or may not bring in monetary rewards for the enterprise behind their inception, but they are never waste of time

Necessity is in truth the mother of invention. No saying is more strictly accurate. A large proportion of the world's inventions were created to meet obvious requirements. The interpretation of the old tag which gives the inventor's poverty as the meaning of "necessity" is wrong. For every one of those traditional needy inventors all but starving in garrets, there are dozens who were reasonably well situated.

Of course, there are true romantic stories of inventors who rose from comparative poverty to great riches solely through their inventions. Edison is an outstanding example. But Edison also provides an example of something else. He was probably the greatest inventor-to-order of all times. He proved up to the hilt that, in the sense of the world's needs for ideas, necessity is indeed the mother of invention. Practically every one of his hundreds of inventions was the result of his finding the answer to a stated problem.

Edison's phonograph was not the first talking machine. He realised the deficiencies of existing ones and set out to invent

a better one. The same applies to his telephone and cinema inventions. Maxim did not invent the first machine-gun or Stevenson the first steam railway engine. Marconi did not invent wireless or the Wright Brothers the aeroplane.

These men were practical inventors who produced something better than anyone before them, or who gave practical expression to what had previously been mere theories.

If you just think and think and keep on thinking vaguely and at large in the hope that some revolutionary invention will swim into your mind out of the blue, you are not likely to get very far beyond day dreams. You must have something definite, something tangible to aim at. The working principle for the inventor is to locate a need and then to endeavour to invent something to supply it.

Perhaps you believe that there is nothing left to invent, that all possible requirements must by now surely have been met. If so, you could not be more wrong. Tens of thousands of things will be invented during the next year or two. If you are able to get there easily, go to the Patent Office in London every now and then and note the new patents that are issued. There will be among them hundreds of quite simple ideas that are really novel. And if you don't say to yourself many times, "Why didn't I think of that . . . !" I should be surprised. You "can think of that" before anyone else if you apply correctly the principle of inventing to order.

The cynical reader will by now have said something like this to himself. "It's all very well this chap going on and on about anybody being an inventor, but he knows that only one so-called invention in a thousand is successful, and that only one man in ten thousand ever invents anything worth while. He knows that there isn't a dog's chance that more than a very few of the misguided people who buy his book will ever make any money from inventions. He's been lucky himself."

O.K.! O.K.! I do know all this. I realise that only a mere handful of those who are reading these words may make big money by means of the romantic method of inventing. But they will do so because they are the ones with the determination and courage to apply themselves successfully to the work of inventing. There is a technique about it, too, a technique some stumble upon but others have to learn from their fellow men or by long experience. Just as with the stringing together of words called writing articles or short stories or novels. When I was an editor of popular periodicals (I am now Book Editor for one of the Big Three in British publishing) I used to receive hundreds of articles and stories a week. I looked at every one. It didn't take long. Ninety-nine per cent. and more of those received from unknown authors could be rejected almost at sight for failing so hopelessly to obey the first rules of the craft

of authorship. Would-be authors who hadn't troubled to learn the first fundamentals of the necessary technique!

To succeed as an inventor, just as it is essential with authorship, one must not be afraid of work . . . mental work, at any rate.

There was once a youth named Potter. He didn't like work. His job was to turn the taps of a primitive steam engine on and off to make the cylinder move to and fro. It was a monotonous, tiring job. So he rigged up some string connections between the cylinder and the taps which performed the operations automatically. When his employer came along he was amazed to find that, although the lad was lying back fast asleep, the engine was going quicker and better than ever before. Thus Master Potter invented automatic valve action for steam engines. He was the supreme exception to the rule that invention is "half inspiration and half perspiration." Incidentally, the word perspiration should not be read too literally; half inspiration and half determination would be better.

Nevertheless, Potter did invent to order. He was heartily sick of his repetition job and so he invented a simple mechanism to do that job for him. It was quite incidental that he invented something to order that not only met his own immediate requirements, but also the pressing needs of all manufacturers and users of steam engines, something which made the steam engine more efficient.

But all that happened many years ago; millions of inventions have appeared since then. But there are just as fruitful territories for inventors in existence to-day as there were in Potter's time. More, in fact, for our needs have increased.

You should search for ideas among the newest fields of interest, where there is obvious room for development and expansion, where the public's attention is directed, and where big business is investing its capital. Run your mind back over the history of this country. In the early nineteen-hundreds, motoring was beginning to develop. Here was a happy hunting ground indeed for contemporary inventors. Hundreds of thousands of technical automobile inventions were patented during the first quarter of this century; hundreds of thousands of gadget ideas ranging from novel non-slip control pedals to natty arm-rest ash-trays were patented. Thousands of these were mere novelties having no permanent niche in motoring technique, but they made money for their inventors.

Motoring as a potential source of inspiration for inventors is not yet played out. In the meantime, aviation was developing and the aeroplane became a focus of attention for inventors. And it still is. What, you may well say, is there left to invent about an aeroplane? A revolutionary new form of jet or rocket propulsion? If you are not an aeronautical engineer or at least

a qualified mechanical engineer, don't spend too much time on the more technical aspects of flying. But there is plenty of scope for invention of a simpler kind in the aeroplane in the way of improving the amenities and services for passengers.

After flying came that popular entertainment the cinema as a germinator of hosts of inventions. Then, in the nineteen-twenties, wireless opened up in a really big way with the inauguration of broadcasting, and thousands of inventors reaped rich harvests. Now there is television. And there is nothing more certain than that many others as well as scientists will produce patentable and marketable television ideas. The one thing the would-be inventor should never do is to be frightened completely away from a gigantic new development on the score that it is the province of no one but scientists and engineers. Television will provide inventors of all degrees of technical skill with plenty of opportunities for many years to come.

Games, toys and puzzles are grand subjects for invention, and there is plenty of money to be made from them. But the novelty angle is a vital one. A new game or a new toy for kiddies must have something really original about it. It's no good making some trivial change in a well-known design, such as putting topical pictures on Snap cards or coloured stripes on an ordinary top. Such minor variations in design are not patentable, and, in any case, manufacturers can always produce their own versions of well-known ideas as a matter of routine. Some would-be inventors may think that everything that appears in bright new packing and backed by an advertising campaign, is an invention from which some fortunate inventor will reap a rich reward. But many such articles are merely existing lines revived by enterprising sales staffs.

As the toys and games market is a good one, there are plenty of people supplying ideas for it. But there is always room for others. Nevertheless, you must not expect to get away with one bright idea, however good it is; if you can invent one good game or a novelty of some other type, you ought to be able to invent several.

There are always dozens of propositions under consideration by any of the big firms in this line of business, and it is only that new one which stands out well above the rest that has an assured future. And your own estimation as to the merits of something you may have invented might not be shared by the hard-boiled individuals it goes before. Remember, they may see hundreds every year and become a little tired of those propositions which are only mediocre or fairly good.

The games, toys and novelties market is an excellent one for the inventor to prospect, but a hard one to break into. That is why I suggest that if you are interested in it, you should try to invent several games or toys, or what you will, and launch them in

different directions. But never bombard one firm with a whole string of them. And go all out on each invention as though it were the best idea of your life and the only one.

The manufacturers demand two essentials. These are that the novelty should be comparatively easy and fairly cheap to produce in comparison with what could be asked for it. Large margins of profit have to be allowed in this market.

A game does not necessarily have to be extremely simple or be devised solely for the young folk. "Monopoly" is a best seller which proves this; but the best chances of success are usually possessed by a simple idea that strikes some entirely new note. The manufacturer does not directly consider the public; his first thoughts are always for the trade buyers . . . the wholesalers. And these people give the most enthusiastic welcome to new lines that lend themselves well to publicity and sales campaigns.

In short, then, you must invent something which will appeal to the manufacturer because it is easy and preferably cheap to make, while allowing good margins of profit, and to the trade in general because it will provide good material for sales promotion schemes. Sales promotion includes everything employed to promote sales. First there are the advertisements in the trade journals, and, if the campaign is to be a big one, advertisements in the general press and on hoardings and so on. Then there are letters which are sent by wholesalers to their retail clients, window display cards and special display cartons. Of course, the inventor is not expected to prepare all this publicity stuff, that is the job of the various sales staffs. And given a good idea as their ammunition, they will do their utmost to create big sales. But if you desire to succeed in a really big way with a novelty invention, it is advisable to develop your inventions with one eye on their possibilities for providing good themes for publicity.

The two or three weeks just before Xmas are the best selling weeks for all kinds of games and novelties. But don't make the mistake that so many do of thinking that a novelty invention will be in time for Xmas sales if it is placed before a manufacturer in September or October. An Xmas line needs to be in actual production early in the year. Similarly, if Xmas gives you an inspiration, don't put the idea aside because you feel that there will be ample time to develop it for the following Xmas. To catch that market, which is apparently so far ahead, you would need to get to work quickly.

Needless to say, for the foregoing reasons, topical ideas are best avoided.

Sales promotion, including press and display advertising, themselves provide many opportunities for inventors. For instance, there will always be a buyer for an outstanding novelty that

will help to bring a particular brand of goods to the notice of the public. It might take the form of a small article to be sold cheaply as a special offer by a manufacturer, or even a publisher of a periodical. For such a purpose, originality and usefulness are the obvious requisites. Originality would enable the article to be eulogised as something "entirely new," and its usefulness should be such as to give it a very wide appeal.

Devices for window displays offer possibilities. Most of you will have seen the clock without works; just two hands indicating the time in the middle of a clear, plate-glass window, with no apparent motive power.

Then there are signs of various kinds. An example is the illuminated sign that spells out words. A very simple and successful invention is the reflecting sign which, by means of a mirror inclined at an angle, reflects light from the sky through lettering cut in a metal plate. The would-be inventor should also bear in mind mechanical devices for use at exhibitions.

Warring devices are very popular among inventors. Perhaps that is because of the glamour that has surrounded the efforts of the "back-room boys" during the war periods!

But it is seldom that a worth-while military or naval invention comes from anyone outside the official establishments or the great armament firms. The reason is that military science, which is largely pursued under the closest veils of secrecy, is always miles ahead of common knowledge. It isn't even possible to find out what is going on by referring to published patent specifications, for all those that are really important are kept secret. You can be pretty sure that when anything naval or military comes off the secret list and details are published in the press, it is far from representing the last word of its kind.

Of course, there is a remote possibility that something new might be invented by someone outside these secret circles. But it is only a remote possibility . . . very remote. The Government is continually bombarded with amateur inventions, hundreds of thousands of them in the course of any war. Yet nothing original of vital importance has been obtained from that source. There have been stories of even schoolboys inventing marvellous military machines. These stories usually end on some such note as, "It is understood that Government officials have expressed keen interest in Master X's invention," or, "War Office experts have promised to attend a demonstration." And that is usually in very truth the end of the story.

Electricity is still new enough to provide considerable scope for invention. In actual fact, there are probably more electrical devices patented in the course of the year than any other class of article.

Some of these patents, many of them, in fact, describe electrical engineering developments which could come only from trained

scientists and engineers. This sort of thing ; "Electric discharge devices having electrodes treated to increase thermal radiation," and, "Oscillation generator apparatus for induction heating," and, "Apparatus for the electrical evaluation of linear expressions." These are the titles of some recently published specifications.

But as you look down a list of these titles, every now and then much simpler systems and devices can be visualised. Here is an example, "Latch for performing both a locking operation and an electrical switching operation." The patent, number 11945, was issued to a Mr. Young. I haven't examined the full specification, but it is not difficult to gain from the title a suggestion of what it might cover. Perhaps a lock which turns an electric light on and off when the key is turned? Quite an excellent brain-wave, that! It could be applied to a front door, so that a hall-light came on immediately the front door key was used to open the door. Or to a garage, so that the garage light was switched off on locking the door.

That is just the kind of idea that can be thought of as easily by someone with little or no knowledge of electricity, as by an electrical engineer.

But again a word of warning. The would-be inventor should not think in terms of only mechanical ingenuity. Undoubtedly, that is an excellent invention, the lazy man's early morning tea-maker. It comprises a combination of alarm-clock, electric kettle and teapot. A few minutes before the alarm rings at any hour you like to set the clock, the electric kettle is automatically switched on. As soon as the kettle boils, the water is automatically poured into the teapot and then, but not till then, the alarm rings. So the owner of the wonderful contraption is awakened to find a pot of tea already made for him.

All most ingenious and practical. And I believe it has sold well in the United States, which is always a fine market for ingenious devices of this order. But it is not a good example for the aspiring inventor. If your mind gets set on mechanical or electrical gadgets of this style, you may never invent anything that constitutes a new principle having wide and valuable applications.

The alarm-clock-cum-tea-maker is an admirable invention, but its application is narrow. It can appeal only to those people who want their alarm-clocks to make tea for them, and are prepared to buy some expensive apparatus for that purpose. That the idea verges on the Heath Robinsonish, the cartoon type of invention, is of little importance.

To make the point clearer, consider these two gramophone inventions. The first consists of a portable gramophone with spring legs. You open the lid of the instrument and four legs automatically spring out. This invention is obviously limited in its application to portable gramophones, and it is not every buyer

of a portable gramophone who considers "retractable legs" are an essential, as is proved by the few that have been manufactured.

Compare this invention, ingenious and comparatively simple though it may be, with the invention of the disc record which entirely replaced the cylindrical type for all gramophones throughout the world. I know which of the above two things I would have preferred to have invented!

There is this further point; combination ideas, as I might well describe the coupling of an alarm-clock and an electric kettle, or the lid of a portable gramophone and spring legs, are not always patentable. The putting together of two known things is not invariably accepted by the Patent Office as an invention. In any case, there are sometimes hidden snags. Indeed, you might well make the expert smile if you are not absolutely sure of your ground. I will illustrate this with the first thought that comes to my mind. Let me think for a moment.

Supposing you conceived the idea of combining an ordinary tumbler switch with a resistance and you rushed off a "provisional" patent application, and then a description with drawings to a manufacturer of electrical fittings. You might well extol the invention as a most useful one. You click the switch on and the electric light economically goes on only dimly. Then, wanting to read, you click the switch over further, and the light blazes up brightly. Nice to be able to choose between subdued, inexpensive lighting and full brilliance at a touch of the same switch! Any switch, you would explain, could be replaced by the new one without any difficulty at all. Indeed, every house fitted with electric light ought to be fitted with these new two-way-brilliance switches.

If you did manage to obtain an interview with a manufacturer, you would find yourself talking, not to some non-technical business man, but to an electrical expert.

"What is the value of the resistance in this switch?" he might ask.

"One suitable for the job," you might reasonably reply.

"Have you brought a model with you?"

"Sorry," you apologise, "but I thought the idea so simple that a model would not be necessary."

"What about heat dissipation? What about the power factor in A.C. circuits?" And so on.

However, don't let me discourage you. Ignorance can sometimes be bliss for an inventor who produces an idea and pursues it doggedly with no visions of fearful technical snags which, had he envisaged them, might have frightened him away from a unique idea almost before he started thinking about it.

There was the case of the young fellow who knew so little about electricity that he invented a gadget for motor-car lighting sets, which depended in part for its operation on a substance

having the same resilience as rubber and as conductive to electricity as a metal like copper or brass. There wasn't such a thing . . . until someone else invented an electrically conductive rubber, and thereby made that one-time impractical brainwave completely practical!

There have been many inventions among domestic appliances, and there will be many more, as finality is a long way off in the design of electric refrigerators, radiators, cookers, washers and other such things. And nothing is more certain than that there are hundreds of new ideas waiting to be brought forward.

Electrical appliances are only just beginning to assume an individuality of their own. It is not surprising that the first electric cookers should have been very much the shape of gas cookers, or that the first electric fires should have aped the coal fire. The first electric trams were like horse trams without the horses, the first motor-cars were in truth "horseless carriages" in appearance.

It often happens that obvious improvements are for a long time overlooked because of the conditioning of everyone's mind to a traditional form of design.

It is those who can approach the design of new things with fresh minds who make the greatest of all inventors; they invent as they design and they design for their inventions.

Electricity will be the complete slave of the twenty-first century home. Tens of millions of pounds will be paid to inventors as rewards for aiding the realisation of this domestic ideal.

Some of the present-day electrical appliances are comparatively crude affairs, others are quite advanced in design. It is for the individual inventor to search out the weaknesses and to devise improvements. He can do even more than that; he can endeavour to discover new principles for the development of the components of the all-electric home. Coupling an electric motor to a pair of mangle rollers would not be a new principle; it would not be a new notion at all. On the other hand, a simple and certain means whereby the power was at once turned off automatically by an electric cooker the moment before there was the slightest burning of any food, might be a new principle of considerable value.

Electricity will not figure in everything in the house of the future. I imagine there will still be scope for the straightforward mechanical domestic invention, such as a better, cheaper tin-opener. But there will always be plenty of competition among inventors in these lines. The mats and lino between the front door letter-box and the kitchen sink have been paced over and cogitated over by hordes of them, and, no doubt, will continue to be. Clearly, then, the best domestic territory to explore for new inventions is not in the obvious quarters, the kitchen, living-room and passage or hall. My advice is to

go out into the garden or into the lesser used rooms for inspiration and ideas. But do not be lured by the bigger constructional aspects of a house. Prefabrication, building materials and the like are not for the amateur to invent; there are hosts of professionals concentrating on these larger considerations.

You will notice that I have been generalising about this matter of what to invent. This may seem rather vague as compared with those lists of things to invent that have been published from time to time. But what absurdities those lists are; their compilers are either confessing to an inability to invent anything themselves, or are so rich that they can afford to pass on the keys of the treasure chamber to others. Or are those lists merely lists of the unwanted, the impossible and the already-dones? Take your choice! Anyway, I do know this; if I could think of a long list of things to invent that the public was really wanting, things that it was possible to invent, I would keep that list to myself and work hard on it for a year or two. And, by then, I would, of course, be well on the way to being the richest man on this earth.

The intelligent would-be inventor realises that there is no fortune waiting for anyone who has to be told exactly what to invent. He knows that most such lists are lists of the obvious sort of ideas that would occur to anyone's mind and have no relation to practical possibilities or to patent prospects.

Such hoary old-timers as the Unpuncturable Tyre, Heatless Light and Anti-Dazzle Motor-car Lamps appear time after time in these amusing lists. I *could* give you a list; a really good list. It would be a short one; in fact, it would consist of three items. But I am certainly not going to invite numberless rivals to try and work out those three ideas; I am sure I should be beaten in the race to the Patent Office!

Of far greater assistance to the inventor than a ready-made collection of ideas titles, is an inventive observation. There is inspiration for invention all round us in town or country. And the greatest idea of your life may come from the least expected source. Remember Archimedes and his invention of the "Archimedean Screw" while in his bath? Well might he have shouted "Eureka!" (I have found it).

Indeed, a motto for the inventor could well be, "Think anywhere of everything till you've found the one thing."

CHAPTER V

DEVELOPING A NEW IDEA

Expanding one's ideas on paper. How to use words in the description of an invention. Importance of drawings. Easy way to draw well. Five simple rules. When models are necessary. How to get models made. Practical experiments and how to carry them out and evaluate results. Materials for models.

It is seldom that an idea for an invention can be mentally developed beyond a certain point by an inexperienced inventor, unless it is an idea of extreme fundamental simplicity. Generally, a stage is inevitably reached where the development must be continued in a more practical manner, if the idea is to be rounded off properly.

The first step is to write it up in a notebook. As a matter of fact, this practice is followed even by most professional inventors. A careful description in writing helps to bring all the relevant details together. It gives some kind of tangible construction to the idea external to the inventor, which he can then study in a more objective manner than is possible with a mere collection of thoughts, many of which, though persisting in the mind, may not be needed any further.

If the notebook write-up is done with care, it may materially advance the invention. The framing of the words required to present a clear picture of it tends to stimulate further ideas for its improvement.

Even although you are writing in your own private notebook, the words ought to be chosen carefully and the notes be given as precise a presentation as possible. It will be good practice in the cultivation of logical and clear trains of thought. Also, if you eventually employ a patent agent, he will find such notes of very great value. Subsequent notes may, in your judgment, seem to render earlier one's out of date and unwanted. But in the earlier ones, though they may well contain much that is useless and could well be completely discarded, the patent agent might see points which would help him in framing the claims for the patent specification.

Further, it is not beyond the bounds of possibility for your notes to have some legal significance in the event of any legal difficulties that might arise in connection with the patent, especially if these difficulties were to centre around an interpretation of the claims. Inventors' notebooks have often been produced in the courts, and notable decisions have been given largely on the evidence they provided as to an inventor's intentions.

Therefore, it obviously follows that all your notes ought to be dated.

If you intend to write your own specifications and dispense with the services of a patent agent, as many inventors do in the case of at least the provisional application for protection, then your notes will provide the basis for these specifications. For this reason, it is advisable always to make your notes follow something of the form required by the Patent Office for patent applications.

There is no law about a precise form of wording. But what you have to do is to satisfy the Patent Office examiner that your invention is accurately and fairly described. It is true that most patent specifications seem to follow a kind of standardised style of literary treatment, but I think this is a convention that has been developed by the profession of patent agents rather than one which has been insisted upon by the law. Or, perhaps, it would be fairer to say that in the friendly and helpful association and co-operation that exists between the Patent Office officials and the profession, a convention in the use of words in patent specifications has been developed as a consequence of a general desire to put a specification over with a minimum of words and a maximum of clarity. And this is, of course, just as much in the interests of the inventor, to whom ambiguities and loose phraseology in a specification of a patent might prove costly.

Incidentally, I should quickly say two things; the Patent Office officials are, in my experience, just as friendly and helpful to private individuals endeavouring to steer their own patent specifications through as they are to patent agents, and one need not stick rigidly to the conventional, traditional treatment of specifications beloved of some patent agents. Anyway, if you do wander too far off the rails, the examiner will soon tell you all about it in polite but firm terms. However, we haven't got to the point where the finer details of drafting specifications must be considered.

For the first notebook jottings there should be a brief, generalised account of the objects of the invention. Then the constructional details of it, what it comprises, and how it is made, should be clearly given. That corresponds more or less with what you have to do in an application for provisional patent protection, but, as you may have gathered, and as I shall explain in full later, a vital section of a complete specification is formed by what they call the "claims" with which it ends. So I suggest that even preliminary notes ought always to conclude with a summary of all the alternative forms and applications of the invention you can possibly think of; and I will repeat, the whole must be dated.

The three headings are, then: Objects, Construction, Applica-

tions and Alternative Forms. To make this quite clear, I follow an idea through from its conception to the notebook stage. Supposing, as an example, you had been thinking around an idea for a self-winding mechanical bell. The idea might have been inspired by a bell on your own front door; you know, one of those bells which you wind up by twisting the dome round. When the clockwork in due course runs down, you wind it up by again twisting the dome round. But sometimes you forget to wind it. People press the push on the door and nothing happens. So they have to knock to attract attention.

"Why not," you ask yourself, "have a bell which winds itself up when the door is opened and shut?" That seems to be the germ of quite an ingenious and useful invention.

You think around the notion from all angles. Is the mechanical door-bell sufficiently in demand these days to stand a new and rather more complicated design, however attractive? You decide that it is, and that one which would never want winding would have advantages even over an electric bell of the battery type. True, those people with electricity laid on to their houses could just as well have their door-bells run from the mains. But those without electricity, and there are still many of these, though they are decreasing in number, would surely welcome a self-winding bell, and, indeed, prefer it to a battery-driven electric one with its messy cells that need periodic maintenance, or relatively expensive dry cells that need renewal from time to time.

Therefore, you decide that the idea is worth pursuing, and endeavour to think out a principle for the operation of such a device. (It will not be until you have schemed the whole thing in fairly intimate detail and have made your first notes, that you will try to assess the invention in terms of probable commercial practicability.)

The self-winding action must obviously take place near the jamb of the door at the side where the hinges are; perhaps there could be a lever projecting from the mechanism which would be pushed back as the door was opened, and so impart a winding motion to the spring by means of a ratchet.

But what would necessitate having the pushbutton for ringing the bell right over on the hinge side of the door, and this might not always be convenient. After dwelling on this problem for a while you arrive at what seems to be the perfect solution, and that is to use a flexible cable of the type used for cycle brakes, to connect the push to the bell mechanism. By this means, the two units could be placed to their best advantage without affecting their efficiency.

After a few days of mentally building up a design, you arrive at a point where the general principles of the invention seem to have been fairly well rounded off. A concise outline should

now be recorded in your notebook. Write it in ink and don't forget that vital item, the date.

It is worth spending a careful hour or two on these notes. Don't hesitate to use ordinary, simple words, and keep well in your mind that the purpose of the notes is to provide a clear description of the objects, construction and applications of the invention. Head the notes with a title. Pursuing our example, a suitable title would be "Improvements in Mechanically Operated Door-Bells." Now there are two points to note in this title; the use of the word "improvements" and the use of the plural form.

Our invention is not an entirely new device; let us accept that fact right away. We can fairly claim that it is a better mechanical door-bell than any other, but it isn't all new. There have been spring-actuated door-bells in existence for decades. But ours is wound up automatically; it can never be on a door in a useless, unwound condition.

Nothing is lost by thinking of the invention as an "improvement"; on the contrary, there may be much to be gained. If you ever invent anything that is in every respect entirely novel, you will have made a discovery which can be presented as such in your notebook and elsewhere. But when you arrive at the stage where others have to be told about it, you will find nothing stimulates more suspicion and criticism than a claim that an invention is "entirely new." It seems to provoke people, including Patent Office officials, to search the harder for evidence to disprove the claim. It is a challenge. And if something even only remotely resembling the invention can be trotted out to cast doubts on your statement, you will to that extent seem to be discredited.

To say that an invention is "an improvement" implies a modest acceptance of the fact that there may be other things like it. But, and this is the psychological point with a punch, your invention has something that other things like it haven't got!

A thing that is said to be completely original is obviously untried. There may be snags. No history of practical testing and trying and proof of service lies behind it. On the other hand, in our title, "Improvements in Mechanically Operated Door-Bells," we as much as say, "You all know of the mechanically operated door-bell and its usefulness, but, despite its proved success, it has disadvantages which you will also know. This new invention removes these disadvantages. In other words, it puts the finishing touches on a good old friend."

I have enlarged on this point because it is important that the inventor should see his invention in its proper perspective right from the very beginning, and to adopt that attitude towards it which is most likely to react favourably on it.

The second point is the use of the plural in the title. And the purpose of this is to make our mind receptive to alternative forms of construction. To make an invention comprehensive, to provide subject matter for broad patent claims, and in that way to anticipate rival inventions, as much ground as possible must be covered in its forms of construction and its applications.

It is a grand thrill to get an invention on to the market, but intensely irritating if it is quickly followed by something that is an improvement on it, but which belongs to someone else.

Now your notes should not be a kind of publicity blurb for your own private consumption. Whatever your enthusiasm for the invention, and the more you have of that the better, keep it well under restraint while you pen your technical description. Employ a minimum of adjectives; leave the "amazings" and "wonderfuls" for others to say. Keep your sentences short and to the point. Long rambling sentences will be difficult for you to follow on subsequent re-readings. Don't forget, the main purpose of your notes is to present for your leisured consideration a clear picture of the invention, sharply in focus.

As a guide, this is the way I would write up the mechanical door-bell invention:

Improvements in Mechanically Operated Door-Bells.

The object of this invention is to provide means for automatically winding a mechanically operated door-bell. The ordinary mechanically operated door-bell embodies spring mechanism which is wound by twisting the dome round. If this is not done, the bell will not work. There may be bells of this nature which are wound up by means of fixed or removable keys; my invention eliminates the necessity for any manually-operated winding action.

In one form of construction there can be a small lever, connected to a rack and pinion movement, which would be pushed back every time the door was opened. The full extent of the movement of the lever corresponds with the full mechanism is wound by the operation of the bell (note the use of the present tense to give the invention reality), so the lever tends to return to its original position. But on opening the door, the lever is pushed back towards the fully-wound position.

The bell mechanism can be on either side of the jamb of the door. A metal plate can be provided to thrust against the lever. The lever could have a roller on its end to reduce friction on the plate.

The simplest form of construction necessitates having the bell mechanism complete with push close to the hinge edge of the door. To provide greater freedom of choice in the positions of the mechanism and its push, the push can be

remote from the body of the mechanism and connected to it by means of a flexible wire cable. Alternatively, there can be a bell-pull arrangement coupled to the mechanism by either a wire or cord.

* * * * *

Now we have a picture of the invention in words. It is as well to put it away for a day or two. Then, with a fresh mind, spend an hour trying to think of every conceivable modification of the idea and jot these down in the form of dated supplementary notes. I will continue the example by pretending to do this, and you may be interested to know that, until the moment of writing these particular words which you are at this instant reading, I hadn't the faintest notion of what would follow them. Here are the further notes as I would write them.

Instead of a lever action to wind up the bell mechanism, there could be a wire or cord or chain to rotate a barrel containing the spring. Pulling the wire, cord or chain on shutting the door would wind up the mechanism in this manner. Or there could be a direct ratchet and pinion action between the bell mechanism and the door with the ratchet on the door jamb and the pinion on the mechanism unit on the door, or vice versa.

As an alternative to the winding being done by opening or shutting the door, it could be done by means of a geared movement under the door-mat or under a movable floor-board near the door, this movement to be actuated by the weight of any person treading on the mat or floor-board. In this case, the bell mechanism could, if desired, be mounted on the wall or skirting.

There may be other forms of construction which would widen the scope of the invention; I will leave it to you to try and think of some.

An invention is made a great deal clearer to others if drawings accompany the written description. These also make the invention clearer, in its practical aspects, to the inventor. Therefore, all inventors ought to make a practice of adding sketches to their notebooks. This may seem a tall order to those who have not hitherto done any drawing beyond noughts and crosses and the like! But the drawing required to illustrate inventions does not involve the highest form of art. It is true that for a patent specification, the drawings must be at least fairly competently done, but when the time comes for these to be executed, you can have them drawn for you.

In your notebook sketches you should embody as much form and detail as you can; in this manner you will be planning the practical expression of your invention as you draw. Don't make

the mistake of thinking you ought to be able to dash a drawing off freehand in a few minutes ; once the notion is accepted that anything up to an hour or more must be spent on even a small sketch, you will discover through your painstaking effort that you can draw much better than you thought you could! I would remind you that great painters sometimes spend hours on just one short line, rubbing it out and drawing it again until they have exactly the effect required.

I don't suggest that you should go as far as that, but you should take your time and first make the sketches in pencil, without hesitating to rub out poor lines several times if necessary.

The pencil must be fairly hard and sharp-pointed. The notebook should have unruled pages and not be small ; certainly, the page area ought not to be less than that of an exercise-book. If need be, extend the sketches over two full pages. Within reason, the bigger you make your drawings the better they will serve your purpose.

When you take the pencil in your hand in order to present in sketch form your idea of how your invention should look and should be constructed, you may feel quite lost as to how to start. But you must remember that before the world can ever enjoy your invention it must assume some concrete, tangible form, and the earlier you yourself contribute to this the more it will be your own invention and not merely an idea worked up by others. As I have already said, sometimes an invention is so simple and so fundamental that it does not require much development, but one like our self-winding mechanical bell does not come into that category.

The strength of the patent and its potential financial value might well depend upon the ingenuity displayed in presenting alternative forms of design. And the details of these can seldom be worked out without the aid of drawings.

The ideal would be to get a good book on drawing and train yourself to draw. Or you could practise drawing simple objects and copying other people's drawings out of any illustrated book ; a little of that might suffice to get your ideas over with sufficient clearness.

Here are five simple rules to follow :

1. Pay strict attention to proportions. If one part of a mechanism is supposed to be twice the size of another part, make sure that it is shown to be twice the size and the relations of all the other parts must be ~~correctly~~ maintained in this way.

2. Use a ruler for drawing the straight lines, even short ones, and a compass for drawing as many of the curved ones as possible.

3. Use the rubber generously and never leave a line that you are not fairly well satisfied with.

4. Letter the sketches liberally. If it is not immediately obvious what a part is, write its name in block letters near it,

or use a letter or a figure and provide a key below the drawing.

5. Copy as many parts of the drawing as you can from other drawings, or from photographs. Draughtsmen call this rule, "using references." Of course, you must not copy whole drawings or identifiable parts of them; at least, not if there is the faintest chance of the copies being used outside your own secret notebook, or you will be infringing someones copyright. However, the scheme is simply this, and it is extremely good practice for the beginner: Supposing you wish to illustrate that self-winding bell invention, instead of, for example, trying to draw a part of a front door you would search in some likely book for an illustration of some sort of door that you could, in part, copy. Naturally, it might take some time to find such a picture, but it would be time well spent.

Then you would, perhaps, require to draw some box-like structure to represent the bell mechanism, and, even for this, it might be worth while trying to find in a picture in some periodical or book, something having the required shape. The same principle could be followed for even some of the small parts of the device.

Now I have been referring, as an example, to an illustration intended to show the suggested outward appearance and application of an invention. Of even greater importance are the drawings which illustrate its detailed mechanical construction. These do not require to have pictorial form, to be three-dimensional pictures. In other words, perspective is not essential. They can be simple plan and section drawings. Their main purpose is to record clearly in simple drawings your ideas as to the various forms of construction that you visualise.

Although the drawings made at this stage are for your personal notes, they will obviously constitute the basis for your later descriptions. Therefore, they should as vividly as possible give all the essential information; they should not only supplement but also, in the foregoing sense, duplicate the accompanying text. Care and patience are investments at every single stage in the development of an invention.

I will remind you that a vital aim of the inventor must be to widen the scope of his invention to the greatest possible extent. Clearly, it is an advantage to spend plenty of time on recording every conceivable aspect of it in the notebook. Clarity in regard to the objects and applications of the invention and comprehensiveness in constructional alternatives are the secrets of sound inventive lore.

In the same way as there inevitably comes a time in the history of most inventions when they must be translated from the mind to paper, so does the time subsequently arrive when the question of a model has to be given consideration.

All those who are mechanically minded and have had some experience at carpentry and woodwork, will enjoy building a model or rigging up experimental testing apparatus. This is, indeed, the most exciting of all the inventor's activities.

Others who have no skill with tools will find themselves facing a considerable problem, particularly if their inventions are at all complicated in construction. But it is often essential for an invention to be given some sort of practical test before even the inventor himself can be sure it will work. However promising it may seem in theory, in practice it might prove a complete failure. And there is nothing so humiliating for an inventor as to have his invention discredited after having used all his enthusiasm about it for the purpose of getting someone interested in it.

Although some ideas may be so straightforward and obvious that models are not essential, the safe rule for the inexperienced inventor is that a model is almost always required. If you are very well up in a subject, such as, for example, automobile engineering, can prepare machine drawings and are able to discuss every aspect of an automobile invention on equal technical terms with any expert, then a model might not be needed.

I will admit that even for a handyman, the business of model-making can present difficulties. The model of a simple device is one matter, a model of a fairly complicated mechanism is another. However, there are several solutions. The fortunate ones who have enough money to cover the cost can get their models made for them. There are small engineering firms that actually specialise in the making of models for inventors. You can obtain the addresses of such firms from a patent agent.

But before an order is given to a model-maker, a hard and fast estimate should be obtained in writing. There are in this line, as in all trades, some rather "fast workers," and I don't mean "fast" in the ordinary sense of speed!

On the other hand, there are some very good model-makers. Many years ago I was directed to one by the big firm of patent agents I was then employing, and I must say I obtained excellent services from them at most reasonable rates. In fact, they contributed many ideas of their own which considerably added to the value of the particular invention for which they made models.

However, one must not expect such people to invent for one, any more than patent agents should be expected to perfect not-quite-practical inventions. But a good model-maker can render invaluable service in improving minor mechanical details, and will often regard that as part of the contract. Naturally, if you request a model-maker to devise for you some apparatus concerning which you have only vague ideas, that may involve him

in experimental work that he will rightly charge for at appropriate rates.

Alternatively, you may be able to get a large firm interested in your invention to the extent that, in return for rights in the patent, they will be prepared to develop the idea in their own workshops. But, quite justifiably, they will demand favourable terms in return for their co-operation.

It is essential that provisional protection should be obtained by the filing of a professional application at the Patent Office before anyone is told anything at all about the invention. This is necessary not only to guard against the invention being deliberately pirated by someone, but also to keep its patent title clear. Any "prior publication" might invalidate the patent even were it granted by the Patent Office.

Now I may have given the impression that making a model is a straightforward job in many instances, and that it is a final stage that rounds off an invention. But often a considerable amount of experimenting has to be done with the completed model, and it may turn out to be only the first of many models that have to be constructed before the inventor is satisfied that his ideas are sound in all respects.

Many changes, some quite fundamental, might have to be made in the design before this conclusion is reached.

When putting a model through its paces, one must beware of that insidious desire which besets most inventors to see their inventions through rose-coloured glasses. It is so easy to ascribe to one's own wonderful invention virtues which, in cold matter of fact, it does not possess.

Those inventions which are designed to do something better than anything else of a similar nature, ought to be tested comparatively under proper test conditions. To explain more clearly what I mean, I will describe some experiments with one of my recent inventions. There are quite a few lessons to be learned from these experiments and I will indicate them as we go along.

I begin with the first vague idea and show you how it was worked up. I was endeavouring to think of some way of improving the performance of an aeroplane. As I am not an aeronautical engineer, that was a pretty ambitious line of thought, in view of the intense research that is carried on by both government and private laboratories, in regard to all aspects of aero-dynamics. And I must say that I consider such mental adventuring in the nature of a very long shot. However, there is always the chance one may conjure up something that has eluded all the experts.

I thought of having extension wings which could be fully extended to get the machine off the ground and then retracted once it was air-borne. But although I haven't heard of an aeroplane designed with such wings, I concluded that this must

be one of those obvious ideas which had not been overlooked, in view of the work that I knew had been done on clipped wings plus pick-a-back take-offs.

Then, what seemed to be quite a nice little brainwave popped up. Now the earlier aeroplanes had propellers with uncovered hubs, or whatever you call them. The blades grew out from a flat central affair carrying the bolts which held the propeller in position.

Nowadays, this hub is always covered by a stream-lined "spinner" to reduce its air resistance. It is a kind of cone-shaped covering. But inside this cone there may be the mechanism for automatically altering the pitch of the blades to maintain the greatest efficiency of the propeller under varying conditions of altitude and so on.

Why not, I thought to myself, go one better and make that "spinner" not only reduce air resistance by virtue of its stream-lined shape, but also do some useful work and contribute to the pull of the propeller by having ribs moulded on it which would be, in effect, extensions of the blades?

My enthusiasm for this idea grew. I thought all round it. There didn't seem to be any snags. I visualised that plain cone affair buzzing round in the centre of the propeller. If the blades were removed altogether, it ought to be possible to mould ribs on it which, by following the required curves, would give the spinner a propelling action all by itself. Add the blades and you would have a propeller with normal efficiency plus the little bit of extra pulling power contributed by my "screwed spinner" in the centre.

I was so sure that it was a good and practical invention that I concluded that if it had been thought of before it would be bound to be in use; that it must be one of those obvious things which had hitherto passed everybody by.

I wrote it up in full in my notebook. I drew sketches in which the screw ribs were shown with, according to my calculations, exactly the correct pitch for a particular propeller of normal design. Incidentally, I secured the propeller details from a book on aeronautical engineering which I borrowed.

But, although the idea seemed to be perfectly straightforward, I decided to rig up a miniature testing equipment to try it out. First, I carefully carved out a small two-bladed propeller about nine inches long. Then I made two removable stream-lined spinners; one with screw ribs and the other exactly the same size and shape without these ribs.

I attached the small propeller to an electric motor, which I suspended by means of wires from the ceiling of my workshop. The great moment had arrived: I was to enjoy the thrill of the first practical experiment with the invention.

I fitted the plain spinner and switched on the small mains-

driven electric motor. The contraption moved forward and quite steadily held a position out of the vertical by virtue of the propeller's pull forward. I switched off and changed over to the screwed spinner. Again I switched on. The suspended motor seemed to pull its suspension wires appreciably further out of the vertical.

So far so good. But I was an old hand at this experimenting, and realised that my eyes might have deceived me. I *wanted* to see the propeller move the motor forward a greater distance! One must not trust one's senses too much in testing an invention.

Therefore, I fixed a thin cord to the back of the motor and led this cord over a pulley mounted rigidly on the edge of a bench. On the free end of the cord I fixed the lid of a tin for the purpose of carrying weights. Behind, I placed a board with white paper tacked on it so that the exact height of the tin lid from the floor could be marked.

See the idea? I was able to note exactly the height to which the tin lid and weights were raised by the motor when, first, it was fitted with a plain spinner on the propeller, and then with the screwed spinner that I had invented.

The test was apparently quite successful. The screwed spinner did add to the pull and lift the weights higher to quite an appreciable extent. But don't jump to the conclusion that, with my wonderful spinner on, the motor went buzzing right up to the ceiling; my calculations were that the pull was increased by approximately three-quarters of one per cent. for a precisely determined and constant electrical power input. I had a special arrangement to maintain a constancy of input.

It is quite certain that the improvement would not have been perceptible to the eye; the motor probably moved forward only a further degree or two. But I had left casual observations and imagination behind, and was now measuring the results with fair accuracy.

Three-quarters of one per cent. may not appear to be much. But increasing the effectiveness of a propeller that amount would, in practice, mean a substantial gain. It might add three and a half miles per hour to the maximum speed of a single-engine fighter, more to a twin-engine type. And this with something that could be fitted to any aeroplane, and which would cost hardly anything at all.

I carefully prepared a full description of the invention and sent it off to the Air Ministry. They were at once interested, and asked for an explanation as to how I had arrived at the performance figures. So I gave them an account of the tests I had carried out and the calculations I had employed to assess the results of those tests.

Unfortunately, it seems that my tests were not sound. They appeared to me to be quite all right. Here was an electric motor

suspended on wires With a propeller fitted with an ordinary spinner, the motor moved forward with such and such a pull ; with my screwed spinner, the power of the pull forward by the motor was increased to this and that extent for exactly the same amount of electrical power.

Where had I gone wrong? My tests, said the Air Ministry, were static tests. The conditions were not the same as if the motor were continuously rushing through the air. Courteously, the Air Ministry explained that, on a dynamic test, the invention failed to show any improvement. On the contrary, there was even a tendency for the screwed spinner to lower the overall efficiency of an aircraft to which it was fitted.

Exactly why this should be, I just don't know. But I accepted the verdict of the experts who were able to test such inventions with apparatus that precisely duplicates the conditions encountered in full-scale aeronautical practice. There is often a wide gap between theory and practice ; even theory which seems to be proved by tests with a small-scale model.

In the case I have outlined, the gap was apparently unbridgeable. The idea was shown to be fundamentally unsound. There did not seem to be much purpose in pursuing further an idea of this order. One might as well forget it and try to think of something entirely different, for the idea has a narrow quality which forbids wide thinking. The moment one tries to conceive of something which is the same, yet sufficiently different to be worth further experimenting, one finds oneself off the spinner! Or does one?

The answer to all this is a very definite "no" If the idea were new, and at first appeared to be heading in the right direction, then, despite adverse reports from all the experts in the world and all the tests to be devised by experts, the idea must never be entirely jettisoned. Put it in cold storage by all means, but never kill it.

I have made this point already, but it is one that can hardly be over-emphasised. Nor can that one in reference to the testing and performance of inventors' models. There are some inventors who, if they invented something that, according to their theories, ought to make a blue bag turn red, would see red in any colour revealed during their testing! Wishful thinking has a lot to answer for in the lives of would-be inventors.

Nevertheless, one must not be dogmatic about such an aspect of inventing. The world would still be waiting for many great inventions that we have enjoyed for years, if the men who conceived them had been turned aside from their work by the pronouncements of contemporary experts. And who is there to say that in at least some cases there was not just a little self-deception in the initial stages? Marconi told me he was over-optimistic during his first wireless experiments ; it didn't seem to do him

any harm in the long run. Edison stated he would rather an inventive employee of his would be super-optimistic than hyper-critical and pessimistic of his own efforts. Said the great American inventor, "It is easy to hire a careful scientist, there are plenty of them, but imaginative and creative craftsmen are harder to find."

Now it will have been noted that my screwed spinner model was quite small. Naturally, one often builds small models because it is much easier to do so. The construction and testing of a full-scale aeroplane propeller in an engineering undertaking of some magnitude, and out of the reach of the majority of amateurs.

But it is by no means certain that the results achieved in a small model will be comparative in a definite proportion with those given by a full-scale version. There may be all kinds of factors that ought to be considered before any calculations as to probable results in practice would prove acceptable.

Just as one must be wary of the small-scale model and its results, one must also beware of jumping to conclusions with an incomplete model. It is all very well saying to oneself hopefully some such words as, "Well, there is no need to fiddle about any longer; this part works all right; add the required this or that or the other and it is bound to be O K." But is it?

In any case, it ought always to be remembered that a model is generally in the nature of a sample. A very well made model will at once create a good impression on others. If it also tells the whole story of the invention in a practical manner and clearly shows what it can do, the good impression it makes will obviously be greater still.

There will be no need for apologies and long-winded explanations. If the invention is some working mechanism, then the model must be a working model, otherwise it is not much better than a drawing. Indeed, it might not be as good, for a detailed machine drawing can be appreciated by an expert almost as well as a model.

The materials of a model require careful thought. Again, if it is designed to show some new form of working mechanism, the nature of the materials used might have an important bearing on performance. Wood can, of course, often be employed instead of metal, and ingenious inventors have done wonders with old tins, pieces of cardboard and so on. But would-be inventors must learn to appreciate the limitations of substitute materials.

These are generalisations; it is impossible to be more specific, for the range of inventive endeavour is so wide that definite rules cannot be laid down to meet all contingencies. The inventor must often apply his inventive powers to the task of devising and building models. But he must not "invent" results to satisfy his theories. When an inventor moves from the

mental plane to model-making, he should realise that he is entering the first fields of hard fact.

CHAPTER VI

LEGAL PROTECTION FOR INVENTORS

Pitfalls of premature disclosure, and how to avoid them. Collaboration for development Suitable agreements. A guide to the laws relating to copyrights, registered designs, trade marks and patents: their relative values and how they apply to inventions.

THE atmosphere of intense secrecy in which inventors are supposed to work, has been the theme of many thriller stories. Some inventor heroes of fiction have done their experimenting in huts on lonely moors, with savage dogs to ward off intruders, others have worked behind electrified fences on otherwise uninhabited islands, or even on ships that have sailed away to secluded waters.

Fiction also provides lurid stories of unscrupulous villains stealing plans from inventors. Despite their exaggeration, there is a great deal of foundation in real life for such plots. It can, indeed, be fairly said that they are dramatised allegories.

The need for secrecy concerning an invention is very real. An inventor can jeopardise his patent prospects by describing an invention in detail before he has received provisional protection from the Patent Office.

If, for example, he were to write an article for a periodical or newspaper giving in full the why's, wherefore's and how's of his invention, that would, in effect, be telling the public that it was free for all, and that he did not want a patent monopoly. At least, that might well be the attitude of the Patent Office if, subsequently, anyone objected to the issue of a patent on the grounds of what is known as "prior publication."

Again, telling people about the invention just in casual conversation could result in somebody using the information as a basis for an article for publication; or it might be passed on and on in the way of interesting things until, eventually, that happened.

And in this imperfect world there is always the possibility that lurking around is an out-and-out thief of ideas, who would not hesitate to pirate the invention and rush in a patent application bearing his own name. So the inventor is right to take precautions, and, while he is working on his invention, to refuse to discuss it with anyone, even a friend or near relation. If

others poke fun at him because of his secrecy, well, let them laugh.

Not a soul should be let into the secret until provisional protection has been obtained from the Patent Office, either by the inventor himself or a patent agent acting for him.

It would be foolish not to take full advantage of the protection the law provides. Certainly, no form of partnership or collaboration should be entered into without the inventor first "taking out a provisional."

Collaboration or partnership is sometimes necessary. Maybe, for the purpose of securing financial backing to develop an invention, though this is not in my experience easy to get. You must first find someone who has the required cash, and then convince him that he will back a winner by financing you and your idea. It is not a pleasant undertaking for an inventor to try and obtain backing of this kind, for most inventors have somewhat proud and sensitive natures!

The money can be found if you look far enough, and, of course, if the idea appears to others to be sound at heart; but it may prove to be uneasy money that will be kept well in your mind by the lender, or expensive money that can be paid back only by a major share of the profits. Take it from me, if you can't get a big firm, or at any rate a sound and honest little firm, to develop your invention on a sharing basis, then the next best thing is to sell it outright at whatever you can get for it.

There is another kind of partnership, and that is a partnership of individuals having as its object the moulding of an idea into a practical invention. For example, you might have, in theoretical outline, a grand brainwave but lack the required technical knowledge or mechanical experience to work it into practical shape. If you had a friend who was a trained engineer, or at least a skilful amateur, or you were closely acquainted with the proprietor of a small workshop or garage, then suitable help might readily be obtainable.

But you should start in on a businesslike footing. I have had two collaborators at different times, and how different they turned out to be! The first one was Squadron-Leader Keith Rogers. We were partners for some years, and shared all our ideas (and profits) in, probably, a dozen inventions.

That was a fine, inspiring and fruitful partnership with never a single difficulty. Who contributed the most in the way of original ideas or ideas for building them up, I just don't know. There was never any attempt on either side to assess that; it was a perfect fifty-fifty relationship, and not one disagreement of any kind. Nor was there anything at all in writing to establish our individual rights; we hadn't got any; it was each for both and both for each. A grand partnership founded solely

on mutual trust and friendship. Thank you, K.R., wherever you are, for those happy and profitable years.

Later, I had a different kind of partner. Again, there was no written agreement. He was a clever engineer. He was so clever that he devised a better mechanism than I had invented. It did the same job by means of simple mechanical motions instead of employing rather complicated electrical circuits. He patented and then sold his mechanical version without any reference to me, and seemed quite astonished when I endeavoured to convince him that I had some claims in it, in view of the fact that it was the direct result of our partnership, and was obviously inspired by my invention.

However, I did not go beyond using a few blunt words to dissolve our partnership. I may have had a case at law, but litigation is not to my liking, for it inevitably takes the form of mud-slinging in public. So I merely said to myself ruefully, "I've had it; one more lesson learned!" and then proceeded to direct my thoughts and actions into other quarters. The lesson I learned is that there must always be an agreement in writing in any partnership. And I now extend this sentiment to the limits. Even when I get a local garage to make me small parts for one of my models, I obtain a written undertaking from them that they will not claim anything from the proceeds of any patent that I might take out in connection with any apparatus with which those small parts might be used.

Of course, there must always be a certain amount of give-and-take in any form of partnership. Written agreements framed by the craftiest solicitors in the land cannot cover everything. In fact, there has hardly ever been an agreement signed that couldn't have had a horse and cart driven through it, if one of the parties were intent on evading its terms.

Therefore, the strongest elements of any agreement will be the unwritten parts of it, the spirit behind its drafting and its implementing. Yet it does serve the definite purpose of clearly setting forth individual rights, responsibilities and commitments so that there cannot afterwards be any arguments, however friendly or otherwise, occasioned by lapses of memory and other causes of misunderstanding.

The form a partnership agreement should take for the development and selling of an invention, will depend to some extent upon the nature of the invention, but here is an indication of the items that ought to be included. I should first mention, though, that I have been using the word "partnership" in its more colloquial sense: there is a rather tight legal definition of it that will not always apply to the kind of agreement two people may make concerning an invention. This will generally be fairly straightforward, for there will not, for instance, be a trading concern and all its intricacies to form the background

as when two people enter into association for the running of a business.

If you are entering into an agreement with a company in regard to an invention that they are to develop, obviously it will have nothing to do with any other aspects of the affairs of that company. It will be a very limited form of partnership. Incidentally, they may take it as a matter of course that they will be drafting the agreement. That would save you money initially, for it is usually cheaper to have an agreement vetted by a solicitor than to have one prepared. But it may be a false economy, for it is generally harder to get the second party to include certain clauses that may be favourable to you in the first place than to accept them once they are embodied.

So the inventor will be well advised to instruct a good solicitor to draft the agreement, though this is not a course to be pressed if strong objections are raised against it, particularly if the firm is a reputable one which might, through its association with you, bring you great prestige, and, possibly, big profits. There is the likelihood that it has a special patent department which, through the years, has standardised forms of agreement to suit all normal cases. These may even be printed, though they are not necessarily sacrosanct because of that. Never sign a printed form that is casually laid before you, without first having it scrutinised by a solicitor.

Now for the clauses. There ought to be one that clearly defines the general terms of the association, and another that limits the financial liability of the inventor. If the other party is a private individual, there can be a straightforward cost-sharing arrangement, but it would be unwise to sign an agreement embodying such a clause with a strange industrial concern, for it might conveniently debit vast sums to the development of the invention! Then what about patent and legal costs? I always take the view that these are burdens for the big fellows to shoulder, and I have so far generally been successful in making them do it. The inventor provides the essential germ . . . the new idea . . . the big fellow, the firm, weighs in with capital and other facilities for its exploitation. Who is there to say which is the bigger contribution?

Now if the agreement is between two ordinary people, their relative shares in expenditure and profits are a matter for friendly thrashing out, and the results ought to be clearly set down in the document. It is also reasonable to contract that every item of expenditure should be subject to the approval of both parties before it is incurred.

Then, and this is quite vital, there must be a straightforward statement as to any individual, parallel activities. Personally, I am all for a really strong tie-up in this regard. If two people get together for the purpose of developing an in-

vention, then all their inventive activities subsequent to signing the agreement, however remote they may be from the original invention, ought to be pooled while the agreement is in force. Of course, this cannot be done with a large firm that might be patenting dozens of inventions every year. You might be able to have a clause included that gave you some rights in any invention protected by the firm which could be said directly to have resulted from work on your own invention. But what is such a clause worth? Precisely what that firm wants it to be worth. This is one of the things that must be left to goodwill and the strength of your patent and the claims with which it concludes.

To forestall any difficulties, many firms will not have anything to do with an invention unless it has been granted a full patent. This is as much a protection for them as for inventors. The complete patent specification outlines the officially accepted scope of the invention.

There must be a period set to the agreement. The time it is to remain in force and the terms of renewal, if any, are points to be settled with the advice of a solicitor, and, perhaps, patent agent.

Then there are questions of commercialisation to be thought around and talked around and eventually embodied in clauses. But for information about these, I will refer you to chapters nine and ten.

Finally, that unpleasant word dispute has to be given consideration. What is to happen if the parties to an agreement just cannot agree as to the interpretation of something or other in the agreement?

The solution is to name an arbitrator, whose decision both parties bind themselves to accept in any case of dispute.

A patent agent or a solicitor will often be willing to act in such a capacity, and, of course, it is necessary to obtain their permission beforehand.

Now, before we discuss patent law and procedure in detail, it will be as well if I give a brief outline of the various forms of legal protection which may be useful to inventors. It may happen that the laws relating to copyright might be applicable in some circumstances.

The Copyright Act is not directly concerned with such inventions as pieces of machinery and so on, but gives expression to the rights granted in every civilised country to authors of literary, musical and artistic works to prevent the reproduction of their works without their consent.

Now it has been held that charts and tables are covered by these rights. So if you were to devise a new system of time-keeping for railway schedules which involved an original and very special arrangement of times and so on, or a new telegraph code, or a chart that gave in some novel manner a ready-reckoner

kind of reference for chemists or electricians or dog-racing fans. or what you will, it would probably be protected by this Copyright Act. And nobody else would be able to commercialise any colourable imitation of the idea without risking the danger of proceedings for infringement.

One word, even a word coined especially by an inventor as a name for his invention, or a title for a book or system or anything else is not covered by copyright. Nor is a chemical formula.

The duration of a copyright is for the lifetime of the author and fifty years after, except in the case of gramophone records, perforated rolls and other such articles for the reproduction of sounds, and photographs, where the duration is fifty years from the time they are made.

There is no registration and no fees have to be paid to secure copyright protection in Great Britain. It is automatically granted. If you can prove that you are the author of something, that is all that is necessary in proceedings for infringement. But, and this is very important, copyright is not a monopoly. If someone were to produce a chart or a table of signs and figures for some special purpose which closely resembled one that you had devised, there might be no case against him if it were merely a coincidence. The fact that you were first in the field would not mean a thing, if he could prove that this was a quite innocent duplication of your idea. Indeed, for there to be a case at law it must be clearly proved that it was a deliberate piracy; in short, the act of a thief. As a matter of fact, you could not get damages from anyone who really did copy whatever it is in which you claimed copyright, if he could convince the court that it was an innocent act, and that he did not know there was a copyright existing in the work.

That is the fundamental difference between copyright and patents. With a patentable invention, the inventor establishes a monopoly if he gets in first with a granted patent, and even if some poor chap had been working for years on exactly the same thing, he has no rights at all if, metaphorically speaking, he arrives even a single day later at the Patent Office. The most he could do would be to try to oppose the granting of a patent on the grounds that there was prior use or prior publication.

Copyright protection is available on an international basis. An owner of a copyright in this country is automatically given protection in, for example, France or any other country subscribing to what is known as the Berne Convention. Unfortunately, the United States is still outside this Convention, so that special steps have to be taken to secure copyright protection in that country. It is not a straightforward process for the citizens of other countries to do this, and, therefore, I would

recommend anyone desiring to obtain this protection in the United States to do so through a patent or literary agent. This must be done before the copyright is exploited elsewhere, otherwise it might subsequently be found that the U.S. rights have been lost. A copyright is negotiable, and it can be sold or licensed in much the same way as a patent.

You have no doubt seen on articles the words "Registered Design," followed by a number; or the words might be abbreviated to "Regd." or even "R.D." Such an inscription is a warning that anyone deliberately copying the designs of these articles is infringing copyrights, and, therefore, liable to penalties.

But this is not quite the same kind of copyright that we have been discussing. However, the legal aspects are, in many respects, similar. The major difference is implied by that word "Registered." A Design has to be registered at the Patent Office in order to obtain protection.

It is almost impossible to define the line between what constitutes an ordinary copyright, and that which is subject for a Registered Design. The two merge and tend to overlap. Many things which automatically fall within the cover of the Copyright Act can be registered as Designs, but, unless their copyright strength is doubtful, there would be no advantage, as the life of a Registered Design is shorter. On the other hand, many designs are registered simply because the Copyright Act would not give them any protection.

The Copyright Act says that:—"This Act shall not apply to Designs capable of being registered under the Patents and Designs Act, 1907, except designs which, though capable of being so registered, are not used or intended to be used as models or patterns to be multiplied by any industrial process."

This means that the Copyright Act does, in fact, apply to designs which are not used or intended to be used as models or patterns for articles manufactured in factories. And it also means that someone who has devised some minor variation in shape for an article must not expect to be able to fly to the Copyright Act for a lifetime of protection against all comers in the commercial field. He must register this variation in shape as a Design, so that all others, by reference to the files at the Patent Office, will be able to know that it exists as a copyright for a period.

The subjects of copyright according to the Copyright Act are literary, musical and artistic works. Quite rightly, the person with artistic ability who produces something original which falls into these categories is given automatically full rights in his work for the whole of his life, and, for a further fifty years, his heirs or the persons to whom he has assigned rights can enjoy the full benefits of its use. A Design is an essentially commercial thing, and has as its main purpose the giving of

distinction or individuality to the goods produced by a manufacturer.

The rights in a Design last for five years, and, on the payment of further fees, can be extended for two further periods of five years. A Design applies to printing, painting, embroidery, weaving, sewing, modelling, casting, embossing, engraving or other means of reproduction by manual, mechanical, or chemical means, separately or in combination. The utility of a Design is in no way concerned with its validity for registration.

It is a very useful form of protection, and it often happens that something which does not contain subject matter for a patent can be protected in this manner. But, in many cases, it is not a very strong form of protection, for anybody else could register something similar, providing it was different in a substantial manner.

It is wrong to say that only a minor alteration need be made to evade infringement. Any obvious imitation would certainly be actionable.

The cost of registering a Design varies from 2s. 6d. to 20s., according to the class in which it is registered. There are 15 classes as follows:—1. Metal articles and jewellery. 2. Books and bookbinding of all materials. 3. Articles of wood, bone, etc. 4. Articles of glass, earthenware or porcelain, bricks, tiles, or cement. 5. Articles of paper, cardboard, etc. 6. Articles of leather, or in which leather predominates. 7. Paper hangings. 8. Carpets, rugs, linoleums, and other floor coverings. 9. Boots and shoes. 10. Millinery and wearing apparel. 11. Goods not included in other classes. 12. Printed, woven or embroidered designs on textile piece goods, other than stripes or checks. 13. Printed, woven or embroidered designs on shawls and handkerchiefs, other than stripes or checks. 14. Printed, woven or embroidered designs, being stripes or checks.

The one design can be registered in more than one class. And it is permissible to obtain patent rights as well as a Registered Design for the same article. It is sometimes advisable to take advantage of this fact.

A Registered Design can be sold outright or licensed on a royalty basis in the same way as a patent, and Designs can be registered abroad, although there is a period of only six months grace allowed from the date of registration in this country for the claiming of a priority date under the terms of the International Convention, as against a year in the case of a provisional patent application.

The subject of a patent has to be useful in the sense that it will do what it sets out to do; Letters Patent are issued only for things that work or have a function. But, as I have said, the utility of a Design has no bearing on its validity for registration; indeed, quite a number of articles protected as Registered

Designs are purely ornamental. As a matter of fact, you cannot register as a Design any working mechanism; that sort of thing is subject matter for a patent, though, of course, all patents do not have to be working mechanisms.

Now, bearing all this in mind, of what real value to an inventor are these facilities for registering a Design. Well, they can be of fairly considerable value. You may have a really brilliant brainwave, but find you cannot obtain a patent for it, even though apparently no one has thought of it before.

A jug that was drip-proof in a novel manner might be well and truly patentable; but a jug that had an original shape for no special practical purpose would not be patentable, however striking the originality of its shape. But it could be given fair protection by the registration of its design.

A new kind of ladies' wedge shoe, which was merely a novel shaping, would not be accepted for patenting at the Patent Office, but if some ingenious springing in a wooden sole were incorporated to facilitate walking, then Letters Patent might be granted.

Broadly, you see, a Registered Design is what you would no doubt think of it as being, a new design divorced from all considerations of usefulness, whereas, and also broadly speaking, a patent concerns a process or article which has a definite purpose in the way of doing something or enabling something to be done differently from, or better than, anything else of a like nature.

Let us take another example. Supposing you thought of a means of making the bathroom walls for prefabricated houses out of some plastic material, and had the further brainwave that the plastic material should be moulded in large sections to look like separate tiles cemented together. You apply for a patent, but find that you cannot obtain one, as the use of the particular plastic material in such a way is not patentable. It might still be possible to register a design of tiles for moulding on the surface of sheets of plastic material.

And a manufacturer of plastic materials might think it worth while to buy your Registered Design. But don't expect a fortune from such a transaction. Registered Designs, as I have indicated, are not as strong as good patents. Their strength is to a considerable extent the strength of the owner. That is to say, if a large industrial organisation with great capital behind it puts an article that is a Registered Design on the market, there is less likelihood of others trying to chisel in with colourable imitations. A few thousand pounds here or there for the purpose of issuing writs, applying for injunctions, instituting other legal proceedings, taking actions to High Courts, or even the House of Lords is nothing to a big public company, which might have a permanent legal staff to protect its interests. A

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smaller company, or a private individual faced by the possibility of an action brought by a concern able to command the services of the best lawyers in the country, would hesitate to proceed with anything that might be ruled as infringing the copyright of the Registered Design.

If the situation were reversed, and it was the big fellow who was blustering on to the market with an article that was directly competitive with a design that was being marketed by a little fellow, then the little fellow might well think twice before he took action, if his case were not cast-iron, and the infringing design were not a very close infringement indeed.

So you see a Registered Design is not to be lightly thought of as something an inventor can license widely, and in which he can maintain a monopolistic interest, as might be possible with a patentable invention. It is more in the way of something to put up to some companies that might be interested, in the hope that one or other of them would be prepared to do something of a deal.

Trade Marks are registered in a similar manner to Designs. But a Trade Mark is a name or mark for the distinction of a manufacturer's goods, or of a business. It is not so much something to be invented by an individual for sale to the highest bidder.

Yet the inventor might well remember the Trade Mark. If, in his search for novel ideas, one occurred to him that seemed to have very striking features, and it also appeared to be just the word or mark to denote some new product that had just appeared on the market, it would certainly be worth while putting it forward to the firm concerned.

A good registered Trade Mark is one of the most valuable commercial assets in existence, and often manufacturers meet with the greatest difficulty in devising one for a particular purpose. Sometimes prizes are offered for suitable marks. At the moment of writing these words, there is a series of prizes being offered through the medium of a trade paper for the best name for a new product, and the competition is open to all. A firm with which I have been associated has examined over two thousand marks devised by various members of its large staff, and has not yet found THE one.

But from the point of view of the inventor, there is a much more important aspect of Trade Mark registration than the chancy business of thinking them up for other people; this is the use of Trade Marks in connection with his own inventions.

A Trade Mark can be a word and an invention becomes, commercially, of greater value if a first-class name is coined for it. As a matter of fact, its coined name can be its greatest value.

Supposing you invented an extremely good vacuum cleaner. There are already many good vacuum cleaners on the market.

Despite its merits, your vacuum cleaner would have to face intense competition, so much so that a manufacturer, whatever his sales resources, might well hesitate to enter such a competitive market. However, if you could think of a name for your new vacuum cleaner that would make a very good Trade Mark, and which might help to put the appliance over with the public, then that could conceivably turn the balance.

But it is to be noted that a Trade Mark consisting of a word must not bear such a close resemblance to any existing mark that it is likely to be confused with it. It need not be a coined word, but if it is a dictionary word, it must not describe the nature or quality of the article to which it is applied. The well-known Trade Mark "Sunlight" is a good mark, because it has no direct bearing on soap, but Hot-Spark or Super-Plug applied to a new sparking plug would not be accepted.

CHAPTER VII

ALL ABOUT PATENTS

Provisional protection. Can patent agents be trusted? When a patent agent is essential. Guide to the charges made by patent agents. Official patent fees. "Patentee" and "Inventor." Joint application for a patent. Patent rights of individuals Inventor-employees and their rights. Works ideas and suggestions schemes. The official requirements of an invention. The four categories. How to write a provisional specification. Cognate applications. Choosing a title for a specification. Search for anticipation at the Patent Office. The complete specification. Official questions and objections. Hearings at the Patent Office. Master patents. Life of a patent. Grounds for revocation. Renewal fees. Licences of right.

EVERY country in the world appreciates the services of the inventor; at any rate, to the extent of affording him a legal status. And in return for the payment of fees, a world monopoly can be obtained for an invention. If it is a worth-while invention, the value of this monopoly may indeed be enormous. It means that only those firms licensed by the patentee can manufacture and sell the invention. But the procedure of obtaining a patent, and the conditions of its granting vary in different countries. It is not possible to obtain a world patent from an international authority. Separate application must be made in each country.

There is, however, a bureau at Berne that operates in conjunction with an international convention, which, among other things, covers patent rights. Most countries are parties to this convention.

In accordance with it, anyone applying for patent protection in any of the countries, establishes claims in all the other countries. These claims hold good for twelve months. So if you apply for provisional protection in Great Britain, the date of the application is conceded in the U.S.A. even though the papers are not lodged in that country until, say, nine or ten months have elapsed.

One does not have to apply for provisional protection as an essential preliminary to obtaining a patent. A complete specification can be filed in the first instance if desired. But there is no great advantage in this; no fees are saved. But it sometimes happens that it is possible to get into production quickly with an invention. For example, the research and development section of a big firm might produce an improvement in one of the firm's existing lines which could be effected by only a slight modification in the manufacturing process. In such a case, a complete specification might at once be lodged, for it is only a granted "complete" that gives a patentee any operative legal rights.

You cannot take legal proceedings against anyone merely on the basis of a "provisional." In fact, provisional protection is only the fixing of a date. But dates are obviously vitally important to an invention.

If anyone lodges a provisional application before you do, and that application specifically covers the same idea as is expressed in your invention, then you might not secure a patent unless you were able to show that there had been a fraud and not an innocent anticipation. Even a granted patent may be invalidated if it can be proved that there was a previous publication of all the details of the invention.

It might at first seem wrong that an inventor cannot get a good patent simply because he has described his own invention in a newspaper or periodical before applying for protection. But this is how the patent law stands, and it is a just law. Supposing publication in the general press were permitted without prejudicing the later claims of an inventor for a patent. The obvious development would be that publication by an inventor would establish his rights and the whole system of patent protection from central authority would be undermined. You might even have imaginative journalists using all the skill they could command in order to anticipate possible inventions for the purpose of staking claims in other people's future ideas!

However, subject to notification, a paper can be rushed through for the printed transactions of a learned society, or read before

members of that society, without prejudice to a patent applied for within a prescribed period.

An inventor cannot have his invention stolen from him for the exclusive use of some artful thief who has engineered some kind of published anticipation. But it is not impossible that he could have his patent wrecked so that he loses his monopoly and the idea becomes public property.

There is another aspect of this matter. In some circumstances, an inventor cannot even use his own invention without jeopardising the value of any patent for which he subsequently applies. Supposing a manufacturer had a brainwave regarding machinery for making paint brushes. If he used the machinery in secret, you might think he had a perfect right to do so, and that as long as nobody knew anything about it, he ought to be able to apply for a patent any time afterwards. The law says no; if he were allowed to get away with this it would mean he might well enjoy a monopoly of his invention for a much longer period than is normally allowed by law.

The cost of provisional protection is one pound. And for that you get provisional protection throughout most of the world. And all by merely taking or posting some forms to the Patent Office.

If you think you have invented something good, it is surely worth while spending one pound to stake a claim for a monopoly in its use. Not another soul ought to know anything at all about the invention until you have taken this step. That is, with the exception of the patent agent, if you decide to employ one for the drafting of the provisional specification.

Can patent agents be trusted?

British patent agents have to be registered in much the same way as doctors, and it is a legal obligation. If any patent agent were to do anything dishonest, his name would be removed from the register, and the Patent Office would refuse to have any further dealings with him. Therefore, the mere fact that a patent agent is practising is a pretty good guarantee that he is doing his job in a trustworthy manner.

so should be three reasons why inventors who can afford to do and most important, the employment of a patent agent. First of making patents watertight. Patent agents are experienced in the art of making watertight patents, thousands of. And, believe me, there are against the most powerful attacks. My that have stood firm were assailed from a host of quarters without success. Unidyne patents

The second reason why a patent agent can be useful to an inventor is because of his expert knowledge of patent law and procedure. He can steer a patent specification through official objections and preserve a maximum of value in it against all

kinds of attempts on the part of a Patent Office examiner to narrow it down.

Finally, a patent agent may contribute a great deal to an invention in the course of expertly preparing the specification. In my earlier days as an inventor I owed much to patent agents in this way. Very often they would suggest alternative forms of construction which had not occurred to me, and which were sometimes better than those I had envisaged. Even nowadays, there are occasions when I prefer to engage the services of an agent rather than to rely entirely upon my own ability in the drafting of specifications.

If patents in other countries are required, then a patent agent is practically essential.

In general, the fees of patent agents appear to conform to some kind of more or less unofficial uniformity, although they will, of course, vary a great deal as with specifications of different lengths and different degrees of complexity. Naturally, a long, involved specification accompanied by many drawings will cost you more than a short, unillustrated one.

The charges of a patent agent for drafting a provisional specification will probably be five guineas for the simplest one, and range up to seven or eight for the more complex. Drawings are usually avoided at this stage, although they may be demanded by the Patent Office, and then they must be supplied.

The official fee for completing the application is four pounds. Alternatively, five pounds must be paid if a complete specification is lodged as a first application and provisional protection avoided. The patent agent's fee for a "complete" will range from seven or eight guineas up to fifteen or more, in accordance with its complexity, number of drawings, "official objections," correspondence, and so on. His charges for steering a patent through on a world basis and all the official fees may amount to hundreds of pounds. As much as seven or eight hundred pounds might have to be spent to give an inventor full patent protection in all the principal countries. But it might be well worth it. And, in any case, perhaps someone else can be made to pay in return for some concession in the rights!

The words "patentee" and "inventor" do not mean the same thing. A patent issued to an inventor applying for office and for his own invention establishes him as both the the person for inventor, for the official definition of patent the grantee or proprietor the time being entered on the register is convenient for two or more people who have been associated in the development of an invention to a joint application. It is not necessary for both to be described as inventors on the form of application. both here could be four applicants, and only one of them given that description. But, in the absence of any statement in the patent

or any other contract to the contrary, the ownership of the patent, when it is issued, will be equally shared among all the applicants.

In the official language, unless otherwise specified, they shall "be treated for the purpose of the devolution of the legal interests therein as joint tenants."

Any of these "joint tenants" could use the invention for his own profit without accounting to the others, but he is not allowed to enter into independent arrangements for licensing it.

Many inventors do their utmost to avoid having other people's names mentioned in their patent applications, even to the extent of breaking off negotiations on that score. I suppose they fear that they risk losing all control of the invention, and that the coupling of other persons' or firms' names with their name in the patent gives them the right to veto any exploitation of the patent, should it suit their purpose to do so.

But it does not. The Comptroller of the Patent Office has wide powers to administer fair play. He can even give directions for the granting of licences, if he thinks the patent is unreasonably being withheld from the public. In fact, patent law is extremely equitable, and there is always that beneficent despot, the Comptroller, appeal to in any difficulty. And if anyone disagrees with his decision, he can go higher and appeal to the Appeal Tribunal consisting of a judge of the High Court nominated by the Lord Chancellor.

So the inventor need not worry about being chiselled on account of some involved technicality connected with patent rights. One of the main purposes of the Patents and Designs Act is to give fairplay to inventors and those associated with the use of the invention. At every turn, the Comptroller has power to interpret patent claims and licensing details in that spirit.

But there is one thorny bone of contention and that is the position of an inventor-employee relative to his employer. It has often been said that the inventions of an employee automatically become the property of his employer. Well, in some circumstances that may be right. If a man is engaged and paid as a research worker or as a designer, and he is provided with tools and facilities for such work, then it is fair that the results of his work, including patentable inventions, should become the property of his employer unless, of course, there is a contract to the contrary.

There might be such a contract or an agreement which entitles the employee to some share in the profits of such patents, or to some fixed bonus. In the absence of such a contract, the employee has no claim. But a patent application must include the name of the inventor or anyone who contributed a material part of the invention, or it may be rendered invalid.

A workman employed by an inventor to work out in detail

principles he has discovered, is not entitled to be joined in a patent application.

What about an ordinary mechanic who operates a machine in a machine shop? Supposing he invents a better machine; what are his rights? The answer is to be found in another question; to what degree is the invention due to the use of the firm's time, materials and the nature of the work to which the inventive employee was directed by the firm?

From which you will gather that there can be numerous border-line cases. When these arise, the inventor ought to get advice from a patent agent before he takes steps to assert a claim. At any rate, you can take it from me that the law to-day does not regard an employee as a vassal whose whole existence can be enslaved by his contract of employment, written or implied.

The Employers and Workmen Act gives power to the courts to settle disputes between employers and employees on such matters, as well as almost all others that may arise out of their relations. Not that I would urge anyone into litigation if it can possibly be avoided. But the machinery is there as a check on grasping employers. There are some. I know of a case of a man employed by a large printing organisation which tried to divert an invention from him on the claim that there were overriding employer's rights. Yet his invention, invented and developed in his spare time, had nothing to do with printing, out was merely concerned with an industry in which a company associated with that printing firm was engaged. Simply because of this associated company, the firm tried to make out it had rights in the man's invention. Which is the same kind of thing as saying that a brewer's drayman ought to deliver up to his brewery employers a recipe for a pudding he had thought out because the brewery was associated with a company running hotels!

Of course, the printing company had no case. Yet the incident is a reminder that there is still quite a feudal flavour about some of these big companies. But there are other employers who will give every encouragement and assistance to an inventive employee, with no thought of curbing his rewards.

It is a common practice for some enterprising organisations to run suggestions schemes. Their employees are invited to submit ideas for improvement of machines, production methods, general organisation and so on. Money prizes and other awards such as extra holidays are offered.

It sometimes happens that patentable inventions are forthcoming as a result of such schemes. Supposing a clerk in the planning department of a factory submits a practical idea for increasing the efficiency of a plastics moulding machine. He wins the principal award of, say, twenty-five pounds. The firm

patents the idea and licenses other firms to make it. A year or two later, some one points out to the inventor that his invention has proved extremely successful and must now be worth a great deal of money. Has he any claims?

There might be some thin claim in respect of licensing the patent, on the score that the employee was led to believe that the idea was to be used only in the factory of his employees. But I doubt if the case would lie well, as they say in legal circles, as there was a clear-cut buying and selling of the invention.

The firm could advance a strong claim in defence of their action, and in their assertion of ownership rights. They offered prizes for ideas. The best of these prizes was given for what seemed to be the most useful idea. But it was, they might say, an expensive business trying it out and patenting it. Only when the inventor saw that this enterprise was rewarded, did he make a claim. Would he have repudiated the original transaction whereby he received a cash payment for his idea if the invention had subsequently caused loss to the firm? Would he have offered to return the prize money and to share the losses?

Anyway, the terms of such schemes are plain enough; cash payment for ideas. Cash payment for suggestions, including any that might be patentable, if you like to throw them in. No idea is a "patent" until it has gone through all the vicissitudes of official patent procedure and stood the test of publication.

If an inventor does not visualise the possibilities of an idea until someone else has developed it and patented it, that is his own fault, and he has no right to grumble at anyone but himself.

When an idea has been thought of which seems to have possibilities of being a good invention, it can certainly be advanced as a suggestion in a works or any other scheme. But provisional patent protection ought to be secured first, and, when the idea is entered, that fact made known to the organisers of the scheme. There should also be a plain statement in writing about the rights in any granted Letters Patent.

If that seems rather outside the spirit of a suggestions scheme and the spirit of co-operation in industry, then all I can say is that an inventor should not enter a patentable invention in such an affair. It might be better to approach the management separately about it, if it is indeed an invention in which they might be interested. It may not in all cases be legally essential for an employee to approach his employer about an invention, but if it is in their line of country, it is a courtesy which at least is not likely to do any harm.

Until fairly recently, the Patent Office seemed to accept almost anything for patenting providing it satisfied the general requirements of novelty within the meaning of the Patents and Designs Act. That is why enshrined within the official archives are

some of the weirdest and most ridiculous ideas ever conceived by man.

But a present-day examiner at the Patent Office will not accept a specification describing as an invention, "A means for transmuting lead into gold by melting the lead in an earthenware vessel exposed to beams of light from the moon."

Indeed, the examiners demand that an invention should not only have novelty but also utility and an ability to work. They will not give an official welcome to crazy things.

Nevertheless, a provisional specification generally has a fairly tolerant reception. It is not required to provide a detailed description of the nature of an invention and its working. Very often an inventor is not in a position to give these when he first feels impelled to stake his claim for patent protection.

The only official necessity in a provisional is that it should clearly describe in not too general terms what it is that the inventor claims as his invention. And, I repeat, for the point is vital, it has no value as an instrument for instituting legal proceedings for infringement. Just because the Patent Office accepts and gives a number to a provisional specification, that gives no right to the inventor to describe his invention as "patented." It is not patented until Letters Patent have been issued in respect of a complete specification.

An inventor should have some idea as to what officially constitutes subject matter for a patent. It is waste of time trying to get a patent for any invention which completely fails to comply with the definition in the Act which reads, "'Invention' means any manner of new manufacture . . ."

I cannot tell you exactly what these words mean, and nor can anybody else. Numerous decisions have been given in separate cases, but not in any one of these decisions is there a real explanation. They all deal with the particular facts in question

There was the case of an applicant for a patent who was apparently endeavouring to obtain a patent for the use of well-known electrical apparatus for the purpose of extracting lead from living objects. The application was refused, because it was concerned with the treatment of human beings, and it could not be said that the extraction of lead from their bodies was a process employed in any form of trade or manufacture!

It seems that different considerations might have arisen if the specification had been limited to the treatment of cows or sheep, since these are merchantable articles!

On one occasion I had a letter from the Patent Office, regarding one of my own inventions, which included the statement, "The examiner reports that the alleged invention in so far as the subject matter of claims 1 to 3 is concerned is not a manner of new manufacture within the meaning of Section 93 of the

Acts. It appears to be merely a scheme or plan for using a known physical effect to cause certain sensations in an observer of visual scenes, or an auditor of sound reproductions."

I suppose, on the analogy of the decision in regard to the lead-extracting invention, I would have got a claim through if it had been limited to the entertainment of cows for the purpose of improving their yield of milk!

Bearing all this in mind, it is obviously necessary to base a patent specification on the apparatus needed to produce an effect rather than on the effect itself, however novel it might be. Which, when you think about it, is fair enough. Patenting an effect such as, say, the changing of the colours of stage-lighting simultaneously with changes of volume or pitch of the music from a cinema organ or orchestra is merely the idea; for patent purposes, you must show you have novel apparatus to produce the effect; in other words, you must have a manufacture!

Machinery, apparatus and processes, and saleable articles produced by chemical or mechanical operations appear to be the kind of things that are patentable.

And almost all patentable inventions can be placed in one or other of the following categories:—

1. A new contrivance applied to a new purpose. This is the highest form of invention; examples are the first telephone and the first apparatus for projecting moving pictures on to a screen

2. A new contrivance applied to an old purpose. That is, in other words, inventing an article or process for doing something that is already being done and perhaps being done very well by other means.

3. - New combinations of old things. But it should be noted that the combination must not be an obvious one; it has to result in something that is substantially new. For example, it would not be regarded as a patentable novelty merely to combine a cup and a saucer in one construction. But if a cup and saucer were so designed that, by means of a moulded screw on the saucer and a screwed socket in the bottom of the cup, they could be used together as one object or separately in the usual way, that might get past the Patent Office examiner. That is, if no one had done it before.

4. New method of applying a known object. This is about the thinnest kind of subject matter for a patent application. As an illustration, the examiner is not likely to pass a specification which claimed the use of ordinary paper clips for holding plants to stakes or wires. However, there need be only a small amount of invention, so long as it introduces an appreciable improvement in the way of economy in time or labour or in some other way.

It is a common error to suppose that the validity of a granted

patent is unassailable; that once you have pushed a patent through the Patent Office it has an official immunity against any attack. This is far from being the case. Hundreds of patents have been successfully assaulted in the courts, and the thinner their subject matter the more vulnerable they are to attack.

There is always this as well; the examiners at the Patent Office are not infallible. They certainly do their best to approve only good subject matter for patenting, for it would be contrary to the spirit of the Act to grant a monopoly for an invention which did not fully comply with the official requirements. But they may overlook or not be aware of a prior publication that might knock the bottom right out of a claim that a particular invention has novelty.

In the United States the official investigation into novelty is extremely thorough. Not only are patent specifications and technical literature in that country searched for possible anticipations, but those published abroad into the bargain. And the examiners are most strict. That is why many big firms prefer to apply for an American patent before completing a British application; it is one of the finest tests of the probable validity of a patent.

But to return to the application for provisional protection. If you decide to draft the specification yourself, you can obtain the required forms at any postal money order office in Great Britain. The stamp is one pound. When completed, the forms can be posted to the Patent Office.

The provisional specification needs to be drawn up as a kind of initial summary of the complete specification. These should not be thought of as separate things. You, or a patent agent you subsequently employ, can include in the complete any improvements made in the invention subsequent to filing the provisional; indeed, you are obliged to do this, for a complete specification must be a complete disclosure. But if the complete specification is so different that it amounts to the description of a new invention, it will not be accepted, unless it is amended. Alternatively, the provisional specification will be cancelled, and the application treated as though it had been made on the date the complete specification was lodged at the Patent Office.

The writing of the specification for a provisional application does not demand that degree of meticulous precision in the use of words which is essential for the complete specification. This is simply for the obvious reason that the provisional is not, for patenting purposes, the final and finished description of the invention. It is a kind of synopsis and need not be minutely detailed, so long as it gives a clear outline of the principles of the idea.

Of course, it must be a thoughtful description, and not a hurriedly brief and scanty one; nevertheless, it is something

an inventor can do for himself if he has an average ability in the use of words.

The secret of laying the foundation in a provisional for a good patent, is to use sentences which, while being perfectly clear and free from obscurities and ambiguities, are not too definite. For example, considerable use should be made of such words as "may" and "might."

Here is a sentence which appears in one of my own provisional specifications. It deals with an idea for improving the sound reproduction of talkie apparatus:

"The invention may be employed in conjunction with talking pictures."

Now when I wrote those words I did not think that the idea was applicable to anything other than films. Therefore, I might have written the plain, definite statement, 'The invention is for use with talking films.' But I had in mind the remote possibility (seemingly, then very remote) that it might find some other application, so I used the expression "may be employed," and left the door open for bringing in other uses in the complete specification if any came to light. "May be employed" implied that I was mentioning only one example of its use, and that there were probably others.

As it turned out, in the course of developing the invention there emerged some uses for it in connection with radio and gramophones, but these uses necessitated apparatus somewhat different from that hitherto figuring in my experiments. So I lodged another provisional. In this second provisional I said, "In part the present invention is a modification or development of the prior invention described in my application No. 5203/44"

Now Section 16 of the Patents and Designs Act says:—

"(1) Where the same applicant has put in two or more provisional specifications which are cognate or modifications one of the other, and has obtained thereby concurrent provisional protection for the same, and the comptroller is of the opinion that the whole of such inventions are such as to constitute a single invention, and may properly be included in one patent, he may accept one complete specification in respect of the whole of such applications and grant a single patent thereon.

"(2) Such patent should bear the date of the earliest of such applications, but in considering the validity of the same, and in determining other questions under this Act, the court or the comptroller, as the case may be, shall have regard to the respective dates of the provisional specifications relating to the several matters claimed in the complete specification."

You will see that there is a limit set on this procedure. Otherwise, one could keep firing in provisionals to build up one patent to cover a tremendously wide field and embrace anything relevant that was published, and all under the date of the very first

provisional. But that would be going beyond the whole intention of Section 16, which is really a privilege extended to the inventor to save him the cost of a new complete and its heavy renewal fees, should the invention turn out to be somewhat wider in its applications than was visualised in the first place.

Even so, if the provisional is very narrow in its wording, the examiner might consider the terms of Section 16 are inapplicable. In the instance I have just quoted, the words "may be employed" were probably not by themselves enough to leave the door open for the joining of another provisional. In addition, however, I concluded that first provisional specification with the sentence, "While I have referred specifically to only cinematographs, the invention might also be used in association with ordinary stage production or the like." And this, no doubt, turned the balance.

Incidentally, provisional specifications are quite secret, and are not published in any form by the Patent Office. Only the titles appear in official records. No one outside the Patent Office can gain access to them. When the complete specification is published, then, of course, the provisional one appears with it.

Perhaps it will be useful to the reader if I now, as an example, show how a provisional could be drafted. I will presume that we have had the idea of a flashlamp with a large spring switch running down its full length. This switch is so designed that it operates only when a normal kind of grip is imposed on the torch. In other words, when you grasp the torch in your hand it lights; when you put it down it goes out. It cannot be left switched on so that the battery prematurely runs down. In order that no accidental pressure can light the torch while it is in anyone's pocket, the switch is slightly sunk and sprung at each end.

I would select as a title:

"Improvements In or Relating to Electric Hand Torches."

A certain amount of latitude is allowed in titles, but they must fairly describe the inventions and not be misleading. There is no necessity to strive for learned words in either the title or the body of the specification. Use your own way of writing. Avoid comment and adjectives. Make it a plain statement of fact. Here is how I would frame the specification:

"I, George Victor Dowding, of 13 Streate Row, London, E.C.4, a British subject, do hereby declare the nature of this invention to be:—

"This invention relates to electric hand torches, and has for its object a positive means of switching on the current without the risk of any accidental operation of the switch, and the consequent premature exhaustion of the battery.

"According to one form of the invention the switch consists of a relatively long movable member which actuates

a simple make-and-break mechanism. This long movable member may be disposed along the length of a tubular type of hand torch so that it is conveniently operated when the torch is grasped by the hand. On releasing the torch the switch at once returns to the off position. In order to prevent any unwanted switching through accidental pressure while the torch is carried in the pocket or laid aside elsewhere, the long movable member of the switch is sprung at both ends, and the switch contacts so arranged that only a distributed pressure along the length of the movable member will cause the contacts to close. Further to guard against the accidental operation of the switch, the movable member may be sunk below the surface of the case of the torch.

"The invention may be applied to hand torches of different forms of construction by varying the proportions and position of the switch. For example, in a lantern type of electric torch with a carrying handle, the switch could be embodied in the handle."

I should expect the examiner to pass this provisional specification without comment, even during times when provisionals are examined (at the moment of writing this procedure is suspended), but I doubt if he would do so if it went on to claim the use of such a switch with electric irons, vacuum cleaners and other electrical appliances. He would regard it then as too sweeping. There is no elaborate search for possible anticipation in the case of the provisional, but he would know as I happen to know that the type of switch I have described is, in principle, a common one on portable machine tools and other devices, and, as a matter of fact, I should be surprised if it were new for electric hand torches.

There is nothing to be gained by attempting to claim the sun, moon and stars in a patent specification. While it is obviously wise to make wide claims, one must not be too greedy or the whole patent may be weakened by being nothing but loose generalities. Indeed, the examiner might sharply demand a more specific treatment, and this it would be in your own interests to give.

In due course you will receive a small certificate acknowledging the lodging of the provisional and giving it a number. You are then protected, and the invention can be marketed. Each article can be marked "Patent Pending." "Patent Applied for," or "Provisionally Protected," followed by the number of the application.

If someone else comes out with a flagrant copy of the idea, there is nothing you can do about it except to draw their attention to the fact that you have obtained provisional protection. But on no account must you threaten to take legal proceedings.

Even when you have a full patent, it is dangerous to make threats of that nature, for if you do not follow up such threats by actually taking proceedings which are eventually successful, you may land yourself in for heavy damages.

The granting of provisional patent protection is no tribute at all to an invention. It does not mean that in the view of officialdom you have something worth patenting. No search for anticipation has been made by an examiner

Therefore, you take a chance when you urge someone to put an article on the market that is only provisionally protected. You might be refused a full patent when, later, you apply for one. What you thought in all good faith to be a new invention might, indeed, be already patented by someone else, and any commercialisation of it would be an infringement. Your provisional cannot protect you against this happening.

That is why many firms refuse to have anything to do with an invention until it has been granted Letter Patent.

To save time and expense in developing an invention, and filing a complete specification which might be rejected owing to an anticipation, you yourself can have a search made without waiting for this to be done by the Patent Office. Any patent agent will undertake a search. The fee will be about five guineas for a search through published patents.

He can then tell you whether or not in his opinion your idea is likely to make a sound patent. But, of course, even a search by a patent agent cannot be complete. There might have been "prior publication" of the idea in some foreign journal. However, a good agent can generally provide a fairly complete judgment on patent prospects, because he and his colleagues will be well read in all technical publications.

As I have said, the search made by the American patent authorities is much more thorough than that made by the British Patent Office, and many inventors prefer to lodge a complete specification in that country first. Not much is likely to be overlooked by the American examiners, for they seem to comb the patents and publications of the world for anything bearing on the invention. A similar search done independently through a patent agent would cost a lot of money, but it is carried out as a part of the normal procedure when applying for the American patent and costs nothing extra.

Now it is not impossible for a person with no previous experience to draw up quite a good complete specification for a straightforward invention, though it is not, in my view, wise to do so. If you think an invention is worth patenting, then you should obtain the skilled services of a patent agent to see it through. One need not do this until the possibilities of the invention have been well explored. Under the protection of the

provisional, you can bring the invention to the notice of those in a position to assess its probable value.

The complete specification must be left within a period of twelve months from the date of the provisional, but an extension of one month can be obtained. After that the provisional becomes void if a complete is not lodged.

The patent agent will expect you to help him with the specification, and it would be unfair to accuse him of not knowing his job if he constantly refers to you. After all, you are the inventor, and should know more about the actual invention than anyone else.

Subsequent to the first interview, during which you describe the invention in detail, and, perhaps, demonstrate it with a model, the agent will prepare a draft specification, which he will send to you for your approval. Read this draft very carefully and do not hesitate to criticise the wording wherever you consider it does not clearly convey your intentions. If you can think of anything to add to it, especially in regard to the claims at the end, the patent agent will be only too pleased to give your suggestions his closest consideration, for it is in his professional interests to make the patent specification as comprehensive and as good as it can be made. The name of his firm may appear on the published copy for all to see.

Very few specifications are accepted without question. The examiner at the Patent Office who is given the task of dealing with it will doubtless raise some queries and, possibly, objections. In the first instance, there may be questions regarding the description of the invention.

These will have to be answered, and, perhaps, modifications made here and there in the wording in order to satisfy him. But he can be argued with, and appeals made against him if you or your agent think he is wrong.

Then, after a search by the examiner of all relevant patent specifications published during the previous fifty years, matters relating to prior specifications will probably have to be dealt with. If your specification is completely anticipated, the Patent Office will refuse to grant you a patent. But I can tell you from numerous personal experiences that one need not be worried unduly by that first intimation from the examiner that "it appears that your specification is anticipated by . . ." or words to that effect. Yours would indeed be a poor unfortunate invention if it had nothing new in it at all.

However, any prior specification which overlaps must be taken into account. For the benefit of the public, reference has to be made to it in your specification so that they shall know that if your patent is used it may be necessary to pay tribute in money to someone else as well.

Obviously, a citation (as it is called) of this nature is to be

avoided if possible, for it weakens the commercial value of a patent. But it can be avoided only by adjusting your specification so that it is completely clear of any overlapping from a prior one that is in existence.

And it is in doing this kind of thing that a patent agent reveals his worth, for clearly, as much as possible of the substance of the original claims must be retained in your patent. Sometimes a citation just cannot be avoided. In order to satisfy the examiner it may have to be a sweeping one in some such words as, "I am aware it is a common practice to (do this, that and the other), and that patents number X X X X specifically . . . etc., etc." And in such words you may see the foundation of your patent torn out to leave only a minor improvement in a manufacture which you can claim as your invention. Even so, it might still be a marketable improvement.

In difficult cases, a hearing can be arranged at the Patent Office for you to discuss the wording of a specification with the examiner. Your agent can attend this on your behalf. If you go as well, make sure you have discussed the matter with him beforehand. The atmosphere at a hearing is often very pleasant and apparently informal, but the Patent Office official will be a keen, alert-minded individual not only, and as you would expect, very well up in patent lore, but also extremely knowledgeable about all matters concerning your invention. He will almost certainly have high academic and professional qualifications, and, perhaps, be a fully qualified barrister into the bargain.

He will be able to hold his own against any of the highly-paid specialists he sees who are briefed on behalf of great industrial organisations to attend hearings; so, obviously, he is not a man to be bluffed. You and your agent should put all your cards on the table and make sure that they are good cards. You can take your notebooks or anything else bearing on your invention along with you, if you think they may serve a useful purpose.

When the complete specification has been accepted by the Patent Office, it is advertised in the official journal, and, during the following two months, anyone can enter an objection against it on any of the following grounds.

1. That the invention described in the complete specification differs from that described in the provisional specification.

2. That the nature of the invention, or the manner in which it is carried out, is not fairly and accurately described in the specification.

3. That the identical invention has already been patented in Great Britain, which would include the fact that a prior provisional specification had been lodged, though the complete patent had not been taken out. (This is a nasty one that just cannot be foreseen, as provisional specifications are not subject to an

examiner's search, nor are they available for inspection.)

4. That the opposer himself is the inventor of the invention or the owner of the invention, having acquired it from the true inventor.

Even after the granting of Letters Patent, some one can come along and say that he has a Master Patent which should be referred to in the specification. And he might be right, for examiners are not infallible. If indeed he is right, the Comptroller will order the reference to be inserted.

Incidentally, a really good master patent is a wonderful thing to have; in fact, it is the inventor's dream. It has to be referred to in every subsequent patent in a similar field, and the practical effect is that the new patentees have to pay royalties to the master patentee.

Sir Oliver Lodge had a master patent in his famous "four sevens" wireless tuning specification. If you are superstitious, you may say that a patent numbered 7777 could not help being a master! Anyway, for years this patent stood firm as a master to which the whole radio industry (and every buyer of a wireless set) paid tribute in hard cash.

When a patent specification has stood the test of publication for the prescribed period, and no one has successfully raised objections against it, it is sealed. That is to say, the Letters Patent are sealed and issued to you. The official sealing fee is one pound. Then, and only then, are you permitted to use the word "patent" or "patented" in describing your invention. Any person who sells an article so marked for which Letters Patent have not been granted is liable to a stiff fine.

The life of a patent is sixteen years from the date of the first application. In special circumstances it can be extended for a further term. For example, if, owing to delays in commercialising the invention, delays, perhaps caused by a war, the sixteen years do not bring you a just reward, a petition can be presented to the Supreme Court for an extension. This will be granted, if the Court considers that your claim is justified. The length of the extension will depend upon the merits of the case.

On the other hand, a patent can be revoked by application to the Court for any one of a number of reasons. It has sometimes happened that someone against whom proceedings are taken for infringing a patent will endeavour to obtain its revocation. It is a pretty good defence, to try and destroy the patent!

There are numerous grounds for revocation, including grounds for the rejection of a specification by the Patent Office when it is first lodged, such as the invention being the subject of a valid prior grant, that the true and first inventor was not the applicant nor one of the applicants for the patent, that the patent was

obtained by fraud, that the invention is not new nor useful, that the complete specification does not sufficiently and fairly describe and ascertain the nature of the invention, or is not the same as that contained in the provisional specification, and so on.

All this may tend to give the impression to some readers that it is difficult for a patent to survive if the big guns of a strong opposition are brought to bear on it. But, as I have said, a really good patent will stand up against any attack.

Renewal fees have to be paid in this country on a patent. These are five pounds in respect of the fifth year, six pounds for the sixth year, and so on, right up to sixteen pounds for the sixteenth year.

Not a day's grace is allowed for the payment of these fees. If they are not paid on time, the patent automatically lapses, and can be restored only by special application on Patents Form 16, stamped £20! which must be accompanied by a very good excuse for the omission.

Renewal fees are a considerable drain on the resources of an inventor who has not negotiated his invention. A reduction of fifty per cent. can be obtained by asking, at least six weeks before the payment of a renewal fee is due, to have the patent indorsed "Licences of Right," but that is as much as can be done to cut them down. This indorsement gives anybody the right to use the invention on terms to be settled by the Comptroller of the Patent Office.

In the United States of America, there are no renewal fees, and in some other countries where they have to be paid they are much lower than in Great Britain.

The Patent Office must be notified on the appropriate forms as to any change in the ownership of a patent, and details of all contracts and agreements regarding the granting of licences, or anything else affecting the proprietorship of Letter Patent must be sent to the Patent Office for entry on the Register of Patents. And there are penalties if this is not done. Which is all fair enough; the Patent Office must know what happens to that valuable, legally created monopoly they have granted you.

CHAPTER VIII

TELLING THE WORLD

Value of the right kind of publicity. The wrong kind of publicity. How to obtain publicity. Arranging a demonstration. When, where and how to give demonstrations.

PUBLICITY of the right kind can be most valuable to an inventor. Obviously, if he has a good invention to sell, telling the world all about it will stimulate the demand. But general publicity can react against him if it is premature. There is often a natural urge for an inventor to get his name into the newspapers at the earliest moment. But news is ephemeral; what appears to-day in the newspapers is overshadowed to-morrow by the records of other events.

A paragraph in a national newspaper about a novel domestic appliance, or what you will, that has some intriguing angle, has enormous value if people who are interested can at once obtain that new appliance, but very little value, indeed, if it does not appear in the shops until months have elapsed.

Tit-bits that appear in the papers about inventions do not often result in hordes of big manufacturers and financiers at once rushing to the proud inventor with attractive offers.

If the invention were something completely revolutionary that was likely to obtain follow-up stories in the press, there might be a few opportunists on the scene to try and cash in on the publicity. The really big men in finance and industry will probably just grin sceptically to themselves and turn to other columns in the paper.

You see, in the past, the press has been overkind to inventors. There has been no attempt to discriminate scientifically in the selection of "inventor stories." Any story having colour and "news value" could get into the columns of at least some of the dailies, whatever its intrinsic merits.

A local representative hears in a public-house about a farmer's son who is supposed to have done something really novel with an old wheatfield. He probably hears it in this sort of way.

A farm labourer over a pint of beer says to a friend:

"Old Bink's son, just left college he has, he's a clever boy. Mark my words, he'll go a long ways. You should see that there wheat in Long Bottom meddy! Soil was always as sour as could be in that there field. Young Binks, so's I hear, thinks him up some special chemicals and puts 'em to the soil. And the wheat grows like he never done before."

So the local representative rushes a story up to his London editor.

"Farmer Boy's Amazing Invention. Huge Crops of Wheat from Condemned Ground, Etc., etc."

The local representative pockets his three guineas gratefully, the public reads the paragraph with interest, for there is romance in "an amazing invention"; they are not told that the "farmer's boy" is the farmer's son, not a poor young labourer, and that he had an expensive education and is merely applying the fruits of this in the way of well-known principles of scientific agriculture! The story is the thing.

The rich agriculturists and financiers interested in the land just smile and ask their wives to "pass the salt, dear; no, there is nothing much in the paper this morning."

My advice, then, to the inventor is to resist the urge to tell the world in the first flush of inventive success. The romantic little story in the newspapers which is headed "Young Inventor's Machine May Revolutionise Motor Industry" might create a glow of pride in the "young inventor," but if he holds his hand and, eventually, the story appears in some such form as "XYZ Motors Interested in Revolutionary Invention," there will be more of a stir in both manufacturing and consumer automobile circles of the world, for the name of "XYZ" carries weight, and, if they are interested, there must be something in it!

The harsh truth is that of every hundred inventor stories in the press, only one or two have any future at all. Until the Patent Office and the experts have had their say, an "invention" has no reality. But once an inventor has established a reputation for delivering the goods, a certain amount of preliminary publicity can be useful for building up a good background for his latest idea.

"It is understood that Mr Theodore Jones, who is well known as the inventor of the Sub-Atomic smoke extractor, is working on a new carburetter for motor-cars which greatly reduces petrol consumption. In an interview with one of our representatives, Mr. Jones said that . . ."

This sort of thing is bound to make the people in the trade sit up and take notice.

However, the best publicity for an invention during its pre-production existence, that is before it is ready in large quantities for sale to the public, or before it has even been brought to the attention of a manufacturer, is in the trade press. Every trade has its journals, and all those who matter in the various industries will be subscribers to and readers of their appropriate trade journals.

So, as a preliminary to searching for a buyer or licensee for a patent, the inventor will be well advised to try and get a write-up in some of these journals. It is easier to obtain this kind of publicity, too, for the trade press is ever receptive of news about new developments, if they are, in fact, new develop-

ments. Why shouldn't a hairdressing journal be receptive to news about something novel concerning hairdressing, or a plumbing paper about a plumbing invention? But, of course, it must be good; these papers have real experts as editors.

Most interesting and helpful correspondence often follows an article in a trade journal. There may be valuable expert comment, and, perhaps, information about similar inventions which will prove useful. Also, inquiries may come from interested manufacturers.

Many of these trade journals are prepared to do all the writing-up subsequent to an interview with the inventor. Nevertheless, it is advisable to have ready for their guidance a concise description of the invention. It is an advantage to write this up in article form, for if it is well written a great deal of it may be used as it stands. This "dope," as it will be irreverently called by the editorial staff, ought not to exceed one thousand words, and should be "full of meat." Unlike the patent specification, it can introduce a little colour. Adjectives are not barred, but should be used discreetly. Some of the more technical papers, however, require an extremely factual treatment. Still, their sub-editor experts will edit the "dope" to suit their style. There is no harm in being enthusiastic in your writing. Even the most dry-as-dust technical editorial man is capable of being influenced to some extent by an enthusiastic write-up about a sound invention. So, if you really do feel you have a good invention, do not be unduly modest about it.

I would not advise you to make any communication about any invention to the trade press until you are actually ready to produce a model, for you may be asked to show what it is and can do. As a matter of fact, if the invention appears to be one of importance and to have a wide interest, a demonstration to which a number of people are invited is sometimes a good way of launching it.

Whether or not this should be left until all preparations have been made to put it on the market, is a moot question. Personally, I am inclined to say that it should not be left until then. Your bargaining power with a buyer or licensee is increased if your invention has had a good reception at a demonstration reported in the trade press. The cuttings about it can be displayed, often with advantage, during negotiations. And if you can say truthfully that various other concerns have approached you, a helpful competitive note is introduced. It should be noted that trade press publicity is different from publicity in the general press in that it is directed at industry rather than the consumer market.

Demonstrations are not invariably essential, either to obtain publicity or to assist negotiations. Some inventions are so self-explanatory that they do not call for it. But it is useful to have

something to show. Inventors who have the ability to talk well can often go a long way on words alone; those who do not possess this ability are almost obliged to back up their words with something more tangible, either in the way of good drawings or a model. When an invention is mechanical, a working model is an enormous asset.

Small things can be demonstrated successfully to an audience just as well as big ones, if the inventor goes the right way about it. It is all a matter of presentation and showmanship. Supposing the invention were some simple thing for facilitating cooking. There ought to be an assistant to show the device in action, leaving you free to talk and emphasise points of interest and importance. Indeed, it is always as well to have an assistant so that you are not tied up in any moments of embarrassing silence while you fiddle about with the model, or try to lay your hand on something momentarily mislaid. And, needless to say, if it is probable that the audience is to be predominantly male, then an attractive girl assistant will strike the right note.

All this is on the assumption that the demonstration is to take place before a number of people, perhaps representatives from various trade and technical journals and trade organisations, from whom you would, of course, obtain statements of opinion if they are prepared to give them. Incidentally, you are almost certain to obtain friendly advice about the use and design of the invention, and this alone makes a demonstration before impartial experts well worth while.

If it is an intimate affair with only one or two in attendance, then less of the above kind of presentation is needed, or the wrong note might be struck. But, whatever the dimensions of your audience, whether it is one person or a hundred, there should be for each member of it a copy of some brief, factual notes about the invention which they can refer to and take away if desired. These notes should be in the form of a re-sumé of the description you give, and they should clearly summarise the nature and advantages of your invention.

The best time to give a demonstration is in the afternoon at about four o'clock. If possible, there should be tea and biscuits, and, in boxes on a side-table, two or three popular brands of cigarettes.

The place where the demonstration is held ought to be easily accessible. If it is a demonstration for one journal or one firm, offer to give it on their own premises, if it can be arranged that way. Otherwise, it may be necessary to hire a room for an hour or two.

I arranged one of my first demonstrations at a place five miles out of London, and hopefully sent letters inviting representatives from the London newspapers to attend. That was before I realised the worthlessness, in many cases, of general press pub-

licity! However, none turned up and only one, the "Daily Mail," acknowledged the invitation, but this was only to say, in a telegram, "Sorry cannot attend demonstration to-night." Later, I learned that it takes an exceptional "story" to tempt a news editor to send a reporter five miles out of town. Perhaps if I had supplied cars to whisk invitees to my house and back again, some might have come.

A few years after this debacle, I arranged a demonstration at which all the London newspapers were represented in strength (as well as various experts); it was held at Anderton's Hotel in Fleet Street!

Then there was that one skilfully staged by a concern which was backing another of my inventions.

People were not invited to "a demonstration," but to a free banquet at one of the biggest hotels in London. A banquet of nine marvellous courses with cocktails, sherry, the finest French white wine, champagne (Mum or Krug, take your choice), vintage port, liqueur brandy (1878), whisky, gin, and as many cigars and cigarettes as you care to poke into your pocket. There was the British National Opera Company, including Mary Blyth, Walter Widdup, Robert Radford and others, especially engaged to entertain you with music. A replica in ice of my invention was borne in by waiters amid much cheering.

Not surprising that nearly one hundred people accepted the invitation, including representatives from the "Times," "Daily Telegraph," "Daily Express," and other leading newspapers! There were about ten noble persons with titles and sixteen M.P.'s in the impressive throng to enjoy the free meal and entertainment, with yours truly self-consciously sitting at the top table in a seat of honour. I gave a speech, which may or may not have added to the attractions of the brilliant and expensive affair; I immediately followed that great King's Counsel, Sir Edward Marshall Hall . . . !

But I doubt whether it was worth the money it cost those who paid for this banquet-cum-demonstration. Perhaps the industrialists and financiers present were influenced a little by the lavish hospitality. I don't know. I rather fancy the invention would have gone over just as well without such princely entertainment as a background to its initial publicity.

Anyway, this I do know, you cannot hold the faith of others in an invention that is intrinsically unsound. There may be quick money to be made from a phoney invention demonstrated in trickery and publicised at a free luncheon or dinner. In fact, I know there has been, plenty of it. But this book has nothing to do with the shady side of invention, but with honest inventions and straight inventors who have faith in the products of their brain.

A good invention should not require expensive boosting, even

if an inventor could find a backer to provide the money for it. The later commercial stages are different. Then, advertising allocations will be made by the licensees in the usual way of business.

A little hospitality in the way of cups of tea and some cigarettes will suffice in normal circumstances when an inventor is giving his invention a first showing. But I will repeat, in my opinion, general press publicity has its greatest value when the invention is actually on the market, and that is a matter for the firm that is selling it, not the inventor, unless he is marketing the invention himself.

Any demonstration of an invention should be planned to show something definite by relating its performance or application to a standard. In fact, it is a good idea to make the demonstration fall into two parts. The first to show what an ordinary article or piece of mechanism of the same kind will do, and then, the second, to illustrate the advantages in the way of superior performance or ease of application and so on of the invention. If applicable, figures of performance ought to be proved with measuring instruments

Should the invention be an article that does a certain job in a lighter or more compact construction, then it is clearly as well to be able to reveal this in actual comparisons.

In short, the demonstration should be carefully planned beforehand, and all reasonable and appropriate arts of showmanship introduced. Enthusiasm must be maintained at a high level despite any adverse comments. A good temper and a little humour will go a long way to win over the severest critics.

Yes, I know, a good invention ought not to require "putting over." But, goodness, the restraint I have exercised in face of carping criticism! It is bound to come. Unknown to you, among that audience of experts is someone who does not want your invention to go on to the market. Don't ask me why, I wouldn't know. Maybe, it is just jealousy of you as an inventor, he being a frustrated chaser of moonbeams in his spare time; maybe, he has money on something which your invention will depreciate. Forget him as much as you can. If you adopt a superior attitude of, "I know it's good; you can take it or leave it," you will be alienating the goodwill of those others who have come in the friendliest spirit.

CHAPTER IX

HOW TO SELL INVENTIONS

Finding a buyer. The three kinds of licences. Secrets of successful negotiations. How to fix a price. Marketing your own inventions.

THE old saying to the effect that the whole world will make tracks to the door of the man who invents a better mousetrap, does not often work out in practice. It is more true to say that if word goes forth that X has a fine invention, all the get-rich-quick gentry and smart workers will make tracks in his direction. Even publicity restricted to the trade press may attract undesirables. Therefore, the inventor should be guarded in his attitude towards all who approach him with propositions. The trouble is, inventors are not usually good business men or women.

They are liable to fly to extremes of emotion and be easy game for opportunists. If they overflow with exhilaration and are super-optimistic about their inventions, they will be so eager to see them commercialised that they are likely to fall for the first offer, good or bad. On the other hand, those inventors who suffer reactions when they have finished their work of development and become pessimistic about the future, also tend to accept offers blindly.

It does not do any harm to be a trifle suspicious about someone who rushes forward with extended pen and waving a contract under your nose. Maybe, the gentleman is well dressed, has an expensive car and says he represents the Y syndicate, or the Z company. What do you know about these concerns? They may be sound, or they may not.

I have been caught twice. In each case it was an apparently quite sound, fairly well-known concern that approached me and offered to commercialise one of my inventions. The names of these companies were familiar; they advertised fairly regularly. I wasn't to know that both were financially rocky and saw in my inventions possibilities of recovering their stability. Perhaps they used the fact that they had secured my patents, or at least licences of them, to try and raise more capital. Anyway, both companies eventually failed without paying up the royalties owing to me.

My advice to the inventor in this respect is always to start at the top. The great industrial organisations do not seek out inventors and inventions in quite the active manner of small and unsound ones. Of course, any approach from anyone is a tribute to an invention and heartening on that account. It can also be useful. Although "playing off" one

firm against another may not always be good tactics, it sometimes turns the balance in negotiations if one can state that others are showing a keen interest in your invention.

Now I will assume that an inventor, having perfected his invention, and at least secured provisional patent protection, is wondering how to take the first step to secure its commercial exploitation. How should he go about it? Advertising in the newspapers, which is often done, is not, in my opinion, a good plan. You may have seen such advertisements as, "Owner of patent number 123456, improvements in printing processes, invites inquiries." Inquiries from whom?

A direct approach to likely buyers is usually much more fruitful. And, as I have said, it is advisable to start at the top. There is an argument in favour of the small company so long as it is sound. Its products will be fewer, its range of manufactures less extensive, it might be able to concentrate on a new invention and be delighted to do so in order to break into the markets in a bigger way. But the large organisation, with its superior facilities for large-scale production, and with its modern sales promotion and distribution methods, can create large demands as well as supply them.

The inventor is indeed fortunate who can tie himself to a company of national proportions that is prepared to put his invention across in a big way. Unfortunately, not all such firms are receptive to every new idea, however good it may seem and however much in their line it may appear to be to an outsider. It could happen that a firm is in economical production in a vast manner with similar articles well known to the public for their cheapness and reliability, articles which will stay in production until something entirely revolutionary forces them out of the line. If the invention is something so different as to constitute a new line, then the commitments of the firm might not permit its inclusion in their programme whatever its attractions. Indeed, it might be with sincere regret that they passed it by. Therefore, the inventor must not be disappointed if the first large company that he contacts turns him down. The reasons they give for this may or may not be the real ones.

I consider the best way of going about it is not to write to the first firm that occurs to mind, but to write and ask the editor of one of the journals of the trade concerned if he will kindly supply the names of some reputable manufacturers who might be prepared to consider the invention. Of course, a brief description of it should be provided. The trade journals not only have a good knowledge of the products of the leading manufacturers, but also have up-to-the-minute news of their current policies and requirements.

Then start at the top of the list and work down. You will note that I have taken in for granted that the inventor will

approach only one firm at a time, and a few words of explanation about this ought to be given.

Undoubtedly, the ideal for an important invention is to grant licences for its manufacture and sale to a number of firms, but this can usually be done only with a really important invention. One way of going about this is to form a syndicate having some capital behind it. The capital is required for pursuing patents in all countries, to defend patent rights when necessary, and to cover general expenses. Incidentally, an invention of really considerable potentialities may interest one of the large insurance companies.

Alternatively, one leading manufacturing concern can be given an exclusive licence plus the right to sub-license other firms anywhere in the world, and, generally, this is to be preferred, for it removes a lot of trouble, expense, anxiety and unknown and unpredictable liabilities from the inventor.

Negotiating a patent, for that is the saleable part of an invention, should be regarded as a campaign to be planned and pursued with care and skill. As many of the opening phases as possible should be done by means of personal interviews, rather than by correspondence. It is even bad strategy, in my view, to send in the first instance to the selected firm a full description of the invention. I prefer to ask for an interview with one of their executives, giving as a reason for the request that I would like to bring to their notice an invention in which I think they might be interested.

If the reply is, as may be the case, that they would first want to see a full description of the invention and a copy of the patent specification, then a brief and general outline of the objects of the invention, but not a detailed description of its design and construction, should be sent. A further request for an interview can be added as well as the statement that you would be bringing the patent specification with you.

Now some firms will not go forward with any negotiations at all unless a full patent has been granted. The inventor will be told to come back again after he has secured Letters Patent. If he has only a provisional, and is hoping to find a firm prepared to do a deal on that as well as pay the further patent charges, he may have to try several before he succeeds.

The inventor may find himself floundering hopelessly in the discussions if he has not made himself conversant with the various ways in which a patent can be negotiated.

Negotiations can go forward on a provisional protection, subject to the terms agreed being confirmed on issue of Letters Patent, but it is only these which confer on the patentee or his agents or licensees, "the exclusive right to make, use, exercise and vend the invention, within the United Kingdom of Great Britain and Ireland, and the Isle of Man, for the full term of

sixteen years, subject to any question affecting its validity and the payment of renewal fees, and also subject to certain provisions against the abuse of the patent monopoly."

You will see from this that, if he desires to do so, an inventor who has patented his invention can manufacture and sell the invention on his own account. Alternatively, he can sell the whole of his interests in the patent to someone else for a lump sum, or he can license others to make and sell the invention for agreed sums or royalties.

There are three kinds of licences, and if any licensee uses or makes or sells the invention in any other way than is indicated by the licence, he makes himself liable to infringement proceedings.

A Restricted Licence is a licence to use the invention that has limiting conditions attached to it. These restrictions may be in regard to time, perhaps a period of, say, five years, is set; or place, the licensee being permitted to sell the invention in only a restricted area; or there might be a limit set on the quantity the licensee is allowed to manufacture. There can be any of a number of restrictions, according to circumstances.

Then there is the General Licence, which provides freedom for the patentee to license other people on either the same or different terms.

An Exclusive Licence gives the licensee, subject to the agreed terms, the sole right to exploit the invention. This is, in effect, transferring the complete monopoly of the invention to the licensee.

Finally, the inventor can sell all his interests in the invention to anyone he likes in return for a lump sum, or, in return for a certain amount of money, he can give someone the option to purchase the patent for an agreed figure at any time within a specified period.

There are various vital things to take into consideration in regard to licensing an invention, and I will discuss these in the next chapter. In the meantime, we have not yet arrived at the point where the initial negotiations have been successfully completed. There is generally a long way to go between that moment when, for the first time, you sit in the office of some junior executive and the signing of an agreement. That first contact with big business is bound to be a somewhat uncomfortable experience for many amateur inventors. Especially if the executive happens to be one of those sleek, slightly sneering young men one so often meets in near-managerial positions in head offices. How very superior they are, how conscious of their own ability and the commercial might behind them. But the watchword must be patience. Suppress the impulse to put on your hat and walk out. You certainly have the freedom to do it, but it is worth playing along with a big firm

as far as you can. There are not so many in any one particular line that you can afford to break off discussions just because a young executive is being condescending and superior. He is only the first "filter"; his will probably be the job of seeing various people on behalf of a Very Big Noise; when, eventually, if all goes well, you are passed on to the presence of the mighty one you will probably find him both courteous and pleasant.

So retain your good humour to the last. But avoid being over familiar; a little respect in your attitude will do no one any harm. It does not hurt to slip in a "sir" now and then if it is a big pot, such as a director, whom you are seeing.

A little modesty is helpful, but only in the personal sense, there must also be plenty of enthusiasm. The inventor goes a long way who can say sincerely something like this; "I believe I have here one of the best things of its kind that has ever been invented. That is my opinion and I'm sticking to it, though I realise that there are people who know even more about (whatever it is) than I do."

It is also useful to be a good listener, to be able just to sit and listen with apparent interest to streams of irrelevancies from the other fellow, despite the fact that you are bursting to say something yourself.

Lastly, do not fear to ask for much more than you ever expect to get. You may not get it, but you can always come down. I remember an interview with a negotiating official of Marconi's Wireless Telegraph Co. It was a question of an outright sale of my interests in a provisional protection of one of my inventions.

"How much do you want?" he asked.

I named a figure exactly twice that I thought would be the very most I should receive. The Marconi man whistled.

"As much as that?" he exclaimed incredulously.

"As much as that and cheap at the price," I replied with a grin.

Whereupon he went into deep cogitation for a while. Then, suddenly,

"Would you take half of what you said?" he asked.

I at once agreed to do so. There is always a psychological moment in these bargainings. If you miss it, then you are either in for a long period of haggling, which might end in no business at all being done, or the discussions might be suddenly ended with a suave, "I'm sorry, but I don't think we are interested." Yes, that does happen. It could be the result of pique, and big organisations can afford to give vent to this now and then, except, of course, with inventions that are world shattering. Or it could be because they were only fifty-fifty about the proposition anyway, and were prepared to risk a run on it, but only subject to terms very agreeable to them.

If an inventor could be a mind-reader, he might make even more money! On the other side of the picture, a studied disparagement of the invention can be part and parcel of a deliberate attempt to get it as cheap as possible. It is hard to know, though you can learn a lot if you adopt a disarming air of being an innocent in the other fellow's hands and carefully noting his reactions to all your carefully chosen remarks.

But, I repeat, don't be over anxious. Be adventurous, even a little audacious in your bargaining. And keep calm. You will gain nothing by getting hot under the collar. You are the seller and must needs be diplomatic, yet if yours is a really good invention and well and truly patentable or patented, you have a proposition not lightly to be let out of sight by an enterprising firm.

It is difficult to assess the value of an invention in terms of hard cash. If it is an invention that may have a sale over a long period and can go quickly into production with the fair certainty of there being a reasonable public demand for it, then, if it is a big firm, offer an exclusive licence on a royalty basis.

Should you have secured only provisional patent protection, you could suggest a trial run on royalties in this country with the provision that if the sales are good, the firm pays for world-wide patents, and, in return, shares half the returns from sub-licensing.

Do not, on any account, pretend you do not care anything about the financial side of the business, and that all you want to do is to see the invention brought within reach of the deserving public. Altruistic motives are not often appreciated in the commercial world. You may be esteemed more if you make it plain that you are out to get just as much as you can from your invention. After all, that implies your confidence in the idea!

Fixing the royalty may not be as difficult as you might think. Every large organisation has entered into dozens, maybe hundreds, of agreements to use patents on royalty bases. They know how much an article will stand, taking into consideration probable selling price, cost of manufacture, general overheads and profit. If they offer X pence or shillings per article, say that you were thinking of at least two or three times that, and note the reactions. Alternatively, if you must start the ball rolling yourself, sound the way with vague suggestions based on one penny or twopence per shilling of the tentative selling price, according to your own weighing up of the worth of the invention.

Refuse to be bludgeoned into accepting infinitesimal sums, such as one-tenth of a farthing per pound sterling, by a weight of figures regarding costs of tools, advertising expenses, tremendous risks and so on. There would be no new manu-

facture but for the inventor, and that is you; therefore, it is fitting that a just reward should be paid to him on each article made in accordance with his invention.

I once secured a royalty of threepence each on an article that retailed at one shilling. Half a million were made and sold in the first three months of production. At one shilling it was good value for money, too, though the manufacturer must have been pleased with his share of the profit, because he afterwards said so . . . and in writing at that!

However, unless you are sure about yourself, there is no reason why any royalty figure should be fixed on the spot. Plead for time to think about it, and then obtain somebody else's opinion, preferably that of a patent agent. This will be advisable in any case, if you have an invention of front-rank importance. Indeed, in such circumstances, not a step should be taken with regard to it without having expert advice. Not even an initial interview. With such an invention, your monopoly rights will be of supreme value, though they must not be abused.

The law can step in if you try to hold your fellow men at ransom by denying it reasonable use of an invention in return for reasonable rewards. Reasonable is the operative word. It is conceivable that, in outstanding circumstances, a million pounds would not be unreasonable!

I have often been asked if it is worth while making and marketing one's own inventions. It can be, for in that way one takes all the profit. Many large businesses have been started in this manner. What better beginning for any business than to commence with a new patented product? But it requires capital, and one must have a keen business brain.

Mail order is the best way to begin, if one has only a limited capital. But I don't think anyone can learn to run a business successfully from a book. Either you have it in you to organise a business on either mail order or wholesale lines, or you have not. I would not accept the responsibility of urging anyone to stake their time or money in business, unless they were already well equipped for the venture. A great deal of money has been lost by inexperienced people venturing into commerce and, however good an invention may be, and however readily the public might welcome it, there can still be a failure.

Is it not better to swim into money on the broad back of an established organisation, rather than to struggle alone, unqualified and ill-equipped, in the savage competition of industry?

CHAPTER X

SOME TYPICAL AGREEMENTS

Outright sales and selling on royalty. Vital points for inclusion in agreements. The various forms of contract between patentee and licensees or purchasers of inventions.

A SHORT letter agreement between an inventor and a manufacturer who is to be the licensee of the patent is not fair to either side. There are many points involved in the granting of licences and the payment of royalties which simply must not be left in the air.

The manufacturer might be so reputable and so long established that his word could indeed be accepted as his bond, but supposing he dies suddenly, will his successor honour the spirit of the simple agreement? As for a public company, there can be such changes in personnel and policy almost overnight that the inventor would be foolish to accept unwritten terms.

For example, what does the following imply?

"The X.E.Q. Company undertakes to pay a royalty of sixpence in respect of letters patent No. 1234567."

Signed by a director, such a letter is a contract that the company must honour. While that same director was guiding the fortunes of the firm, his cheery words about leaving the details to him, "I'll see you are all right, no need for an agreement as long as your arm," would no doubt be given full and fair effect. But if there were any change of direction, numerous difficulties might arise.

If you think that no big firm would be so unbusinesslike as to offer an agreement of such an absurdly brief and vague nature as the above, then I can assure you that it could and would. I have had several such agreements sent my way, one from a manufacturing organisation which is the biggest of its kind in the world. But each time I asked for and obtained something much longer and more detailed.

An agreement for licensing a patent ought to include the following:—

1. A clear definition of the nature of the licence. Is it to be an exclusive licence? If not, what are the restrictions? If others also are to be licensed, are there to be any conditions, or is the inventor free to make any other bargains he likes?

2. The amount of royalty to be paid, and conditions regarding the selling price of the article, if it is considered important by the inventor's competent advisers that there should be such conditions.

3. A provision for the payment of royalties on specified dates

and for the licensee to keep accounts in respect of all sales and other transactions regarding the invention. The agreement must give the right to the inventor or his appointed agent to inspect these accounts at any time. Incidentally, it is normal practice to stipulate that they should be verified by a statutory declaration if required.

4. A period for the licence and the terms for renewal. In the absence of these, it would be implied that the agreement would operate for the full life of the patent.

5. The right for the inventor to terminate the licence if the sales of the invention are not satisfactory, or if the royalties are not paid, without prejudice to the inventor to take legal action for the recovery of any royalties which may be due to him.

6. Conditions regarding the marking of each article with an identifying mark or number to facilitate the recording of sales. This would be in addition to a patent number marking.

7. A clear statement as to the payment of renewal fees on the patent. The licensor will probably require, in addition, a stipulation that the licence would terminate if the patent should be revoked, or, of course, he might be obliged to pay royalties while others could use the invention without paying anything at all.

8. A clear explanation as to who would accept responsibility for prosecuting or defending any actions for infringement, or any proceedings taken for the revocation of the patent.

9. An undertaking by the licensee not to raise or cause to be raised any questions affecting the validity of the patent.

Now let us see how an actual agreement that has been made lines up with these requirements. Here is one:

An agreement made the fifteenth of April, One thousand nine hundred and forty-five between Albert Smith, of Thistle House, Tane Street, Hunton (hereinafter called "the inventor"), and Modern Measurements, Ltd., an Incorporated Company, of Blackburn Road, Liverpool (hereinafter called "the manufacturer") on the other part.

Whereas the inventor has a sole interest in letters patent granted in respect of a certain automobile component (hereinafter referred to as the Antirad device), and whereas the said Manufacturer is desirous of manufacturing and marketing the said Antirad device.

Now these presents witness that in consideration of the expeditious and energetic commercial exploitation of the said Antirad device by the said Manufacturer and of the payment by the said Manufacturer to the said Inventor of the sum of four shillings for each Antirad made and sold by him the said Inventor agrees not to authorise or licence any other party or parties to make and sell the said device save on the payment of a charge or royalty of four shillings

in respect of each *Antirad*, of which charge or royalty one-half shall be paid over by the said Inventor to the said Manufacturer.

The Inventor also agrees to give the said Manufacturer seven days' notice prior to granting any other party or parties a licence to make and sell the said *Antirad* device under said letters patent.

The said Manufacturer hereby agrees to furnish said Inventor on the twenty-first day of each month commencing the twenty-first day of October, 1945, with a statement showing the number of *Antirad* devices made and sold during the preceding month together with a cheque for the amount shown to be due at the rate of four shillings for each *Antirad* so sold. The said Manufacturer also agrees to produce his books of this account when required for inspection by the said Inventor, or his duly authorised Agent. The said Manufacturer also agrees not to raise or cause to be raised any question adversely affecting the validity of said letters patent.

As witness the hands of the said parties

Judged by the nine points I have outlined, there are omissions, very important omissions, and the reader may find it interesting and instructive to search these out, and, perhaps, to try his hand at re-wording the agreement and adding to it so that all the points are covered.

If the inventor is an employee of the firm that is to commercialise his invention, there should be a straightforward agreement between them defining their respective rights. This is, of course, presuming that the invention is not one in which the firm, by reason of the conditions of employment of the employee, can automatically assume full rights.

Here is an actual employee-employer agreement, with fictitious names in place of the real ones:

AN AGREEMENT made the Ninth day of June, One Thousand Nine Hundred and Forty-Five BETWEEN SOUNDER PICTURE, LIMITED, whose registered address is at The Mogul House, Great Dormar Street, in the City of London, of the first part, and JOHN STONE, of 26 Gypsy Lane, Old Catton, in the County of Norfolk, of the second part.

WHEREAS SOUNDER PICTURE, LIMITED and JOHN STONE have jointly applied for Letters Patent in respect of certain improvements in and relating to talking picture apparatus, and WHEREAS the said SOUNDER PICTURES, LIMITED and JOHN STONE are desirous of defining their respective rights and interests in the said invention and in any Letters Patent that may be obtained for the same NOW IT IS HEREBY AGREED as follows:—

1. All fees, costs, charges and expenses connected with protecting, extending, or prolonging the said Letters Patent shall be borne by the parties hereto in equal shares.

2. NONE of the parties hereto shall assign his share or interest in, or grant a licence, or do any act in connection with the said Letters Patent without the consent of the other party.

3. All profits derived from the said Letters Patent whether by licence or otherwise shall be divided as to fifty per cent. (50%) to SOUNDER PICTURE, LIMITED, and fifty per cent. (50%) to the said JOHN STONE

4. NOTWITHSTANDING anything to the contrary herein contained during the continuance of the employment of the said JOHN STONE by SOUNDER PICTURE, LIMITED in the event of the parties hereto disagreeing as to whether an offer to purchase the Letters Patent or to take a licence thereunder shall or shall not be accepted, or as to any other matter arising hereunder the final decision shall be made by SOUNDER PICTURE, LIMITED, but if, and when, the said JOHN STONE shall cease to be an employee of SOUNDER PICTURE, LIMITED, then and thereafter if the parties disagree as to any matter arising hereunder the dispute shall be referred to a single Arbitrator to be appointed in default of agreement by the President for the time being of the Chartered Institute of Patent Agents, and such Arbitrator's decision shall be final

5. THIS agreement shall bind the personal representatives and/or successors or assigns of the parties hereto

6. IN WITNESS WHEREOF the parties hereto have set their hands and seals the day and year first above written

THE COMMON SEAL of SOUNDER PICTURES was hereunto affixed in the presence of:—

SIGNED, SEALED AND DELIVERED by the within names JOHN STONE in the presence of:—

Again there are omissions, but the clauses defining the general rights of the employee are well drawn up, and the example has value for that reason. It is not always politic or even possible for one party in such circumstances to insist beyond a certain point, on exacting details of the operation of a licence. You might query the sharing of financial liabilities, on the principle which I propounded that this is something the "big fellow" ought to carry. But note the division of profits. As a matter of fact, the inventor made an excellent deal in this instance. Within one year there were many thousands of pounds in hand.

You will remember that I said it is possible to sell a provisionally protected invention; the following is an agreement regarding such a sale. It is interesting to note the conditions imposed by the purchaser. These are fair enough, and give

point to the fact that it is the Letters Patent that are the vendible part of an invention. Again, fictitious names are used in place of the real ones.

AGREEMENT made the tenth day of August, One Thousand Nine Hundred and Forty-three BETWEEN GEORGE VICTOR, of 25 London Road, Hainault (hereinafter called "the inventor"), of the one part, and DOMETO, LIMITED, of Jesse House, London, E., of the other part, WHEREAS the Inventor has filed a Provisional Patent Application in Great Britain, No. 65432/43, and dated the fourteenth day of April, One Thousand Nine Hundred and Forty-three in respect of an invention for and under the title of "Improvements in Domestic Water Heating Apparatus" (hereinafter called "the said invention"), AND WHEREAS the Inventor has agreed to sell and Dometo, Limited, have agreed to purchase all the rights in the said invention for the sum of Seven Thousand Pounds (£7,000), subject to the covenants herein contained. NOW IT IS HEREBY AGREED AS FOLLOWS:—

1. The Inventor hereby sells and Dometo, Limited, purchase for the sum of Seven Thousand Pounds (£7,000) all the rights in the said invention, and including all the rights and benefits in the said Patent Application, No. 65432/43, and the right to apply for and obtain patents or other like grants or instruments in respect of the said invention in any part of the world. The said sum of Seven Thousand Pounds (£7,000) shall be paid on the execution of this agreement.

2. The Inventor shall at the expense of Dometo, Limited, and as promptly as possible sign all such documents, and do all such things as may be necessary, or of assistance to enable Dometo, Limited, to obtain the grant of a patent in respect of British Patent Application, No. 65432/43, and to file such further applications as Dometo, Limited, may deem desirable in respect of the said invention in Great Britain and elsewhere, and to obtain the grant of patents or like instruments in respect of such further applications, and assist Dometo, Limited, in answering Patent Office objections, or contesting oppositions or applications for the amendment or revocation of a patent or patent application for the said invention in any country or in otherwise satisfying the Patent authorities with a view to obtaining the best possible grant, and the Inventor shall when required execute Assignments in respect of any patent or like instrument granted in pursuance of an application in respect of the said invention filed in any country, and sign all such documents, and do all such things as may be necessary to vest Dometo, Limited, and/or in nominees of Dometo, Limited, the sole and exclusive

rights in the said invention in any part of the world, and to enable Dometo, Limited, and/or any nominees of Dometo, Limited, to become the Registered Owners of all such patents and like instruments granted in respect of the said invention in any part of the world, all such documents and things being executed and done at the expense of Dometo, Limited.

3. If the Inventor shall hereafter invent, discover, or make any improvements in the said Invention, or in the mode of manufacturing working or using the same, or shall become the owner of any such improvement or improvements whether patented or not then, and in every such case the Inventor shall communicate them to Dometo, Limited, and give full and sufficient information instructions and assistance respecting the mode of working and using the same, and so far as practicable render the same available at the expense of Dometo, Limited, for Dometo, Limited's benefit in any part of the world, and to do every act which may be necessary or convenient for enabling Dometo, Limited, should they so wish, to obtain patents grants or instruments, and for vesting the exclusive right thereto in Dometo, Limited, and/or their nominees.

4. The Inventor shall whenever required give to Dometo, Limited, at the expense of Dometo, Limited, such assistance and information respecting the said Invention, or any improvements, and the mode of working and using the same, and all processes connected therewith, and such specifications and drawings as may be required by Dometo, Limited, for enabling them to use and exercise the said invention or improvements to the best advantage.

IN WITNESS whereof this Agreement has been signed for, and on behalf of Dometo, Limited, by its Managing Director, and by the Inventor the day and year first above written.

The sale of a complete patent is quite a different matter, and there need be no conditions attaching to it. A buyer may try to get you to accept conditions such as that the purchase money, or a part of it, is returnable if the patent is revoked; or that you must assist "in any reasonable manner such legal proceedings as may be necessary," or that any improvements in the invention should be handed over.

Have none of it. If you sell a patent outright, the buyer must take the rough with the smooth. It will be his patent to do what he likes with, and he might make vast profits out of it. Equally, then, he must be prepared to deal with difficulties should they arise, without interminably dragging in the inventor. As for improvements in the invention, well, perhaps, it might be fair to have a clause in the contract of sale giving the buyer

of the patent the first refusal. That does not commit you to much.

In some circumstances, a manufacturer will offer to take an option on a patent rather than to buy it outright. This may be because he wants to explore the possibilities of the invention carefully before paying all the cash you may have asked for it. This is the kind of agreement you will meet in such a transaction.

First of all come the usual preliminaries, and then:—

WHEREBY IT IS AGREED AS FOLLOWS:—

1. In consideration of the sum of Five Hundred Pounds now paid by the Purchaser to the Inventor (the receipt of which the Inventor hereby acknowledges) the Purchaser shall have the option to purchase for the additional sum of Four Thousand Five Hundred Pounds the letters patent No. 12345678 entitled "Improvements in or relating to Milk Containers," and all the rights and benefits appertaining thereto.

2. This option shall be exercisable in writing given to the Inventor at any time within two years from the date hereof, and if and when the same shall be exercised the Inventor shall execute an assignment of the said letters patent.

3. The Inventor shall also in such assignment covenant to disclose to the purchaser all improvements upon the invention protected by the letters patent, but such improvements shall only be secured to the purchaser at sums to be mutually agreed should such improvements be subject to further letters patent.

4. The Inventor shall pending the exercise of the said option pay all renewal or other fees in respect of the said letters patent, and shall do all other acts and things necessary for keeping the said letters patent in full force and effect.

IN WITNESS WHEREOF . . . etc.

Agreements are well understood to be the province of the legal profession, so that the inventor will not jeopardise his relations with a firm that has agreed to do a deal with him, if he briefs a solicitor to guard his interests. But not all solicitors are necessarily well up in patent work; it is hardly to be expected that a local man who is mainly concerned with house property, mortgages, insurance, petty civil actions and so on, should be an expert in the highly complex and difficult subject of licensing patents, and other matters relating to inventions. However, there are solicitors who specialise in them, and any patent agent can give you the name and address of one.

And so we have followed invention through, from the first misty stirrings in the mind of the inventor to the details of their commercialisation as practical devices for the use of mankind.

Inventors have often been accused of adding fuel to an already fevered existence, of bringing new things into the world for the world to misuse. But it is an outworn philosophy which states that true happiness is to be found in only an Arcadian simplicity of life. The material needs of modern man, who has learned to harness the very elements for his own purposes, have of necessity developed in tune with his scientific conquests.

And there is a wonder-world ahead, if he can restrict his ambitions to a moral employment of these scientific and mechanical achievements.

The inventor who is inspired by the desire to further this aim is the one to whom should go the richest rewards.

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