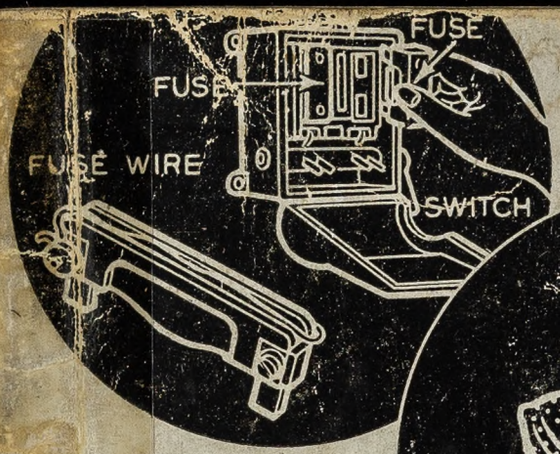

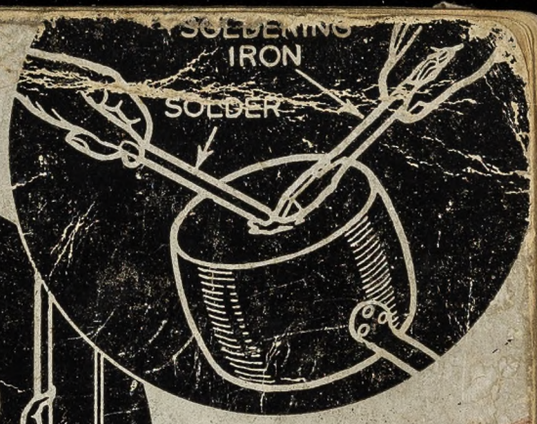

the HANDYWOMAN IN THE HOME

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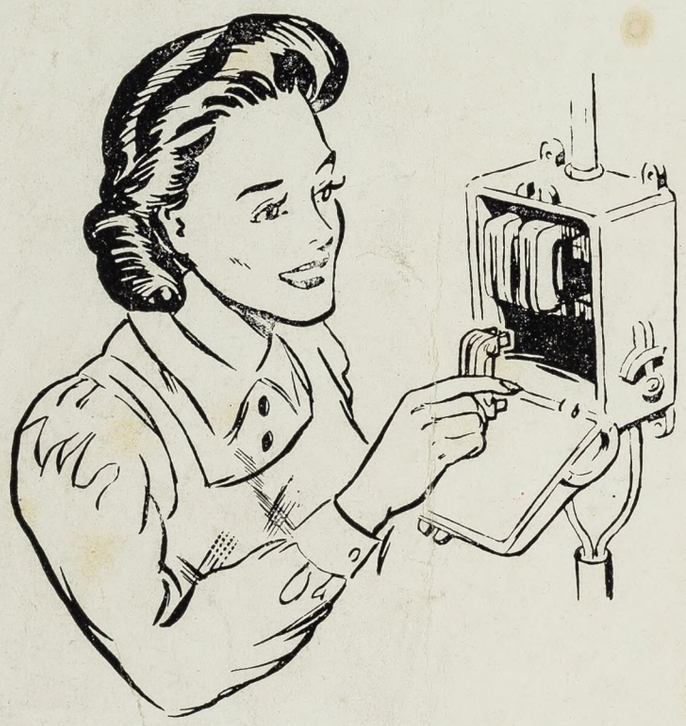

THE HANDYWOMAN IN THE HOME

Written and Illustrated

by

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CONTENTS

INTRODUCTION

This little book is intended as a guide to the housewife to enable her to carry out small household repairs and adjustments to domestic appliances which would normally call for the services of a handyman.

For this reason an endeavour has been made to make the instructions simple and straightforward, avoiding all confusing technical terms. At the same time no work is described which is outside the ability of the average housewife, while the numerous illustrations help to show just how each job is carried out down to the smallest detail. Of particular importance is the fact that any mechanical part or detail described in the following pages, and with which the reader may not be altogether familiar, is not left to the imagination but is also shown pictorially; all such parts being named clearly in the illustrations.

There are chapters covering almost every problem from renewing a tap washer to repairing an electric iron. In fact, it can be said with confidence that the small initial cost of this handbook will be repaid many times by the saving on repair bills.

Note.—Naturally one or two simple tools will be necessary to carry out repairs, but these can be limited to such as are generally to be found in any household. As a guide the following tools are suggested: A hammer, screwdriver, small bradawl, pair of pliers, pair of pincers, an adjustable spanner, and a half-round file. Any additions to this list may be considered as helpful rather than absolutely necessary.

HOW TO RENEW A TAP WASHER

There are two faults which may be developed by the ordinary domestic tap if it is in constant use—water may leak from the stem, or the tap may continue to run when it is shut off.

LEAKAGE FROM THE STEM

When the leakage occurs at the stem it often dribbles out slowly when the tap is off and then flows quite copiously when the tap is turned on. If you take a pride in your taps and keep them nicely polished this leakage becomes annoying and the constant dribbling soon makes marks on the polished exterior of the tap.

The way to stop the leakage is to tighten up the milled collar which is situated where the stem enters the body of the tap. This will be quite clear from Fig. 1. The round jaws of a pair of pliers can be used for this purpose, but be careful to grip only the milled edge with the pliers, otherwise the part below may be scratched. To tighten the "gland" as it is called, turn the pliers in a clockwise direction.

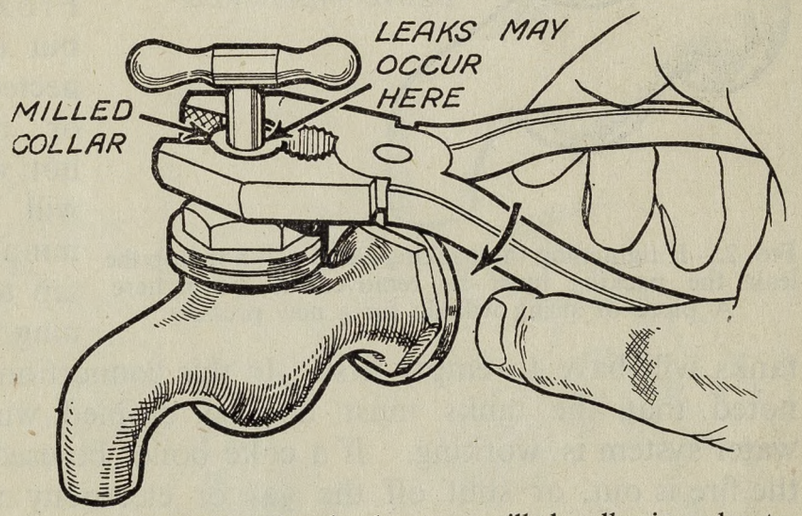

FIG. 1.—Tightening the gland nut or milled collar in order to cure a leak from the stem of a water tap. The arrow shows the direction in which to tighten the collar.

Give it about half a turn and then see if the leaking has ceased. If it has not, give it another half turn. Do not tighten more than is just sufficient to stop the leak. Should the gland already be tightened up as far as it will go it will have to be re-stuffed. This is quite simple. Unscrew the milled collar completely and dig out the old

packing with a steel knitting needle or the prong of a cooking fork. This packing is like greasy string, and in order to renew it some fresh soft string should be wound round the stem and stuffed down into the gland. See Fig. 2. Grease the string well with lard or motor grease and replace the milled collar.

If the tap continues to run even when turned off hard it is a sign that the washer wants renewing. This is a comparatively simple job, but the water must be turned off at the main before starting operations. If the tap be connected directly to the main the water will cease running almost immediately the supply is shut off (see chapter on Frozen Pipes), but if it be connected to a tank or if it be a hot water tap it will take some minutes for the tap to stop running, because the tanks will have to empty first. In this connection it must be noted that the tanks must not be drained while the hot water system is working. If a coke boiler be used, wait until the fire is out, or shut off the gas or electricity when either of these methods are used for heating the water.

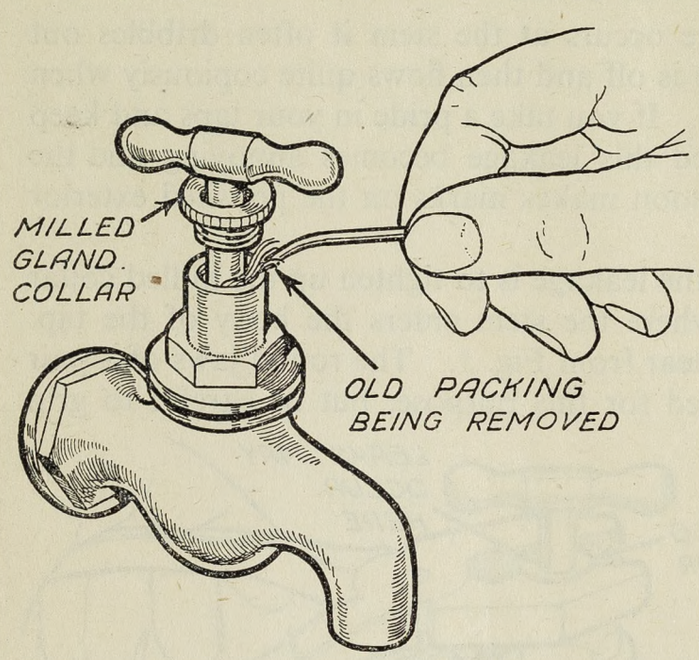

FIG. 2.—If tightening the packing gland will not stop the leak the packing must be removed as shown here. A piece of string will do for a new packing.

REMOVING THE OLD WASHER

To remove the old washer, undo the large nut with an adjustable wrench or spanner as shown in Fig. 3. This nut usually has a normal right-hand thread and, therefore, to undo it the spanner should be turned in an anti-clockwise direction. A few taps have a left-hand thread, however, so if it will not undo, try turning it in the opposite direction. The whole

of the top part of the tap will come off when the nut is unscrewed and a little rod or "jumper" will be found sticking up inside the lower part of the tap. This should be lifted out after the manner illustrated in Fig. 4. The washer will be found to be attached to the lower end of it by means of a nut. Remove this nut and take off the old washer which should be replaced by a new one. The usual size washer for a domestic

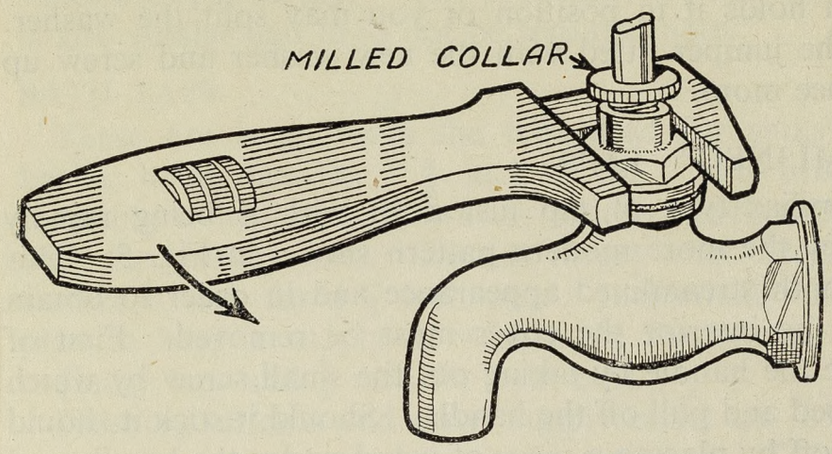

FIG. 3.—How to unscrew a tap when fitting a new washer.

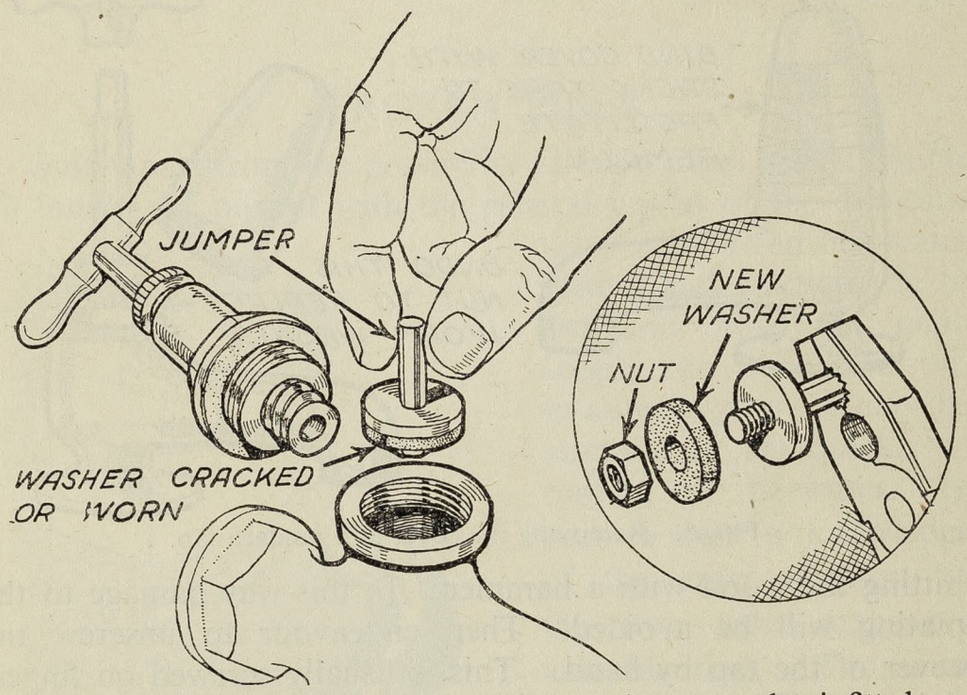

FIG. 4.—The tap dismantled, showing how the new washer is fitted.

water tap is a "half inch." It will be fairly safe to buy one of this size beforehand, so that it is ready to replace the old washer immediately it is removed. You should buy a

vulcanised rubber washer for a hot water tap but a leather washer for a "cold" tap.

When fitting the new washer do not tighten unduly the nut which holds it in position or you may split the washer. Replace the jumper fitted with the new washer and screw up the tap once more.

"STREAMLINED" TAPS

The familiar type of tap just dealt with is being rapidly replaced by the more modern pattern shown in Fig. 5. This has a smooth streamlined appearance and in order to obtain access to the interior the cover must be removed. First of all remove the handle by taking out the small screw by which it is attached and pull off the handle. Should it stick it should be driven off by placing a piece of wood under the handle and

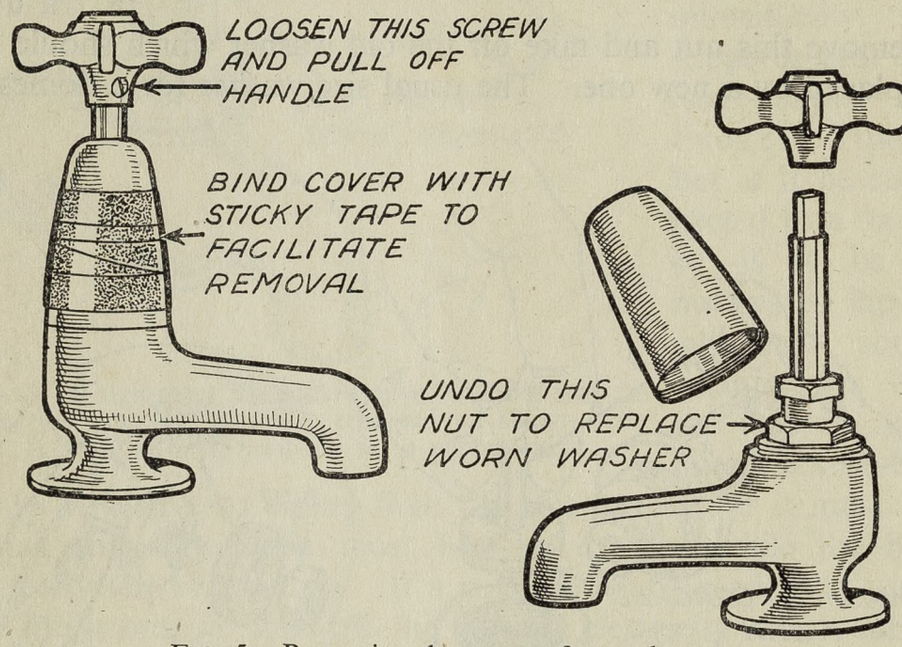

FIG. 5.—Removing the cover of a modern tap.

hitting the wood with a hammer. In this way damage to the plating will be avoided. Then endeavour to unscrew the cover of the tap by hand. This is usually screwed on finger-tight, but if it will not unscrew bind a length of electrician's insulating tape or a strip of sticking plaster tightly around it. This will grip the polished surface and thus enable the cover to be unscrewed. Do not use pipe grips or any other tool on the cover or it will be scratched and damaged.

With the cover removed the interior of the tap will be exposed and it will be seen that it is similar to the more conventional type of tap. The procedure for renewing a washer is also similar and need not be repeated here.

BATH TAPS.

These are larger than the taps used for sinks and wash basins being usually "$\frac{3}{4}$ inch" size. The procedure for renewing a washer is, however, exactly similar to that used with the smaller sizes. Do not forget when ordering a new washer to ask for a $\frac{3}{4}$ inch one. Incidentally, it is a good plan to keep a supply of washers in the house—$\frac{1}{2}$ inch for ordinary taps and $\frac{3}{4}$ inch for bath taps.

Flushing cisterns and water supply tanks are fitted with an automatic tap operated by a floating ball. This may leak in exactly the same manner as an ordinary tap and cause overflowing. How to fit a new washer to one of these "ball valves" is described in the chapter on W.C. Cisterns.

FROZEN PIPES

Quite apart from the possibility of burst pipes it is advisable to familiarise oneself with the general layout of the domestic water supply and hot water system and particularly to ascertain how the main supply can be turned off. In an emergency it may be essential to act quickly in turning off the water. In such a case a knowledge of the exact position of the stop valve may save valuable time. The same thing applies in the case of burst pipes. Considerable damage may be prevented by prompt action in shutting off the supply.

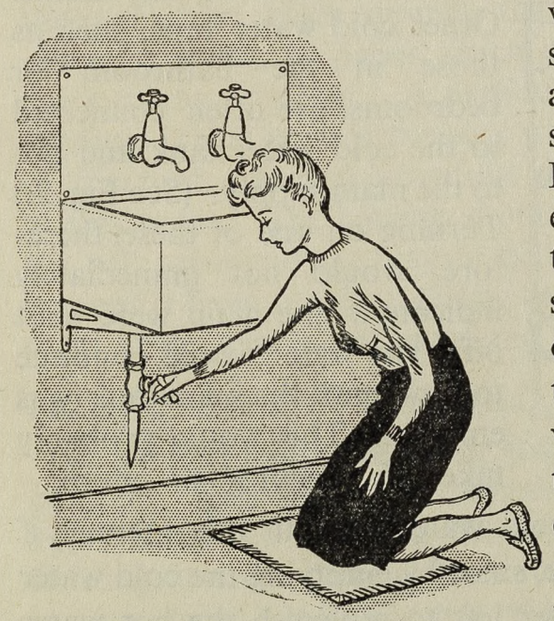

FIG. 1.—Turning off the main supply as a precaution against burst pipes.

WHERE TO FIND THE STOP VALVE.

The usual arrangement for turning off the main water supply consists of a stop valve or tap similar to an ordinary water tap. Sometimes it is placed under the kitchen sink as shown in Fig. 1. This is, of course, a very handy position but it is also possible for it to be concealed away in the cellar or in a cupboard. Once it has been located it is a good plan to test it by turning the tap as far as it will go in a clockwise direction. This should cut off the supply. The next thing to do is to turn on the cold water tap in the scullery or kitchen. The water should flow for a few seconds, until the pipes are empty, and then stop. If it continues to dribble slowly it may be that the main tap has not been turned off quite hard enough. It is suggested that the test should be made with the cold tap in the scullery or kitchen because the supply here usually comes direct from the mains. Other cold water taps, such as those in the bathroom or bedrooms, are often connected to the cold water tank and not to the main supply. (See Fig. 2.) Turning on one of these, therefore, would not immediately indicate if the main were shut off. The water would continue to flow until the main tank was emptied. This would probably take 15 minutes or more.

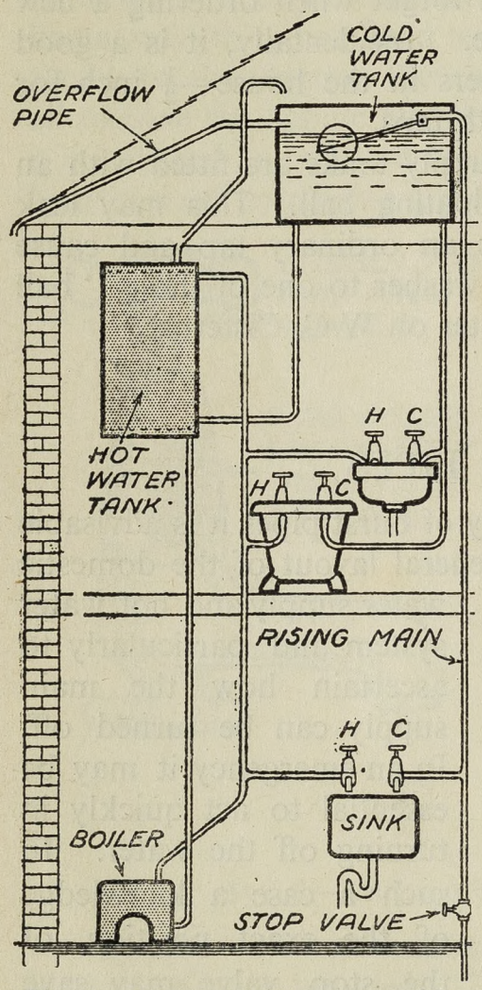

FIG. 2.—General arrangement of hot and cold water supply.

Do not drain the main cold water tank in this manner if the hot water system is in use, since by emptying the cold water tank there would be no water left to replenish the hot water tank and this might then boil. Turning off the main temporarily

and draining off the water in the cold water pipes as suggested can be quite safely carried out while the hot water system is in commission.

PREVENTING A FREEZE-UP.

Recent severe winters have shown us what to expect in the way of frozen pipes—even in England ! However, the fact that many houses have been entirely unaffected by the frost proves that frozen and burst pipes need not be the inevitable accompaniment of frosty weather.

The builders themselves and the plumbing engineers are often entirely to blame for this trouble. Many years with comparatively mild winters have caused them to become neglectful of the most elementary precautions, with the result that the first really cold spell reveals their guilt. Fortunately, however, it is usually possible to remedy matters and prevent trouble by taking a few simple precautions before the winter sets in.

" LAGGING " THE PIPES.

The most important thing to do is to cover or " lag " all the pipes which are in an exposed position, Usually the cold water tank is situated in the roof, as shown in Fig. 3, and it is here that the frost is first likely to attack. Fig. 3 shows how the main pipe which supplies the tank should be lagged with old rags, straw, or paper which can be held in position with strips of rag or string. A particularly vulnerable point in this example is that part of the pipe which passes close to the eaves of the roof. Special attention should be paid to protection at this point. The lagging should also be carried close up to the ball valve and rag may be tied over the valve itself so as to prevent it from freezing, taking care, of course, that the movement of the arm is not interfered with.

PROTECTION FOR THE COLD WATER TANK.

Quite frequently the tank itself will be found to be uncovered. This should be remedied if possible, because quite apart from the covering helping to prevent the tank from freezing, it also protects the water from impurities. A board or two placed across the top of the tank and covered with an old piece of linoleum will form quite an effective cover. A few

newspapers or some old sacking placed on top of this lid will provide the necessary protection from frost. It is often the formation of a thin layer of ice on the water which, by holding

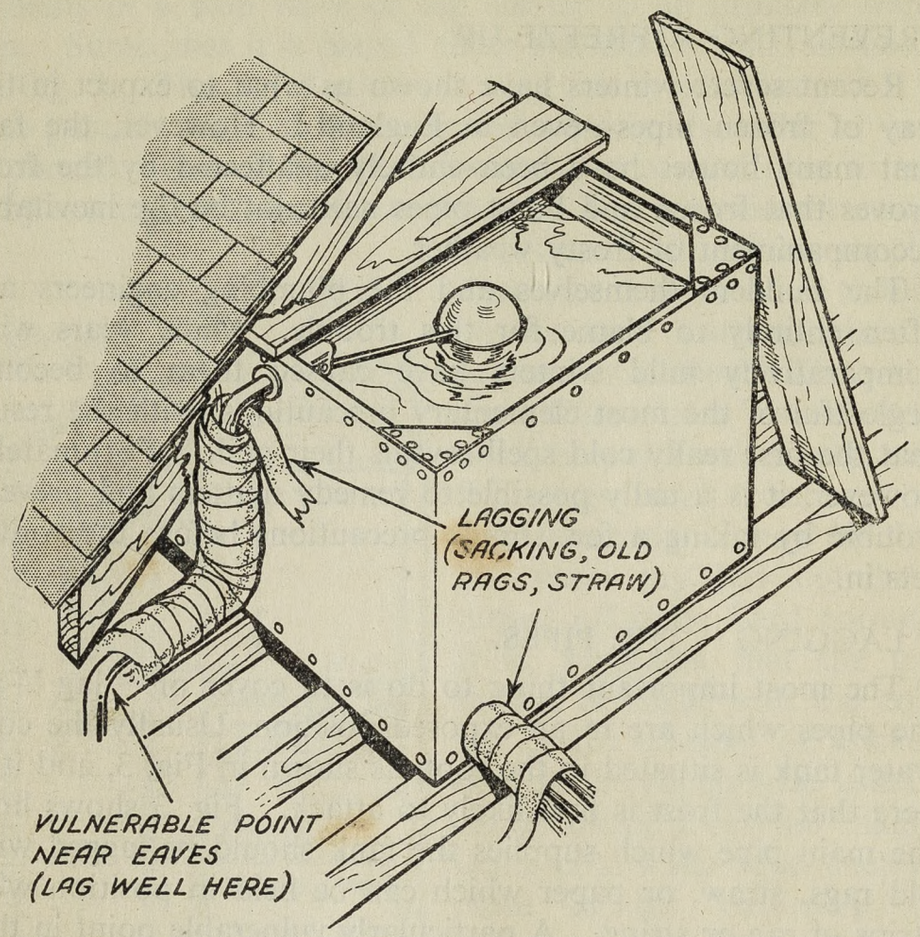

FIG. 3.—Pipes leading to and from the cistern in the roof should be "lagged" as shown. Boards placed over the tank and covered with old sacking will help to prevent the tank from freezing.

the copper ball stationary and allowing the valve to freeze starts the freezing of the whole system. A protective covering to the tank will often prevent this.

Here is one note of warning which is perhaps necessary regarding working in the roof. It is very rarely that the ceiling joists are boarded over, therefore, great care should be taken to walk only on the joists and not to step on the plaster between. The sudden appearance of a lady's leg through the ceiling may give rise to comment in the room below, and incidentally may cause grave injury to the owner—not to mention the damage to the ceiling !

As an added precaution in very severe weather the water should be turned off at the main each night and the pipe to the tank drained by turning on the cold water tap in the kitchen or scullery as already explained. There will then be no possible chance of the supply pipe freezing, since it will be empty. In the morning the main should be turned on again.

THAWING OUT WITH LAMPS AND STOVES.

If in spite of precautions, or through lack of them the system becomes frozen then steps should immediately be taken to remedy matters. Unfortunately, the first indication that the supply is frozen often occurs only when the water in the supply tank has been used up, thus the user may continue to draw off water for some hours after the main supply has ceased and be in ignorance of the fact. This in itself is not harmful but if the hot water system is in use it becomes definitely dangerous to continue drawing off hot water without replenishment.

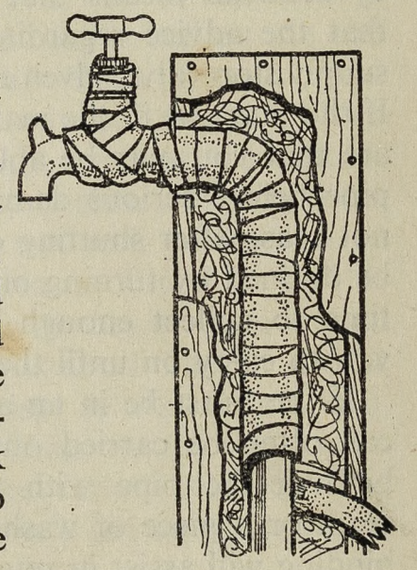

FIG. 4.—Outdoor taps need particular protection against frost. The box covering shown here is packed with straw and the supply pipe and tap is wound with felt or strips of canvas.

If, therefore, the cold water supply ceases or becomes erratic the supply tank in the roof should be inspected. If the ball valve be frozen up and the tank dry then the heating should be discontinued immediately. On the other hand, should there be considerable water (not ice) in the tank there will be no immediate need to stop the firing so long as efforts are made to get the supply working again. A quick method of thawing the supply pipe is to play a blowlamp on it, but as a blowlamp may not be easy to obtain other methods, such as placing an oil lamp or stove in the roof, or swathing the pipes temporarily in rags dipped in boiling water will have to be resorted to. Any lagging will naturally have to be removed to use a blowlamp or hot rags. Do not forget to replace it afterwards and even to supplement it if possible. Incidentally, old

newspapers placed over a pipe provide a first-rate protection against frost.

FROZEN WASTE PIPES.

Frozen waste pipes present a problem of their own. If the water will not run away in the bath or sink empty it by hand and pour in boiling water in which has been dissolved as much salt as it will hold in solution. This should do the trick. Incidentally, it is a wise plan to put a handful of salt in the lavatory pan the last thing at night to prevent the water in the trap from freezing. If it is allowed to freeze the pan may be cracked by the expanding ice.

DEALING WITH BURST PIPES.

It is not until the pipes have thawed out or have been thawed by artificial means that bursts become apparent. It is then that the advice regarding locating the situation of the main supply stop valve, given earlier in this book, will be appreciated. If the burst be in the main supply pipe to the tank the chances are that you may be able to turn off the water and drain the pipe before serious damage has been done. If the leak does not cease after shutting off the main the whole system should be drained by turning on all the taps, taking care at the same time to collect enough water in kettles and pails to enable you to carry on until the arrival of the plumber.

If the burst be in an accessible position a temporary repair can often be carried out by filling the crack with soap and binding the pipe with tape. A small patch of rubberised cloth or a piece of wash leather placed over the crack before binding will assist in retaining the soap in place. If the burst be in a lead pipe and is not very extensive the crack can usually be reduced, if not completely closed, by gently hammering it together. Use the reverse end of the hammer and tap the pipe lightly on either side of the crack endeavouring to spread the metal towards the crack so that it fills up. Only the very lightest blows should be employed using a stroking action towards the crack. Heavy blows will damage the pipe.

W.C. CISTERNS AND OVERFLOWING WASTE PIPES

For some peculiar reason a W.C. Cistern is known in the trade as a "Water Waste Preventer" but it is not every W.W.P. that lives up to its name.

The ordinary type of cistern is usually fairly trouble-free, but there are one or two defects which may develop and which can be very annoying. Probably the commonest is the failure to flush. Often it requires a definite knack to make the cistern operate, much to the embarrassment of visitors who have not acquired it. More often than not this trouble is due to the level of the water in the cistern being too low so that there is insufficient head of water to start the syphoning action when the chain is pulled.

The level of the water is controlled by a ball valve, which is simply a copper ball on the end of a rod. The other end of the rod is connected to a tap which admits the water to the cistern. When the cistern is empty the copper ball rests on the bottom as shown in Fig. 1. In this position the tap or valve is open and water is admitted. As the water rises so the copper ball, which floats on the water, also rises until a point is reached when the valve is closed. The water should by this time have reached the level shown in Fig. 2—just below the overflow pipe. If the tap shuts off before the water reaches this level, however, it will be difficult to make the cistern flush.

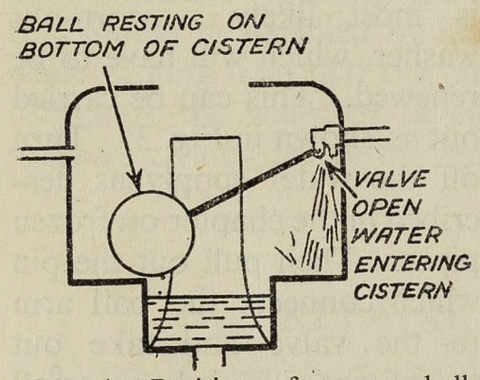

FIG. 1.—Position of copper ball when cistern is empty.

In order to raise the water level the arm of the ball valve may be bent slightly so as to raise the ball. This should be done

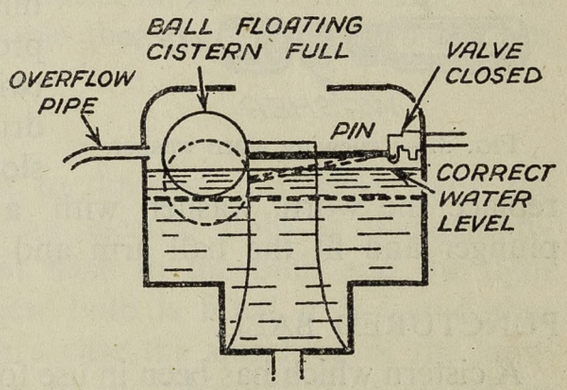

FIG. 2.—Water level when valve is closed.

carefully as it is easy to overdo the bending. Use both hands to bend the rod but do not press on the ball itself. By giving an upward curve to the rod the position of the ball will be raised. Do not endeavour to raise the copper ball by simply lifting it upwards because this will put a great strain on the valve and may injure the washer.

TROUBLE WITH THE OVERFLOW.

Should trouble be experienced through water running out of the overflow it may be that the level of the water in the cistern is a little too high. To make a test raise the ball by hand. This should be done while the cistern is full and actually overflowing. If the valve immediately shuts off and the water ceases to flow then a cure may be effected by lowering the position of the ball slightly. Bend the arm downward. Should this expedient fail to cure the trouble then the cause is most likely a worn-out washer, which will have to be renewed. This can be carried out as shown in Fig. 3. Turn off the water supply as described in the chapter on frozen pipes. Then pull out the pin which connects the ball arm to the valve and take out the plunger. This has a small rubber washer at the inner end held in place by a screwed-on cap. Unscrew this cap with a pair of pliers, preventing the plunger from twisting by means of a screwdriver passed through the slot in the plunger. Finally, replace the worn washer with a new one, put back the plunger and fit the ball arm and pin.

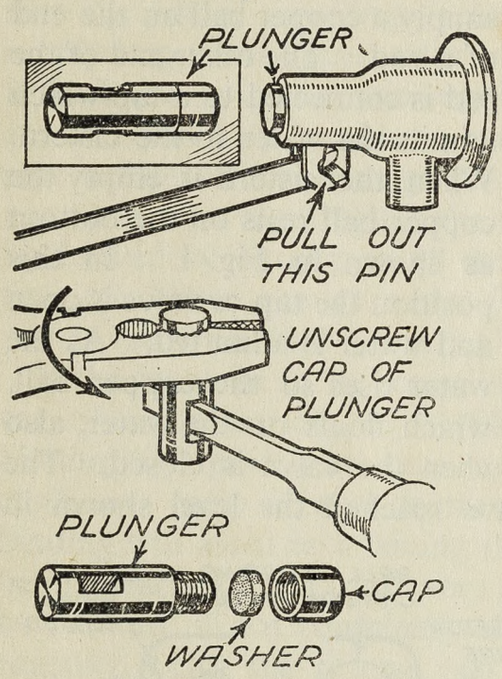

FIG. 3.—Renewing worn washer.

PUNCTURED BALL.

A cistern which has been in use for many years may suddenly commence to overflow due to a punctured ball. This is very

easy to detect for the copper ball, instead of rising with the water in the cistern remains practically or completely submerged. Usually the ball leaks round the seam and becomes partly filled with water. First of all turn off the water supply (see chapter on Frozen Pipes) and then remove the ball and arm by pulling out the split pin on which the arm pivots. Shaking the ball will soon show if it contains water. If it does it is often cheaper and more satisfactory to replace the ball by a new one than to attempt to repair it. A new ball can be obtained at any good ironmongers. In any case the ironmonger will be able to advise as to whether it will make a satisfactory job to solder the old ball.

If the punctured ball is in reasonable condition and not badly corroded you may decide to repair it yourself, in which case you should refer to the chapter on Soldering given in this book. Before repairing the hole, however, the water in the ball should be expelled by heating the ball over the gas stove while turning it so that the puncture is underneath. The heat will cause the water to be ejected from the hole due to the pressure created inside the ball.

REPAIRING A FUSE

A fuse is a safety device designed to protect the electrical system from a sudden rush of current such as would occur should two wires be accidentally "short-circuited." A fuse will not "blow" of its own accord, therefore, before fitting a new fuse wire you should endeavour to find the cause of its fusing, otherwise, it is possible that the wire will fuse again as soon as it is replaced.

WHY A FUSE BLOWS.

Usually it is not difficult to discover the reason why the fuse has blown. Perhaps an electric bulb is accidentally knocked. There is a bright flash in the bulb and the light goes out. Then when a new bulb is fitted it is found that the fuse has gone. In such a case the smashing of the lamp would have caused the fuse to go. Naturally, it would be unwise to repair the fuse before the burnt-out lamp had been

removed because there might still be a short circuit within the lamp which would blow the fuse again.

Take another simple case of a fuse blowing ; you are, perhaps, ironing with an electric iron. You may hear a slight crackling noise from within the connector which joins the flex to the iron, and then you become aware that the iron is losing heat although you have not switched off. What has happened is that the insulation of the flex has rotted due to the constant heat from the iron and momentarily the bare wires have touched. This has caused a spark which crackled inside the connector and at the same time the extra current used when the wires touched has caused the fuse to burn out. Since a clue to the trouble is provided by the crackling noise it would be foolish to merely replace the fuse without first attending to the cause of its blowing. The thing to do in such a case is to switch off, remove the connector from the iron and dismantle it. (You only need a small screwdriver for the job.) The condition of the wires inside the connector will probably appear somewhat as depicted in Fig. 1. By cutting off about an inch and a-half of the old wire the rotted part will be disposed of and a new connection can be made. Note that with the type of socket shown here, in which the flex enters the side, it is necessary to cut one wire a little shorter than the other in order that the wires may follow the channels in the socket.

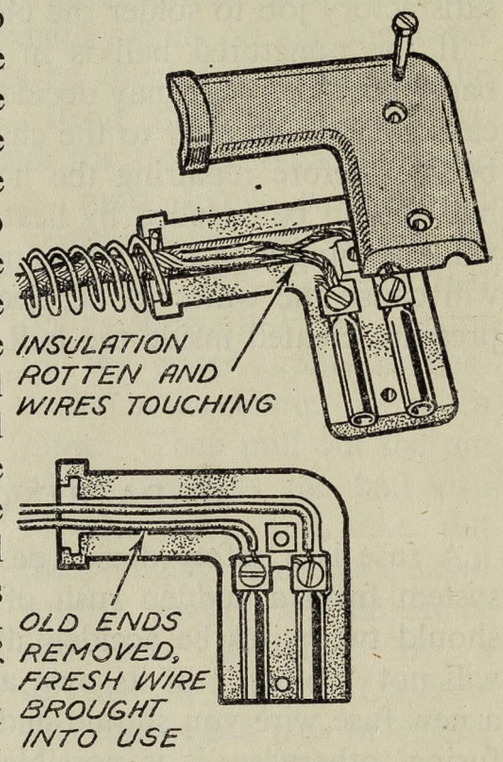

FIG. 1.—A faulty connection is often the cause of a fuse "blowing." This shows how to cure the fault in the case of an electric iron connector.

FINDING THE DEFECTIVE FUSE.

The replacement of the fuse itself can be carried out in a few moments. For this it is necessary to have some "5 amp."

fuse wire. This can be bought wound on a small card, as shown in Fig. 2, and for convenience it is a good plan to hang the card near the fuse box. The older type of fuse box is made of wood with a glass door. Before opening the box the main switch should be turned off. See Fig. 3. It will be necessary to remove each fuse in turn in order to discover the one which is "burned out." At first glance they may all appear intact, since there may be only a small break in the defective wire. Test each wire by lightly pulling it. The break often occurs close to one of the terminals and may, therefore, pass unnoticed until the wire is pulled.

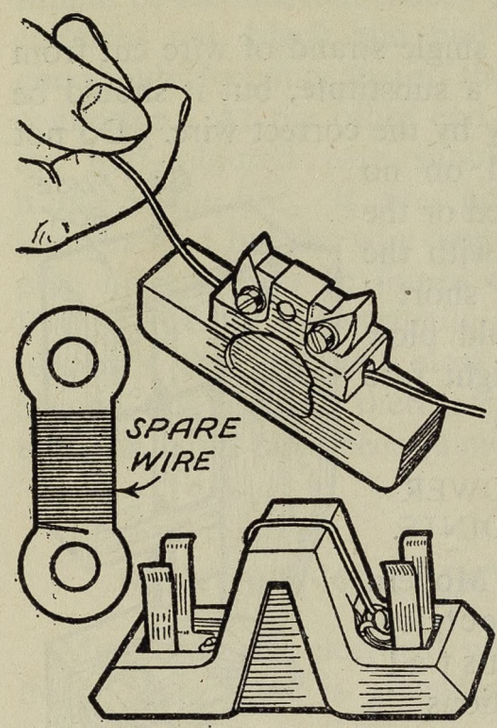

FIG. 2.—Two common types of fuse. Fuse wire for repairing them is sold wound on a small card bobbin as shown.

When the defective fuse has been discovered remove the remains of the old wire and replace it with a new piece. Wind the wire just once round the first terminal in a clockwise direction and tighten up the terminal. Then guide the wire along the groove in the porcelain to the other terminal and secure it to this as before. The fuse holder may then be replaced and the current switched on. There are several different patterns of fuse holder, but all operate on the same principle. Two very common patterns are shown in Fig. 2. With the one type the wire rests in a groove whereas with the other it is threaded through a hole in the porcelain.

Modern fuse boxes are mounted in an iron case, the door of which can only be opened when the switch is in the "off" position. This arrangement makes it impossible to replace a fuse without switching off the current ; thus safeguarding the operator against an electric shock or burns, Such a fuse box is shown in Fig. 4.

The 5 amp. fuse wire already referred to is the correct wire

for all lighting circuits, but if a fuse controlling one of the "power" points has blown it should be repaired with a piece of "15 amp." wire. Alternatively, three strands of 5 amp. wire may be used.

MAKESHIFT FUSE WIRE.

If no fuse wire is available a single strand of wire cut from a piece of flex may be used as a substitute, but it should be replaced at the first opportunity by the correct wire. Do not use more than one strand and on no account should thick wire be used or the fuse will be rendered useless with the result that in the event of a "short" either the company's fuse would blow or the wiring in the house might fuse with the attendant risk of fire.

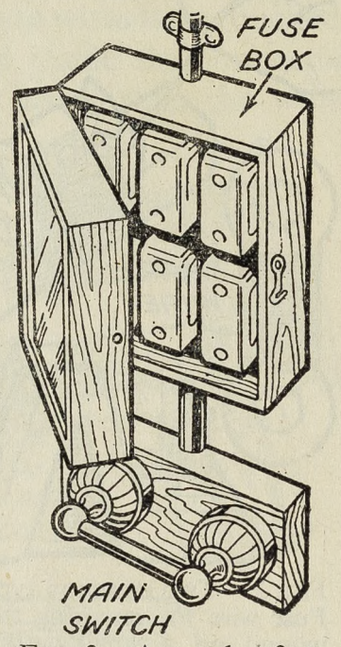

FIG. 3.—A wooden fuse box with glass door as used on old installations.

POWER POINTS.

Modern electrical installations in the home employ 3-point plugs and wall sockets for the "power" supply to electric fires, etc. The flex or cable used, therefore, contains three separate wires. It is known as 3-cored cable. Two of these wires carry the electric current while the third acts as a safety device for conducting the current to earth in the case of a defect in the appliance or connections. "Earthing" the current in this way minimises the risk of the user receiving an electric shock.

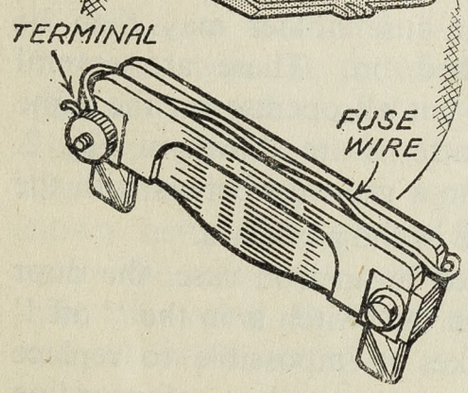

FIG. 4.—A modern Fuse and Switch box combined. It is not possible to open the box until the switch has been moved to the "off" position. A typical fuse is also shown.

Should you need to fit a new cable or to reconnect it, due to it becoming rotten or the connections having become loose, take great care to join the three wires correctly. You will find that they are covered in three different colours, and they should be reconnected exactly as found. Usually the wires are coloured red, black and buff or yellow. The buff-coloured one should be connected to the largest of the three pins of the connector. At the other end, where the cable joins the fire, the buff-coloured wire should be connected to the metal frame of the fire. It does not matter if the other wires are interchanged but the wire from the large pin of the connecting plug must always be joined to the frame of the apparatus. If this wire be inadvertently connected to one of the other terminals the fuse will blow when the fire is switched on. Should this happen, therefore, it is useless to mend the fuse until the wires have been joined correctly.

RENEWING ELECTRIC LIGHT FLEX

After ordinary electrical wire or flex has been in use for many years there is a tendency for the rubber covering to perish. Failure is most likely to occur where the wire enters the lamp holder. This is due to the heat from the lamp which tends to rot the insulation. The lamp may work perfectly well until it is touched or handled, as when changing a bulb or cleaning the shade; then the next time the lamp is switched on there is a momentary flash and the fuse blows.

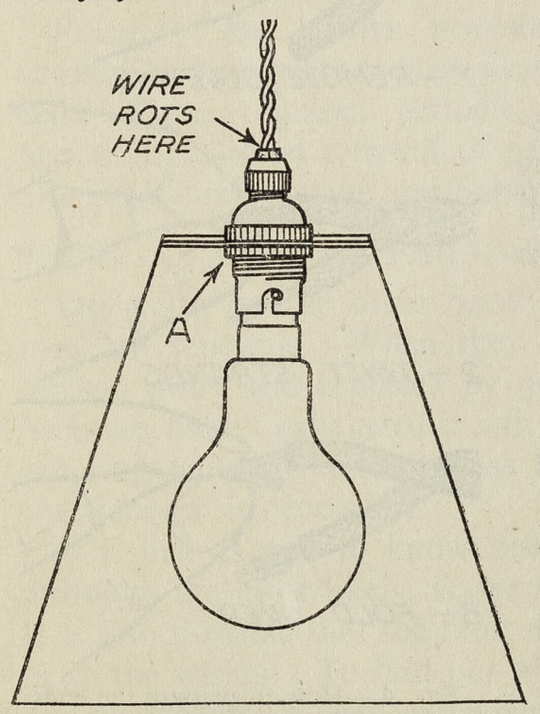

FIG. 1.—A typical lamp holder and shade.

What happens is that the two wires which comprise the flex touch one another where the rubber and cotton covering has rotted away,

thus causing a short circuit. An immediate repair can usually be carried out by cutting off the defective part of the wire and reconnecting the lamp holder. But first make certain the current is switched off. In order to remove the lamp holder take off the shade by unscrewing the ring "A" as shown in Fig. 1. Then unscrew the ferrule "B" Fig. 2, where the wire enters the holder. This will reveal two little pieces of wood which serve to grip the wire. Remove these so as to free the wire. Next unscrew the ring "C" and dismantle the holder as shown. By undoing the two small screws marked "D" the wires can be released from the holder.

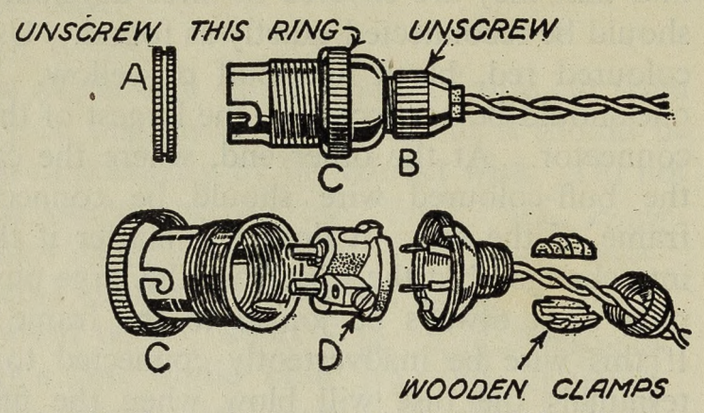

FIG. 2.—The various parts of a lamp holder showing how the "flex" is fitted.

Although a temporary repair can be effected by removing the defective part, this naturally shortens the wire somewhat, also, if the wire is very old, it is advisable to replace it, since after many years of use it becomes inflexible and rotten throughout its whole length. To do this it will be necessary to remove the old wire from the ceiling rose. A typical rose fitting is shown in Fig. 3. Unscrew the cover as depicted here and undo the small screws which hold the wire in position.

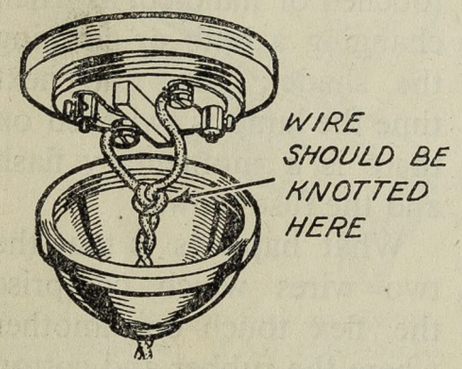

FIG. 3.—Method of wiring a ceiling "rose."

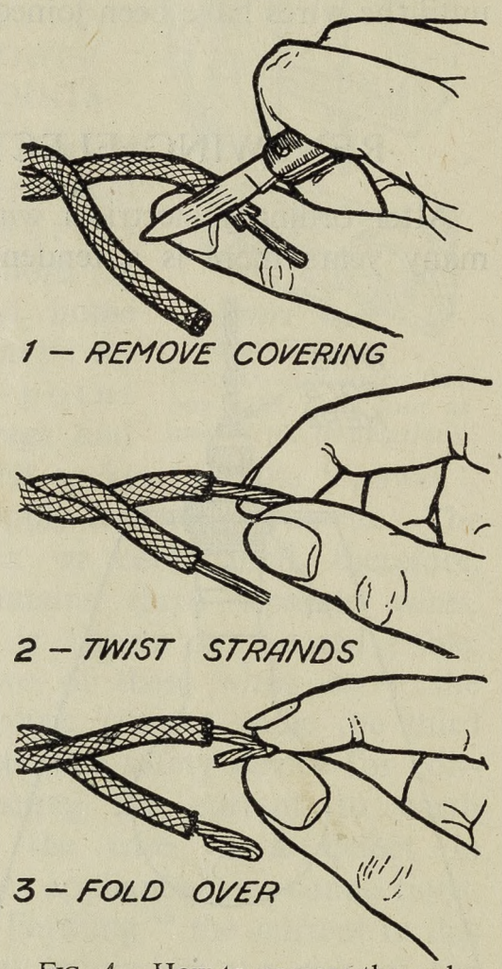

FIG. 4.—How to prepare the ends of electric "flex."

When fitting the new flex the ends should be bared and folded over before inserting them in the terminals of the rose. The best way of preparing the ends of a length of flex is illustrated in Fig. 4. This method will be found suitable for any connection in which the wire is inserted in a hole and pinched with a small screw. Before inserting the ends of the wires into the terminals a knot should be tied in the wire about an inch from the end. When the cover of the ceiling rose is replaced this knot will take the strain due to the weight of the lamp holder and shade. Fig. 3 will make this clear.

REPAIRS TO ELECTRIC BELLS

Electric house bells are operated either by dry batteries or from the electric mains.

Formally the motive power was provided by batteries similar in appearance to large jam jars and known as Leclanche cells. These required periodic "topping up" with water and an occasional renewal of certain parts. Besides this the cells were cumbersome and liable to corrosion.

SIGNS OF BATTERY FAILURE.

Dry cells, on the other hand, are clean and compact and need no renewals. When they are finished they are simply thrown away and replaced by new ones. Before the battery becomes finally exhausted it will be noticed that the bell does not ring quite so vigorously as formally, and this is the clue that renewal is necessary.

It is just as well to know that exhaustion of the batteries, although the most likely, is not the only cause of bell failure. It is also possible that the fault may lie in the switch, the bell, or in the wiring. To find out where the trouble lies there are one or two simple tests which can be carried out.

EXAMINE THE CONNECTIONS.

First of all look at Fig. 1, which shows the layout of a typical bell circuit. There are two bell pushes, the battery and the

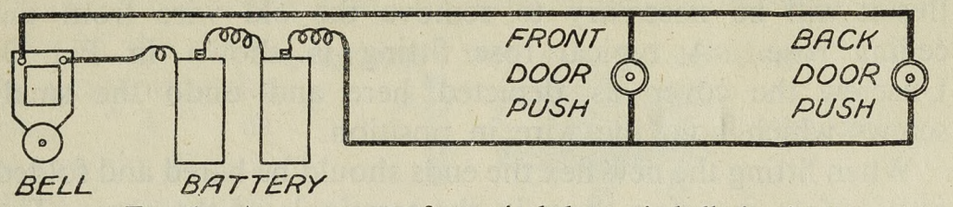

FIG. 1.—Arrangement of a typical domestic bell circuit.

bell itself. With this kind of circuit it is possible to tell immediately if the failure of the bell to ring is due to one of the pushes. If the bell rings when one push is operated but not when the other is pressed, then obviously the second push or the wires leading to it are the cause of the trouble. If, however, neither push works then the seat of the failure may be looked for elsewhere, for it is a million to one chance against both pushes failing at the same instant.

WHERE TO LOOK FOR FAULTS.

The most likely points of failure apart from the battery and pushes are the connections to the bell and to the battery. If the bell suddenly fails go over these connections carefully and see that the terminals (see Fig. 2) on the bell are screwed down tightly on the wires, and that the battery connections are all sound and clean.

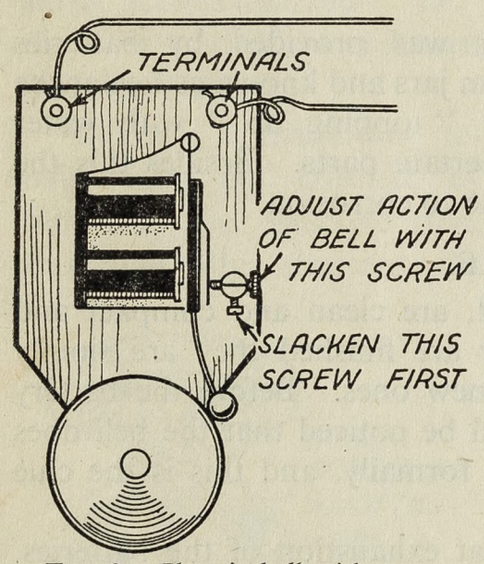

FIG. 2.—Electric bell with cover removed.

To make a proper test of the battery requires a voltmeter, but as the housewife is as likely to have a voltmeter in her possession as a talking parrot the alternative would be to remove the battery and get it tested at the local electricians. Incidentally, each cell should show a voltage of $1\frac{1}{2}$. A very rough and ready test of a battery consists in momentarily touching

or "shorting" the wires as shown in Fig. 3. If a small spark is generated as

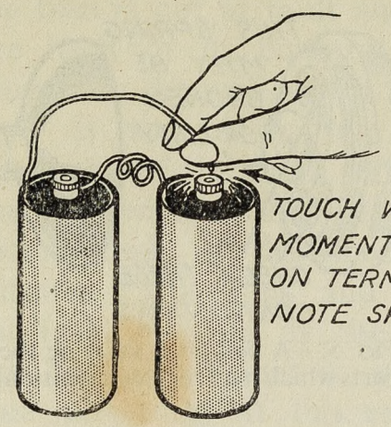

FIG. 3.—A simple battery test.

through the small coil spring coming broken or through the spring be broken it will probably fall out when the cover of the bell is unscrewed, in which case nothing can be done except to buy a new push. Should the spring appear to be in order it may be that the connections to the wires are broken or dirty, or perhaps the spring when pressed home does not make proper contact with the brass strip underneath. If the contacting parts appear dirty try cleaning them with a piece of very fine emery cloth. A typical bell push showing the various parts under discussion is illustrated in Fig. 5.

the wires flick together there is still life in the battery. When replacing batteries make sure that you have the connections right. Right and wrong ways of connecting two cells are shown in Fig. 4. For your assurance let me tell you that it is not possible to get an electric shock from bell batteries.

Bell pushes, especially cheap ones, occasionally give trouble which forms the contact becontacts getting dirty. If the

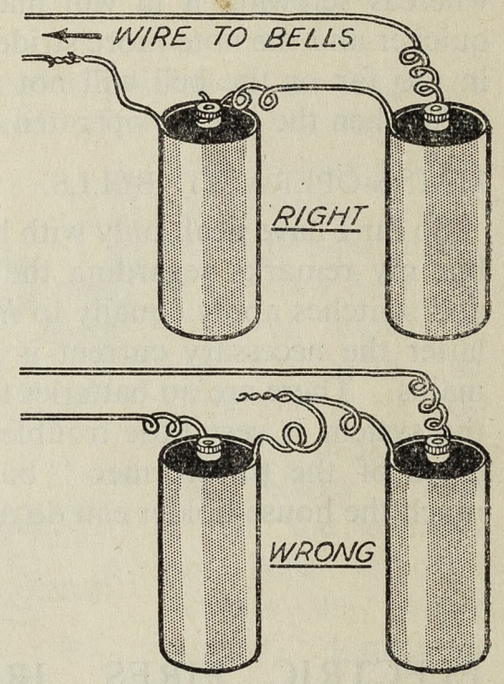

FIG. 4.—Right and wrong ways of connecting new batteries.

ADJUSTING THE TONE OF THE BELL.

It is only very occasionally that the bell itself requires adjustment, but it is quite an easy matter to tune it up should the note become erratic or harsh.

Remove the cover of the bell and inside will be found an adjusting screw which can be set with a screwdriver. Bells vary slightly in detail but the general construction is similar to that shown in Fig. 2. The adjusting screw is clearly shown, but before it can be turned the little locking screw should be loosened. This will allow the adjusting screw to turn freely and once it is set the locking screw should be screwed tight again so as to prevent it moving.

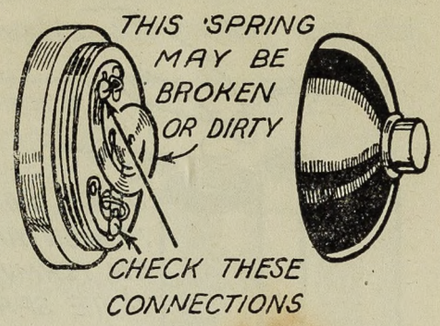

FIG. 5.—A bell push showing the parts which may require attention.

In order to find the best setting for the adjusting screw get someone to ring the bell while you turn the screw. Screwing it out will give a slow and somewhat flabby note, whereas screwing it in will make the vibrations of the gong quicker and the note more strident. Do not screw the adjuster in too far or the bell will not work although current will be used when the push is operated.

MAINS-OPERATED BELLS.

So far I have dealt only with house bells worked by batteries, but my remarks regarding the inspection of the connections and switches apply equally to mains-operated bells. With the latter the necessary current is derived from the electric light mains. There are no batteries to need renewing and, therefore, the system is very little trouble to maintain. In the unlikely event of the transformer "burning out" there is not very much the house-holder can do as this is a job for an electrician.

ELECTRIC FIRES, IRONS, KETTLES AND COOKERS

Electric fires are fairly easy to repair because the elements are exposed and very accessible. However, if the fire fails to operate on being switched on or suddenly goes out do not immediately conclude that the element has burnt out until the connections to the fire and also the fuses have been examined.

First of all connect another fire or an electric iron or some other electrical apparatus to the point. If this operates then the fuse is not at fault and the trouble can be traced to the fire itself or its connections. Unscrew the adapter which plugs into the wall socket and examine the connections to the flex. It may be that the wire has rotted and broken away from one of the small terminals inside the adapter, in which case the ends of the wire should be cut away and carefully reconnected, as described in the chapters on Renewing Electric Light Flex and Repairing a Fuse. Of course, the fault may lie at the connection of the flex and the fire itself, but this is unlikely because there is usually less movement at this end of the flex. Therefore, if the flex and its connection to the plug appears to be in good condition the next most likely point of failure to examine is the element.

BOWL FIRES.

There is usually a wire screen clipped over the edges of the bowl which is easily removed. The element is a fireclay cone wound with a coil of wire. It may have a two-pin fitting or unscrew from the bowl, as shown in Fig. 1. With the latter type it is advisable to look inside the holder from which the element has been removed because the centre contact sometimes becomes weak and burnt away, with the result that the fire goes out. If it is so badly burned that it cannot be cleaned it can be replaced by a strip of brass cut from the contacts of a flash-lamp battery. This should be cut (a pair of stout gardening scissors will

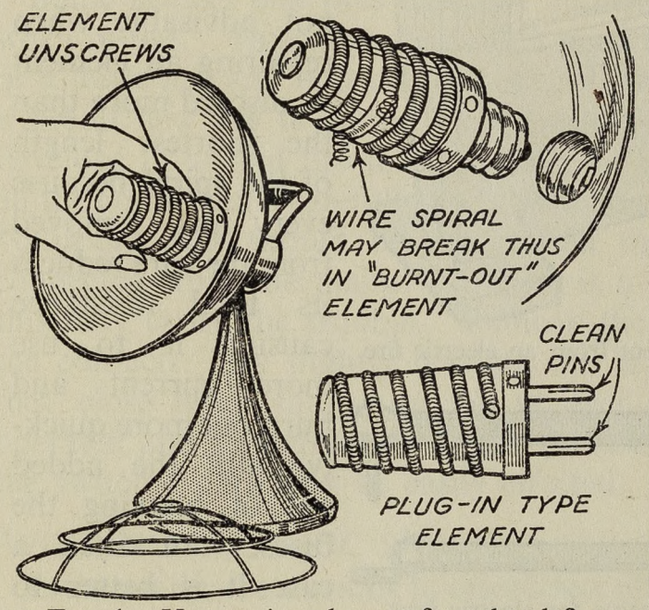

FIG. 1.—Unscrewing element from bowl fire. A plug-in type element is also shown.

do) exactly the same size as the original or it may touch the edges of the holder and cause a "short."

REPAIRING THE ELEMENT.

If the element is burnt out it will be quite obvious because the wire will be broken and slack. Should the break occur near the end of the wire it will be permissible to reconnect it and discard the short length attached to the screw. This will have to be carried out very carefully because the wire becomes brittle after it has been in use. If the break occurs near the middle of the wire the broken ends may be twisted together, but such a repair does not last very long since the wire usually breaks again sooner or later. It is not advisable when repairing an element to discard more than the shortest length of the spiral because every inch removed from the wire reduces its total resistance causing it to use more current and burn out more quickly, with the added risk of blowing the fuses. In such a case it is better to obtain a new spiral, stating the make of the fire, the voltage and the wattage. These particulars will be found on the back of the appliance. A new wire may appear to be too short but should be pulled out slightly as it is being wound in

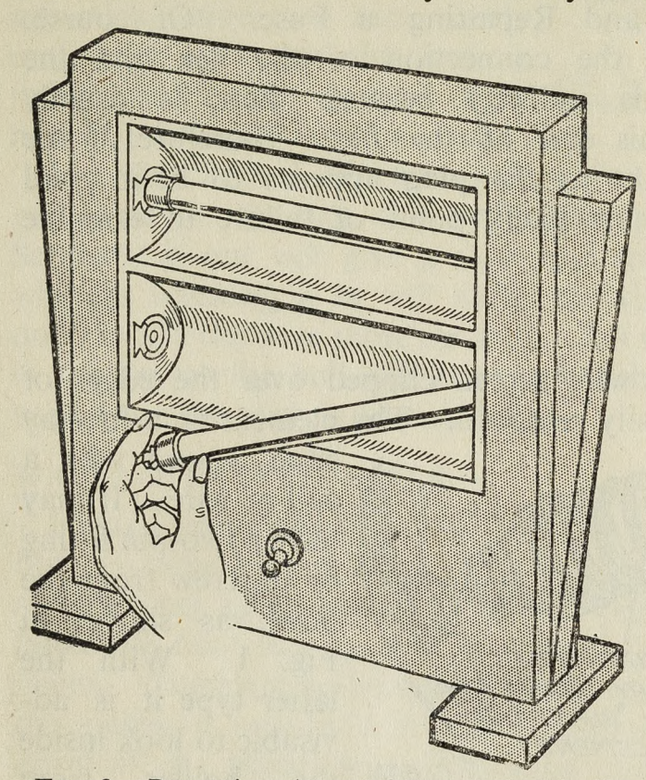

FIG. 2.—Removing element from an electric fire.

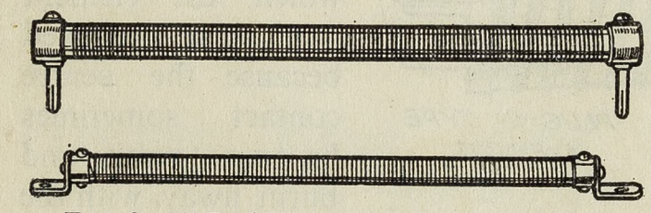

FIG. 3.—"Rod" elements for electric fires.

the grooves. It will then be under slight tension when joined up.

Similar procedure applies in the diagnosis and repair of larger electric fires. Usually, however, the elements (there are generally several of them) are not in the form of an unsupported spiral but consist of rods tightly wound with wire similar to those illustrated in Figs. 2 and 3. There is a kind of thimble or ferrule at each end of the rod and this clips into a socket in the fire. The socket at one end is spring-loaded and to remove the element it is necessary to push it into the socket at this end and give it a slight twist when it will disengage at the other end. It can then be removed as shown in Fig. 2. With some types of rod it is possible to reconnect the wire in the event of its breaking where it joins the end cap because there is a small terminal or screw to which the wire is connected. With other types, on the other hand, this is not possible and the whole element must be replaced when the wire burns through.

HUMMING NOISES.

Some heaters and fires make an unpleasant humming noise when in use. This can usually be traced to loose connections or a loose nut and bolt on the case. If this noise occurs with a brand new fire it should be changed for another, but if it develops in an old fire it can usually be cured by going over all the connections carefully and tightening everything securely. Naturally, this should be done when the apparatus is disconnected from the mains. If there is a switch on the stove this may cause the trouble. Remove the cover and examine the contacts. By slightly bending the brass contacts so that they close more snugly on the plunger when the switch is operated and by tightening all the terminals and screws inside the switch a cure may be easily effected.

AVOIDING ELECTRIC SHOCKS.

Incidentally, the warning to disconnect all electrical apparatus from the mains before making adjustments cannot be too strongly emphasised, for some nasty shocks, not to mention dangerous burns, may result from neglecting to observe this precaution. The danger of electric shock is greater in a damp building or where electrical appliances are not properly

"earthed." For instance, by standing on a damp floor and touching the contacts of a wall plug or switch with a metal screwdriver without previously switching off the current at the mains may result in an electric shock due to current leaking from the switch, through the operator's body, and thence to earth via the damp floor. Incidentally, the reason for the third pin in modern power plugs is to obviate electric shocks by providing a passage to earth for the current in the event of a short circuit or leakage. The flex or cable used in conjunction with a three-point plug of this type consists of three wires the third one being connected to the frame of the stove, kettle, or other appliance in use. For this reason particular attention should be paid to the connection of the third wire where the three-point plugs are in use. The correct method of joining the three wires is explained in the chapter on Repairing a Fuse.

ELECTRIC IRONS AND KETTLES.

Apparent failures of the element can often be traced to the connecting socket and wire. The connector becomes quite hot when the iron or kettle is in use with the result that eventually the wire may rot and break where it enters the connector and the appliance fails. The fuse may blow at the same time if the wires happen to touch each other inside the connector.

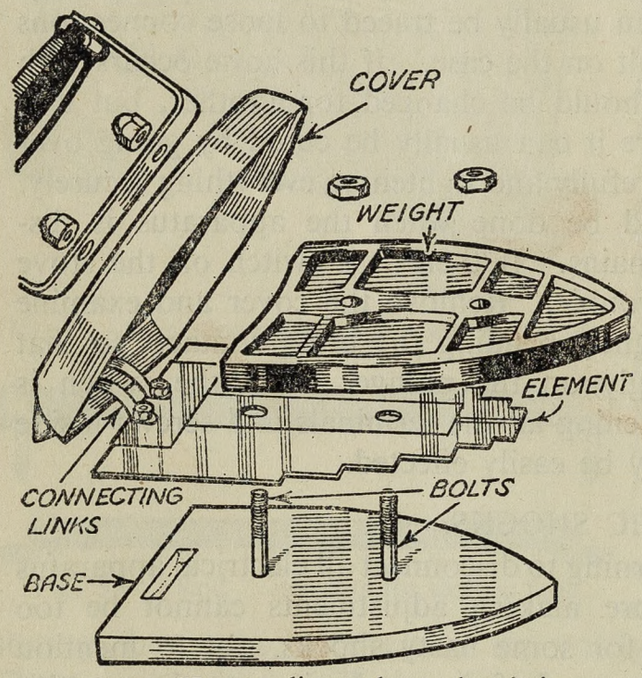

FIG. 4.—How to dismantle an electric iron.

The connector can easily be dismantled with a small screwdriver when the rotten part of the wire can be cut away with a penknife and a fresh connection made. See Fig. 1 in the chapter on Repairing a Fuse. Do

not forget when you have the connector apart to clean the brass sockets and also the pins on the iron or kettle as these usually become somewhat corroded and burnt.

The elements of kettles and electric irons are not easily repairable. The element of an iron can, however, be replaced. Dismantle the iron as shown in Fig. 4 by undoing the two nuts on top. The element is flat and covered with mica. Replacements can be bought ready for fitting. Some types have strip brass connecting links as illustrated. Others have two spring connectors which automatically make contact with the terminals when the iron is assembled. When ordering a new element quote the voltage and make of iron. The replacement should be connected to the two terminals—unless spring connectors are used—and slipped over the two bolts. The weight is placed on next and the nuts tightened. Finally the cover is replaced, the handle put on and the two domed nuts tightened.

Some electric kettles have a flat element like that of an iron and this is replaced in a similar manner by unscrewing the base of the kettle. Others have an immersion element in the form of a flat loop which can be seen inside the kettle itself. It is advisable in the case of failure to leave this type to be repaired by the makers.

ELECTRIC COOKERS.

Repairing or overhauling an electric cooker is really a job for the service department of the suppliers of the cooker. There is little that the housewife can do apart from repairing a fuse. Elements can burn out, however, and can be replaced in just the same way as a fire element. Should one of the switches break down it will have to be replaced—a job which is better left to a competent electrician, since the wiring is rather complicated.

CLEANING AND ADJUSTING AN ELECTRIC TORCH

There are three reasons for electric torch failures—a worn-out battery, a broken bulb or bad contacts.

HOW TO REVIVE THE BATTERY.

Failure of the battery is indicated when the light becomes progressively feeble, but before finally discarding the battery there is a tip which is well worth trying and which will often give it another short lease of life. The idea is to heat the battery for a few minutes. This can be done by leaving it in a warm oven for ten minutes. Preferably it should be placed in the oven immediately after it has been in use and while it is still hot, but with the heat turned off. Alternatively, the battery may be stood in the hearth and turned round occasionally so that it is warmed on either side. Do not bake the battery fiercely or the inside will boil out and it will be ruined. However, if carried out carefully this heat treatment usually puts renewed life into a battery which is just running out. An old battery which is completely "flat" will not, of course, respond in the same manner.

FITTING A NEW BULB.

A bulb may fail suddenly through the filament burning out or the filament may break due to a shock such as might be sustained on accidentally dropping the torch. There is no way of repairing a broken bulb and another one must be fitted. It is advisable to remove the battery before attempting to unscrew the defective bulb, since the spring used to keep the battery in contact with the bulb may exert enough pressure

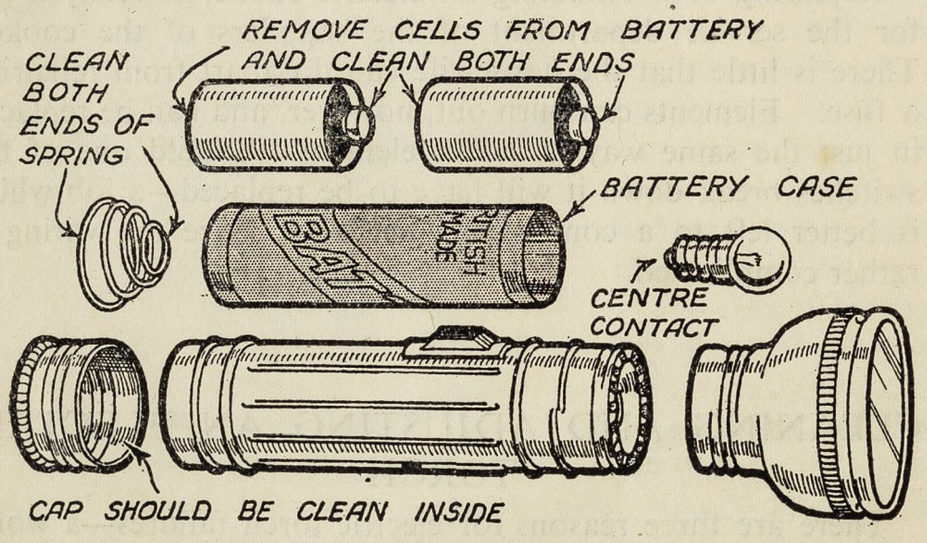

FIG. 1.—An "exploded" view of an electric torch showing the points to examine in the event of a failure.

to make it difficult to unscrew. An illustration of a typical hand torch showing the component parts will be found in Fig. 1.

Some torches can be focused by twisting the head of the torch. In this way the reflector moves backwards and forwards in relation to the bulb and so makes the circle of light wide or narrow as required. Torches which are not fitted with this refinement rely for focusing of the light on the position of the bulb itself, thus it is not always necessary to screw a new bulb in as far as it will go. It is better first of all to screw it in half-way, replace the battery, and see how it works. If the beam is too wide or too narrow it can then be adjusted by screwing the bulb in a little farther or alternatively unscrewing it.

CLEANING THE CONTACTS.

Sometimes after fitting a new battery or bulb the torch will not operate. In other instances it will give intermittent light or fail altogether after being switched on. Erratic behaviour of this sort is due to a bad contact somewhere. It is best, in such cases, to dismantle the torch and clean the parts on which the electrical contact depends. In the base of the lamp will be found a coil spring which serves to hold the battery in place. This spring conveys the electric current from the bottom of the battery to the case of the torch and thence to the bulb. For this reason it should be kept clean. An old battery may have been left in the torch and due to leakage it may have corroded the spring. Worn-out batteries should never be left in the torch since they are always liable to disintegrate and become messy. The fluid which leaks from them is corrosive and will readily attack the inside of the torch. If the spring is dirty or corroded it should be scraped clean, both top and bottom, with a penknife or cleaned with a small piece of emery cloth. The inside of the cap into which the spring fits should also be cleaned.

Next turn your attention to the battery itself. This should be cleaned at the bottom where it comes in contact with the spring and also the little copper cap at the top should be quite bright. This cap makes contact with the bulb. As the battery consists of two units or cells it is advisable to slip them out of the cardboard container and scrape both ends of

each cell. You will then be certain that there is good contact throughout. Fig. 1 shows the two small cells which comprise the battery. After cleaning them they should be re-inserted into their case.

Before finally reassembling the torch it is advisable to unscrew the bulb and make certain that this too is quite clean, paying particular attention to the centre contact.

FITTING A NEW SPRING TO A DOOR LOCK

There are two types of door lock used for interior doors. One type is concealed within the thickness of the door itself and is called a "mortise" lock, whereas the other type which screws on to the outside of the door, is known as a "rim" lock. The internal mechanism is similar in each case, but the mortise lock is perhaps a little more difficult to remove should it require attention.

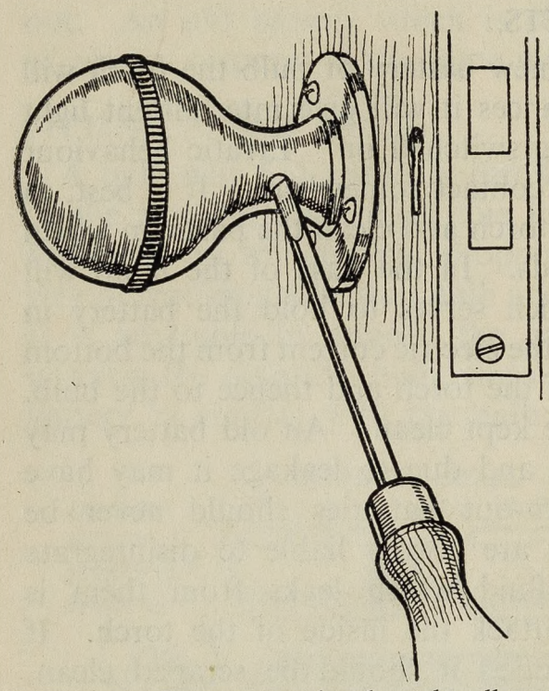

FIG. 1.—To remove the door handles unscrew a small screw in the side of one of the handles.

A broken spring is indicated by the fact that the bolt will not spring out again after the door handle is released. Thus on shutting the door the bolt remains in the body of the lock and the door swings open again. There is also no "spring" in the handle so that when it is turned it remains in that position.

REMOVING THE LOCK.

To renew the spring it is necessary to remove the lock from the door. To do this the handles must first of all be taken off. Whatever the pattern, whether ordinary brass door knobs, or some more fanciful moulded handles are fitted the method

of removal is the same and is quite simple. In the side of each handle will be found a small screw. This screw should be removed from one handle (see Fig. 1); the handle will then pull off, allowing the other handle to be withdrawn complete with the spindle as shown in Fig. 2. Any loose washers on the spindle should be carefully put aside with the handles.

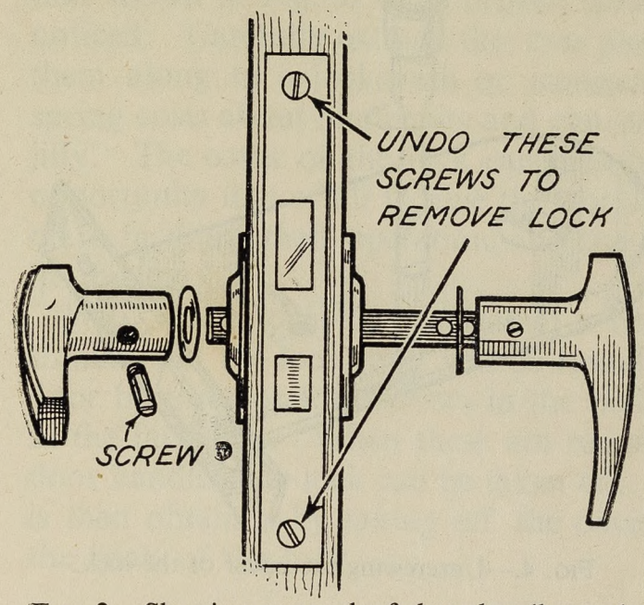

FIG. 2.—Showing removal of door handles and the screws which attach the lock to the door.

MORTISE LOCKS.

Now unscrew the two screws in the faceplate of the lock. These are shown in Fig. 2. With some locks the removal of these two screws will allow the plate to be prised off revealing two more screws underneath. The removal of this second pair of screws then allows the lock itself to be removed as

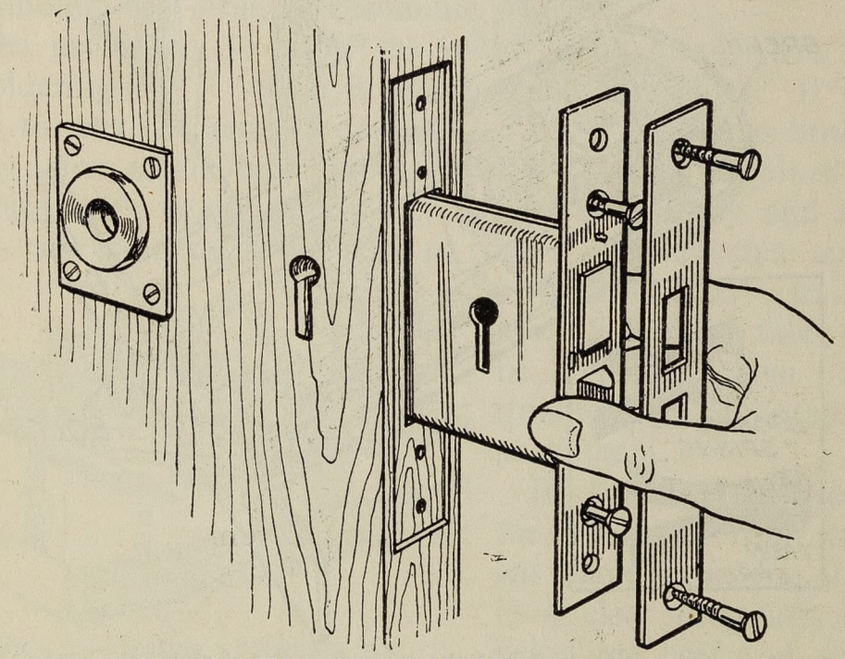

FIG. 3.—How a mortise lock is removed.

depicted in Fig. 3. Other patterns of lock, however, dispense with the additional plate and screws and the lock will slide out on removal of just one pair of screws.

MATCHING THE BROKEN SPRING

Fig. 4 shows the lock after removal. There is usually a single screw in the side of the lock, which when unscrewed as shown in this illustration permits the removal of the cover. Inside the lock the arrangement is something like that shown in Fig. 5. The broken spring will immediately be noticed. Carefully extract the two pieces of spring and take them along to a locksmith or ironmongers. A replacement spring costs about one penny and can be fitted in position in a jiffy. The cover of the lock can then be replaced, taking the opportunity first of all to give the working parts a few drops of oil to facilitate their operation, and the whole lock re-inserted in the door.

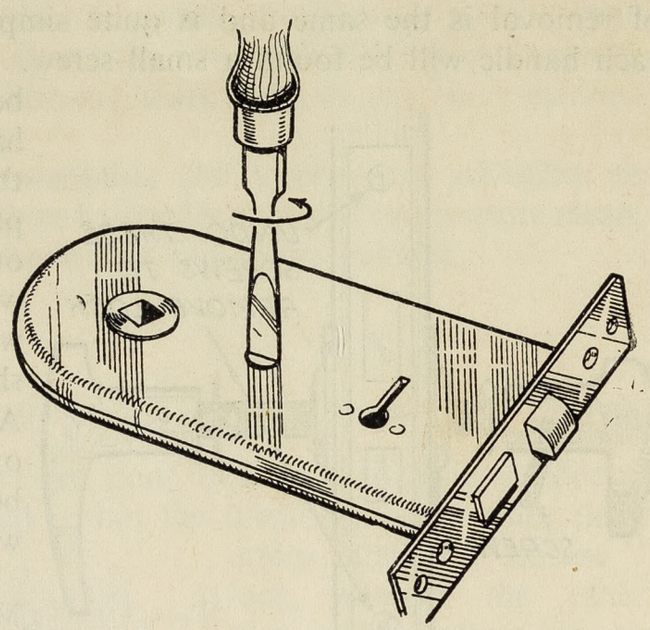

FIG. 4.—Unscrewing the cover of the lock.

With a rim lock the renewal of a broken spring is exactly similar, but the lock itself will be found to be attached to the door by three or four screws in the body of the lock and two in the faceplate. When these are removed, together with the door handles, the lock can be taken off. Access to the interior is then obtained by taking off the cover which is screwed to the back of the lock.

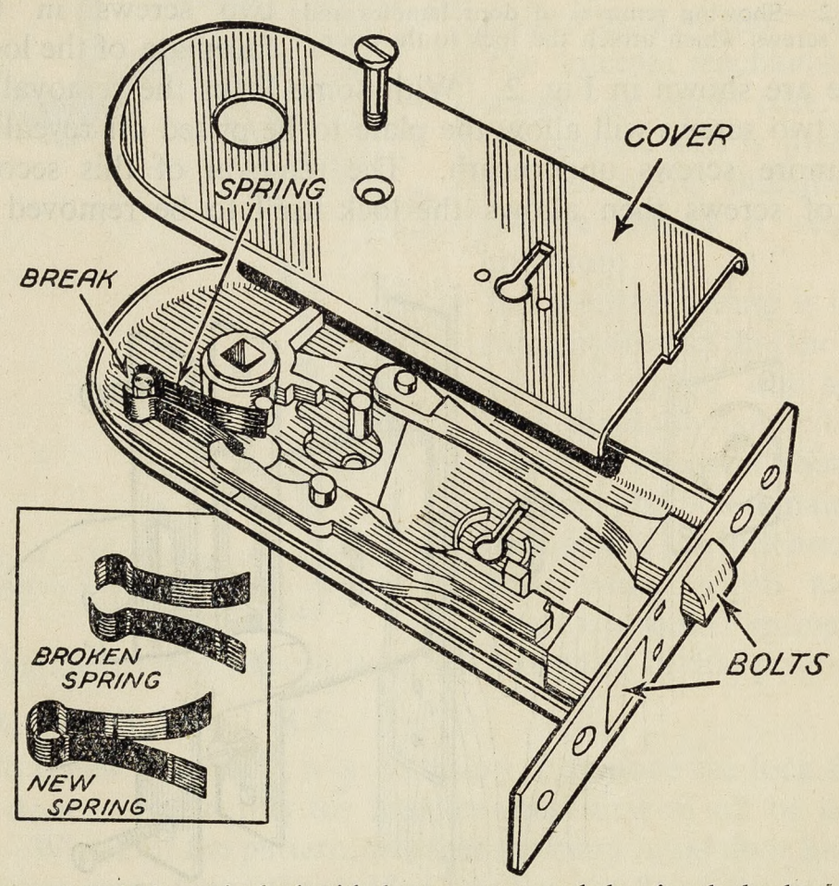

FIG. 5.—A typical mortise lock with the cover removed showing the broken spring

SOLDERING

This is a very strong and useful method of joining or repairing metal articles. Steel, copper, brass and zinc can easily be soldered but the solder will not "take" on aluminium, cast-iron, or chromium plate.

The usual way to apply the solder is by means of a hot "soldering-iron" which is used to melt the solder. If you wish to refix the handle or spout of a kettle which has broken away: first of all thoroughly clean the parts to be joined by rubbing with emery cloth until the metal is shiny and free from rust (solder will not stick to rust or dirt) and then apply a little "flux" to the job. Soldering flux can be obtained from any ironmongers in liquid or paste form.

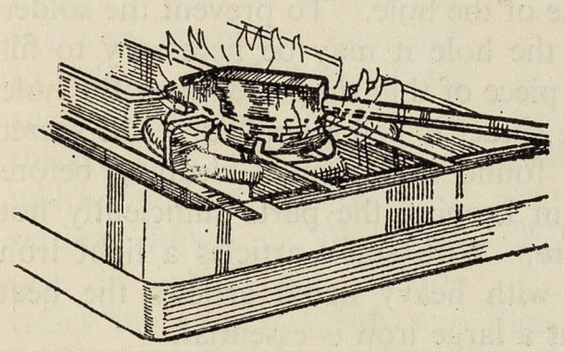

FIG. 1.—Heating a soldering iron.

In the meantime heat the soldering iron in a gas flame as in Fig. 1 or in a clear fire until just below red heat and while

still hot give the iron a few quick strokes with a file as shown in Fig. 2 so as to remove any scale, and dip the iron in the flux, a little of which has been placed in a tin lid (see Fig. 3). Apply a stick of tinman's solder to the iron until it melts and runs over the iron. This is called "tinning" the iron. The flux is used to make the solder stick because without it a thin film of oxide would form on the heated metal and prevent the solder from adhering to the iron. Reheat theiron and rub it over the parts to be soldered, at the same time holding the stick of solder against the iron so that a small pool of molten solder follows the iron. Guide the solder along the crack between the two parts to be joined, applying a little more flux should the solder be disinclined to stick. Now remove the iron and allow the article to cool and finally wash with soap and water to remove any remaining flux.

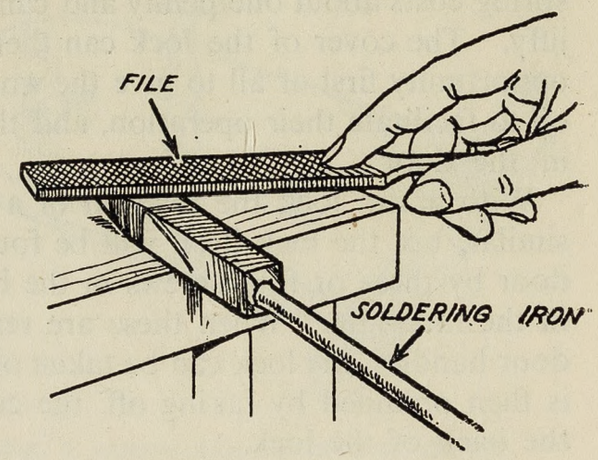

FIG. 2.—Cleaning the iron with a file.

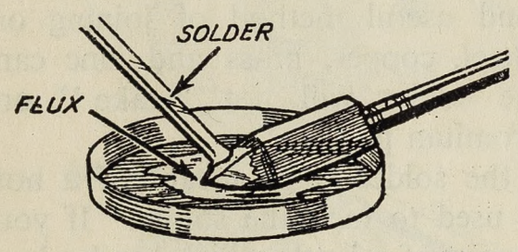

FIG. 3.—"Tinning" the iron before using.

To repair a small hole in a pot or kettle the same method is employed, but on cleaning the area surrounding the hole it is often found that the metal is so thin, that it crumbles away and increases the size of the hole. To prevent the solder running straight through the hole it may be necessary to fill it up by means of a small piece of thin tin placed over the hole to form a patch while the solder is being applied. The secret of successful soldering is found in thorough cleaning before applying the solder and in keeping the parts sufficiently hot to make the solder adhere. With small articles a light iron is quite satisfactory but with heavy metal articles the heat leaks away quickly so that a large iron is essential.

RUNNING REPAIRS TO VACUUM CLEANERS

Vacuum cleaners fall into two groups—those which rely on suction alone and those which incorporate a revolving brush. The suction principle, however, is the same in both types and it is just as well to acquire a knowledge of this principle before carrying out repairs and adjustments.

ADJUSTING THE SUCTION HEIGHT.

Vacuum cleaners vary in power somewhat according to the size and power of the motor and the area which the suction tool covers, although a small light machine may give just as strong suction as a large cleaner, providing the suction opening is proportionately small. On the other hand no machine, however powerful, will extract dirt from a carpet if the suction opening is not in close contact with the carpet. If there is a gap between the opening and the carpet as shown (somewhat exaggerated for clearness) in Fig. 1, the force of air will be greatly reduced, besides which it will merely pick up loose dirt from the surface. If the suction opening is kept in close contact with the carpet the available space for the air to enter will be very small and the intensity of the suction correspondingly great. Air will not be able to rush in over the top of the carpet but will be drawn through it as shown in the illustration (Fig. 2). In this way dirt embedded in the texture of the carpet and even that under it will be drawn out. It is very important, therefore, to adjust the height of the suction opening to suit the thickness of the carpet. It will be noticed that the ideal setting shown in Fig. 2 is one in which the suction raises the carpet slightly and then draws the air through it. Incidentally, it is possible to have it too close so that suction

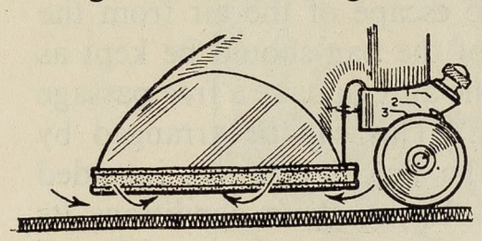
FIG. 1.—Suction height of a vacuum cleaner must not be too great or air will be sucked over the carpet instead of through it.

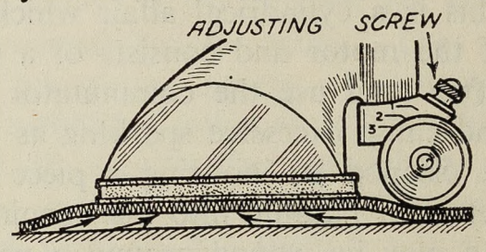

FIG. 2.—When the suction height is correctly adjusted the carpet will be lifted slightly (shown here somewhat exaggerated for clarity.)

occurs only at the edges of the opening. By paying attention to this adjustment, which is usually easily carried out by turning a small adjusting nut on the side of the cleaner, as shown in Fig. 2, much greater efficiency will be maintained than if the setting were left for, say, medium thickness carpets under all conditions of use.

HOW A FULL BAG AFFECTS EFFICIENCY.

The air is sucked into a vacuum cleaner by means of a rotating fan driven by an electric motor. Naturally, the air has to find a way out, and this way out is through the sides of the bag. The bag is essential for collecting the dirt, but apart from that it tends to obstruct the escape of the air from the fan. For this reason the inside of the bag should be kept as free from dirt as possible so that the air can have a free passage through the texture of the cloth. This can be arranged by emptying the bag frequently. The machine is not intended to be run until the bag is full. Under these conditions its air-filtering capacity is practically nil and the suction falls off to nothing.

ATTENTION TO THE MOTOR.

The electric motor is the heart of the cleaner. If that is not working properly the efficiency of the whole machine will be affected. Unfortunately (or fortunately) many machines provide no means of access to the working parts of the motor so that any defect here necessitates returning the cleaner to the makers. On some motors, however, there is a small opening on either side through which the *commutator* can be seen. This is a cylindrical affair which is mounted on the spindle of the motor and consists of a number of copper segments. After long use the commutator tends to become blackened and cause excessive sparking as the motor revolves. It may be cleaned by inserting a piece of non-fluffy rag soaked in petrol or paraffin into the opening, as shown in Fig. 3. The rag may be wound around a pencil and pressed against the commutator while the motor is slowly revolved by turning the fan by hand. It may be necessary to remove the motor by unscrewing it from the main body of the cleaner in order to obtain access to the fan.

The discolouration of the commutator is due partly to the carbon of the *brushes*, which press against it, becoming deposited on the commutator. The brushes are two little black carbon pencils which are held against the commutator with a light spring. (See Fig. 3.) They serve to conduct the electric current to the commutator of the revolving motor. Naturally the carbon wears away in time and they lose their efficiency, besides coating the commutator with carbon dust. When worn down the spring tension will be less and the brushes may also stick in their holders due to the presence of dust or grease. This may cause excessive sparking between the commutator and brushes and the former will acquire a burnt blackened appearance. Undue sparking is often accompanied by that peculiar smell which is associated with electrical machinery.

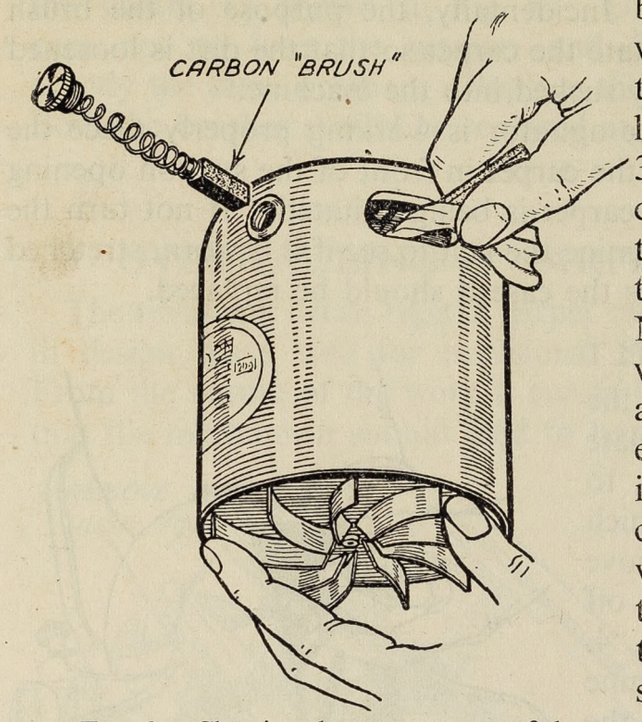

FIG. 3.—Cleaning the commutator of the electric motor.

It is advisable to remove the brushes occasionally where this is practicable and to examine them for wear. In the case of the machine shown in Fig. 3 the brushes are easily extracted by unscrewing two small Bakelite plugs. They are attached to a flexible wire and a coil spring. The brushes should be wiped clean of all embedded grease and their holders cleaned by inserting a strip of petrol-soaked rag with the aid of a thin screwdriver. The brushes may then be replaced. If the brushes are very much worn so that there is very little of them remaining they will have to be replaced by new ones obtained from the makers or the local electrician. When cleaning the brushes the commutator should be done at the same time as already described.

The revolving brush type of vacuum cleaner incorporates several parts not found in the ordinary suction cleaner and these parts may need renewal after the machine has seen considerable service. Incidentally, the purpose of the brush and agitator is to agitate the carpet so that the dirt is loosened and thus more readily sucked into the machine.

To determine if the agitator is working properly place the tips of the fingers on the carpet in front of the suction opening and feel whether the carpet is being agitated. If not turn the machine over and examine the belt to see if it is worn, stretched or broken. If such is the case it should be replaced.

RENEWING THE BELT

On the front of the machine is a cover plate which allows access to the small pulley which drives the belt. Remove the cover and slip off the belt as in Fig. 4. Then turn the machine over and lift out the agitator by lifting up the belt guard and raising the two levers which hold the agitator in position. See Fig. 5.

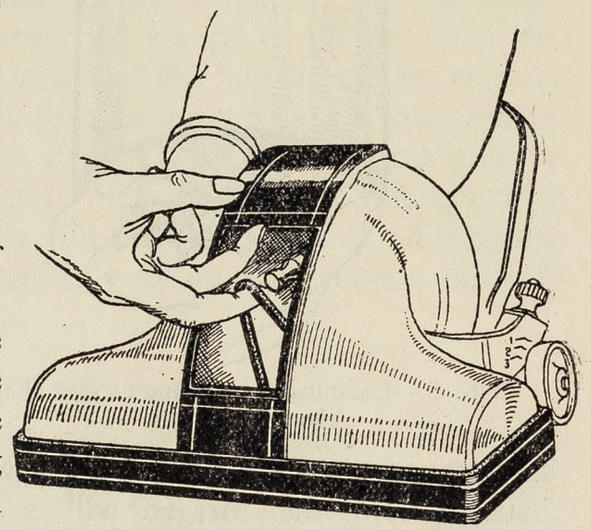

FIG. 4.—Renewing the belt which drives the revolving brush.

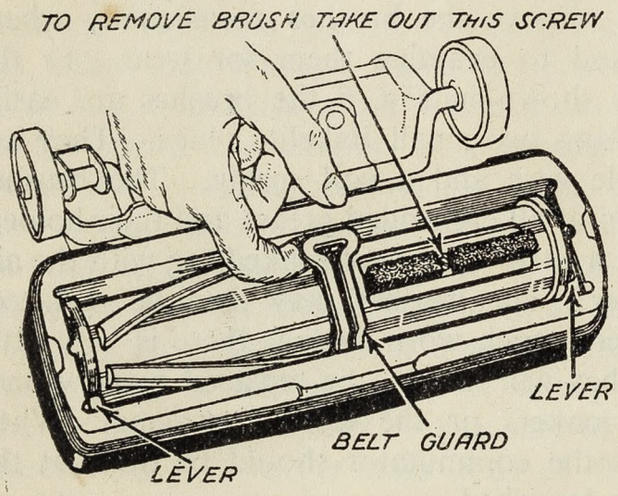

FIG. 5.—Taking out the agitator.

Replace the old belt with the new and reassemble the machine by reversing the process of dismantling it.

REPLACING WORN SWEEPING BRUSHES.

To check for wear of the sweeping brushes place a ruler or piece of straight

card across the suction opening. If the bristles do not touch the edge of the card replacement is necessary. Each brush is usually held in position by a small screw in the centre, as shown in Fig. 5. Undo this screw, taking care not to lose the washer, and fit the new brush in exactly the same position. Replace the screw and tighten up. Both the brushes should be replaced at the same time.

OVERHAULING A CARPET SWEEPER

The revolving brush type of carpet sweeper, although simple in design, pays well for occasional cleaning and attention. From the nature of the work it has to perform it is inevitable that the mechanism should tend to become clogged with hair

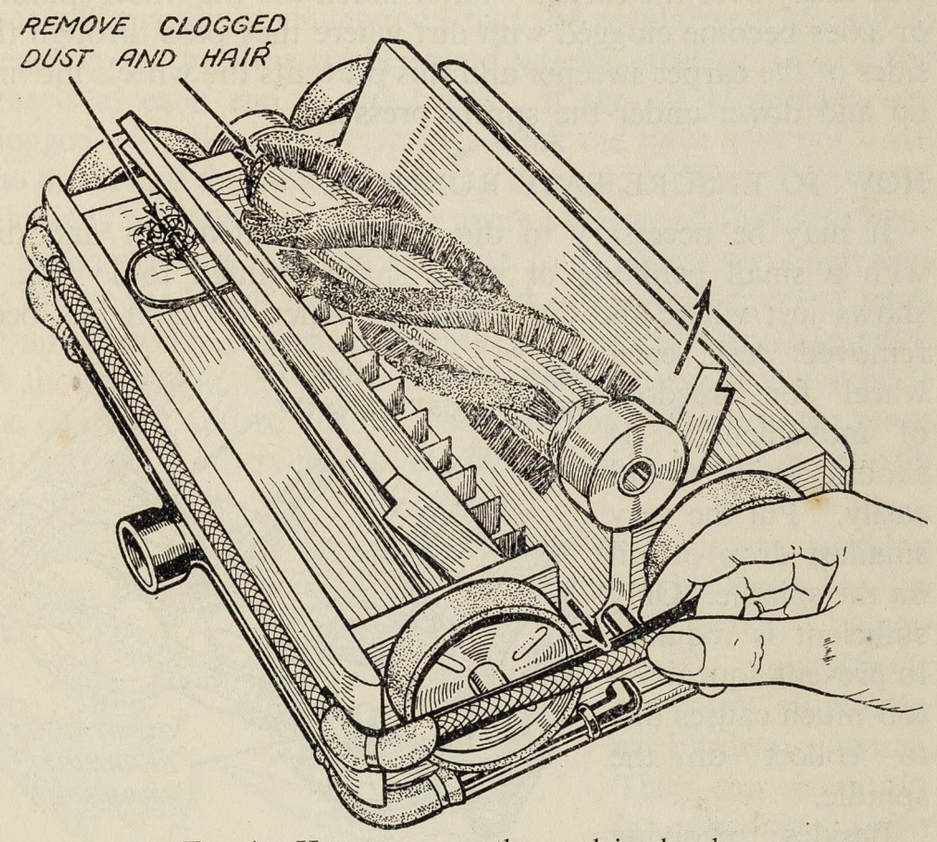

FIG. 1.—How to remove the revolving brush.

and fluff after continual use. It may also squeak when being used, but cleaning and oiling will usually restore its original smooth quiet running and renew its efficiency.

REMOVING THE BRUSH.

Before attempting any adjustments open the two containers and empty out any dirt. Then remove the wooden handle by unscrewing it and turn the sweeper upside down on an old table covered with paper in order to collect the dirt and hair which will be removed from the brush and wheels. Reference to Fig. 1 will show how the brush can be taken out. Pull back the spring strip on one side of the sweeper and push the brush away from the strip. It will then come away from this side and may be lifted out as shown. All hair and fluff should be carefully removed from the brush and also from the comb below it. Next examine the rubber-tyred wheels. Each wheel has a spring which keeps it pressed against the small wheel at the end of the brush and also allows the machine to ride easily over the carpet. After much use the wheel spindles or axles become clogged with dirt where they pass through the sides of the carpet sweeper and this prevents the wheels moving up and down under the spring pressure.

HOW TO ENSURE EASY RUNNING.

It may be necessary to dig out the matted hair and dirt with a small penknife or some sharp pointed tool. Fig. 1 shows just where the dirt collects. When all of it has been removed test each wheel for freedom of movement. It should spin round easily. Put the very smallest drop of oil on the spindle. Only sufficient is required to prevent squeaks—too much causes dirt to collect on the spindle.

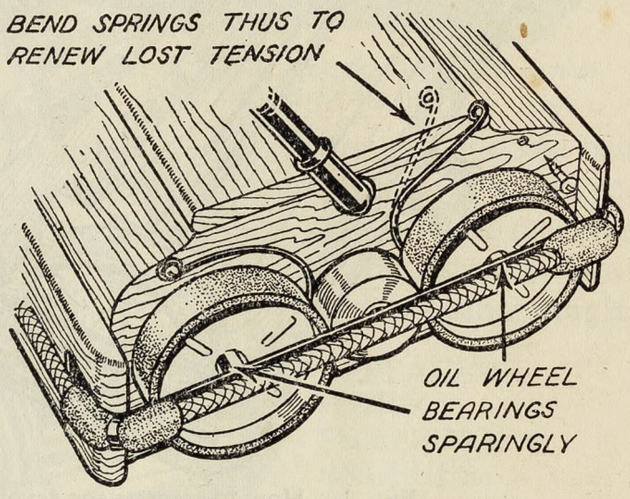

FIG. 2.—Adjusting the wheel springs.

Besides revolving freely each wheel should move downwards when pressure is applied and return smartly when released. In pressing "downwards" it is assumed that the sweeper is upside down. If the movement is sluggish or

the wheels do not return to the normal position after pressing on them the reason may be that there is still some foreign matter which prevents the free movement of the wheel spindles. Apart from this the springs may be too weak. On the type of machine shown here it is possible to remove a small screw at the end of each spring and bend the spring slightly by hand so as to give it more tension. Fig. 2 shows how to do this. Do not overdo the bending, however, or the wheel will be set too low in relation to the body of the sweeper so that the brush will not come close enough to the carpet. The ideal spring tension for the wheels is one which allows the body of the sweeper just to clear the carpet when in use. If the springs are weak the underside of the sweeper will rest on the carpet. If they are too strong it will ride high and the brush will be ineffective.

It will readily be understood that the revolving of the brush depends on the four rubber-tyred wheels pressing against the wheels at each end of the brush. If the wheel spindles are clogged with dirt and the springs weak the tyres may not drive the brush and the sweeper will fail to work. This is the reason why it is so necessary to clear away all clogged fluff and hair.

When you are satisfied that the four wheels are quite free to move, the brush may be replaced. The very smallest trace of oil applied to the wheel bearings and the short brush spindles as shown in Fig. 2, is all the lubrication necessary to complete the overhaul and to ensure silent running. Do not use more oil than this, otherwise the dirt will stick to it and eventually clog the machine.

Badly worn tyres are another cause of inefficient working because they fail to grip the small brush wheel and revolve the brush. Normally, replacements are easily obtainable at hardware stores. They can be stuck in position (after removing the old tyres) with rubber solution or perambulator tyre cement.

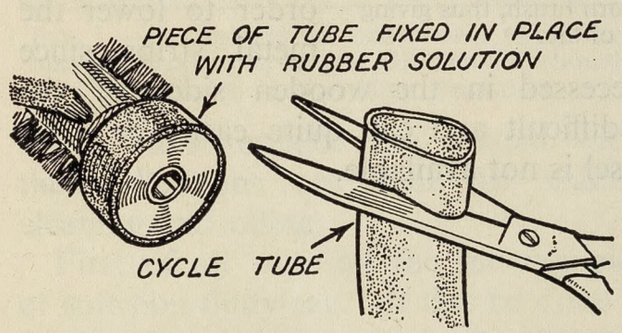

FIG. 3.—Improvising a rubber tyre for the brush driving wheels.

If, however, new tyres are not readily available the effective grip of the tyres can be increased, as a temporary expedient, by fitting thin rubber tyres to the brush wheels. These can be improvised from two short lengths of tubing cut from an old cycle inner tube and secured in position with rubber solution. See Fig. 3.

WHAT TO DO WITH A WORN BRUSH.

The brush, after constant use, may be so worn that it fails to reach the carpet. The brush should project at least one eighth of an inch below the underside of the sweeper. If it does not it is time it was renewed. However, further service may be obtained from the old brush by lowering it slightly. This is done as shown in Fig. 4. Around the outside of the metal bands which carry the brush spindles there is usually a thick cord with rubber buffers at the corners as shown in Fig. 1. These should be removed when the fixing of the metal strips will be revealed. There is a strip on each side of the machine and they are held in position with small screws. Take out these screws and refix the band about one eighth of an inch lower by making fresh screw holes. It may also be necessary to cut away the wood slightly in order to lower the metal strips since they are sometimes recessed in the wooden sides of the sweeper. This is not difficult and can quite easily be done with a penknife if a chisel is not available.

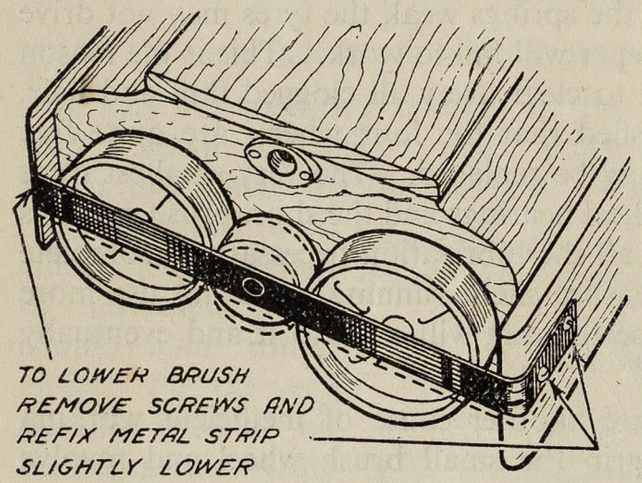

FIG. 4.—How to lower a worn brush, thus giving it a new lease of life.

CLEANING AND LUBRICATING A SEWING MACHINE

REMEDYING DEFECTS IN WORKING

Sewing machines vary slightly in detail according to the make of machine, but the general method of operation is similar. For this reason the notes on oiling and general upkeep will be applicable to all types. No attempt will be made to give instructions for dismantling or carrying out major repairs as these are beyond the capacity of the few simple tools which it is assumed that the average housewife will have available. The renewal of broken parts or the execution of major overhauls should be entrusted only to the makers or their agents.

THE CAUSE OF HEAVY RUNNING.

A machine which has been neglected or has not been used for some time may be heavy to work and noisy in operation. This can be caused by lack of oil, congealed oil or heavy oil of the wrong type, in addition to dirt and fluff in the working parts. A good indication of the condition of the machine can be obtained by examining the underworks as shown in Fig. 1. If it is a treadle machine the belt will have to be slipped off the treadle wheel before it can be opened. If the works thus revealed are coated with fluff and sticky oil the indications are that the machine needs thoroughly cleaning and oiling.

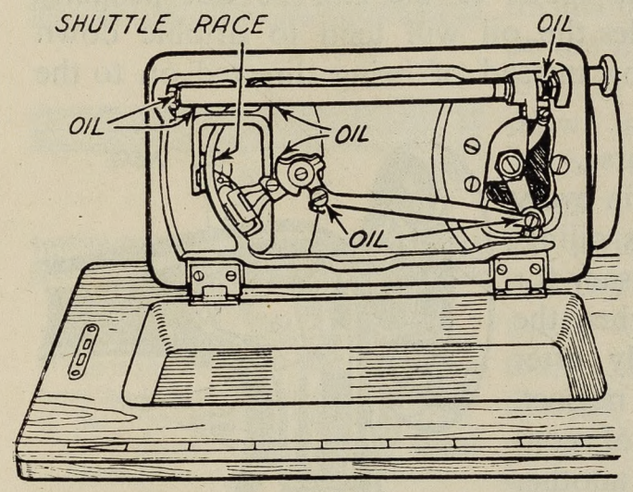

FIG. 1.—To examine the underworks swing the machine back on its hinges. Dirt and fluff should be removed before oiling the works.

First of all wipe all the moving parts clean with a piece of soft non-fluffy rag. If this be done carefully it will prevent further dirt being washed into the moving parts when they are oiled. Before applying the oil squirt a little paraffin in

all the oil holes and then run the machine rapidly to clean the bearings. Allow the machine to stand in its normal position for ten minutes or so in order that the surplus paraffin may drain off. The machine should then be opened and all paraffin still adhering to the underworks should be wiped away. Now apply sewing machine oil only to all the oil holes shown in Figs. 2 and 3. It is essential to use an oilcan and to insert the spout well into the holes so that the oil reaches the works. If a feather or match be used or the spout of the can be not properly inserted into the oil holes the oil will tend to dribble down the inside of the casting instead of being directed on to the moving parts.

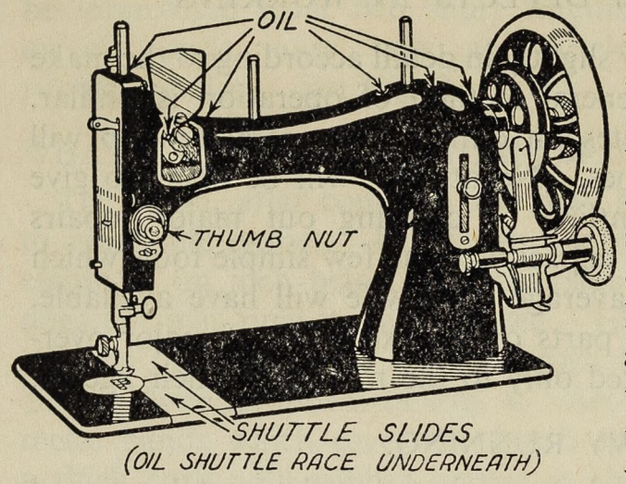

FIG. 2.—Showing the points which need periodic oiling.

It will not, of course, be necessary to use paraffin every time the machine needs oiling. It should only be necessary for flushing the bearings when the machine works heavily after long standing or neglect. Besides the presence of congealed oil and dirt another cause of heavy running, in the case of a treadle machine, is too much tension on the belt. Unfortunately, many machines have no means of adjusting the tension of the belt other than by shortening and rejoining it. If, therefore, it has been inadvertently shortened too much it may be stretched slightly by pulling it, taking care to avoid pulling the joint.

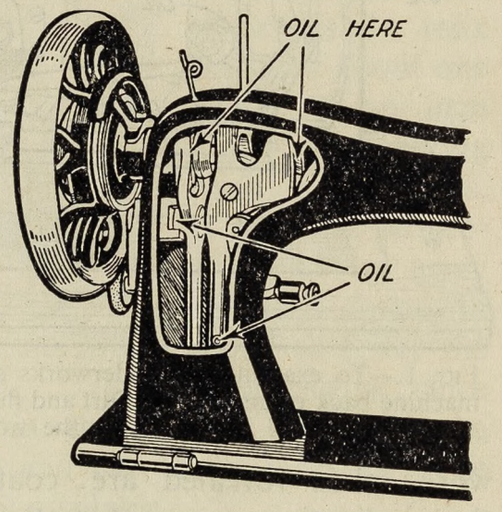

FIG. 3.—Some parts can be lubricated by the removal of an inspection cover at the back of the machine.

OILING THE SHUTTLE RACE.

When once the machine has been thoroughly cleaned and oiled it should be kept in running order by regular oiling at all the points shown in Fig. 2. Particularly is it necessary to oil the curved track against which the shuttle slides. In fact once daily is not too frequent if the machine is used constantly.

Open the two shuttle slides and rub the face of the track or race with a small piece of muslin moistened with oil. At the same time put a drop of oil on the wadding pad which will be found under the front shuttle slide.

THREAD BREAKING.

If the needle thread breaks it may be due to one of the following causes :—

The upper tension may be too strong (unscrew thumb nut, Fig. 2) or the machine may be wrongly threaded, thus putting too much tension on the thread. Incidentally, if the upper thread be too tight it is likely to cause looping of the stitches, as shown in B, Fig. 4.

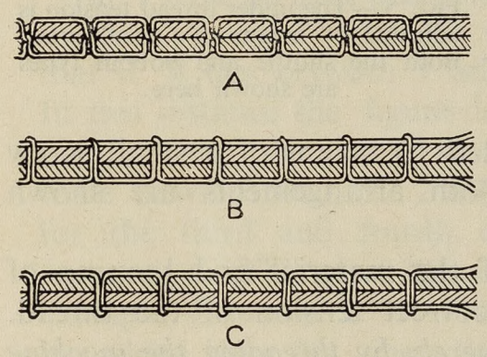

FIG. 4.—The correct form of machine stitch is shown at "A." "B" shows how the looping of the stitches occurs if the upper thread be too tight. "C" shows effect of the upper thread having too little tension.

The needle may be bent or blunt. It may be fixed too low in its holder or it may be too fine for the thread being used ; in which case the thread tends to stick when passing through the eye. A badly polished needle with sharp edges to the eye will have the same effect. The remedy is to change the needle. A worn point to the shuttle or rough or sharp places through long use may cause the upper thread to break as it loops over the shuttle. Examine the shuttle carefully and polish any rough parts with the smoothest grade of emery cloth.

If the under thread breaks the tension may be too strong or the shuttle may be incorrectly threaded. The tension can be adjusted by means of a small screw (see Fig. 5) turning it to the right increases the tension and vice versa. Rough

edges or sharp places on the shuttle or bobbin will also help to fray the thread and cause it to break.

REGULATING THE TENSION.

Reference to Fig. 4 shows at A the correct form of stitch and what happens if the needle thread be too tight compared with the under thread and vice versa (B and C respectively). If, therefore, any adjustment has been made to the thread tension to overcome thread breakages the stitch should be examined to see that it conforms to the correct pattern as at A, Fig. 4. Thus, if the upper thread has been slackened to prevent it snapping it may be necessary also to reduce the tension of the under thread, otherwise the latter may be relatively too tight and produce the kind of stitch shown at C, Fig. 4. The under thread tension is adjusted by means of a small screw on the shuttle or bobbin. Both arrangements are shown in Fig. 5.

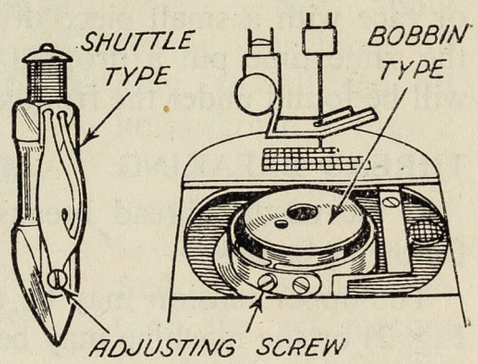

FIG. 5.—The under thread tension is adjusted by means of a small screw. Both the shuttle and bobbin types are shown here.

Such faults as puckering of the material and looping of the stitches are caused by incorrect tension of the thread. *But the tension may be upset merely by threading the machine wrongly*. Check this point before altering the adjustment.

WHY NEEDLES BREAK.

This occurs when the needle is bent and strikes the throat plate as it descends. Pulling the material while stitching may deflect the needle and cause it to snap for the same reason. Using too fine a needle for heavy work or having the tension of the needle thread too tight will also lead to breakages. Inferior needles or those of the wrong type for the machine are obvious causes of breakages. Missed stitches are usually caused by a defective needle. This will occur if it be fixed too low, bent or blunt, or if it be too fine for the thread. Do not use thread of widely differing thicknesses.

HOW TO READ YOUR GAS AND ELECTRICITY METERS

What appears to be rather a formidable array of dials on the gas meter is, in reality, quite a simple arrangement and easy to understand. First of all the top dial (see Fig. 1) is used only as a test dial and has nothing to do with the record of the gas used. It should be ignored altogether. Then commencing with the left-hand dial write down the smaller of the two numbers between which the hand is standing (with the exception that if it lies between 9 and 0 the figure to record is 9). In this instance the figure is 2. Then proceed to the next dial. Here the hand is between 5 and 6. Therefore, write down 5 after the 2 already written down. The figures for the third and fourth dials are written down in the same way. This gives a reading in the example shown of 2551. To this must be added two 0's since the last dial records hundreds of feet. Thus the final reading is 255,100 cubic feet. When applying the rule of recording the lesser of the two numbers between which the hand is resting it may happen that the hand appears almost exactly on a figure. Take the example shown in Fig. 2. The pointer on the left-hand dial appears to be almost exactly on 8. Should this reading be 8 or 7? The answer is given by the position of the hand on the next or following dial. In this case it points to 9. Therefore, the figure on the first dial is obviously 7 for the reading of the two dials together then gives 79 which is practically 80.

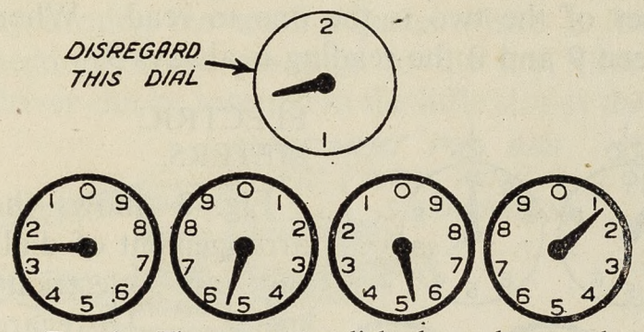

FIG. 1.—The gas meter dials shown here read 255,100 cubic feet.

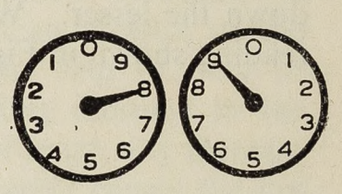

FIG. 2.—Always record the *lesser* of the two figures between which the pointer lies. Reading here is 79 although the left-hand pointer is almost on the "8."

Had the hand of the second dial pointed to 1 then the reading of the first dial would have been 8, not 7, giving a reading of the two dials together of 81. It will thus be seen that for readings of the two dials in the region of 79, 80, and 81, the first hand will be so nearly on the 8 that without consulting the next dial it may be difficult to decide whether it should be taken as 7 or 8. This difficulty does not arise when the hand of the following dial reads round about 4, 5 or 6, for the hand of the first dial is then approximately half-way between two figures and the lesser of the two is the one to read. When a hand stands between 9 and 0 the reading is always 9.

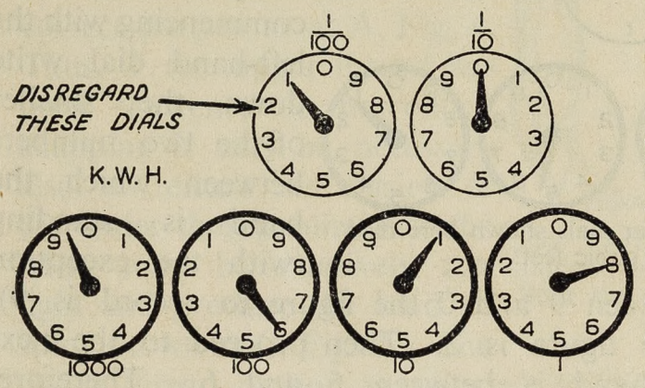

FIG. 3.—Electricity consumed is here shown as 9608 units.

ELECTRIC METERS.

Fig. 3 shows the arrangement of dials on an electricity meter. Disregard the dial marked 1/10 and 1/100. Take each dial in turn from the left. When the pointer is between two figures put down the lesser. When between 9 and 0 put down 9. The reading shown in Fig. 3 is 9608 units.

IMPROVING THE EFFICIENCY OF A GAS FIRE

The only parts of a modern gas fire likely to give trouble are the clay elements or "candles." These become extremely brittle after prolonged use and may easily be broken by rough handling. Incidentally, whenever the reflector is cleaned or the fire is handled in any way the candles should first of all be carefully lifted out and placed aside, for a careless knock with a duster or a sudden jolt may be quite sufficient to smash them. Broken candles should be replaced at the earliest opportunity as they impair the radiating properties of the fire.

ADJUSTMENTS.

After the fire has been in use for a considerable time the burner may need slight adjustment. This may also apply if the fire be used on a different gas supply. The gas pressure is not always the same at different points and consequently a slightly larger or smaller jet may be necessary for maximum efficiency. Should the flame appear to be weak so that the candles are only partially incandescent, the flow of gas may need increasing. With one popular model this is carried out by turning the small adjuster which is situated near the connection of the gas pipe to the fire. (See Fig. 1.) A screwdriver can be inserted in the little slot at the end of the adjuster.

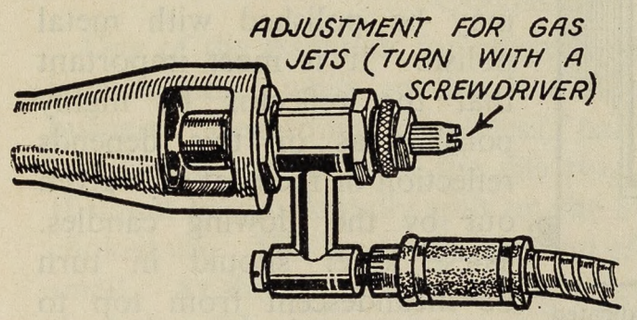

FIG. 1.—On some gas fires the supply of gas can be regulated by a small screw as shown.

The screwdriver should be turned slowly and the increase or decrease in the size of the flame noted. If the flame be too low increase the setting a little and watch the behaviour of the fire for some few seconds before making a further adjustment. The reason for this is that after the flame has been increased it takes some appreciable time for the incandescence of the candles to intensify. Do not increase the rate of flow to excess as this will not give a corresponding increase in the amount of heat thrown out. On the other hand, any increase in the flow of gas above a certain point merely causes the fire to give off an unpleasant odour and wastes gas. If a bluish flame appears at the top of the candles the supply is too copious and should be cut down. (See Fig. 2.) No flame should appear outside the candles.

OBTAINING MAXIMUM EFFICIENCY.

The aim of the user should be to obtain the maximum radiation of heat with the lowest consumption of gas. The efficiency of a gas fire, unlike a coal fire, depends mostly on radiation, therefore, particular attention should be given to the parts concerned with radiating the heat, namely, the elements

or "candles" and the reflector. The reflector of a modern gas fire is usually of highly polished chromium plate and, therefore, very efficient. It may be kept so by wiping it occasionally with a soft damp cloth and polishing it with a soft duster. Do not use metal polish or the chromium will soon be entirely removed. Older types of reflector with a burnished finish may be treated similarly, but if the reflector is badly tarnished it may be polished with metal polish. It is most important that the reflector be highly polished as on this depends reflection of the heat rays given out by the glowing candles. These latter should in turn be incandescent from top to bottom. In this condition they radiate the maximum heat.

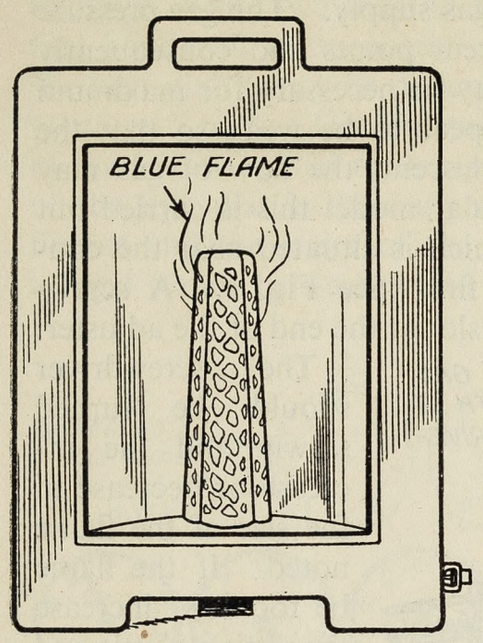

FIG. 2.—Too much gas is indicated by a blue flame at the top of the "candles."

Another point affecting economy is the proportion of air to gas which is consumed. Some gas fires have no air adjustment, the burner being designed to supply the correct amount of air automatically, but other types of fire are adjustable.

One type of adjuster is shown in Fig. 3. It consists of a milled-edged disc which can be turned with the fingers. By screwing it outwards as indicated in the sketch the air supply is increased and vice versa.

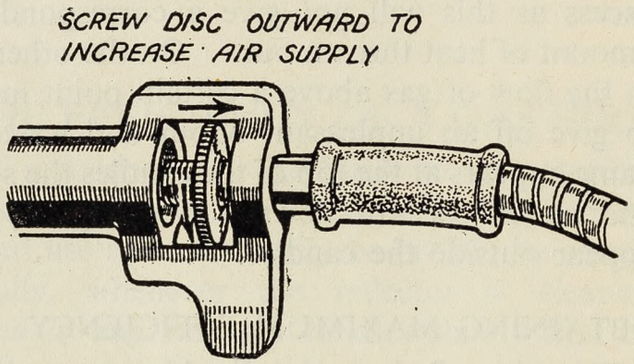

FIG. 3.—How the air supply can be adjusted. Increasing the flow of air will economise gas.

The remarks regarding the adjustment of the air supply given in the chapter on Gas Cookers applies equally to gas fires, with the exception that it may not be possible to use quite

such a large proportion of air with a gas fire on account of the noise. A flame with a large air content is inclined to roar and this is often found distracting ; also a large proportion of air tends to make the fire "pop" or burn back if it be lighted immediately the gas is turned on. Therefore, an endeavour should be made to adjust the air supply so as to strike a compromise between thermal efficiency and quietness.

HOW TO GET THE BEST FROM YOUR GAS COOKER

One of the essentials for efficient operation of a gas cooker is cleanliness ; while another is the correct adjustment of the burners. Regarding cleanliness, particular attention should be paid to the holes in the gas rings and the oven burners. If liquid be accidentally spilt on the burners the holes may be choked up. This wastes the gas and often causes an unpleasant smell. At the same time, it only takes a few minutes to clear the holes with a piece of wire, a skewer, or some similar sharp-pointed instrument.

Occasionally, the burners, together with the bars and other fittings, should be removed and washed thoroughly in strong soda water so as to remove the grease.

HOW TO ADJUST THE BURNERS.

A frequent cause of inefficient working is due to the air supply being out of adjustment. Many gas cookers, particularly the older patterns, have a little clip or slide fitted to the stem of each burner, which is intended to control the amount of air entering the hole in the stem. Quite frequently, however, these slides become hopelessly out of adjustment through being accidentally knocked or dislodged when cleaning the burners. Thus it is not unusual to find a cooker with the burners in various states of adjustment, some having long yellowish blue flames and others having short roaring flames with bright blue cones in the centre.

The trouble in this case is partly due to the fact that the air adjusters have no device to lock them in position ; with the result that they are easily disturbed. Each burner should be

adjusted in turn by moving the slide while the burner is alight. It will be noticed that on moving the slide so that it restricts or covers up the air hole the flames will become large and flabby and the blue cones in the centre will lengthen. This type of flame, which often has yellowish edges to it, is both wasteful and malodourous.

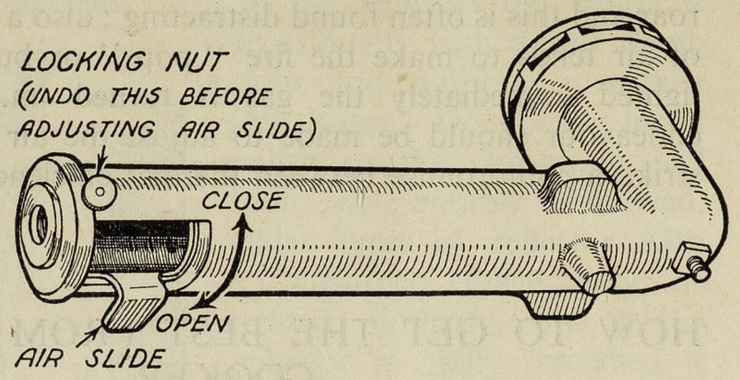

FIG. 1.—How the air supply to a gas cooker burner can be adjusted. Increasing the air effects a saving of gas and gives a hot flame.

FOR ECONOMY INCREASE THE AIR SUPPLY.

On moving the slide so as to uncover the air inlet, however, the flame will become more intense, the cone in the centre shorter, and it will tend to roar. This is an hot economical flame. But if the air be increased too much the flame, although still hot, will tend to pop back in the pipe and light at the jet. It may also be unduly noisy while burning. The adjustment should be set somewhere between these two extremes.

Some modern cookers such as the Radiation " New World " have a locking device on each burner so that the air supply cannot readily get out of adjustment. This consists of a little milled nut on the side of the stem of the burner, as shown in Fig. 1. When making adjustments to the air-slide this nut should first of all be slackened off, and should then be tightened again when the correct setting has been determined.

COMPENSATING FOR SUPPLY PRESSURE VARIATIONS.

Some gas cookers have, besides the air adjustment, an adjustment for the gas supply to each burner. This adjustment is set by the gas company to suit the pressure and nature of the supply and should thereafter require no further attention. In the event of the gas supply pressure altering ; or should it be desired to give the flares a somewhat more generous, or alternatively, a more economical setting, this can be quite

easily carried out. An illustration of this type of burner is given in Fig. 2. Just behind the gas tap will be found a small screw adjuster in the centre of a nut. The gas supply to the burner is altered by turning the screw with a small screwdriver or even a nail file inserted in the slot will turn the screw and then, with the burner alight, the setting can be adjusted to suit requirements. The gland nut need not and should not be touched. It may be necessary, however, to readjust the air supply after altering the gas setting ; thus if more gas be fed to the burner a little more air may be used with advantage and vice versa.

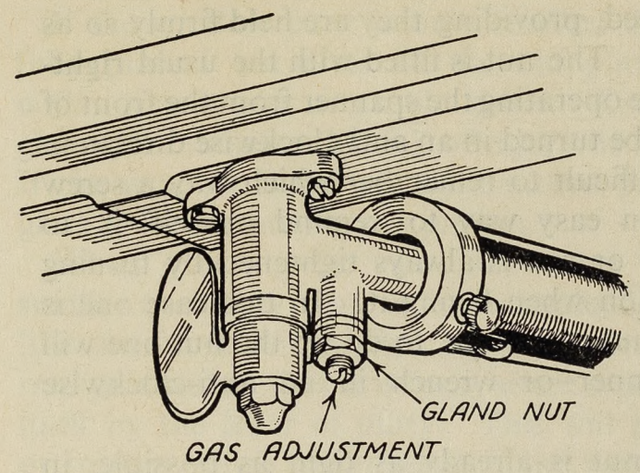

FIG. 2.—It is possible with some gas stoves to regulate the supply of gas to each burner. There is a small adjusting screw as shown.

LOOSE OR STICKING GAS TAPS.

Those taps on gas cookers which are constantly in use tend to work loose and may reach the state where the slightest touch will turn them on or off. Naturally, this is very troublesome and even dangerous—especially if there are children about.

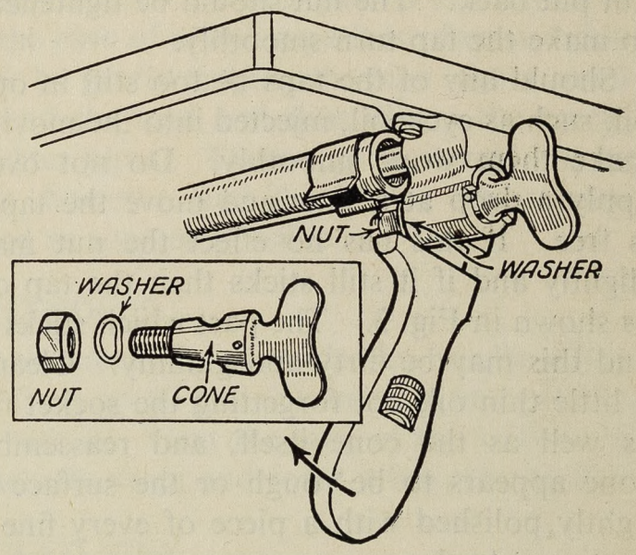

FIG. 3.—How to dismantle a sticking tap.

When the ordinary horizontal gas tap becomes loose it can quite easily be tightened by means of the small nut at the rear of the tap. This is clearly shown in Fig. 3.

To adjust the tap first turn off the gas supply at the meter. Then tighten the nut about half a turn by means of a small adjustable spanner such as is used by cyclists, or failing this a pair of pliers may be used, providing they are held firmly so as not to damage the nut. The nut is fitted with the usual right-hand thread so if you are operating the spanner from the front of the stove it will have to be turned in an anti-clockwise direction. Many women find it difficult to remember which way a screw thread operates, but an easy way to remind oneself is to remember that a screw or nut is always tightened by turning it in a clockwise direction when facing it. In this case one is facing the back of the nut, therefore, to do up the nut one will have to turn the spanner or wrench in an anti-clockwise direction.

It may be that the nut is already as tight as possible, in which case it should be unscrewed and the little washer which will be found behind it should be carefully removed. Take special care not to lose this washer. It is not flat but slightly bent so that it acts as a spring and takes up play as the tap wears. In order to increase the stiffness of the tap an additional thin washer (a flat one will do) should be used as well as the spring washer. Both washers should then be replaced and the nut put back. The nut should be tightened up just sufficiently to make the tap turn smoothly.

Should any of the taps be too stiff in operation a little thin oil, such as cycle oil, injected into the moving parts will usually make them work smoothly. Do not overdo the oiling but apply a drop at a time and move the tap on and off until it is free. If this has no effect the nut may be slackened off slightly and if it still sticks then the tap could be dismantled as shown in Fig. 3. The part which sticks is the conical shank and this may be dirty and gummy. Clean it thoroughly with a little thin oil, not forgetting the socket from which it comes as well as the cone itself, and reassemble the tap. If the cone appears to be rough or the surface ridged it should be lightly polished with a piece of every fine emery cloth before putting it back.

MISCELLANEOUS HINTS AND TIPS

REPAIRING A BROKEN WINDOW.

If the window pane is only cracked the glass may be carefully pushed out after all the old putty has been removed with a screwdriver or an old chisel. Use a pair of old leather gloves to minimise the risk of injury while removing the glass. If the window is completely smashed pick out the remaining glass before removing the putty.

When ordering the new glass have the pane cut $\frac{1}{4}$ inch smaller each way than would completely fill the frame ; then line the frame with a thin layer of putty and press the pane into position so that it is everywhere separated from the frame itself by the layer of putty. This will prevent the setting up of stresses which might result if the pane was in hard contact with the frame. Complete the job by filling-in the edge of the frame with putty to form a bevel similar to the other frames. Paint the new putty to match the surrounding paintwork.

STOPPING A GAS LEAK.

As a temporary measure rub soap into the crack and bind the pipe with insulating tape. Chewing gum is also effective instead of soap. In the case of a lead pipe it is often possible to fill up a small crack by gently tapping the pipe with a small hammer so as to spread the lead and thus fill up the crack. This applies also to water pipes. These repairs should not be considered permanent, however, and the gas or water company should be notified as soon as possible.

REFIXING KNIFE HANDLES.

Scrape out any loose cement from inside the handle. Buy a small knob of resin from an oil and colour shop and powder this and fill the hole with it. Heat the tang of the knife until it is hot enough to melt the resin and force it into the handle.

CLEARING A BLOCKED SINK.

The usual method of clearing a stopped-up sink is by means of a force-cup, or plunger. This is a rubber cup attached to the end of a short stick. The cup is placed over the waste

hole and pumped up and down vigorously several times. The disadvantage of this device, however, is that when the cup is depressed the air usually blows back through the overflow holes at the top of the sink. In order to make full use of the pressure available, therefore, a wet rag should be held tightly over the overflow holes, and the sink, if not already containing water, should be partly filled so that water (which is incompressible) and not air is forced into the pipe.

Quite often the stoppage can be cleared by cleaning out the " trap " under the sink. At the bottom of the bend in the pipe under the sink will be found a brass cap with two projections on it. By placing a bar, such as a square poker, between the two projections and giving a twist the cap will unscrew, and any grease or other obstruction can be scraped out into a pail which should be placed under the pipe.

REPAIRING A CRACKED LAVATORY BASIN.

To stop the basin from leaking make certain it is thoroughly dry and then paint the outside of the crack with white lead paint for half an inch on either side of the crack. Cut a strip of muslin about one inch wide and press it on to the paint while it is still wet. Allow the paint to dry. Repaint the muslin and stick on another strip slightly narrower. Allow this to dry and give a final coat of paint. Should the basin be glazed in colour the final coat of paint should also be coloured to match the glaze.

MAKING YOUR OWN POT MENDERS.

The popular type of pot mender which consists of two small metal discs with a couple of cork discs between and a bolt to hold the discs in position can quite easily be made at home.

Mark out two circles on a piece of tinplate such as the lid of a treacle tin or sardine tin using a penny and marking around it with a pencil. Cut out the two discs with an old pair of scissors and punch a hole in the centre of each disc with a nail. Trim up the burrs with a file and if the discs are bent or cockled flatten them by laying them on a flat surface and tapping with a hammer. The cork discs can either be made by cutting a thin slice from the end of a vacuum flask cork by means of a razor blade, or can be obtained ready

made from inside the metal cap of a mineral water bottle. A hole should also be made in the centre of each cork. A small bolt and nut will be necessary to fix the pot mender in position. Slip one metal disc on the bolt followed by a cork disc, push the bolt through the hole in the saucepan or kettle ; then put on the other cork and metal discs from the inside of the pot and tighten up the nut.

FREEING STICKING DRAWERS.

First ascertain if the cause of the sticking is due to the sides of the drawer springing apart at the joints. If the dovetail joints are loose the sides may spring outwards and cause the drawer to jam. If this has happened the sides should be lightly knocked back in position and secured with small brads, the heads of which are punched well into the wood. An even better way is to glue the joints by first knocking them apart, applying liquid glue, and driving the joints together again. The drawer should be bound with string or stood on its side with some heavy books on top to compress the joints while the glue is setting.

If the drawer or frame has warped the parts which have been sticking will show signs of scraping and these parts should be rubbed down with glasspaper. Candle grease is the best lubricant for making drawers run smoothly. Do not use oil, it collects dirt and often causes the wood to swell.

HINTS ON THE USE OF TOOLS.

There is a wrong as well as a right way to manipulate even the simple tools required for the work described in this book, therefore, to obtain full advantage from their use the following hints together with the illustrations inside the back cover may be found helpful.

Screwdriver. In removing a screw make certain the blade of the screwdriver is properly inserted in the screw slot before attempting to turn it, otherwise it will jump out and injure the screw head. *Press* on the screwdriver at the same time as turning it, and if the first effort fails tap the handle of the screwdriver smartly with a hammer as though trying to drive in the screw. This will loosen the screw and enable it to be removed more easily. Never attempt to remove the screw

before first of all scraping away all paint and cleaning out the slot with the screwdriver itself. Do not use a screwdriver with a chipped or twisted blade.

Pliers. This tool should not be confused with pincers. Pliers are used to grip small objects including round ones such as bolts, pipes, etc. New pliers are often stiff to operate but a little oil applied to the hinge, followed by vigorous opening and shutting will usually free them. When gripping polished metal parts or anything with a delicate finish a small piece of rag or wash leather should be interposed between the jaws to protect the object from damage.

Pincers. (Often erroneously called "pinchers"). These are most useful for removing nails and tintacks. Do not give a straight pull but rock the pincers, taking advantage of the rounded jaws to give a lever effect.

Hammer. One with a rounded head opposite the hammer head itself is probably the most useful type. Do not tolerate a loose head ; it is dangerous. Drive in the wooden wedge (see illustration) to tighten the head. If this is insufficient soak the head in water which will cause the wood to swell.

Spanners. The most useful type is the adjustable spanner about six inches long. This type will fit varying sizes of nuts. Use the spanner in the direction shown by the arrow and make certain it is screwed up so that the jaws fit the nut tightly before attempting to turn the nut. Fixed spanners are less likely to spring open in use than adjustable spanners, but each one generally fits only two sizes of nut, therefore, several are needed to cover all purposes.

Files. These are used for scraping away metal. Two useful shapes are shown here. They can be obtained in coarse or fine types. When filing soft metal such as brass the file may become clogged with metal dust. If it does clean it with a wire brush, or even a scrubbing brush will do.

Bradawl. This is a small pointed tool very useful for making small holes in wood. Its chief use will be in making screw holes.

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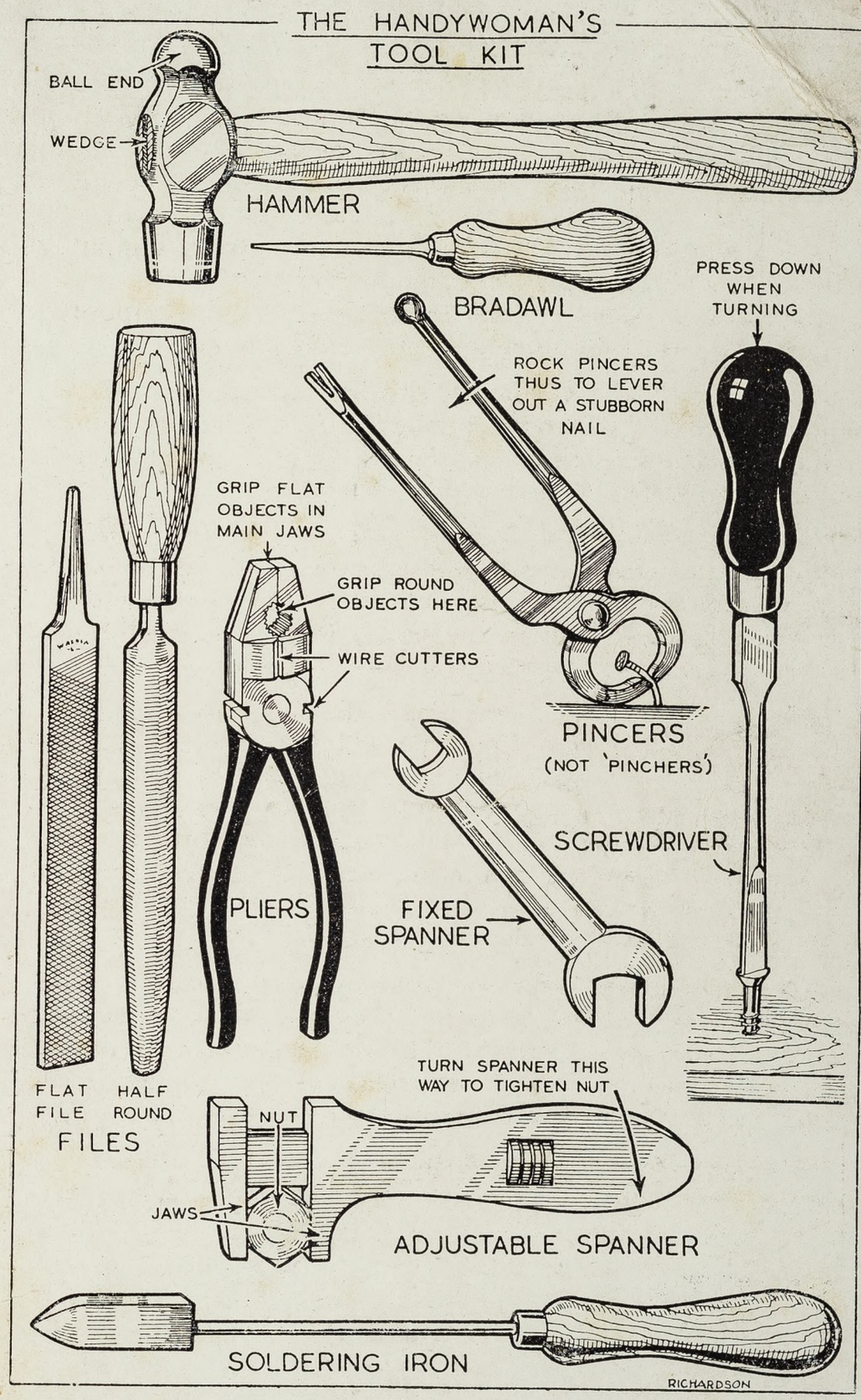

C8

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