U. S. DEPARTMENT OF AGRICULTURE

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SIMPLE PLUMBING REPAIRS IN THE HOME

PLUMBING often gets out of order, and upon prompt attention to the little repair jobs depends its smooth, satisfactory operation. This bulletin describes simple ways of doing little things, with the aid of a few simple tools, to keep home plumbing in good working order.

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SIMPLE PLUMBING REPAIRS IN THE HOME

By GEORGE M. WARREN, Associate Hydraulic Engineer, Bureau of Public Roads

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HOW BEST to make small plumbing repairs is a problem that comes to most householders. The employment of a plumber may be difficult or too costly. In such situations a little time and knowledge on the part of the householder often saves much delay, trouble, and expense. Repairs made by the householder may not always be so thorough and workmanlike as those made by an experienced plumber, but they are valuable in emergencies and for most of the simple jobs are about as satisfactory. Where local or State plumbing regulations are in force and extensive repairs or alterations are contemplated, the householder should make sure that the work is duly authorized and is done by a properly qualified plumber.

In making repairs it is often necessary to tighten or to loosen a screw or nut, and the householder is sometimes uncertain in which direction it should be turned. To screw or tighten an ordinary right-hand screw, nut, or bolt, first think of the head of the part to be turned as being the face of a clock and the screw driver or wrench as being the shaft which turns the clock hands, and then rotate the tool from left to right or in the same direction the clock hands move. Conversely, to unscrew or loosen rotate the tool from right to left or in the direction opposite to clockwise. Small, brass screws and stems are easily twisted off and rendered useless, especially if a large tool is used to turn them. Undue strain should be avoided, as it may result in the part or parts being broken at an unfortunate time.

FAUCETS

SEAT WASHERS

Loose or rough-edged washers cause vibrating or rattling noises; worn washers cause leakage. Moderate force on the handle of a faucet in good repair should stop all flow and drip. Figure 1 shows an ordinary, half-inch, tee handle, compression faucet which closes

against the pressure of the water. To replace the seat washer, shut off the water to the faucet. Unscrew the cap nut with a monkey wrench. (Placing cloth or thick paper between the jaws of the wrench saves marring the cap nut.) Take hold of the faucet handle and unscrew the stem from the body of the faucet. With a screw driver remove the washer screw at the bottom of the stem. This screw is often hard to start. One or two drops of kerosene and lightly tapping the head of the screw may help to loosen it in the stem. Use strong even force on the screw driver, the blade of which should have a good square edge to fit the slot. The head of the screw often splits before the shank of the screw turns in the stem, because of corroded and weakened condition. If it splits, deepen the slot in the head with a hacksaw, cutting a little into the shank of the screw. No harm is done if the saw cuts slightly into the stem of the faucet. The washer screw may now be turned with a small screw driver. Replace the old washer with a new one, replace the washer screw, screw the stem into the faucet, and screw down the cap nut. Hard fiber composition washers one-eighth to three-sixteenths inch thick and costing about 10 cents a dozen are in general use and are suitable for both hot and cold water faucets. A few washers of the needed sizes should be kept in the home. If none is at hand, a temporary washer may be cut from a piece of leather, rubber, or sheet packing. Leather is preferable on cold-water faucets and rubber on hot-water faucets.

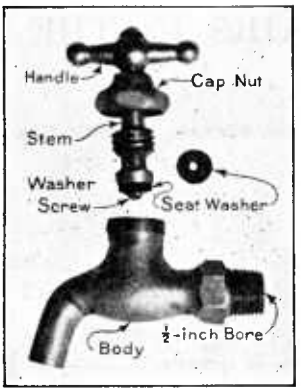

FIG. 1.—Compression faucet

Figure 2 shows an ordinary, three-eighths inch, 4-ball handle, compression faucet for a washstand. To replace the seat washer, shut off the water to the faucet and open the faucet one or two turns of the handle. With a monkey wrench on the hexagonal part of the stuffing box unscrew the stuffing box from the body of the faucet. Lift out the stem, replace the old washer, as previously described, with a new one, and screw the stuffing box into the body.

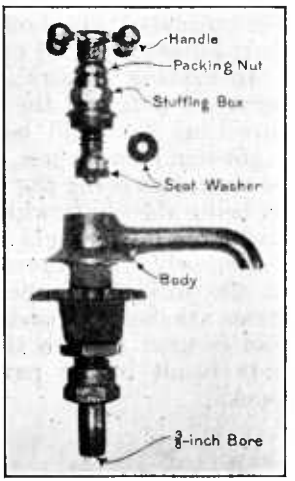

FIG. 2.—Compression faucet for a washstand

A worn washer with constant leakage over the seat of a compression faucet together with grit lodging there, often causes the seat to become cut, nicked, and grooved. The trouble occurs more often in hot-water faucets than in cold. Such seats can easily be reground or squared with a simple seat dressing tool, of which two types are shown in Figure 3 A and B. A seat dresser with four cutters for different-size faucets costs about $2 and its use saves buying new faucets. To dress the seat of a faucet, un-

screw the stem from the body of the faucet, as above described. Screw the adjustable, threaded cone of the tool (see fig. 3 A) down into the body of the faucet as shown in Figure 3 C, thus centering it over the seat. With the hand as shown in Figure 3 D, gently rotate the wheel handle at the top of the tool several times, and the cutter on the bottom of the stem squares the seat. Turn the faucet bottom side up and shake out the cuttings. Reassemble the faucet and turn on the water to wash out any remaining cuttings.

Seat washers are subject to damage from metal filings left in newly installed water pipes. A good plumber, before screwing up a piece

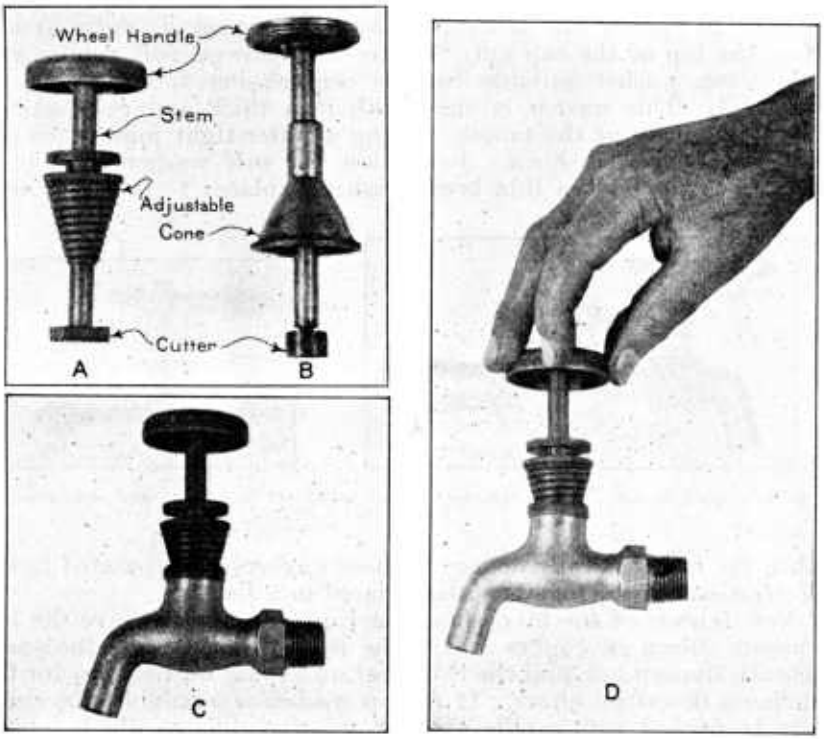

FIG. 3.—Faucet seat dressers: A, dresser with inside adjustable cone; B, dresser with outside adjustable cone; C, dresser A screwed into a compression faucet; D, rotating the wheel handle and cutter

of pipe, always stands the pipe on end and raps it with a hammer to clear the bore.

Figure 4 A shows an ordinary half-inch lever-handle Fuller faucet which closes with the pressure. As shown in Figure 4 B, the bottom of the spindle is eccentric, so that slight turning of the handle moves the rubber ball to and from the beveled seat. To replace the ball shut off the water to the faucet. Unscrew the body from the tailpiece with the hands or with a monkey wrench on the hexagonal part of the body of the faucet. It may be necessary to apply a wrench to the hexagonal nut on the tailpiece and press the wrench downward to prevent unscrewing the tailpiece. Unscrew the stem nut which holds the brass cap and rubber ball on the stem. Put on

a new ball and replace cap and nut. Red rubber balls are considered to be better than black balls for hot-water faucets. Avoid using too large a ball, as swelling of the rubber may hinder the flow. Screw the faucet into the tailpiece. Just before the joint closes or "makes up," wrap a little string packing or candle wicking around the thread on the faucet to make the joint water-tight.

TOP WASHERS AND PACKINGS

A top washer or packing snugly fitting the stem is necessary to prevent leakage upward through the cap nut when a faucet is opened. If the space is too tightly packed, the stem binds, making it hard to operate the faucet; if too loosely packed, water spurts from the top of the cap nut. Figure 5 A shows a soft rubber and fabric top washer suitable for the compression faucet shown in Figure 1. This washer is one-eighth inch thick and rests on the top of the body of the faucet, making a water-tight joint when the cap nut is screwed down. Just below the soft washer and inside the top of the body a thin brass washer is placed to take the wear

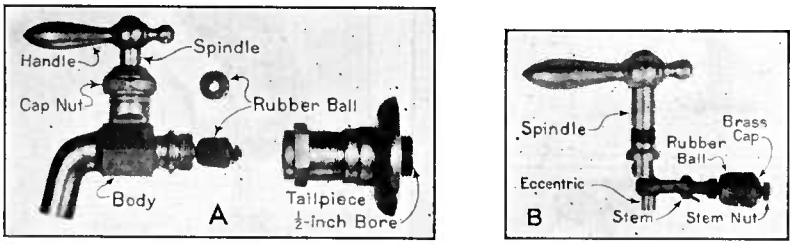

FIG. 4.—Fuller faucet: A, body unscrewed from tailpiece; B, spindle and stem removed from body

when the faucet is fully opened. These washers are separated in the illustration but are together when placed in a faucet.

New faucets of the kind shown in Figure 1 usually have the top washers shown in Figure 5 B. The rubber washer fills the space beneath the cap nut, and the thin fiber and brass washers are for the purposes described above. If no top washer is available, the space may be packed with candle wicking or soft twine, to which a little mutton or beef tallow should be applied to lubricate the stem, to preserve the packing, and to make it more impervious to water.

When placing the top washer or washers on a compression faucet of the kind shown in Figure 1, it is unnecessary to shut off the water provided the faucet is closed. With the right hand keep the faucet closed and with a monkey wrench in the left hand unscrew the cap nut. Unscrew the handle screw and remove handle and cap nut. Put on new washers as shown in Figure 5 A or 5 B and reassemble the parts.

Figure 5 C shows the stem packing for the washstand faucet shown in Figure 2. The packing space is very small and is filled with candle wicking lubricated with tallow. There is a thin brass friction washer in the bottom of the stuffing box, and a hexagonal packing nut screws into the top of the box. To renew the candle

wicking, keep the faucet closed. Unscrew the packing nut with a monkey wrench, wrap a little wicking around the stem, and screw the packing nut down against the wicking and into the stuffing box.

Spindle packing for a Fuller faucet (see fig. 4) is shown in Figure 5 D and consists of three collars or rings obtainable from plumbing dealers for a few cents. A lead ring or packing about one-eighth inch long goes first (lowest) on the spindle; then a rubber and fabric composition packing about one-fourth inch long; then a brass packing about one-fourth inch long. Screwing down the cap nut compresses the composition packing, and the metal packings take up friction and wear. To put in new packings, shut off the water from the faucet and remove handle and cap nut as was described for compression faucets.

STOP AND WASTE COCKS

Figure 6 A shows an adjustable socket-lever handle, ground key, flat way, stop and waste cock to shut off water to part or all of a piping system and to drain the higher situated pipes from which the flow is cut off. A stop and waste should always be placed on

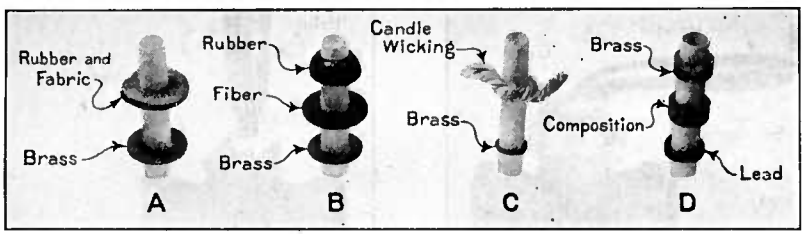

FIG. 5.—Top washers and packings: A, top washers commonly used in ordinary compression faucets (fig. 1); B, top washers which fill the space beneath the cap nut (fig. 1); C, candle wick packing and brass washer for washstand faucet (fig. 2); D, spindle packing for Fuller faucet (fig. 4)

the house supply pipe just inside the house or the cellar wall. They are very useful on branch pipes from a cellar or kitchen to upstairs or back rooms subject to freezing temperatures or other temporary discontinuance of the supply. Figure 6 B shows the disassembled parts, all excepting the handle being brass. The key or plug is ground to a water-tight fit in the body of the cock, and water is turned on or off by giving the handle a quarter turn. Turning the handle crosswise of the pipe shuts off the supply, and the dead water drains back through the small round hole in the side of the plug and out the waste tube.

Many stop and waste cocks have broken or bent handles or are otherwise rendered useless, because people do not understand them. As received from dealers, the nut on the bottom of the plug is generally screwed up tight, making it difficult or impossible to turn the handle and plug. Long periods of disuse frequently cause the plug to stick fast in the body. The plug is easily loosened by slightly unscrewing the bottom nut and striking the lower end of the plug a few light blows with a hammer. Slight leakage caused by wear of the plug or dirt around it may be prevented by cleaning the plug and tightening the bottom nut. A plug badly worn from long or

continual use can be reground, but it is usually better and cheaper to get a new plug or a complete new cock.

BALL COCKS

Figure 7 A shows an ordinary, compound lever, ball cock to control the water supply in a flush tank. The float ball and the seat washer on the bottom of the plunger are the only parts likely to need repairs. The buoyancy of the float is the force which lowers the plunger, shutting off the water as the tank fills. A leaky, water-logged float holds the plunger up, permitting constant flow and waste of water. A small leak in a copper float can be soldered. If a glass float is broken or a copper float is badly corroded, do not try to repair it. A new 5-inch copper float costs about 40 cents.

Figure 7 B shows the plunger and washer-holder cap which screws on the bottom of the plunger. The washer should be soft rubber or leather, because the force which holds it to its seat is not heavy. The cap is thin brass. To replace the washer, shut off the water and drain the tank. Unscrew the two thumbscrews which pivot the float-rod lever and plunger lever. Push the two levers to the left, drawing the plunger lever through the head of the plunger. Lift out the plunger, unscrew the cap on the bottom of the plunger, insert a soft, new washer, and reassemble the parts. The cap may be so corroded and weakened that it breaks during removal from the plunger. A new cap is then necessary, and it is well to have one or two on hand. When putting a washer on a ball cock, examine the seat to see that it is free of nicks and grit. The seat may need regrinding, as explained under compression faucets.

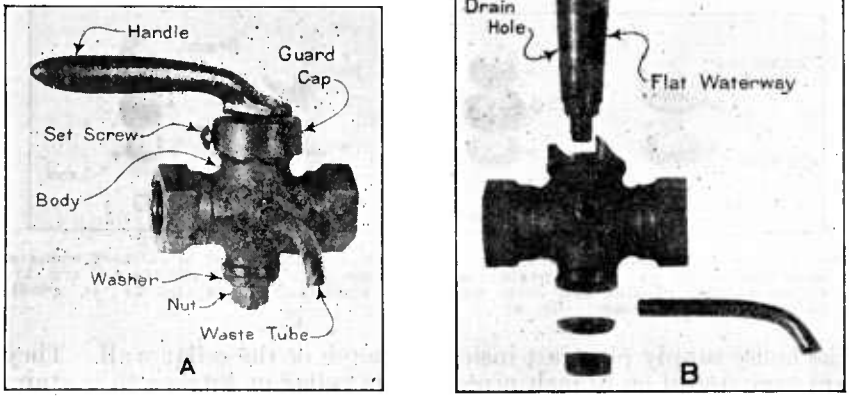

FIG. 6.—Stop and waste cock: A, parts assembled; B, parts unassembled

FLUSH VALVES FOR LOW TANKS

Figure 8 shows a common type of flush valve for a low tank. Probably no other plumbing in the home needs attention so often.

It is under water and subject to fouling and neglect. The hollow rubber ball gets out of shape and fails to drop squarely into the hollowed seat. The handle and lever fail to work smoothly or the lift wires get out of plumb, causing the ball to remain up when it should drop to its seat. To remove these difficulties, stop inflow to the tank by holding up the float of the ball cock or supporting it with a stick. Drain the tank by raising the rubber ball. If the ball is worn, out of shape, or has lost its elasticity, unscrew the lower lift wire from the ball and replace with a new one. A 2½-inch rubber ball costs about 25 cents, and a new one should always be kept in the home. The lift wires should be straight and plumb. The lower lift wire is readily centered over the center of the valve by means of the adjustable guide holder. By loosening the thumbscrew, the holder is raised, lowered, or rotated about the overflow tube. By loosening the lock nut and turning the guide screw, the horizontal position of the guide is fixed exactly over the center of the valve. These adjustments are very important. The upper lift wire should loop into the lever arm hole nearest to a vertical from the center of the valve. A tank should empty within 10 seconds. Owing to lengthening of the rubber ball and insufficient rise from its seat, the time may be longer than 10 seconds with a correspondingly weak flush. This trouble may be overcome by shortening the loop in the upper lift wire. A drop or two of lubricating oil on the lever mechanism makes it work more smoothly.

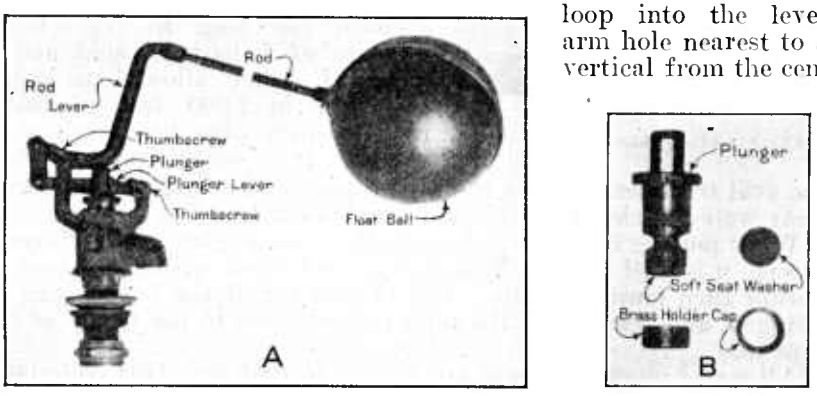

FIG. 7.—Ball cock: A, parts assembled; B, plunger, washer and cap

CLOGGED PIPES

Rust and dirt in water pipes are more or less successfully removed as follows: Tie a piece of small, stout cord to each end of a 2-foot length of small chain. Each piece of cord should be a little longer than the length of pipe to be cleaned. Attach the free end of one of the cords to a stiff steel wire and push the wire and cord through the pipe. By means of the cords pull the chain back and forth through the pipe, and then thoroughly flush the pipe with clean water under strong pressure. Long lines may be opened at intervals and cleaned section by section.

Other methods are: Use of a swab or wire brush attached to a small steel or brass rod, flushing with a powerful hand pump, or

pouring in ordinary commercial muriatic acid, allowing time for the acid to act, and then flushing out the acid and dirt with clean water. The undiluted acid, acting for about an hour, may be used in lead pipe. A milder treatment is advisable for galvanized pipe, because zinc and iron are attacked by muriatic acid. However, a badly rusted pipe is unlikely to have much galvanizing left, and therefore the benefits of acid treatment should outweigh possible damage to the pipe. Although the action of muriatic acid on iron rust is slow, it is generally considered better to use a dilute solution of the acid for a short or moderate period of time, repeating the operation if necessary, rather than run the risk of damaging the pipe with a strong solution too long in contact. A mixture of 1 part of acid and 7 parts of water allowed to stand overnight in 1,000 feet of badly rusted 1-inch pipe has given good results. It is very important after the acid treatment to give the pipe a long and strong flushing with clear water to clean out the acid and loosened rust and dirt.

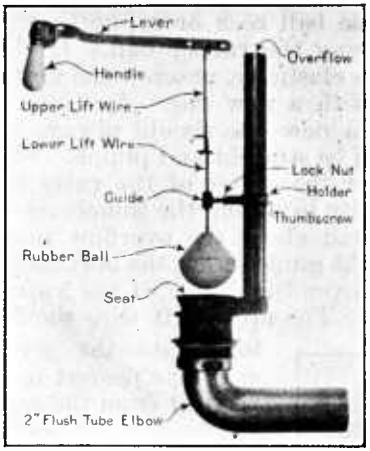

FIG. 8.—Flush valve for low tank

When putting in new pipe lines liable to need cleaning or to become frozen, it is well to use a T branch instead of an elbow wherever an abrupt turn must be made. The unused leg of the branch can be plugged, and removal of the plug makes access to the inside of the pipe easy.

All waste pipes and traps are subject to fouling. Dirt collects in the bottom and grease adheres to the sides. The usual way of clearing ordinary fixture traps is to unscrew the clean-out plug, as shown in Figure 9, and wash out the obstructing matter or pull it out with a wire bent to form a hook. Small obstructions are often forced down or drawn up by the use of a simple rubber force cup (sometimes called "the plumber's friend") costing 30 to 60 cents. This device is shown in Figure 10. The cup is placed over the fixture outlet and the fixture is partially filled with water. The wood handle of the cup is then worked rapidly down and up, causing alternate expulsion of the water from beneath the cup and suction upward through the waste pipe and trap. If a trap and the waste pipe from it are clogged with grease, hair, or lint, it is best to open or disconnect the trap and dig out the greasy matter with a stick. The use of chemical solvents in waste pipes is explained in Farmers' Bulletin 1426, "Farm Plumbing."

FIG. 9.—Cleaning out a sink trap

Small, coil spring-steel augers, of which two types are shown in Figure 11, are useful in dislodging or hooking obstructions in water-closets and other inaccessible traps and pipes. These augers are about one-half inch in diameter and come in lengths varying from 3 to 25 or more feet. The lower auger is about 8 feet long and has a crank at one end, and the other end is shaped like a dull corkscrew. It costs about $2 and is generally preferred to the upper auger for hard work in water-closets. The upper auger is about 4 feet long and is very useful for hooking rags and paper. By means of the handle and a small steel cable inside the coil the wire hooks can be pulled into the coil, thus facilitating entry into a trap.

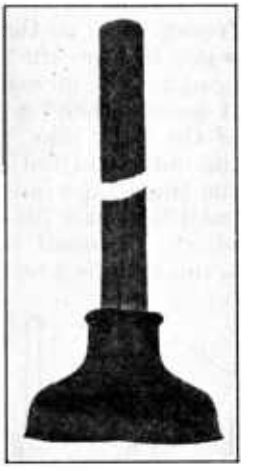

FIG. 10.—Rubber force cup

Two persons are generally needed to do effective work, one turning the crank and the other guiding the auger into the trap and helping to keep the coil free of folds and kinks. After using the auger, place a few sheets of crumpled toilet paper in the bowl and flush it to find out if the obstruction has been dislodged. The passageway through a water-closet is smaller than the connecting soil pipe. If the auger has forced the obstruction into the closet bend or the soil stack, there is usually no further trouble. Stoppages are generally due to improper use or carelessness. Newspapers, rags, matches, bottles, garbage, large pieces of soap, the tops of tin cans, and small toilet articles are the chief causes of trouble.

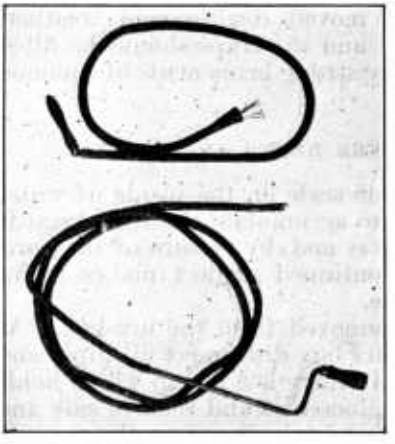

FIG. 11.—Coil spring steel augers

A coil spring cable one-fourth inch in diameter and 8 feet long with corkscrew ends and an adjustable handle for clamping at any point on the cable costs about $1.50. Its small size permits it to enter the waste openings of ordinary fixtures.

THAWING PIPES

The middle of a frozen pipe should never be thawed first, because expansion of the water confined by ice on both sides may burst the pipe. When thawing a water pipe, work toward the supply, opening a faucet to show when the flow starts. When thawing a waste or sewer pipe, work upward from the lower end to permit the water to drain away.

Applying boiling water or hot cloths to a frozen pipe is simple and effective. Where there is no danger of fire a torch or burning newspaper run back and forth along the frozen pipe gives quick results. Underground or otherwise inaccessible pipes may be thawed as

follows: Open the frozen water pipe on the house end. Insert one end of a small pipe or tube. With the aid of a funnel at the other end of the small pipe pour boiling water into it and push it forward as the ice melts. A piece of rubber tubing may be used to connect the funnel to the thaw pipe. Hold the funnel higher than the frozen pipe, so that the hot water has head and forces the cooled water back to the opening, where it may be caught in a pail. The head may be increased and the funnel may be more conveniently used if an elbow and a piece of vertical pipe are added to the outer end of the thaw pipe, as shown in Figure 12. Add more thaw pipe at the outer end until a passage is made through the ice. Withdraw the thaw pipe quickly after the flow starts. Do not stop the flow until the thaw pipe is fully removed and the frozen pipe is cleared of ice. A small force pump is often used instead of a funnel and is much to be preferred for opening a long piece of pipe. If available, a jet of steam may be used instead of hot water; being hotter, it is more rapid.

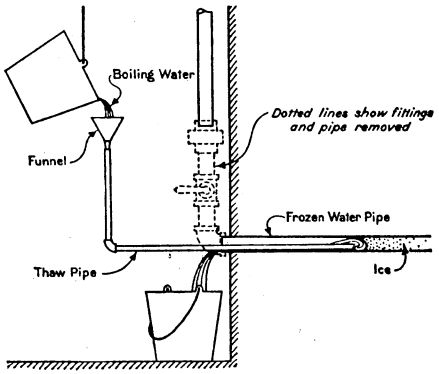

FIG. 12.—Thawing a frozen pipe

Frozen traps and waste pipes are sometimes thawed by pouring in caustic soda or lye, obtainable at grocery stores for about 25 cents per pound. Chemicals of this character should be labeled "Poison" and should be kept where children can not get them. To prevent freezing, the water in the traps of a vacant house should be removed during cold weather, and the traps should be filled with kerosene, crude glycerin, or a very strong brine made of common salt and water.

REMOVING SCALE FROM WATER BACKS AND COILS

Hard water causes a limy deposit or scale on the inside of water backs and heating coils. If allowed to accumulate the scale retards the circulation and heating of the water and, by closure of the bore, may prove dangerous. Moreover, continued neglect makes it increasingly difficult to remove the scale.

The water back or coil should be removed from the fire box. At the union or other joints nearest the fire box disconnect all pipes and unscrew them from the water back. If there is a clamp which holds the fire-brick lining against the oven, loosen it and remove side and end linings. Lift out the water back and take it out on the ground. Soft scale or sludge may be removed by pounding the water back with a mallet or hammer and then flushing with a strong jet of water. A long gouge or chisel is used on those surfaces that can be reached. Sometimes the water back is heated in a blacksmith's forge and then pounded, but unless carefully done this treatment may break it. Some householders keep a spare water back for use while the other is being cleaned.

Waters of varying chemical composition cause scale differing in composition and hardness. Ordinary limestone (calcium carbonate) scale, if not of excessive thickness, may readily be removed with muriatic acid. Gypsum (calcium sulfate) scale is hard and resistant and with other constituents in their more compact forms is little affected by muriatic acid. The water back should be laid on the ground and filled with a strong solution of the acid in water. The strength of the solution should vary with the amount of deposit, the ordinary mixture being 1 part of acid and 5 to 7 parts of water. If the deposit is very thick, the acid needs little dilution. Commercial muriatic acid in bottles containing 6 pounds (about 2½ quarts) costs 20 to 25 cents a pound. The bottle should be labeled "Muriatic acid—poison"; and, like the chemicals previously mentioned, it should be kept where children can not get it. Heating the water back hastens the action of the acid. At the end of an hour or two, or sooner if the deposit is dissolved, pour the solution from the water back and flush it thoroughly with hot water to remove the acid. If all the deposit has not been removed, repeat the operation, making sure that the acid is completely washed out before replacing the water back. In replacing the water back it is important to have it level, using a spirit level for this purpose.

Similar methods may be used with copper coils. Place the coil (or heater) on two sticks over a large bowl. With the aid of a lead funnel pour the acid solution down through the coil. Dip from the bowl and continue to circulate the solution through the coil until the deposit is dissolved. The coil should then be thoroughly washed out with hot water.

The hot-water flow pipe close to a water back or coil frequently becomes thickly covered with scale. If the pipe is brass, it may be disconnected and treated with acid and then washed out with hot water. If the pipe is galvanized iron and in bad condition, it will probably be more satisfactory to replace it with new pipe.

LEAKS IN PIPES AND TANKS

A small leak in a water pipe can be stopped in emergencies as follows: Place a flat rubber or leather gasket over the leak and hammer a stiff piece of metal, such as a picture hook, to fit over the gasket; secure both to the pipe with a vise or clamp obtainable at hardware or 5 and 10 cent stores. A small leak under low pressure is sometimes stopped by embedding the pipe in richly mixed Portland cement mortar or concrete. It is necessary to shut off the water from the pipe and build a boxing around it to hold the soft mortar closely against the pipe. Broken sewer pipe can be repaired in like manner. A wrapping of wire netting embedded in the mortar or concrete increases its tensile strength. A small hole in cast-iron pipe may be tapped for a screw plug.

Where a leaky screw joint can not be tightened with a pipe wrench, the leak is sometimes stopped with a blunt chisel or calking tool and hammer. Sometimes a crack or hole is cleaned out and then plugged and calked with lead, tinfoil, or a commercial iron cement mixed to the consistency of stiff putty. Sometimes a pipe band, a clamp with two bolts (similar but stronger than the one shown in

fig. 14), or a split sleeve is employed to hold a thin coating of iron cement or a gasket over a leak. If the leak is at a screw joint, the band is usually coated inside with one-eighth inch of iron cement and then slipped over the pipe. Keeping the bolt farthest from the coupling or fitting a little tighter than the other, both bolts are tightened. During the tightening, the band should be driven with a hammer snugly against the coupling or fitting.

In addition to these methods and devices, there are several kinds of good, inexpensive, ready-made pipe and joint repairers obtainable of manufacturers and dealers.

A corroded and leaky spot in a steel tank or range boiler can be closed with an inexpensive repair bolt or plug obtainable from dealers. Figure 13 shows a homemade repairer consisting of a three-sixteenths by 3-inch toggle bolt costing 10 cents and a flat rubber gasket, brass washer, and nut. The link of the bolt, after being passed through the hole, takes an upright position, and screwing up the nut forces the gasket tightly against the outside of the boiler.

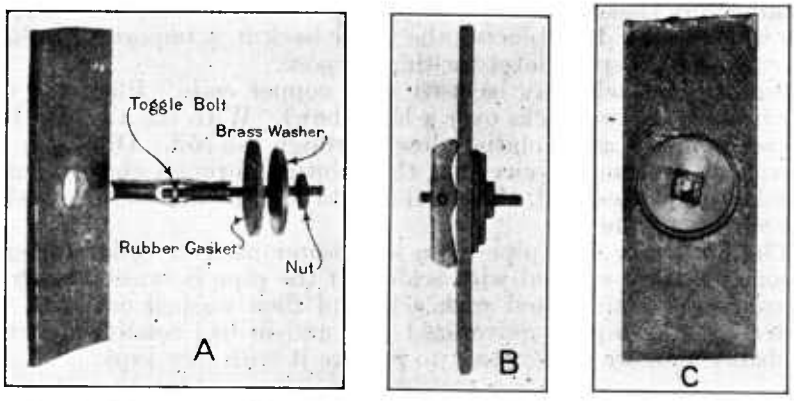

FIG. 13.—Homemade tank repairer: A, passing the link of the toggle bolt through the hole (enlarged) in the tank; B, side view of edge of tank with bolt, washers, and nut after being tightened; C, outside view of completed job

A small hole must be reamed or enlarged with a round file to a diameter of about five-eighths inch. The metal beneath the gasket should be firm and clean. A little candle wick packing may be wrapped around the bolt to prevent leakage along the bolt. Sometimes a hole is closed by driving in a tapered steel pin to turn the metal inward, forming a surface which can be tapped for an ordinary screw plug. A hole in the wall of a tank or pipe having considerable thickness can be easily and quickly closed by screwing in a tapered steel tap-plug which cuts and threads its way through the wall. These plugs in different sizes are obtainable of dealers and a monkey wrench is the only tool required to insert them; it is unnecessary to shut off or drain the water from the tank or pipe.

A small leak at a seam or rivet can often be closed by merely rubbing a cold chisel along the beveled edge of the joint. Do not attempt to calk a seam unless the plates have considerable thickness and the rivets are closely spaced and are close to the calking edge, and then use extreme caution. Run a regular calking tool or blunt chisel along the beveled edge, tapping the tool very lightly with a

light hammer to force the edge of the upper plate against and into the lower plate.

CRACKED LAUNDRY TUBS

Cracks in slate, soapstone, or cement laundry tubs are made watertight with a mixture of litharge and glycerin or a specially prepared commercial cement. The litharge and glycerin are mixed and stirred to form a smooth heavy paste free from lumps. The crack should be cleaned out to remove all grease and dirt and the paste should be worked into the crack with a case knife. A paste of Portland cement and water, or of the white of an egg and fresh lump lime, has been used successfully for this purpose.

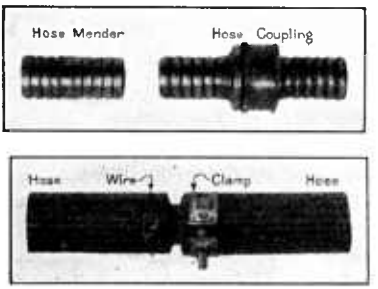

FIG. 14.—Hose menders: Above, hose mender and hose coupling; below, two pieces of hose joined with a mender. The left-hand piece is fastened with wire twisted with a pair of pliers, and the right-hand piece is clamped

HOSE MENDERS OR SPLICERS

A break in garden hose can be quickly repaired or two pieces of hose can be joined with a 10 or 15 cent iron or brass hose mender or splicer shown in Figure 14 (upper left). Cut off the defective piece of hose, insert the mender in the good ends of the hose, and wire or clamp the hose as shown in Figure 14 (below). Menders come to slip inside of one-half, three-fourths, or 1 inch hose. A regular brass hose coupling shown in Figure 14 (upper right) and costing 25 to 40 cents can be used for this purpose.

ORGANIZATION OF THE UNITED STATES DEPARTMENT OF AGRICULTURE

September 3, 1925

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