CHAPTER VII

SERVICE-PIPES AND METERS.

Wiped-Joints and Cup-Joints—The Lawrence Air-Pump—Wire-Drawn Solder—Weight of Lead Service-Pipe—Tapping Wrought-Iron Mains—Service-Boxes—Meters.

THE regulation wiped-joint is one of the awful mysteries of the plumber's craft, and a description of its making would avail but little. It is the plumber's shibboleth, and if one of the trade can be found who will admit that any other joint is its equal he may be counted as one out of many. It is not to be denied that in many instances nothing can equal in appearance and fitness a well-wiped joint, and a thorough workman certainly knows how to make one; but a well-made cup-joint is equally strong—perhaps stronger—does not require a tenth part of the solder, and is made more quickly and with less practice.

A cup-joint is shown in Figure 22, and is made by expanding the end of the lead pipe with a properly shaped plug, scraping the inside of the cup with a jack-knife to give a surface of clean metal, dropping a soldering nut or tail-piece, properly tinned, into the cup, heating the whole joint by some appropriate method, and finally by filling the thin annular

space between the cup and the tinned brass casting with melted solder. If these details are properly executed a perfect joint is the result. The writer has had several of these joints sawn in two and the bond is then seen to be perfect.

This joint was brought to the writer's attention by Mr. Dexter Brackett, Assistant Engineer of the Boston Water-Works, and a study of the method and its results will show that this is not a "tinker's joint," for it is used in Boston, Lawrence, New Bedford, and Taunton by the water departments of those cities, who have no sort of reason for using any methods or materials but the best.

The only portions of the process of cup-joint making which call for special mention are the method of heating the joint and the kind of solder to be used.

We should note in passing, however, that while the plug is being driven to form the cup, that this end of the lead pipe should be firmly held in a vise between two cast-iron half-round clamps that are cut out to correspond with the outside shape of the cup. When under these circumstances the plug is driven home, the lead forming the walls of the cup is compressed, and anything like a blister or defect has a chance of being closed.

For heating, Mr. Brackett uses, or did use, a sweating-iron, and so did the writer until Mr. Henry W. Rogers, formerly Superintendent of the Lawrence Water-Works, introduced a blow-pipe and air-pump apparatus, which is a great improvement in speed and convenience over a pair of hot irons.

The air-pump and the blow-pipe or lamp are shown in Figure 23. A jet of water, whose size may vary with the pressure under which it is to be used and the work to be done, from $\frac{1}{16}$-inch to ¼-inch, induces a current of air to enter the tee, and water and air together enter the separating chamber C made of 2-inch brass or iron pipe. The water flows off through the trap or bent pipe to waste and the air through the smaller pipe to the lamp or blow-pipe. When the apparatus is in operation the outlet for the air is so small that air accumulates in the separating chamber and forces the water down

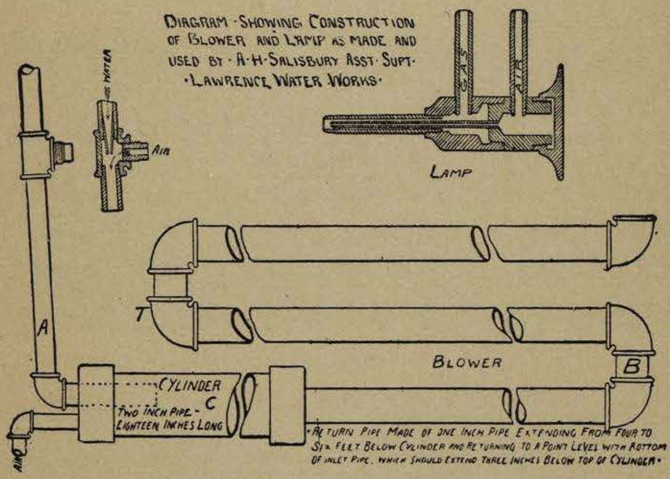

FIGURE 23.

below the the top of the trap a distance depending on the special conditions which exist in any given case; and the pressure under which the air accumulates is measured by the difference between the heights of the two water columns in C B and T B. The lamp is a Bunsen burner and the quantity of air from the pump, and of common gas from a convenient

jet, may be so regulated as to produce a flame hot enough to make a bit of chalk glow like a calcium light. In fact there is an excess of heat for joint-making purposes, and a little experience will be required to prevent one from getting the metals so hot as to cause the solder to run through.

A very convenient form in which to use the solder is that given by drawing the common sticks into wire, about ⅛-inch in diameter. Wire solder has been for sale at a high price, and a large consumer would find it cheaper to build a small mill and draw the wire for himself than to pay twenty-five cents per pound.

There seems to be no standard weights for the various sizes of lead pipe, and an examination of a "Table showing weights of lead service-pipes used in various cities," which was compiled by Mr. William B. Sherman, of Providence, R. I., as an appendix to Mr. Richards' paper before referred to, will show more clearly than anything else the absence of uniformity.

For any but excessive pressures, exceeding 150 pounds per square inch, the following weights will be found sufficient:

Size..............Inches	½	⅝	¾	1	1¼	1½
Weight per foot...Pounds	3	3½	4	4½	5½	7

TAPPING WROUGHT-IRON MAINS.

There are more different methods of tapping cement-lined or coated wrought-iron pipe of any sort than of tapping cast-iron mains. Cast iron is seldom less than half an inch in thickness, but with wrought iron the actual thickness of metal is one quarter of an inch or less, and it is evident that such different conditions call for different treatment. Figure 24 shows in section the apparatus used for tapping wrought-iron kalamein pipe, used by Mr. Frank E. Hall, Superintendent of the Quincy, Mass., Water Co., and to whom I am indebted for a drawing of the machine. A packing of sheet-lead is put between the clamp and the pipe at the point to be drilled, and if tightness is not secured by screwing the nuts down hard, the lead can be calked up.

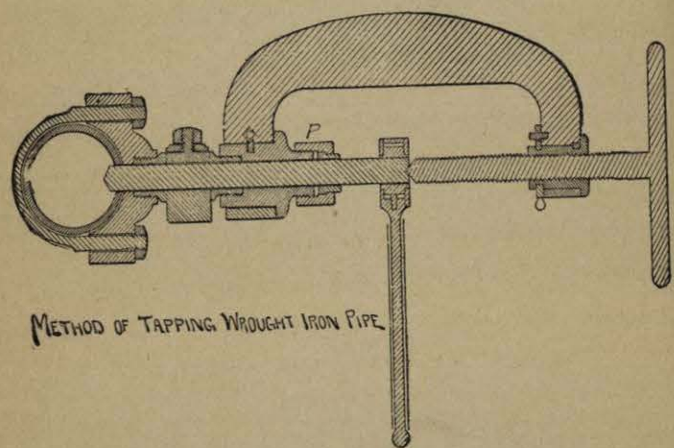

FIGURE 24

With cement-lined pipe a similar clamp may be used, and such a clamp is a regular article of trade. A corporation cock may, however, be soldered or wiped directly on to the wrought-iron pipe without any clamp, and this is now the practice in many places. A small portion of the outside coating of cement is carefully broken away, the pipe is thoroughly cleaned and tinned, the cock is then attached to the main by

soldering with an ordinary iron, or by wiping, and then, with an arrangement similar to that shown in Figure 24, a hole is drilled, passing the drill through the opened cock. After perforation the drill is withdrawn just far enough to allow the tapper to close the cock, and then the tapping apparatus is removed, the stuffing-box at P having kept the water back during the operation. Any convenient form of drill may be used, but Figure 22 shows the form used at Plymouth, Mass.

SERVICE-BOXES.

Considerable ingenuity has been expended in efforts to devise a cheap and satisfactory service-box. Wood was, naturally enough, one of the first materials to be chosen, and scored at first an apparent success when the stock was kyanized, but even if the preserving process proved to be in some cases successful, the frost made stumbling-blocks of the boxes by throwing them above the sidewalk level. Combinations of drain-pipe, light and heavy castings, and wrought-iron pipe with cast-iron bases might be described, but none of them, so far as the writer can judge, are any better, if as good as a simple cast-iron box in two principal parts sliding, telescope fashion, one inside of the other. The extension shut-off boxes, well known to the trade, give entire satisfaction, and at the price at which they are now offered it will hardly pay for any one to design a new pattern for any but special cases.

METERS.

Of making many meters there has been no end, and much experience with some of them is a weariness to the flesh. Of the six hundred or more that have been patented, six or less have come to any extensive use in this country, but in the value of that half dozen the writer has an abiding faith.

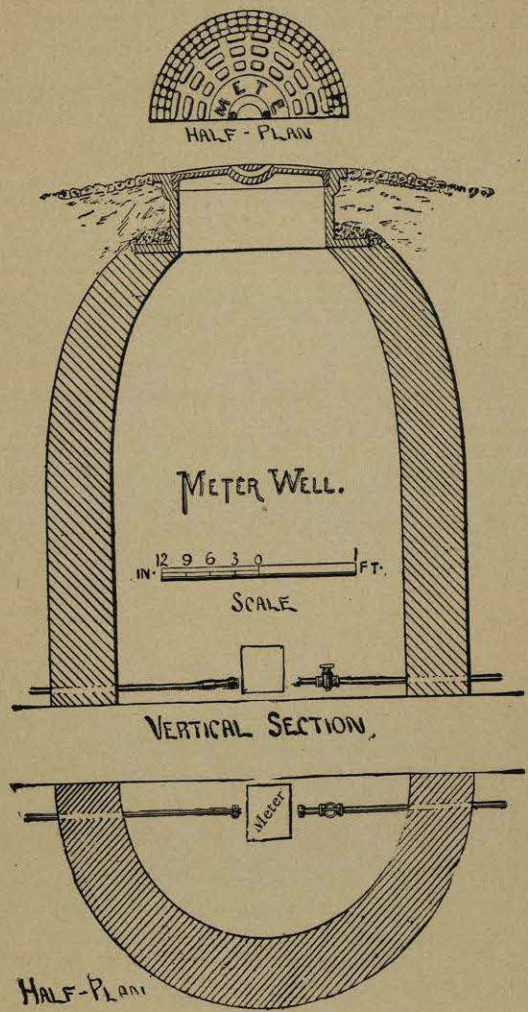

FIGURE 25.

The important points in setting a meter are perfect protection against freezing, a firm support, accessibility, and in

some cases protection against meddlesome fingers. Too much care cannot be exercised in the first of these points, for a frozen meter is worth its weight in junk only, as a rule, and meters have been known to freeze in cellars in which the potatoes (so the owner said) never froze. If a house is to be metered, and the cellar is without a furnace, the safest place for the meter is just below the cellar bottom, and if the ground is too wet to allow this, and draining the cellar is out of the question, then a tight double box, with a 2-inch air-space, affords the next best solution.

Even if a house is not to be metered, it often is wise to enter the service-pipe from the street below the cellar bottom, as this affords protection to the pipe and secures cooler water in summer. In some cases the only place for a meter is in a driveway, a sidewalk, or a lawn, and in such cases a brick well with a cast-iron cover, the whole costing nearly $25, offers the best arrangement, as shown in Figure 25.

Meters should be well supported, either by a hanging shelf or a brick pier if one wishes to avoid all chance of springing the joints or the shell of a meter.

With lead pipe there is, of course, not the chance to hang the meter by the pipe that there is when iron or brass is used. It is quite important that a meter be so constructed as to have the inlet and outlet in the same line, and the distance from face to face of the inlet and outlet points exactly the same on all meters of the same size, for the best have to come out once in a while for repairs or cleaning, and then, with proper construction, a piece of pipe may take the place of the meter, with no inconvenience to the consumer.