

CHAPTER IV.

CONSTRUCTING THE VARIOUS SLIP JOINTS

A formation in sheet metal, which makes the horizontal slip joint between square, triangular or rectangular ducts, is known as a "slip."

When the pipe or duct is round or elliptical, an ordinary slip joint is made, as shown in Fig. 59;

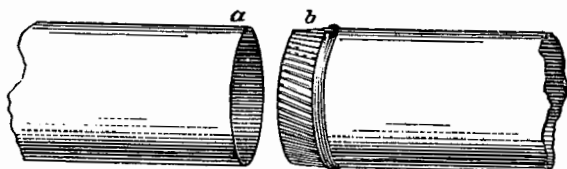


Fig. 59—Slip Joint in Round Ducts

that is, by the end of the one pipe slipping over the crimped part of the lower one, as shown by a and b. When the ducts are square, triangular or rectangular, the most simple slip in use is the S slip, shown in Fig. 60. In addition to these the following slips are used: the riveted S slip, the punched S slip, the wired edge slip, the flat slip with duct edges wired, the re-enforced slip with outer edges beveled, the re-enforced standing edge slip, the doubled edge flat slip, the sheet metal angle slip, the re-enforced angle iron slip, the expansion slip joint and the double angle iron butt joint.

Preparing End of Duct for Slip

There are two methods of preparing one end of the duct previous to fastening the slip on same. One is to notch the corners down as wide as the slip will

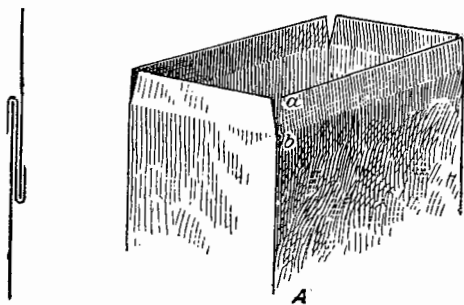
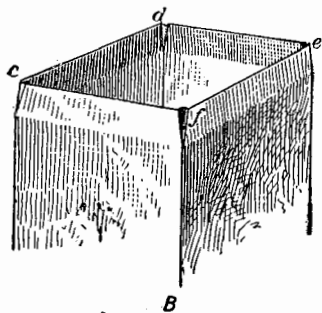


Fig. 60—Ordinary S Slip

be, which is usually about two inches, as shown from a to b in diagram A of Fig. 60; the other is to use the pean of the hammer and turn an inward groove

Fig. 61—Preparing the Ducts
for Receiving the Slips

on each corner, as shown in diagram B by c, d, e, and f, in Fig. 61. The second method is recom-

mended because no notching is required and rigidity is given to the corners.

Uses of a Dolly

A dolly similar to that shown by A in Fig. 62 can be used to advantage to make the inward groove on each corner of the duct. It contains a tapering groove in one corner, as shown. In using same, the dolly is

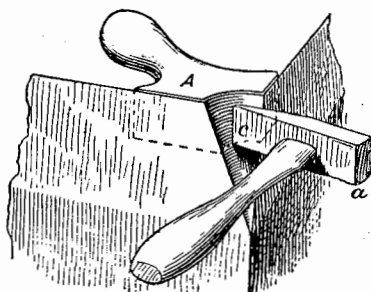


Fig. 62—Putting Groove in Corner

held by the handle in the left hand, is pressed firmly against the inside corner of the duct, and, by means of the face of the hammer a, the corner is slightly flattened; then, with the pean c, the groove is worked into the dolly, in sufficient depth to give the lap the required taper so as to allow the next point to slip over easily.

Cutting the Tapered Ends

In cutting the tapering ends of the slip, the length indicated by A in Fig. 63 should be $\frac{1}{8}$ inch less than the length of the side of the duct on which the slip is to be placed, B should equal the width of the

notch **a**, **b** in Fig. 60, or the tapered groove **f** in Fig. 61, while the length at **C** in Fig. 63 should be $\frac{1}{8}$ inch less than **A**.

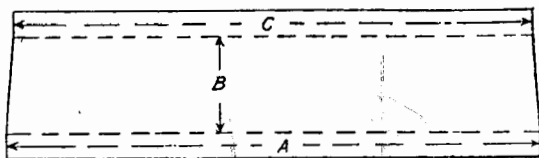


Fig. 63—Pattern for Slip

Fastening the Riveted Slip

The riveted S slip shown in Fig. 64 is hooked over the tapering end of the duct and riveted as shown at **c** in the diagram at the right, after which the straight end of the duct **B** slips into the outer hook, as shown. The cut at the left shows the end of the duct with slips riveted on four sides.

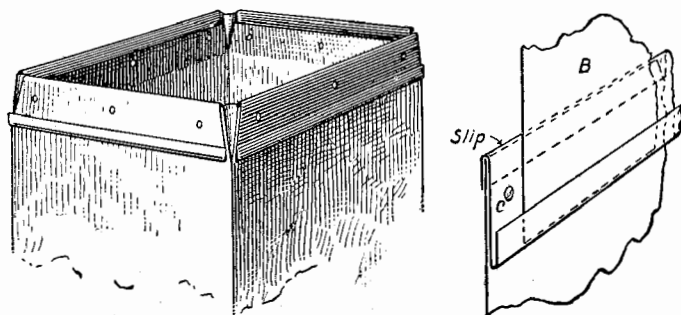


Fig. 64—Applying the Riveted S Slip

Applying Punched S Slip

After the slip has been hooked over the lower joint, the S slip may be secured by punching, as shown in Fig. 65. Triangular holes are punched into the slip and lower joints, as shown. This binds the slip

and keeps it from moving, the slot being covered by the upper joint.

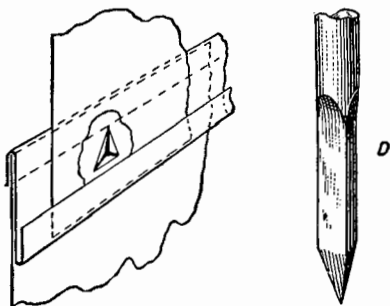


Fig. 65—Applying the Punched S Slip

In punching these slots a three-cornered punch is used, as indicated at D, each side of which measures about half an inch. In using the punch, a block of

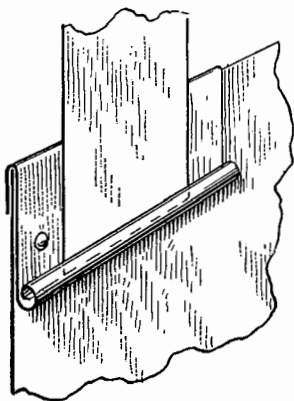


Fig. 66—Slip with Wired Edge

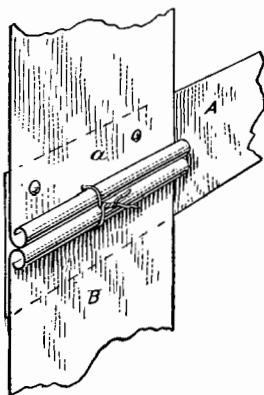


Fig. 67—Flat Slip with Duct Edges Wired

wood or cake of lead is held on the inside and holes are then punched about 12 to 15 inches apart.

Wire Edge Slip

The wire edge slip is made with a hook on one side and a wired edge on the other, as indicated in Fig. 66. This slip can be riveted or punched and the upper joint dropped behind the wired edge. When the ends of the ducts are wired, a flat strip of metal, indicated by A in Fig. 67, is riveted to the end of one of the ducts, as shown at a, after which the lower duct B is slipped over same. This method avoids the notching of one end of the duct. Sometimes the wired edges are fastened together by means of soft brass wire. By using a long, thin prick punch holes

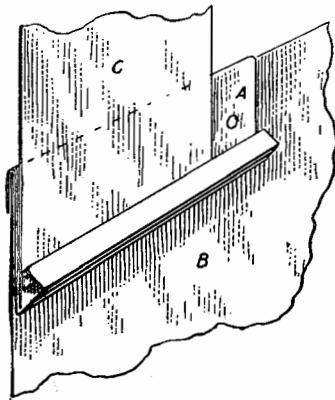


Fig. 68—Beveled Edge Slip

are punched through the duct and slip as shown, and the wire is twisted on the outside as indicated.

Beveled Edge Slip

The beveled edge slip has a formation similar to that shown in Fig. 68 at A. It is slipped over the lower pipe B and riveted, the upper duct C slipping

B and is riveted through the three thicknesses of metal, as at *c*. The upper duct C then slips in at *b*.

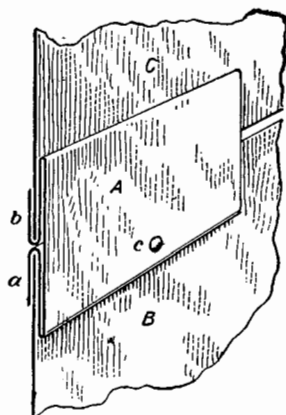


Fig. 70—Double Edge Flat Slip

Sheet Metal Angle Slip

In Fig. 71, A shows the formation of the sheet metal angle slip. When forming this slip on the brake,

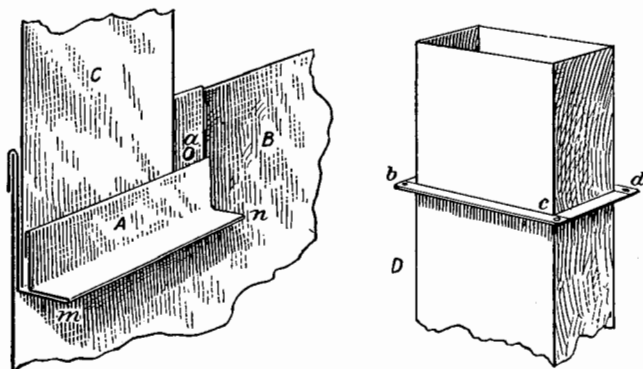


Fig. 71—Sheet Metal Angle Slip

the bend along *m n* is clamped the very last on the brake. The slip is riveted to B along *a*, after which C slips in behind the groove in the slip, as shown. When the cross joints are made in this manner, the angle slip forms a stiff brace, as shown in diagram D, at the right, which can be further strengthened by lapping and riveting the corners, as shown by *b c d*.

Angle Iron Slip

The re-enforced angle iron slip is shown in Fig. 72. The slip is formed similar to that in the previous construction, excepting that an angle iron is inserted, as shown at C. The slip is hooked over B, riveted through, and D dropped into the groove behind the angle iron, as shown. This method forms a rigid construction, which can also be treated at the corners, as in the previous case.

Expansion Slip

An expansion slip joint is one that allows for the expansion and contraction of the sheet metal when gauges heavier than No. 20 are used. It is used on heating ducts, which are usually placed along the ceilings in the basement, which supply the uptakes made up of lighter gauge metal. The method of constructing this expansion slip joint is shown in Fig. 73, in which A and B represent the ends of two joints of the duct. On the end A, using metal having the same gauge as the duct, strips are riveted, as indicated by *a* and *b*, and over *a* the angle iron *c* is placed flush with the edge of the sheet A. These four thicknesses, namely, the inner strip *b*, the sheet A, the outer strip *a* and the angle iron *c*, are carefully punched and riveted at intervals of about 10 inches,

as at *d*. The inner strip *b* is made wider than *a*, so that the joint can easily be slipped into place.

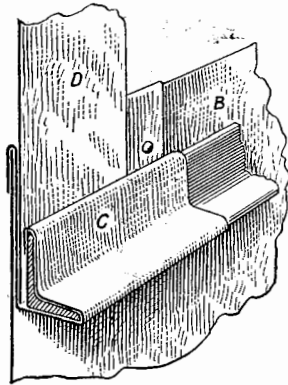


Fig. 72—Re-enforced Angle Iron Slip

Care must be taken in slipping the joints together. By having the strip *b* wider than *a*, the duct *B* can be first slipped over *b*, then pressed forward under

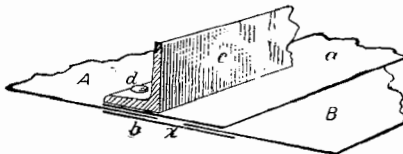


Fig. 73—Expansion Slip Joints for Heavy Metal Ducts

a, but not so closely that the distance between the edges of the sheets *A* and *B* will be less than $\frac{3}{8}$ of an inch, as indicated by point *x*. Sometimes an angle is riveted on the duct *B*, to prevent it from slipping in too far. This will allow the sheets to expand when they become heated, or contract when cooled. If

they were brought tightly together, there would be no chance for expansion when the metal becomes heated.

Angle Iron Butt Joint

The double angle iron butt joint for heavy duct work is constructed by means of two angle irons, each

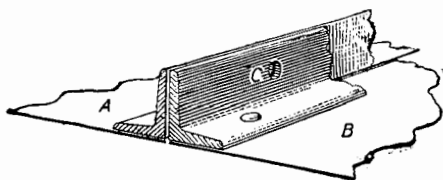


Fig. 74—Horizontal Joints by Means of Angle Iron Connections

riveted to the ends of the sheets A and B, as in Fig. 74. The angle irons are then riveted or bolted together through the holes which have been previously punched, as at C.