ABSTRACT

This invention is concerned with a portable punch and the simplification of the attachment of a downspout to a rain gutter for a roof. The gutter is punched to form a downspout opening having integral downwardly extending tabs surrounding the opening and to which the downspout can be secured. The punch includes male and female dies and guide and lever means for moving the male die into the female die.

5 Claims, 5 Drawing Figures
1 ROOF GUTTER AND DOWNSPOUT AND PUNCH THEREFOR

SUMMARY OF THE INVENTION

Herefore it has been common practice in securing downsputs to rain gutters to require a separate, i.e., additional connector to achieve the connection. Such additional connectors added cost to the installation by the price of the connectors, and by the cost of the additional labor required for installation.

The present invention has as its object the elimination of such extra connectors and the elimination of work back in the sheet metal shop, by the provision of a portable tool usable on the job to simultaneously punch frictional attaching tabs and a downsput opening in a rain gutter. Thereafter, a downsput is simply frictionally stabbed onto the attached tabs.

Another object of the invention is to provide a portable tool as described wherein male and female dies of substantially rectangular shape in cross section punch a vertically downward triangular tab along each side of a substantially rectangular opening in the bottom of a rain gutter.

Another object of the invention is the provision of a simplified, improved combination of rain gutter and downsput characterized by relatively low cost, ease of assembly, desirability of location and watertightness.

For a better understanding of the invention, reference should be had to the accompanying drawings, wherein:

FIG. 1 is a side elevation of the portable punching tool of the invention;
FIG. 2 is a plan view of the tool of FIG. 1;
FIG. 3 is an elevation of the right end of the apparatus of FIG. 2;
FIG. 4 is a fragmentary view similar to a portion of FIG. 1 but showing the end of the work stroke of the dies; and
FIG. 5 is a cross sectional view of the rain gutter and downsput combination of the invention.

In the drawings, the numeral 10 indicates generally a portable tool base made of angle iron feet 12 and thin metal plate sides 14. At one end of the base, the plates 14 are extended upwardly at 16 and support between them a female die 18. The die 18 is further supported on a top 20 welded to the base 10. Pivotedly supported on a bolt 22 extending between the side plates 14 of the base 10 are two horizontally extending tubes 24 which slidably support posts 26 welded to a male die 28 which slides on the cover 20 into and out of operating relation with female die 18.

Lever operated toggle linkage is provided to move the male die 28. This takes the form of an L-shaped lever 30 pivotally secured at 32 to a shaft extending between the tubes 24. An adjustable length link 34 is pivotally secured at 36 to the male die 28 and pivotally to the lever 30 at 38.

The length of the link 34 is adjustable so that the male die 28 bottoms the work piece against the female die 18 as seen in FIG. 4 when the three pivots 32, 38 and 36 come substantially into line. As the pivots come into line, a very high force can be imparted to the work by the lever 30.

As seen in the drawings, the gutter G, which is the work piece, has a flat bottom portion, an integral right angle back flange, and an integral substantially right angle front flange. The gutter G rests with its base against the female die 18 and its back flange against the top 20 (see FIG. 1). It will be understood that the area of the bottom portion of the gutter which is positioned over the female die 18 is the area in which the downsput opening is to be made.

In the form of the invention illustrated, the downsput D (see FIG. 5) is rectangular in cross section. The dies 18 and 28 have a similar shape in cross section so that the operation of the dies on the gutter G produces four substantially triangular tabs 40 extending downwardly at right angles around the rectangular opening in the bottom of the gutter. These tabs 40 engage frictionally with the inside of the downsput to hold it tightly to the gutter G in watertight relation. If desired, sheet metal screws (not shown) may be used to assist in holding the downsput D to the tabs 40. Providing the male die 28 with a pointed end as shown assists in cutting and forming the tabs 40.

Side plates 14 may be extended upwardly, as shown at 17, at the lefthand end of the apparatus of FIG. 1, to provide stops for stripping the gutter G from the male die 28 upon the movement of the male die out of the female die.

By the provision of the described punching apparatus, actually on the job location where rain gutters and downsputs are being installed, the installation can proceed with less labor and parts than heretofore, and at noteworthy savings of time and money.

While in accord with the patent statutes, a best known embodiment of the invention has been shown and described, it is to be understood that the invention is not to be limited thereto and that the scope of the invention is defined in the appended claims.

What is claimed is:

1. A portable tool for punching a plurality of right angle tabs in a downward direction from the flat bottom portion of a rain gutter, including a base, female die means at one end of the base for supporting the bottom portion of the gutter, male die means, guide and lever means for moving the male die means into the female die means, said die means being substantially rectangular in cross section so that the right angle tabs are four in number, one tab along each side of the opening punched, the lever means including a toggle linkage, means in the linkage for adjusting the length of the die stroke, and flange means on the base for stripping the gutter from the male die means.

2. A portable tool as in claim 1 where the guide included a member secured to the male die means, a second member for telescopically engaging the first member, the second member being pivotally mounted on the base.

3. A portable tool as in claim 2 where the male die means slideably engages the base and can be raised therefore as the lever means is retracted to inoperative position.

4. The tool as in claim 1 wherein the male die means is slideably mounted on a tool base, and said guide and lever means include telescopic members.

5. The tool as in claim 1 wherein the lever means include a toggle linkage, and telescoping guide members operatively engage the said male die means.

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