July 17, 1951 R. VOSEN ET AL 2,560,673

SHEET METAL CUTTER

Filed July 10, 1946

Fig. 1.

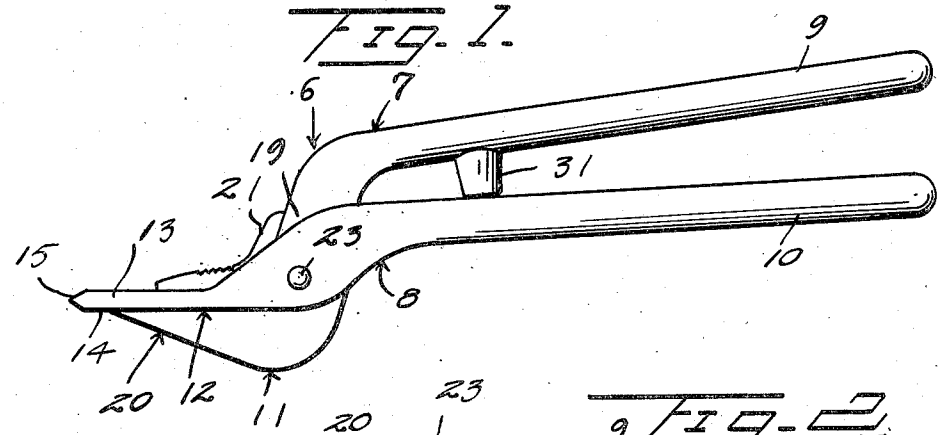


Fig. 2.

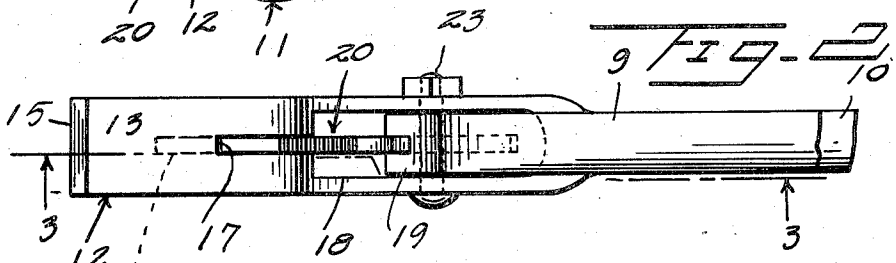


Fig. 3.

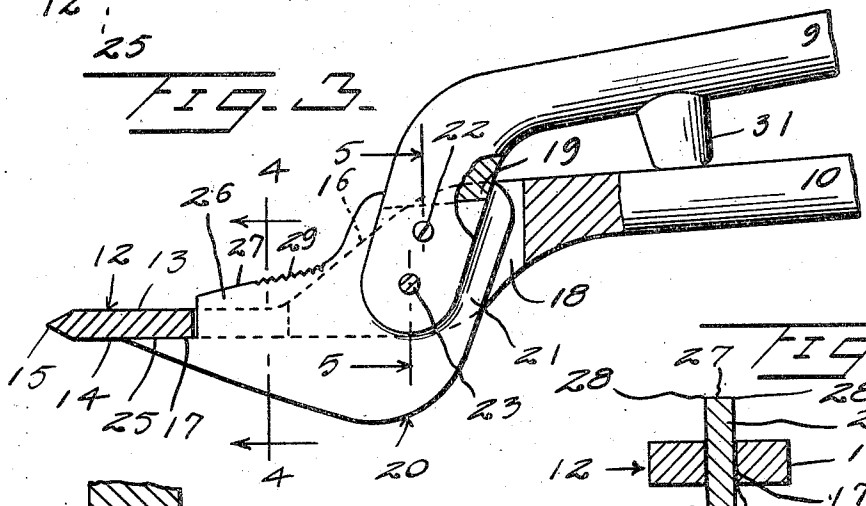


Fig. 4.

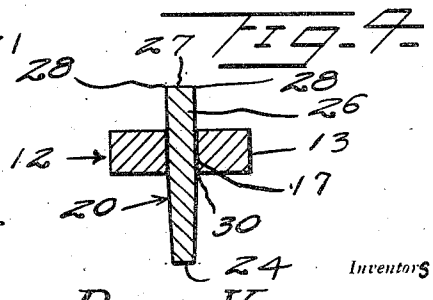
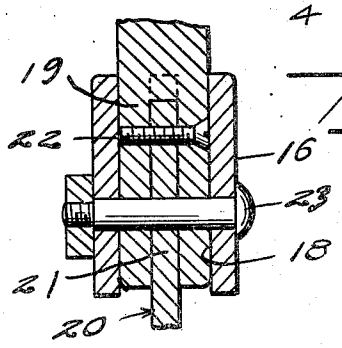


Fig. 5.



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SHEET METAL CUTTER

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Application July 10, 1946, Serial No. 682,570

1 Claim. (Cl. 30—257)

1

This invention relates to an improved construction of shears for cutting sheet metal and which is especially intended and adapted for cutting sheet metal pipes or conduits, such as stove or furnace pipes, as well as flat sheet metal stock.

More particularly, it is the primary aim of the present invention to provide a sheet metal cutter which will not become clogged by sheared fragments of the metal and which will sever a ribbon of metal from the work leaving smooth sheared edges which are not distorted by engagement with the tool.

Still another aim of the invention is to provide a sheet metal shears which is so constructed and arranged that the sheared edges of the work will straddle one blade of the shears and pass entirely under the remainder of the shears to prevent injury to the hands of the user and to prevent the sheared edges from being bent or distorted in passing around the tool.

Various other objects and advantages of the invention will hereinafter become more fully apparent from the following description of the drawing, which illustrates a preferred embodiment thereof, and wherein:

Figure 1 is a side elevational view of the sheet metal shears;

Figure 2 is an enlarged fragmentary top plan view thereof;

Figure 3 is a longitudinal sectional view taken substantially along a plane as indicated by the line 3—3 of Figure 2, and

Figures 4 and 5 are cross sectional views taken substantially along the planes as indicated by the lines 4—4 and 5—5, respectively, of Figure 3.

Referring more specifically to the drawing, the improved cutting shears in its entirety is designated generally 6 and includes a pair of lever members, designated generally 7 and 8 having handle portions 9 and 10, respectively, and jaw portions, designated generally 11 and 12, respectively.

The jaw 12 of the lower lever member 8 includes a substantially flat, relatively wide portion 13 which is downwardly offset relatively to the handle portion 10 and which is provided with a flat underside 14 and a sharpened outer, free end 15, for purposes which will hereinafter become apparent. The substantially flat jaw portion 13 merges with a perpendicularly thickened shank portion 16 which extends upwardly and rearwardly therefrom and which merges at its opposite end with the forward end of the handle member 10 and no part of which is disposed below the level of the underside 14 of the jaw portion 13.

2

The jaw portion 13 is provided with a longitudinal slot 17 which extends rearwardly from intermediate of the ends thereof and which communicates with a longitudinal slot 18 in the shank portion 16; both of said slots being disposed in a vertical plane with respect to the shears 6. As clearly illustrated in Figure 2, the slot 18 is substantially wider than the slot 17, for purposes which will hereinafter become apparent.

The handle member 9 of the lever 7 is provided with a downwturned, bifurcated inner end 19 which extends into the slot 18 and the slot, formed by the furcations, is disposed parallel to the slots 17 and 18. A separate blade 20, forming a part of the jaw 11, is provided with a shank portion 21 which extends into the slot of the bifurcated portion 19 and which is connected thereto by means of a fastening 22 which extends through the furcations of the portion 19 and through the blade shank 21. A pivot pin 23, preferably in the form of a nut and bolt, extends through the shank portion 16 and through the furcations of the portion 19 and the blade shank 21 for pivotally connecting the lever portions 7 and 8 and for cooperating with the fastening 22 to prevent pivotal movement of the blade 20 relatively to the handle portion 19.

The blade 20, forming a part of the movable lower jaw 11, is provided with an underside 24 which is inclined upwardly and toward the free end 15 of the jaw 12 and which merges with a substantially flat upper surface 25 of the blade 20 to form a pointed upper end. The flat upper surface 25 abuts flush against the underside 14 of the jaw 12 when the jaws 11 and 12 are in closed position, as best seen in Figure 3. The surface 25 engages against the surface 14 forwardly of the slot 17. Rearwardly of the surface 25, the blade 20 is provided with an upwardly offset portion 26 which extends upwardly through the slot 17 and through the forward part of the slot 18, when the jaws are in closed positions. The upper surface 27 of the blade portion 26 is inclined downwardly and toward the free end of the jaws and the side edges 28 thereof form the cutting edges of the blade 21 and jaw 11. The upper edge 27 includes a rearwardly disposed serrated portion 29.

As best seen in Figure 4, the blade 20 tapers in thickness slightly toward its bottom edge 24 and the slot 17 is tapered slightly from the upper to the underside of the bar 13 so that it is slightly narrower at the underside of the bar than at the upperside thereof. The bottom edges 30 of the slot 17 constitute the cutting edges thereof

and cooperate with the edges 28 of the blade 20, which latter edges are spaced apart a distance slightly less than the edges 30 to pass therethrough and to execute a cutting operation in conjunction therewith.

The handle member 9 is provided with a depending lug 31 forming a stop to engage the handle member 10 when the surface 25 is in engagement with the surface 14 to prevent undue pressure being exerted on the jaw parts by the handle parts 9 and 10.

From the foregoing it will be readily apparent that the cutting tool or shears 6 is capable of efficiently executing a cutting operation on sheet metal material either in the form of flat stock, tubular stock or stock of rectangular cross section such as duct work. By swinging the handle portions 9 and 10 outwardly of one another, the blade 20 will be swung downwardly with respect to the jaw 12 so that the surface 27, including the serrated portion 29, will be disposed beneath the underside 14 of the bar 13 and out of engagement with the slot 17 or 18. The material to be cut, not shown, is positioned between the jaws 11 and 12 and against the undersurface 14 of the jaw 12. The handle member 9 is then swung downwardly and toward the handle member 10 to cause the blade 20 to return to its position of Figures 1 and 3. As the edges 28 of the blade 20 enter the slot 17 between the edges 30 thereof, the adjacent edges 28 and 30 will execute parallel cuts in the sheet metal material of a width equal to the widest, upper part of the blade 20 and the ribbon of material, not shown, thus cut, will pass upwardly through the slot 17. As this operation is repeated the spaced sheared edges of the sheet metal stock will pass along on opposite sides of the blade 20 and as said blade is tapered toward its lower edge, the space between said sheared edges will be slightly greater than the width of the lower part of the blade 20 so that the sheared edges will not be bent or distorted by the blade. It will be noticed that all other parts of the shears 6 are located above the level of the undersurface 14 so that said sheared edges will not contact any other part of the tool 6 and therefore will not be subject to any bending or distorting.

In actual operation, the lever member 8 is held fixed and the lever member 7 is swung relatively thereto on the pivot 23 so that the member 8

forms a guide which is supported by engagement of its undersurface 14 with the upper surface of the material being cut. The serrated portion 29 is provided to prevent the material being cut from slipping outwardly of the jaws at the commencement of each cutting operation.

Various modifications and changes are contemplated and may obviously be resorted to, without departing from the spirit and scope of the invention as hereinafter defined by the appended claim.

We claim:

In a sheet metal cutting shears, a pair of pivotally connected lever members each including a handle portion and a jaw portion, the jaw portion of one of said lever members comprising a substantially flat bar provided with a longitudinally disposed slot offset downwardly with respect to the handle portion thereof, the handle portion of the other lever member having a downturned inner end extending through the rear portion of said slot and pivotally mounted therein, the jaw of said last mentioned lever member extending forwardly from said downturned, pivotally mounted portion and including an upwardly offset portion disposed for movement through the forward part of said slot and having an upper surface provided with side edges forming cutting edges for cooperation with the lower side edges of the forward portion of the slot, when the jaws are moved from opened toward closed positions, said last mentioned jaw having a downwardly offset upper surface at its forward end for engaging the underside of the first mentioned jaw, forwardly of the slot, when the jaws are in fully closed positions for clamping the material between the jaws at the conclusion of each shearing stroke of the tool.

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