April 27, 1937. F. H. RAUH 2,078,585

SHEARS FOR CUTTING SHEET METAL

Filed May 16, 1936

Fig.1

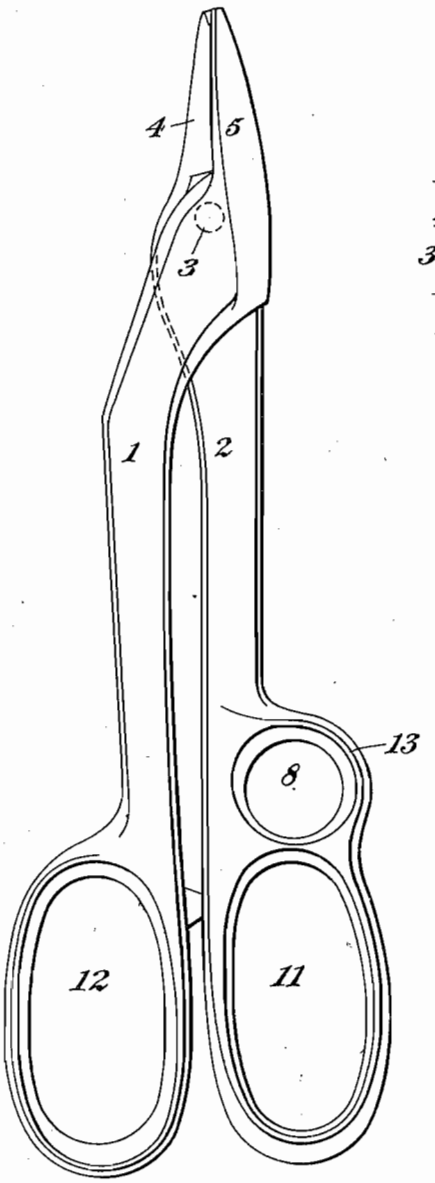

Fig.2

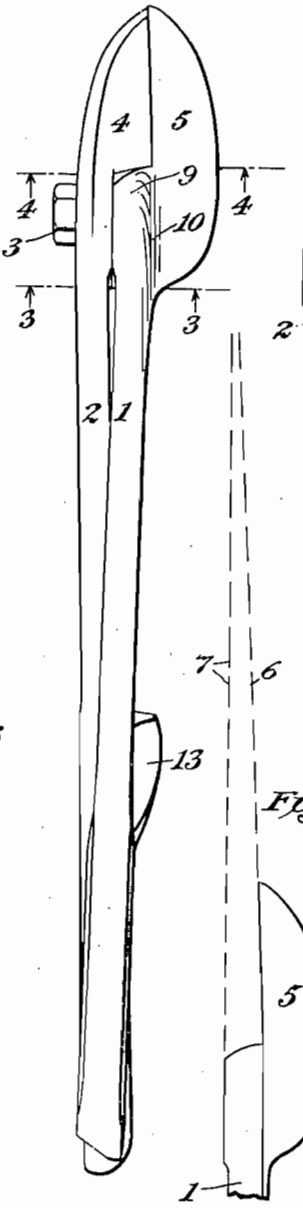

Fig.3

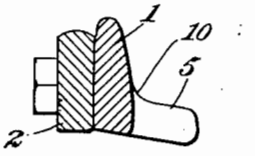

Fig.4

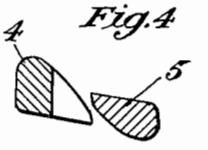

Fig.5

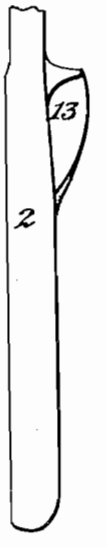

Fig.6

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SHEARS FOR CUTTING SHEET METAL

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Application May 16, 1936, Serial No. 80,029

6 Claims. (Cl. 30—13)

My invention relates to hand shears designed for the purpose of cutting sheet metal and the like; and objects of my invention are to facilitate the cutting of sheet metal along straight and/or irregular lines; to avoid jamming or catching of the severed metal in or against the shears; to provide means for avoiding injury from the severed metal to the hand of the workman using the shears; to provide means for deflecting the metal on both sides of the kerf out of line with the hand of the user and to secure the other advantages hereinafter pointed out and claimed.

In the drawing Fig. 1 is a side view of a pair of shears illustrating my improvements; Fig. 2 is a plan view of the same; Fig. 3 is a cross-sectional view taken on the line 3—3 of Fig. 2; Fig. 4 is a cross-sectional view taken on the line 4—4 of Fig. 2; Fig. 5 is a detail of the handle end of the lower shank; and Fig. 6 is a diagrammatic illustration of the relative angular relations of the edge of a cutting blade and its pivotal axis.

In all the figures similar parts are referred to by similar reference numerals.

Shanks 1 and 2 are secured to each other by a suitable pivot 3 so that by swinging the shanks toward or away from each other their respective blades 4 and 5 may be opened or closed relative to each other.

The cutting edges of these blades 4 and 5 are not set quite at right angles to the axis of the pivot 3, but are deflected slightly toward the left, as shown in Fig. 2 and Fig. 6, so that if extended, the line of the cutting edges, as 6, will converge so as to intersect a line, as 7, representing an extension of a radius of the pivot 3.

Normally the shears are applied to the metal to be cut by being held in the position shown in Fig. 2, the sheet of metal lying substantially flat with the blades opened and the blade 5 below it and the blade 4 above it; and the metal is slit by closing the blades together, and then opening them and advancing them to continue the cut. The severed pieces of the metal will extend backward toward the hand grips on the shanks. And the part below the blade 4 will normally lie below the level of the hand grip on shank 2; and, in case of the kerf extending to the right, the grip will swing over the metal; and if the kerf extends to the left, the hand grip will swing clear of the metal to the right.

The severed metal lying above the blade 5 will extend backward, over and above that blade; and, if the kerf was cut at right angles to the axis of the pivot 3, the severed metal would extend back in line with the shank 1, so that, if the kerf was sufficiently long the severed metal would be apt to strike the hand of the workman gripping the shank, particularly the forefinger of the hand, and perhaps cutting or injuring the hand. To guard against this I deflect the cutting edges of the blades to the left, so that the severed metal extending back from a straight cut will normally pass to the right of the knuckle of the forefinger which is inserted in the loop 8 of the shank 2, thus avoiding injury to the operator's hand. Obviously if the kerf is deflected toward the right the severed metal will swing to the right and away from the hand of the operator. If, however, the kerf is deflected toward the left, the severed metal will swing toward the left and pass up over the forward end of the shank 1, and quite out of line with the operator's hands. To insure this the forward end of the shank 1 is sloped up and backwardly gently from the shank 5 and is also rounded, as indicated at 9, so that the sheet metal will not catch on it but will ride up and over it. Besides this the line of junction between the blade 5 and the shank 1 is slanted or curved as at 10; and the forward part of the shank is sloped toward the left; so that if the severed metal extends back above the blade 5 and to the right of the shank 1, it may, if, for instance, the cut is deflected toward the left, ride up on the side of and over the top of the shank 1, without catching or jamming against the shank. This permits the shears to be used to cut along a straight line or to cut to the right or the left without the severed metal endangering the hand of the workman.

As a further safeguard I form a complete loop 8 to receive the forefinger of the workman while his other fingers pass through the loop 11 and his thumb lies in the loop 12. When grasped in this way the knuckle between the second and third joints of the workman's forefinger will lie in the loop 8; and to protect that knuckle, particularly, I widen the guard of the loop 8 as at 13, so that it will extend in front of the said knuckle and protect it from injury by the severed metal.

It will be seen, therefore, that not only is the severed metal deflected away from the operator's hand by the angular disposition of the cutting edges of the tool and by the described formation of the forward end of the shank 1, but also a positive guard or protection for the workman's forefinger is provided by the laterally expanded rim of the loop 8. This loop also gives the workman's hand a firmer grip on the tool than is possible when the forefinger is simply thrown in

front of the conventional bow through which other fingers are passed. This loop 8, also, furnishes a convenient support for the tool when it is used by allowing its gripped portion to rest directly on a work bench on which it may be slid to and fro.

I wish it to be understood that the embodiment of my invention which I have described is to be considered as typical and not as showing an exclusive form, for it is obvious that details might be modified, as by the use of mechanical equivalents, without departing from the spirit of my invention.

Having thus described my invention, what I claim and desire to secure by Letters Patent of the United States is:—

1. A tool for cutting sheet metal, embodying a pair of shanks provided with hand grips and connected by a transverse pivot and adapted to operate substantially at right angles to the plane of a sheet of metal, and carrying laterally expanded cutting blades disposed approximately at right angles to the plane of operation of the shanks and adapted to lie respectively above and below the sheet of metal in operative relation thereto, the cutting edges of the blades being deflected at an acute angle from a radius of the pivot.

2. A tool for cutting sheet metal, embodying a pair of shanks provided respectively with a thumb bow and with a finger bow expanded laterally substantially further than the finger bow preceded by a forefinger bow constituting hand grips and connected by a transverse pivot and adapted to operate substantially at right angles to the plane of a sheet of metal and carrying laterally expanded cutting blades disposed approximately at right angles to the plane of operation of the shanks and adapted to lie respectively above and below the sheet of metal in operative relation thereto, the cutting edges of the blades being deflected at an acute angle from a radius of the pivot.

3. A tool for cutting sheet metal, embodying a pair of shanks provided with hand grips and connected by a transverse pivot and adapted to operate substantially at right angles to the plane of a sheet of metal and carrying laterally expanded cutting blades disposed approximately at right angles to the plane of operation of the shanks and adapted to lie respectively above and below the sheet of metal in operative relation thereto, the cutting edges of the blades being deflected at an acute angle from a radius of the pivot, the shank of the lower blade having a backwardly sloped and rounded forward edge adjacent to the blade.

4. A tool for cutting sheet metal, embodying a pair of shanks provided with hand grips and connected by a transverse pivot and adapted to operate substantially at right angles to the plane of a sheet of metal and carrying laterally expanded cutting blades disposed approximately at right angles to the plane of operation of the shanks and adapted to lie respectively above and below a sheet of metal in operative relation thereto, the cutting edges of the blades being deflected at an acute angle from a radius of the pivot, the shank of the lower blade having a backwardly sloped and rounded forward edge adjacent to the blade, and being disposed vertically at an obtuse angle thereto.

5. A tool for cutting sheet metal, embodying a pair of shanks provided with hand grips and connected by a transverse pivot and adapted to operate substantially at right angles to the plane of a sheet of metal and carrying laterally expanded cutting blades disposed approximately at right angles to the plane of operation of the shanks and adapted to lie respectively above and below a sheet of metal in operative relation thereto, the cutting edges of the blades being disposed at an acute angle from a radius of the pivot, the shank of the lower blade having a backwardly sloped and rounded forward edge adjacent to the blade, and being disposed vertically at an obtuse angle thereto, the line of junction between said shank and blade being curved laterally.

6. A tool for cutting sheet metal, embodying a pair of shanks provided respectively with a thumb bow and with a finger bow preceded by a forefinger bow laterally expanded substantially wider than the finger bow to form a knuckle guard, constituting hand grips, said shanks being connected by a transverse pivot, and carrying laterally expanded cutting blades disposed approximately at right angles to the plane of operation of the shanks and adapted to lie respectively above and below the sheet of metal in operative relation thereto, the cutting edges of the blades being deflected at an acute angle from a radius of the pivot whereby the severed portion of the sheet metal above a cutting blade may be deflected away from the operator's hand, and the other portion of the sheet metal will be deflected below said hand.

FREDERIC H. RAUH.

CERTIFICATE OF CORRECTION.

Patent No. 2,078,585. April 27, 1937.

FREDERIC H. RAUH.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 2, first column, line 33, claim 2, strike out the words "preceded by a forefinger bow" and insert the same before "expanded" in line 31, same claim; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 29th day of June, A. D. 1937.

Henry Van Arsdale

(Seal) Acting Commissioner of Patents.