Aug. 12, 1969 J. E. ASHWORTH ETAL 3,460,372

RECEPTACLE FORMER

Filed March 10, 1967

FIG. 1.

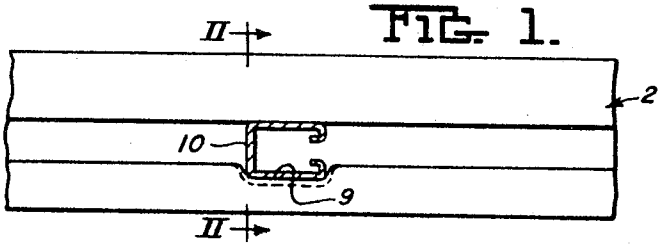


FIG. 6.

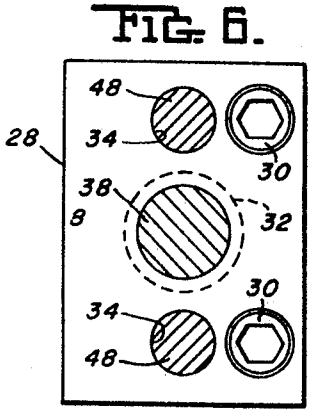


FIG. 5.

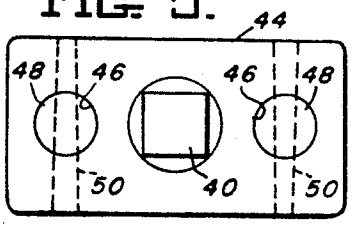


FIG. 2.

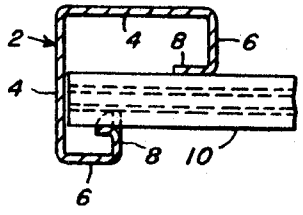


FIG. 4.

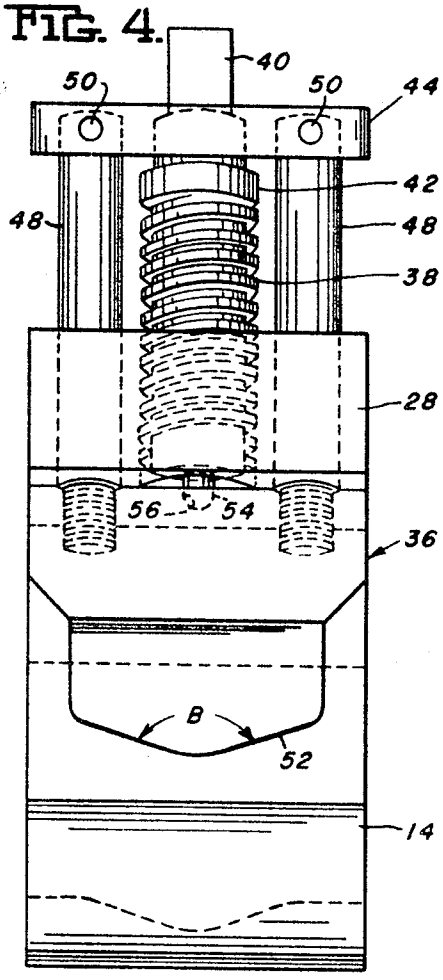
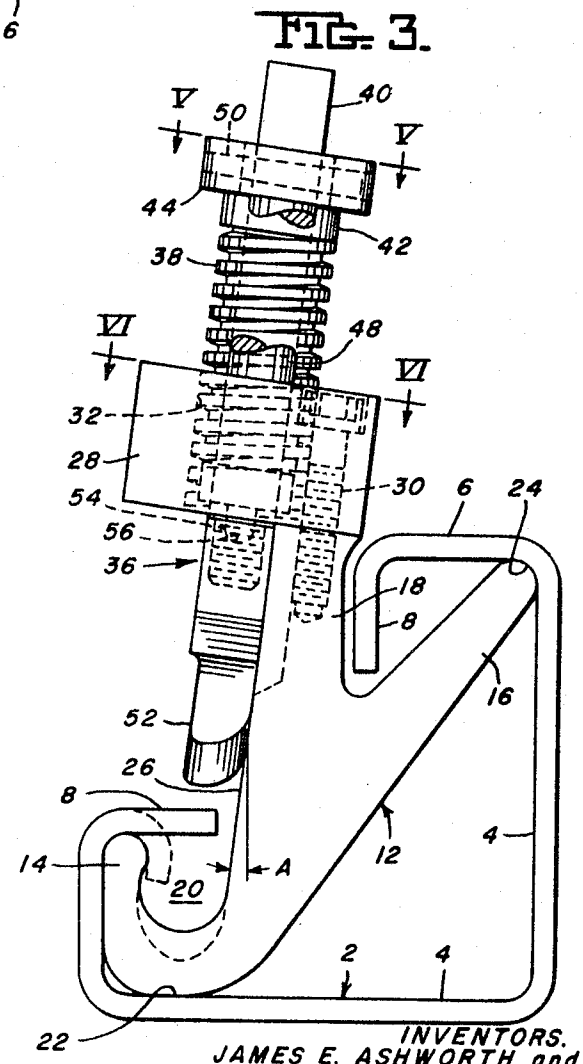


FIG. 3.



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3,460,372

RECEPTACLE FORMER

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U.S. Cl. 72—454 10 Claims

ABSTRACT OF THE DISCLOSURE

A tool for forming a receptacle to hold a horizontal rail in an open corner sheet metal terminal fence post. The tool is closely fitted inside an installed fence post with a stationary die placed against an inwardly extending flange in which the receptacle is to be formed. A pressure screw forces a guided former down on the flange, bending the metal over the die to form the receptacle.

This invention relates to a tool for deforming the metal flange of an open corner type fence post and particularly for forming a receptacle for positioning and securing open section rail members in a fence system of the type shown in our co-pending applications Ser. No. 568,953 filed July 29, 1966, now Patent No. 3,370,836 entitled "Fence System"; Ser. No. 568,955 filed July 29, 1966, now Patent No. 3,389,930 entitled "Rail Corner Mounting"; and Ser. No. 568,874 filed July 29, 1966, now Patent No. 3,367,688 entitled "Adjustable Rail Corner Assembly." As shown in these applications, the fence post consists of sheet metal bent in such a manner as to provide two long sides connected at right angles to each other, two short sides connected at right angles to the long sides, and two flanges extending inwardly from the short side, providing a space between the flanges to position a fence rail. In order to hold the rail in position, it is necessary to form a receptacle in one of the flanges to receive the rail in the space between the flanges. This was a difficult task with those tools of which we had knowledge so that the time required for making the receptacle was unduly long.

It is therefore an object of our invention to provide a portable hand tool capable of forming a horizontal receptacle in a fence post of the type described.

Another object is to provide such a tool that is inexpensive, light weight, and simple to manufacture.

Still another object is to provide such a tool that will not destroy the protective coating of the fence post.

These and other objects will be more apparent after referring to the following specification and attached drawings, in which:

FIGURE 1 is a view of a fence post with a rail secured in its receptacle;

FIGURE 2 is a view taken on the line II—II of FIGURE 1;

FIGURE 3 is a view showing the tool of our invention secured in position in a fence post;

FIGURE 4 is a view looking at the left side of FIGURE 3;

FIGURE 5 is a view taken on the line V—V of FIGURE 3; and

FIGURE 6 is a view taken on the line VI—VI of FIGURE 3.

Referring now to FIGURES 1 to 3 of the drawings, reference numeral 2 indicates an open corner fence post with long sides 4, short sides 6, and inwardly extending flanges 8. A receptacle 9 is formed in one of the flanges 8 for receiving an open section type fence rail 10.

The tool of our invention includes a generally Y-shaped stationary die body 12 having a stationary die 14 extending from one end of its long leg 16, and a leg 18 extending from leg 16 intermediate its length away from the die end thereof. A space 20 is provided between the die body 12 and the stationary die 14. The die body 12 is adapted to rest within post 2 and the length thereof, including leg 16, is such that it will contact the fence post at locations 22 and 24 with the end of die 14 fitted against flange 8. Face 26 of body 12 which includes leg 18 is inclined at an angle A from normal to the side 4 of the fence post adjacent die 14. This angle is preferably approximately 7°30′. A guide cap 28 is secured to the end of leg 18 normal to the face 26 by means of capscrews 30. The cap 28 has a central threaded opening 32 therethrough with openings 34 on each side thereof. The axes of openings 32 and 34 are parallel to the face 26. A former assembly 36 is supported by the guide cap 28. The assembly 36 includes a pressure screw 38 which is threaded into opening 32. The screw 38 has a square portion 40 on its outer end and a collar 42 adjacent thereto at the outer end of the threads. A retainer plate 44 is received on the screw 38 between square portion 40 and collar 42. Two holes 46 in plate 44 receive guide rods 48 which are attached to the plate 44 by means of taper pins 50. A forming die 52 is attached to the ends of guide rods 48 in any suitable manner, such as by the threaded connection shown. The forming die 52 is oblong in shape with the bottom of the long side having a convex V-shape with an angle B of approximately 145° between the sides of the V.

The tool is assembled by threading guide cap 28 onto pressure screw 38. The guide rods 48 are then attached to retainer plate 44. The guide cap is then attached to the outer end of leg 18 by means of capscrews 30 with the pressure screw 38 in its retracted position shown in FIGURE 3, thus providing a maximum opening between the dies 14 and 52.

The assembled tool is then slid inside the fence post 2 in order to deform the desired flange 8 at the desired height. The screw 38 is then rotated by means of a wrench positioned on square portion 40 so as to cause the screw 38 to move inwardly by engagement with the threaded opening 32. The screw 38 will bear against the outer end of die 52 forcing it against the face of flange 8. A projection 54 is preferably formed on the end of screw 38 and a recess 56 in die 52 to aid in alignment of the screw 38 and die 52. Continued movement of screw 38 causes flange 8 to yield and bend around the stationary die 14 as shown in broken lines in FIGURE 3. Because of the V-shape of die 52 a maximum force is exerted on flange 8 at the start of deformation and as the deformation continues the forming force will be dissipated equally across the face of die 52. It will also be noted that the forming face of die 52 is contoured as shown in FIGURES 3 and 4 so that the metal of flange 8 is caused to readily and smoothly flow without fracture of the parent metal or protective coating. The torque of the forming tool is resisted by the die body 12 contacting points 22 and 24. When the travel of forming die 52 is completed the flange 8 will be deformed 97°30′ around stationary die 14 because of travel of the die 7°30′ from normal. The inherent spring back of the formed flange 8 permits the tool to be repositioned to a new location or removed from the post.

After forming, the rotation of pressure screw 38 is reversed causing collar 42 to retract retainer plate 44 and withdraw the forming die 52 to the starting position. The tool is then ready for another operation.

While one embodiment of our invention has been shown and described, it will be apparent that other adaptations and modifications may be made without departing from the scope of the following claims.

We claim:

1. A tool for forming a receptacle in a sheet metal open post, said post having two long sides connected generally normal to each other, two short sides one connected generally normal to each of said long sides, and two inwardly extending flanges one connected generally normal to each of said short sides with a space between said flanges; said tool comprising:

(a) a stationary die body including a leg adapted to be received within said post and extending diagonally thereof with its ends bearing against said post adjacent the junctions of said short and long sides to resist turning of said die body, a stationary die attached to one end of said leg with a space therebetween, said stationary die adapted to be positioned adjacent the inside of one of said short sides and extending substantially to the flange attached thereto, and a second leg extending from said first named leg intermediate its length and away from said one end thereof, said second leg adapted to be positioned adjacent the outside of the other of said short sides; and

(b) a former assembly attached to the free end of said second leg, said former assembly including a forming die, and means for moving said forming die toward and into the space between said first leg and fixed die to bend the end of the flange adjacent thereto into said space.

2. A tool according to claim 1 in which the means for moving said forming die includes a pressure screw bearing against said forming die, and stationary means having a threaded opening for receiving said screw, the axes of said screw and threaded opening extending toward said space.

3. A tool according to claim 2 in which said stationary means includes a guide cap detachably secured to the outer end of the said second leg.

4. A tool according to claim 1 in which the means for moving said forming die includes a guide cap detachably secured to the outer end of the said second leg, said cap having a threaded opening therein and an opening on each side thereof, a pressure screw threaded through said threaded opening with one end bearing against the outer end of said forming die, said screw having a collar thereon spaced inwardly of its outer end, a pair of guide rods attached to said forming die and extending through said side openings in said guide cap, and a retainer plate attached to the outer ends of said guide rods, said retainer plate having an opening therein for receiving said pressure screw, said collar adapted to bear against the inner side of said retainer plate.

5. A tool according to claim 1 in which said forming die moves into the space between said first leg and fixed die at an angle toward said fixed die.

6. A tool according to claim 2 in which said forming die moves into the space between said first leg and fixed die at an angle toward said fixed die.

7. A tool according to claim 3 in which said forming die moves into the space between said first leg and fixed die at an angle toward said fixed die.

8. A tool according to claim 4 in which said forming die moves into the space between said first leg and fixed die at an angle toward said fixed die.

9. A tool according to claim 5 in which said forming die is oblong in shape with the long dimension being longitudinal of the space between said first leg and fixed die, the inner end of the long side of said forming die having a convex V-shape.

10. A tool according to claim 8 in which said forming die is oblong in shape with the long dimension being longitudinal of the space between said first leg and fixed die, the inner end of the long side of said forming die having a convex V-shape.

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U.S. Cl. X.R.

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