

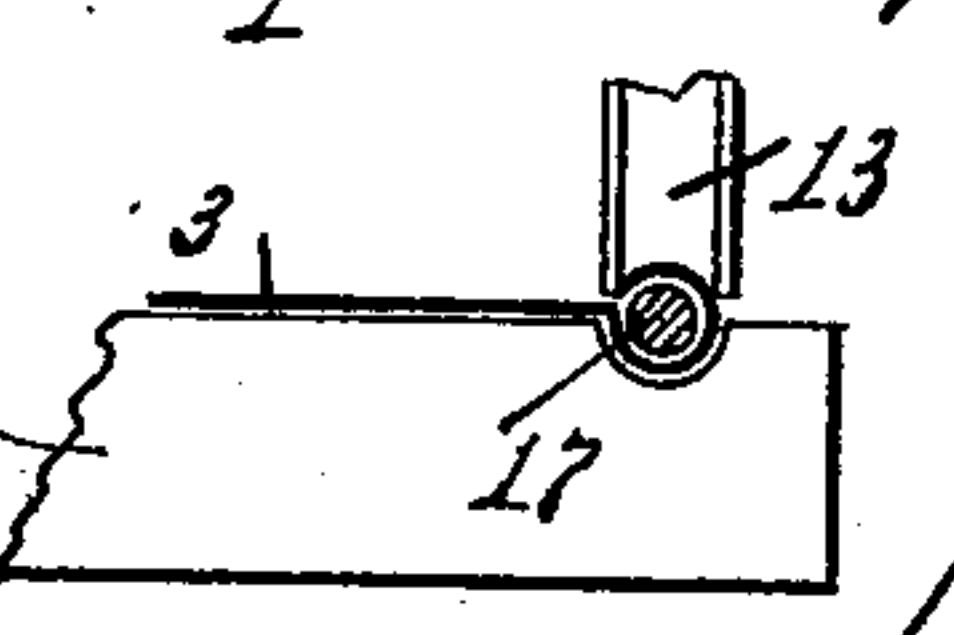
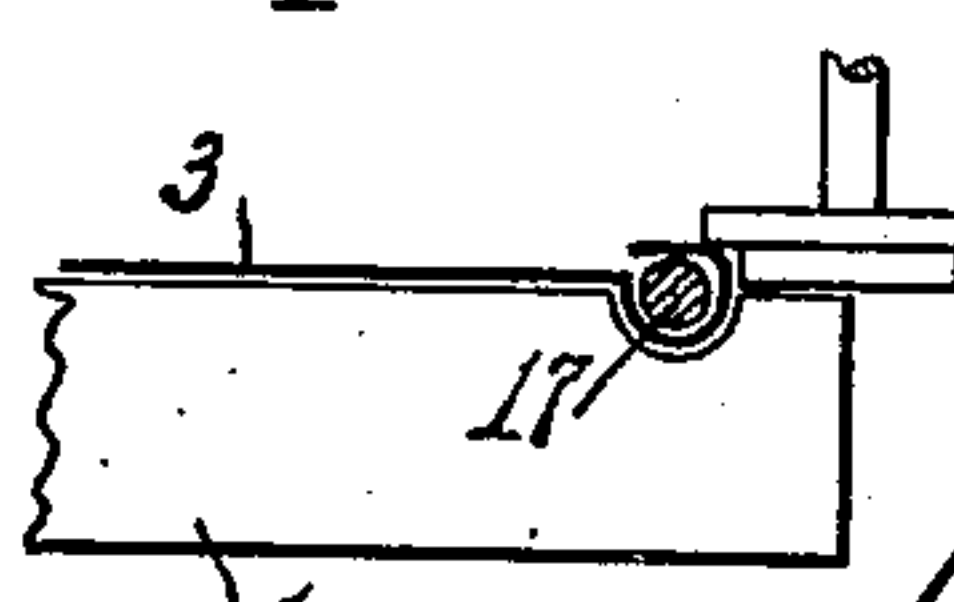
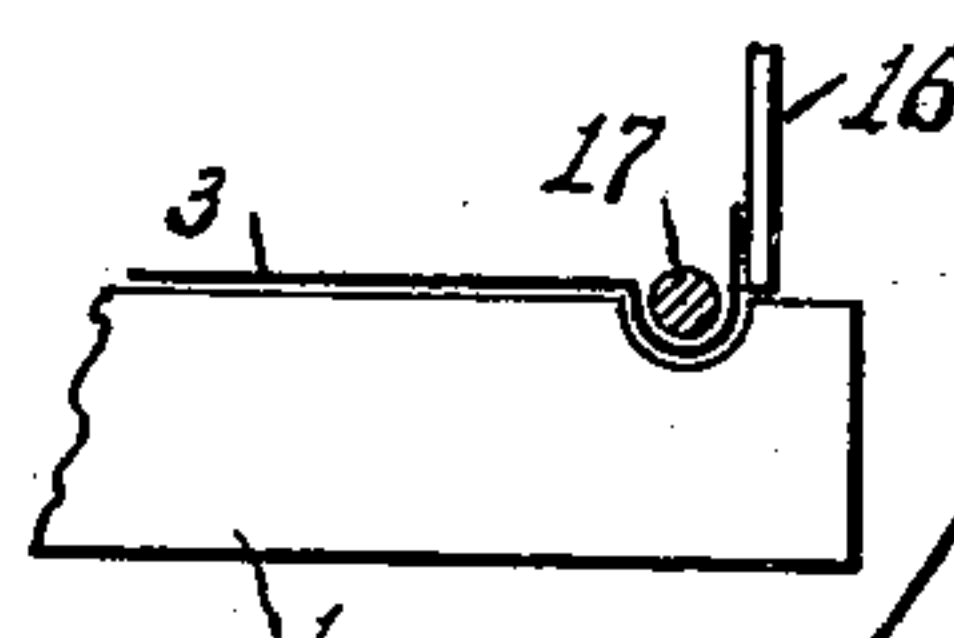
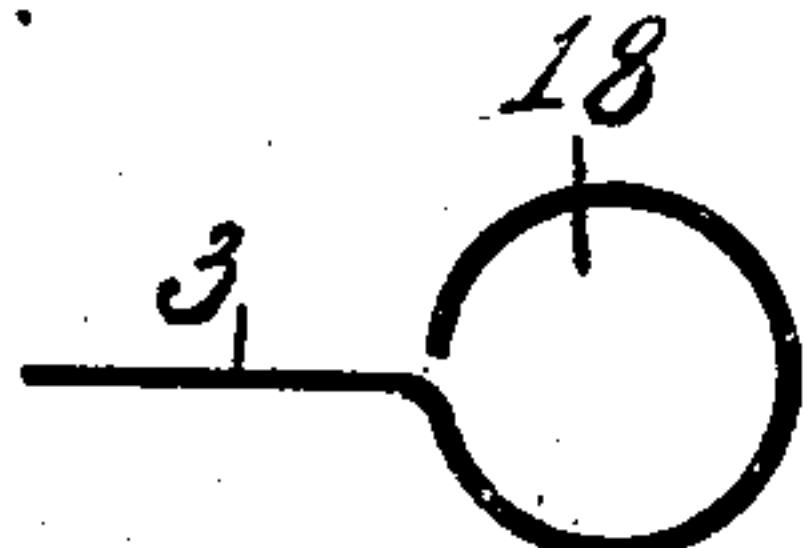
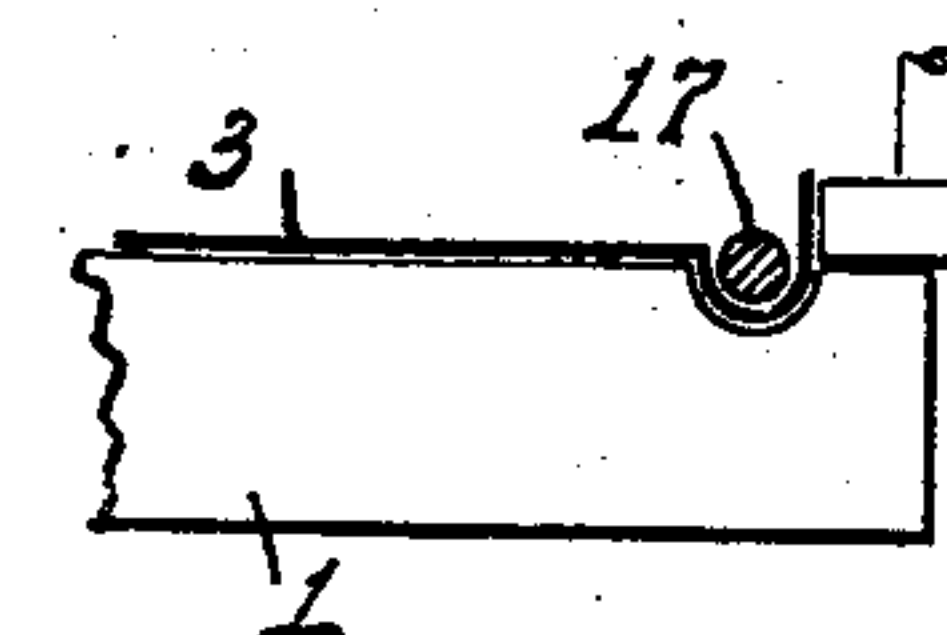
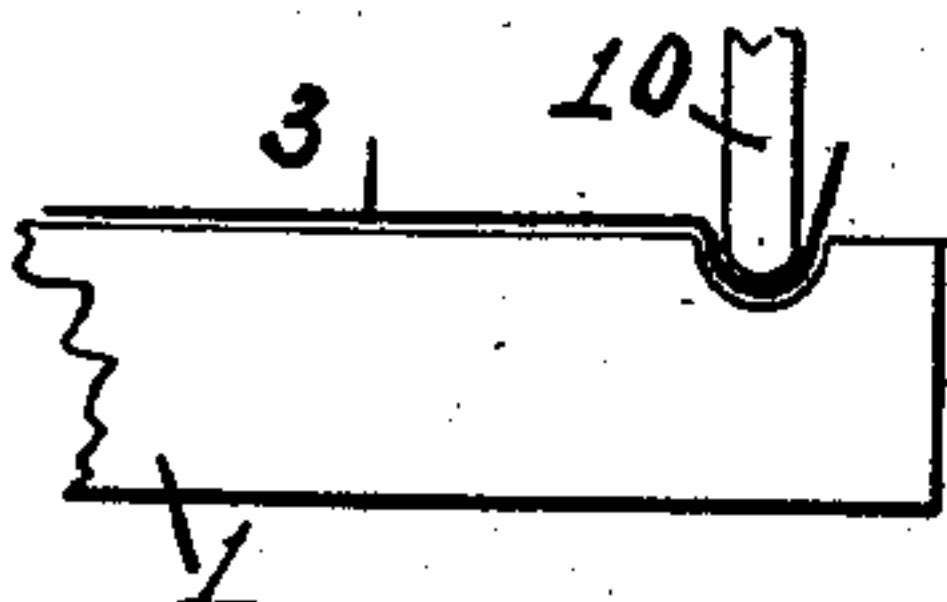
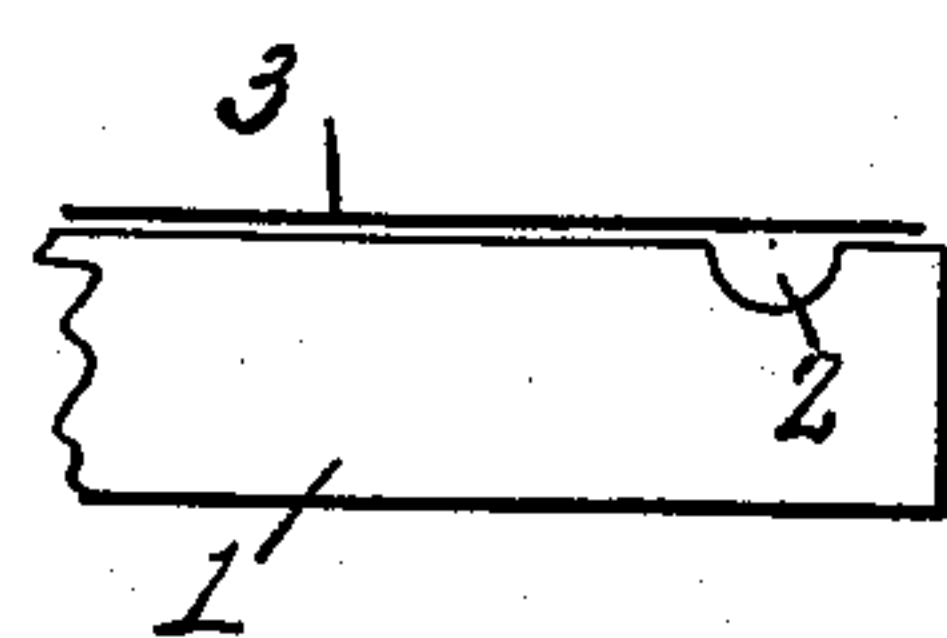
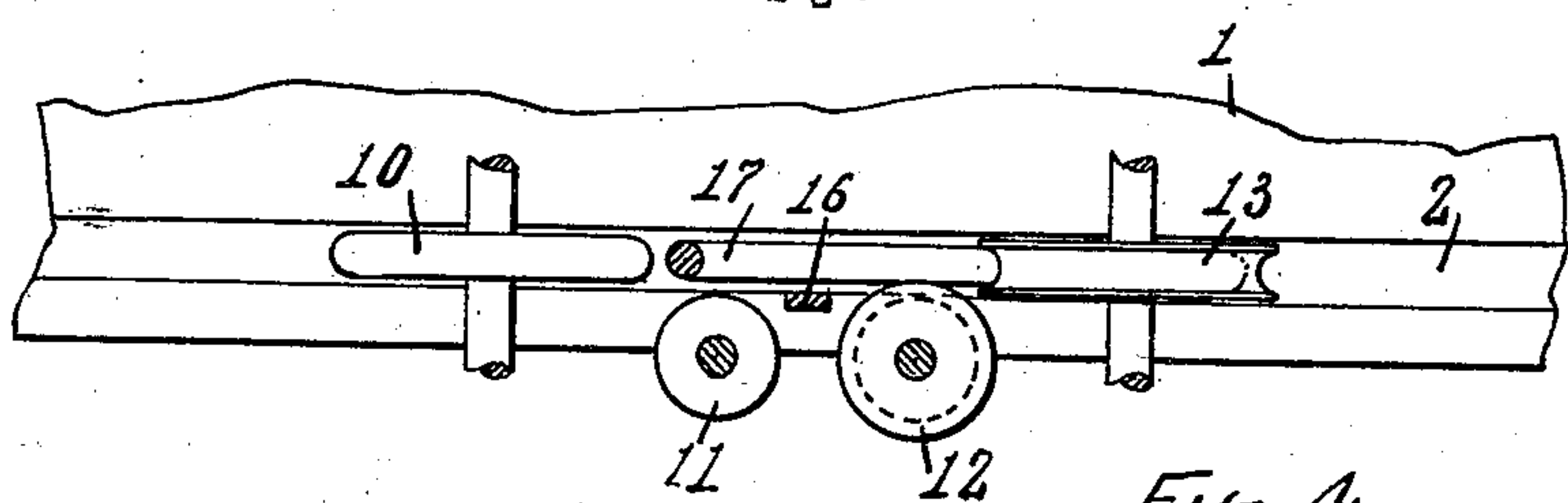
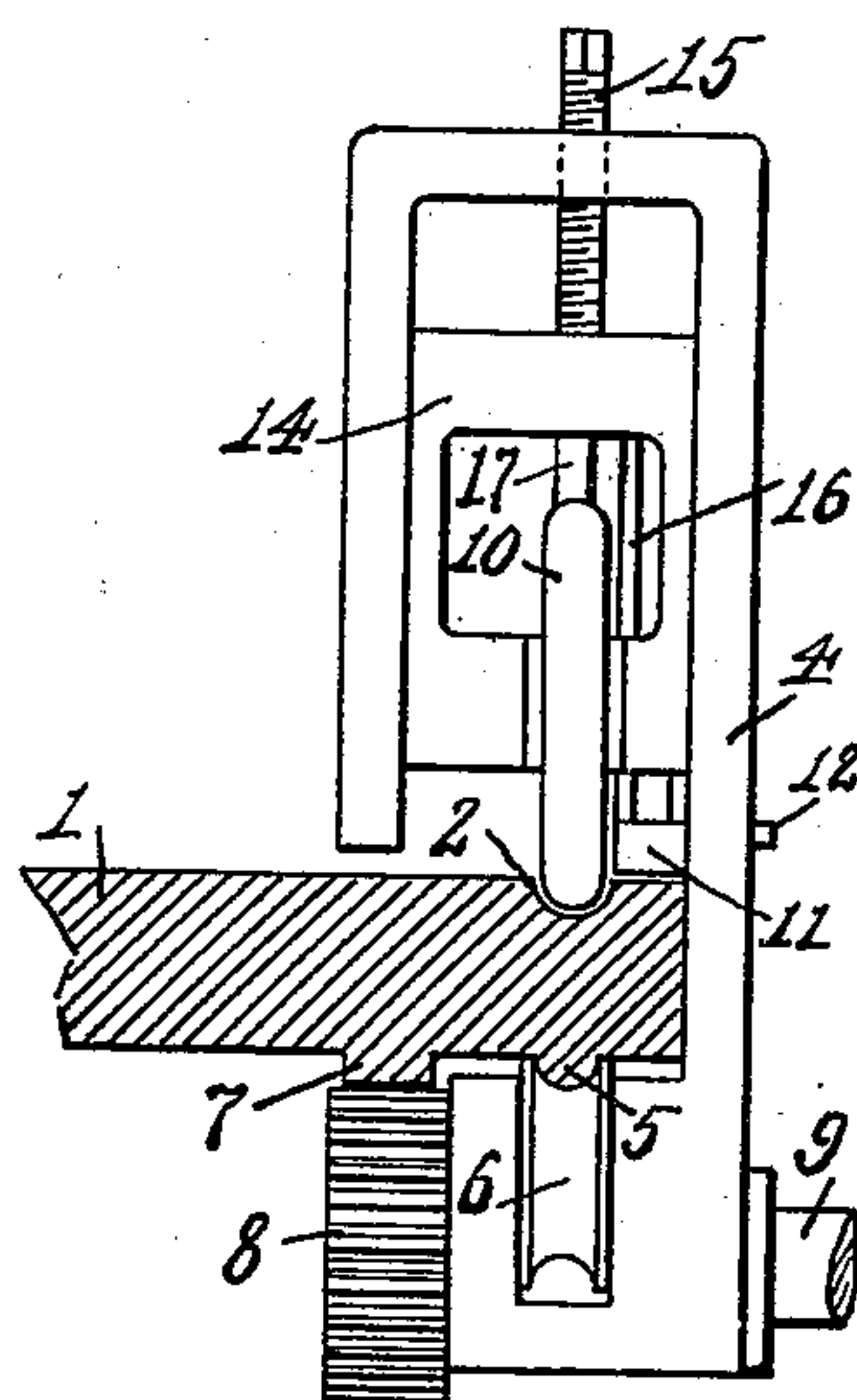
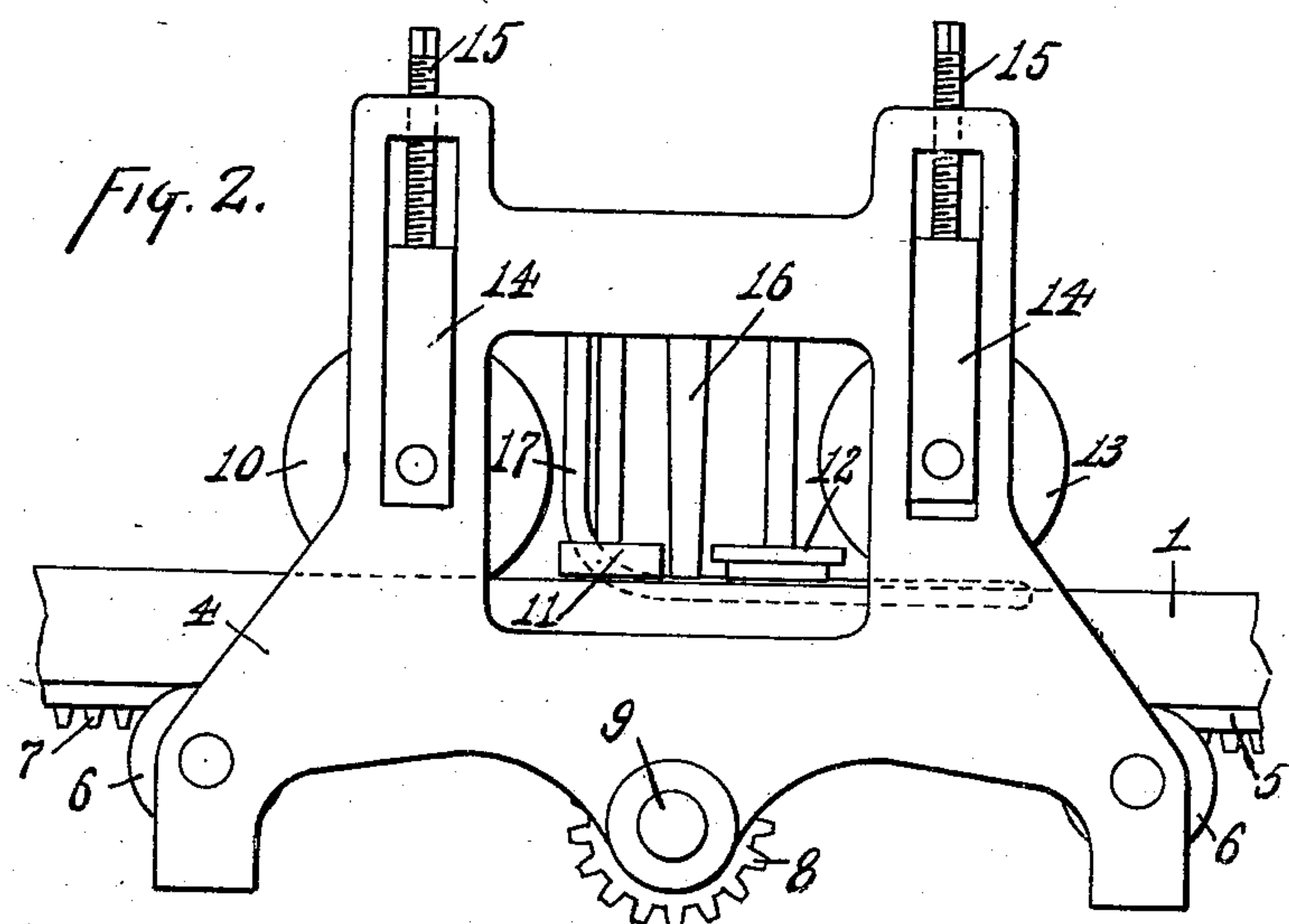
(No Model.)

J. M. FENDER.

BEADING MACHINE FOR SHEET METAL.

No. 506,989.

Patented Oct. 17, 1893.



John M. Fender

Inventor

by James W. See

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Witnesses:

P. P. Sherman  
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# UNITED STATES PATENT OFFICE.

JOHN M. FENDER, OF LIBERTY, INDIANA, ASSIGNOR TO THE COLUMBIA  
DRILL COMPANY, OF SAME PLACE.

## BEADING-MACHINE FOR SHEET METAL.

SPECIFICATION forming part of Letters Patent No. 506,989, dated October 17, 1893.

Application filed May 11, 1893. Serial No. 473,890. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN M. FENDER, of Liberty, Union county, Indiana, have invented certain new and useful Improvements in Beading-Machines for Sheet Metal, of which the following is a specification.

This invention relates to a machine for forming a hollow bead along the edge of a straight sheet of metal, the object of the bead being to stiffen the edge of the sheet and produce a finished appearance. Such beaded edges are useful in boxes, gutters, &c., formed of sheet metal.

My improved machine will be readily understood from the following description taken in connection with the accompanying drawings, in which—

Figure 1, is a transverse section of the beaded edge of a piece of sheet metal, illustrating the work of my machine; Fig. 2, a front elevation of the machine; Fig. 3, an end elevation of the machine; Fig. 4, a plan of the table of the machine with the beading agents in position, the housing being omitted, and Figs. 5, 6, 7, 8, 9 and 10, transverse sections of the sheet being operated upon, shown in successive stages of the operation.

In the drawings:—1, indicates a flat table, to be supported in any suitable manner and of a size adapted for the sheet of metal to be operated upon: 2, a groove extending longitudinally in the table top near one edge, and of a section suited to receive about one-half of the finished bead which is to be produced upon the sheet: 3, the sheet of metal to be operated upon, to be laid upon the table with its edge lying properly over the groove 2: 4, a housing arranged to travel along that edge of the table which is grooved and carry the beading agents: 5, a guide-rib formed upon the table to guide the housing: 6, guide-wheels mounted in the housing and engaging this guide-rib: 7, a longitudinal rack formed on or secured upon the table: 8, a pinion engaging this rack: 9, the spindle of this pinion, journaled in the housing and adapted to be turned by any suitable means, whereby, in an obvious manner, the housing, together with the parts carried by it, may be traversed along in either direction upon the table: 10, a roller mounted in the housing over the table, with its

axis horizontal, the edge of the roller being of convex cross-section adapted to fit the groove in the table, sufficient allowance being made for the thickness of metal being worked on: 11, a cylindrical roller mounted in the housing, with its axis vertical and with its inner edge even with the outer margin of the groove in the table, this roll being disposed just rearwardly beyond roller 10: 12, a roll disposed rearwardly beyond roller 11, and similarly arranged and constructed except that it has a flange at its upper portion, this flange projecting over the groove of the table: 13, a concave-edged roller mounted in the housing, over the groove in the table, and having its periphery concave in cross-section, this roller 13 being disposed rearwardly beyond flanged roll 12: 14, boxes mounted in the housing and carrying the rolls 10 and 13, these boxes being seated in vertical slots in the housing: 15, screws for adjusting the boxes 14 in the housing whereby the rollers 10 and 13 can be adjusted vertically: 16, a finger carried by the housing and projecting down toward the table, between rolls 11 and 12, the inner face of this finger coming about even with the outer margin of the groove in the table: 17, a mandrel carried by the housing and lying concentrically in the groove of the table and extending from just rearwardly of roller 10 to a point rearwardly beyond the center of roller 13, the forward end of this mandrel turning upwardly to form a supporting shank by which it is attached to the housing: and 18 (Fig. 1) the finished bead formed upon the edge of the sheet of metal.

In its operation the housing moves from right to left as viewed in Figs. 2 and 4. The housing will first be moved so far to the right upon the table that the sheet to be dealt with may be laid in place with its edge projecting over and beyond the groove in the table. The housing is then to be moved to the left by turning spindle 9. The sheet will lie upon the table as shown in Fig. 5. The sheet is first attacked by roller 10 which presses the metal of the sheet down into the groove of the table as shown in Fig. 6, thus forming a groove in the sheet, and in this groove the mandrel 17 will lie. As roller 10 produces the guttering of the sheet the edge of the



sheet will turn up angularly as seen in Fig. 6. Roller 11, immediately following roller 10, turns the edge of the sheet up square as seen in Fig. 7, and finger 16, engaging this up-turned edge of the sheet, as seen in Fig. 8, prevents the springing back of the edge. Roll 12, immediately following the finger, folds the up-turned edge of the sheet over onto the mandrel as shown in Fig. 9, and roller 13, following immediately after roll 12, turns the unfolded edge of the sheet down inwardly around the mandrel and presses the bead to finished shape, the bead being thus completely formed at one passage of the housing along the sheet.

In dealing with sheet steel of considerable thickness and stiffness all of the beading agents illustrated will be found extremely useful, but with metal of less thickness or greater softness some of the beading agents may be dispensed with. Indeed, under some conditions, as to character of metal and size of bead, the entire work may be done by rollers 10 and 13, roller 10 extending the metal and leaving the edge in condition for attack by compressing roller 13 which presses the metal around the mandrel, and in some cases even the mandrel may be dispensed with.

I claim as my invention—

1. In a beading machine, the combination, substantially as set forth, of a table provided with a longitudinal groove, a housing arranged to be traversed along said table, a convex-edged roller mounted in said housing over said groove, and a concave-edged roller carried by said housing over said groove in line with the first mentioned roller.

2. In a beading machine, the combination, substantially as set forth, of a longitudinally grooved table, a housing arranged to be traversed along said table, a convex-edged roll and a concave-edged roll carried by said housing in the vertical plane of said groove, and a mandrel carried by said housing concentric with said groove and extending from between said two rolls to a point outwardly beyond the vertical plane of the center of the concave-edged roll.

3. In a beading machine, the combination, substantially as set forth, with a grooved table, a housing arranged to be traversed thereon, and a convex-edged roll and a concave-edged roll carried by the housing in the vertical plane of said groove, of a finger carried by said housing between said rolls and presenting a surface near said table at a margin of the groove therein.

4. In a beading machine, the combination, substantially as set forth, with a grooved table, a housing arranged to be traversed thereon, and a convex-edged roll and a concave-

edged roll carried by said housing in the vertical plane of said groove, of a roll carried by said housing between said first mentioned two rolls and having its axis disposed at right angles to the axis of said first mentioned rolls and having its periphery in the vertical plane of a margin of said groove.

5. In a beading machine, the combination, substantially as set forth, with a grooved table, a housing arranged to be traversed thereon, and a convex-edged roll and a concave-edged roll carried by said housing in the vertical plane of said groove, of a flanged roll carried by said housing between said first mentioned two rolls and having its axis disposed at right angles to the axis of said two rolls, the flange of said intermediate roll projecting over a portion of said groove.

6. In a beading machine, the combination, substantially as set forth, of a grooved table, a housing arranged to be traversed thereon, vertically adjustable boxes carried by the housing, adjusting screws for adjusting said boxes in the housing, a convex-edged roll journaled in one of said boxes in the vertical plane of said groove, and a concave-edged roll carried by one of said boxes in the vertical plane of said groove.

7. In a beading machine, the combination, substantially as set forth, of a grooved table, a housing arranged to be traversed thereon, a convex-edged roll carried by the housing in the vertical plane of said groove, a concave-edged roll carried by the housing in the vertical plane of the groove, a cylindrical roll carried by the housing and with its axis at right angles to the axis of said two rolls, and with its periphery in the vertical plane of a margin of said groove, a flanged roll parallel with said cylindrical roll and with its flange projecting over a portion of said groove, a finger carried by said housing between said cylindrical roll and said flanged roll and in the plane of a margin of said groove, and a mandrel carried by said housing concentric with said groove and extending from near the convex-edged roll to a point beyond the vertical plane of the center of the concave-edged roll.

8. In a beading machine, the combination, substantially as set forth, of a grooved table, provided with a guide-rib and a rack, a housing, guide-rollers carried by the housing and engaging said guide-ribs, a pinion having a spindle and engaging said rack, and beading rolls carried by said housing in the plane of said groove.

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Witnesses:

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