

No. 706,513.

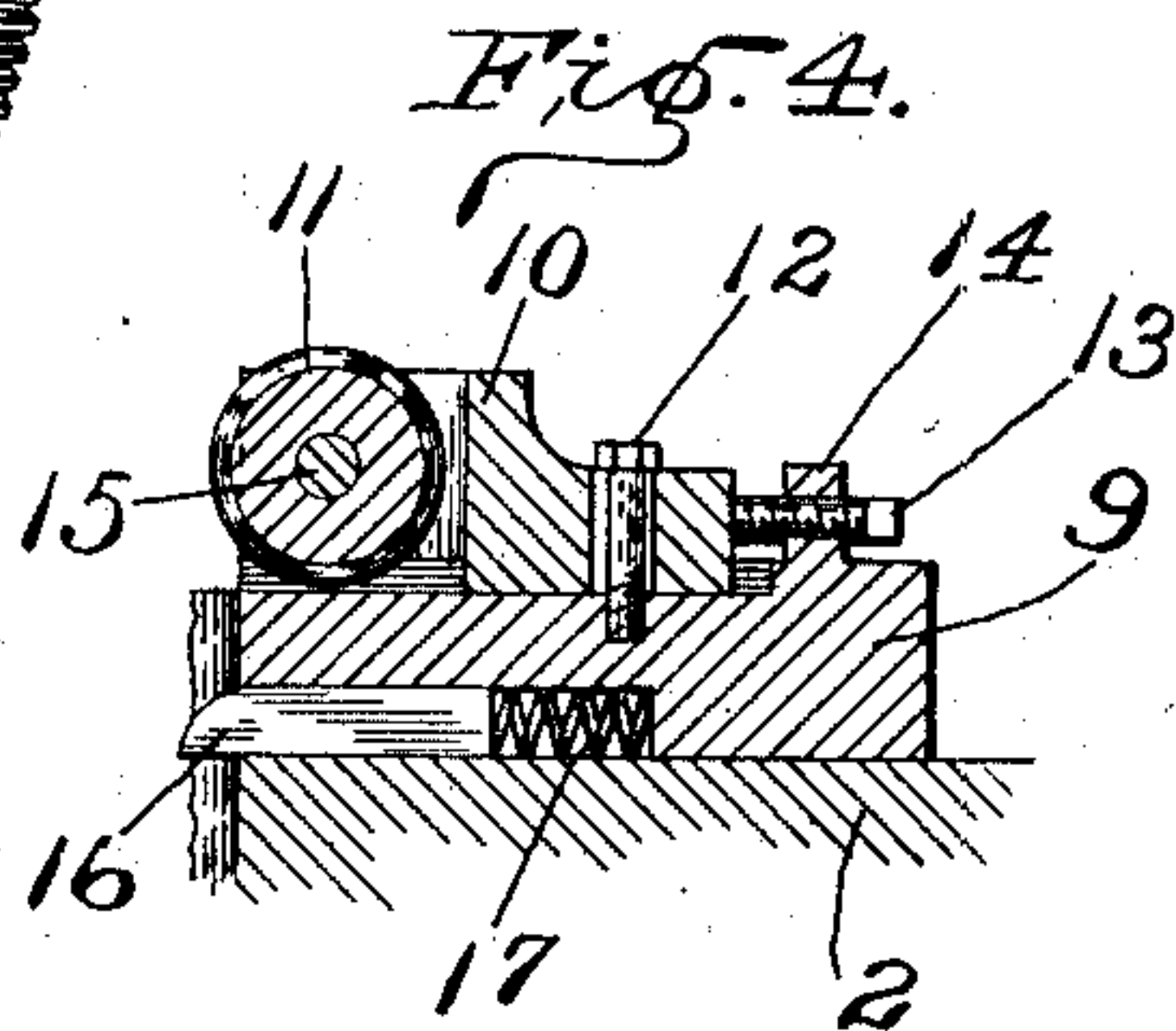
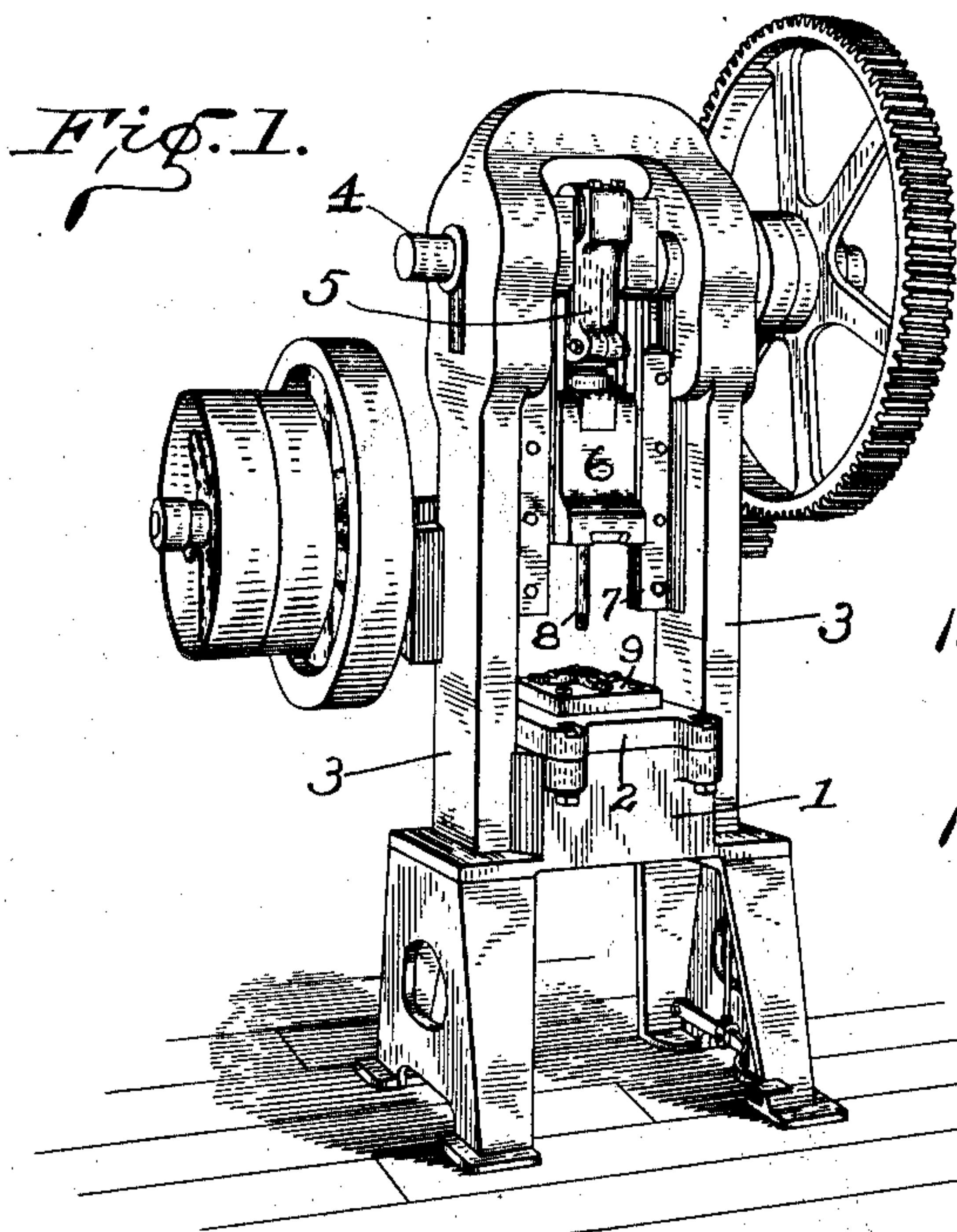
Patented Aug. 12, 1902.

F. P. BATES.

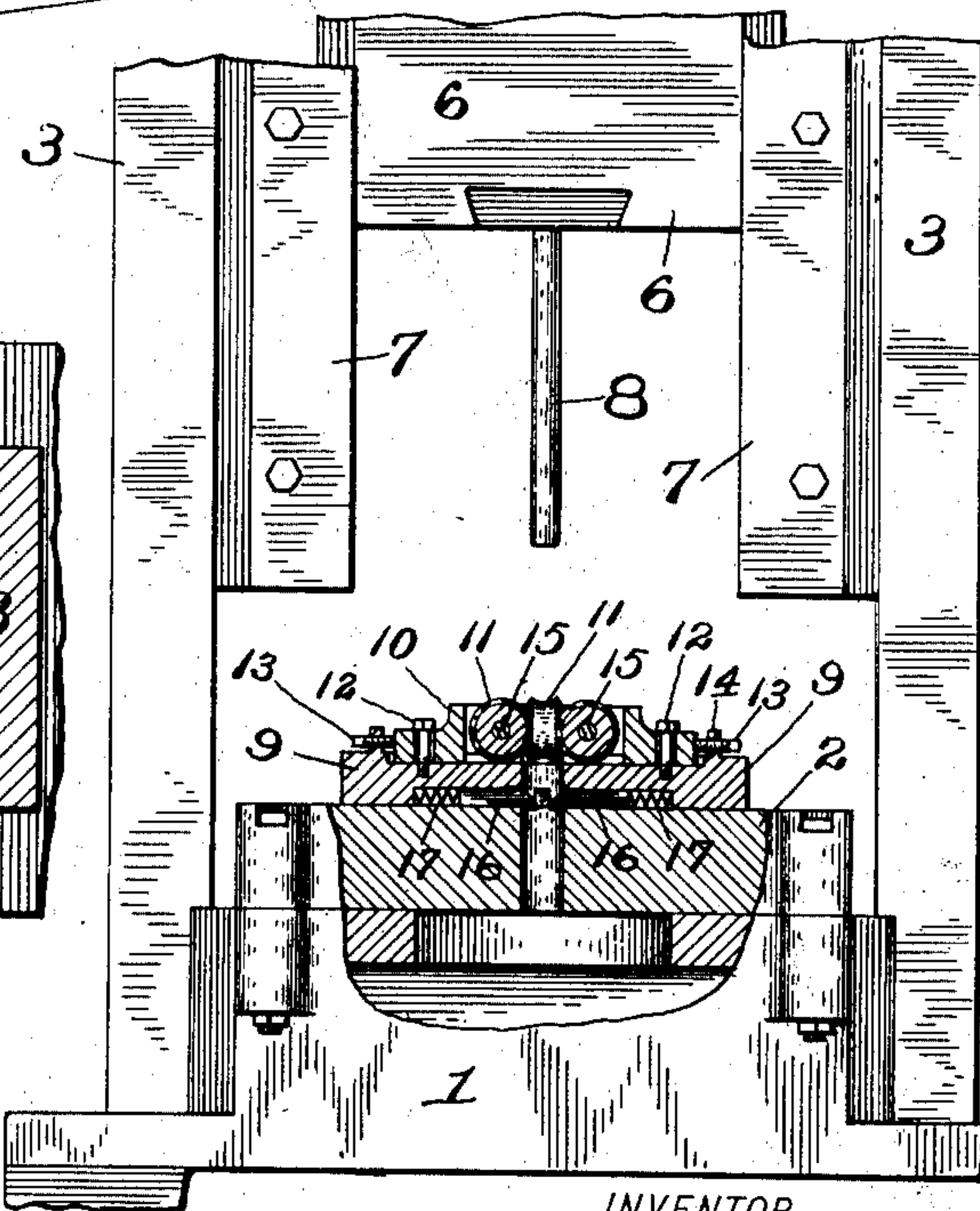
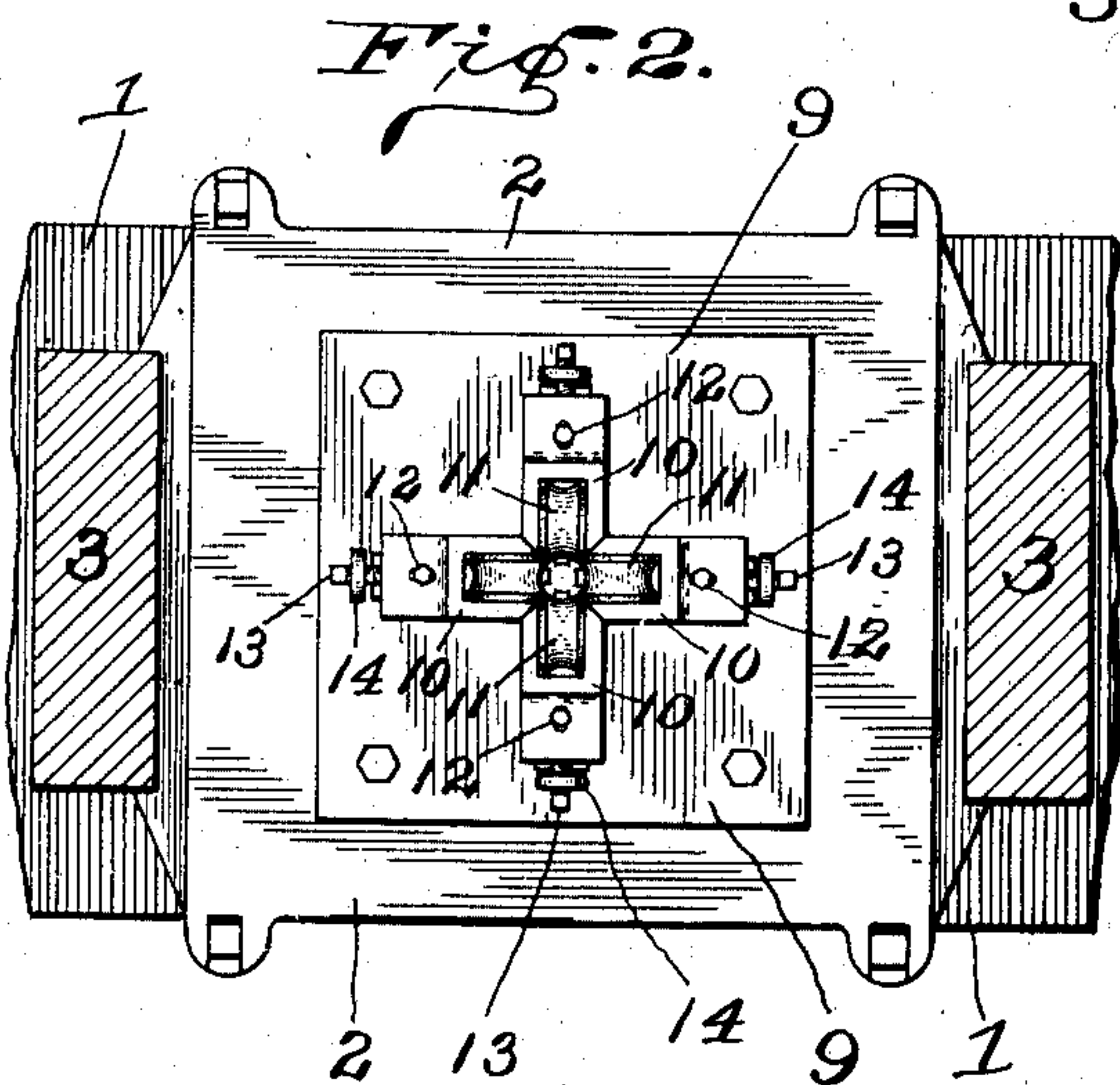
MACHINE FOR MAKING TUBULAR TOOL SHANKS.

(Application filed Apr. 3, 1901.)

(No Model.)



*Fig. 3.*



WITNESSES:

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# UNITED STATES PATENT OFFICE.

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## MACHINE FOR MAKING TUBULAR TOOL-SHANKS.

SPECIFICATION forming part of Letters Patent No. 706,513, dated August 12, 1902.

Application filed April 3, 1901. Serial No. 54,113. (No model.)

*To all whom it may concern:*

Be it known that I, FRANKLIN P. BATES, a citizen of the United States, residing at Indianapolis, in the county of Marion and State of Indiana, have invented certain new and useful Improvements in Machines for Making Tubular Tool-Shanks, of which the following is a specification.

Heretofore in the manufacture of tubular shanks for tools—such as hoes, shovels, chisels, and the like—the metal from which the shank is made has generally been plated out and its edges brought around and welded together, forming the tubular shank for the handle of the tool. In work of this character under the conditions which usually prevail where it is carried on there is a considerable loss in the product by reason of defective welding and otherwise, while the expense of doing the work is considerable.

It is the object of my invention to produce a machine by means of which a tubular tool-shank can be produced from the solid, and the tool itself, or so much thereof as may be desired, afterward formed from the same metal. The machine which I have designed for doing this work is in general form a punch-press, wherein the ordinary dies are replaced by a round punching-die of considerable length, forming a mandrel upon which the shank is rolled and a series of revoluble die parts secured to the bed of the press and adapted to roll the metal up around said punch or mandrel die in performing the operation. Suitable strippers are incorporated in this machine by means of which the shank when rolled is stripped off the punch or mandrel. The press itself, as above stated, is substantially of the ordinary form; but its stroke for this work is generally longer than is common in such presses, for the reason that such shanks are generally required to be longer than the ordinary stroke of a common press.

Referring to the accompanying drawings, which are made a part hereof, and on which similar reference characters indicate similar parts, Figure 1 is a perspective view of a press or machine provided with dies and appliances suitable to the carrying out of my invention; Fig. 2, a top or plan view of the lower dies or

formers; Fig. 3, a fragmentary view, partially in side elevation and partially in central vertical section, illustrating the arrangement of the dies; and Fig. 4, a detail sectional view similar to a portion of Fig. 3, but on a larger scale, showing one of the revoluble die parts, its housing, and the immediately adjacent parts more plainly.

In detail this press is composed of the bed 1, upon which is commonly a bolster-plate 2, which is similar to the bolster-plate usually provided to receive the lower dies of the press. The usual columns 3 extend upwardly and are provided at their upper ends with bearings for the crank-shaft 4, upon which is a pitman 5, operating the plunger 6, which moves in the usual guideways 7 on the columns 3. Secured to this plunger in the ordinary manner of securing upper dies is the punch or mandrel 8.

Secured upon the bolster 2 is a die-frame 9, and in this die-frame are secured the adjustable die-part housings, carrying the revoluble die parts 11. These housings 10 are secured to the die-frame 9 by bolts 12, passing through suitable slots, and are adapted to be accurately adjusted to position by means of screw-followers 13, mounted in ears 14 on the die-frame 9.

The revoluble die parts 11 are in the form of rollers with concave faces, and a set of these rollers when the same are brought into operative relation form a circular external die, the operative face of which is adapted to travel over the surface of the shank being made. In the drawings I have shown this die as composed of four of these revoluble die parts; but manifestly any desired number within the limits of practicability may be employed, and especially in the case of large shanks I should expect to use a larger number, preferably six. These revoluble die parts have axles 15, which are mounted in the housings 10.

In operation a round piece of solid metal of a diameter somewhat greater than the diameter of the opening between the peripheries of the rollers is taken and a slight depression formed in one end, which is adapted to receive the point of the upper die or man-



drel 8. In operation as this die or mandrel descends and forces the metal between the die parts 11 the latter operate to roll so much of the metal as lies outside of a central  
 5 core equal in diameter to the opening between the rollers or revoluble die parts up around said die or mandrel, forming a continuous and seamless tube from a portion of the metal, and thus constituting the hollow shank, while  
 10 the central core of the metal passes on down through and forms a body extending down from the end of the structure. The surplus or external portion of the bar is thus shoved up above the original upper end, which is en-  
 15 gaged by the mandrel. Said central core or body may be afterward forged into any shape desired, and in many cases may be forged into the complete tool or tool-plate, thus producing an entire tool from a solid piece of  
 20 round metal.

At some suitable point strippers are to be provided, by means of which the shank will be stripped off the die or mandrel 8 as the same is drawn out on the upward stroke of  
 25 the machine. These may be conveniently provided by forming suitable chambers in the under side of the die-frame 9 and inserting therein the stripper-points 16, placing behind them springs 17, by which they are normally  
 30 but yieldingly held forward, as will be readily understood.

Having thus fully described my said invention, what I claim as new, and desire to secure by Letters Patent, is—

35 1. The combination, in a machine for making tubular structures, of the reciprocating internal die or mandrel, a lower die composed of rollers surrounding the opening through which the metal is to be forced the faces where-  
 40 of form the outside shape of the hollow structure being made, said several rollers being arranged in the same plane with their adjacent edges adapted to operate in close touch with each other, and adjustable supports in

which said rollers are mounted, substantially 45 as set forth.

2. The combination, in a machine for making tubular structures, of a reciprocating internal die or mandrel, a lower die composed of rollers surrounding the opening through 50 which the metal is to be forced the faces whereof form the outside shape of the tubular structure being made, said several rollers being arranged in the same plane with their adjacent edges adapted to operate in close touch 55 with each other, whereby a rotary internal die is provided with a practically continuous circular face and adjustable housings wherein said rollers are mounted, whereby an accurate adjustment thereof is provided. 60

3. The combination, in a machine for making tubular structures, of a reciprocating internal die or mandrel an outer die composed of rollers arranged in the same plane and 65 formed with concave faces set around and bounding the die-opening through which metal is to be forced, means for adjusting said rollers, and strippers for removing the tubular structure when formed from the internal 70 die or mandrel.

4. The combination, in a machine for making tubular structures, of a reciprocating internal die or mandrel, a bottom die-plate, housings adjustably mounted thereon, and 75 rollers framed with concave faces mounted in said housings and forming the lower die through which the metal is forced in being formed in the tubular structure, said several parts being combined, arranged and operating substantially as shown and described. 80

In witness whereof I have hereunto set my hand and seal, at Indianapolis, Indiana, this 30th day of March, A. D. 1901.

FRANKLIN P. BATES. [L. S.]

Witnesses:

CHESTER BRADFORD,  
 L. H. COLVIN.