

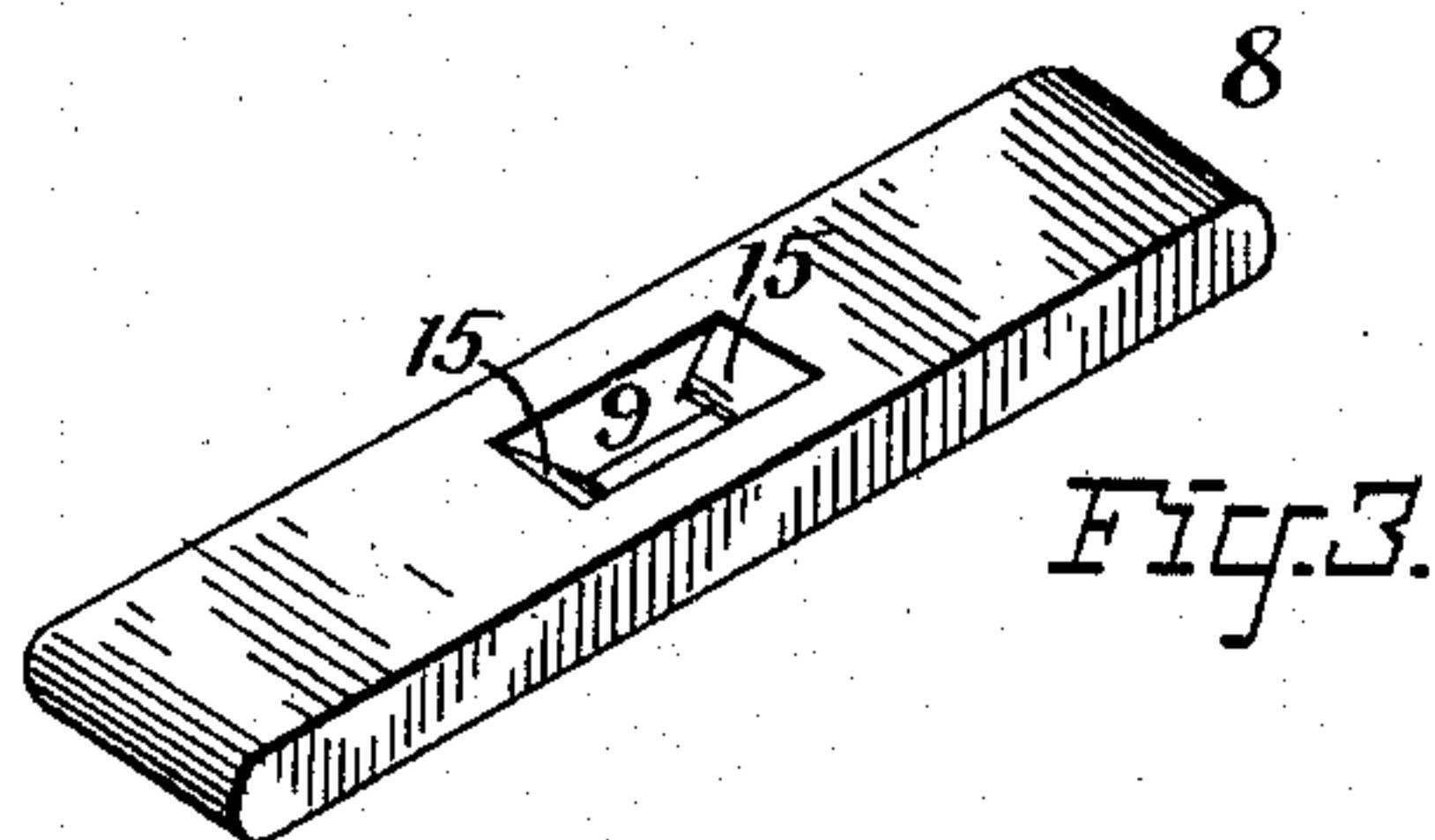
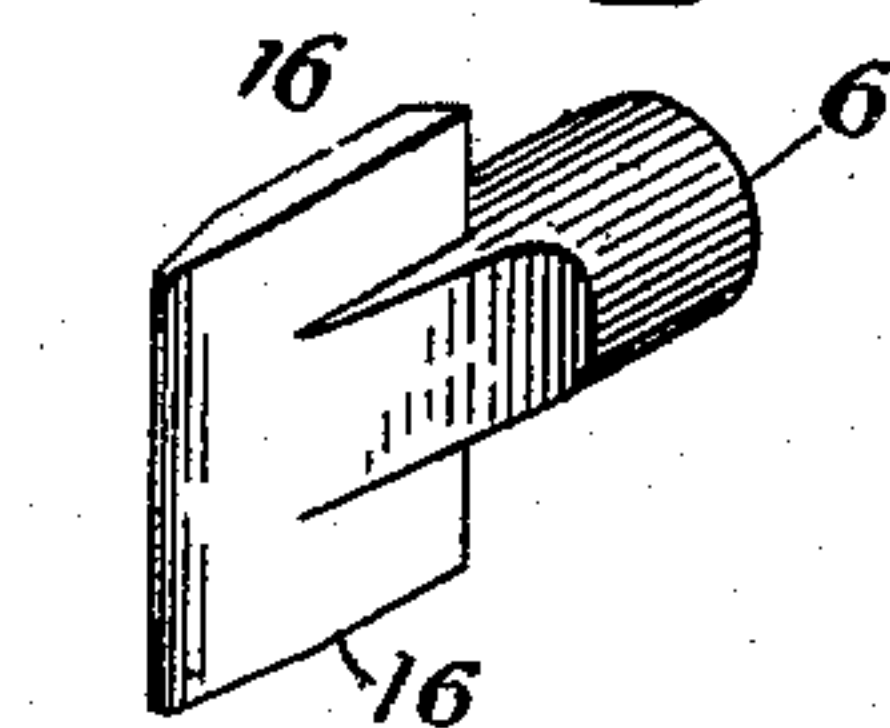
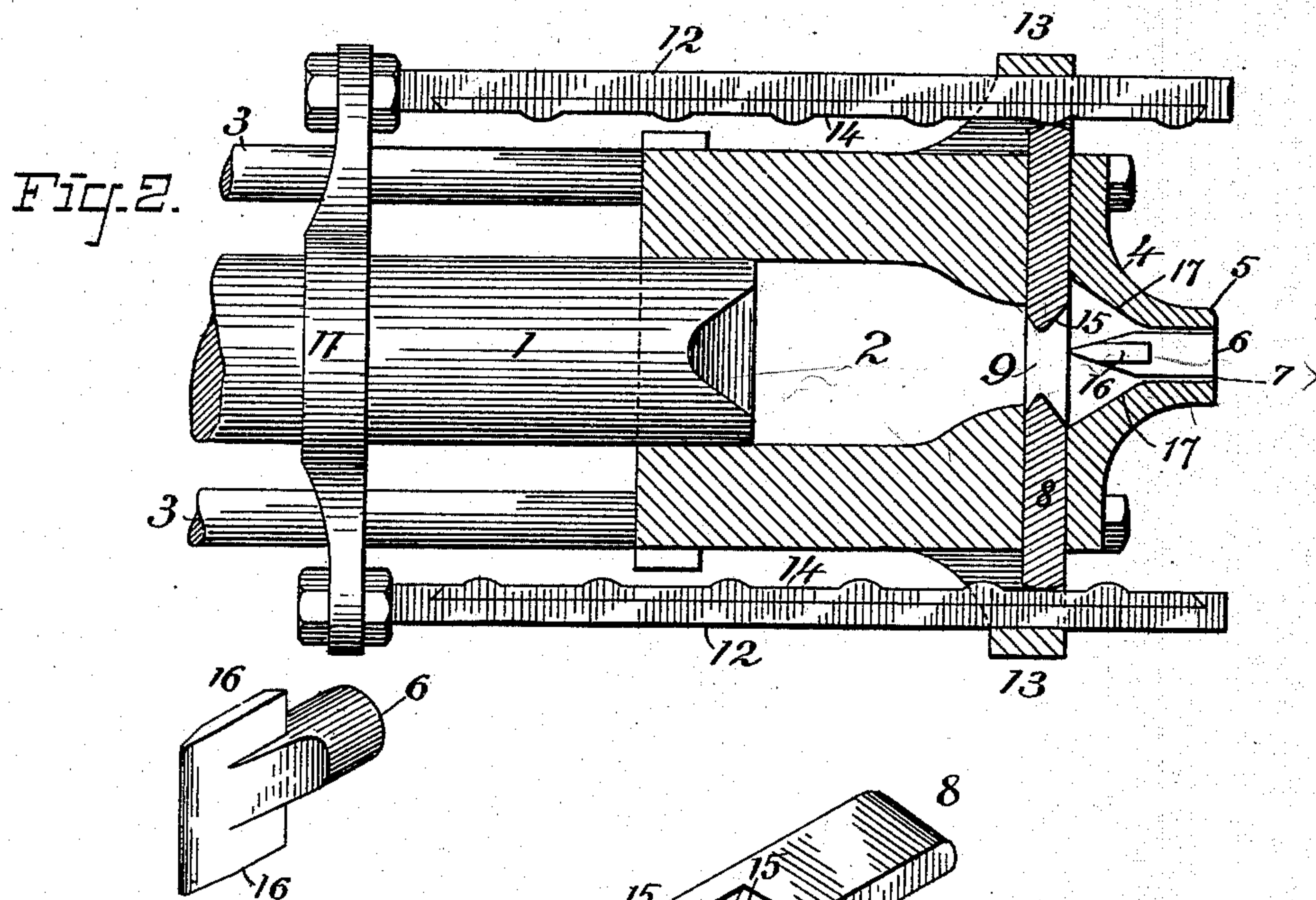
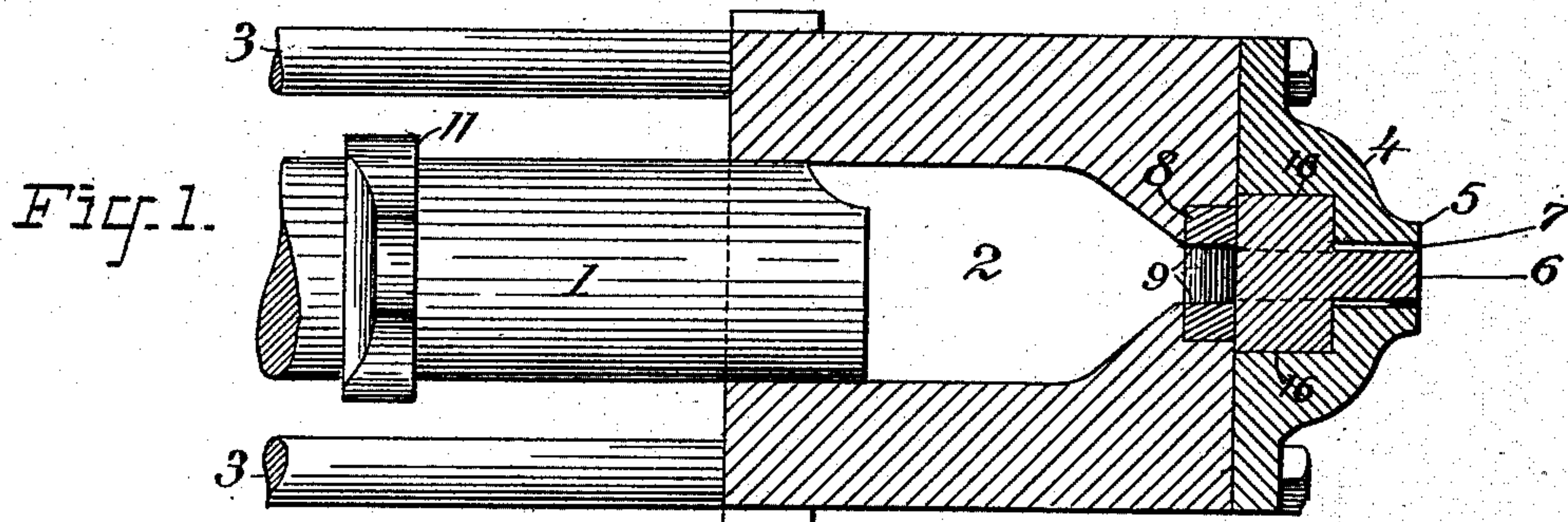
(No Model.)

A. B. RONEY.

APPARATUS FOR MANUFACTURING PLUMBERS' TRAPS.

No. 413,460.

Patented Oct. 22, 1889.



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UNITED STATES PATENT OFFICE.

ALEXANDER B. RONEY, OF PITTSBURG, PENNSYLVANIA, ASSIGNOR OF ONE-HALF TO THOMAS J. MCTIGHE, OF NEW YORK, N. Y.

APPARATUS FOR MANUFACTURING PLUMBERS' TRAPS.

SPECIFICATION forming part of Letters Patent No. 413,460, dated October 22, 1889.

Application filed September 21, 1888. Serial No. 286,000. (No model.)

To all whom it may concern:

Be it known that I, ALEXANDER B. RONEY, a citizen of the United States, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in the Manufacture of Plumbers' Traps; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to the manufacture of plumbers' traps and analogous articles from lead, and has for its immediate object an improved construction of the hydraulic press used for the purpose, whereby the operation is rendered substantially automatic and great uniformity of product is obtained without the aid of a skilled attendant.

The invention consists in the press and its parts, combined and adapted for operation substantially as hereinafter fully described and claimed.

In the drawings which form part of this specification, Figure 1 is a vertical longitudinal section. Fig. 2 is a horizontal section of the trap-shaping portion of a hydraulic press according to my invention, and Fig. 3 is a perspective of my improved differentiating valve. Fig. 4 is a perspective view of the core showing its wedge-shaped form and the sustaining and dividing wings thereon.

The water-ram and its appurtenances are of any of the usual and well-known forms, and are not shown in the figures. The ram and its cylinder would be at the left in the figures, and to the ram is fixed the plunger 1, fitting the lead-cylinder 2 and adapted to move forward therein, so as to eject the lead through the forming-die. The hydraulic cylinder and the lead-cylinder 2 are held rigidly in position relatively by the heavy rods, 3 in the usual manner. The end of the lead-cylinder 2 is closed by the cap 4, which is either formed with or carries the circular die 5 and core 6, which is cylindrical at its outer end and flattened to an edge at its inner end, and has the supporting-wings 16, for holding the core true in its place, and the issuing stream of lead divides at these wings into two separate streams, which again unite after

passing the said wings, the rear portion of the die having converging sides 17, as shown, which have the effect of causing the line of pressure to force the streams together, so as to form a tube. The annular space 7 determines the size or diameter of the issuing-trap. The walls of cylinder 2, behind the cap 4, are slotted transversely to receive the valve. The valve consists of a flat or rectangular bar 8, long enough to extend through the cylinder 2 and project somewhat at both sides thereof. About its center the valve-bar 8 has an oblong opening, whose sides 9 are square and whose ends are wedge-shaped to substantially a cutting-edge.

The purpose of the peculiar angular formation is twofold: first, to equalize the pressure of the lead and relieve the valve-bar from undue strain in the direction of the die, so as to render the movement of the valve comparatively easy and free, and, second, to secure a more direct pressure of the lead toward the die by the movement of the valve laterally on one side of the core, while relieving such pressure and movement on the other side of the core, whereby the acceleration or retardation of the lead issuing from the die is controllable with great facility. The faces 15 of the valve are at substantially right angles to the mean line of pressure required to accelerate the lead through one side of the die, and the transverse movement inwardly of such face acts at once to effect such acceleration, and, besides, the bulk of valve-bar in the cylinder 2 is increased by such movement and the lead must move out of the way. By this means the transverse movement of the bar 8, according to direction relatively to its central position, causes the lead to issue more rapidly at one side than at the other, and therefore curve the issuing tube or trap accordingly. The faces 15 also permit the internal pressure of the lead to be so exerted on the working-face of the valve as to substantially balance it and render its movement comparatively easy.

As the size of the trap made is generally much smaller than the diameter of the lead-cylinder 2, the valve 8, standing across such a distance, would be subject to so great a pressure that its movement under pressure

would be impracticable, I do away with such difficulty by contracting the throat of cylinder 2 immediately behind valve 8 to an opening substantially the size of the port in the valve, and thus the lead in the cylinder cannot exert its pressure against the greater portion of the back of the valve 8. The result is that the valve can be readily moved in the required directions. The movement is rendered automatic by causing the valve to be shifted transversely by the action of the press itself. This can be done in a variety of modes; but I illustrate only that which I prefer. As the length of trap projected bears a definite proportion to the contents of cylinder 2, and therefore to the range of motion of the plunger 1, I arrange the latter so as to control the valve in the following manner: I fix to the plunger 1 a cross-head 11, and on this, at opposite ends, I fix the pattern-bars 12 12 parallel with each other and guided in the lugs 13 of cylinder 2. The bars 12 have removable pattern-faces 14, between which the valve 8 fits neatly. The pattern-faces 14 are formed with undulating surfaces, which at corresponding points are of opposite character—*i. e.*, a depression on one will be opposite a rise on the other. These pattern-faces will be experimentally determined for each size and style of trap to be made. As the plunger 1 moves forward and ejects the lead through the die-aperture 7, the pattern-bars move with it, and their undulating or pattern faces force the valve 8 to one side or the other or hold it centrally, according to the previously-determined relations, and the lead is thus automatically accelerated or retarded to produce the trap, one of which just finished is shown in dotted lines at Fig. 2.

Having thus shown the principle of automatic movement of the valve, various modifications will readily occur to the skilled mechanic and need not be further noted.

In the operation of making the traps the straight end of the trap is of course made first, and for this purpose it is necessary that the valve-bar 8 should occupy a central position, so that its orifice, in connection with the wedge-shaped end of the core, causes two equal streams of lead to pass out on each side of the wedge. When the emerging straight pipe is of the proper length, it is curved, and to be of commercial value the curve must be a short one. By my construction this curving is effected in the following manner: The valve-bar is shifted from its central position, so that, while still effecting the combination of the lead into two separate streams, it will also give each stream a different area of pressure from the other, and such difference of area of pressure is effectively maintained by reason of the partitions constituted by the wings 16, which are in front of the original moving streams of lead. As the final outlet is equal throughout, the effect of this principle of differential areas is to cause one of the streams to move faster than the other, the

faster stream being impelled by the greater area of pressure behind it. This action of course causes the issuing-pipe to curve over, as shown by dotted lines in the drawings, and the curvature may be made as short as practice demands.

I am aware that it has been proposed to use a core in connection with a ported valve, the core passing through the valve and the valve moving transversely for the purpose of effecting the flow of lead. Such an arrangement has the effect of merely obstructing the flow on one side of the core and, as it were, accelerating the flow on the other side; but the two streams could not in this case be completely separated at the moment of changing the rate of flow, and just at the valve the obstructed stream would crowd itself around the core over to the larger port on the other side, and through this it would pass, and on getting beyond the valve-bar it would crowd back again. The immediate result of all this is the necessary formation of a wide curve in the issuing-trap. My invention, however, prevents any such interference between one stream and the other, as each is subjected to its own area of pressure until it has arrived at a point where no interference can take place.

I claim as my invention—

1. In a lead-trap press, the combination, with the lead-cylinder having a contracted throat, of a transversely-movable valve-bar 8, having a central aperture 9, substantially coinciding with the throat-opening, and a die beyond said valve-bar, provided with a core 6, having its inner end wedge-shaped and provided with supporting-wings 16 between the valve-bar and die-orifice.

2. In a lead-trap press, the combination of the lead-cylinder having a contracted throat, a die opposite and having a core 6, whose inner end is wedge-shaped and provided with supporting-wings 16, and a removable valve-bar 8, having a central aperture 9, substantially coinciding with the throat-opening, said valve being located between the throat of the cylinder and the wedge-shaped core, and having its line of movement at right angles to the supporting-wings of the core, substantially as described.

3. In a lead-trap press, the combination of the lead-cylinder having a contracted throat, a movable valve-bar having a central aperture coinciding with said throat-opening, a core opposite the throat beyond the valve-bar, and having supporting-wings in a line transverse to the line of movement of the valve-bar, and a die having the two convergent faces 17 opposite the inner portion of the core.

4. In a lead-trap press, the combination, with the lead-cylinder, a movable plunger therein, the die, and a transversely-movable differentiating valve, of the controlling mechanism interposed between the said plunger and valve for communicating a transverse movement to the valve from the onward move-

ment of the plunger, substantially as described.

5 5. In a lead-pipe press, the combination, with the lead-cylinder and die, of a transversely-movable differentiating valve and pattern-bars in contact with the ends of the valve and moved by the plunger of said cylinder, said pattern-bars having removable pattern-faces, substantially as described.

10 6. The combination of the cylinder 2 and its die, plunger 1, pattern-bars 12, fixed thereto,

guides 13, removable undulating faces 14, and movable valve 8, adapted to be shifted by the undulations of said faces 14, substantially as described.

In testimony whereof I affix my signature
in presence of two witnesses.

ALEXANDER B. RONEY.

Witnesses:

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M. E. HOLLAND.