

No. 694,489.

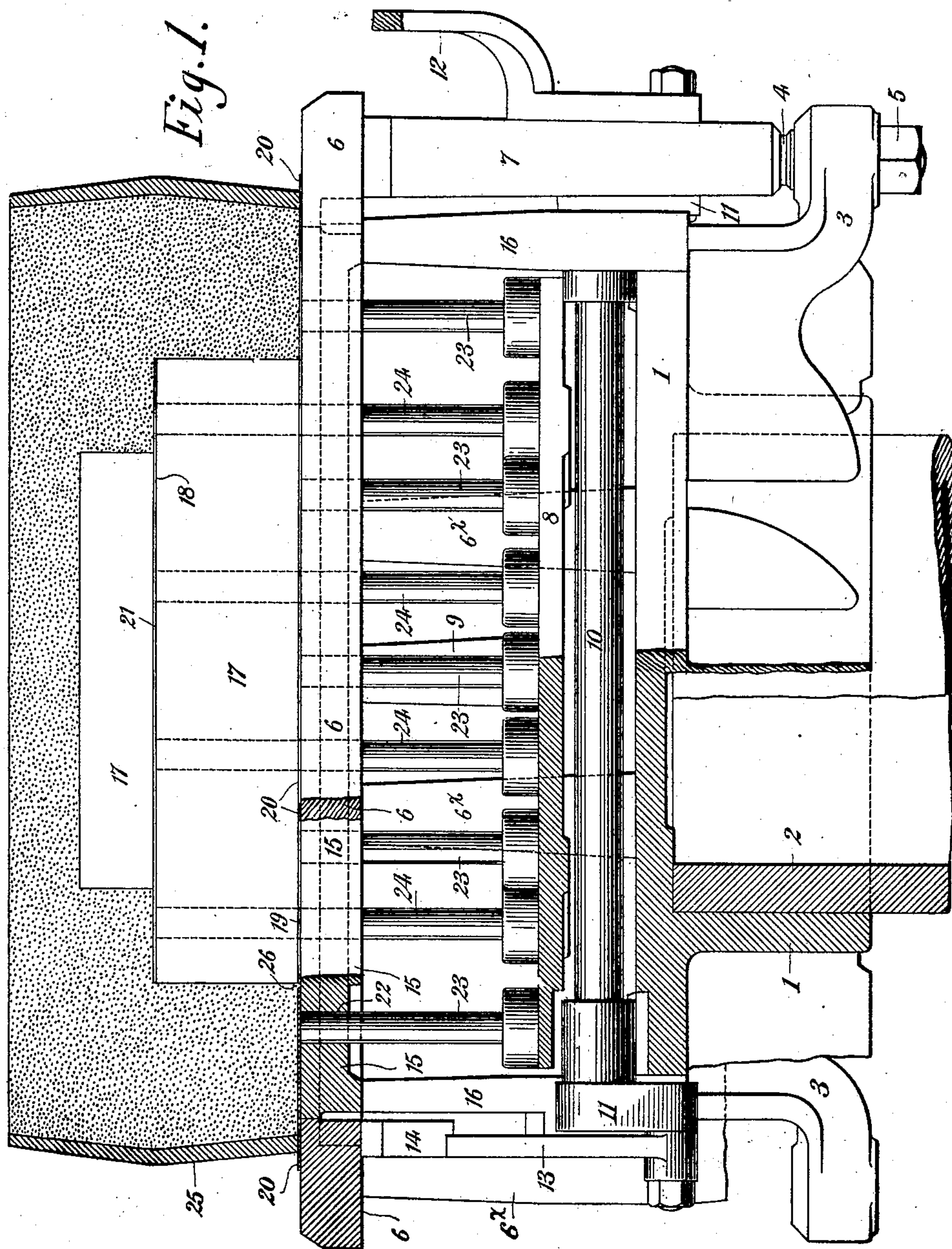
Patented Mar. 4, 1902.

E. H. MUMFORD.
STRIPPING PLATE.

(Application filed Nov. 8, 1899.)

(No Model.)

3 Sheets—Sheet 1.



WITNESSES:

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3 Sheets—Sheet 2.

Fig. 2.

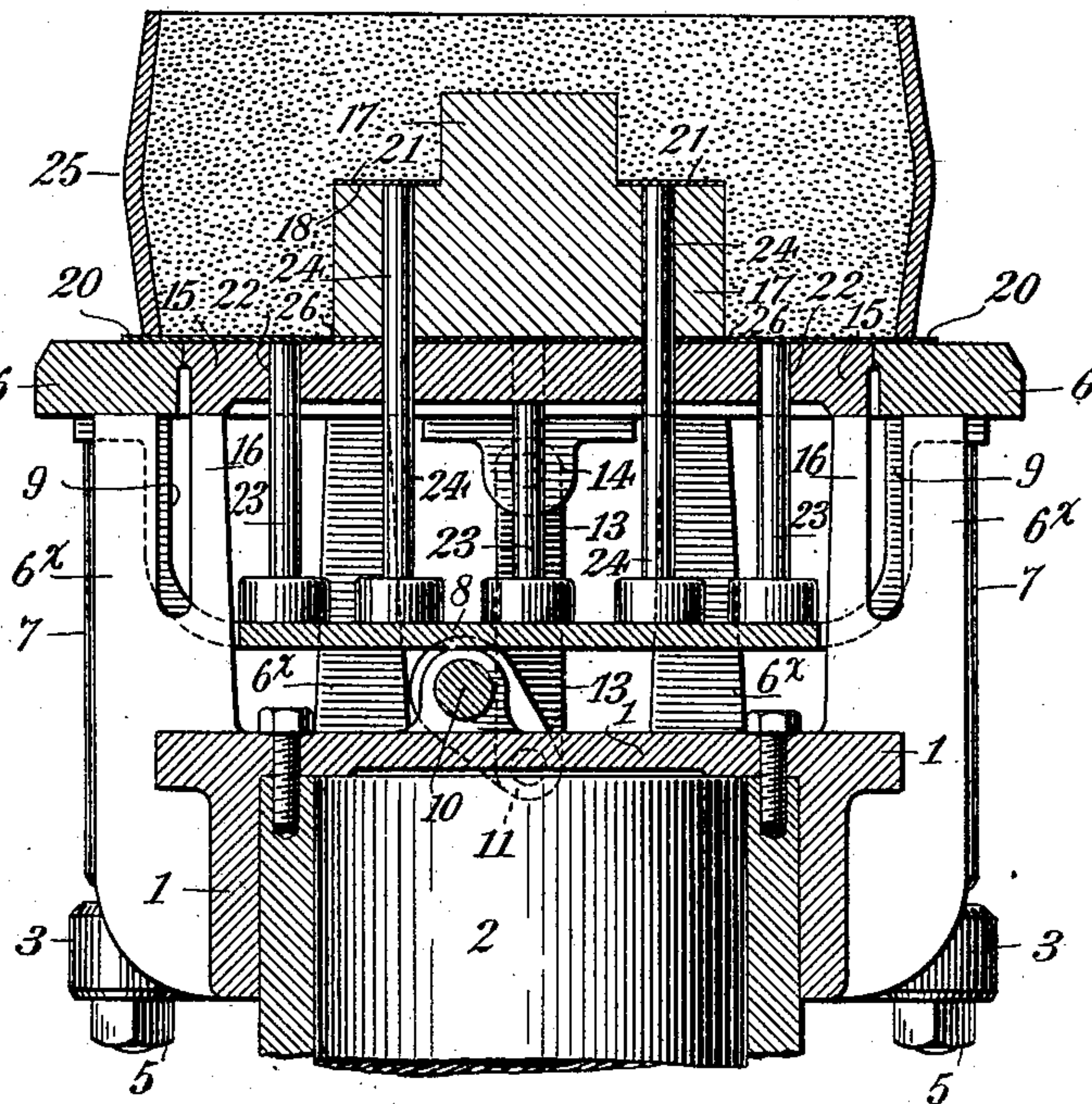
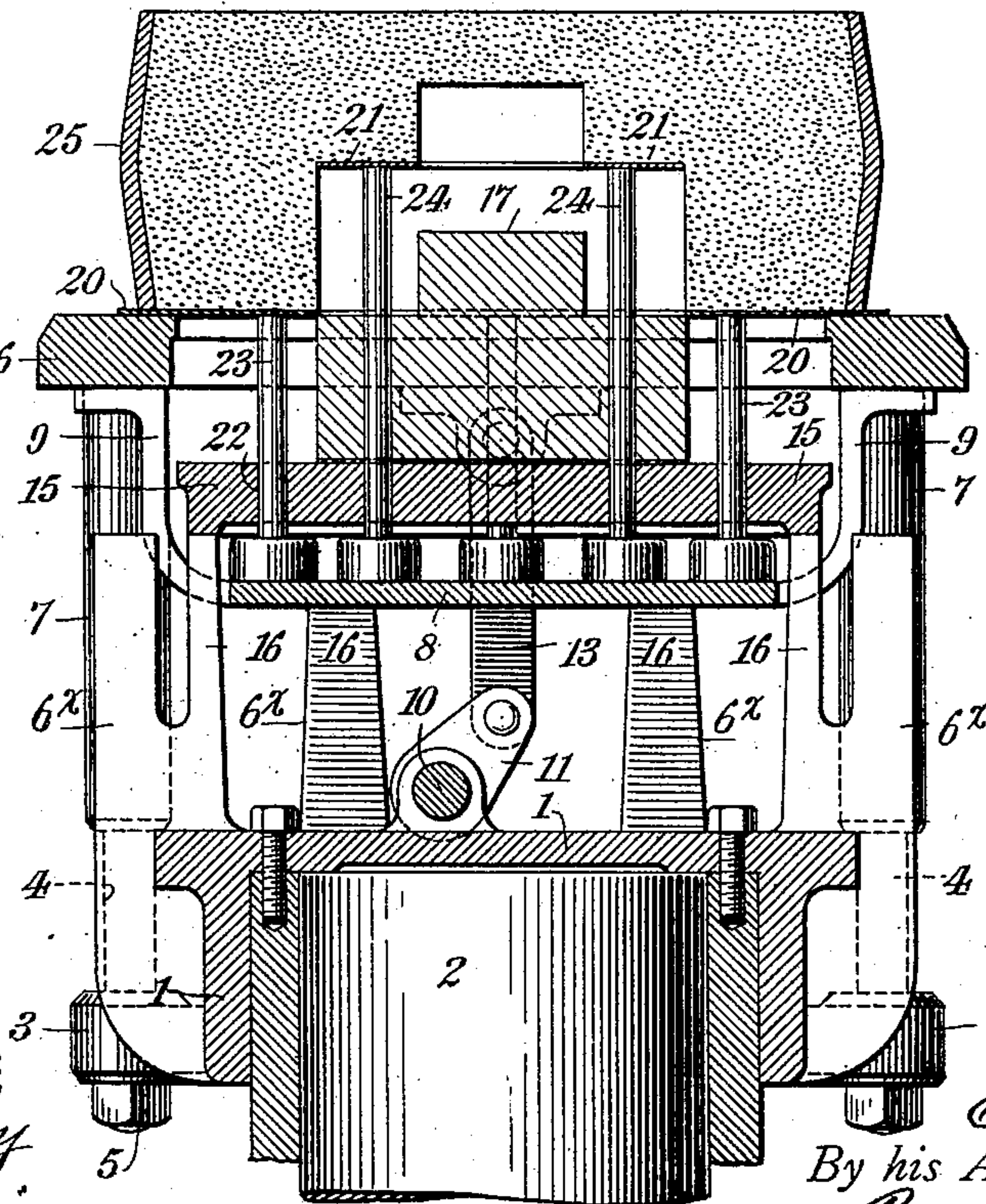


Fig. 3.



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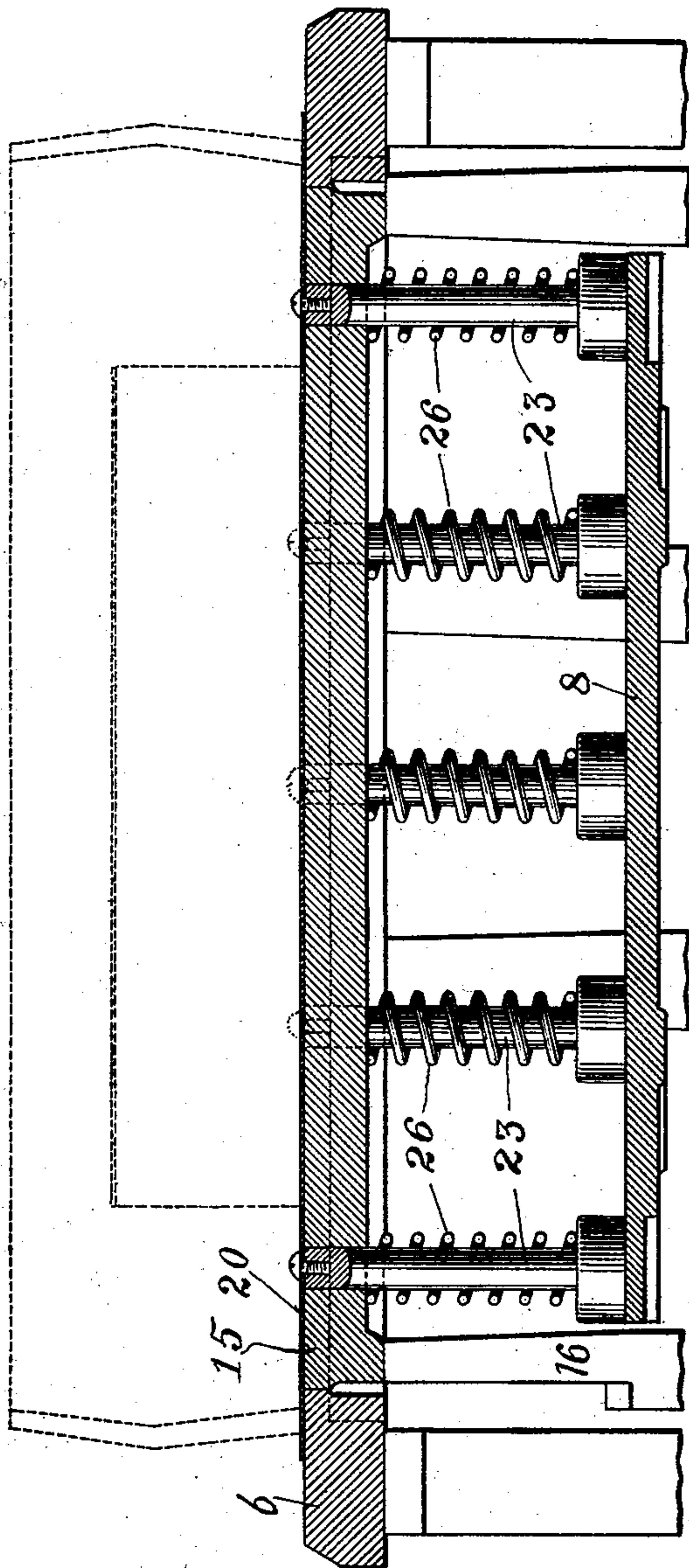
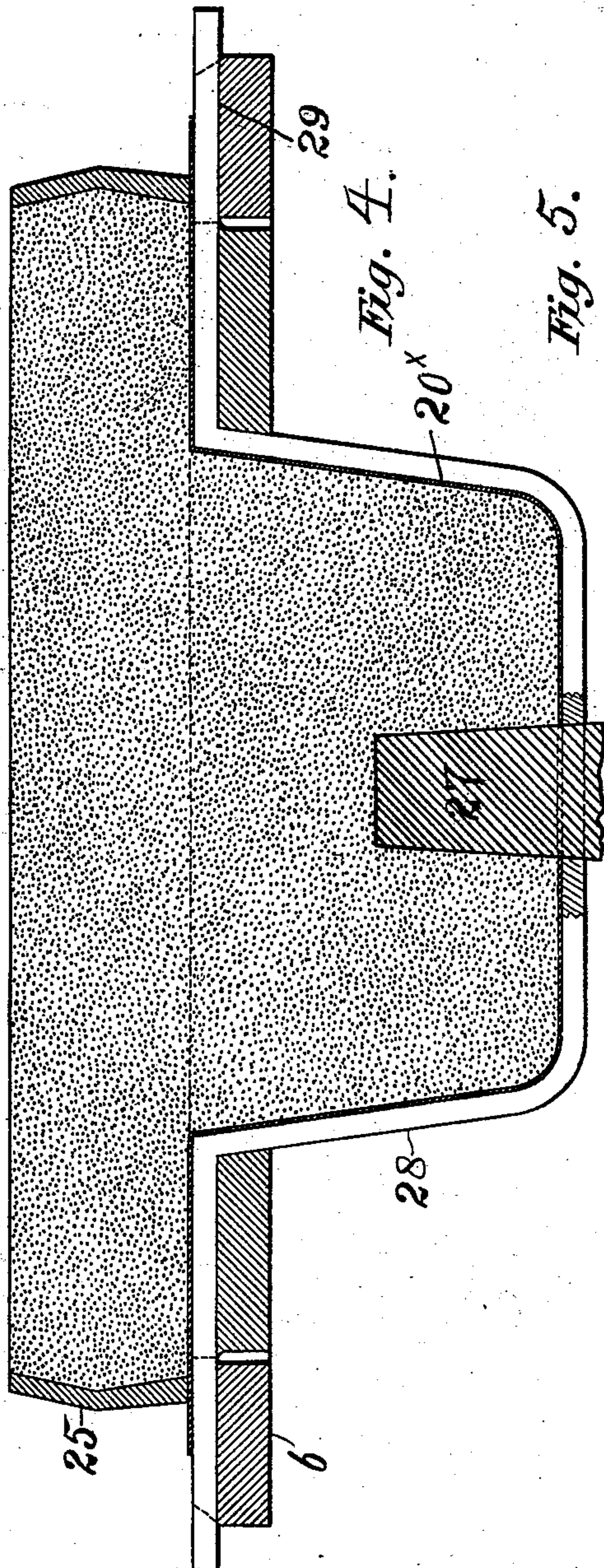
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(No Model.)

3 Sheets—Sheet 3.



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UNITED STATES PATENT OFFICE.

EDGAR H. MUMFORD, OF PLAINFIELD, NEW JERSEY.

STRIPPING-PLATE.

SPECIFICATION forming part of Letters Patent No. 694,489, dated March 4, 1902.

Application filed November 8, 1899. Serial No. 736,293. (No model.)

To all whom it may concern:

Be it known that I, EDGAR H. MUMFORD, a citizen of the United States, and a resident of Plainfield, in the county of Union and State of New Jersey, have invented a certain new and useful Improvement in Stripping-Plates, of which the following is a specification.

The present invention relates more especially to the means employed in many places for retaining the sand against displacement in a flask or part mold during the ramming of the mold and the drawing of the pattern by a relative motion of the flask and the pattern carrier or support. The means ordinarily employed for the above-stated purposes comprises a stripping or drop plate, which is fitted accurately to the outline at the joint-surface of the patterns. Such plates are always expensive, relatively speaking, and represent a large outlay of capital in every large foundry. Furthermore, they are subject to relatively great wear and also cause more or less wear upon the patterns, thus leading to the loss of both in time. In practice these stripping-plates are wholly supported by the frame of the machine and overhang or project inwardly thereof, and the patterns are supported upon an independent plate or frame, and the two supports (flask and pattern) have relative motion for the purpose of positioning the patterns vertically in proper relation to the stripping or drop plate and of drawing the pattern when the ramming is finished. The patterns are generally blocked up from their supporting-plate in order to bring their parting-lines into the plane of the stripping-plate and to provide spaces where sand may collect during the continued use of the apparatus and from which the sand may be removed from time to time. These stripping-plates are almost invariably formed of metal and are of such stiffness or rigidity as will secure that there shall be no perceptible or injurious deflection or bending thereof under the force employed in ramming, thus necessitating the employment of comparatively thick metal plates in the simplest cases for the stripping-plates. These stripping or drop plates are expensive in all cases, and are especially so when the parting-line of the pattern parts is

irregular in outline and does not lie in one plane.

The principal object of the present invention is the provision of an efficient and comparatively durable stripping-plate at a relatively small cost.

To this and other ends the invention consists of features of construction and combinations of devices hereinafter described, and more particularly pointed out in the appended claims.

In the practice of the present invention I take a sheet of flexible material and make a stripping-plate of it by shaping it to the parting-line of the pattern or patterns by suitable means. In the case of large patterns I may use one or more such sheets, and there are cases where it is not necessary to employ a stripping-plate that surrounds the pattern or patterns, inasmuch as the pattern will draw without mishap, except at one or more places, at which the new stripping-plate serves to retain the sand in place without itself surrounding the pattern or patterns. The material I employ, whatever its nature, is of a thickness such that it will not without perceptible and injurious deflection or bending support or resist the ramming of the sand in the mold by hand or by power; but it will without perceptible or injurious deflection or bending stand the drifting in of the sand, the impact of the small masses or particles not being sufficiently great to cause trouble. Stripping-plates have been applied to a great variety of irregular patterns and parting-lines, and the present invention may be used in most, if not all, of these cases. The flexible material employed should therefore be of such a nature as will permit of the use of economic processes in the formation of the stripping-plate, as by drawing or striking up or by cutting out or by combinations of steps or processes. In case the parting-line of the pattern be in one plane a sheet of tin is used by preference, and the pattern is laid on the sheet, and its outline or silhouette is traced thereon. After the removal of the pattern the plate is cut out by a pair of shears or other appropriate means to form the silhouette or outline, or the silhouette of so much of the pattern for

which a stripper may be required is traced and cut. It is preferable to use flexible sheet metal in all cases, as it may be easily worked into shape and is more durable than thin plates of other material.

In the use of the new stripping-plate where hand or power ramming is in vogue it is requisite that it be supported against deflection or bending during ramming and generally, also, during the drawing of the pattern. I therefore provide that the stripping-plate shall be supported in such cases during the ramming and by preference that it shall also always be supported during the drawing of the pattern. By preference I support the new stripping-plate during ramming by means of the plates or supports for the flask and the pattern, the tops thereof being flush and the stripping-plate lying thereon. By preference I support the stripping-plate during the drawing of the pattern by means of stools which pass freely through the pattern-support and coact with the stripping-plate to prevent deflection or bending thereof during the drawing of the pattern. These stools may be in contact with the stripping-plate during the ramming and preferably are.

One form of the invention is illustrated in the accompanying drawing, forming part of this specification, in which—

Figure 1 is a view, partly in section along a transverse central vertical plane, of a machine in which the invention is embodied. Fig. 2 is a view, partly in section along a front to rear vertical plane, of the same with the parts in the positions they occupy during the ramming of the sand. Fig. 3 is a view similar to Fig. 2, but showing the parts in a different relation—that assumed at or near the end of the operation of drawing the pattern. Figs. 4 and 5 illustrate modifications.

The reference 1 indicates a suitable head, which is fast to a hollow cylinder 2, open at the bottom and into which air or other pressure is introduced as occasion arises. This head is provided with arms 3, to which posts or standards 4 are secured, as by nuts 5. A flask-supporting frame 6 is provided with sleeves 7, which coact with the posts 4 to guide the frame in its independent up-and-down motion, hereinafter referred to. 6^x are posts rising from the head 1 and on which frame 6 rests when it is in its down position or that shown in the drawing. A stool support or plate 8 is hung from the supporting-frame 6 by suitable hangers or arms 9, but one of the arms 9 being shown, and moves up and down with the frame 6. A shaft 10 is journaled in bearings attached to the head 1 and is provided with cranks 11 at or near its ends and with a hand-lever 12, by means of which it is rocked as required. Links 13 are pivotally attached to the cranks 11 and to ears or lugs 14, projecting downwardly from the frame 6. The shaft 10, cranks 11, links 13, and arms 14 are arranged so as to secure that the lift-

ing force shall be applied as nearly as may be directly in the axis of symmetry of the parts operated thereby.

15 is a pattern-plate fitting within the opening in frame 6 to permit of relative motion of these two parts.

16 are standards or posts connecting head 1 and plate 15, being formed in one with or attached to the head and having the plate 15 attached to their tops.

17 is a pattern firmly secured to the plate 15 and provided with a shoulder 18, there being a building-up plate or sheet 19 between the pattern and the plate.

20 is a flexible sheet-metal stripping-plate of the same thickness as the sheet 19 and is cut out to fit and surround the pattern 17 at the parting-line. By preference the stripping-plate 20 is of tin-plate, and the block or sheet 19 may also be of tin of the same thickness as plate 20. There is also a flexible stripping-plate 21, placed upon the shoulder 18. The tops of frame 6 and plate 15 are flush with each other, and the stripping-plate 20 lies upon and is supported by both of them, as will hereinafter more fully appear.

The pattern-plate 15 is provided with a number of perforations 22, extending vertically exterior to and distributed about the pattern 17.

23 are stools which rest on stool-plate 8 and pass freely through the holes 22 and in the positions of the parts shown in the drawing or those they have at the moment the ramming is complete just touch the under side of the stripping-plate 20. The plate 15, building-up plate 19, and pattern 17 are also provided with alined or registering perforations opening on the shoulder 18, and 24 are stools resting on plate 8 and extending through said perforations to the under side of the stripping-plate 21.

25 is a flask which rests upon the frame 6 during the formation of the mold.

The operation of the above-described devices is as follows: The head 1, plate 8, stools 23 24, plate 15, pattern 17, and frame 6 being in the positions thereof shown in the drawing, with the tops of the plate 15 and frame 6 flush with each other, and the flask 25 and the stripping-plates not being in place, as shown, the stripping-plates 20 21 are dropped over the pattern and settle to positions thereof shown in the drawing. The flask 25 is also put in place and is filled with sand and rammed, as by power. During the ramming the plates 20 21 merely transmit the pressure thereon to the frame 6 and plate 15 and to the pattern 17, and the plate and frame transmit the pressure to the head 1 through the posts 6^x and 16. In drawing the pattern the lever 12 is moved downward, thus rotating the shaft 10 and through the links 13 and ears 14 lifting the frame 6, plate 8, flask 25, stools 23 24, and stripping-plates 20 21, the pattern-plate, pattern, and head 1 remaining stationary the while. Figs. 1 and 2 show the positions of the

parts before the pattern is drawn, and Fig. 3 shows the positions of the parts at or near the completion of the operation of drawing the pattern, which in this instance is done by moving the mold, stools, stripping-plates, &c., upward away from the pattern. During the passage of the inner edges of the stripping-plates 20 21 by the adjacent or adjoining surfaces of the pattern the sand is held up and is prevented from breaking by the stripping-plates, and these are prevented from yielding to the pressure of the sand and any drag on the sand by the pattern by the stools 23 24 and their own stiffness between the points where they are supported by the said stools. In other words, during the drawing of the patterns the stripping-plates are stiffened adjacent to the patterns. Any free sand that may get between the pattern and the mold quickly works by the narrow edge of the stripping-plate with a minimum of injury to both pattern and stripping-plate.

It is not requisite that the stripping-plate should fit exactly against the pattern, for practice has shown that good results may be had even where there is considerable clearance between the pattern and the stripping-plate, even as much as one-sixteenth of an inch; but it is better, of course, that the fit should be reasonably close. Such a clearance is indicated at 26.

In some cases I secure that the stripping-plate shall return or be held against the frame 6 by fastening it to the tops of the stools and provide the stools with returning-springs 26, which bear against the under side of the plate 15. In other cases (see Fig. 4) the flexible stripping-plate 20^x may form the pattern, being perforated for green-sand cores or similar projections 27 and being supported against deflection by a flat bar 28, which passes thereunder and fits into grooves 29, cut in the upper faces of the flask-support and the pattern-supporting frame. The bar may have one or more openings for the passage of the projections, and the flexible stripping-plate fits against said projections closely and supports the sand forming the mold at the parting-line during the drawing of the pattern or separation of the mold and projections.

I have employed the term "stripping-plate" to designate my new device, inasmuch as it conveys the idea of the function clearly. As above pointed out, the old stripping-plates are, properly speaking, plates or are made of plate metal in order to secure rigidity during ramming, and are therefore thick, comparatively speaking, whereas my new stripping-plate is relatively thin and lacks the rigidity or stiffness of the old stripping-plate.

What I claim as new, and desire to secure by Letters Patent of the United States, is—

1. In molding apparatus, means for retaining the sand in shape at the pattern edge during the operation of separating the mold

and the pattern consisting of a thin flexible sheet (that is to say, a sheet so weak as to be incapable of resisting without bending the force applied during ramming) having a contour at the parting-line which is the counterpart, substantially, of the contour of the corresponding part of the pattern at such line combined with relatively movable supports for preventing flexing or bending of any part of said sheet during the ramming of the sand thereagainst.

2. In molding apparatus, means for retaining the sand in shape at the pattern edge during the operation of separating the mold and the pattern consisting of a thin flexible sheet (that is to say, a sheet so weak as to be incapable of resisting without bending the force applied during ramming) having a contour at the parting-line which is the counterpart, substantially, of the contour of the corresponding part of the pattern at such line combined with supports for preventing flexing or bending of any part of said sheet during the ramming of the sand thereagainst, means for causing relative motion between certain of said supports and the said sheet during the operation of separating mold and pattern, and stools for supporting during said operation of separating mold and pattern those parts of said sheet from which said certain of said supports are so removed.

3. In molding apparatus, the combination of a pattern-support, means for retaining the sand in shape at the pattern edge or parting-line during the operation of separating mold and pattern consisting of a thin flexible sheet having a contour at the parting-line which is the counterpart, substantially, of the contour of the corresponding part of the pattern at such line and conforming to and resting upon the pattern-support, a pattern, and means for preventing flexing or bending of said sheet during the operation of separating pattern and mold and during the relative motion of the pattern-support and said sheet.

4. In molding apparatus, a pattern, a pattern-support, and means for retaining the sand in shape at the pattern edge or parting-line consisting of a thin flexible sheet having a contour at the parting-line which is the counterpart, substantially, of the contour of the corresponding part of the pattern at such line and resting upon said pattern-support and held thereby against flexing or bending during the ramming and combined with stools which pass freely through the pattern-support and prevent flexing or bending of said sheet during the operation of separating mold and pattern and the relative motion of the pattern-support and said sheet.

5. In molding apparatus, a pattern, a pattern-support, a flask-support, said supports being flush with each other during the ramming of the sand, a flask, a thin flexible sand-supporting sheet lying on both of said supports during the ramming of the sand and abutting against the pattern edge, and means

for preventing flexing or bending of said sheet during the operation of separating mold and pattern and the relative motion of the pattern-support and said sheet.

- 5 6. In molding apparatus, a pattern, a pattern-support, and means for retaining the sand in shape at the pattern edge or parting-line consisting of a thin flexible sheet resting upon said pattern-support and held against flexing
10 or bending thereby during the ramming of the sand combined with means for preventing

flexing of said sheet during the operation of separating mold and pattern and the relative motion of the pattern-support and said sheet.

Signed at New York, in the county of New York and State of New York, this 31st day of October, A. D. 1899. 15

EDGAR H. MUMFORD.

Witnesses:

E. H. TUCKER,

R. W. BARKLEY.