

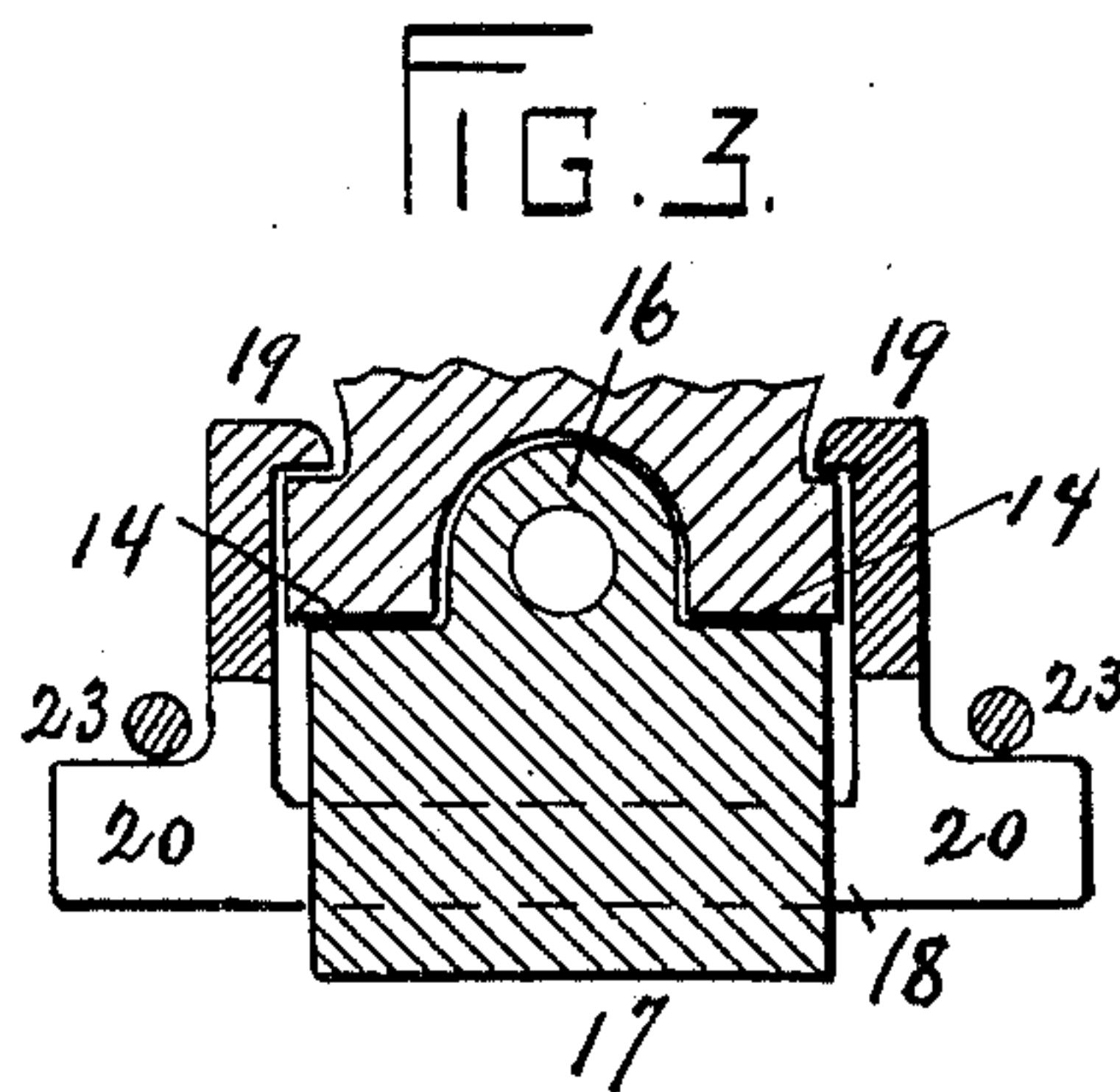
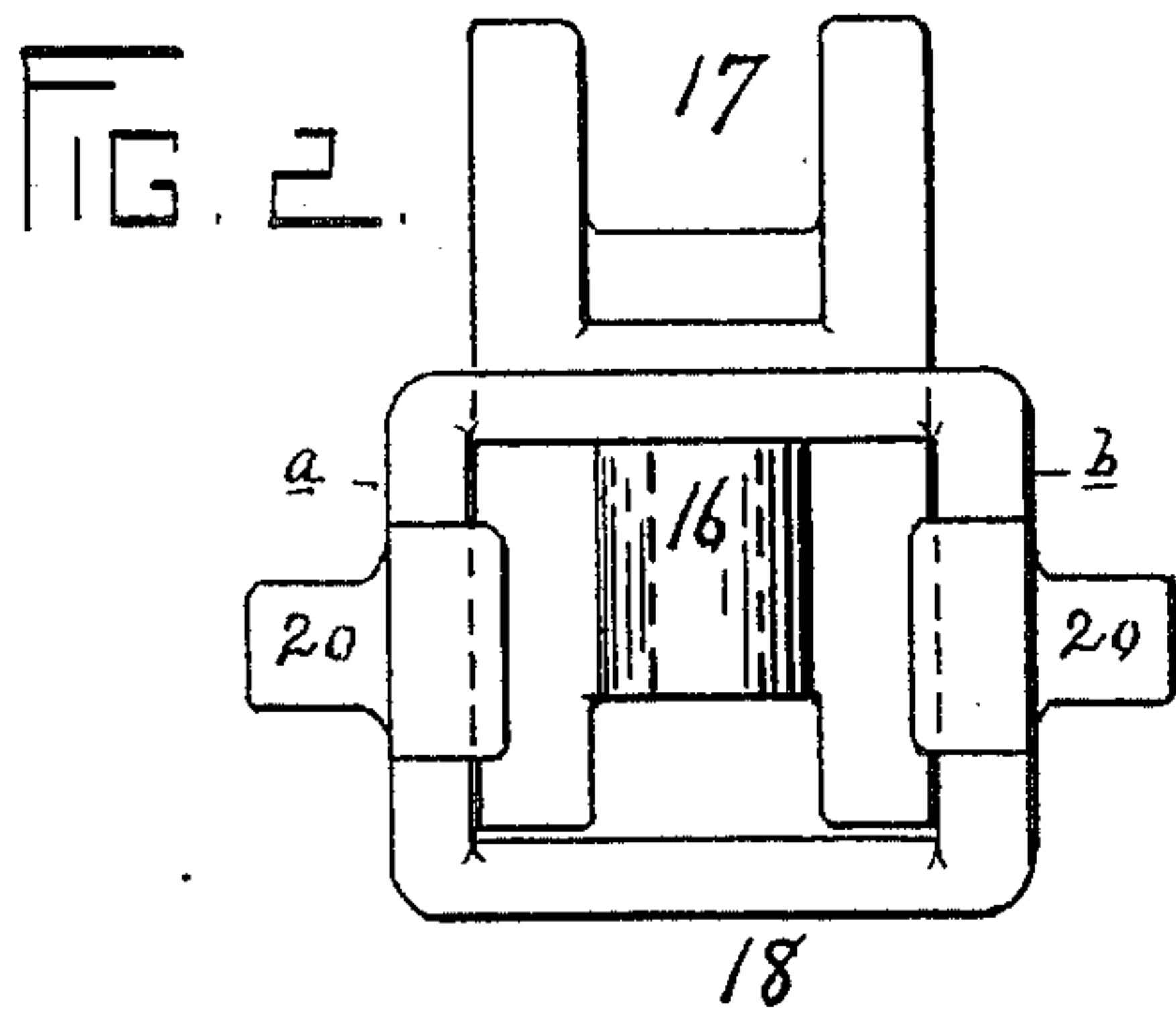
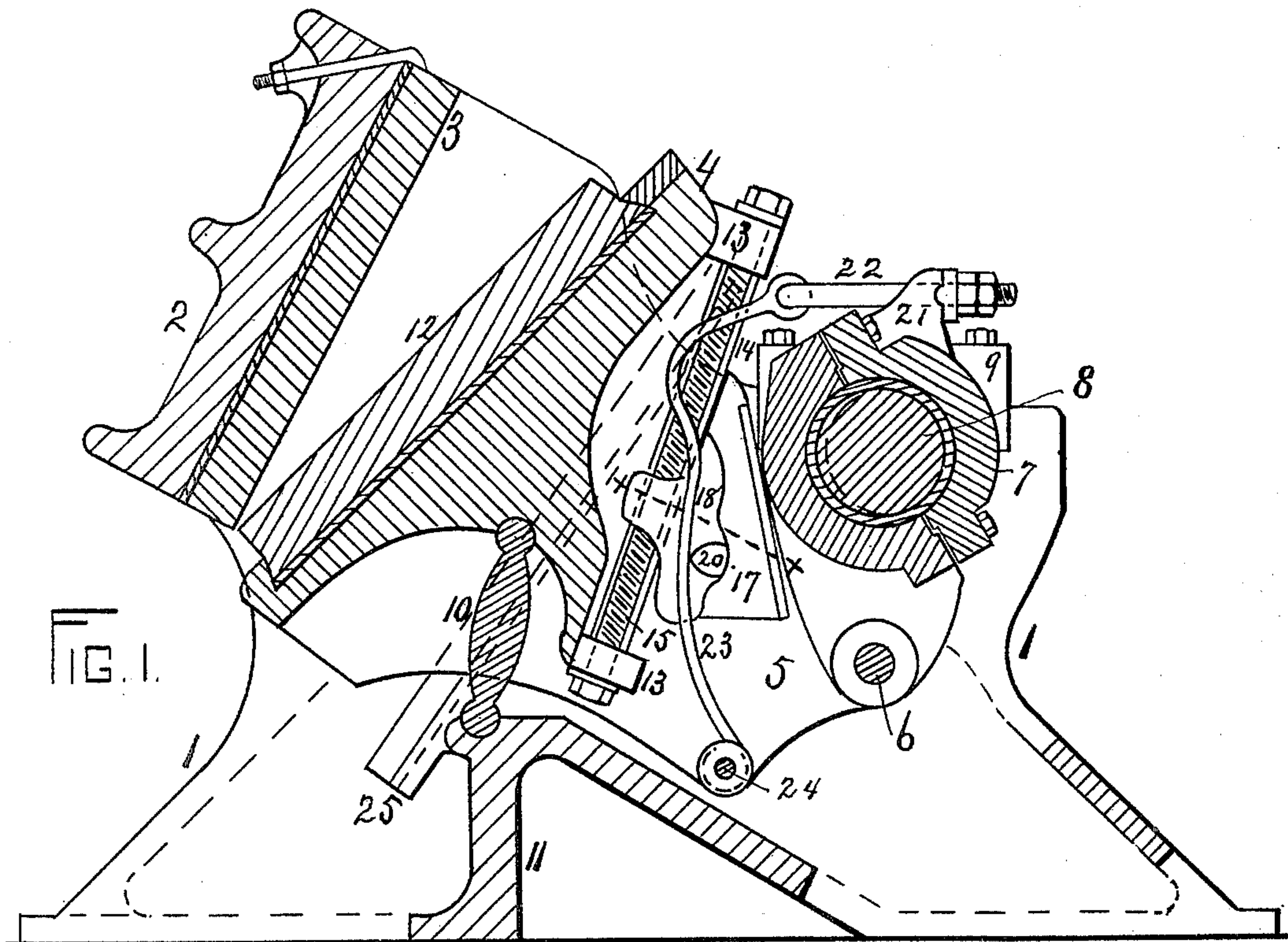
(No Model.)

4 Sheets—Sheet 1.

W. L. MORRIS.
ORE CRUSHER.

No. 581,756.

Patented May 4, 1897.



WITNESSES:

J. E. Harvey

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(No Model.)

4 Sheets—Sheet 2.

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FIG. 10.

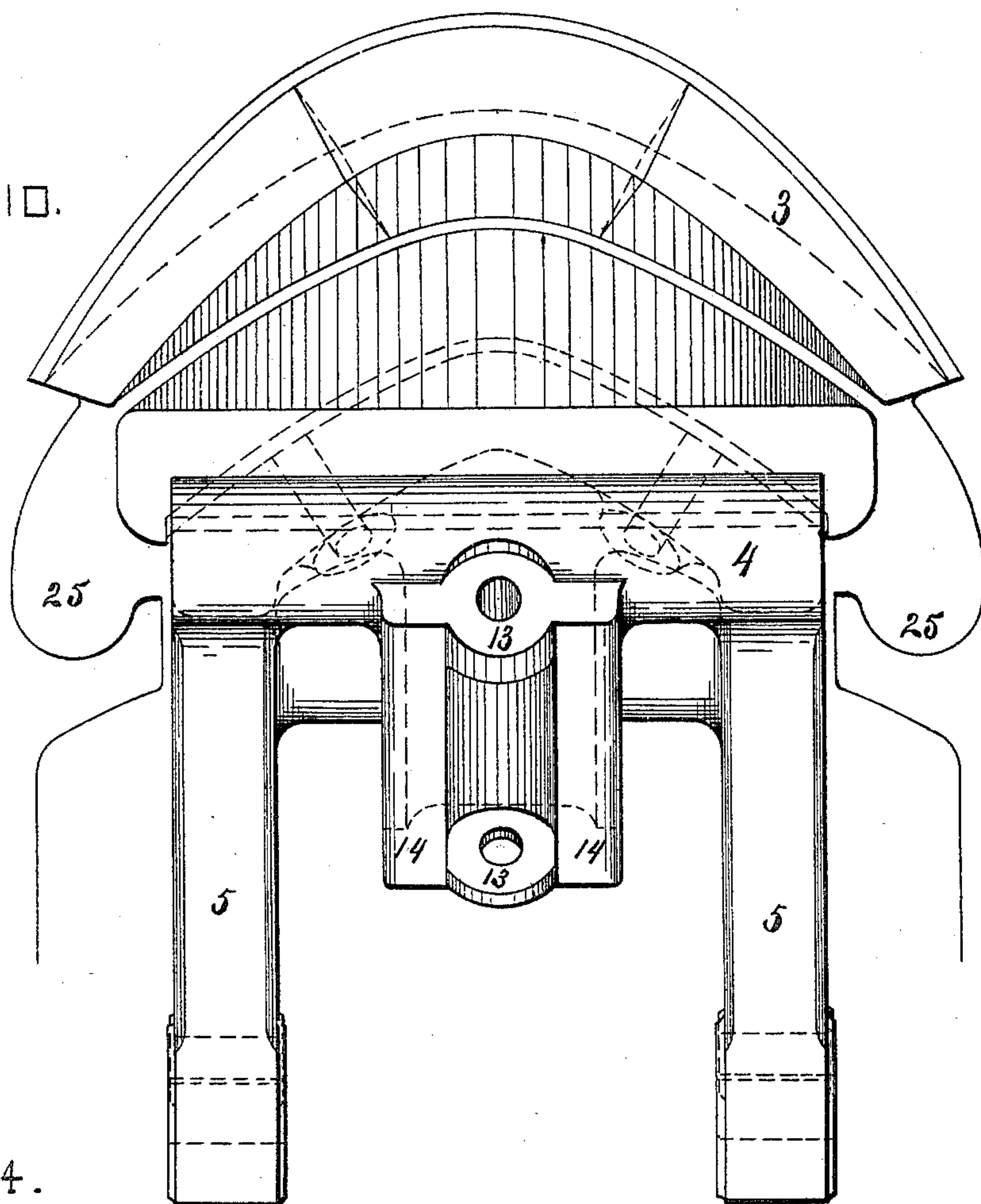
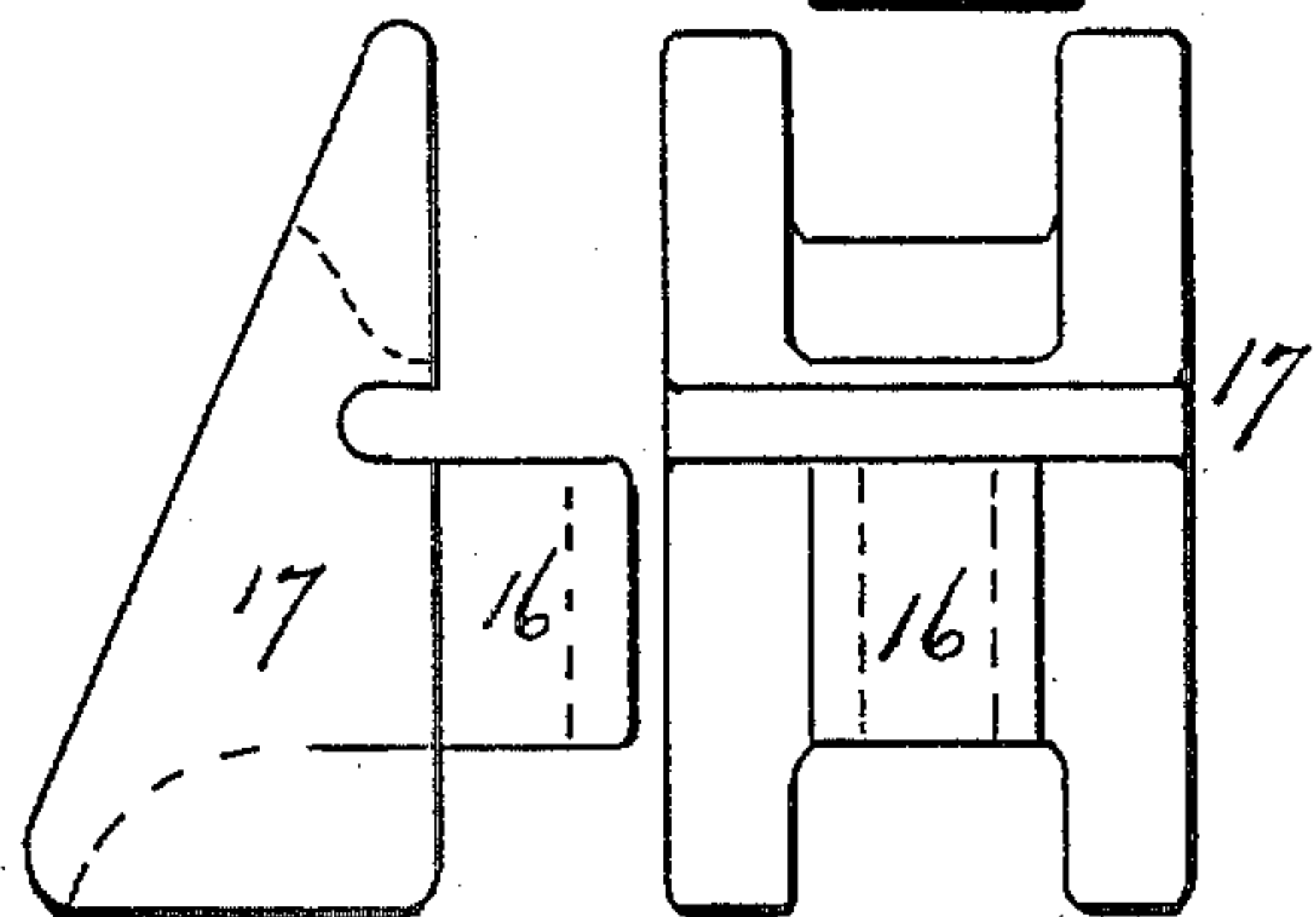


FIG. 4.



WITNESSES:

FIG. 5.

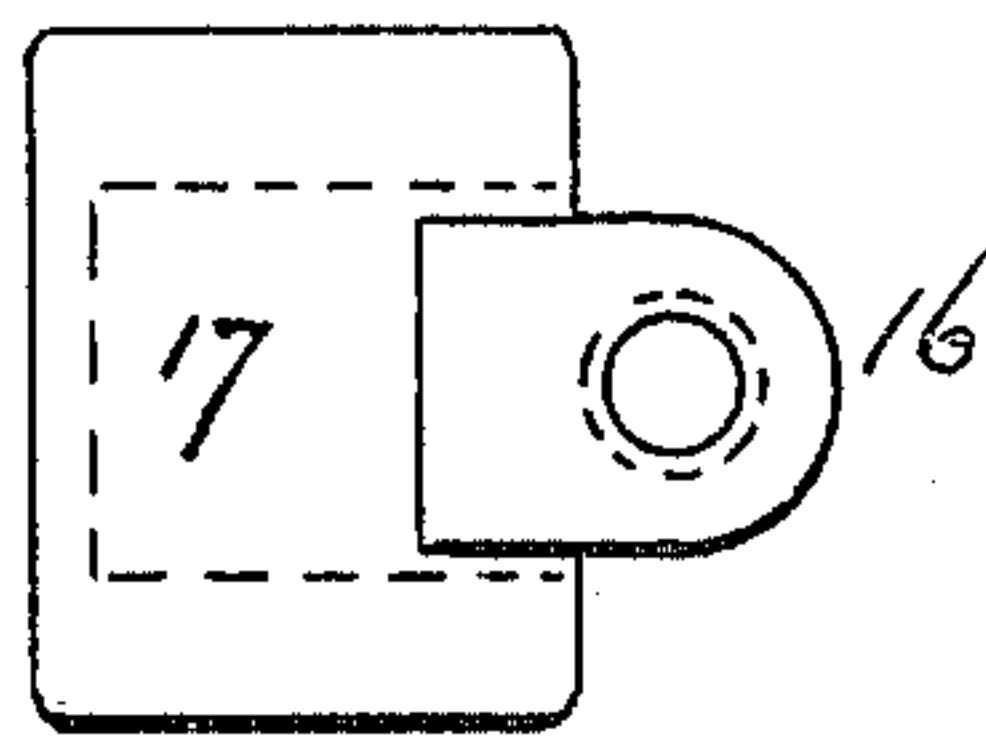
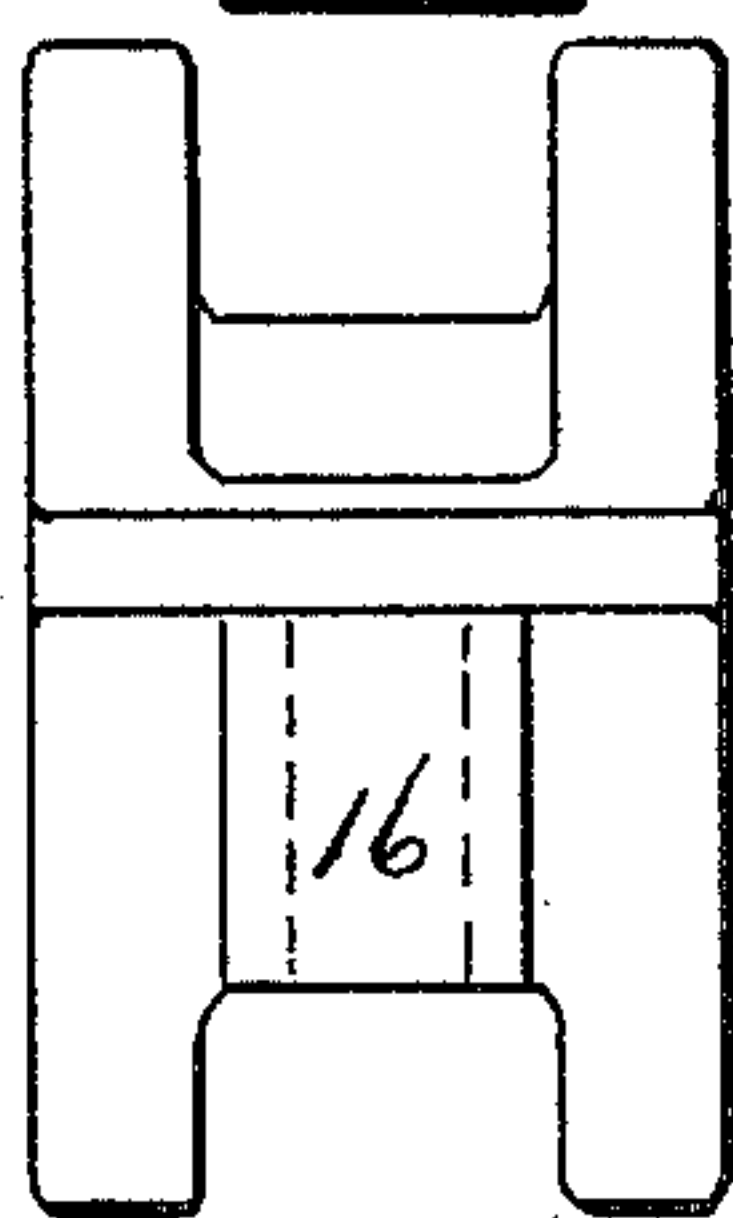


FIG. 6.

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A. J. Clemens

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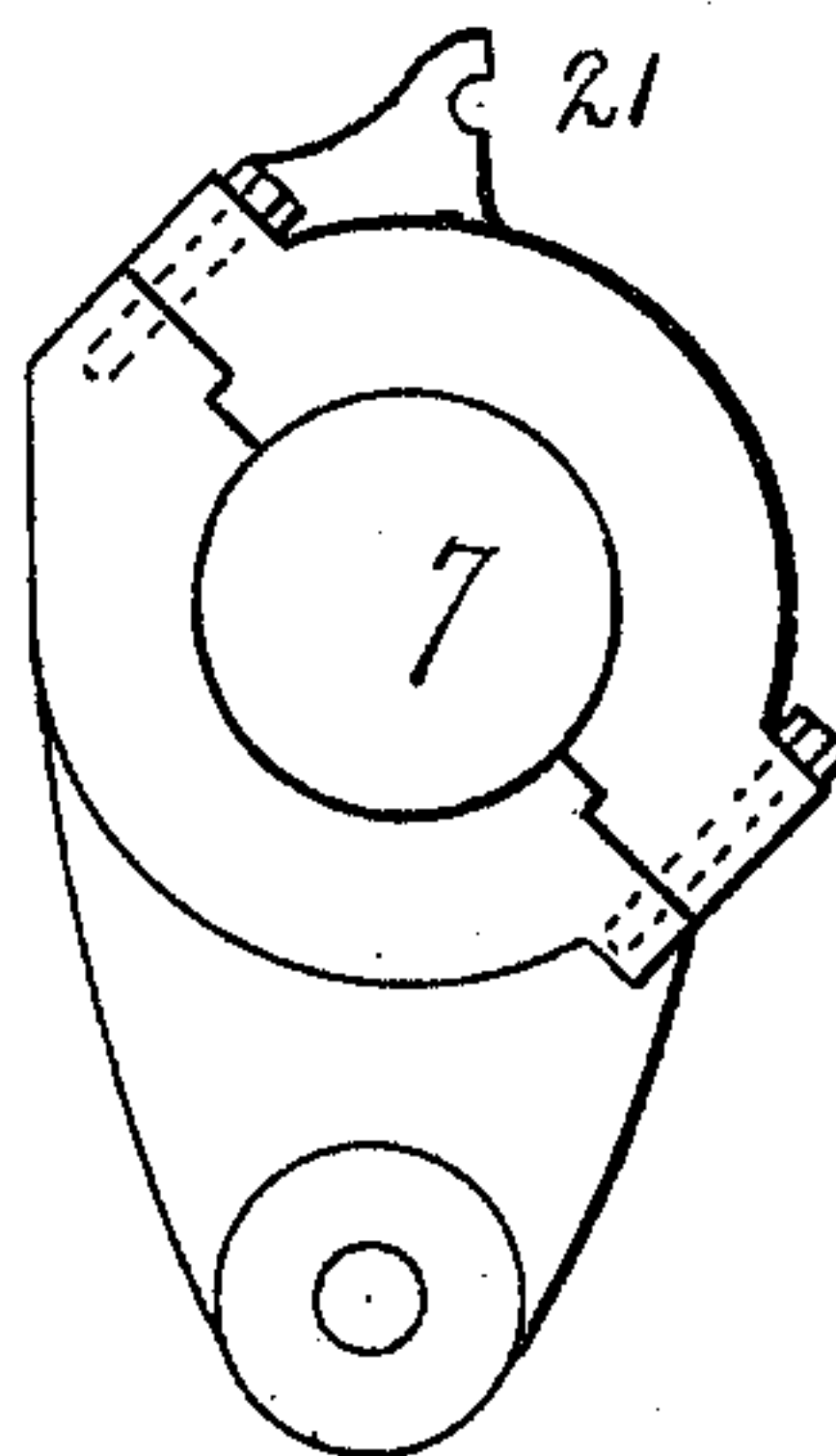
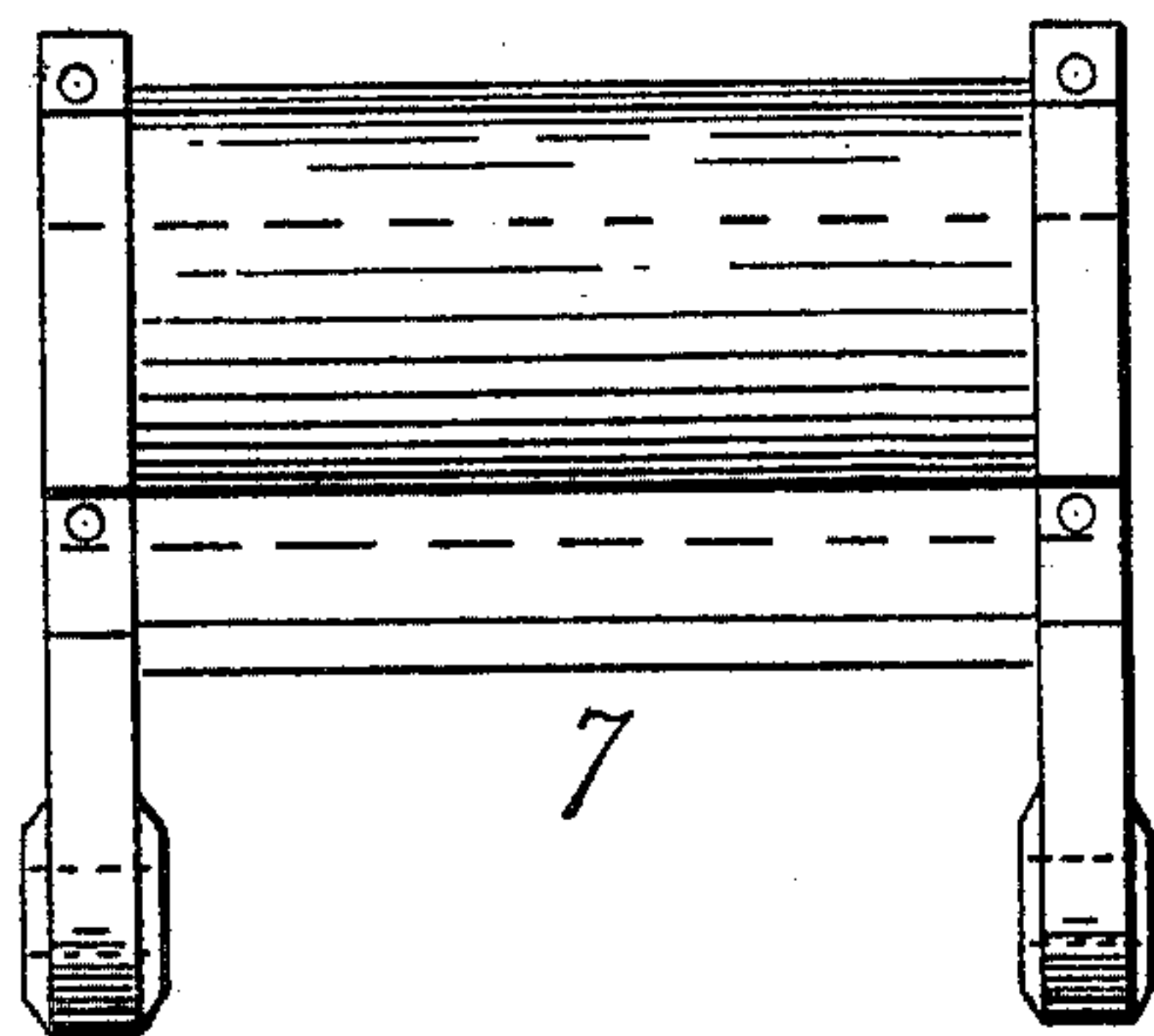
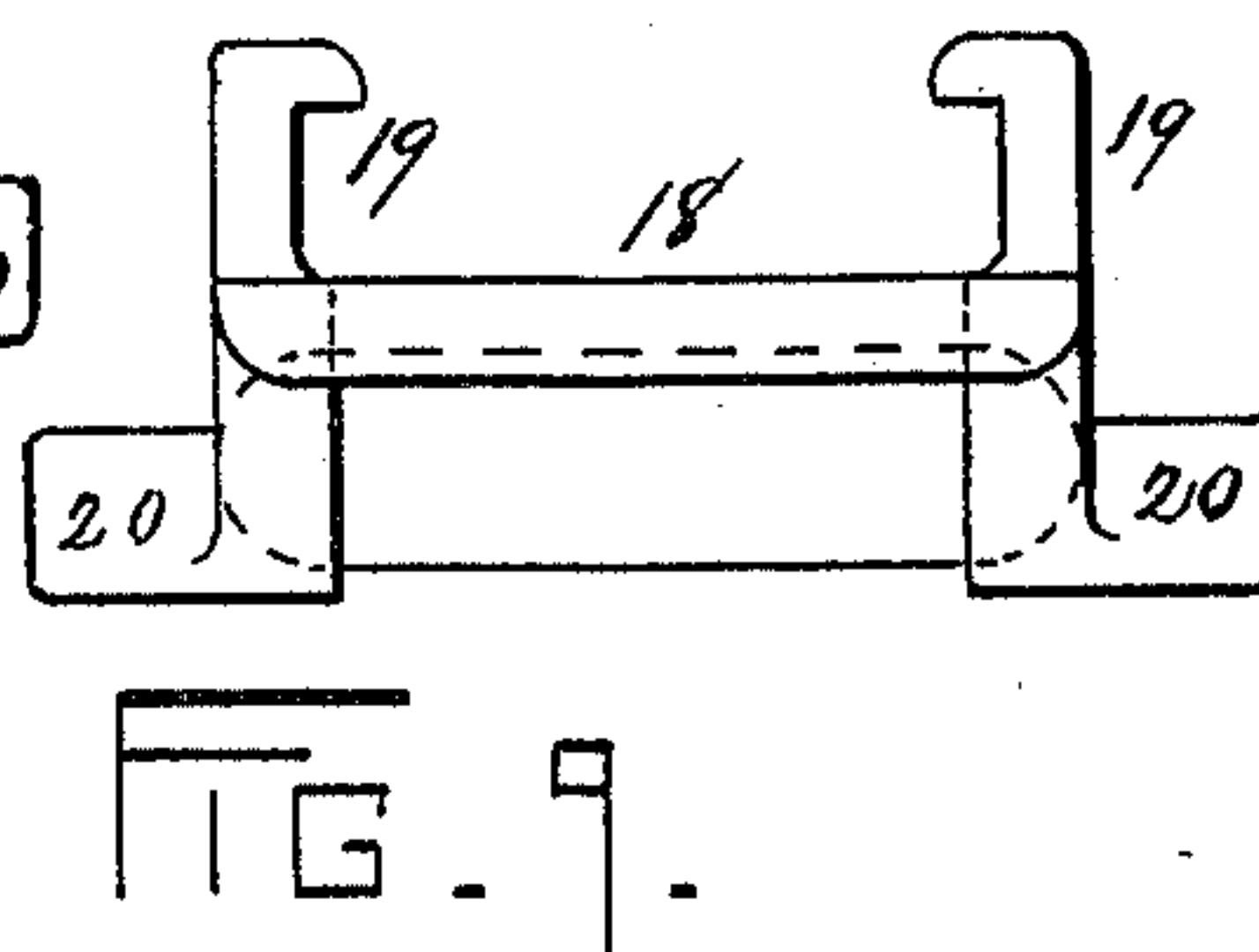
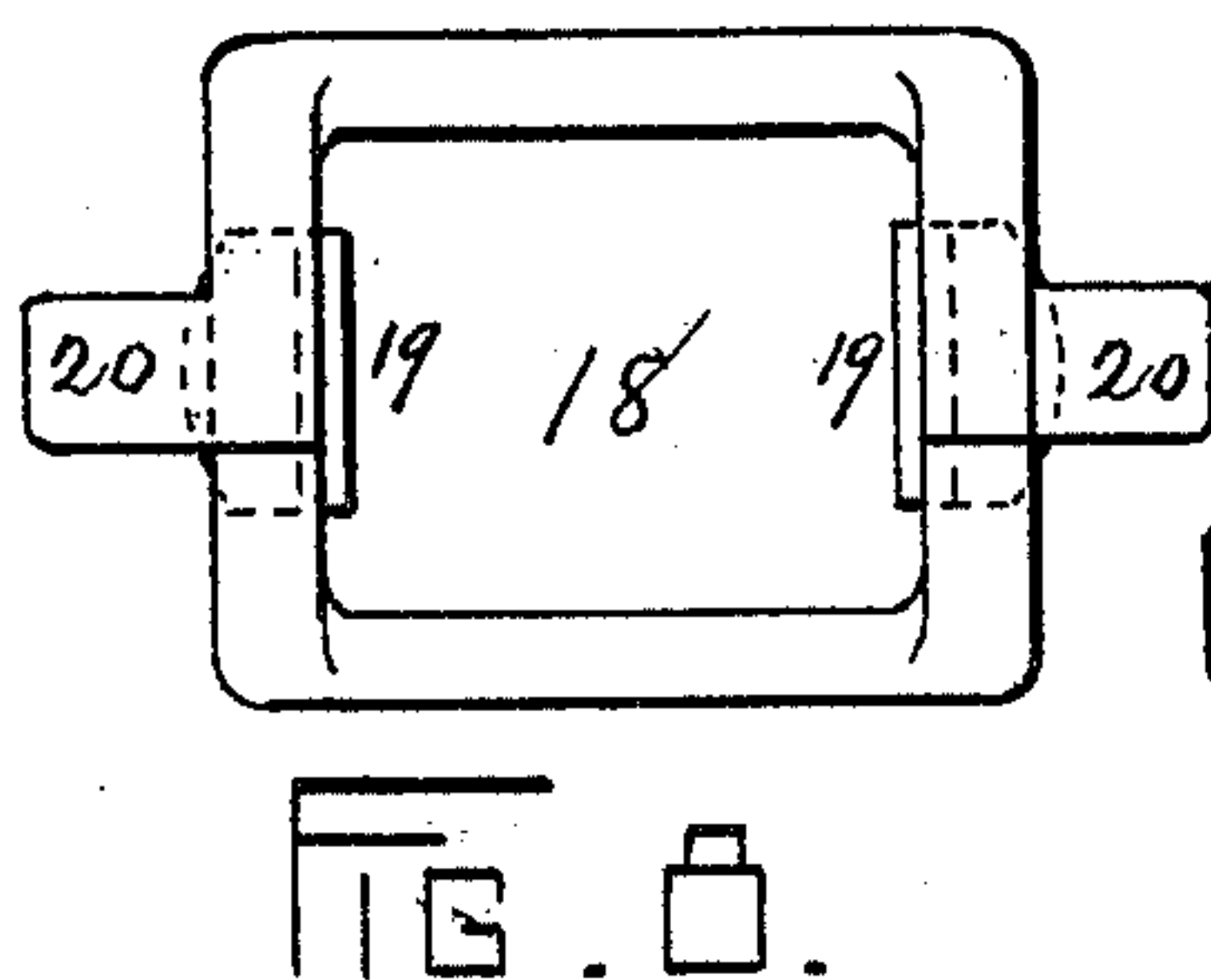
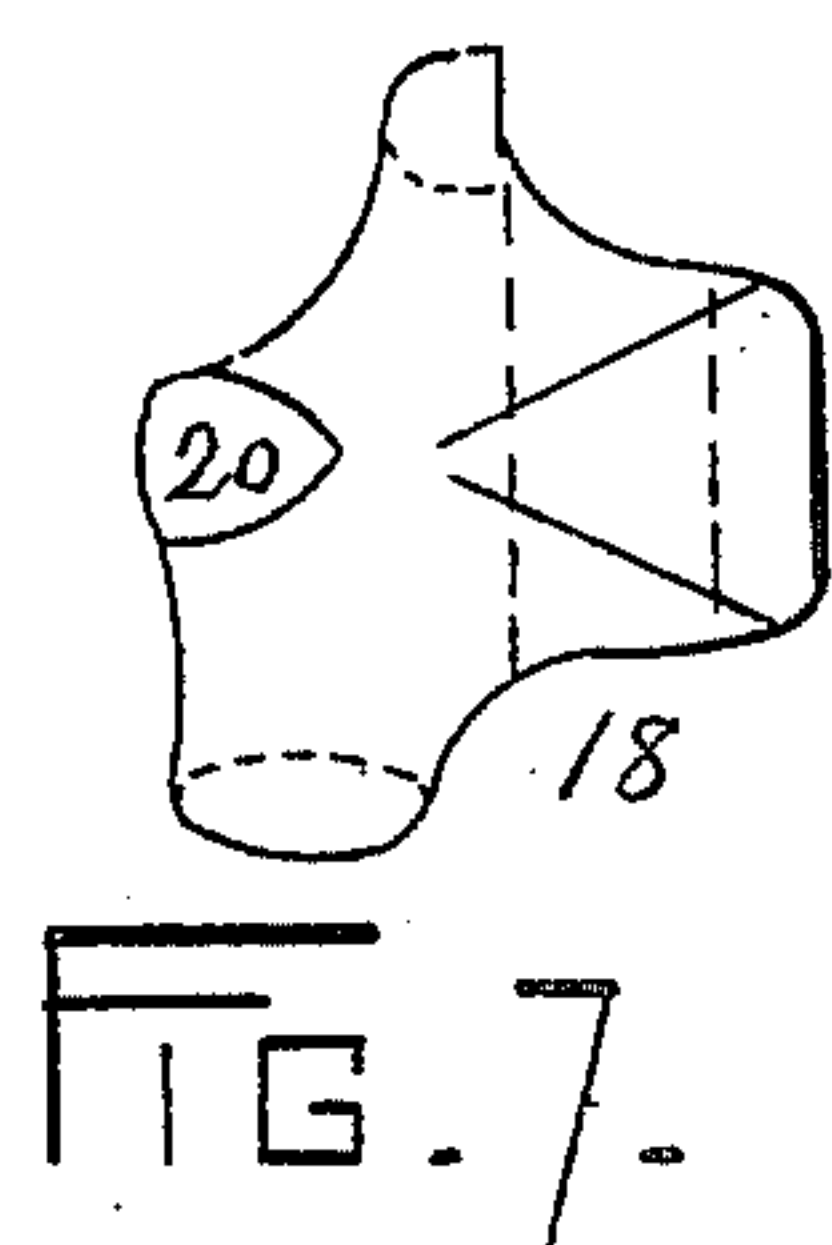
(No Model.)

4 Sheets—Sheet 3.

W. L. MORRIS.
ORE CRUSHER.

No. 581,756.

Patented May 4, 1897.



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(No Model.)

W. L. MORRIS.
ORE CRUSHER.

4 Sheets—Sheet 4.

No. 581,756.

Patented May 4, 1897.

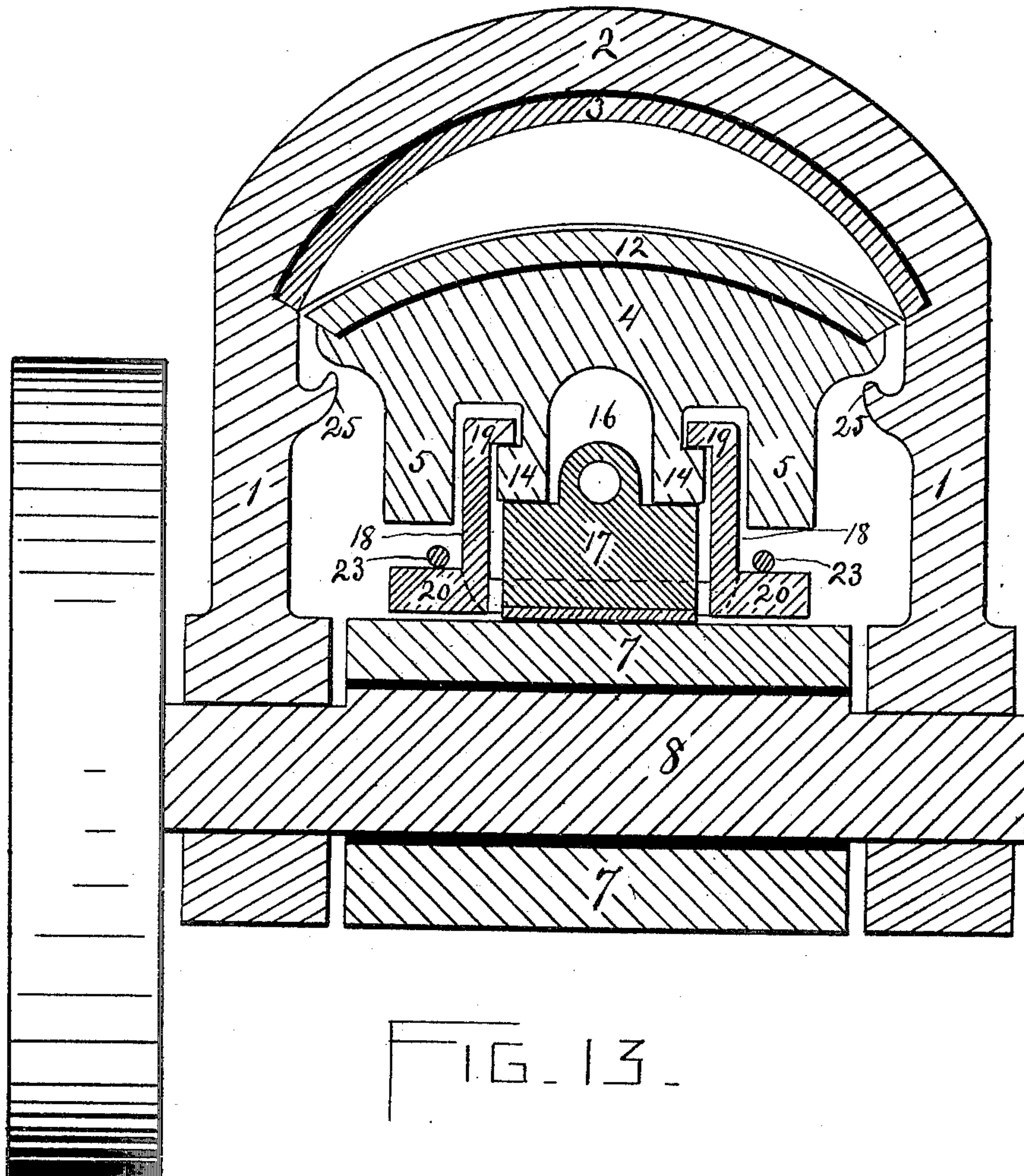


FIG. 13.

ATTEST:

John Holland
S. A. Cook.

INVENTOR:

W. L. Morris
By N. S. Sprague
Atty.

UNITED STATES PATENT OFFICE.

WILLIAM L. MORRIS, OF CLEVELAND, OHIO, ASSIGNOR TO THE MORRIS
BALL PULVERIZER COMPANY, OF SAME PLACE.

ORE-CRUSHER.

SPECIFICATION forming part of Letters Patent No. 581,756, dated May 4, 1897.

Application filed May 29, 1896. Serial No. 593,600. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM L. MORRIS, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Ore-Crushers, of which the following, with the accompanying drawings, is a specification.

This invention relates to certain new and useful improvements in ore-crushers, and is especially designed as an improvement upon Letters Patent No. 450,890, issued to me April 21, 1891.

The invention consists in the means employed for adjusting the movable or oscillatory jaw so as to regulate the machine for crushing ore to different degrees of fineness, as the nature of the ore may require; in the means employed for sustaining the movable jaw in its relative position to the stationary jaw, and in the peculiar movement imparted to said oscillatory jaw, whereby a rolling crushing force is exerted upon the ore, all as more fully hereinafter described.

In the accompanying drawings, which form a part of this specification, Figure 1, Sheet 1, is a vertical longitudinal section showing adjusting mechanism in elevation. Fig. 2, Sheet 1, is a front elevation of the wedge-block and link detached. Fig. 3, Sheet 1, is a section on line *a b* of Fig. 2 and *xx* of Fig. 1, showing the parts connected with the web of the movable jaw. Figs. 4, 5, and 6, Sheet 2, are details of the wedge. Figs. 7, 8, and 9, Sheet 3, are details of the wedge-block link. Fig. 10, Sheet 2, is an enlarged plan looking down upon the two jaws with their dies. Figs. 11 and 12 are side and end elevations of the eccentric-strap. Fig. 13, Sheet 4, is a sectional plan of Fig. 1, taken upon two inclined planes meeting in the axis of the arms 20, one plane passing through the axis of the shaft 8 and the other passing through the arms 19.

1 represents the bed of the machine, which I preferably cast integrally with the stationary jaw 2. This jaw is recessed to receive the removable crushing-die 3.

4 represents the movable or oscillatory jaw, the side arms 5 of which are pivotally hung upon a rod 6, and upon this same rod is also

hung the eccentric strap or box 7, which latter encircles the eccentricated driving-shaft 8, journaled in proper bearings 9 in the bed of the machine.

10 is a toggle or rocking support, the lower end of which has bearing in a bridge 11 of the bed-frame, while its upper end has a similar bearing in the under side of the movable jaw, as is clearly shown in Fig. 1. This jaw is likewise provided with a removable crushing-die 12.

13 represents two lugs cast integrally with the movable jaw and with the bearing-faces 14. An adjusting-screw 15 passes loosely through these lugs and is threaded through the lug 16 of the wedge-block 17, the inclined face of which is in contact with the eccentric sleeve or box 7.

18 is a peculiarly-formed link which engages with the wedge-block, Figs. 2 and 3, the hooked arms 19 engaging with the guide-shoulders formed in the movable jaw in rear of the bearing-faces 14. Projecting laterally from the link are the arms 20.

Rising from the eccentric-box 7 are two lugs 21, with which engages one end of a rod 22, the opposite end of which is connected to the upper end of a spring 23, which passes downwardly in rear of the arm 20 of the link 18, its lower end being connected to a pin or lug 24 near the lower edge of the arm 5 of the movable jaw. There are two of these springs employed, one at each side of the wedge-block, though only one is shown.

25 represents a trough formed on the inner wall of the bed-frame at each side of the machine, and are so formed as to come directly under the side discharge of the machine, so as to catch such material as shall be forced out at the sides in the operation of the machine.

It will be noticed that the movable jaw has no stationary fulcrum, that its weight is mainly supported by an oscillating toggle, and that its rearwardly-projecting arms are pivotally connected to the eccentric-straps which carry the sleeve engaging with the eccentricated shaft. It is by this peculiar arrangement that the movement of parts hereinafter described is attained.

The parts being constructed and arranged substantially as described and shown, the

operation is as follows, it being distinctly understood that the movable jaw is in no way pivotally connected to the body or frame excepting through the medium of the eccentric-box and actuating-shaft: Motion being imparted to the actuating-shaft 8 from any convenient power, the eccentric of said shaft imparts a swinging oscillatory movement to the eccentric-box. The latter, bearing upon the face of the wedge-block, imparts a similar movement, through the connections hereinbefore named, to the movable jaw, causing the latter to rock upon the toggle-support 10, the springs 23 serving to keep the wedge-block and the eccentric-box in contact at all times. The revolution of the eccentric-shaft not only imparts this swinging oscillatory movement to the eccentric-box and movable jaw, but also in the forward or crushing movement causes the jaw to move forward and downward, practically describing the half of an ellipse, while in the retrograde movement the parts assume their original position, thus describing the remaining half of an ellipse, and it will readily be seen that the jaw not only exerts a direct crushing force upon the material introduced, but that it also exerts a rolling or shear crushing force, thus materially increasing the capabilities of the machine.

The object in imparting to the movable jaw the movement herein described is therefore to insure a more positive and effective crushing of the material being operated upon than can be attained by mere compression and to allow the machine to clear itself in the retrograde movement of the jaw without opening the discharge or throat beyond the passage of the maximum-sized ore for which the machine is set.

The position of the wedge-block in relation to the eccentric-box and the movable jaw determines the degree of fineness to which the material is to be crushed. By moving the wedge-block down through the medium of the screw the throat or opening, as between the two jaws, is enlarged, while by

raising it upon the screw such throat or opening is diminished.

The function of the springs 23 is to keep the wedge-block and eccentric-box always in contact, while they also prevent the movable jaw from dropping forward.

To those skilled in the art to which this device appertains its construction and operation will be readily understood without further description.

What I claim as my invention is—

1. In an ore-crusher, in combination, a stationary jaw, a movable jaw resting upon a toggle-support and having its rearwardly-projecting arms pivotally connected to eccentric-straps pendent from an eccentricated shaft, a wedge-block and link located between the eccentric and the movable jaw and in contact with both said eccentric and said jaw, an adjusting-screw engaging said movable jaw and said wedge whereby the latter may be vertically adjusted, the parts being constructed, arranged and operating substantially in the manner and for the purpose set forth.

2. In an ore-crusher, the following elements in combination, a movable jaw, an adjustable wedge-block and link, an adjusting-screw engaging said block and jaw, and said link engaging said block and said jaw, substantially as and for the purpose set forth.

3. In an ore-crusher, in combination, a stationary jaw, a movable jaw, an adjustable wedge-block and link, an adjusting-screw engaging said wedge-block, and said link engaging said block and said movable jaw, and springs the lower ends of which are connected to the movable jaw with their upper ends adjustably connected to the eccentric-sleeve of the eccentricated actuating-shaft, substantially as and for the purpose set forth.

In testimony whereof I affix my signature, in presence of two witnesses, this 21st day of May, 1896.

WM. L. MORRIS.

Witnesses:

JOHN W. MORRIS,
H. S. SPRAGUE.