

No. 720,054.

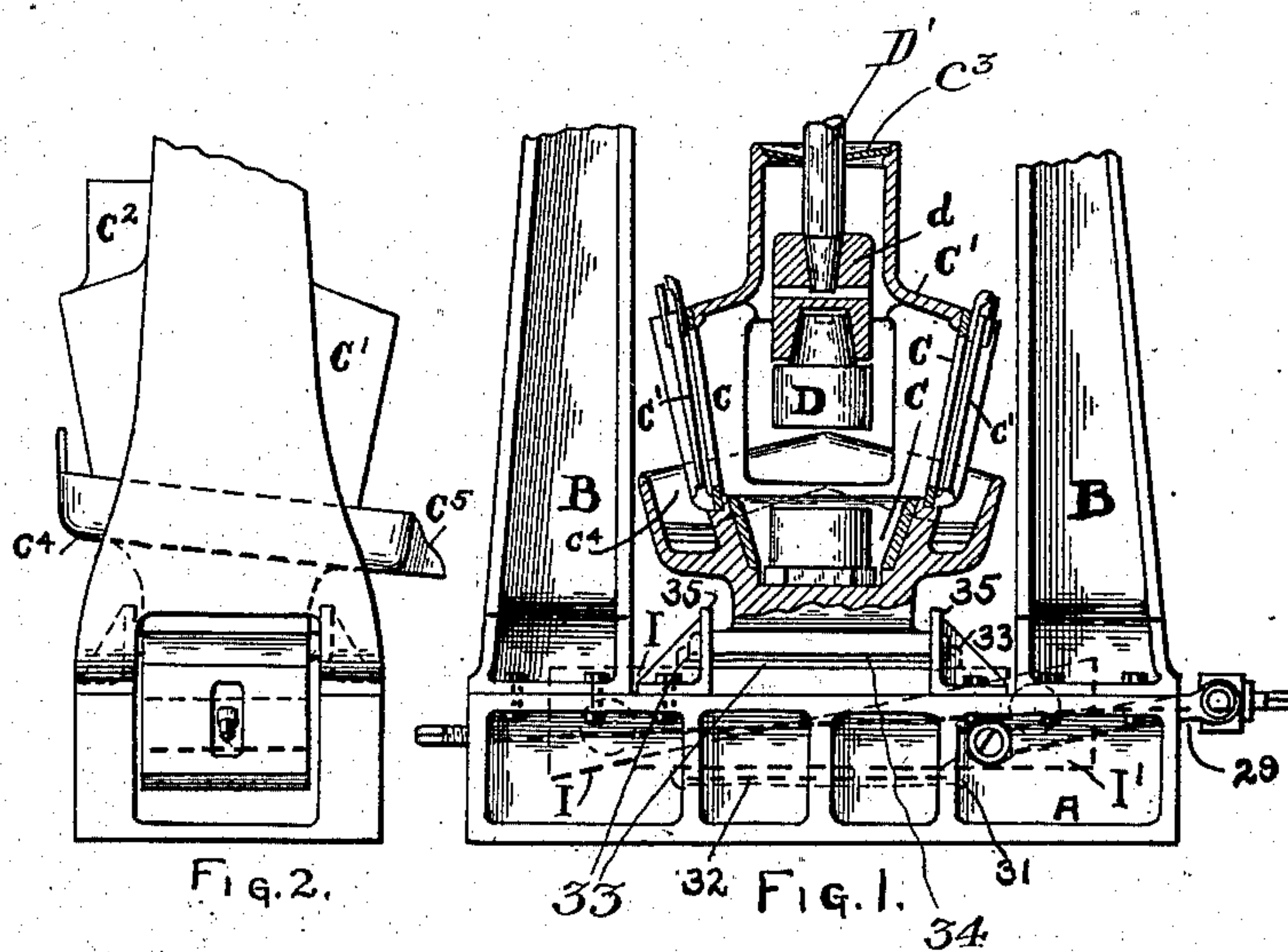
PATENTED FEB. 10, 1903.

W. S. McKINNEY.  
STAMP MILL.

APPLICATION FILED AUG. 26, 1901.

NO MODEL.

3 SHEETS--SHEET 1.



WITNESSES:  
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3 SHEETS—SHEET 2.

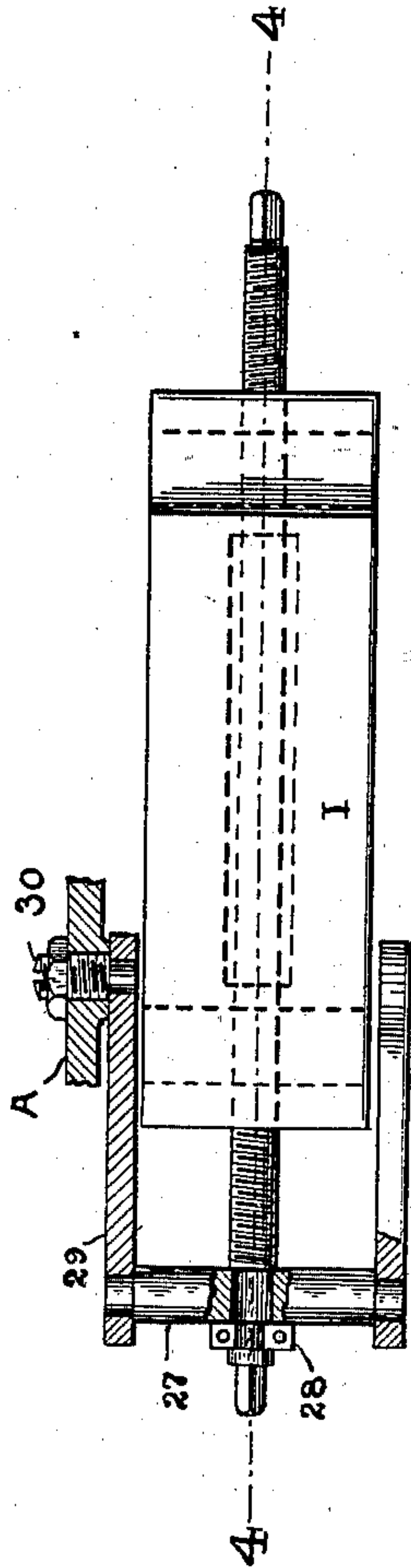


Fig. 3.

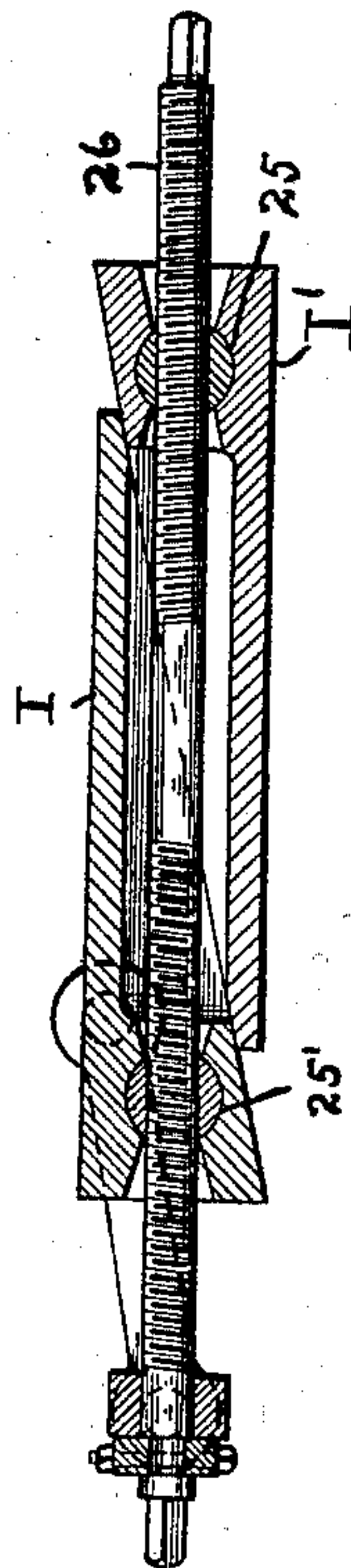


Fig. 4.

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3 SHEETS—SHEET 3.

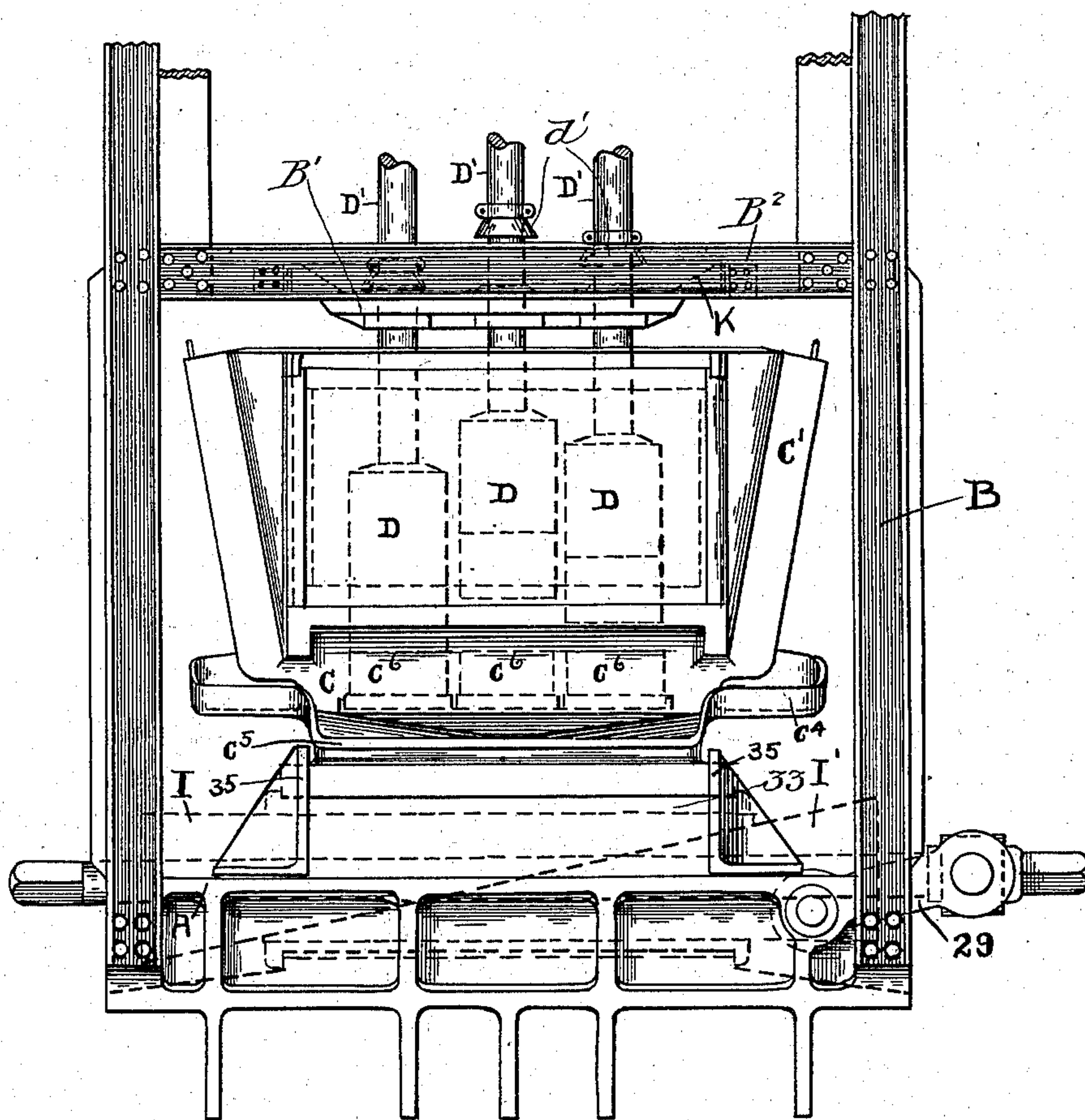


Fig. 5.

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# UNITED STATES PATENT OFFICE.

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## STAMP-MILL.

SPECIFICATION forming part of Letters Patent No. 720,054, dated February 10, 1903.

Original application filed March 14, 1901, Serial No. 51,166. Divided and this application filed August 26, 1901. Serial No. 73,354. (No model.)

*To all whom it may concern:*

Be it known that I, WALTER SABIN MCKINNEY, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Stamp-Mills; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, which form a part of this specification, the same being a division of my application, Serial No. 51,166, filed March 14, 1901.

My invention relates to improvements in stamp-mills for crushing and comminuting ores and like hard substances, and refers more specifically to that class of stamp-mills provided with a stationary die or dies and with reciprocating stamps or shoes.

In the operating of stamp-mills the dies and stamps or shoes are subjected to constant wear, with the result that the correct contact between the shoes and dies necessary to produce a uniform product and to obtain the maximum output or to keep the mill up to its most effective and fullest crushing capacity may be maintained only by providing adjusting means to compensate for this deterioration of the parts and to preserve the relation between the dies and shoes as approximately constant as possible. In stamp-mills as now generally constructed the adjustment to provide for the take-up of this constant wear of the shoes and dies is effected by various expedients or devices—such, for example, as lowering or resetting the steam-cylinder or removing distance-blocks in the frame. In all types of mills with which I am familiar and which embody some such analogous form of device the adjustment always results in a considerable loss of time, for it is necessary to stop the mill while the changes are being made. Furthermore, the adjustment is frequently improperly done, whereby the mill is not properly set—as, for example, the piston-rod is often left out of line with the guides. It is also apparent that in all such types of mill a very serious loss of capacity results, owing not only to the time consumed in making the required adjustments during which the mill is idle, but also due to the fact that while the mill is running it is for much of the time below its

maximum output, owing to the very rapid wear of the shoes and dies, which affects the effective relation between these parts until another adjustment is made.

The primary object of the present invention is to provide a stamp-mill in which the proper adjustment to compensate for the wear of the shoes and dies may be made while the mill is in operation, whereby the relation between the shoes and dies approximates the maximum effective points at all times and the mill is kept up to its fullest capacity.

Another object is to provide an adjusting device whereby the alinement of parts is not disturbed in any manner in effecting the adjustment.

With these objects in view the invention consists in an improved mechanism to provide for the proper adjustment of the parts while the mill is in operation, to compensate for the constant and rapid wear of the shoes and dies, and to preserve the alinement of the parts during the adjusting operation.

In the drawings illustrating an exemplification of my invention, Figure 1 is a front elevation of a mill of the single-stamp style constructed in accordance with my invention, the mortar being shown in section. Fig. 2 is a side elevation of the same. Fig. 3 is a detail plan view of the means to adjust the dies. Fig. 4 is a sectional view on the line 4-4 of Fig. 3, and Fig. 5 is a front elevation of a mill provided with a plurality of dies and shoes and embodying my invention with respect to the adjusting means.

The stamp-mill shown in the drawings consists of a bed or mortar-block A, having a suitable frame bolted or otherwise attached thereto and which consists of vertical standards B, which may be arched at their tops, where they are secured by any suitable cross head or plate (not shown) and braced at any suitable point in their length by a piston-rod guide B', (shown in Fig. 5,) secured thereto in any suitable manner. A mortar is secured upon the mortar-block by means more particularly hereinafter described and consists of the usual casting C, forming the base, and the casing C', the latter having screens c and dash-plates c', placed in the openings around the sides, and a suitable feed-opening c<sup>2</sup> and



cover-plate  $c^3$ , all in the usual manner. A trough  $c^4$  surrounds the mortar, having a suitable spout  $c^5$  at the front. Within the mortar is mounted the die or dies  $c^6$ . Upon the framework is mounted a suitable motor (not shown) for operating the stamp D, which latter is supported within a suitable boss-head  $d$ , mounted upon a reciprocating stamp-stem or piston-rod D', which is attached to the motor and through which motion is imparted to the stamp. The rod D' is provided with a hood  $d'$ , (see Fig. 5,) which prevents any grease or oil following the piston-rod and which co-acts with a drip pan or tray K, surrounding the rod and supported upon the framework B<sup>2</sup>, as shown in Fig. 5, the hood being adapted to deflect the oil within the pan about the rod. The tray K acts as a thorough protector to prevent any grease, oil, or greasy water from the steam-cylinder falling into the mortar. The die and shoe or stamp are subjected to rapid and constant wear in the operation of the mill. It is obvious that as the faces of the shoe and die wear away the force of the blow changes, thereby materially reducing the effective operation of the mill until another adjustment is made to restore the parts to their relative adjustment of maximum capacity. To effect the easy and accurate adjustment of these parts to compensate for wear, I provide a device whereby this may be accomplished while the mill is in operation. For this purpose I employ as illustrating the best exemplification of my invention in this respect a wedge which is susceptible of adjustment during the operation of the mill and which insures a perfectly straight vertical movement of the mortar. As shown in the drawings, the mortar carrying the die lies between the guide-plates 35 and rests upon a wearing-plate 33, which has flanges confining the base of the mortar and a suitable buffer-strip 34 of elastic or other substance. The plate 33 rests in turn upon the upper wedge member, the inclined face of which rests upon the oppositely-inclined face of the lower wedge member, which in turn rests upon a wearing-plate 31 on a suitable buffer-strip 32, the plate 31 being secured to the casting of the base by suitable flanges, as shown. Each wedge member is provided with a swiveling nut 25 in the form of a cross-shaft, which is tapped to receive one end of the screw-rod 26. The rod is reversely threaded or provided with right and left hand threads, as shown, and is squared at each end for manipulation by a suitable wrench. The screw 26 is shouldered at one end and receives the bore of a cross-rod 27, which is held in place against the shoulder by a split collar 28. The cross-rod 27 is connected by any suitable means to the frame of the mill—as, for example, by the links 29, which are secured at one end to the frame A by suitable means, such as the screw-pins 30. It is obvious that the screw 26 may be operated from either end to raise the mortar, so as to compensate for

the wear of the shoe and die. As the wedges are connected by the links 29 to the frame of the mill, they always maintain the same position relative to the center line of the machine and raise the mortar in a straight vertical line without in any manner disturbing the alinement of the parts. By reason of this construction the mill has the great advantage of easy and absolutely accurate adjustment while in operation, permitting its employment at all times and affording the operator means to constantly keep a correct and uniform contact between the shoe and die, as slight adjustment may be made from time to time, with the result of a uniformly-comminuted product and maximum output, as the fullest crushing capacity of the shoe and die can always be maintained.

It is obvious that the adjusting means may be applied to a mill of any capacity. As shown in Fig. 1, it is used in a single-stamp mill; but in Fig. 5 I have shown a three-stamp mill equipped with the wedge adjustment. In this form the mortar is provided with a plurality of dies  $c^6$ , with which coöperate a like number of associated stamps or shoes, the latter being operated from any suitable source of power and in any desired order. The adjustment of the mortar is accomplished in the manner above described by means of the centered wedge arrangement. The force of the blows and their frequency may similarly be controlled in this plural form of mill.

I claim—

1. In a stamp-mill, the combination with the stamp and die, of a wedge to adjust the die, and means to automatically center the wedge in the frame of the mill as the adjustment is effected.

2. In a stamp-mill, the combination with a frame, a stamp and a mortar carrying a die, of means to adjust the mortar comprising oppositely-faced wedge-blocks having a right-and-left screw-rod, and connections between the frame and rod.

3. In a stamp-mill, the combination with a frame, a reciprocating stamp, a mortar having a die, a wedge supporting the mortar, means to operate the wedge to adjust the mortar, and links connecting the wedge and frame to center the former in the latter.

4. In a stamp-mill, the combination of a frame, a stamp reciprocating therein, a mortar carrying a die in alinement with the stamp, a wedge supporting the mortar and comprising a pair of blocks having oppositely-inclined contacting faces, a nut pivoted in each block, a reversely-threaded screw-rod engaging the nuts, and a pair of links pivoted to the frame and connected to the screw-rod.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WALTER SABIN MCKINNEY.

Witnesses:

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