

No. 607,164.

Patented July 12, 1898.

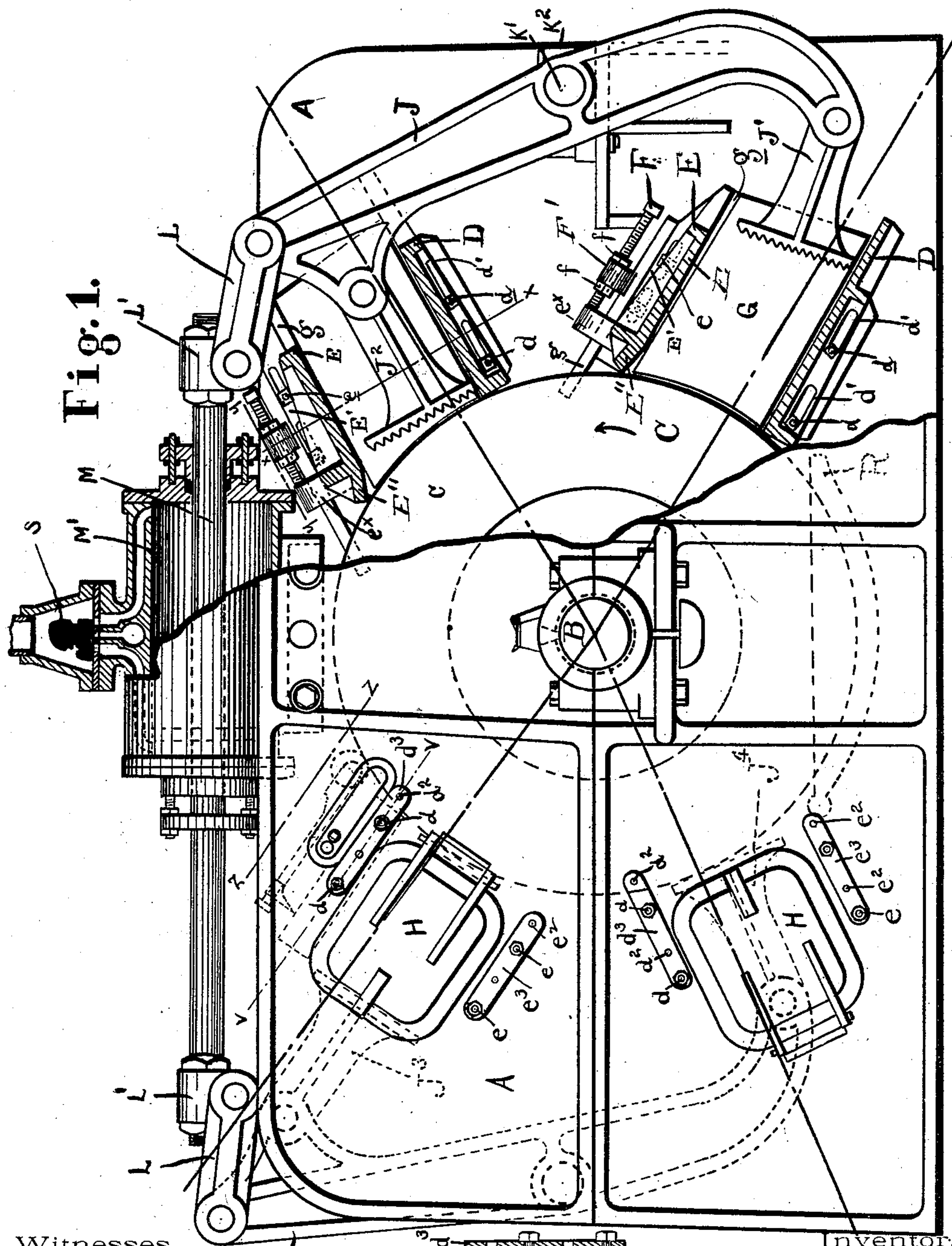
B. EILERS.

WOOD GRINDER FOR PULP MAKING.

(Application filed Oct. 23, 1896.)

(No Model.)

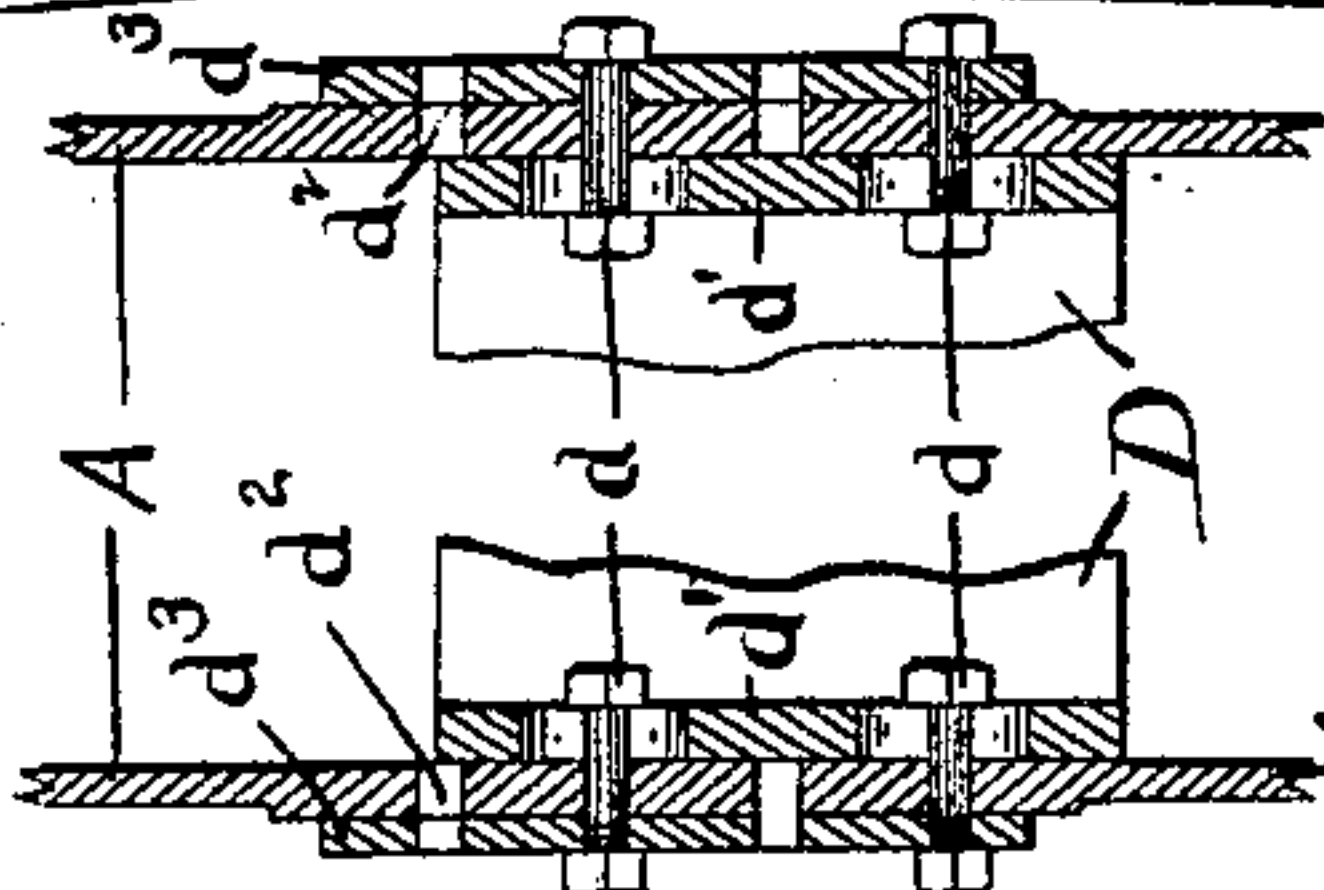
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Witnesses.

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Fig. 1a.



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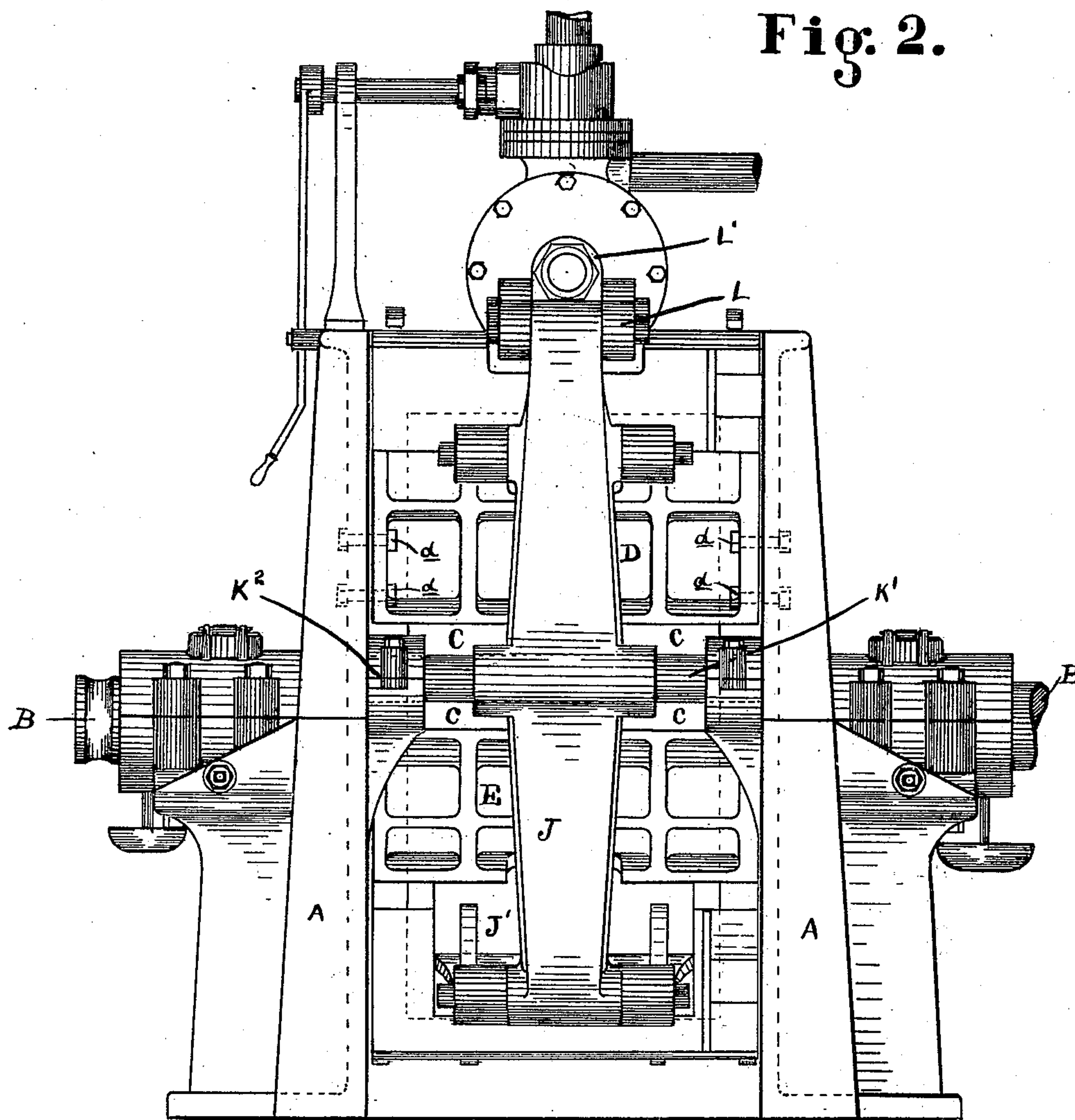
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(No Model.)

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Fig. 2.



Witnesses.

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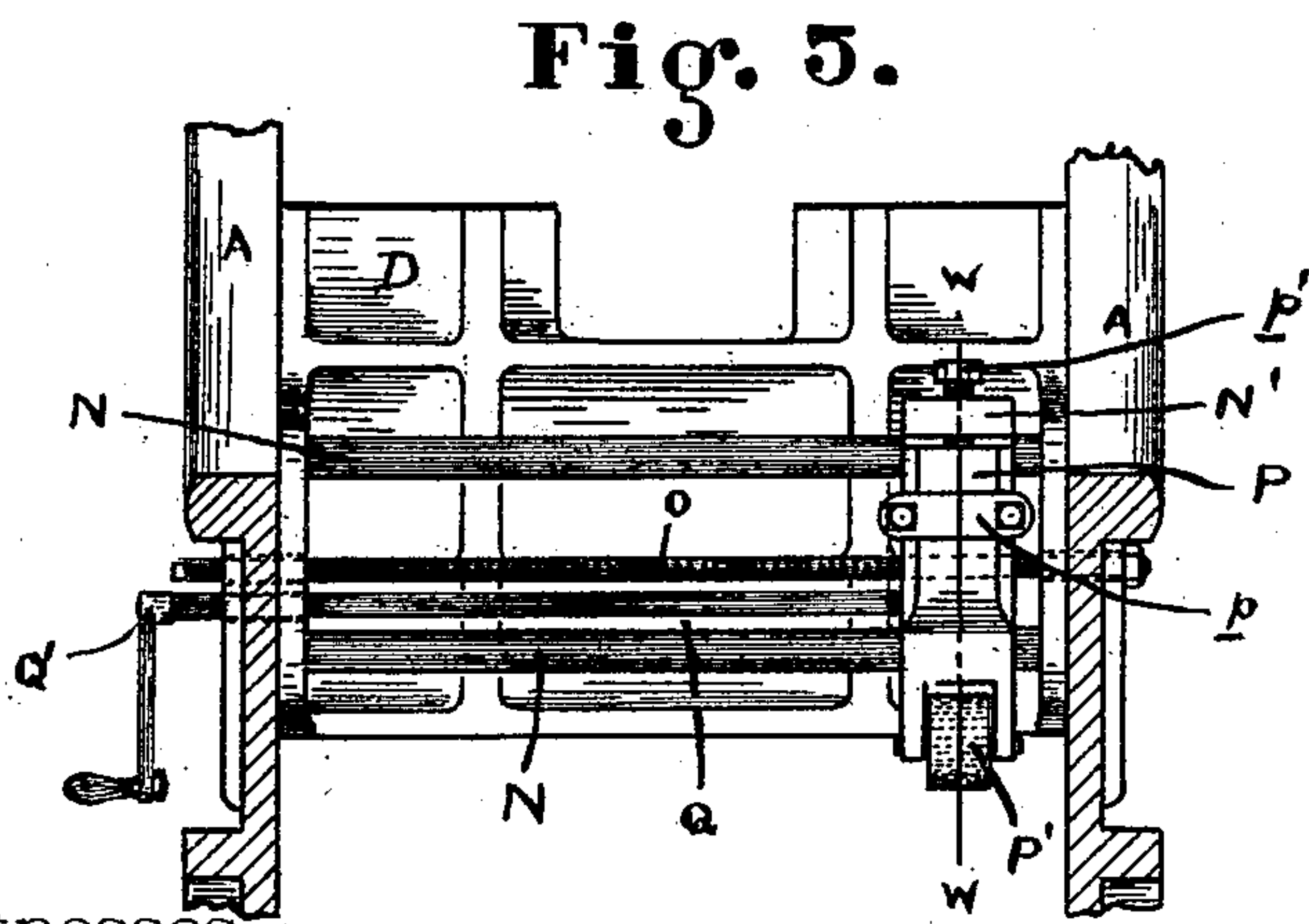
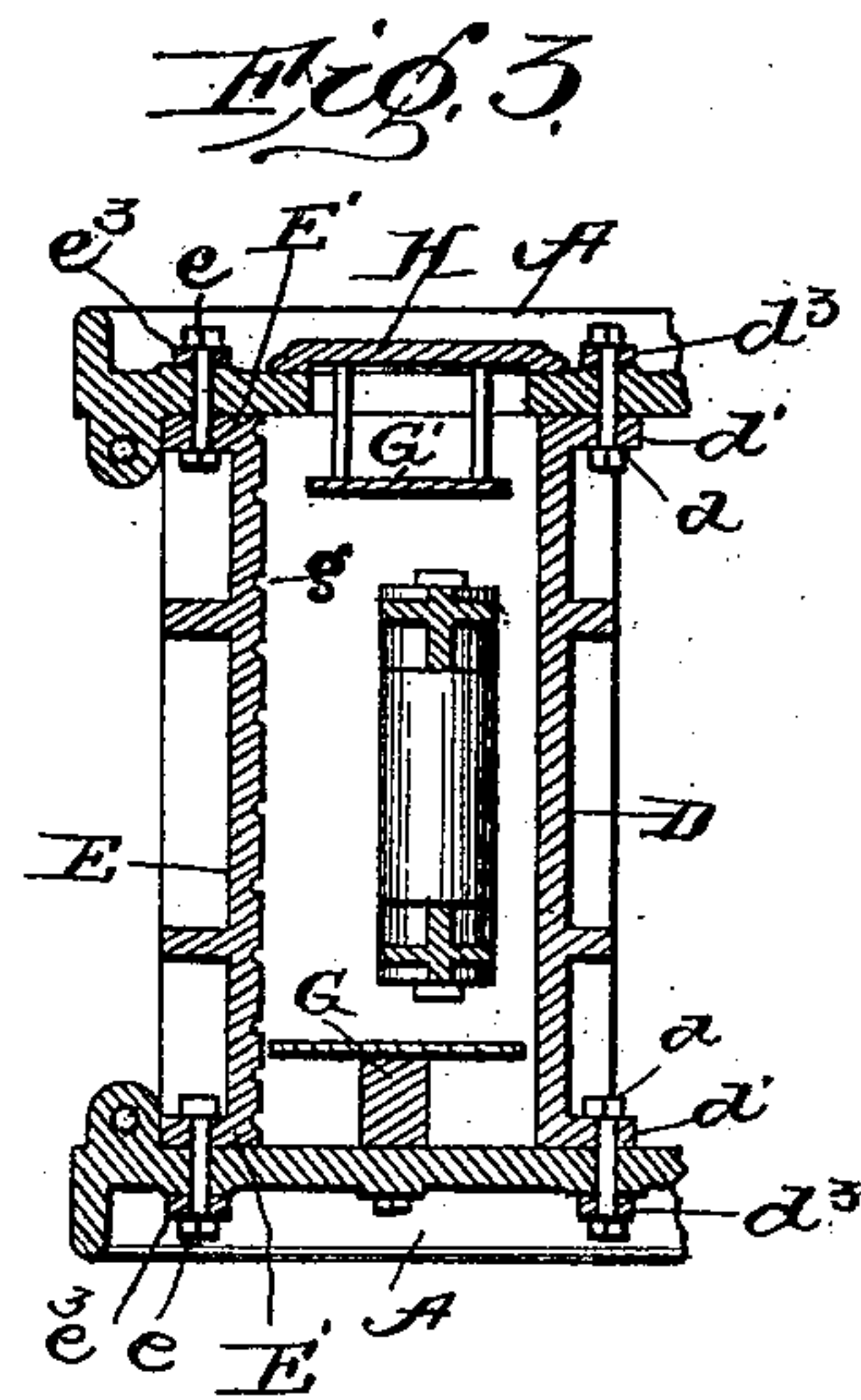
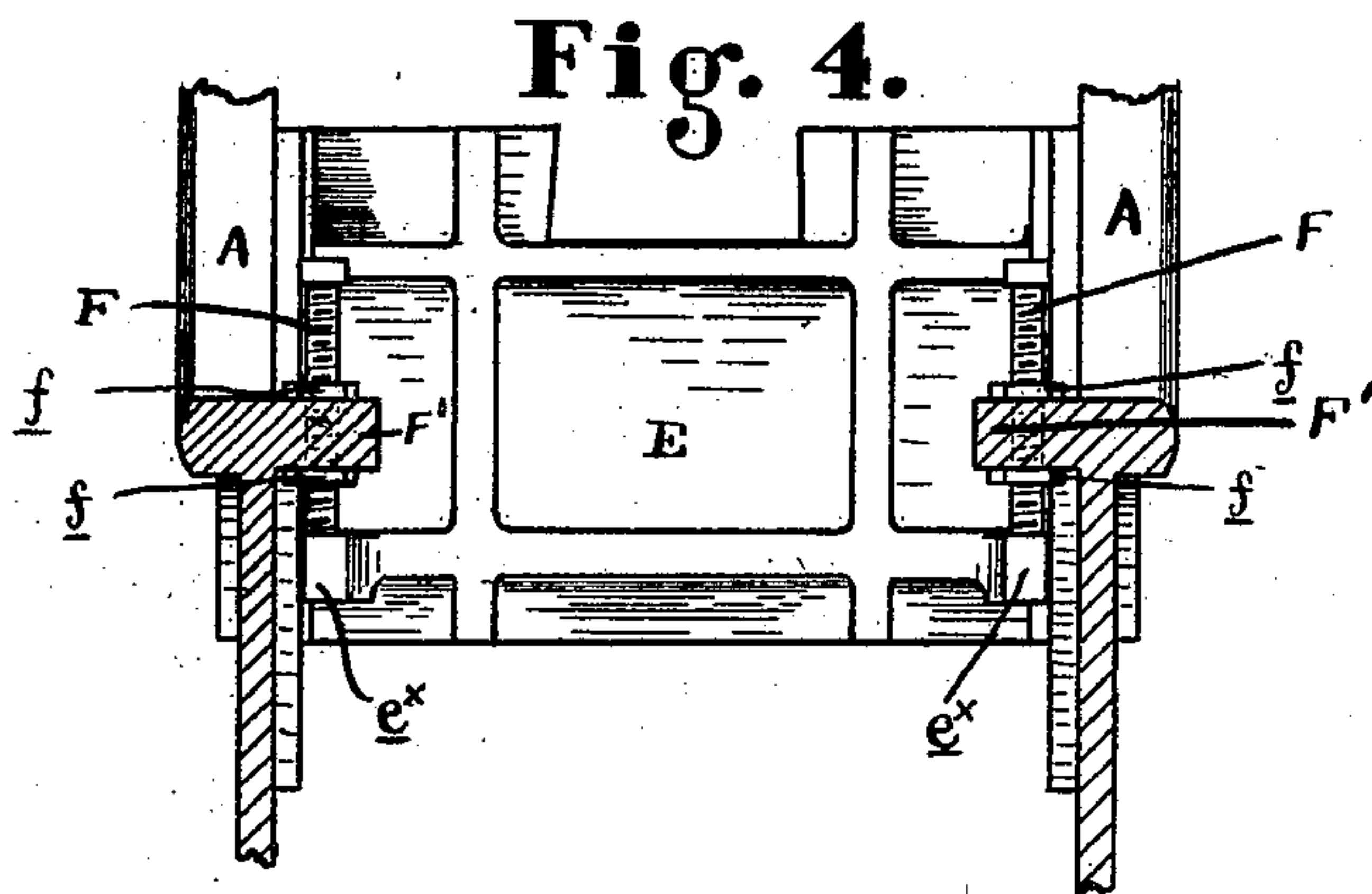
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3 Sheets—Sheet 3.



Witnesses.

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UNITED STATES PATENT OFFICE.

BERNERD EILERS, OF ROCHESTER, NEW YORK, ASSIGNOR OF ONE-HALF
TO WILLIAM A. MURPHY, OF SAME PLACE.

WOOD-GRINDER FOR PULP-MAKING.

SPECIFICATION forming part of Letters Patent No. 607,164, dated July 12, 1898.

Application filed October 23, 1896. Serial No. 609,813. (No model.)

To all whom it may concern:

Be it known that I, BERNERD EILERS, of Rochester, in the county of Monroe and State of New York, have invented certain new and
5 useful Improvements in Wood-Grinders for Pulp-Making; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of
10 this specification, and to the reference-letters marked thereon.

My present invention relates to wood-grinders for making pulp, such as contained in Letters Patent No. 402,425, granted to me
15 April 30, 1889, and has for its objects to improve the construction and operation of said machines whereby the wood or other material to be ground is presented to the grinding-cylinder in such manner as to produce the
20 best quality of pulp and also preserve the feature first illustrated in my patented machine of providing a uniform and continuous feed of material to the grinding-cylinder; and to these and other ends the invention consists
25 in certain arrangements and combinations of parts, all as will be hereinafter described, and the novel features pointed out in the claims at the end of this specification.

In the drawings, Figure 1 is a side elevation
30 of a machine constructed in accordance with my invention, a portion of the ram-cylinder being broken away and the pockets on one side of the machine being shown in section; Fig. 1^a, a section on the line *vv* of Fig. 1; Fig. 2, an end view of the same; Fig. 3, a sectional view on the line *xx* of Fig. 1, looking
35 outward; Fig. 4, a sectional view on the line *yy* of Fig. 1; Fig. 5, a sectional view on the line *zz* of Fig. 1, looking downward; Fig. 6, a
40 sectional view on the line *ww* of Fig. 5.

Similar reference-letters in the several figures indicate similar parts.

As in my prior patent, the machine embodies generally a plurality of wood-pockets
45 or receptacles disposed around a grinding-cylinder, and the pressers or followers in said pockets are so arranged and connected as to enable the grinding operation to be carried on continuously without decreasing the load
50 on the cylinder.

The main frame of the machine embodies

generally two side frames or plates A A, suitably braced and connected and each constructed, preferably, in two parts, divided approximately in a horizontal plane extending through the axle or shaft B, on which the grinding cylinder or stone C is mounted, the shaft and stone being arranged to be driven at a high rate of speed and by a motor having great power.

Arranged around the grinding-cylinder are several wood pockets or receptacles, four being employed in the present instance, and one side of each pocket is composed of a heavy plate or casting D, extending between the
65 sides A and adjustably secured in position, whereby the plates may be moved close to the cylinder as the latter wears down. The plates D are provided with slotted flanges *d'*, through which pass bolts *d*, the latter extending
70 through the side frame A and also through plates *d*³ on the outside of the latter, having apertures *d*² for the bolts. The plates D of each of the pockets are similar in construction and constitute the rearward side of the pockets relatively to the direction of rotation of the grinding-cylinder. The draw or forward side of each of the pockets is constructed of a heavy plate E, having the slotted flanges *E'*, through which pass securing-bolts *e*, extending
80 through apertures in the side plates A and also through apertures *e*² in the plates *e*³ on the outside of the frame A, said plates *d*³ and *e*³, as in Fig. 1^a, constituting merely washers beneath the nuts or bolt-heads. These plates
85 E are further provided with lugs or bosses *e*^x, with which cooperate adjusting-screws F, passing through lugs *F'* on the side frames A, as shown particularly in Figs. 1 and 4, for the purpose of permitting the adjustment of the
90 plates E toward and from the cylinder when the bolts *e* are loosened. The screws F are secured by set-nuts *f* or equivalent securing devices when the machine is in use.

The inner ends of the plates E next the cylinder are beveled slightly at *E''* in the direction of movement of the grinding-cylinder, and their inner faces are provided with longitudinal tapering grooves *g*, said grooves being shallower at the end of the plate in proximity to the cylinder and serving to permit the ground pulp to pass outward into the

pockets and beyond the follower operating therein. These grooves, however, being small, do not permit the chipping of the wood as it is drawn against the plate by the rotation of the cylinder, but, as stated, will prevent choking and regrinding of the pulp. It will be noted that the greater portions of the areas of the pockets are on the "draw" side of lines radiating from the center of the grinding-cylinder, which causes the cylinder in a measure to feed itself by drawing the wood toward the plates E on the draw side of the pockets. The grinding cylinder or stone being slightly narrower than the space between the side frames A, the pockets are formed of the width of the cylinder on one side by the plates G and on the other by plates G', attached to the doors H, closing the feeding-openings into the pockets, as shown particularly in Figs. 1 and 3.

J¹ J² J³ J⁴ indicate the pressers or followers for pressing the wood blocks upon the grinding-cylinder, two of said pressers being located upon each side of the cylinder, one above and the other below the center thereof, and one pair, J¹ and J², is pivoted to the opposite ends of a lever J and the other to the opposite ends of a lever K, said levers being mounted upon shafts or journals K', supported in suitable adjustable bearings K² on the side frames. The inner faces of the pressers J are grooved or serrated longitudinally, so as to prevent the wood blocks from rolling or slipping when the machine is in operation.

To the extreme upper ends of the levers J and K are pivoted links L, connected by collars L' or other suitable connections with the opposite ends of a piston-rod M, having upon it a suitable piston operating in a cylinder M', arranged at the top of the machine and constituting a hydraulic ram for operating the levers J and K in opposite directions alternately.

A suitable valve S is employed for admitting fluid under pressure to opposite ends of the cylinder alternately, thereby causing the movements of the levers in the same direction and moving the pair of followers J¹ and J³ or J² and J⁴ toward the cylinder and pressing the wood against it to be ground while the other pair of pressers or followers are being moved away to open the pockets and permit the introduction of wood, so that when the ram is reversed the followers in the pockets last filled will move toward the cylinder, while the others will be retracted, thereby insuring an even pressure upon the cylinder at all times, rendering the operation continuous and relieving the parts from strain.

In order that the cylinder or stone C may be tried up and dressed when desired, I provide two guide-rods N N, extending across the face of the stone and preferably secured to one of the plates D, (see Figs. 5 and 6,) and upon these guides is a carriage N', operated back and forth across the face of the stone by a screw O, passing through and en-

gaging a threaded aperture in the carriage and supported at its ends in the side frames or preferably in the flanges of the plate D. The end of the screw is made angular for the application of a removable operating-handle.

Mounted upon the carriage N' is a slide P, having at one end a steel dressing-roller P', roughened or corrugated, said slide being held by a plate or strap p and its upper end abutting against an adjusting-screw p' on the carriage. The under side of the slide next the carriage is provided with a rack q, engaged by a pinion q', formed upon or secured to a spindle Q, extending out at the side and adapted to be actuated by a removable handle Q' to move the roller down into engagement with the surface of the stone to dress it, in which position it is secured by the screw p', and when thus secured the screw O is operated to move the carriage back and forth across the stone, as will be understood.

In the lower portion of the main frame and beneath the stone is arranged an adjustable pan R, which is always filled with water and ground pulp and serves to keep the stone wet, though, as usual, several jets of water are supplied to the stone at various portions of its surface.

By the employment of a pivotal connection between the levers J and K and the presser-plates or followers the latter are permitted to accommodate themselves to the wood in the pockets and press it firmly at all times upon the cylinder, and the corrugations in the face of the followers prevent the slipping and rolling of the wood blocks.

The arrangement of a plurality of pockets around the stone with the central longitudinal axis of each on the draw side of radial lines from the shaft, in connection with the pressers connected in pairs for simultaneous operation in opposite directions, is an advantageous feature in that there is a tendency to clamp the stone or cylinder without undue pressure on the shaft, which clamping tendency is changed from one pair of pressers to the other alternately as the ram is reversed. As the faces of the pressers are guided by the lower plates of the pockets to move in lines approximately radially of the cylinder and are caused by their pivotal connection with the levers to maintain substantially the same relation to the surface thereof excepting as to distance, all of the wood in the pockets is pressed upon the cylinder at about the same speed, and this contributes materially to the production of uniform pulp and is one of the features distinguishing my present machine from the one shown in my prior patent.

I claim as my invention—

1. In a grinding-machine, the combination with the grinding-cylinder, of a plurality of pockets arranged symmetrically around the cylinder with the central longitudinal axis of each on the draw side of radial lines from the axis of the cylinder, pressers or followers operating in the pockets, means for maintain-

ing the faces of the followers in the same plane relative to the surface of the cylinder, connections between the pressers on diametrically opposite sides of the cylinder for causing
5 their simultaneous operation toward and from the surface of the cylinder, and motor devices for actuating said pressers, substantially as described.

2. In a grinding-machine, the combination
10 with the grinding-cylinder, of four pockets arranged symmetrically around the cylinder with the central longitudinal axis of each on the draw side of radial lines from the axis of the cylinder, of pressers operating in said
15 pockets, connections between the pressers whereby those on diametrically opposite sides of the cylinder will be operated in the same direction relative to the portion of the cylinder-surface with which they coöperate, and
20 the pressers thus paired will move in opposite directions alternately, means for actuating the followers toward and from the cylinder-surface, and means for guiding the pressers to move radially of the cylinder-axis, and
25 maintaining their faces in substantially the same plane relative to the cylinder-surface, substantially as described.

3. In a grinding-machine, the combination
30 with the grinding-cylinder, of four pockets arranged around the cylinder with their central axes located on the draw side of radial lines from the cylinder-axis, the two pivoted levers connected at one end for simultaneous operation on their pivots, and the pressers or followers one for each pocket pivoted
35 to the opposite ends of said levers and operating in the pockets, substantially as described.

4. In a grinding-machine, the combination
40 with the grinding-cylinder, and four pockets arranged symmetrically around the cylinder, of the two pivoted levers, connections between the levers for causing their proximate ends to move simultaneously in opposite directions relative to the cylinder-surface, the
45 pressers or followers in the pockets pivotally connected to the ends of the levers, and a motor device for actuating the levers on their pivots, substantially as described.

5. In a grinding-machine, the combination
50 with the cylinder, and the pockets arranged around the cylinder, of the pivoted levers J and K, the followers J', J², J³, J⁴ pivoted to the ends of the levers, the rod M, the links
55 connecting it to the ends of the levers, and the motor for actuating the rod in opposite directions, substantially as described.

6. In a grinding-machine, the combination
60 with the grinding-cylinder and a wood-pocket, of a follower or presser operating in said pocket, and a lever pivoted on an axis parallel with that of the cylinder for actuating the follower and pivoted to the follower on an axis also parallel with that of the cylinder, substantially as described.

7. In a grinding-machine, the combination
65 with the frame embodying the two side plates,

the grinding-cylinder operating between them, and the top and bottom pocket-plates adjustably secured to the side plates and movable toward the cylinder, of the filling-plates
70 G forming one side of the pockets, the feed-doors having the filling-plates G' thereon forming the other side of the pockets, and the pressers or followers operating in the
75 pockets to press the wood against the cylinder, substantially as described.

8. In a grinding-machine, the combination
80 with the side plates or frames, and a grinding-cylinder operating between them, of the pocket-plate D forming one of the sides of the pocket, and the independent plate E forming the draw side of the pocket, securing devices for attaching said pocket-plates to the side
85 frames, the adjusting-screws F connecting the plate E with the side frame, the presser or follower operating in the pocket, and means for actuating it, substantially as described.

9. In a grinding-machine, the combination
90 with the grinding-cylinder, of the wood-pockets having the corrugations on the draw side gradually tapering toward the cylinder and a presser or follower operating in the pocket, substantially as described.

10. In a grinding-machine, the combination
95 with the side plates or frames, and the grinding-cylinder operating between them, of the pocket-plate E constituting the draw side of the pocket and extending between the side frames, the bolts for securing said plate to
100 the frames, the adjusting-screws and set-nuts between the frame and plate, the pocket-plate D adjustable toward the cylinder independently of the plate E, the bolts for securing it to the side frames, and a follower
105 operating in the pocket, substantially as described.

11. In a grinder, the combination with the
110 grinding-cylinder, a plurality of wood-pockets arranged around its periphery, plungers or pressers, one in each of the pockets, means for guiding the pressers to move approximately radially of the cylinder, means for maintaining the faces of the pressers in
115 substantially the same plane relative to the cylinder-surface, connections between diametrically opposite pressers for causing their simultaneous movement in pairs toward and from the portions of the surface of the cylinder with which they coöperate, and connections
120 between the several pairs of pressers for causing their simultaneous operation in opposite directions relative to the portions of the cylinder-surface with which they coöperate, substantially as described.

12. In a grinder, the combination with the
125 grinding-cylinder, a plurality of wood-pockets arranged around its periphery, plungers or pressers, one in each of the pockets, means for guiding the pressers to move approximately radially of the cylinder, means for maintaining the faces of the pressers in
130 substantially the same plane relative to the cylinder-surface, and connections between the

diametrically opposite pressers for causing their simultaneous operation toward and from the portions of the cylinder-surface with which they cooperate, substantially as described.

13. In a grinder, the combination with a cylinder and a series of wood-pockets arranged around the periphery thereof, of a series of pressers or plungers, one operating in each pocket, means for guiding the pressers to move approximately radially of the cylinder, means for maintaining the faces of the pressers in substantially the same plane relative to the cylinder-surface, and connections between all of the pressers for causing the simultaneous movement of adjacent ones in

opposite directions toward and from the surface of the cylinder with which they cooperate, and motor devices for operating the pressers, substantially as described.

14. In a grinding-machine, the combination with the grinding-cylinder and two adjacent wood-pockets, of followers or pressers operating in said pockets and a lever pivoted on an axis parallel with that of the cylinder for actuating the followers, and pivoted to the followers on axes also parallel with that of the cylinder, substantially as described.

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Witnesses:

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