

No. 734,070.

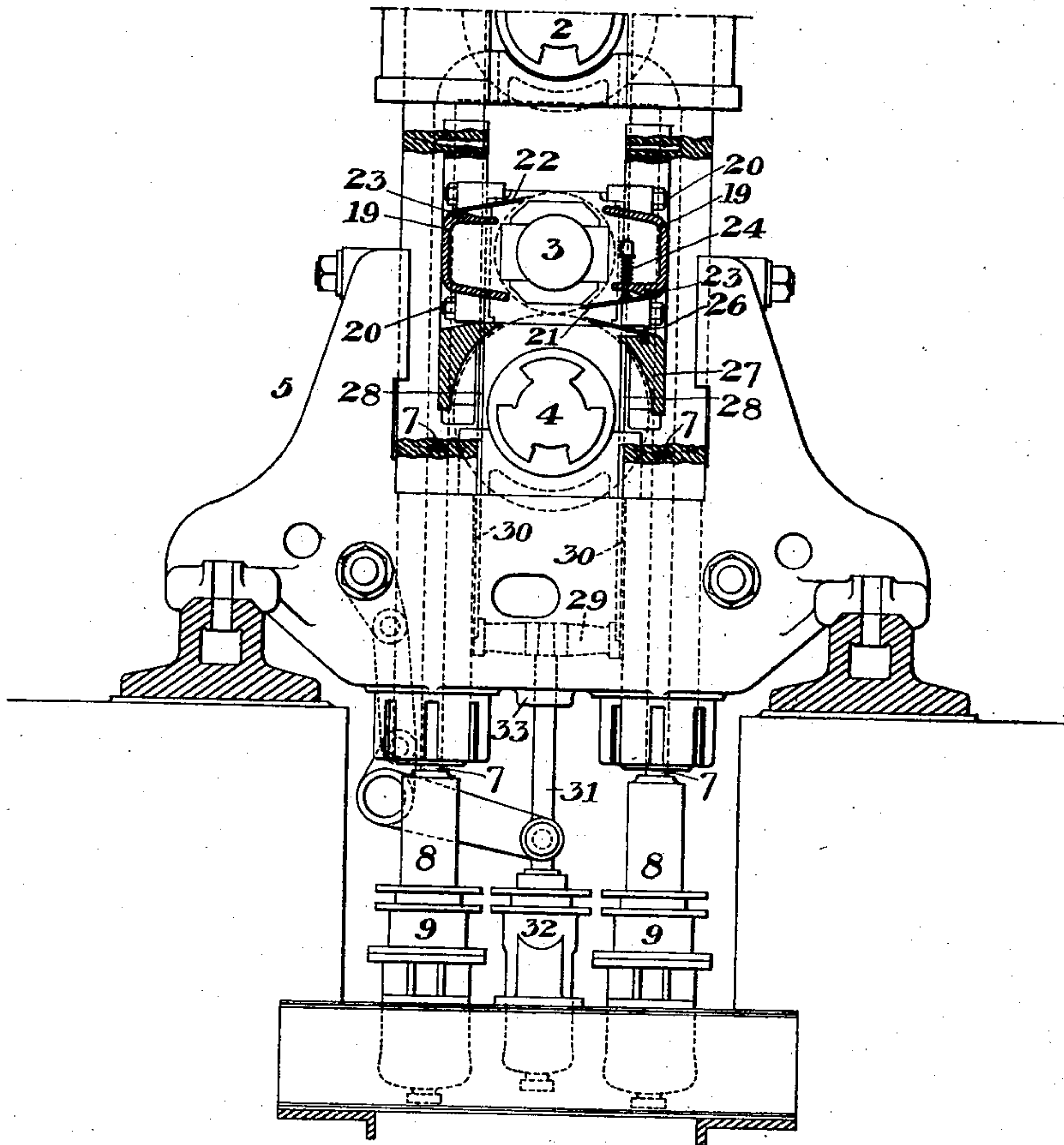
PATENTED JULY 21, 1903.

J. KENNEDY.  
THREE HIGH MILL.  
APPLICATION FILED DEC. 10, 1901.

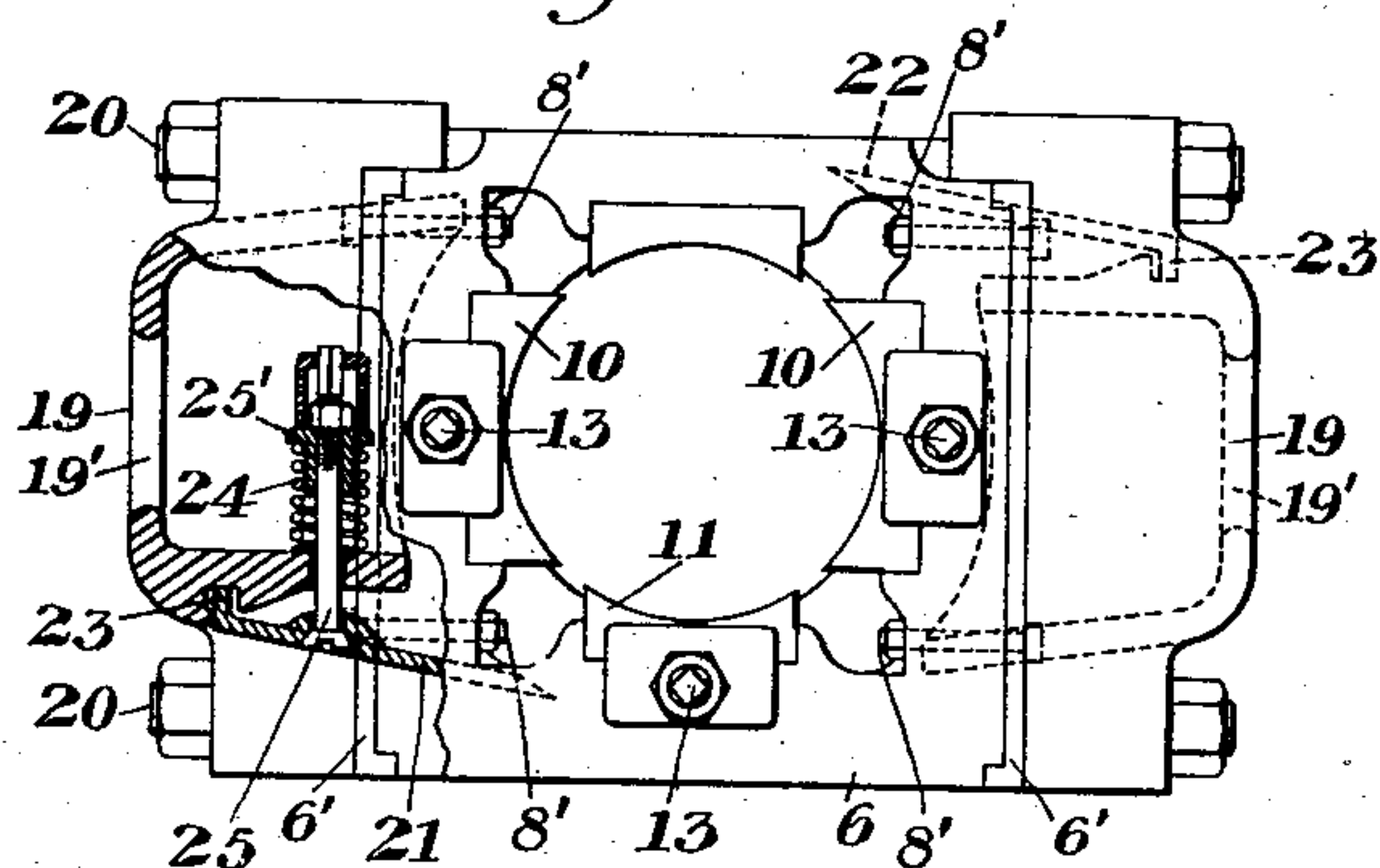
NO MODEL.

2 SHEETS—SHEET 1.

*Fig. 1.*



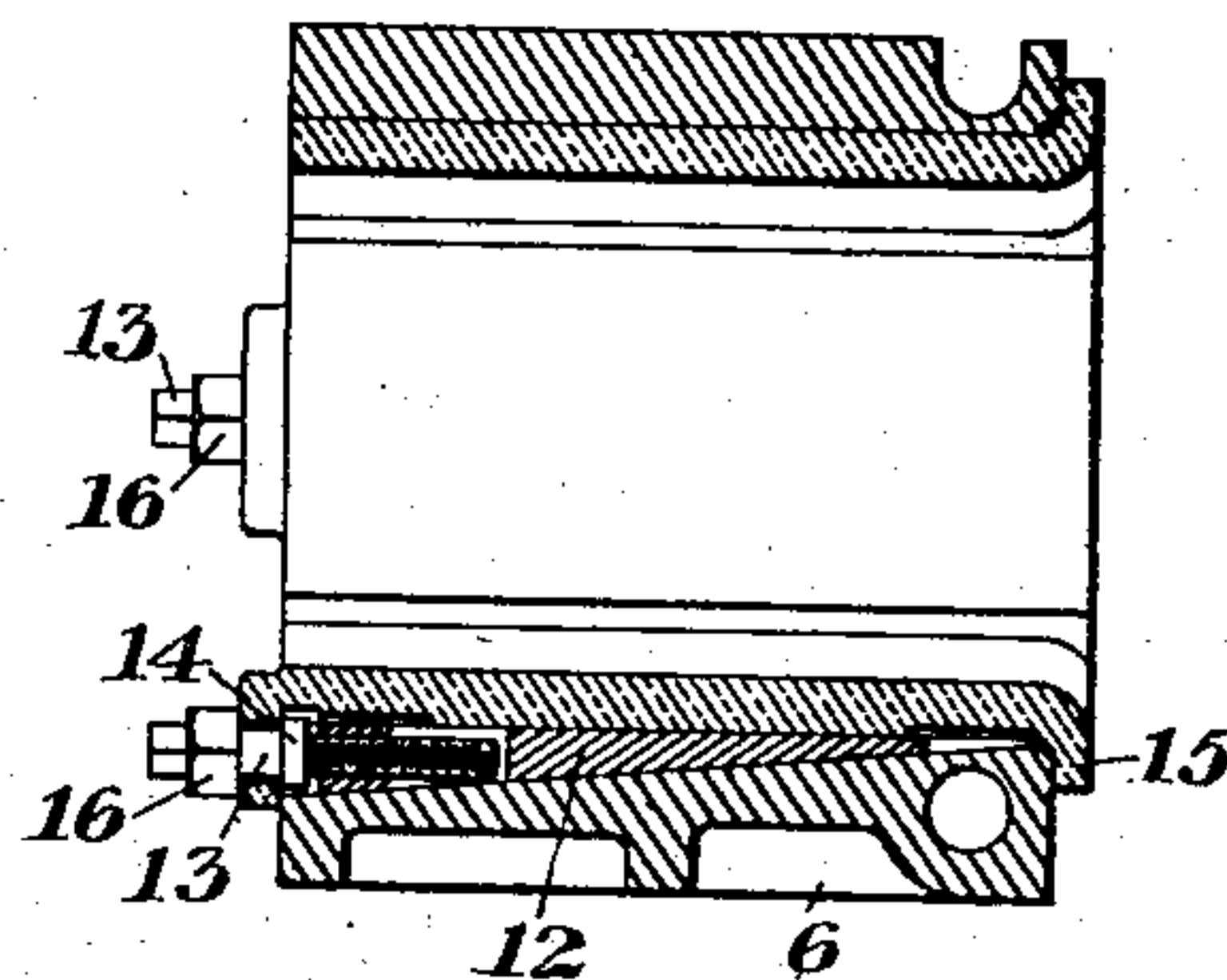
*Fig. 4.*



WITNESSES

Thomas W. Baxwell  
Warren W. Swartz

*Fig. 5.*



INVENTOR

Julian Kennedy

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2 SHEETS—SHEET 2.

Fig. 2.

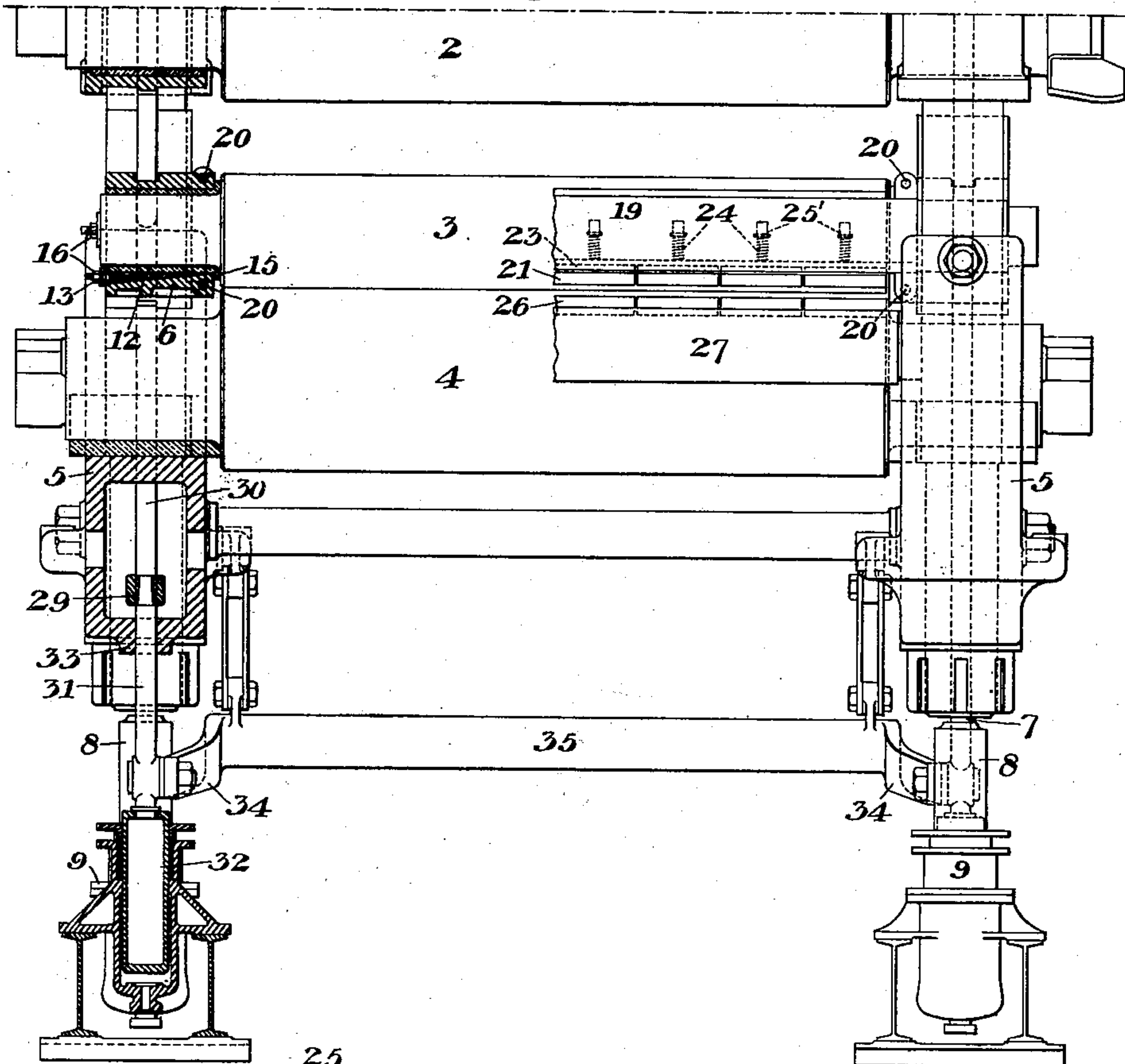
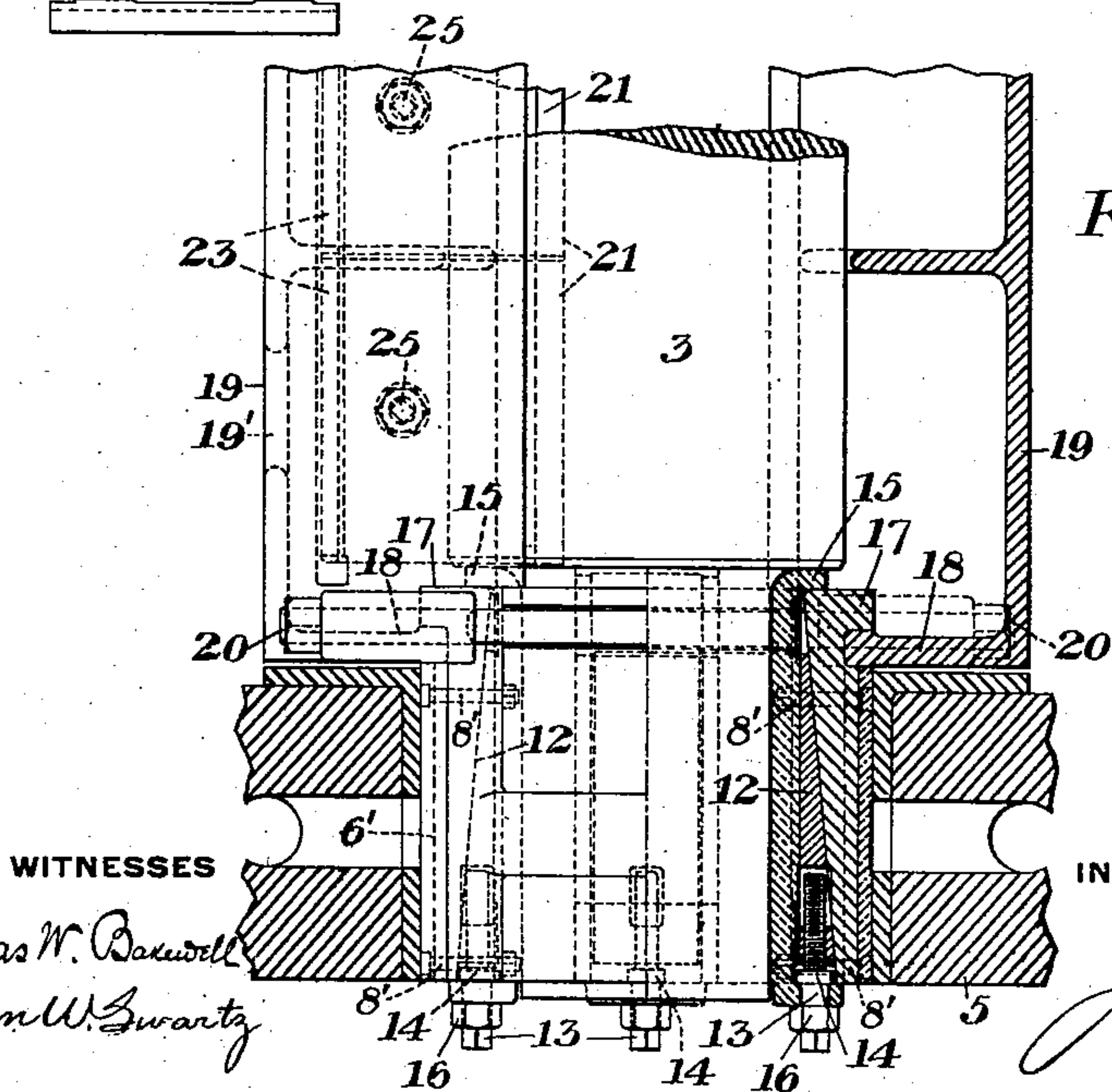


Fig. 3.



WITNESSES

Thomas W. Daxwell  
Warren W. Swartz

INVENTOR

Julian Kennedy



# UNITED STATES PATENT OFFICE.

JULIAN KENNEDY, OF PITTSBURG, PENNSYLVANIA.

## THREE-HIGH MILL.

SPECIFICATION forming part of Letters Patent No. 734,070, dated July 21, 1903.

Application filed December 10, 1901. Serial No. 85,326. (No model.)

*To all whom it may concern:*

Be it known that I, JULIAN KENNEDY, of Pittsburgh, Allegheny county, Pennsylvania, have invented a new and useful Three-High Mill, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a sectional side elevation of a mill constructed in accordance with my invention. Fig. 2 is a front elevation partly in section. Fig. 3 is a partial top plan and section of the middle roll-carrier on a larger scale, and Figs. 4 and 5 are detail views of the roll-carrier and guide-plates.

My invention relates to the supporting of the middle roll and guide-plates of a three-high mill, and is designed to simplify and improve the construction of these parts.

In the drawings, 2, 3, and 4 represent the rolls of a three-high mill mounted in suitable housings 5 5. The top roll is supported upon rods 7, which pass through vertical holes 7' in the columns of the housing and support at their upper ends the bottom bearing of the top roll. These rods are connected to the rams 8 of liquid counterbalance-cylinders 9, located beneath the housings. Each of the bearing-boxes 6 of the middle roll is formed of one integral piece shaped as shown in Figs. 3, 4, and 5 and containing removable side brasses 10 10 and a lower brass 11, which are adjustable by means of wedges 12, fitting within outer longitudinal recesses in the brasses and adjusted by means of screw-bolts 13, engaging suitable screw-thread holes in the wedge. A collar 14 upon this bolt bears upon the inner face of a flange at the outer end of the brass, which is bent or flanged outwardly at its inner end, as shown at 15. The brass thus affords a resistance against which the screw acts to force the wedge inwardly. When adjusted, the bolt is secured by a lock-nut 16. Wearing-plates 6' are interposed between the box and the housing and are held by bolts 8', which pass through the box and the said plates. The lower wedge for the middle lower brass rests upon an inclined face in the bearing-box, while the side wedges rest upon similarly-inclined faces on the sides of the bearing-box. The box is grooved near its end at 17, and the inner

ends of flanges 18 upon the rest-bars 19 interlock and fit in said grooves, as shown in Fig. 3. These rest-bars extend transversely between the housings on each side of the middle rolls, and when they are drawn together and into the grooves by means of through-bolts 20 the box is held rigidly and firmly by the rest-bars in the positions shown; but by loosening the through-bolts the rest-bars may be drawn back and disengaged from the box, leaving the box free to be removed without difficulty. This constitutes a marked improvement over the constructions heretofore employed, in which the bearing-boxes were not made in one piece, but were sectional, and the sections required to be taken apart before the parts could be removed.

The adjustable guides 21 and 22 for the middle roll are provided with lips 23, which enter recesses in the rest-bars, as shown, the upper guide 22 on one side resting upon the roll by gravity, while the lower guide 21 upon the other side is yieldingly pressed toward the roll by a spiral spring 24, surrounding a bolt 25 and bearing at its lower end against the base of a cavity in the side casting of the bearing-box. The spring bears at its upper end against an adjustable sleeve 25', having screw-threaded engagement with bolt 25. The spring-pressure may thus be varied to bring this guide to the proper position and maintain it in such position at a yielding pressure.

26 is the guide for the lower roll, which is provided with a lip loosely engaging the recess in the transverse bar 27, extending between the housings and fitting over the curved portion of the lower roll.

The bolts 25 extend within the respective rest-bars, which bars are hollow and are provided with hand-holes 19', rendering the bolts accessible for adjustment. The boxes of the middle roll are supported by rods 28, which extend up along the inner face of the housings and at their lower ends rest upon cross-heads 29, which move in vertical recesses 30 in the housings and are guided thereby, and the cross-heads in turn are actuated by the plungers 31 of cylinders 32. These plungers pass through guides 33 in the base of the housings, which, in connection



with the cross-heads, give a double bearing to the plungers, and are connected by levers 34 and a shaft 35 to make them work in unison.

The arrangement of the supporting-rods 7 and 28 just described is important, because it is simple and compact and renders unnecessary the levers heretofore used for connecting the middle-roll bearings to their supporting-rods.

Important advantages result from the peculiar form of the brasses and adjusting means in connection with the clamping of the rest-bars and parts in position preferably by through-bolts. This peculiar arrangement affords easy means for changing the brasses and adjusting the parts. The guide-plates for the middle roll move up and down with this roll and are yieldingly held in place, the one by gravity and the other by spring-pressure.

Within the scope of my invention changes may be made in the form and arrangement of the brasses, rest-bars, and their connections, since

What I claim is—

1. A three-high mill having a middle roll provided with a vertically-movable bearing-box and a rest-bar which interfits with the box at the side of the latter and holds the box against outward motion, said box being removable outwardly when the rest-bar is disengaged; substantially as described.

2. In three-high mills, a bearing-box for the vertically-moving middle roll, rest-bars which are connected to and hold the box on opposite sides, and through-bolts by which the rest-bars are drawn together upon the box; substantially as described.

3. In three-high mills, a middle-roll bearing-box made in a single piece and removable endwise, and rest-bars connected to the box on opposite sides and arranged to hold it in position; substantially as described.

4. In three-high mills, a hollow rest-bar carried by the bearing-boxes of the middle

roll, guides pivoted to the rest-bar and held against the roll by springs within the rest-bar; substantially as described.

5. In three-high mills, a hollow rest-bar carried by the bearing-boxes of the middle roll, guides pivoted to the rest-bar and held against the roll by springs within the rest-bar, said rest-bar having hand-holes to allow adjustment of tension of springs; substantially as described.

6. A rolling-mill having in combination with the rolls and housings lifting-rods for the upper roll which pass centrally through holes in the vertical columns of the housing, and lifting-rods for a lower roll which extend upwardly between the lifting-rods of the upper roll; substantially as described.

7. A rolling-mill having a cross-head provided with end extensions or wings fitting in central vertical recesses in the columns of the housings, and connected with the bearings of a roll, and a lifting device arranged to act upon the winged portions of said cross-heads; substantially as described.

8. A rolling-mill having a cross-head with wings extending into vertical central recesses in the columns of the housings, a roll-bearing, a plunger movable through a bearing on the housing below the cross-head, and a lifting device engaging the wings of the cross-head and roll-bearing; substantially as described.

9. A three-high mill having its middle roll provided with vertically-movable boxes, and rest-bars having flanged ends engaging the boxes, said bars being the only means for preventing endwise movement of the boxes; substantially as described.

In testimony whereof I have hereunto set my hand.

JULIAN KENNEDY.

Witnesses:

GEO. B. BLEMING,  
H. M. CORWIN.