

(No Model.)

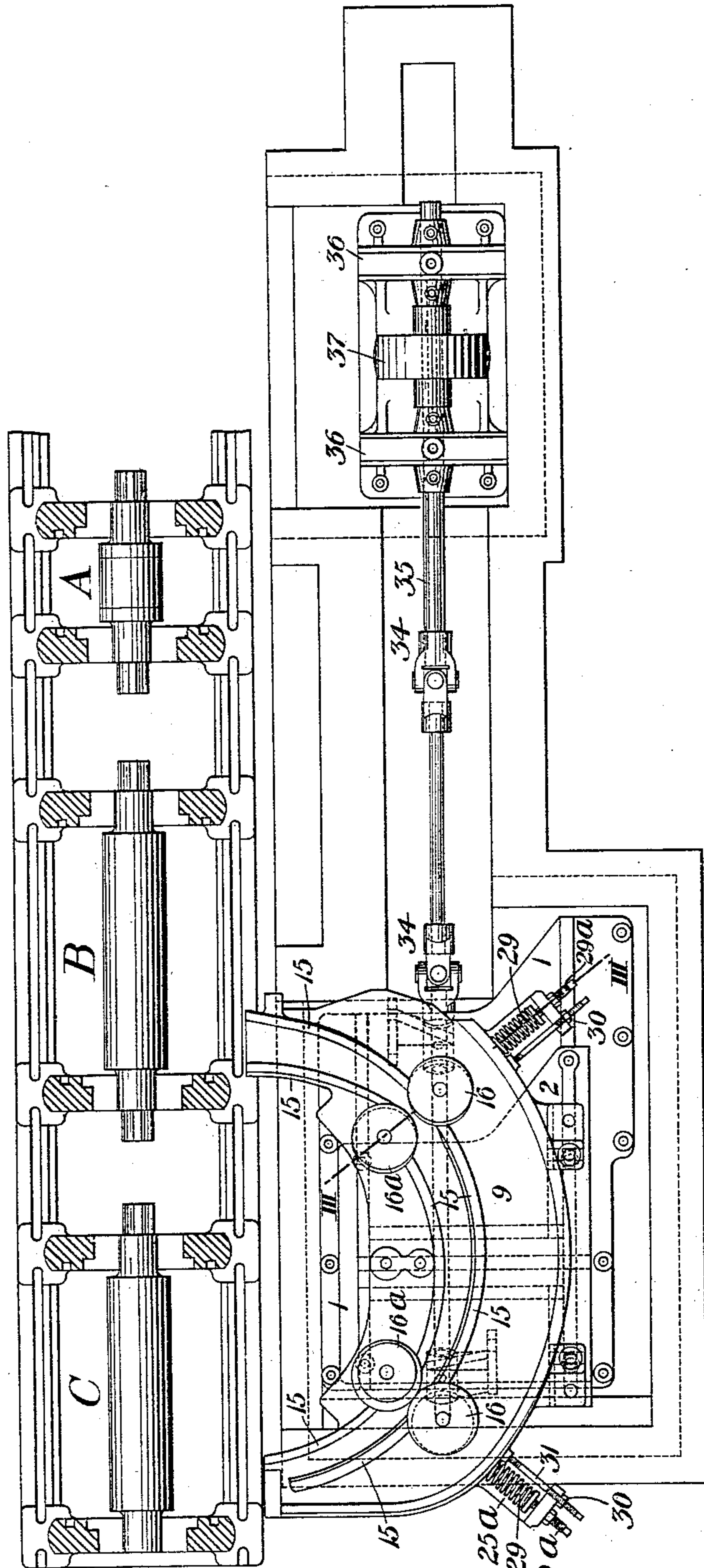
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S. V. HUBER.  
REPEATER FOR ROLLING MILLS.

No. 555,375.

Patented Feb. 25, 1896.

Fig. 1.



WITNESSES

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(No Model.)

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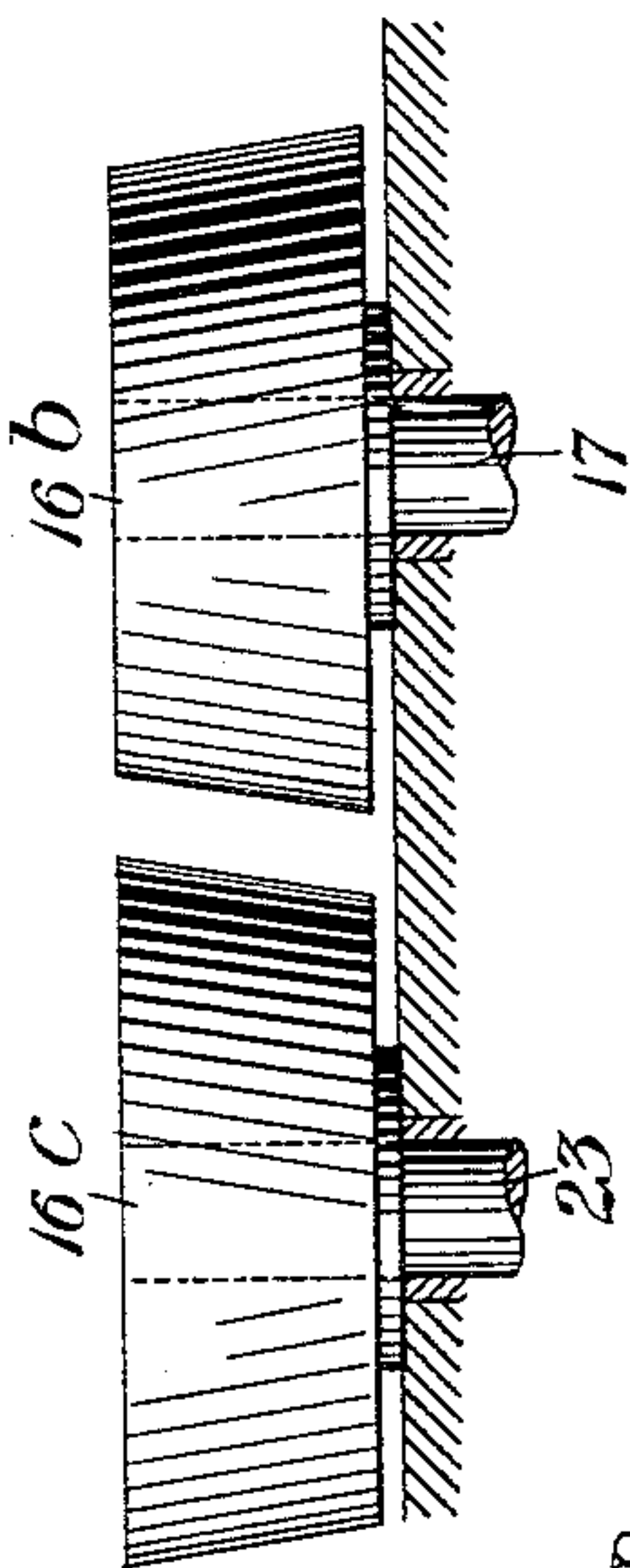
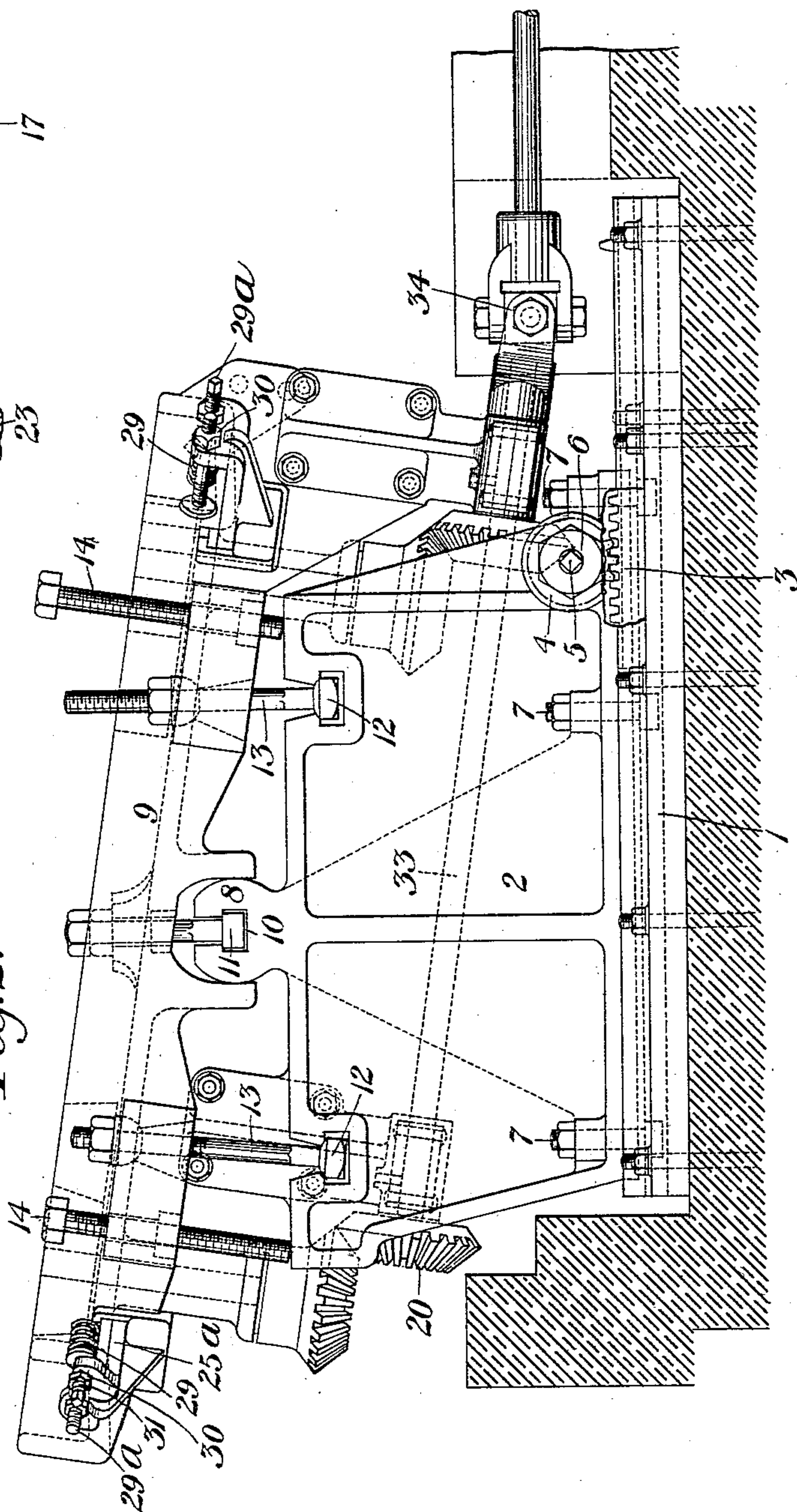


Fig. 5.

Fig. 2.



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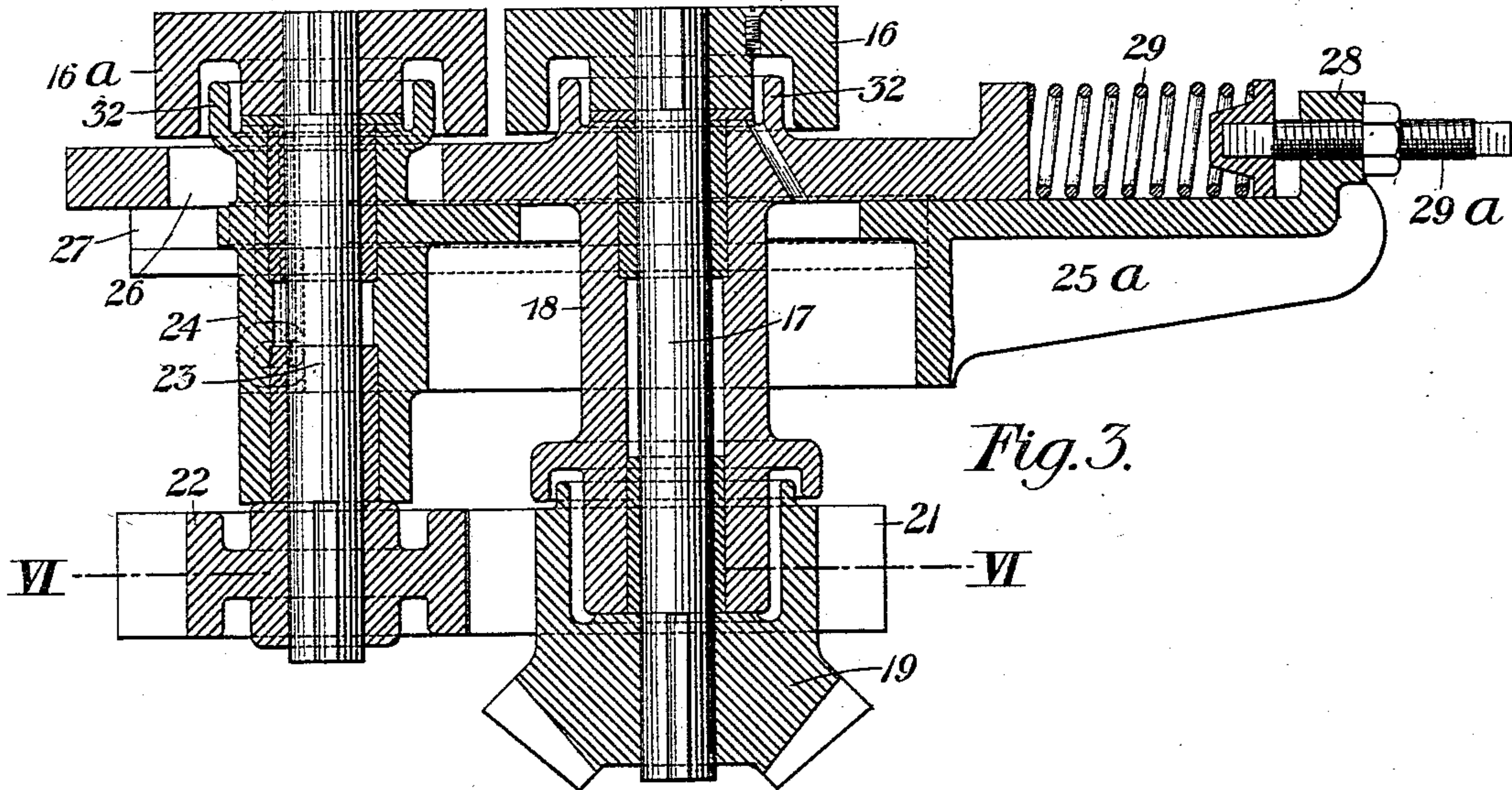


Fig. 3.

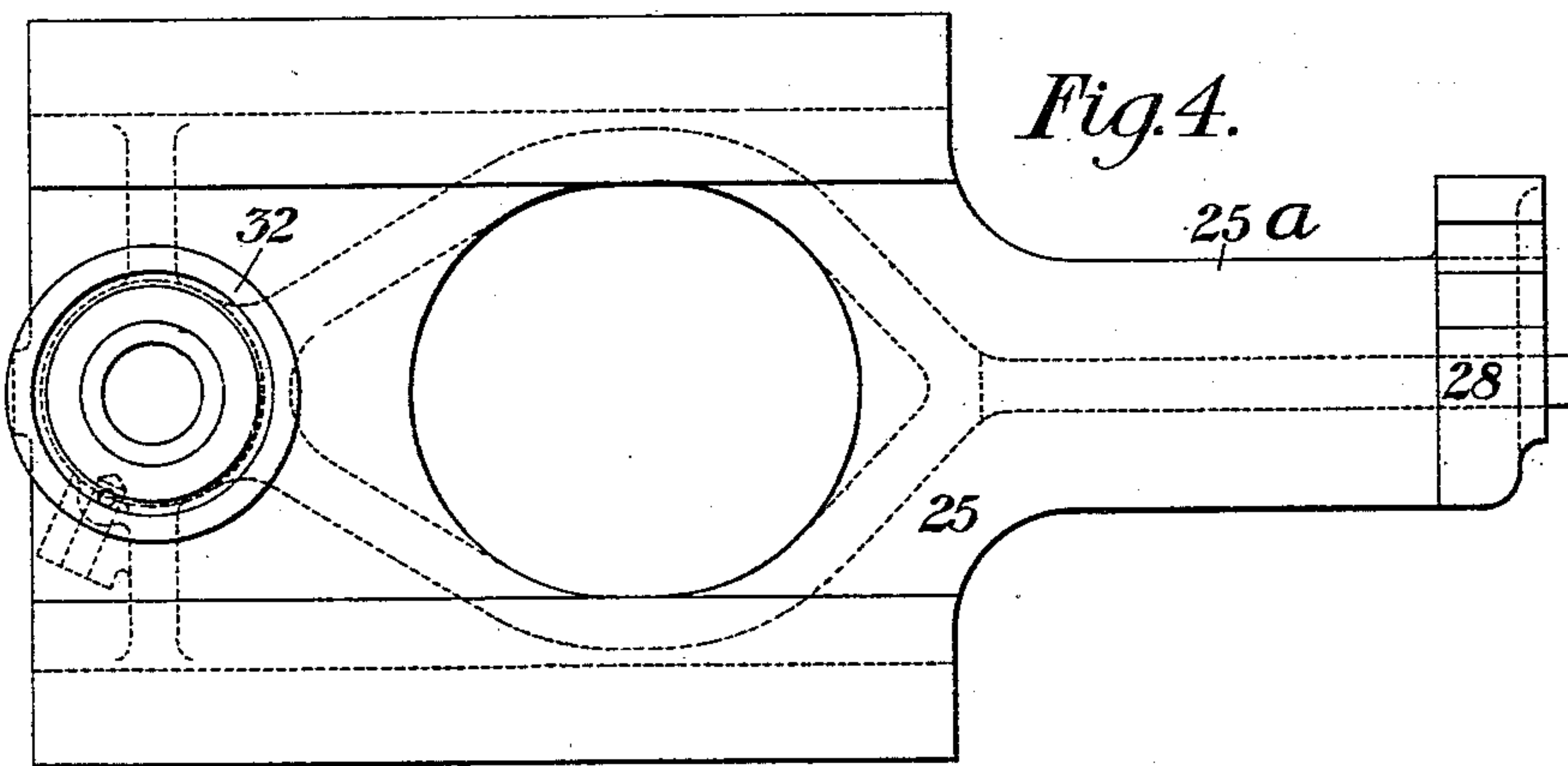


Fig. 4.

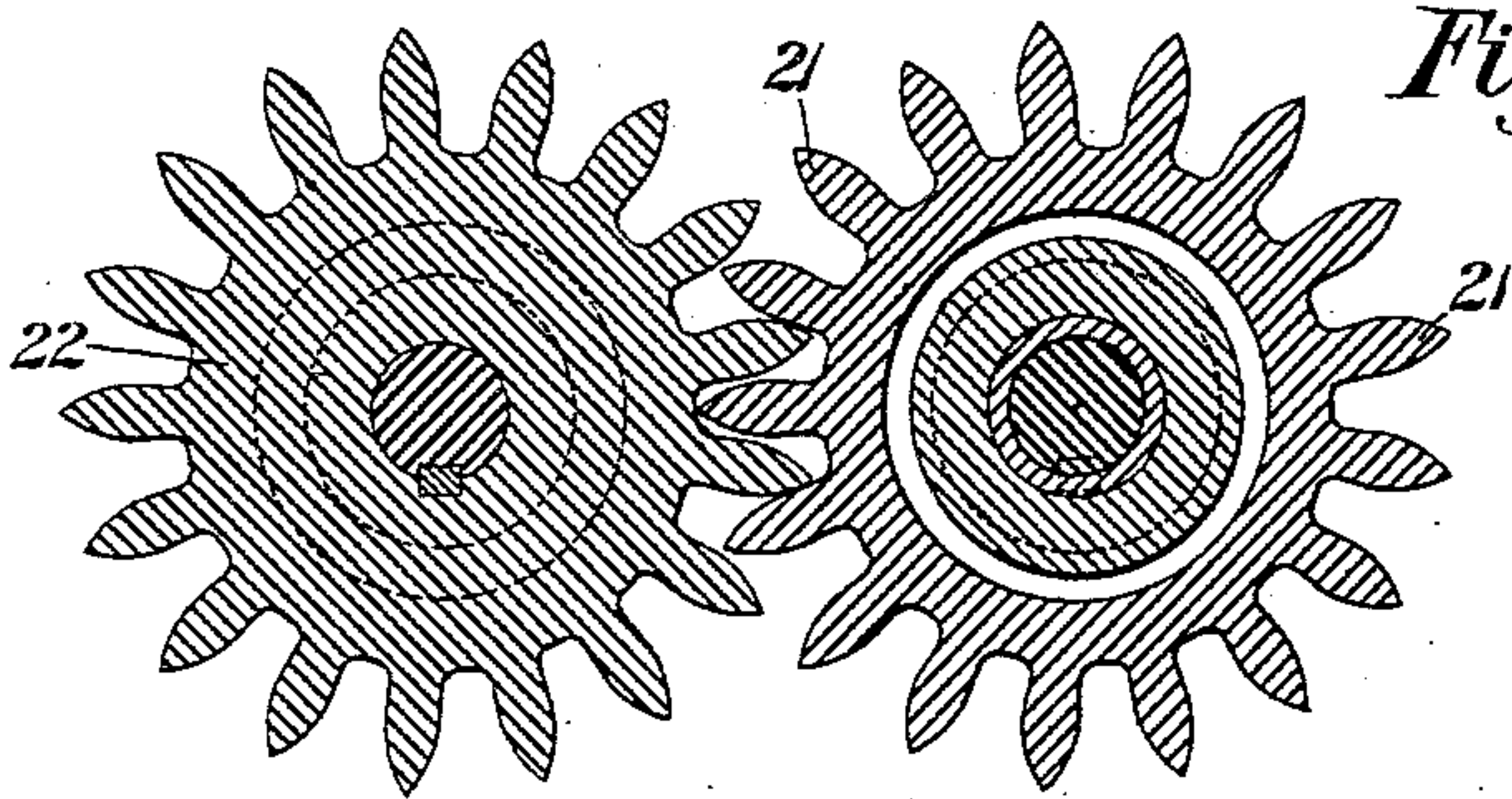


Fig. 6.

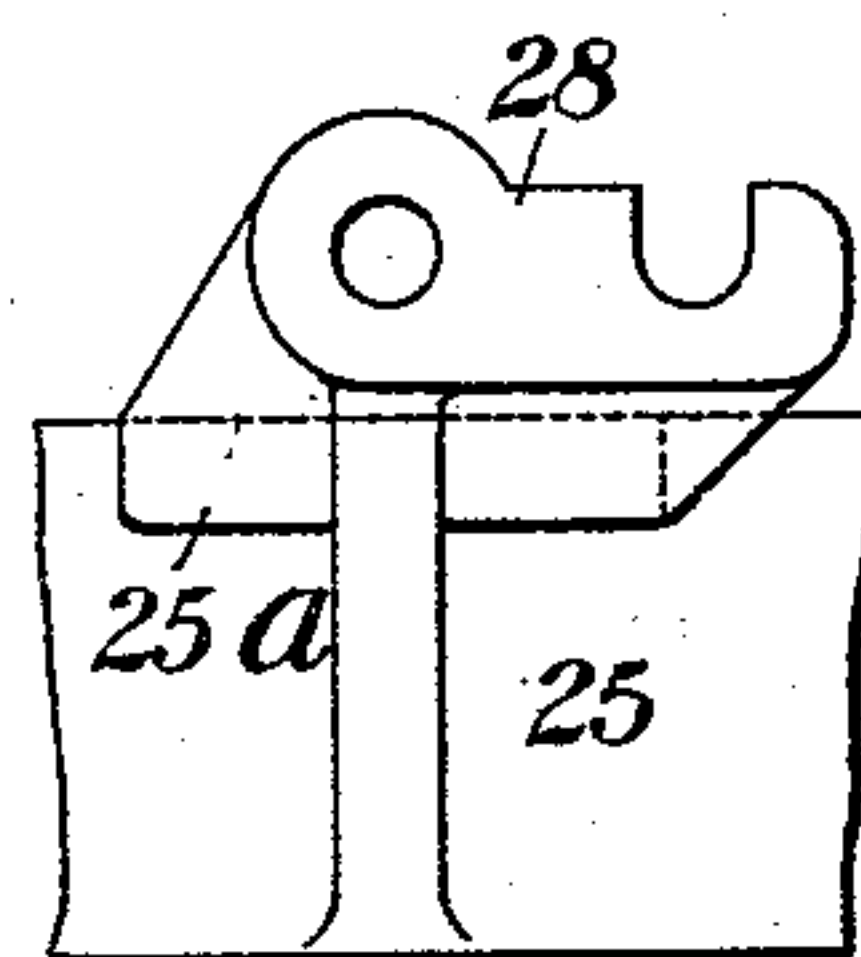


Fig. 7.

WITNESSES

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# UNITED STATES PATENT OFFICE.

SIGMUND V. HUBER, OF PITTSBURG, PENNSYLVANIA.

## REPEATER FOR ROLLING-MILLS.

SPECIFICATION forming part of Letters Patent No. 555,375, dated February 25, 1896.

Application filed September 5, 1895. Serial No. 561,541. (No model.)

*To all whom it may concern:*

Be it known that I, SIGMUND V. HUBER, a citizen of the United States, residing at Pittsburgh, in the county of Allegheny and State of Pennsylvania, have invented or discovered certain new and useful Improvements in Repeaters for Rolling-Mills, of which improvements the following is a specification.

The invention described herein relates to certain improvements in repeaters for rolling-mills.

As heretofore constructed, it is impossible to use repeaters for guiding a bar of metal from one pass to another when the bar is not sufficiently long to extend from one pass to the other. In other words, one pair of rolls must act as a feeder to the other pair when using the present form or construction of repeater.

The object of the present invention is to provide by means of positively-driven rollers for the feeding of long or short bars or pieces of metal through a curved trough arranged between two passes; and, in general terms, the invention consists in the construction and combination substantially as hereinafter more fully described and claimed.

In the accompanying drawings, forming a part of this specification, Figure 1 is a plan view of a rolling-mill having my improved repeater applied thereto. Fig. 2 is a side elevation of the repeater. Fig. 3 is a sectional elevation, on an enlarged scale, the plane of section being indicated by the line III III, Fig. 1. Fig. 4 is a plan view of the slide for shifting one of the feed-rollers. Fig. 5 is a detail view showing conical feeder-rollers. Fig. 6 is a sectional plan view, the plane of section being indicated by the line VI VI, Fig. 3; and Fig. 7 is an end elevation of the adjusting-slide.

In the practice of my invention a bed-plate 1 is secured on a suitable foundation in the rear of the mill, consisting of the roughing-rolls A and the strand-rolls B. A stand 2 is movably mounted on the bed-plate, which is provided with suitable guideways therefor and with a toothed bar 3, engaging a gear-wheel 4 on a shaft 5, mounted on the stand. The outer end of the shaft 5 is provided with an angular nut or head 6 for the reception of a handle for rotating the shaft, and thereby shifting the stand. The guideways for the stand are provided with dovetail grooves for

the reception of the heads of bolts 7, which pass up through side flanges on the stand and serve to hold the latter in place. The stand is provided with a convex rib 8 for supporting the table 9, which is formed on its lower side with a concave seat fitting on the rib. The rib is provided with an undercut groove 10 for the reception of the head of a bolt 11, which passes up through the table, holding the latter in position. At its outer corners the stand is provided with sockets 12 for the reception of holding-bolts 13, which pass up through holes in the table and operate in connection with set-screws 14, screwing down through the table and bearing at their ends upon the stand to adjust and hold the table at any desired inclination.

Curved flanges 15 are formed on the upper side of the table in such relation to each other as to form a groove for guiding the bar from a pass in the rolls A to a pass in the rolls B. The receiving end of the guide groove or trough is preferably made wider than the passes in the rolls A, so as to insure the entrance of the bar, and from this end the trough gradually diminishes in width, the delivery end of the groove or trough being approximately the width of the pass to which the bar is to be delivered.

In order to adapt the repeater for use in rolling bars which are not sufficiently long to be fed by the rolls A through the trough into the rolls B, one or more pairs of feed-rollers 16 and 16<sup>a</sup> are arranged along the line of the trough for effecting the onward movement of the bar after it has passed out of the bite of rolls A. The rollers 16 of each pair are keyed on vertical shafts 17, mounted in sleeves 18, formed on the under side of the table, and on the lower ends of the shafts are keyed miter-wheels 19, adapted to engage corresponding wheels 20, whereby the rollers are driven, as will be hereinafter described.

The miter-wheels 19 are provided above their beveled portions with teeth 21, adapted to engage pinions 22 on the lower ends of shafts 23. These shafts are mounted in sleeves 24, formed on the slides 25 and projecting through openings 26 in the table and have the rollers 16<sup>a</sup> keyed on their upper ends, as shown in Fig. 3. The slides 25 are mounted in suitable guides 27 on the under side of the table and have one end 25<sup>a</sup> projecting beyond the table. The projecting end of the slide is pro-



vided with an upturned portion 28, between which and the edge of the table are placed springs 29. These springs, whose tension is regulated by screws 29<sup>a</sup>, tend to shift the slides  
 5 in such direction as to move the rollers 16<sup>a</sup> toward the rollers 16. The grip of rollers on the bar is regulated by means of nuts 30 on the threaded pins 31, which pass through slots in the upturned portions of the slides and  
 10 screw into the table.

In order to protect the bearings of the shafts 17 and 23 from scale, &c., the rollers 16 16<sup>a</sup> are provided on their undersides with grooves, into which project circular ribs 32, formed on  
 15 the table and slides.

The miter-wheels 20 are keyed upon shaft 33, mounted in suitable bearings on the table and connected by gimbal-joints 34 with the shaft 35, mounted in bearings 36. The driving-pulley 37 is so mounted on the shaft 35  
 20 between the bearings 36 as to permit the shaft to slide longitudinally through the hub of the wheel, but to rotate therewith, thereby permitting of the adjustment of the repeater  
 25 mechanism into line with different passes of the rolls.

It is preferred to drive the feed-rollers of the repeater at a sufficiently higher peripheral speed than that of the delivery-rolls A to compensate for the reduction and consequent elongation effected by said rolls. At such a  
 30 speed there will not be any looping out of the bar; but in case of a reduction of speed of the rollers the bar will first loop up between the rolls A and the first pair of feed-rollers,  
 35 when two or more pairs are employed. This looping up will force the bar from between the feed-rollers, but not until after the forward end of the bar has been caught by the  
 40 rolls B or until after the feed-rollers have performed their function.

Ordinarily, cylindrical feed-rollers are employed; but in case it is desired to give the bar a greater turn while passing from the rolls  
 45 A to the rolls B conical rollers 16<sup>b</sup> 16<sup>c</sup>, one member of each pair being inverted, are substituted for the cylindrical rollers, as shown in Fig. 5. These conical rollers do not give an entire quarter-turn to the bar, but turn it  
 50 sufficiently far—i. e., about forty-five degrees—that when the end of the bar strikes the walls of the pass in the rolls a complete turn of ninety degrees is effected.

It will be readily understood by those skilled in the art that the adjustments provided in my improved mechanism permit of the horizontal adjustment of the repeater,  
 55 but also its vertical adjustment, so that it can be employed in connection with two or three high mills, and that the several adjustments can be easily and quickly effected.

While it is preferred to employ two sets or pairs of feed-rollers, the invention is not limited to that number, as in some cases one  
 65 pair will be sufficient, while in other cases three or more pairs will be needed, dependent upon the length of bars being rolled. It is

further characteristic of my improvements that, screwing the nuts 30 along their pins 31, the rollers 16<sup>a</sup> can be moved so far from the  
 70 rollers 16 as not to grip the bars, the repeater being used in the ordinary manner. If desired, only one roller of each need be positively driven, the other roller being rotated by frictional contact with the article being  
 75 fed through the trough.

I claim herein as my invention—

1. A repeater for rolling-mills having in combination a curved trough adapted to guide a bar or rod from one to another pass in the  
 80 same pair or in an adjacent pair of rolls, means for adjusting such trough, one or more pairs of feed-rollers arranged so as to feed a bar or rod along said trough, means for rotating one roller of each pair, and an adjustable connection  
 85 between the driving mechanism and the roller, substantially as set forth.

2. A repeater for rolling-mills having in combination a curved trough adapted to guide a bar or rod from one to another pass, means  
 90 for adjusting such trough, one or more pairs of positively-driven and oppositely-arranged conical feed-rollers located along the trough and adapted to axially rotate a bar or rod while feeding it along the trough, means for  
 95 rotating one roller of each pair, and an adjustable connection between the driving mechanism and the roller, substantially as set forth.

3. A repeater for rolling-mills having in combination a stand arranged parallel with one or more stands of rolls, means for adjusting such stand, a table mounted on the stand and provided with a curved trough on its upper  
 100 side, one or more pairs of feed-rollers mounted on the table and adapted to feed the bar or rod along the trough, means for rotating said rollers, and an adjustable connection between the driving mechanism and the rollers,  
 105 substantially as set forth.

4. A repeater for rolling-mills having in combination a stand arranged parallel with one or more stands of rolls, a table provided with a curved trough, means for adjusting the table on the stand, and one or more pairs  
 110 of positively-driven feed-rollers mounted on the table and adapted to feed a bar or rod along the trough, substantially as set forth.

5. A repeater for rolling-mills having in combination a stand, a table mounted on the stand and provided with a curved trough, one or more slides adjustably mounted on the table, and one or more pairs of positively-driven feed-rollers, one roller of each pair being  
 115 mounted on the table and the roller of each pair being mounted in the slide, substantially as set forth.

In testimony whereof I have hereunto set my hand.

SIGMUND V. HUBER.

Witnesses:

DARWIN S. WALCOTT,  
 G. I. HOLDSHIP.