

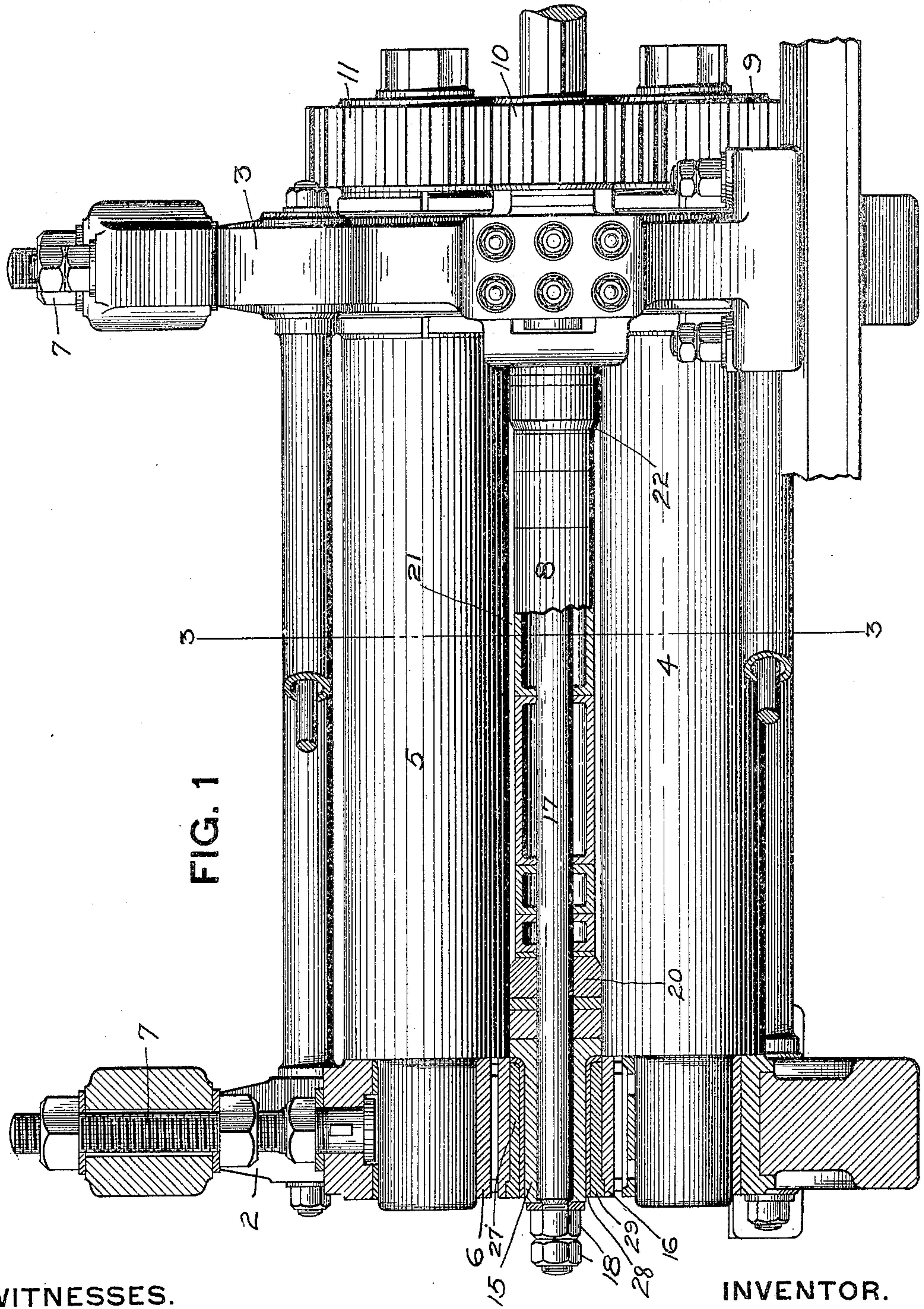
No. 803,247.

PATENTED OCT. 31, 1905.

P. PATTERSON.
ROLLS FOR SCARFING PLATES.

APPLICATION FILED OCT. 21, 1903.

5 SHEETS—SHEET 1.



WITNESSES.

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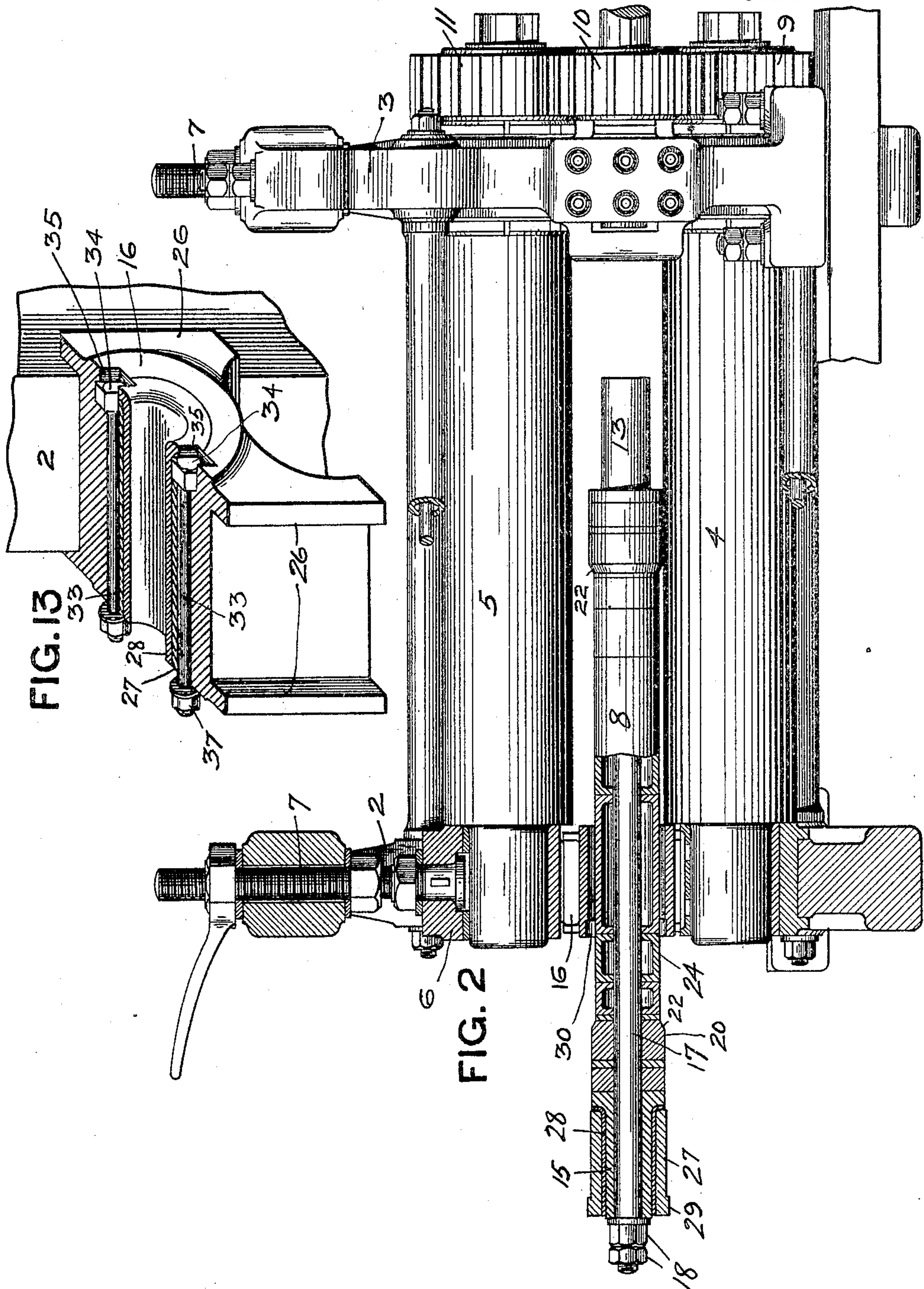
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WITNESSES.

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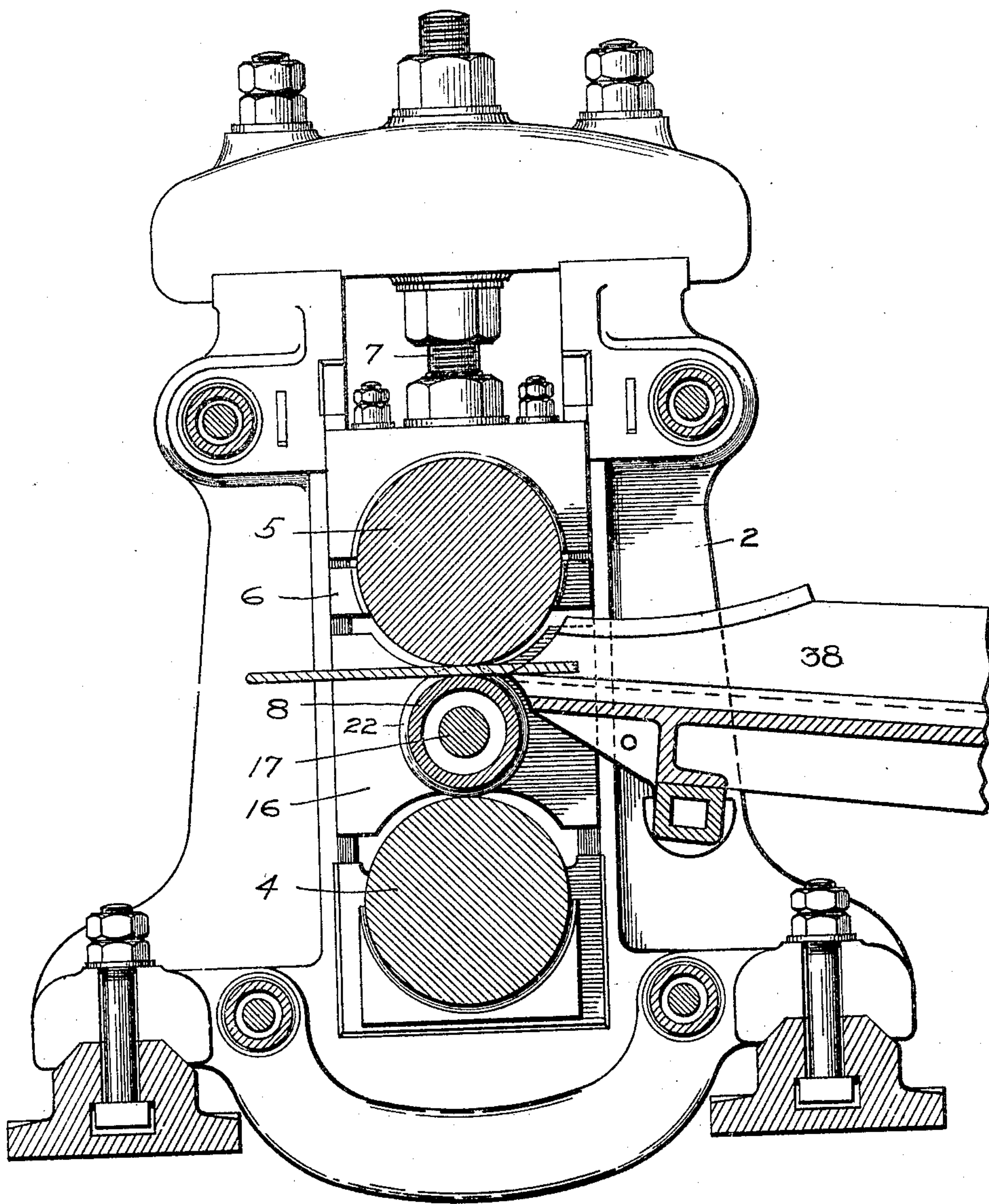
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5 SHEETS—SHEET 3.

FIG. 3



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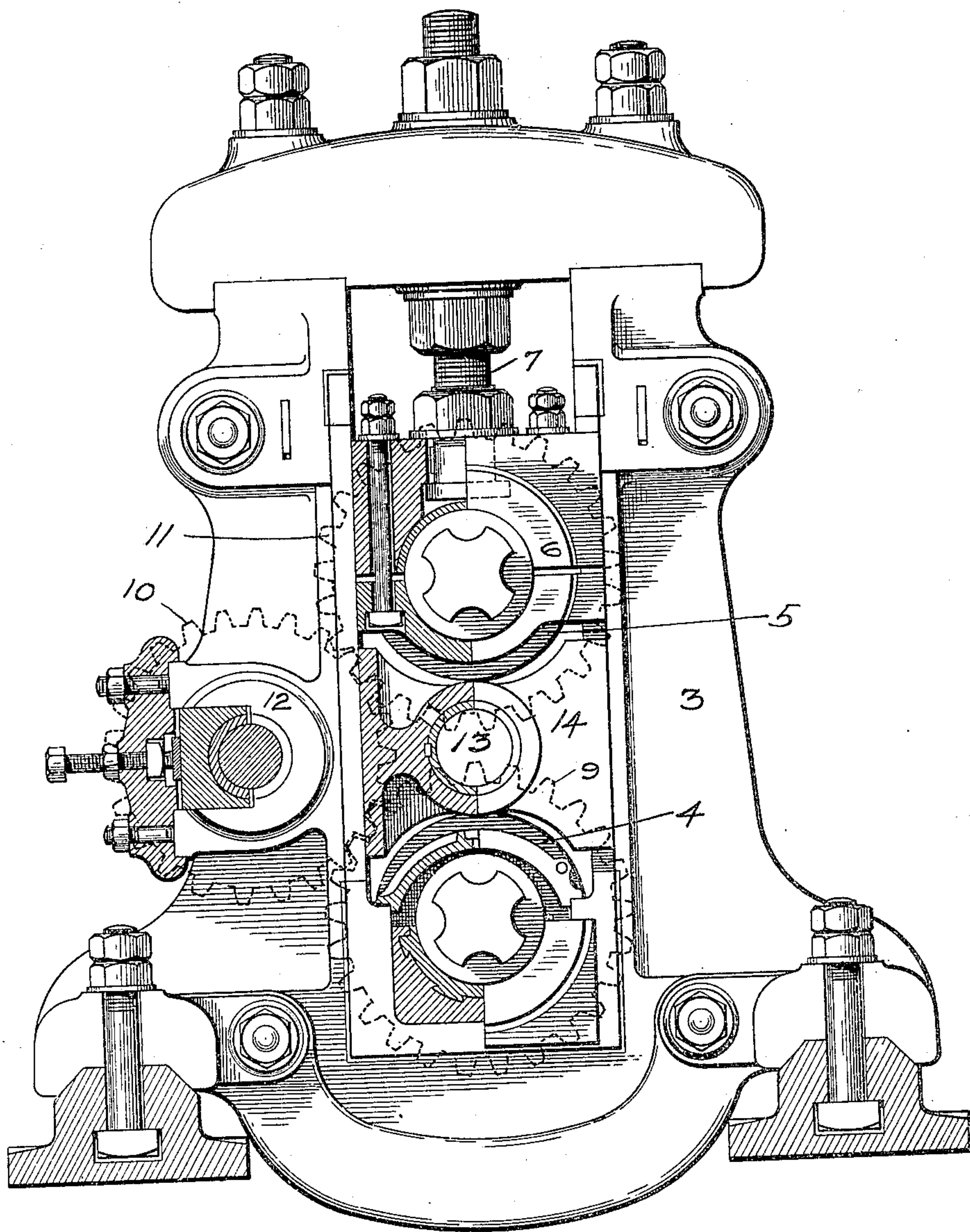
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5 SHEETS—SHEET 4.

FIG. 4



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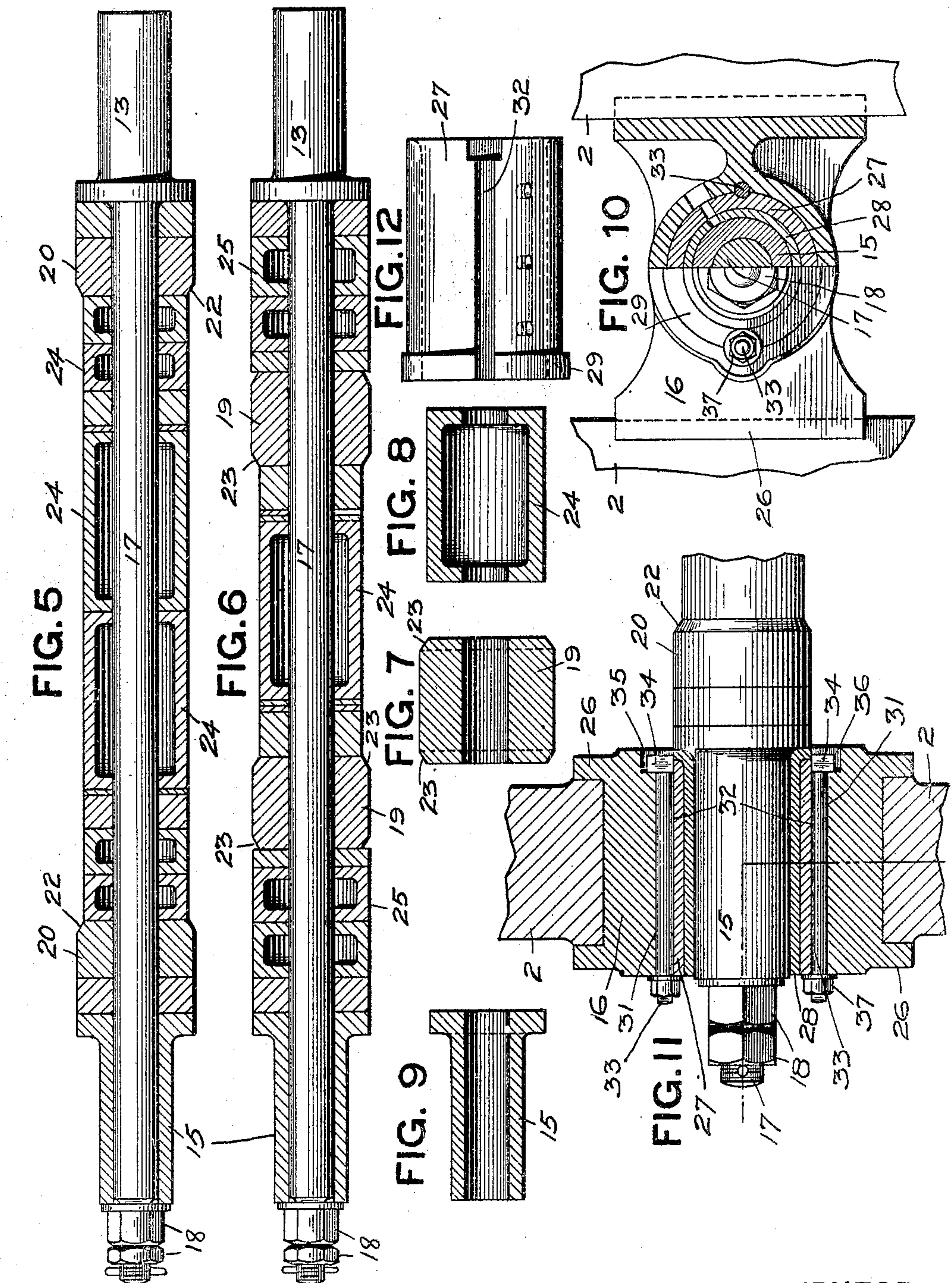
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5 SHEETS—SHEET 5.



WITNESSES.

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UNITED STATES PATENT OFFICE.

PETER PATTERSON, OF McKEESPORT, PENNSYLVANIA, ASSIGNOR TO
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ROLL FOR SCARFING PLATES.

No. 803,247.

Specification of Letters Patent.

Patented Oct. 31, 1905.

Application filed October 21, 1903. Serial No. 177,840.

To all whom it may concern:

Be it known that I, PETER PATTERSON, a resident of McKeesport, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Rolls for Scarfing Plates; and I do hereby declare the following to be a full, clear, and exact description thereof.

This invention relates to three-high plate-scarfing or like mills, its object being to provide a mill for scarfing plates for the manufacture of lap-weld tubing or other like purpose in which the middle roll is so mounted in the housing that it can be quickly and easily removed therefrom and adjusted or replaced by another for the purpose of scarfing plates of different widths and then reinserted in place.

The invention consists in the combination with the housings and upper and lower rolls of an intermediate roll and bearings therefor mounted in the housings, one of said bearings having a sleeve-section of as great diameter as the intermediate roll and entering longitudinally into and fitting within a seat in the bearing, and so providing for the longitudinal withdrawal of the intermediate roll from that bearing.

The invention also comprises certain improvements in the means for fastening or locking the sleeve within the bearing.

In the accompanying drawings, Figure 1 is a face view, partly broken away, showing the general construction of the mill. Fig. 2 is a like general view showing the manner of withdrawing the intermediate roll. Fig. 3 is a cross-section on the line 3 3, Fig. 1. Fig. 4 is an end view, partly in section, illustrating the means for driving the upper and lower rolls. Figs. 5 and 6 are sectional views illustrating the method of building up the intermediate roll for different widths of plates. Fig. 7 is a separate view of one of the collars for forming the beveled edges or ends of the pass. Fig. 8 is a like view of one of the intermediate pieces. Fig. 9 is a view of the journal-section of the roll. Fig. 10 is a detailed view, partly in section; and Fig. 11, a horizontal central section illustrating the method of mounting one end of the intermediate roll in its bearing. Fig. 12 is a view of the sleeve portion of the bearing, and Fig. 13 is a de-

tailed perspective view illustrating the bearing shown in Figs. 10 and 11.

In the drawings the housings 2 and 3 are of suitable construction and have mounted within them the lower plain-faced roll 4 and the upper plain-faced roll 5, the lower plain-faced roll being seated in the usual bearings, while the upper roll 5 is mounted in suspended bearings 6, which are hung from the adjusting-screw mechanism 7 and moving in suitable guides, so that, as illustrated in Fig. 2, the upper roll, with its bearings, may be raised to permit of the withdrawal of the intermediate scarfing-roll 8 longitudinally through one of the housings. The upper and lower rolls are driven from any suitable gear-train, the general practice being to make the power connections with the lower roll 4 and through suitable intermediate gearing 9 10 11, as shown in dotted lines in Fig. 4, to drive the upper roll, the gear-wheel 10 being mounted in a suitable bearing 12 at one side of the upper and lower rolls, which are thus power-driven in the same direction. One journal 13 of the intermediate roll 8 is mounted in the bearing 14, (particularly shown in Fig. 4,) which is of the ordinary form, mounted so as to be vertically adjustable in the housing 3. The other journal 15 is mounted in a peculiar journal-box 16, hereinafter described, which provides for the longitudinal withdrawal of the roll from that housing.

The intermediate scarfing-roll 8 is shown as formed of a series of collars mounted upon the central shaft 17, which in the preferred construction has one of the journals, such as the journal 13, formed therewith, while the other journal 15 is in the form of a sleeve acting to clamp the different collars of the built-up roll between the two journals, the parts being secured together by suitable nuts 18. The working portion of the roll is built up of collars of different diameters, the main portions thereof being the collars 19 or 20, forming the end portions of the scarfing-pass 21. These collars are preferably made of hardened steel and of diameter to contact with, or practically contact with, the upper and lower rolls, so as to close the ends of the scarfing-pass. It is evident that in the operation of scarfing the principal work and strain are brought on such end portions, and as they are braced by the upper and lower

rolls it is evident that little, if any, strain is brought upon the built-up roll, which even though formed in sections and having the scarfing-collar portions, which do the principal work in scarfing the edges of the heated plates, is so sustained, especially by the lower roll, that but little strain is brought upon the central shaft of the built-up roll. By making the scarfing-collars separate in this way I am also enabled to form them of tempered or hardened steel, which will stand much greater wear than the ordinary casting, while in case of wear on the collars they may be dressed by grinding or turning, and so present new faces, and may be utilized by gradually reducing the length of the collar until practically the whole body of the same is employed for scarfing purposes. For this purpose the collars may either have the single scarfing-face 22, as shown in Fig. 5, or the scarfing-faces 23 at each end, as shown in Figs. 6 and 7, the latter providing for the finishing of the collars and for quick change of same in case of injury to the other scarfing-face. In addition to such scarfing-collars I employ the intermediate plain-faced collars 24 of less diameter than the scarfing-collars, which form the base of the scarfing groove or pass. These may be made as hollow castings, as illustrated in the drawings, to reduce weight or may be in the form of solid rings. When necessary, I also employ the outer filling-collars 25 between the scarfing-collars and the journal portions of the roll, which collars are usually made of the full diameter of the roll, it being desirable that either such collars or the scarfing-collars shall contact with the upper and lower rolls for the purpose of driving the intermediate roll and sustaining the strain upon the roll. Through the use of these different collar-sections and of suitable washers, as found desirable, it is evident that the intermediate roll may be arranged for rolling any width of plate and that to accomplish this work it is only necessary to remove the collars from the roll-shaft 17, readjust them, and reclamp them in place. The construction is therefore flexible and made so by the combination with the scarfing-collars having their bevel edges of these intermediate collars, which are both plain-faced and of less diameter than the roll-body and which can be made of different widths, and provided through their use for scarfing-grooves of any desired width, while the scarfing-collars of greater width take the mass of the wear.

As it is desirable to provide for the quick changing of the roll, as well as its quick adjustment, any suitable form of bearing for the one end of the roll which will permit it to be withdrawn through that housing may be employed. The form of such bearing illustrated in the drawings is believed to be well adapted to the purpose, and I will describe the same. The bearing 16 has suitable ver-

tical guide-flanges 26, engaging with the housing and holding it in position therein. This bearing receives the sleeve 27, which is lined with Babbitt or other suitable metal, as at 28, and in which the journal 15 of the intermediate roll is seated. To provide for the removal of this sleeve with the intermediate roll, as well shown in Figs. 10, 11, and 13, the sleeve is provided with an annular shoulder or collar 29 at its outer end, which is seated in the annular recess 30 at the outer end of the bearing 16, so limiting the inward movement of the sleeve. In the bearing 16 are also formed the grooves 31 for the passage of the bolt 33, like grooves 32 being preferably formed in the outer face of the sleeve 27, and the two grooves forming the seat for the passage of the bolt 33. To receive the head 34 of this bolt, an enlarged seat 36 is formed at the inner end of the bearing, a like seat 35 being preferably formed in the sleeve 27, so that when such bolts are inserted in their seats and secured thereto by suitable nuts 37 at the opposite end the heads 34 engage with the inner face of the bearing 16, and thereby through the nuts 37 hold the sleeve from outward movement in said bearing, the bearing therefore being held in proper position by its collar 29 and said bolts and nuts. Suitable guiding means 38 for directing the heated plates to be rolled into the upper pass between the intermediate roll 8 and the upper roll 5 are secured to the housings or other proper support.

In the use of the three-high mill the upper and lower rolls are positively driven through the gear connections and the intermediate roll is driven by friction from the upper and lower rolls through the contact of its scarfing or other collar sections therewith. The plates to be scarfed are suitably heated and are fed from the furnace to the scarfing-rolls, and in passing through the same their edges are gripped by means of the scarfing-collars and forced against the upper roll, and the intermediate collars forming the base of the working groove contact with the plate and aid in its passage through the rolls. In case it is desired to change to another width of plate it is only necessary to stop the mill, raise the upper roll slightly, and loosen or remove the bolts 33, when the intermediate roll, together with the bearing-sleeve 27, fitting around the journal 15, can be withdrawn longitudinally through the housing 2, as illustrated in Fig. 2. Another roll-section previously prepared can then be immediately inserted and secured in place by simply slipping the sleeve 27 over the roll-journal and forcing the roll to place until the collar 29 of said sleeve is seated in the bearing 16 and then slipping the bolts 33 from the inner end of the housing through their seats formed in the sleeve and bearing and securing them in place. This requires but a few minutes. If it is necessary to readjust the same roll or to regrind the faces thereof, it is only

necessary to take the roll apart, which can be done very easily by removing the nuts 18, slipping off the journal 15, and removing the other collars, and if necessary grinding the beveled faces of the scarfing-collars and readjusting the rolls either to form the same or another width of pass, employing the same or other intermediate plain-faced collars and washers to bring it to the proper width of pass. The roll can then be quickly passed back into the same position and secured in place in the manner above described. The outer bearing for the roll is thus formed of the sleeve seated in the main bearing, as above described, and the bolts 33, when seated in grooves formed in both sleeve and main bearing, serve in addition to the above function to hold the sleeve from turning. The mill thus provides for the scarfing of any size of plate, overcoming the necessity of maintaining separate rolls for each particular size, while it provides for great facility of operation and enables me to employ special hard-steel collars for the parts of the roll which receive the hardest work, so greatly extending the life of the mill.

What I claim is—

1. In a three-high plate-scarfing or like mill, the combination with the housings and upper and lower rolls, of an intermediate roll, bearings therefor mounted in the housings and vertically movable therein, one bearing having a central sleeve-section of as great diameter as the intermediate roll and entering longitudinally into and fitting within a seat in the bearing and so providing for the longitudinal withdrawal of the intermediate roll through

that bearing, and means for locking the sleeve within the bearing.

2. In a three-high plate-scarfing or like mill, the combination with the housings and upper and lower rolls, of an intermediate roll and bearings therefor mounted in the housings, one bearing having a central sleeve-section of as great diameter as the intermediate roll and provided with a shoulder at its outer end and entering into and fitting within a seat in the bearing, and means for locking the sleeve against outward movement.

3. In a plate-scarfing or like mill, the combination with the housings, of a roll journaled in said housings, a bearing therefor in one housing having a sleeve portion fitting around the roll-journal and being of as great diameter as said roll, seats formed between the main bearing and the outer face of the sleeve, and locking-bolts fitting in said seats.

4. In a plate-scarfing or like mill, the combination with the housings, of a roll journaled in said housings, a bearing therefor in one housing having a sleeve portion fitting around the roll-journal and being of as great diameter as said roll, seats formed between the main bearing and the outer face of said sleeve, bolt-head recesses formed in the main bearing, and bolts secured in said seats and having their heads seated in said recesses.

In testimony whereof I, the said PETER PATTERSON, have hereunto set my hand.

PETER PATTERSON.

Witnesses:

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