No. 780,644. PATENTED JAN. 24, 1905.

V. E. EDWARDS.

MILL FOR POLISHING ROUND BARS.

APPLICATION FILED JULY 8, 1902.

2 SHEETS—SHEET 1.

Fig 1.

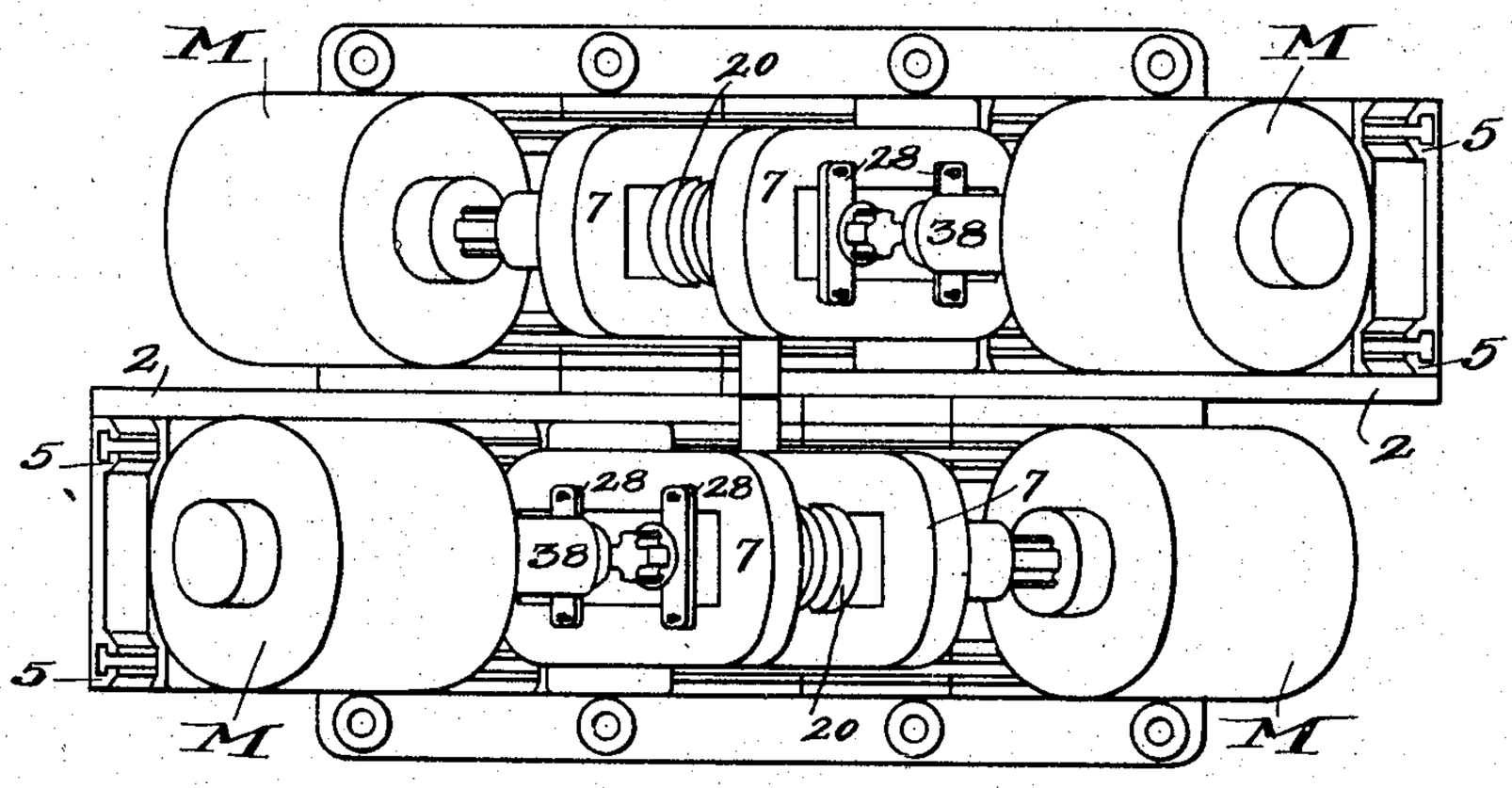
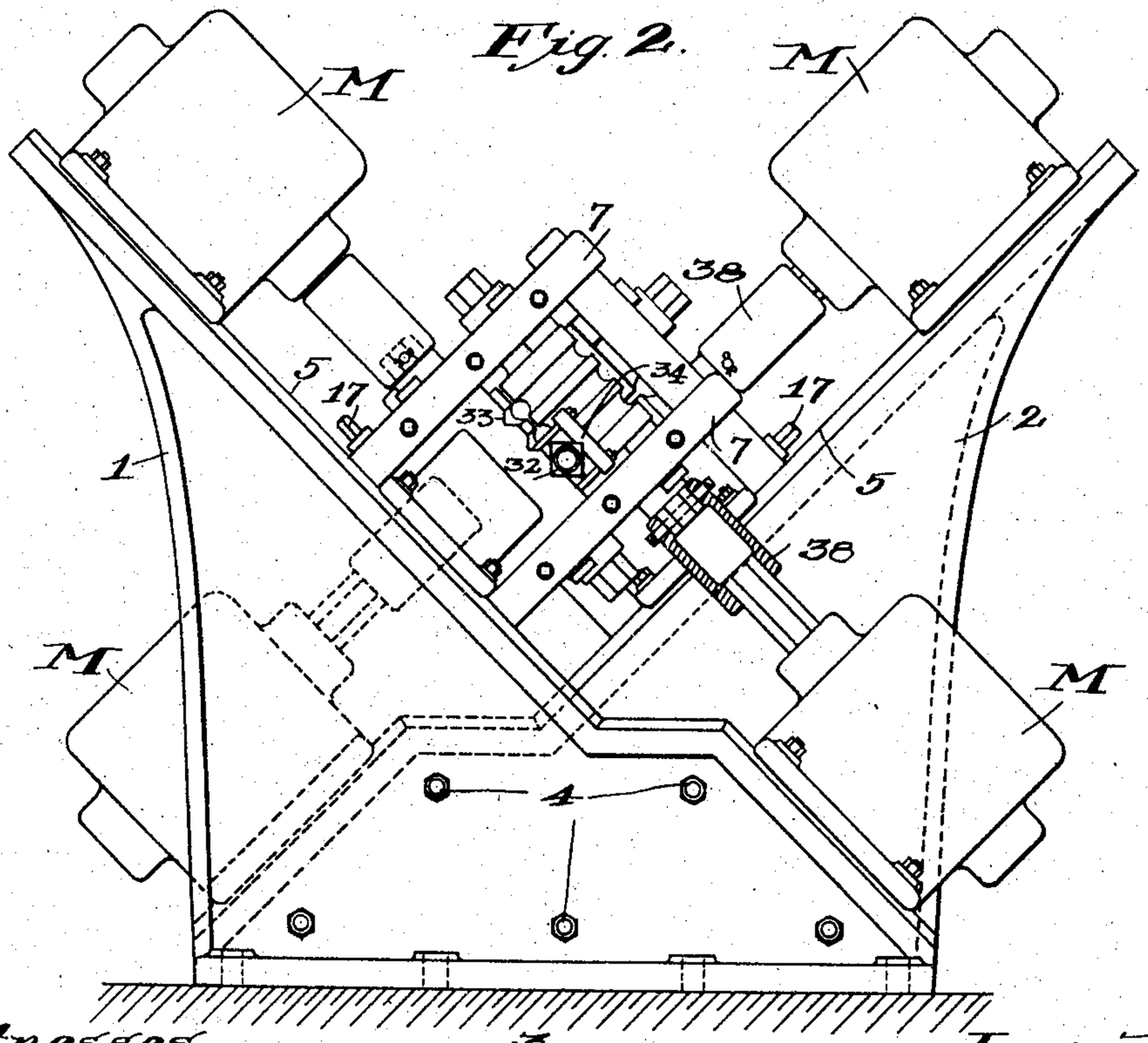


Fig 2.



Witnesses
M. M. Schuermann
Ernest J. Howe

Inventor
Victor E. Edwards
By Rufus B. Fowler
Attorney.

No. 780,644. PATENTED JAN. 24, 1905.

V. E. EDWARDS.

MILL FOR POLISHING ROUND BARS.

APPLICATION FILED JULY 8, 1902.

2 SHEETS—SHEET 2.

Fig. 3.

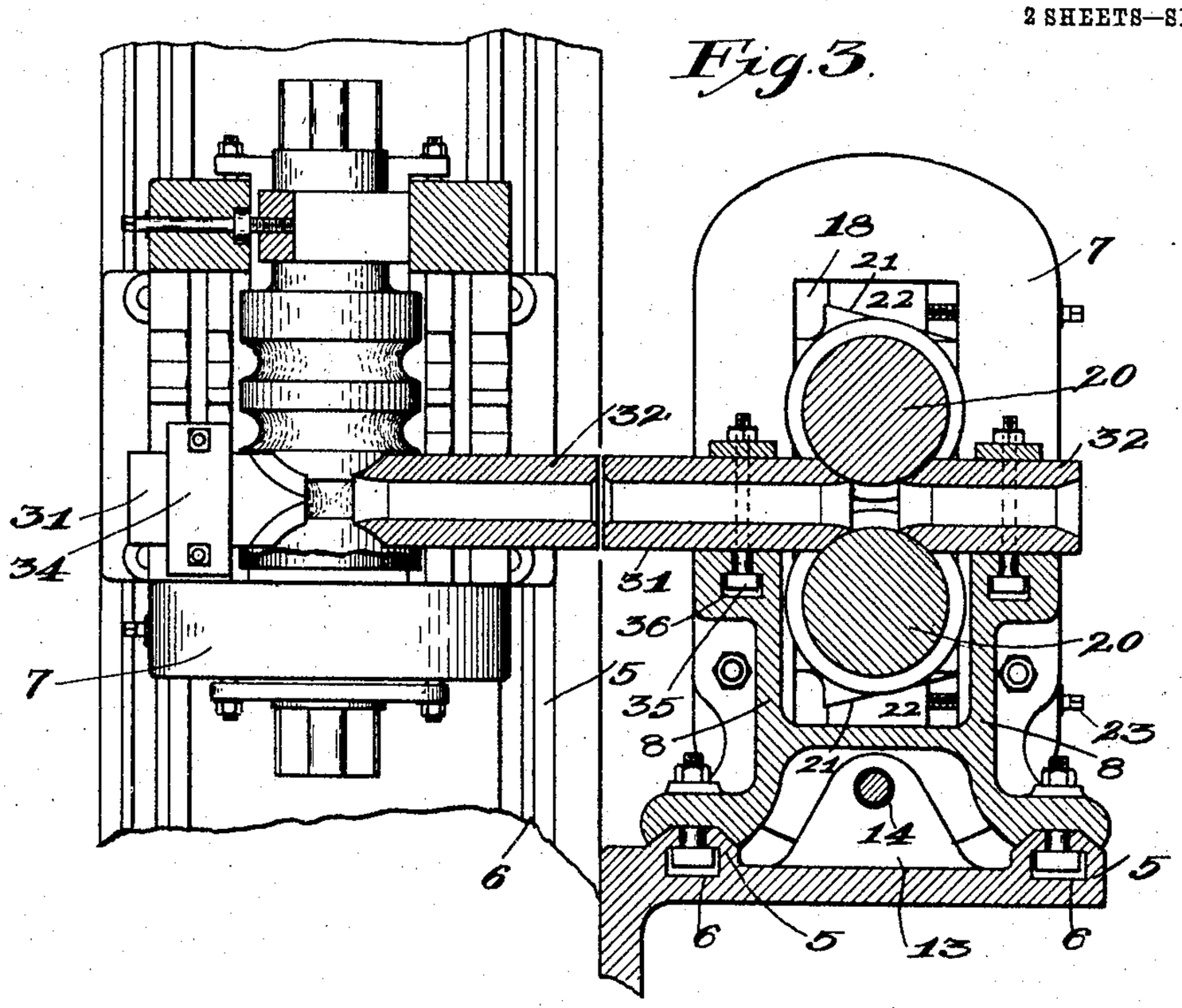


Fig. 4.

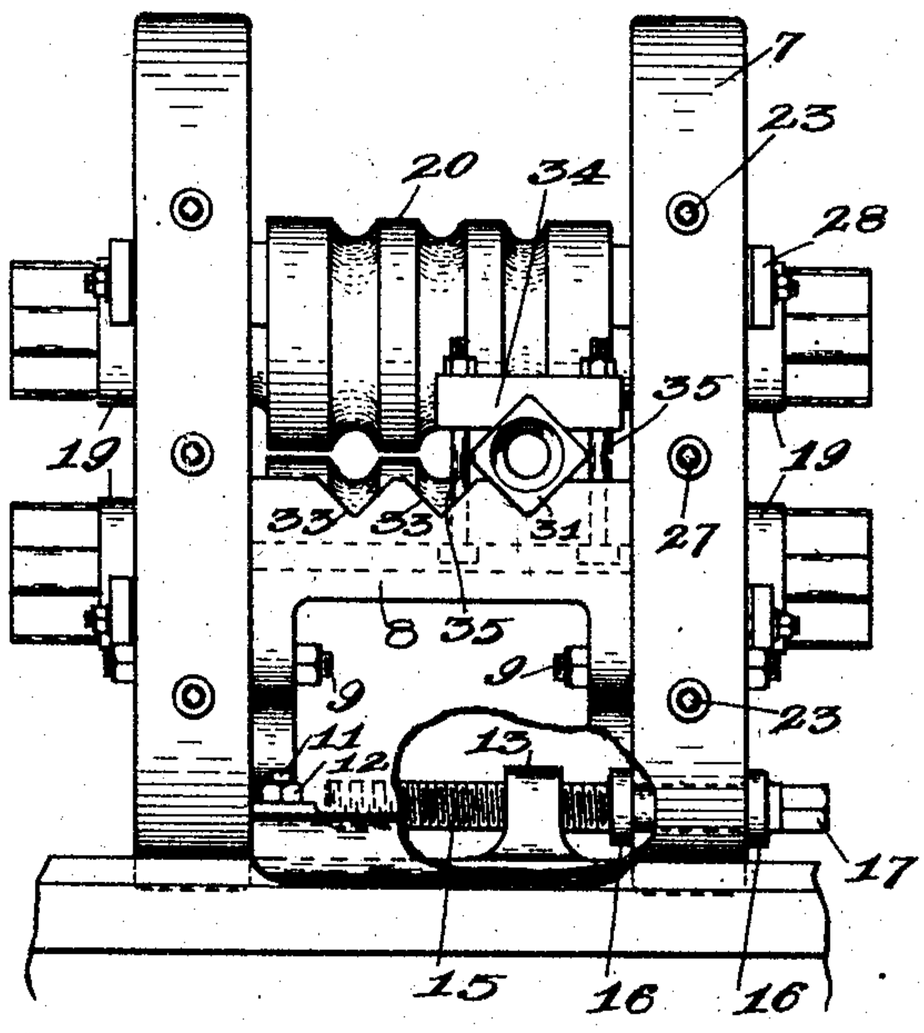
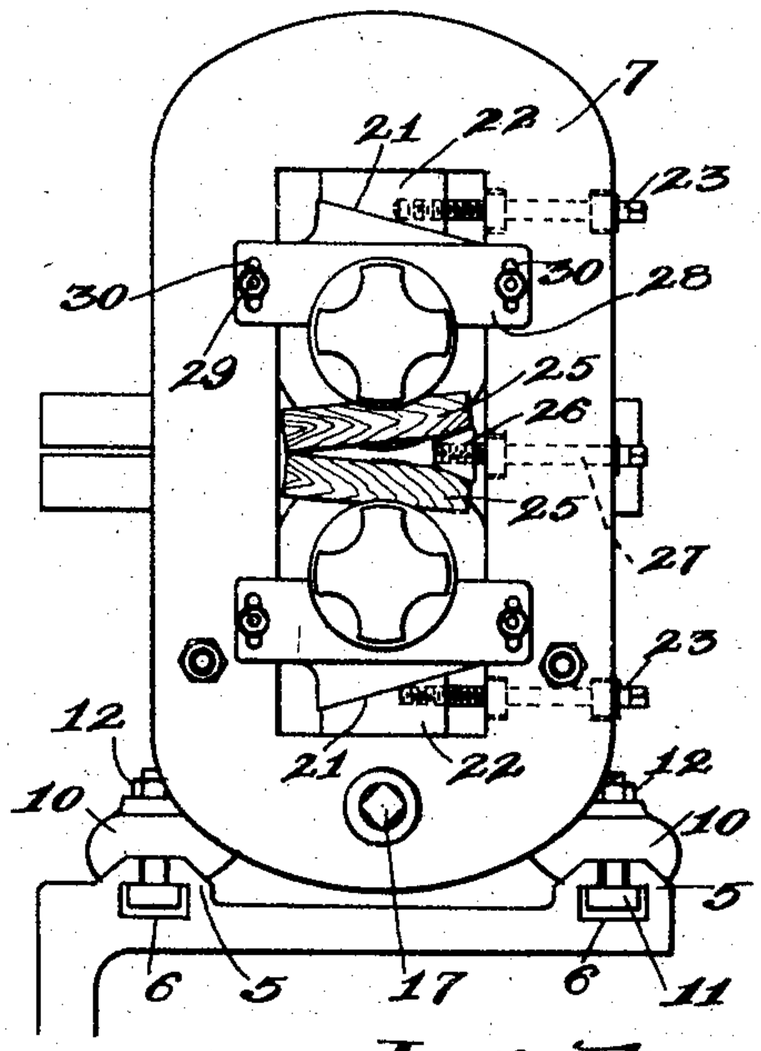


Fig. 5.



Witnesses
M. M. Schuermann
Ernest J. Howe

Inventor
Victor E. Edwards
By Rufus B. Fowler
Attorney.

No. 780,644. Patented January 24, 1905.

UNITED STATES PATENT OFFICE.

VICTOR E. EDWARDS, OF WORCESTER, MASSACHUSETTS, ASSIGNOR TO MORGAN CONSTRUCTION COMPANY, OF WORCESTER, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

MILL FOR POLISHING ROUND BARS.

SPECIFICATION forming part of Letters Patent No. 780,644, dated January 24, 1905.

Application filed July 8, 1902. Serial No. 114,712.

To all whom it may concern:

Be it known that I, VICTOR E. EDWARDS, a citizen of the United States, residing at Worcester, in the county of Worcester and Commonwealth of Massachusetts, have invented a new and useful Improvement in Mills for Polishing Round Bars, of which the following is a specification accompanied by drawings forming a part of the same, in which—

Figure 1 is a plan view of the mill. Fig. 2 is a view in side elevation. Fig. 3 is a sectional view, portions being in elevation. Fig. 4 is a side view of the housing, showing two rollers in position therein; and Fig. 5 is an end view of the same.

Similar reference letters and figures refer to similar parts in the different views.

The object of my invention is to provide a self-contained mill in which the successive passes are located in close proximity to each other, requiring no handling during their passage from one set of rolls to the other, and, further, to provide lateral support for the bar of metal between the two sets of rolls.

It is also the object to provide means for bringing the passes between the contiguous pairs of rollers into exact alinement with each other and also to apply constant and uniform speed to the several rollers and to connect all parts of the machinery upon a single rigid frame, with means for adjusting the housings and likewise the pairs of rollers in each housing; and with these objects in view my present invention consists in certain novel features of construction and combinations of parts, which will be hereinafter fully described, and pointed out in the claims.

Referring to the accompanying drawings, 1 and 2 represent a pair of frames cast substantially in duplicate and placed together and bolted to the bed 3 of the mill and bolted together at the center, as at 4 4, so that the two frames are perfectly rigid and as if made in a single casting. On the inner inclining bases of these frames tracks 5 5 are formed, these being provided with longitudinal T-shaped grooves 6 6. Housings consisting each of a pair of uprights 7 7 and intermediate webs 8 8 are bolted thereto, as at 9 9. These webs have feet 10 10, which are mounted upon the tracks 5 5, upon which the housings are adapted to be adjusted, they being clamped in position by the bolts 11 11, the heads of which are located in the undercut of the T-shaped grooves 6 6, nuts 12 12 being screwed on their upper ends to hold them in place.

Between the ends 7 7 of each housing an outwardly-extending lug 13 is cast, and through its center a screw-threaded hole 14 is bored. The screw 15, swiveled in a hole in one of the end housings 7 between collars 16 16, is screw-threaded, and the threads are adapted to turn in the threads of hole 14 in the lug 13, so that the entire housing comprising the ends and connecting-web is capable of being adjusted bodily up or down on the tracks 5 5 by applying a wrench to the head 17 of the screw and turning it in the direction desired. The ends of the housing have openings 18 18 therein, and the trunnions 19 19 of the rollers 20 20 extend therethrough, they being supported to turn in suitable journals which are adjustable with respect to the housings, and for this purpose the upper and lower surfaces of the upper and lower journal-boxes are provided with inclined outer surfaces 21, as shown in Fig. 5, and movable blocks 22 22, with oppositely-inclined inner surfaces adapted to engage the inclined surfaces 21 21 of the bearings, are interposed between said inclining surfaces 21 21 and the extreme ends of the opening 18 in the ends 7 7, their function being to act as wedges between said surfaces to force the journal-boxes toward each other or to permit them to be separated, this movement of the blocks 22 22 being conveniently effected by means of the screws 23 23, which are swiveled in the ends 7 7 of the housings and screw-threaded into the blocks, so that when a wrench is applied to their outer ends and they are turned the blocks are moved in or out, as the case may be. Interposed between the trunnions are a pair of adjustable bearing-plates 25 25, and between them a wedge-shaped block 26 is adapted to be moved in or out by the screw 27 in a

similar manner, so that instead of merely providing means for taking up the wear in the journals as heretofore it is the purpose of my invention to provide means of adjusting the rolls in pairs bodily, so that the whole pass is movable bodily to bring it into exact alinement with the guide through which the bar travels to and from the passes. This would be impossible if the bearing between the trunnions were stationary, although means were provided at the upper and lower ends of the housing for taking up wear in the journals. This would be equally impossible if the outer bearings were stationary and the journals between the rolls only were adjustable; but by making the entire set adjustable and independent of any anchorage upon the housings the passes are movable bodily by shifting two rollers which form them in unison to effect an alinement with the guide with absolute accuracy. The end thrust of the rolls is upon bars 28 28, and these are held in position by bolts 29 29 in the elongated slots 30 30, extending transversely of the end-thrust plates. So to adjust the rolls endwise these bolts are turned, and thereby the grooves of the two rolls are made to exactly coincide and insure the proper contour in the rod being polished. These thrust-bars 28 28 likewise sustain the end pressure, which, of course, is only slight, maintaining the accurate alinement of the two grooves of a pass.

The guides may be designated as "entrance" and "delivery" guides and are denoted by the numerals 31 and 32, respectively, and they are rigidly secured in place in the notches 33 33 on the upper edges of webs 8 8 by the clamp-bars 34 34, which are held in place by bolts and nuts 35 35, the heads of which bolts are movable in the T-shaped slots 36 36. These notches are in exact alinement with the passes and in that way serve as gages to insure the proper adjustment of the guides relative to the passes. Each roll has one or more passes, although only one is used at a time, the others being in reserve, so the usefulness of a mill is correspondingly lengthened before it is necessary to repair or remill the grooves. The entrance and delivery guides are in alinement on opposite sides of each set of rolls, as shown more clearly in Fig. 3 of the drawings, and it is a desideratum that the guides leading to and from one set of rolls should be in absolute alinement with the working pass of the next pair of rolls, and that is why the rolls are bodily adjustable in pairs within the housings and to acquire the requisite transverse or lateral adjustment, and the housings themselves are adjustable bodily to shift the rolls endwise to bring the passes of two pairs of rolls, with their attached guides, into absolute and accurate alinement. Of course it is understood that when a new pass is to be used the guides must be reset in another one of the notches 33 33; but, as explained, these notches are gaged to exact alinement with their respective passes, and if not the rollers are adjusted to bring them into proper alinement, as previously explained. In like manner the housings may be shifted on the tracks 5 5, so as to raise or lower them to the precise position required. Power is applied to each roll independently by any kind of motor desired, and preferably each roll is driven independently by an electric motor M, and these are constant-speed motors, so that all four rolls are driven at a uniform speed, their armatures being connected to the adjacent end of the roll by any style of coupling-sleeve 38 38.

In a mill for polishing round bars it is a desideratum that no reduction, or as little as possible, should take place in the bar from pass to pass. At the same time sufficient pressure is necessary to cause the progressive movement of the bar through the passes and guides. In order to reduce this pressure to a minimum and yet make it adequate, it would be recognized at once that a possibility might arise of one set of rolls at some time exerting a greater feeding action than the other set, and if this should happen to be in the rear set of rolls it would tend to impart a greater speed at that point, and the result would be the buckling and the bending of the bar between the rolls. This tendency is resisted by the use of the guides, which afford lateral support for the bar during its transit all the way from one pass to another, so that any possibility to deviate from a straightforward course is positively precluded, even though there should for any cause be a variation in the speed of the two sets of rollers.

I am aware that it is old to pass a bar of steel between two contiguous pairs of rollers having their axes placed at an angle to each other; but, so far as I am aware, the passes have been reducing passes and of different diameters, whereas my invention contemplates a difference in this respect, as the passes which I wish are duplicate passes and as nearly alike as possible.

I am also aware that it is old to locate the two sets of rollers with their axes parallel, so that the intervening space affords ample room for an operator to twist the bar by hand preparatory to its entrance to the second set of rollers; but that is not the idea of my invention.

My invention resides in placing the two sets of rollers contiguous to each other and with their axes at an angle instead of parallel, so that no twisting of the bar is necessary to insure the proper position of the major and minor axes of the bar; and it further resides in affording lateral support for the bar throughout the entire passage from one set of rolls to the next.

I am likewise aware that it is not broadly new to adjust the bearings of the rollers independently. I do not, therefore, claim that as my

invention; but, so far as I am aware, it is new to adjust the rollers bodily in pairs, so that the pass which is formed by grooves partly in each roll of a pair is adjustable bodily to insure its exact alinement with the pass of the next pair of rolls; but

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a mill for polishing round bars, the combination of the triangular frames 1 and 2 placed in reverse position to each other and united together at their bases with the inclined faces of said frames provided with tracks 5, 5, roll-housings adjustably mounted on said tracks, a pair of rolls journaled in each of said housings, motors mounted on said frames with their axes in alinement with the axes of the lower rolls in each pair of rolls, motors mounted upon said frames with their axes in alinement with the axes of the upper rolls in each pair of rolls, and couplings connecting said motors with their respective rolls in alinement therewith.

2. In a mill for polishing round bars, the combination with a bed, of a pair of duplicate triangular frames attached to said bed with their inclined sides in reverse position, roll-housings attached to the inclined sides of said frames, a pair of rolls journaled in each of said housings, and a pair of motors attached to each of said frames and independently coupled to each roll in the pairs of rolls.

Dated this 1st day of July, 1902.

VICTOR E. EDWARDS.

Witnesses:
M. M. SCHUERMANN,
RUFUS B. FOWLER.