

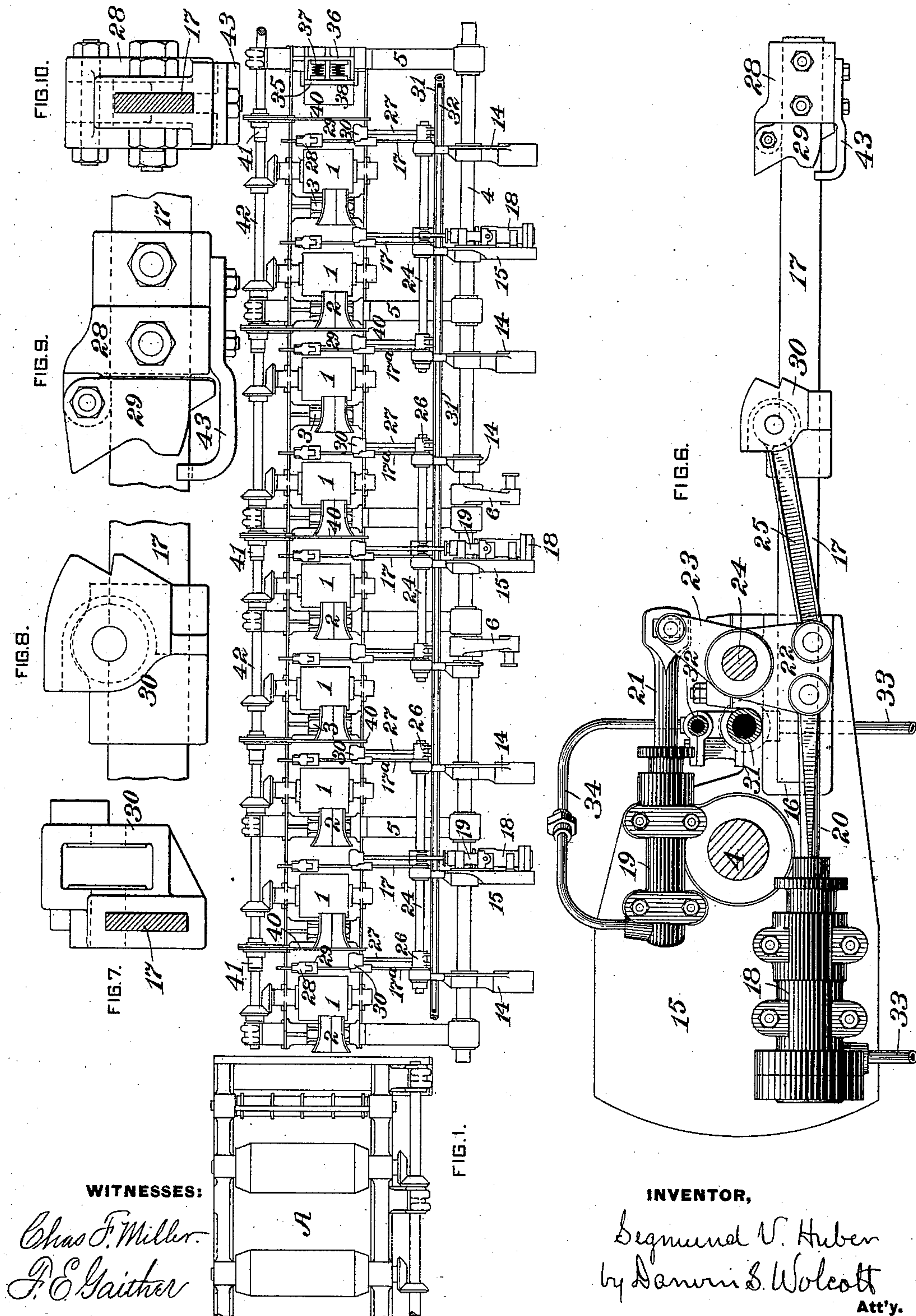
(No Model.)

5 Sheets—Sheet 1.

S. V. HUBER.
MACHINE FOR BOSHING PLATES.

No. 540,447.

Patented June 4, 1895.



WITNESSES:

Chas F. Miller.
J. E. Gaither

INVENTOR,

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by Darwin S. Wolcott
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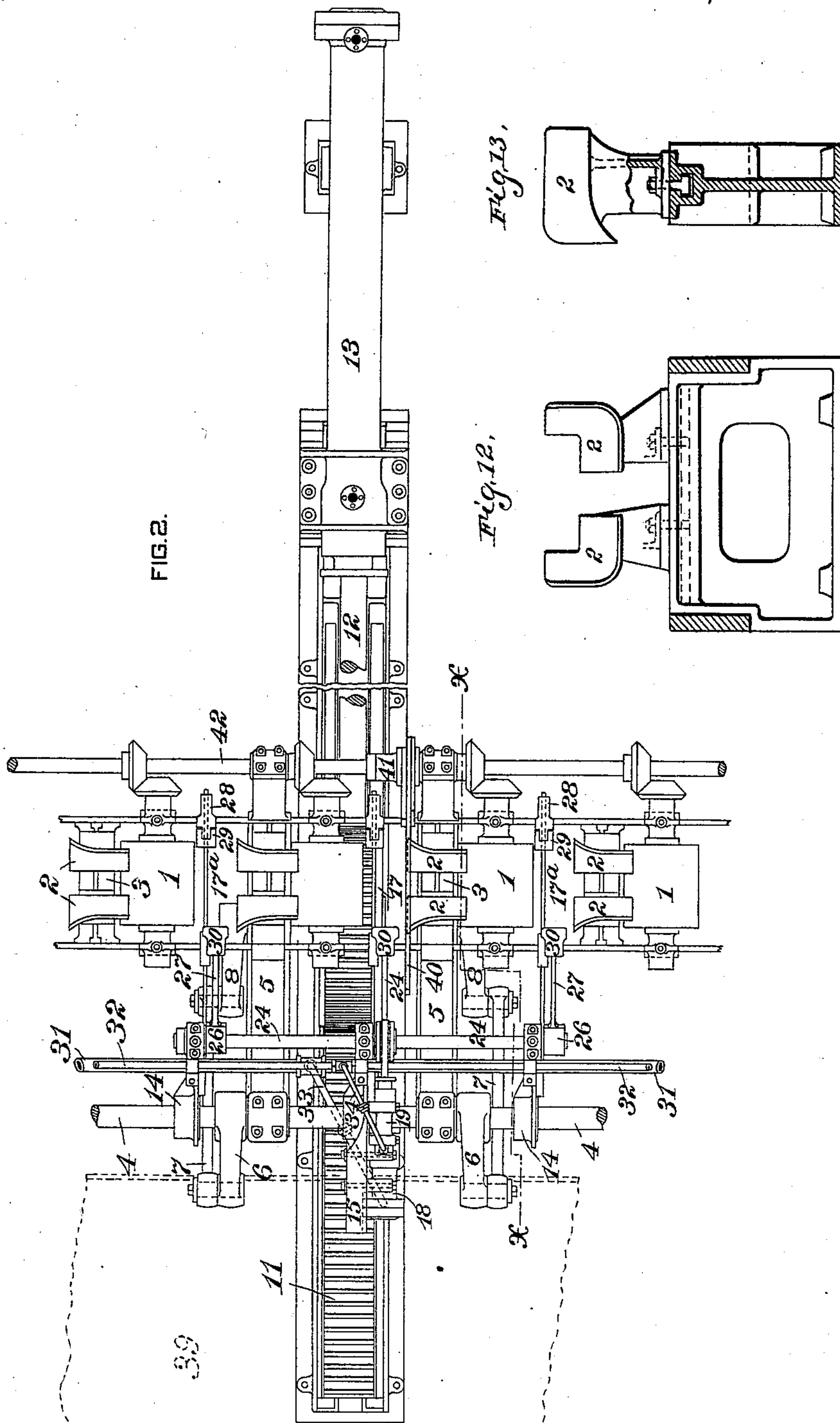
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FIG. II.

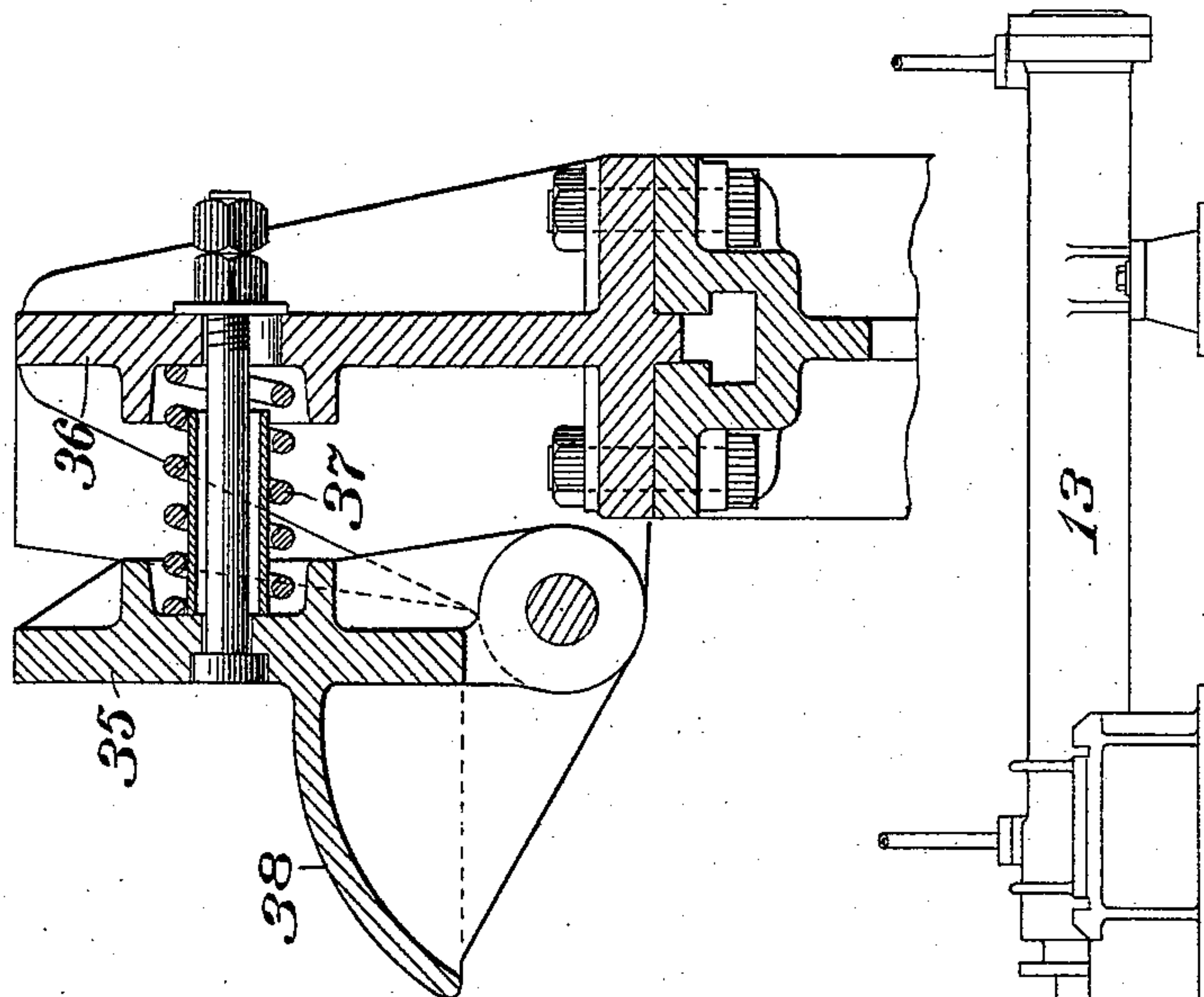
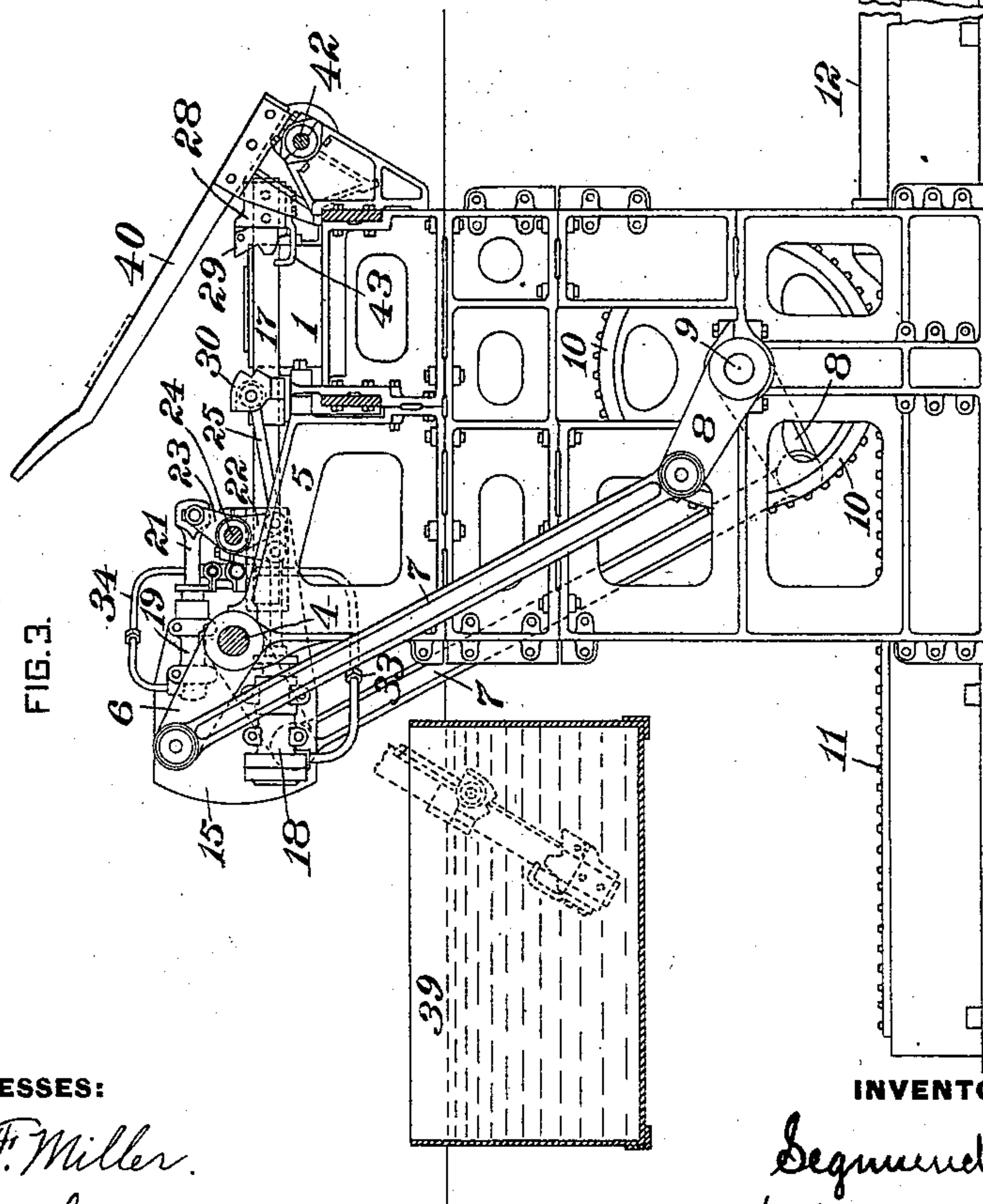


FIG. 3.



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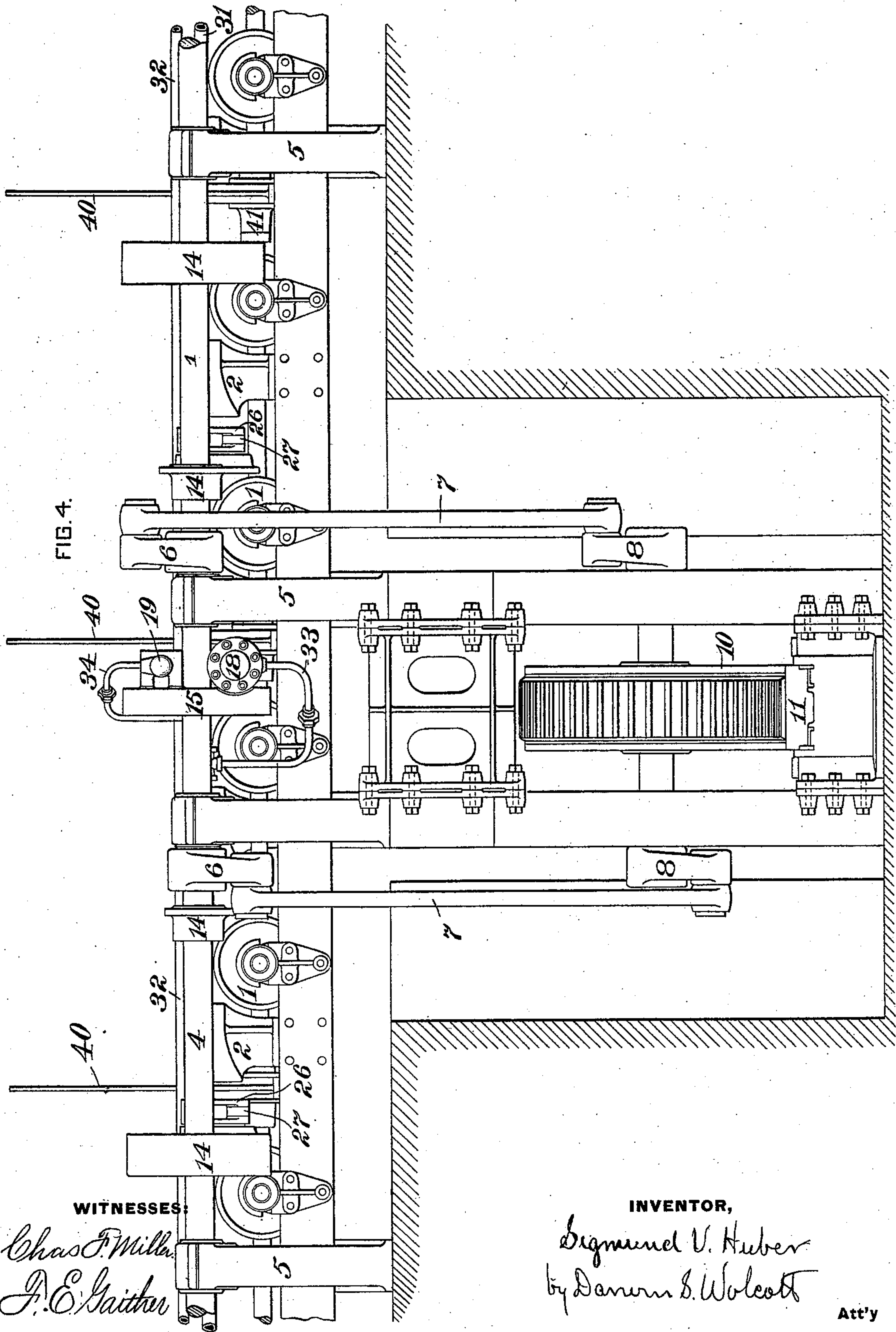
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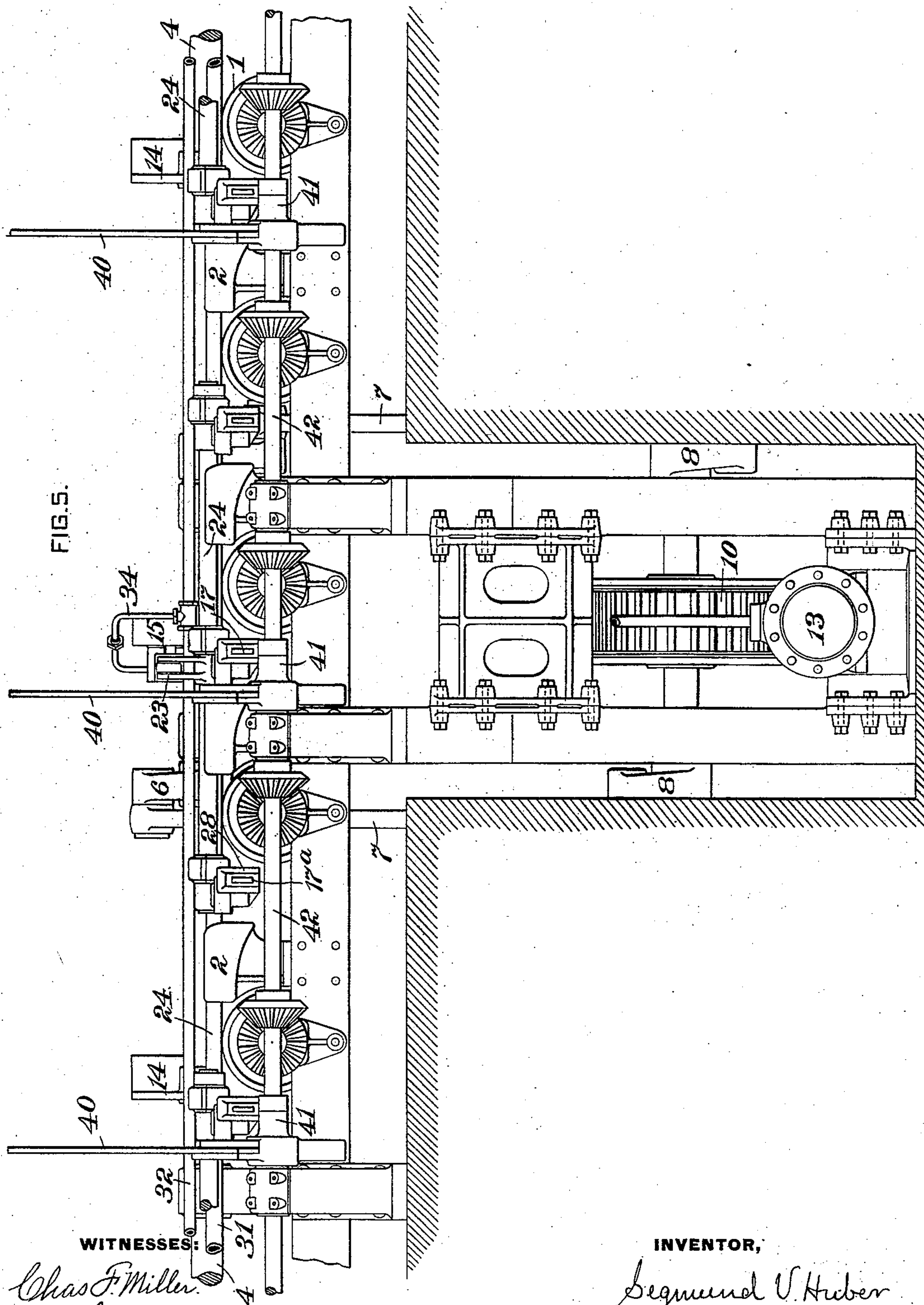
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UNITED STATES PATENT OFFICE.

SIGMUND V. HUBER, OF PITTSBURG, PENNSYLVANIA.

MACHINE FOR BOSHING PLATES.

SPECIFICATION forming part of Letters Patent No. 540,447, dated June 4, 1895.

Application filed February 2, 1895. Serial No. 537,088. (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 Machines for Boshing Plates, &c., of which improvements the following is a specification.

The invention described herein relates to certain improvements in machines for boshing metal plates, bars, &c., and has for its object a construction of machine whereby the hot plates or bars are so grasped as they come from the rolls, that when immersed in a bath of cold water, they will be prevented from warping or twisting.

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 top plan view of my improved machine. Fig. 2 is a similar view of a portion of the machine on an enlarged scale. Fig. 3 is a sectional elevation, the plane of section being indicated by the line *x x*, Fig. 2, certain portions of the machine being removed. Figs. 4 and 5 are elevations of opposite sides of the machine on an enlarged scale. Fig. 6 is an enlarged detail view of the gripping and swinging mechanism. Figs. 7, 8, 9, and 10 are details of the gripping mechanism. Fig. 11 is a sectional view of the stop. Fig. 12 is a transverse section of the frame of the machine, showing the manner of mounting the guide-troughs on the frame; and Fig. 13 is a sectional detail of the same parts of the machine, the plane of section being at right angles to that on which Fig. 12 is taken.

In the practice of my invention a suitable frame is arranged preferably in line with the feed table A of a rolling mill, and on this a series of positively driven rollers 1, for the reception and onward movement of the piece to be treated.

In order to direct the plate or bar into proper relation to the gripping mechanism, bell mouthed troughs 2, which are preferably formed in two parts or sections, are adjustably mounted on cross-bars 3, of the frame, the adjustment of the sections permitting of

their adaptation to different sizes of plates or bars.

A shaft 4 is mounted on brackets 5, projecting from one side of the frame, and provided with suitable bearings for the shaft, which is provided with crank arms 6. The pins on these arms, which are arranged at an angle to each other, are connected by rods 7 to pins on corresponding arms 8, on a shaft 9, having keyed thereon a gear wheel 10. This wheel intermeshes with a rack bar 11, connected to the rod 12, of the piston in the fluid pressure cylinder 13.

On the shaft 4, are keyed a series of sets of counter-weighted arms, each set consisting of two arms 14, and an arm 15 arranged between the arms 14, as shown in Figs. 1, 2 and 4. The counter-weighted portions of these arms hang outside of the shaft 4, and the inner ends of the arms are provided with recesses 16 (see Fig. 6), for the reception of one end of bars 17, which in the normal position of the mechanism project over the main frame, their upper edges being a little below the rollers 1, so as not to interfere with the feed of the article operated on, as shown in Figs. 3 and 5. The arms 15 of each set are provided with suitable seats for the fluid pressure cylinders 18 and 19, whose piston rods 20 and 21 are connected respectively to arms 22 and 23, which are keyed to a short shaft 24, mounted in suitable bearings formed on the arms 14 and 15 of each set. The arms 22 and 23 are preferably formed integral with each other, as shown in Fig. 6. The arm 22 is also connected, by a rod 25, to one member of the gripping mechanism on the bar 17, extending from the arm 15. In order to operate the gripping mechanism on the bars 17^a, extending from the arms 14, the short shaft 24 is provided near its ends with arms 26, which are connected by rods 27 to the movable member of the gripping mechanism on the bars 17^a.

The gripping mechanisms on the bars 17 and 17^a consist of stationary blocks 28, bolted to said bars, as shown in Fig. 6, and provided with jaws 29, pivoted to the blocks 28 and the jaws 30, arranged to be shifted along the bars 17 and 17^a, by the arms 22 and 26, on the shaft 24, as described. The jaws 29 and 30 have their operative faces suitably shaped to hold

the article being treated firmly against the bars 17 and 17^a. The jaw 29 is so pivoted on the block 28, that it can be shifted as will be hereinafter described, into such position as to permit the ready removal of the article.

Fluid pressure is conducted to the cylinders 18 and 19, by pipes 31 and 32, extending along these several sets of arms and supported thereon, and provided with branches 33 and 34, at each set, to connect said main pipes with their respective cylinders. The cylinders are by preference of the single acting type, the cylinders 18, which are the larger of the two, being employed to effect the gripping of the plate, while the smaller cylinders 19 are employed to release the plate by withdrawing the movable gripping jaws. In operation a constant pressure is maintained in the smaller cylinders, so that they will serve as cushions for the larger cylinders, whose pistons have sufficient area to not only operate the movable gripping jaws, but also force the pistons of the smaller cylinders back against their constant pressure, which is the same per square inch as that in the larger cylinders. The flow of fluid pressure to and from the larger cylinders is controlled by a suitable valve located at any convenient point in pipe 31. It will be understood that a double acting cylinder and piston may be substituted for the two single acting cylinders, if desired.

In operating my improved apparatus, the several parts being in the position shown in the drawings, a plate is fed in by the rollers 1, the troughs 2 guiding it into proper position between the gripping jaws. The onward movement of the plate is arrested by a stop mechanism at the end of the frame, consisting of a plate 35, pivoted to a suitable support 36, and backed by a spring 37. In order to prevent the end of the plate or bar being operated from being bent by striking against the stop plate 35, the latter is provided with a forwardly projecting ledge 38, which curves downwardly so as to prevent the ends of the plate or bar passing under it, as shown in Fig. 11.

As soon as the plate or bar has come to rest on the rollers 1, fluid pressure is admitted to the cylinders 18, thereby shifting the movable jaws 30, and with them the plate or bar, until the edges of the latter are firmly clamped by the jaws 29 and 30, and the side of the plate or bar held against the transverse bars 17, 17^a. Fluid pressure is now admitted to one end of the cylinder 13, thereby, through the medium of the mechanism described, rotating the shaft 4, the several sets of arms 14 and 15 keyed on the shaft, and the gripping mechanisms carried by said arms, through an arc of about two hundred and twenty-five or two hundred and thirty degrees, so as to immerse the gripping mechanisms and the plate or bar held therein into a trough 39, containing a cooling liquid and arranged parallel with the frame of the machine, as shown in Fig. 3. As soon as the bar or plate has become chilled,

the movement of the shaft 4 is reversed by admitting fluid pressure into the opposite end of the cylinder 13. After the gripping mechanisms have passed beyond a vertical position in their return movement, fluid pressure is permitted to escape from the cylinders 18, whereupon the pressure in the cylinders 19 will become operative to open the jaws of the gripping mechanism, so as to permit the removal of the plate or bar by the fingers 40, which project across the path of the plate or bar. These fingers are attached to a sleeve 41, loosely mounted on the shaft 42, employed for driving the feed rollers 1, and are normally in the inclined position by a shoulder on the sleeve resting on one of the side bars of the main frame. As the plate or bar is shifted toward the trough the fingers are pushed aside by the plate and drop back to normal position as soon as the plate has passed by. On the return movement of the gripping mechanisms, the plate or bar strikes upon the fingers and is held by them from onward movement with the gripping mechanisms. The pivotal mounting of the jaw 29, permits its being turned to release the plate or bar, in case the latter does not slide from under the overhanging portion of the jaw 29, as the jaw 30 is withdrawn as stated. In order to prevent such a movement of the jaw 29, that it will become jammed against the block 28 and not return to operative position, a finger 43, with an upturned end, is so attached to the block 28, as to engage the jaw 29 or a projection and prevent a too great movement of the jaw. After the gripping mechanisms have passed below the fingers, the plate or bar will slide down the fingers onto the floor of the mill.

If desired, all the gripping mechanisms may be operated by a single motor located centrally in which case one shaft running the full length of the boshing apparatus, would be substituted for the short shaft 24, mounted on each set of arms 14 and 15, as described.

As shown in Figs. 1 and 2, the arms 14 adjacent to the crank arms 6, need not be counter-weighted, as said crank arms will operate as counter-weights at those points.

I claim herein as my invention—

1. In a machine for boshing metal plates or bars, the combination of a series of pivotally mounted arms, gripping mechanisms carried by said arms, mechanisms mounted on the arms for opening and closing the gripping mechanism, mechanism for swinging the arms on their pivotal support, a trough ranged in the path of the gripping mechanism, and fingers for removing the plate or bar from the gripping mechanism, substantially as set forth.

2. In a machine for boshing metal plates or bars, the combination of a series of positively driven feed rollers, a series of pivotally mounted arms, gripping mechanisms carried by said arms and normally held in such position between the feed rollers, that the plates

or bars are fed longitudinally between the jaws of the gripping mechanism, mechanism for swinging the arms on their pivoted support, and a trough arranged in the path of the gripping mechanism, substantially as set forth.

3. In a machine for boshing plates or bars, the combination of a series of two or more sets of arms pivotally mounted, a gripping mechanism carried by each arm, mechanism arranged on one of the arms of each set, and connected to the several gripping mechanisms of such set, means for simultaneously swinging all the sets of arms, and a trough arranged in the path of the gripping mechanisms, substantially as set forth.

4. In a machine for boshing plates, bars, &c.,

the combination of a series of arms pivoted along one side of the frame of the machine, gripping mechanisms carried by said arms, mechanism for swinging the gripping mechanisms, a trough arranged in the path of the gripping mechanisms, and a series of fingers loosely pivoted on the opposite side of the frame of the machine, so as to normally project across the path of the gripping mechanisms, substantially as set forth.

In testimony whereof I have hereunto set my hand.

SIGMUND V. HUBER.

Witnesses:

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