

(No Model.)

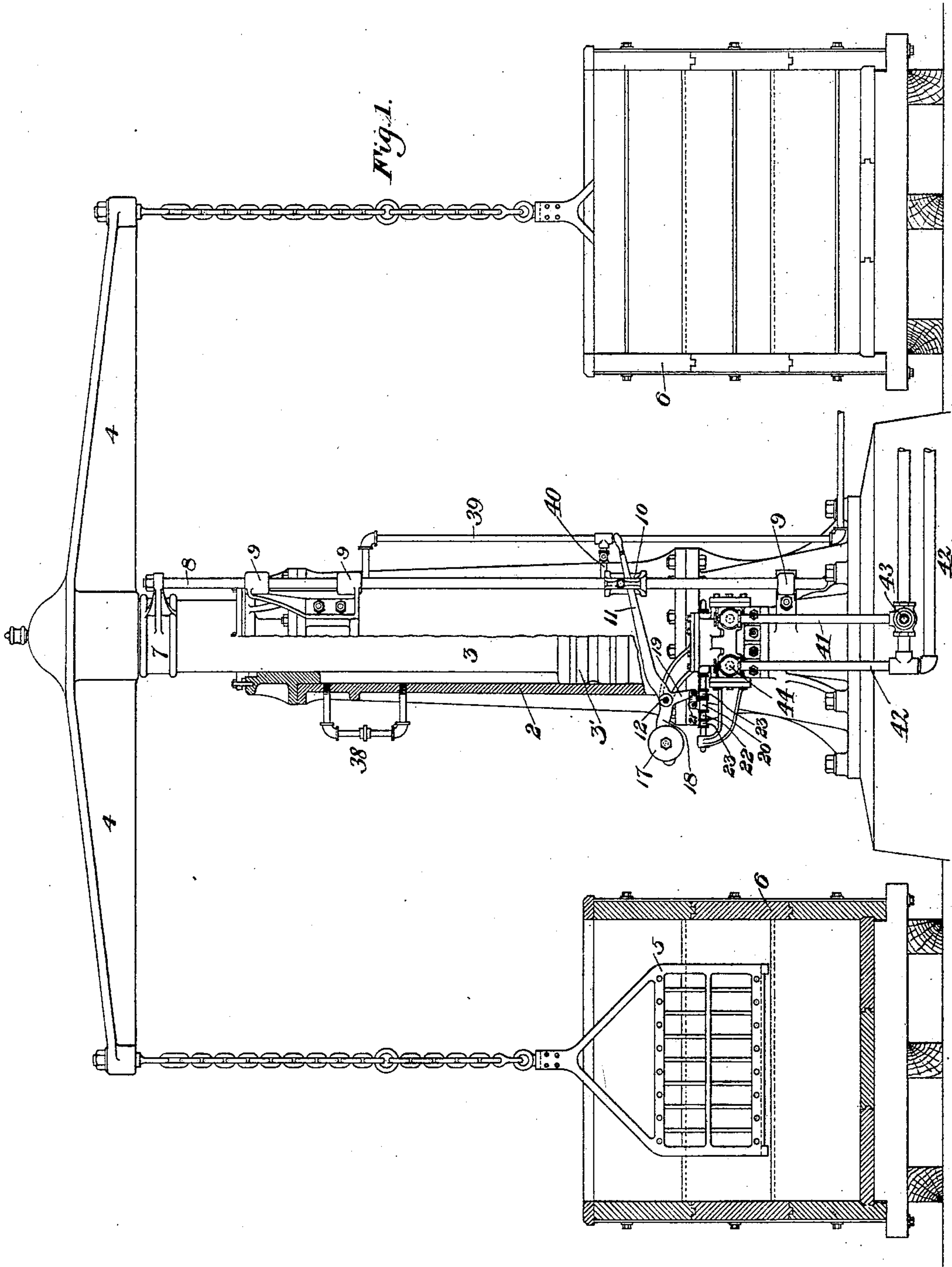
3 Sheets—Sheet 1.

G. MESTA.

MOTOR IN APPARATUS FOR PICKLING AND WASHING METAL PLATES.

No. 602,686.

Patented Apr. 19, 1898.



WITNESSES

Harvey M. Swartz
H. B. Corwin

INVENTOR

George Mesta

(No Model.)

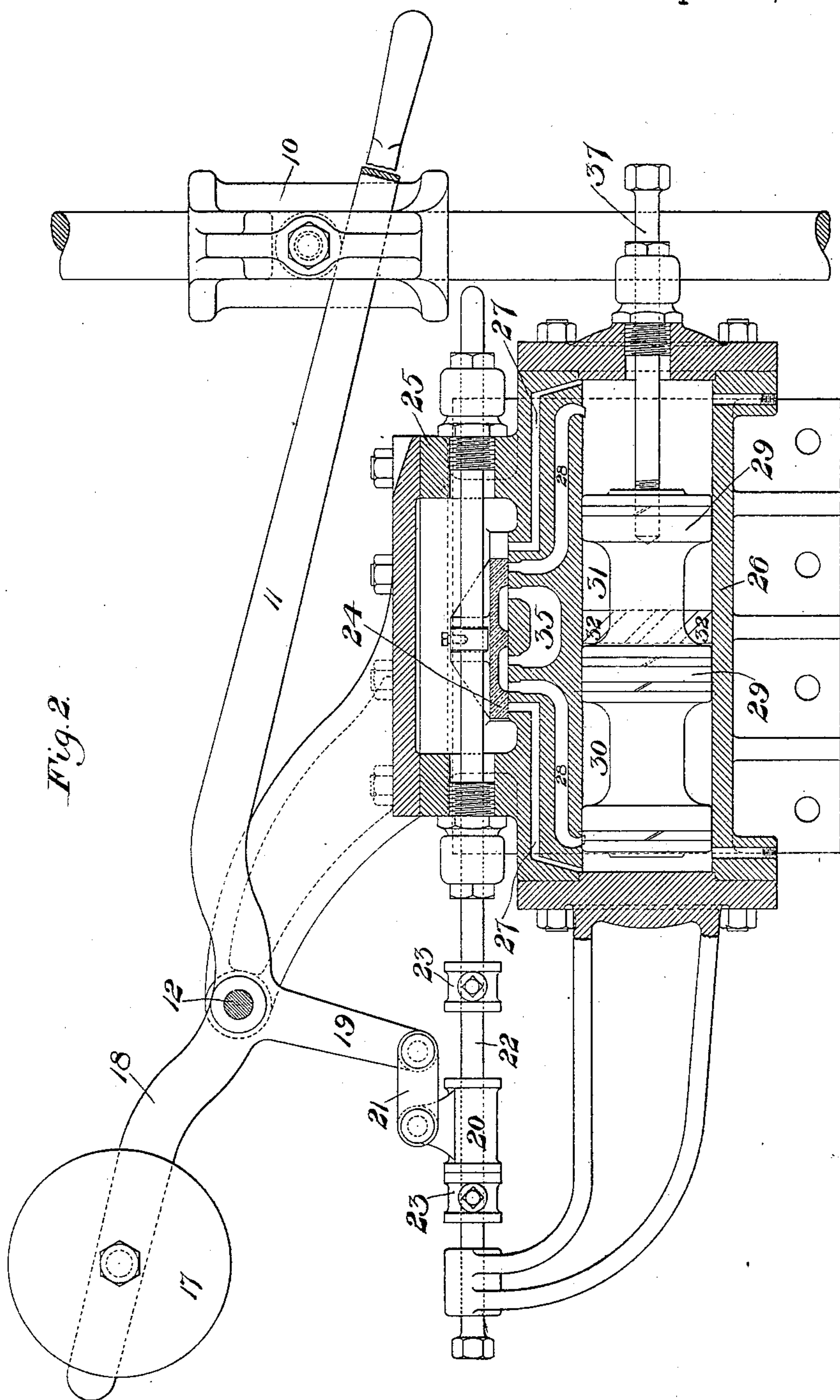
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Patented Apr. 19, 1898.



WITNESSES

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(No Model.)

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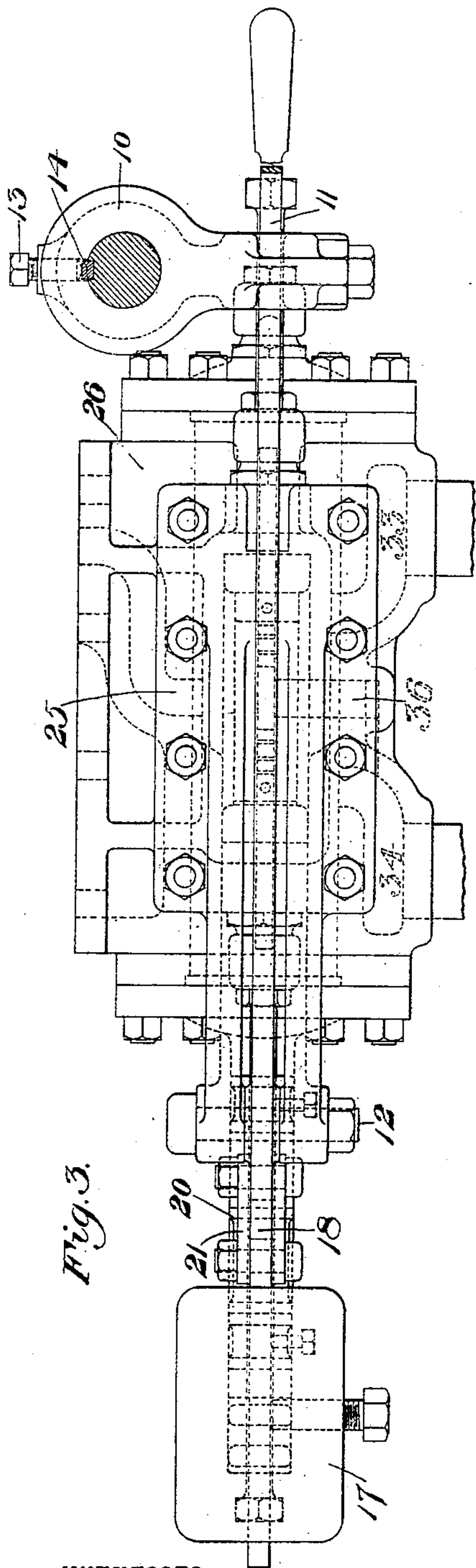


Fig. 3.

WITNESSES

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Fig. 5.

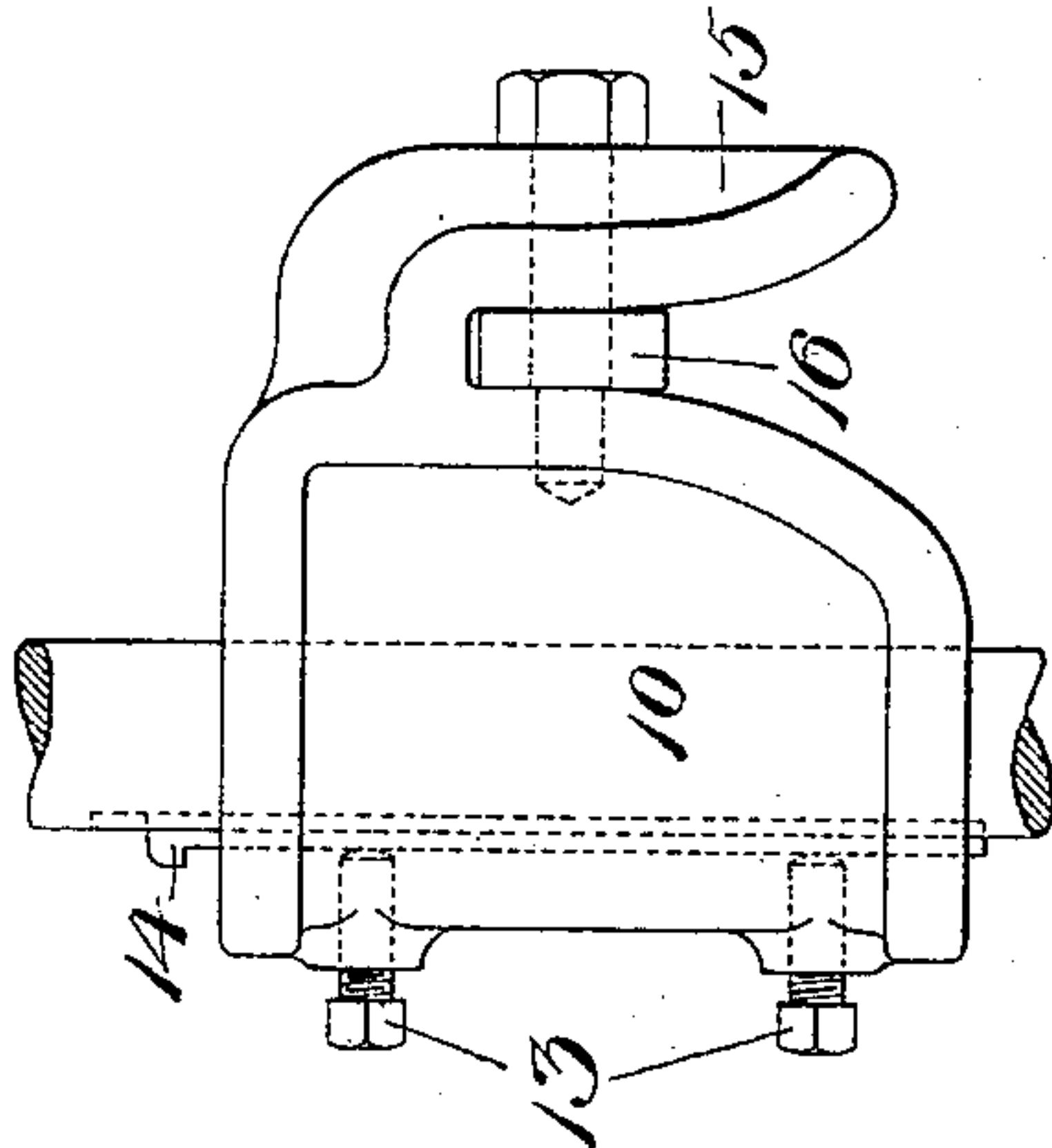
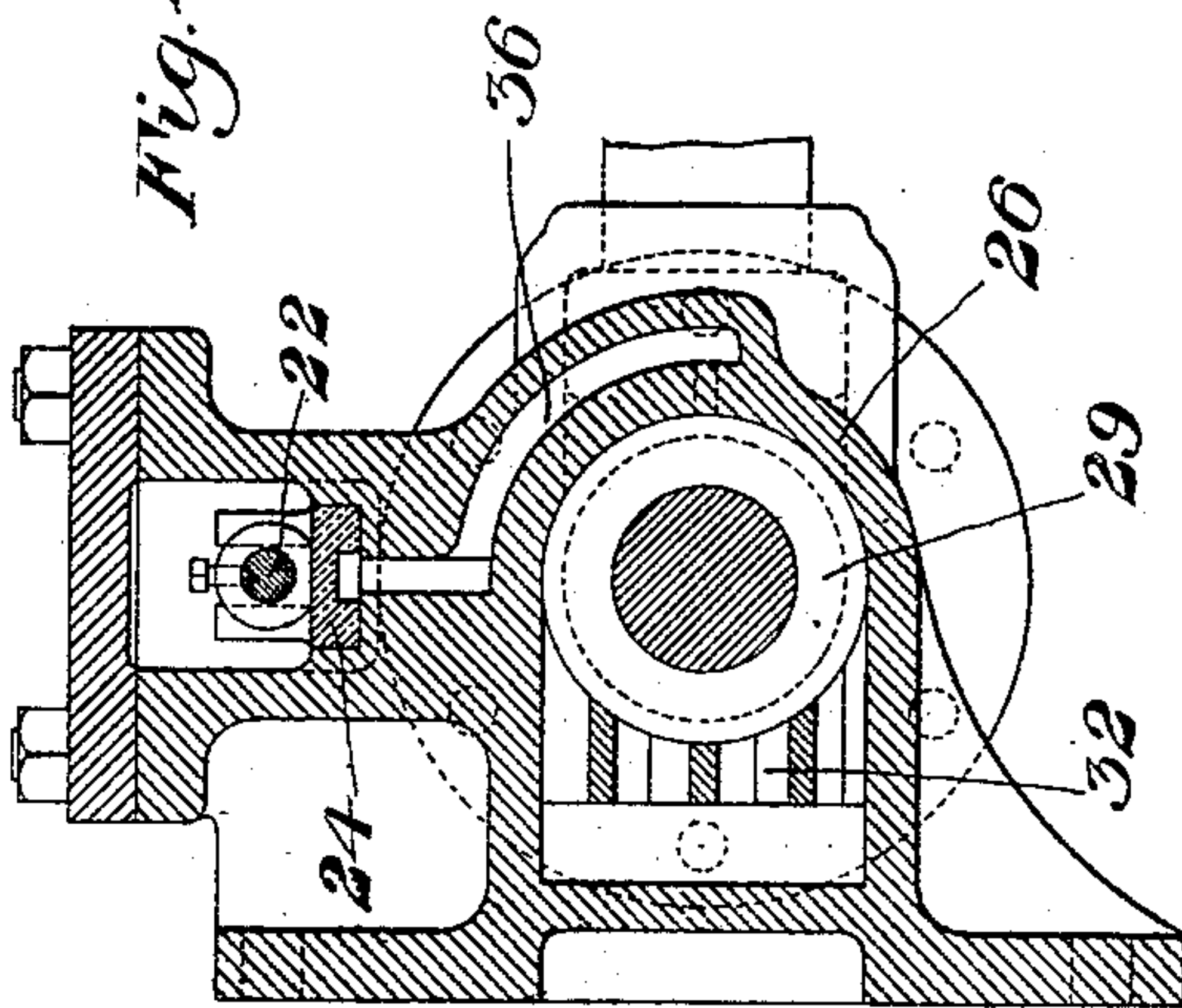


Fig. 4.



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GEORGE MESTA, OF PITTSBURG, PENNSYLVANIA.

MOTOR IN APPARATUS FOR PICKLING AND WASHING METAL PLATES.

SPECIFICATION forming part of Letters Patent No. 602,686, dated April 19, 1898.

Application filed June 8, 1894. Serial No. 513,913. (No model.)

To all whom it may concern:

Be it known that I, GEORGE MESTA, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Motors in Apparatus for Pickling and Washing Metal Plates, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, in which—

10 Figure 1 is a side elevation, partly in section, of my improved pickling and washing apparatus. Fig. 2 is an enlarged elevation, partly in section, of the valve mechanism. Fig. 3 is a top plan view of Fig. 2. Fig. 4 is
15 a vertical cross-sectional view of the same, and Fig. 5 is a detail view of a portion of the plunger-rod.

My invention relates to motors for machines employed for pickling and washing metal
20 plates, and is designed to improve the valve mechanism of such machines and prevent any possibility of imperfect action and sticking thereof, to avoid pounding of the piston against the stops or cylinder-head, and to
25 provide means for automatically starting the short stroke of the plunger as soon as the crates are lowered into the vats, for changing to the long stroke without any connecting or disconnecting of the parts, and for regulating
30 the length of stroke according to the width of plates being operated upon without stopping the machine.

It also consists in the construction and arrangement of the parts, as hereinafter more
35 fully described, and set forth in the claims.

In the drawings, 2 represents the vertical single-acting cylinder of the machine, having therein the piston or plunger 3, to whose upper end is secured the spider 4, having two
40 or more arms, as desired.

5 are the usual crates, and 6 the pickling and washing vats, within which the crates are actuated.

Upon the upper end of the plunger is carried a collar 7, to which is secured the downwardly - extending plunger - rod 8, passing through guides 9 and carrying the tappet 10, which actuates the arm 11 of a bell-crank lever pivoted to a stationary bracket at the
45 point 12. As shown more clearly in Fig. 5, the tappet 10 is adjustably held upon the plunger-rod by set-screws 13, bearing upon

the key 14, and is provided with a lug or projection 15, forming a downwardly - opening inverted-V-shaped slot, within which is piv- 55
oted a roller 16, which bears and rolls upon the handle-arm of the lever. This arm is held against the roller 16 by an adjustable weight 17, secured to an extension 18 of the arm, while the other arm 19 of the lever is con- 60
nected to a sliding collar 20 by a pivoted link 21. The collar 20 slides upon a valve-rod 22 and is limited in its movement thereon by the adjustable tappets 23, this rod carrying a slide- 65
valve 24 within a valve-chest 25, through which the rod extends. The chest 25 is a small supplemental chest secured upon the main valve chest or cylinder 26, with which it communicates by the two series of ports 27
and 28, 27 being the admission and 28 the ex- 70
haust ports. These ports are controlled by the valve 24, which is of the "double-D" class, and alternately connects one end of the valve-cylinder 26 with the inlet and the other
75 with the exhaust port to actuate the piston or plunger valve 29. This valve is provided with two annular ports 30 and 31, adapted to connect alternately with the bridged port 32, leading from the central portion of the cylinder 26 to the actuating-cylinder 2. The port 80
31 is in constant communication with a live-steam inlet 33, while into the other in all positions opens the exhaust-outlet 34, Fig. 3. The exhaust-chamber 35, between the ports 28, connects with the outlet 34 by the branch 85
passage 36, Fig. 4. One end of the valve 29 is provided with a projecting rod 37, by which the valve, which is perfectly balanced, may be tested by hand before starting the machine. 90

The valve action is as follows: The parts being in the position of Fig. 2, the live steam passing from the chest 25 through the port 27 holds the piston 29, with its port 31, in communication with the inlet 32. The plunger 3 95
then rises until the collar 20 strikes the right-hand tappet 23, when the weight 17, overcoming the friction of the valve 24, throws it to the right, thus closing the right-hand and opening the left-hand inlet-port. The plunger-valve 29 is thereby driven to the right, and the steam in its cylinder exhausts through the right-hand port 28 until the end of the plunger covers it, when the small amount of steam 100

imprisoned in the cylinder cushions the stroke and prevents the valve from striking the cylinder-head. In the meantime the port 30 has been put in communication with the main-
 5 cylinder port 32, and the steam within the actuating-cylinder exhausting therethrough the plunger falls by gravity, forcing down the lever 11 until the collar 20 strikes the left-hand tappet 23, when the slide-valve is thrown
 10 to the left and the cycle of movements is repeated.

When it is desired to raise the crates out of the vats, the handle-lever 11 is held down against the action of the weight. The port 31
 15 being thereby held in communication with the port 32, the plunger 3 rises the entire length of the cylinder and is held until the handle is released, when the weight 17 actuates the valves 24 and 29 and the plunger descends
 20 until the tappet upon the plunger-rod engages the lever 11, when the short strokes are again automatically started.

To prevent pounding of the upper head of the actuating-cylinder 2, I provide at its upper
 25 end the by-pass pipe 38, which is of slightly greater length than the plunger-head 3' and admits a small amount of steam above the plunger-head to cushion the same. To exhaust this cushioning-steam, I provide in the
 30 cylinder, about midway of the length of the by-pass pipe, an exit-pipe 39, through which such steam exhausts into the air.

To drain off any water collecting above the plunger-head, I employ a valved pipe 40, lead-
 35 ing from the pipe 39 into the cylinder just above the plunger-head when in its lowermost position, the cylinder draining there-through when the valve is opened.

With the ports 33 and 34 connect, respectively, the inlet and exhaust pipes 41 and 42.
 40 The inlet-pipe 41 is provided at its bend with the three-way cock 43, so that when the machine is stopped communication may be opened between the pipes 41 and 42, all mois-
 45 ture draining off through the exhaust 42.

To regulate the drop of the plunger and prevent its pounding the lower cylinder-head, I provide a throttle-valve 44 in the exhaust-
 50 pipe, by which the velocity of the exhaust may be nicely regulated and the speed of descent of the plunger altered as desired. This feature is an important one in all machines of this class, and I intend to claim it independent of the particular valve, &c., shown.

The advantages of the invention will be ap- 55
 parent to those skilled in the art. As soon as the plunger lowers from its long stroke, the short stroke is begun automatically, while the long stroke may be taken at any time with-
 out any connecting or disconnecting of the 60
 parts by merely holding down the lever-handle. The inlet-valve cannot stick in one position, as it is positively actuated by steam admitted by a second valve, and being per-
 65 fectly balanced is easily actuated. The length of stroke is easily changed by adjustment of the tappets, the valve and actuating cylinders are both cushioned and injury to the cylinders prevented, and the entire ma-
 70 chine is simple, easily actuated, and not liable to get out of order.

The valve mechanism may be used in other connections, and a spring may replace the counterbalancing-weight, and many other changes may be made by the skilled mechanic 75
 in the form and arrangement of the parts without departing from my invention, since

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

1. The combination with a cylinder con- 80
 taining a plunger, of a plunger-rod having a tappet, a lever contacting with said tappet and connected to the valve controlling the admission of fluid to the cylinder, and a weight arranged to move the valve in one di- 85
 rection; substantially as described.

2. The combination with a cylinder con-
 90 taining a plunger or piston, of a tappet-rod connected to and moving therewith, a counterweighted lever having an arm bearing against the tappet, a valve having a valve-rod provided with tappets, and a sliding sleeve upon said rod connected to the lever; substantially as described.

3. A cylinder containing unobstructed cy- 95
 lindrical valve having annular ports, one of said ports being in constant communication with a fluid-supply, a port leading from the cylinder to a motive cylinder and ports lead-
 100 ing to either end of the cylinder and communicating with another fluid-supply, substantially as described.

In testimony whereof I have hereunto set my hand.

GEORGE MESTA.

Witnesses:

W. B. CORWIN,
 H. M. CORWIN.