

(No Model.)

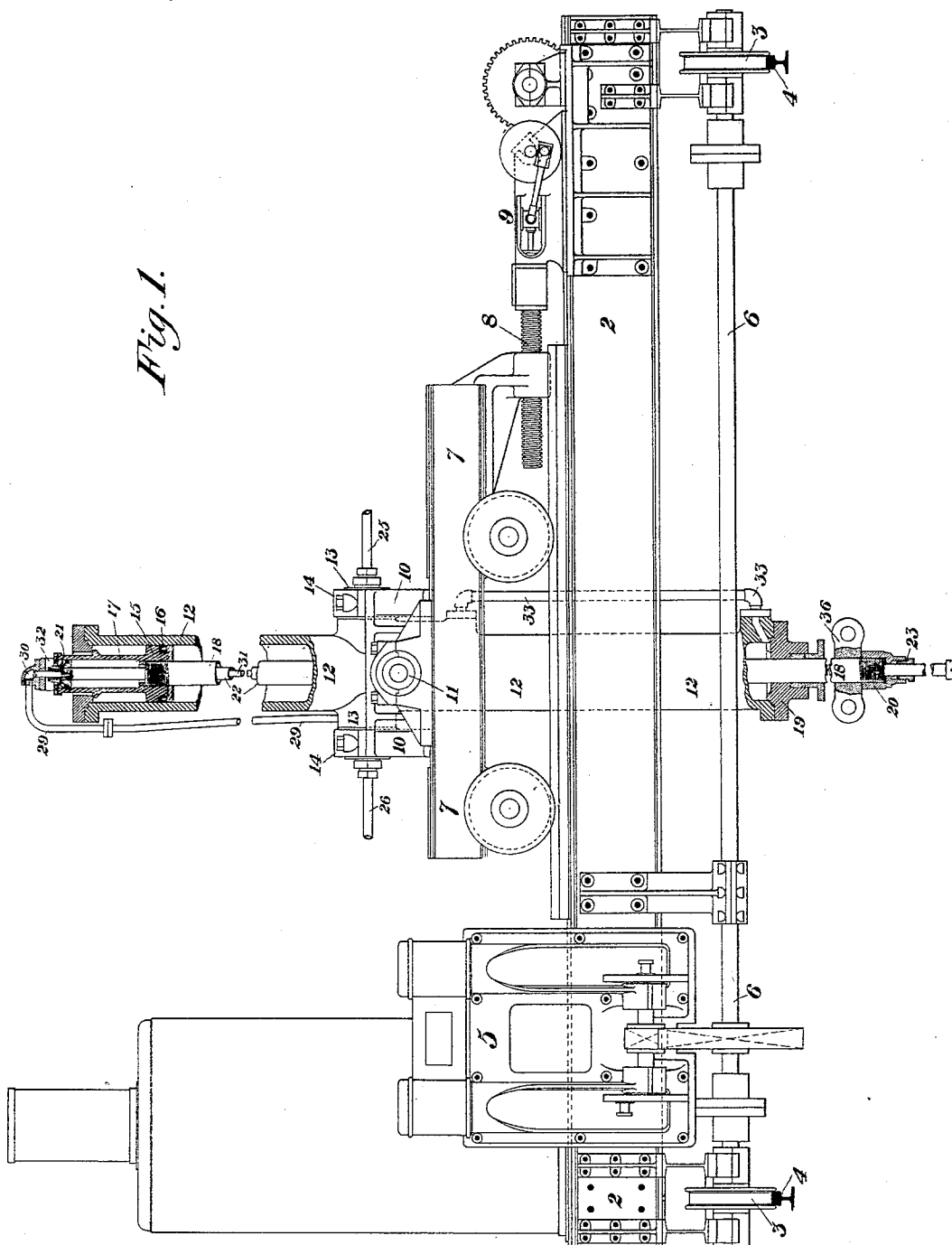
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J. A. POTTER.
MILL APPLIANCE.

No. 477,822.

Patented June 28, 1892.

Fig. 1.



WITNESSES

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(No Model.)

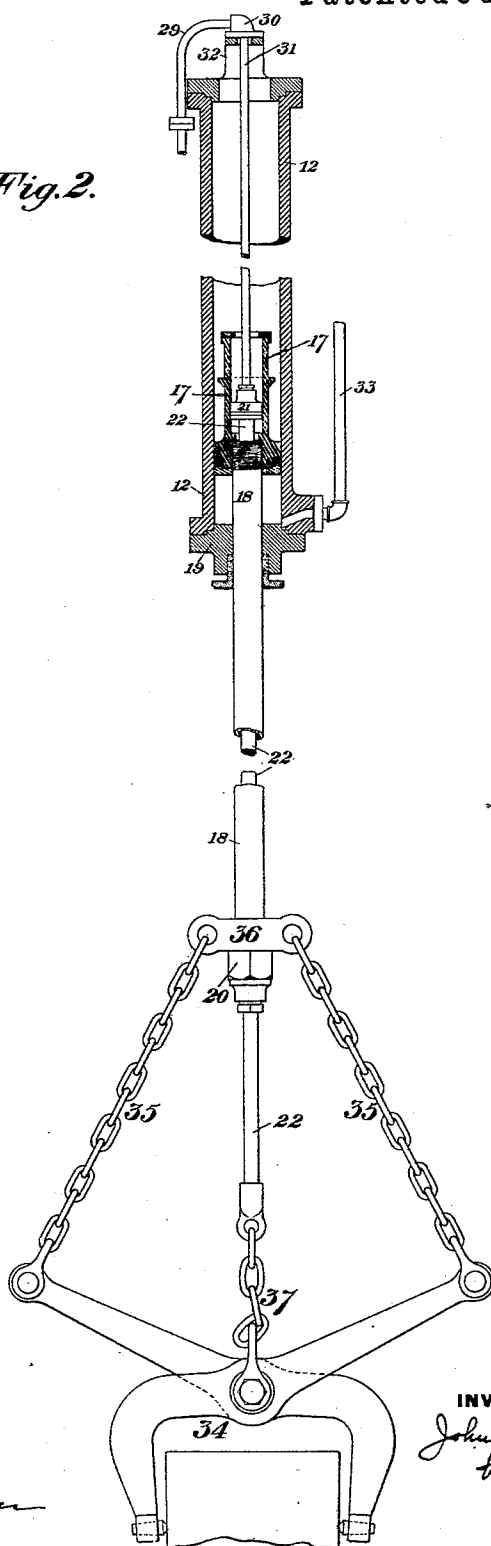
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Patented June 28, 1892.

Fig. 2.



WITNESSES

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(No Model.)

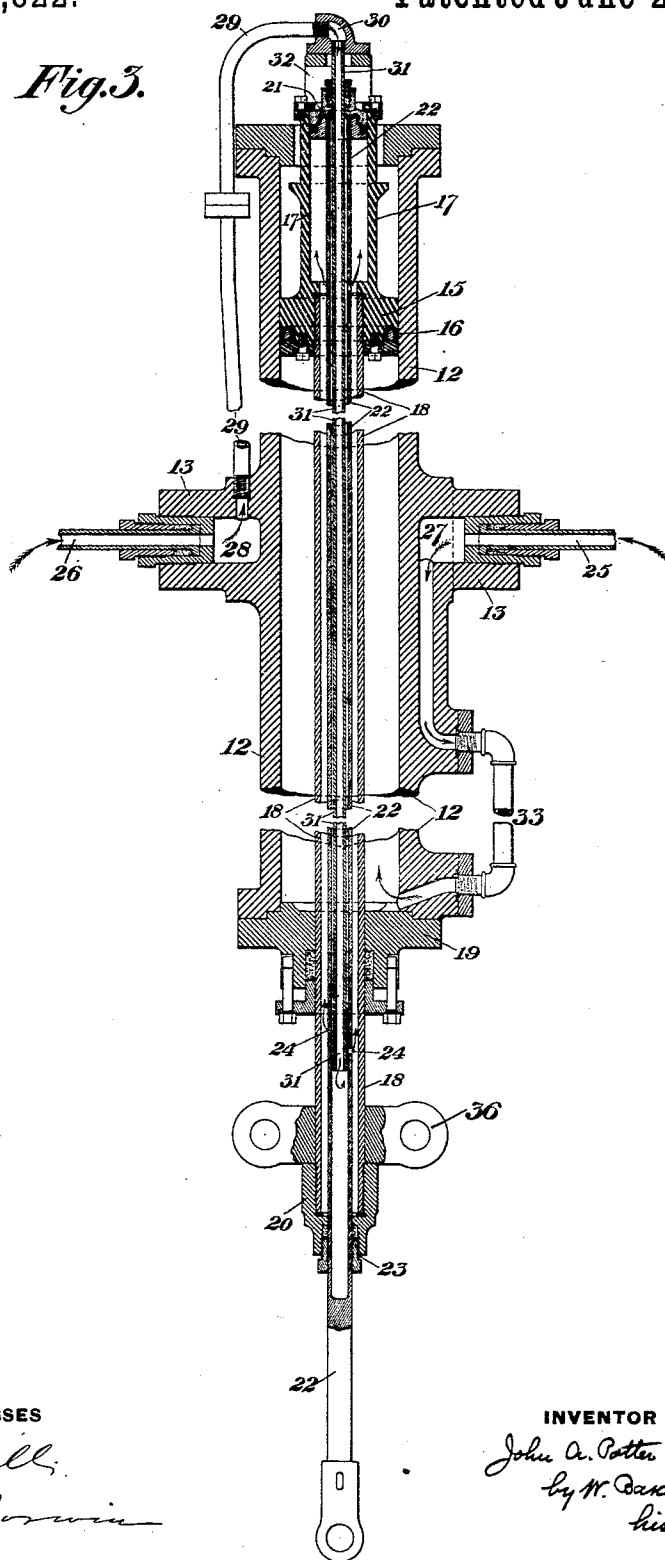
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Fig. 3.



WITNESSES

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UNITED STATES PATENT OFFICE.

JOHN A. POTTER, OF MUNHALL, PENNSYLVANIA.

MILL APPLIANCE.

SPECIFICATION forming part of Letters Patent No. 477,822, dated June 28, 1892.

Application filed December 5, 1891. Serial No. 414,091. (No model.)

To all whom it may concern:

Be it known that I, JOHN A. POTTER, of Munhall, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Mill Appliances, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a side elevation, partly in vertical section, of my improved apparatus. Fig. 2 is a view showing the ingot-tongs and the cylinder for operating the same, the tongs being in elevation and the cylinder, whose ends only are shown, being in vertical section. Fig. 3 is a vertical sectional view of the cylinder, on a larger scale, separated at two places for convenience of illustration.

Like symbols of reference indicate like parts in each.

My invention relates to an improvement in actuating mechanism for tongs or other appliances adapted to be used for handling ingots, &c. Such tongs are carried by a crane, which enables them to be moved from place to place to bring them into position to grasp their burden and for shifting the burden from one place to another. In the drawings such crane is illustrated as being of the type known as "traveling cranes;" but the invention is not limited thereto.

2 is the frame or truck of the traveling crane, mounted on wheels 3, which travel on elevated rails 4. An engine 5, carried by the truck and in gear with the axle-shaft 6, affords the motive power for moving the crane on the rails.

7 is a trolley or carriage, which is mounted on wheels on a track on the frame of the truck and is adapted to be moved back and forth thereon by suitable means—such, for example, as a screw-shaft 8, driven by a suitable engine 9. This trolley carries the tongs and their operating-cylinder, hereinafter described.

10 is a block or casting provided with trunnions 11, by which it is mounted on the trolley, so as to be capable of oscillation thereon, and 12 is a vertical lifting-cylinder of long stroke, having trunnions 13, which are journaled in standards 14, forming parts of the block 10, these trunnions being directed at right angles to the trunnions 11, so that the cylinder,

by virtue of the two pivotal sets of trunnions, is capable of oscillation in any direction to accommodate itself to the tendency to deflection occasioned when the burden is seized by the tongs. The plunger of the cylinder has a head 15, provided with suitable packing 16, and has projecting upwardly from the head a hollow trunk 17, which serves as a cylinder to a second plunger, hereinafter described. A hollow rod or pipe 18 is fixed to the plunger-head 15 and extends downwardly therefrom through the cylinder 12 and through a stuffing-cavity in the lower head 19 of said cylinder and is secured at its lower end to a hollow nut or block 20.

21 is a plunger adapted to work within the hollow trunk 17 and having a hollow rod 22, which extends downwardly through the plunger-head 15 and through the hollow rod 18 and through the nut 20, where it is provided with a stuffing-box 23. The lower end of the hollow rod 22 is closed; but the rod is provided with lateral perforations 24 within the plunger-rod 18.

The cylinders 12 and 17 are supplied with water by means of supply-pipes 25 and 26, which fit in stuffing-boxes made in plugs set axially in the trunnions 13, discharge into cavities 27 28 in said trunnions, and receive their water-supply from a suitable pump on the crane. A pipe 29 leads from the cavity 28 and by a coupling 30 communicates with the pipe 31, which leads down through a stuffing-box in the plunger 21 and through the hollow rod 22 and at its lower end discharges into said hollow rod. The coupling 30 is fixed to a standard 32 on the head of the cylinder 12. Water is supplied to the cylinder 12 below the plunger 15 by a pipe 33, which leads from the cavity 28 and discharges into the lower end of the cylinder, as shown in Fig. 3.

The arms of the ingot-tongs 34 are connected by chains 35, with a cross-head 36, set on the nut 20 or otherwise secured to the plunger-rod 18. The plunger-rod 22, which extends from the plunger-head 21, is connected at its lower end by a chain 37 to the frame or pivotal point of the tongs. It is apparent that if the tongs are suspended solely by means of the chains 35, as shown in Fig. 2, the gravity of the parts will cause the jaws of

the tongs to approach and to seize an interposed ingot. If, however, the rod 22 be raised, so as to cause the tongs to be suspended from their frame or pivotal point, the tongue-arms will drop by gravity and will spread the jaws. To cause these motions of the parts, the cylinders 12 and 17 form efficient means. In order to open the jaws of the tongs, water is caused to flow through the pipe 26 by means of a suitable valve, (not shown,) and, passing through the pipe 29 and pipe 31, escapes through the open lower end of the latter pipe and passes through the holes 24 into the hollow rod 18, and thence through said rod up into the cylinder 17, where it actuates the plunger-head, raising the same, as shown in Fig. 3, and thus lifting the rod 22 and causing it to support the tongs. While the plunger-head is in this position, the plunger 15 may be moved up or down in its cylinder 12 by admitting water to or exhausting it from the pipe 25, thereby raising or lowering the tongs, but without varying the relative positions of the plungers 21 and 15 and of the cross-head 36 and rod 22. In such vertical motions of the plunger 15 the plunger-head 21 moves telescopically over the pipe 31. The cylinder 12 is made of proper length to enable the plunger 15 to have a sufficient stroke to lift the tongs as high as the conditions of work of the crane may require. When by motion of the crane and lowering of the plunger 15 the tongs have been brought into position over the ingot to be seized, (the tongs being held open by elevation of the plunger 21, as above explained,) the plunger 21 is lowered by exhausting water from the pipe 25, thus causing the rod 22 to descend a short distance and to cause the tongs to depend from the cross-head 36, thus closing the jaws upon the ingot, as shown in Fig. 2. The tongs with their burden may then be lifted by raising the plunger 15, which carries with it the plunger 21 and the rod 18. The tongs may be opened in any position of the plunger 15 by raising the plunger 21 in its cylinder 17.

The construction and arrangement of the

parts of the apparatus may be modified in various ways without departure from the scope of my invention as stated in the following claims.

I claim—

1. The combination, with a lifting-cylinder and plunger having a hollow plunger-rod projecting therefrom, of a second cylinder fixed to said plunger and having a plunger and a plunger-rod extending through the hollow plunger-rod first named, substantially as and for the purposes described.

2. The combination, with a lifting-cylinder and plunger having a hollow plunger-rod projecting therefrom, of a second cylinder fixed to said plunger and having a plunger and a plunger-rod extending through the hollow plunger-rod first named, and a fluid-supply pipe extending longitudinally through the plunger-rod of the second cylinder and discharging therein, the plunger-rod last named being perforated to permit passage of the fluid into the outer plunger-rod and thence into the second cylinder, substantially as and for the purposes described.

3. The combination, with a pivoted lifting-cylinder and plunger having a hollow plunger-rod projecting therefrom, of a second cylinder fixed to said plunger and having a plunger and a plunger-rod extending through the hollow plunger-rod first named, a fluid-supply pipe extending longitudinally through the plunger-rod of the second cylinder and discharging therein, the plunger-rod last named being perforated to permit passage of the fluid into the outer plunger-rod and thence into the second cylinder, and water-supply passages extending through the trunnions of the pivoted lifting-cylinder, substantially as and for the purposes described.

In testimony whereof I have hereunto set my hand this 4th day of December, A. D. 1891.

JOHN A. POTTER.

Witnesses:

A. C. DINKEY,
J. H. SLOCUM.