

No. 788,339.

PATENTED APR. 25, 1905.

C. L. TAYLOR.
INGOT STRIPPING APPARATUS.
APPLICATION FILED SEPT. 30, 1902.

6 SHEETS—SHEET 1.

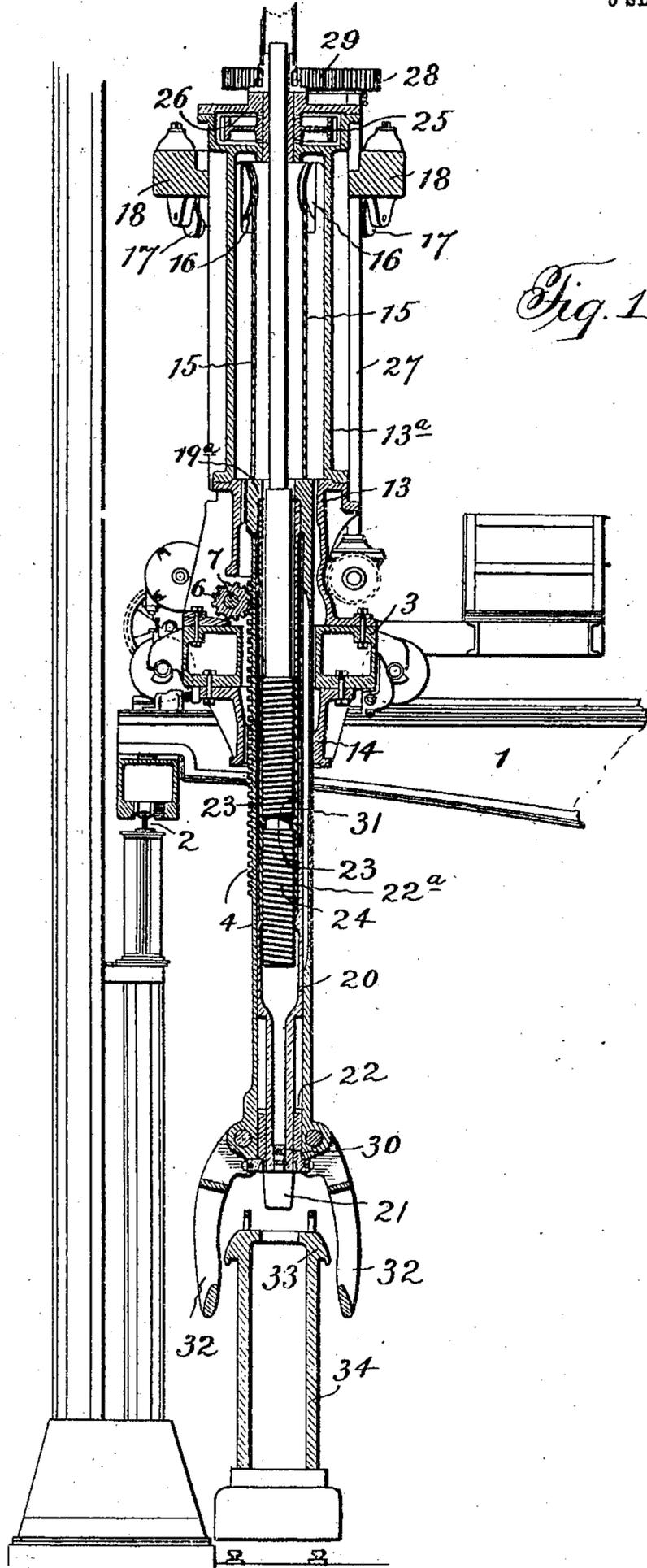


Fig. 1.

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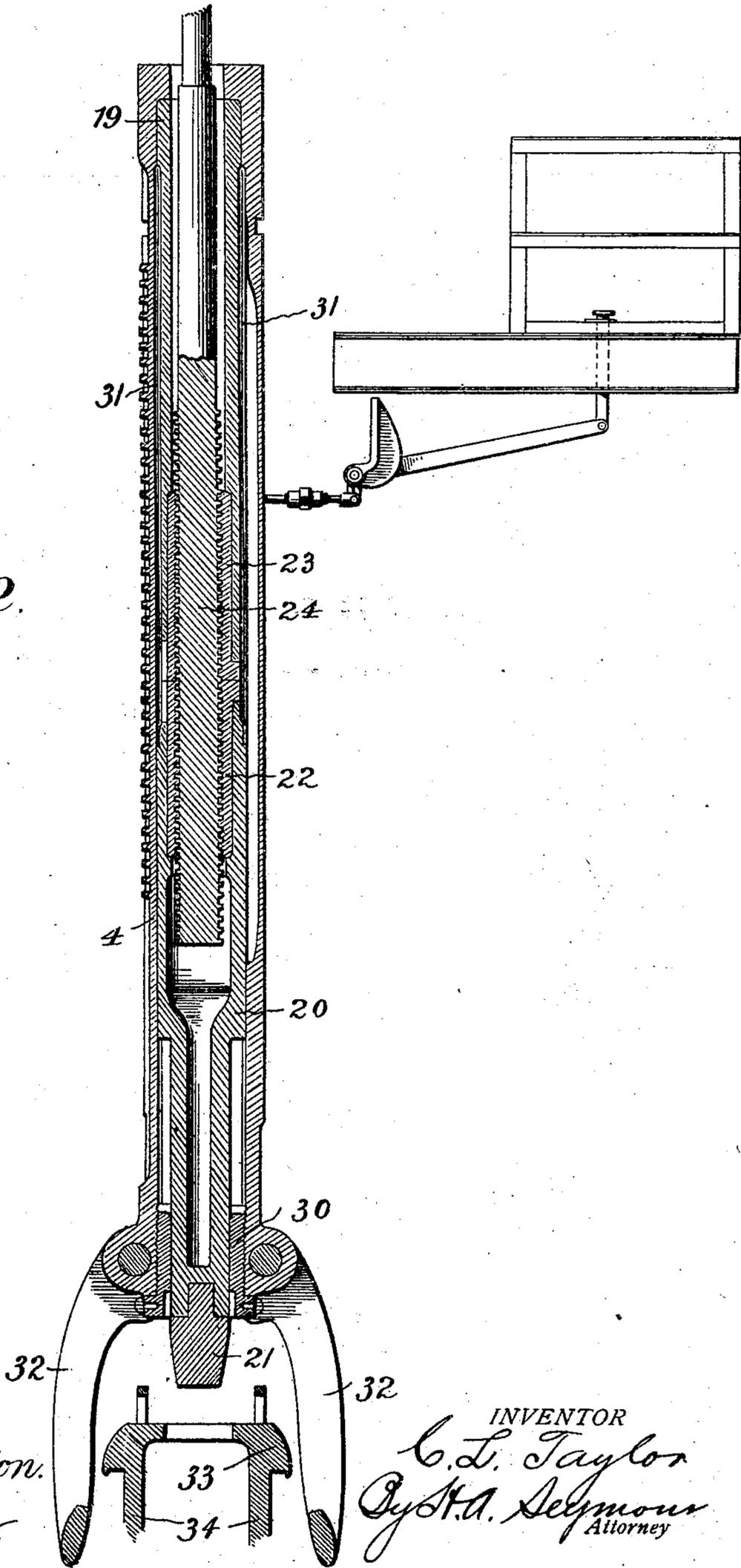
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5 SHEETS—SHEET 2.

Fig. 2.



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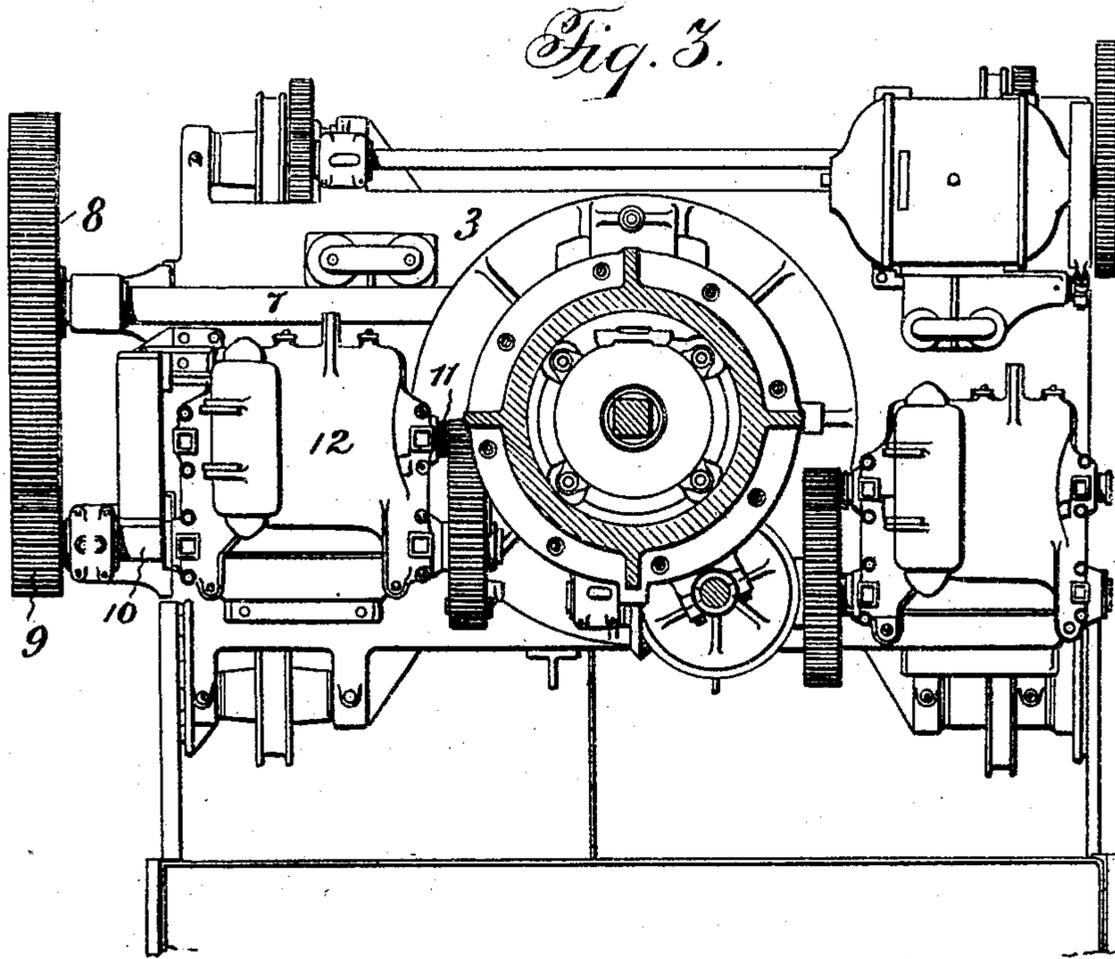
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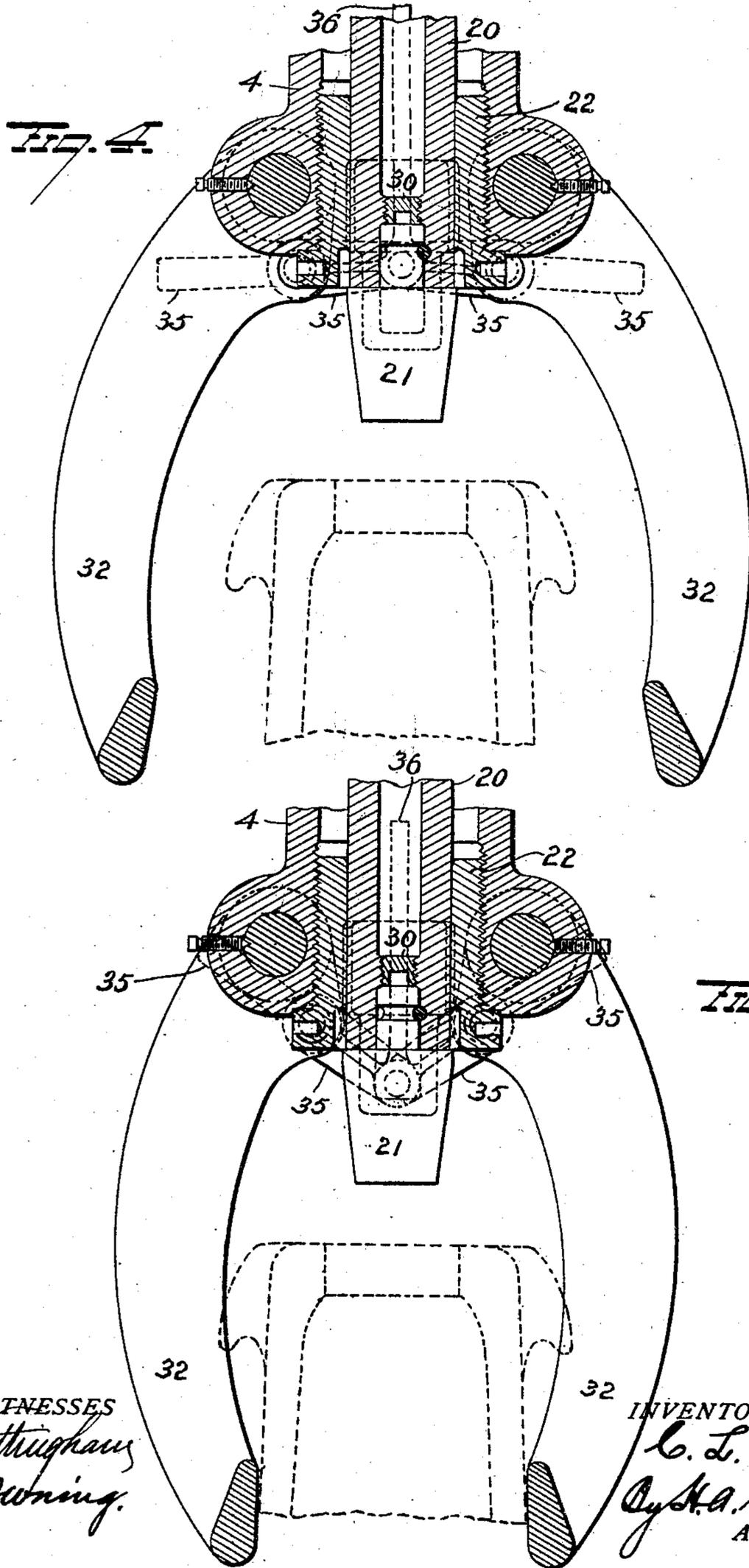
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6 SHEETS—SHEET 4.



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5 SHEETS—SHEET 5.

Fig. 5.

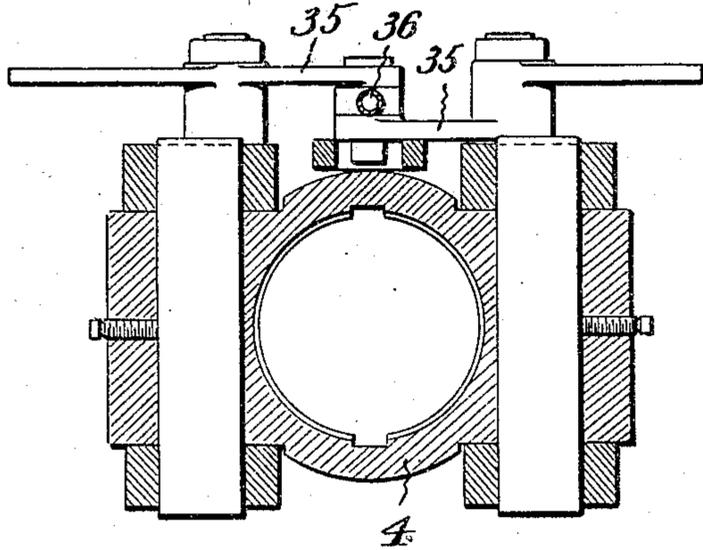


Fig. 6.

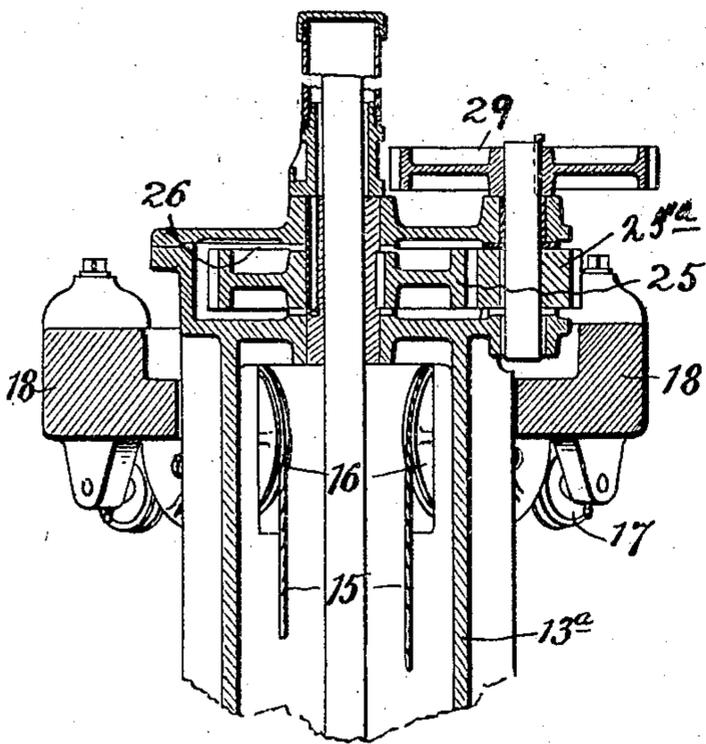
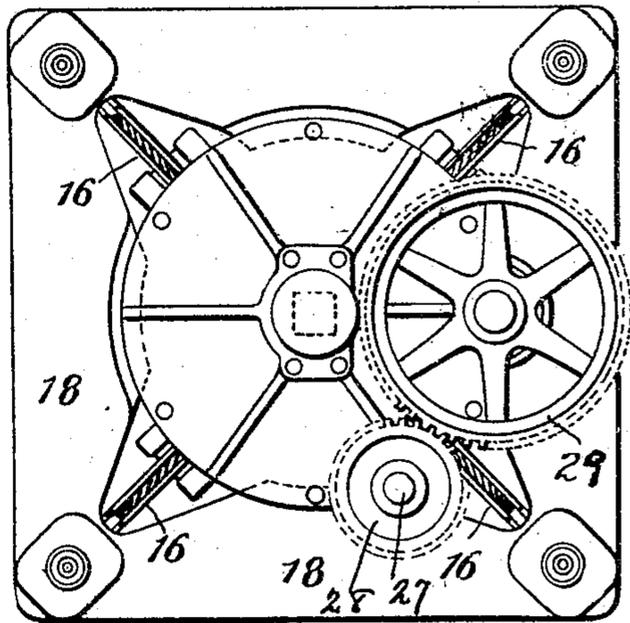


Fig. 7.



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UNITED STATES PATENT OFFICE.

CLARENCE L. TAYLOR, OF ALLIANCE, OHIO, ASSIGNOR TO THE MORGAN ENGINEERING COMPANY, OF ALLIANCE, OHIO.

INGOT-STRIPPING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 788,339, dated April 25, 1905.

Application filed September 30, 1902. Serial No. 125,418.

To all whom it may concern:

Be it known that I, CLARENCE L. TAYLOR, of Alliance, in the county of Stark and State of Ohio, have invented certain new and useful
5 Improvements in Ingot-Stripping Apparatus; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the
10 same.

My invention relates to an improvement in ingot-stripping apparatus; and it consists in the parts and combinations of parts, as will be more fully described, and pointed out in the
15 claims.

In the accompanying drawings, Figure 1 is a view in vertical section of my improved apparatus. Fig. 2 is a similar view, enlarged, of the stripping-tongs, rack, plunger, and
20 screw. Fig. 3 is a view in plan of the trolley, showing the rack-casing in section. Figs. 4, 4^a, and 5 are views of the tongs, showing the mechanism for opening the latter; and Figs. 6 and 7 are views showing the counterweight
25 for the rack-bar and the mechanism for rotating the screw.

1 represents an overhead traveling bridge, mounted at its ends on rails 2 and carrying the traveling trolley 3, the latter having flanged
30 wheels which travel on rails secured to the upper faces of the bridge-girders. This trolley 3 is propelled by a motor and suitable gearing connecting the armature-shaft of the motor and two of the flanged track-wheels. The
35 bridge travels lengthwise the mill and the trolley lengthwise the bridge, so that rack-bar 4, carried by the trolley, practically takes in the entire floor-space of the mill in which the bridge is located. The rack-bar 4 is carried
40 by the trolley and is actuated vertically by the pinion 6 on shaft 7. This shaft is mounted in suitable bearings on the trolley 3 and carries at its outer end the gear 8, meshing with the smaller pinion 9 on shaft 10.
45 This shaft 10 carries a gear meshing with a smaller pinion on the armature-shaft 11 of the motor 12. This motor 12 and the gearing above referred to operate to move the rack-bar vertically, the bar being guided and sup-

ported above and below the pinion 6 by the
50 bearings or housings 13 and 14, which respectively project above and depend below the trolley 3 and sustain the rack-bar against any lateral or swaying movement. This rack-bar
4 is hollow throughout its entire length and
55 is connected at its upper end to the cables 15, which latter pass upwardly inside the housing 13^a, over sheaves 16 in said housing, under sheaves 17, carried by the counterweight 18,
60 and secured at their outer ends to said counterweight. This counterweight embraces the upper section 13^a of housing 13 and is adapted to be moved vertically as the rack-bar is elevated and lowered, and thus relieve the motor
65 12 of the weight of the bar.

Located within the upper section of the rack-bar 4 is the thrust-sleeve 19, and located within the lower half of the bar is the hollow
70 plunger 20, carrying the bull-head 21 at its lower end. When the parts are in their normal position, with the plunger abutting against the adjacent end of the thrust-sleeve, the lower end of the plunger is approximately flush with the lower end of the rack-bar, with the bull-head 21 projecting below the bar. The upper
75 section of the plunger closely fits within the bore of the rack-bar, while the lower end thereof is reduced in diameter and snugly fits the bushing 22, secured in the lower end
80 of the bore, the reduced portion of the plunger being of sufficient length to permit of the necessary stroke of the plunger.

Secured in the upper end of the hollow plunger 20 is the threaded nut 22. This nut projects slightly above the plunger and when
85 the parts are in the position shown in Fig. 1 abuts against the lower end of nut 23, secured within the lower end of thrust-sleeve 19. One of the nuts is right hand and the other left and engage the threads on the ingot-stripping
90 screw-shaft 24. This screw-shaft, as clearly shown in Fig. 1, is provided with right and left hand threaded sections. Hence it is apparent that when the screw is rotated in one direction the lower nut will be moved away
95 from the upper nut and when rotated in the opposite direction it will be drawn toward the upper nut, and as the nuts are secured, respec-

tively, to the plunger and thrust-sleeve there can be no movement of the nuts independent of these parts.

The thrust-sleeve is held against any movement in the bar 4. Hence it is evident that as one threaded section of the shaft engages the nut carried by the sleeve the shaft will be moved longitudinally within the rack-bar. This stripping screw-shaft 24 passes up through the rack-bar 4 and through housings 13 and 13^a and has a sliding or spline connection with the gear-wheel 25, located within chamber 26, formed at the upper end of housing 13^a. This gear-wheel 25 is driven by the shaft 27, actuated by a suitable motor and provided at its upper end with a pinion 28, which latter meshes with a gear-wheel 29, mounted on a short shaft, which latter carries at its lower end a pinion 25^a, (shown in Fig. 6,) engaging the teeth of gear-wheel 25. As the screw-shaft 24 has a sliding connection with gear-wheel 25, the former can be moving vertically while being rotated by the gear.

The lower end of the bore of the hollow plunger 20 is closed by the plug 30, and the upper end of the plunger carries the shield 31, which latter embraces and extends well up around the thrust-sleeve and above the nuts and is of such length that its upper end never reaches a plane below the lower end of the thrust-sleeve. The hollow plunger, (which is open at the top,) with its shield, forms an oil-chamber in which the nuts and screws rest and move. Hence these parts are always immersed in oil and are always thoroughly lubricated.

The tongs 32 are pivoted to the lower end of the rack-bar and are designed to engage the ears or lugs 33 on the ingot-mold 34. These tongs 32 are each provided with a lever 35, both of which are connected to a vertical rod 36, which projects upwardly alongside of the rack.

The tongs 32 are normally in a closed position, as shown in Fig. 4^a, as they swing toward each other by gravity, and the operation of opening them is as follows: The rack carrying the tongs is brought over the ingot-mold and is lowered to permit the tongs to pass on opposite sides of the mold. A foot-lever in the operator's platform operates a friction-shoe which grips the vertical rod 36, and while lowering the operator applies pressure to the foot-lever, thus gripping the vertical rod and preventing it from descending with the rack. As the lower end of the rod 36 is connected to the levers 35, carried by the tongs, it follows that as the rod 36 stops the tongs open, as shown in Fig. 4. The tongs can thus be held in an open position as long as pressure is maintained on the foot-lever. After the tongs have been opened to their extreme position, as shown in Fig. 4, they are lowered until well below the lugs on the ingot-

mold; when by releasing the pressure on the rod 36 the tongs will swing by gravity into position against the side of the mold, as shown in Fig. 4^a, and under the lugs or ears.

With the parts in the positions above described the apparatus is ready to strip the mold from the ingot. At the start the rack-bar is raised and the screw-shaft turned in a direction to move the latter downwardly. This downward motion of the screw is caused by the threads thereof turning in the nut 23, which latter is carried by the thrust-sleeve 19, and the lower screw-threaded section of the shaft 24 turning in nut 22 causes the plunger 20 to move downwardly. These motions continue until the tongs engage the lugs on the mold and the bull-head on the end of the plunger 20 comes in contact with the end of the ingot within the mold. The hoisting motion of the rack should then be stopped, while the plunger, which, as before explained, is actuated by the stripping-screw, continues to move downward until the ingot is free of the mold. After the ingot is thus released from the mold the motion of the screw is discontinued, while the rack is hoisted until the mold carried thereby is free of the ingot, which remains standing on the car. The empty mold should then be deposited on another car or in any convenient place and the machine moved to the next mold, where the operation is repeated.

In depositing the empty mold the tongs are opened in the same manner as described above, pressure being applied to the foot-lever when the bottom of the mold comes in contact with its support.

I have described the ingot-stripper as being mounted on a traveling trolley carried on a traveling bridge; but it is evident that the stripper may be a fixed structure, so that instead of moving the stripper to the cars containing the molds and to cars to receive the molds the cars with the filled molds and cars for the empty molds can be run in under the stripper.

It is evident that many slight changes might be resorted to in the relative arrangement of parts herein shown and described without departing from the spirit and scope of my invention. Hence I would have it understood that I do not wish to confine myself to the exact construction and arrangement of parts shown and described; but,

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In an ingot-stripper, the combination with a hollow rack-bar carrying tongs, and a screw within the bar, of a plunger also within the bar and carrying a nut which engages the screw and means for rotating the screw.

2. In an ingot-stripper, the combination with a counterweighted rack-bar, tongs carried by the bar, means for opening the tongs,

a screw located within the bar and means for rotating the screw, of a plunger and a nut carried by the plunger and actuated by the screw.

5 3. In an ingot-stripper, the combination with a rack-bar, tongs carried by the bar, a screw located within the bar, and means for opening the tongs, of a plunger carried by the bar and a nut carried by the plunger and
10 engaging the screw.

4. In an ingot-stripper, the combination with a rack-bar, a support therefor, means for moving the rack-bar, and a counterweight for same, of a screw within the bar, a plunger
15 also carried by said bar and moved longitudinally independently of the bar by the screw, and means for rotating the screw.

5. In an ingot-stripper, the combination with a bar, carrying tongs, a thrust-sleeve
20 within the bar and a nut carried by said sleeve, of a plunger, a nut therein, and a single shaft having screw-threads for engaging the nut carried by the sleeve, and threads for engaging the nut on the plunger.

25 6. In an ingot-stripper, the combination with a bar, tongs carried thereby and means for opening the tongs, of a screw-shaft with-

in the bar, means for rotating said shaft, a plunger passing through the lower end of said bar and engaging threads on the shaft, and a
30 shield carried by said plunger and projecting upwardly above the screw-threaded section of the shaft and forming a receptacle for a lubricant.

7. In an ingot-stripper, the combination
35 with a bar, tongs carried thereby, means for opening the tongs and a nut located within the bar, of a double screw-shaft, one threaded section of which engages said nut, a plunger carrying a nut which engages the other
40 threaded section of the shaft, the said plunger extending through the lower end of the bar, and a shield secured to said plunger and projecting around and above the said nuts and threaded sections of the shaft, for the purpose
45 specified.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

CLARENCE L. TAYLOR.

Witnesses:

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C. W. CASSELMAN.