(No Model.)

W. R. JONES.

APPARATUS FOR REMOVING INGOTS FROM MOLDS.

No. 395,330. Patented Jan. 1, 1889

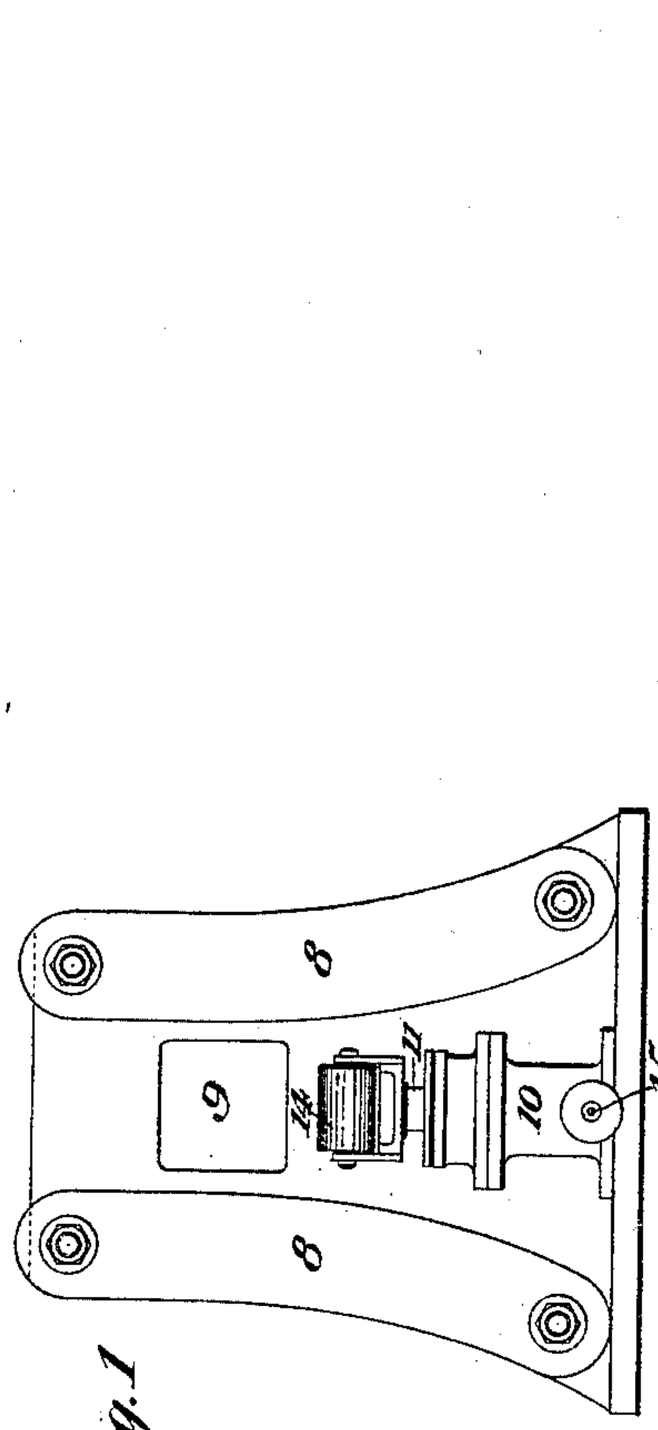

Fig. 1

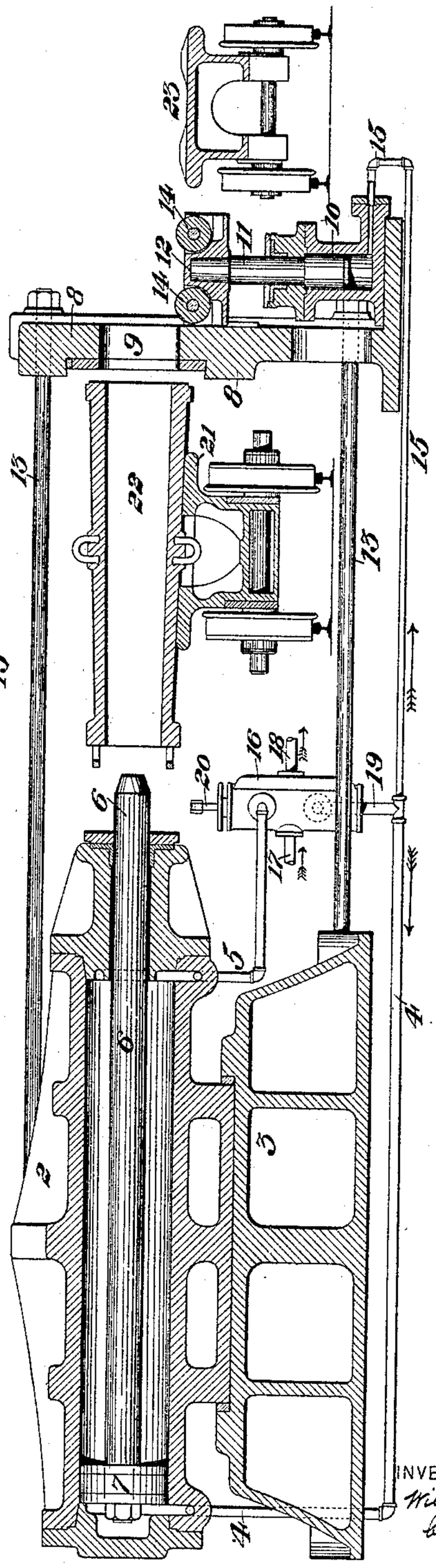

Fig. 2

WITNESSES.

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WILLIAM R. JONES, OF BRADDOCK, PENNSYLVANIA.

APPARATUS FOR REMOVING INGOTS FROM MOLDS.

SPECIFICATION forming part of Letters Patent No. 395,330, dated January 1, 1889.

Application filed August 13, 1888. Serial No. 282,692. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM R. JONES, of Braddock, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Apparatus for Removing Ingots from their Molds; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to an improvement in apparatus for removing ingots from the molds in which they are cast, and is illustrated in the accompanying drawings, in which—

Figure 1 is a front view of the apparatus. Fig. 2 is a vertical longitudinal central section thereof, showing a buggy or car in position for receiving the ingot when it is ejected from the mold.

Like symbols of reference indicate like parts in each.

In the drawings, 2 is a hydraulic cylinder, which is mounted horizontally on a supporting bed or frame, 3, and is provided with the usual fluid-supply pipes, 4 and 5, which enter the cylinder at its rear and front ends, respectively.

6 is the ejecting plunger or pusher, which is fixed at its rear end to the piston 7, and at its forward end projects from the cylinder.

In front of the cylinder 2 is an upright frame, 8, which is provided with an opening, 9, opposite to the end of the plunger 6. The frame 8 is preferably connected with the cylinder and its supporting-frame by the longitudinal brace-rods 13. On the outer side of the frame 8 is a hydraulic cylinder, 10, whose piston-rod 11 bears on its upper end a block or table, 12, on which are journaled one or more friction-rollers, 14. The water-supply pipe 15 of the cylinder 10 preferably communicates with the supply-pipe 4, which enters the rear end of the cylinder 2; but it may be worked by a separate valve, if so desired. By the power supplied by the water the table 12 is movable vertically up to the level of the ingot-mold during the ejecting operation, as shown in Fig. 2, and by allowing the water to escape from the cylinder below the piston the table will drop down below the level thereof, as shown in Fig. 1.

16 is a hydraulic valve of the usual form, provided with a pipe, 17, through which the water under pressure enters the valve, a waste or exhaust pipe, 18, a pipe, 5, leading to the forward end of the cylinder 2, and a pipe, 19, which is connected with the pipes 4 and 15. The packing-disks on the valve-stem of this valve are arranged in the usual way, so that when set in one position they put in communication the pressure-port and the port of the pipe 19, thus subjecting the rear ends of the pistons of both cylinders 2 and 10 to water-pressure. When set in another position, they connect the pipe 5 with the pressure-port and the pipe 19 with the exhaust-port, thus subjecting the forward end of the piston of the cylinder 2 to pressure and permitting the water to escape from the cylinders 2 and 10 behind the pistons, and when set in a third position the pressure-port is closed and both pipes 19 and 5 are put into communication with the exhaust-port.

The ingot-molds are carried into position to have the ingots ejected therefrom by means of a car or buggy, 21, on which the molds 22 are laid horizontally. The car is moved on its track so as to bring an ingot into line with the end of the plunger 6 and the opening 9 of the frame 8. When in this position, the valve-stem is moved so as to connect the pipes 4 and 15 with the pressure-port, as above described. The water then immediately enters the cylinders 2 and 10 at their rear ends, and by reason of the comparatively small diameter of the cylinder 10 it first raises its piston and the table 12, which is supported thereby, up to or nearly to the level of the lower side of the opening 9. It also acts on the piston 7 of the large cylinder 2 and forces it forward, thus causing the end of the pusher 6 to engage the end of the ingot in the mold. The continued forward motion of the pusher forces the ends of the ingot-mold against the frame 8, and then pushes the ingot out of the mold through the opening 9, over the rollers 14, and onto the bed of a car, 23, which is placed in position to receive it. The body of the ingot then rests upon the car and its rear end rests on the rollers of the table 12, so that the car could not be moved to bring it into position to receive another ingot without displacing the ingot unless the table were removed. This is effected by reversing the valve 16,

which then admits water to the front end of the cylinder 2 and forces back the pusher 6, and at the same time allows the water to escape from the cylinder 10 and causes the supporting-table to drop by gravity out of the way of the ingot. When a proper number of ingots have been thus placed on the car 23, the ingots may be carried away on the car, the ingot-molds in like manner carried away on their car, and the operations which I have just described repeated for the purpose of ejecting other ingots.

The advantages of the apparatus will be appreciated by those skilled in the art. It is simple in construction, strong, and enables the work of ejecting the ingots to be performed without the necessity of handling the mold or ingot further than to move the car containing the ingot into position in front of the plunger and removing the car carrying the ejected ingot. This is due to the use of the table arranged at the delivery end of the ingot-mold, between the mold and the receiving-car, which table is movable into position to afford a support for the ingot in passing from the mold, and is removable therefrom to permit free removal of the ingot on the car. It is also due to the second feature of my invention—namely, the operation of the actuating-pistons of the ingot-pusher and the supporting-table by a common power connection, so that they shall be operated simultaneously from a single point, though, if desired, a separate valve may be used to operate each.

The apparatus may be modified greatly in form and details of construction by the skilled mechanic without involving a departure from the principles of my invention, since

What I claim is—

1. An improvement in apparatus for removing ingots from the molds, which consists in the combination, with the ingot-pusher and a car upon which the ingot is pushed from the mold, of an interposed supporting-table which is movable into and out of the path of the ingot, substantially as and for the purposes described.

2. An improvement in apparatus for removing ingots from the molds, which consists in the combination, with the ingot-pusher and a car upon which the ingot is pushed from the mold, of an interposed supporting-table which is movable into and out of the path of the ingot, said table being provided with friction-rollers, substantially as and for the purposes described.

3. An improvement in apparatus for removing ingots from the molds, which consists in the combination, with the pusher and its motive cylinder, of a supporting-table and its motive cylinder by which it is movable into and out of the path of the ingot, the fluid-pressure supply-pipes of said cylinders being connected with a common supply, whereby the motions of the pusher and table are effected simultaneously, substantially as and for the purposes described.

In testimony whereof I have hereunto set my hand this 8th day of August, A. D. 1888.

WILLIAM R. JONES.

Witnesses:
W. P. POTTER,
THOMAS W. BAKEWELL.