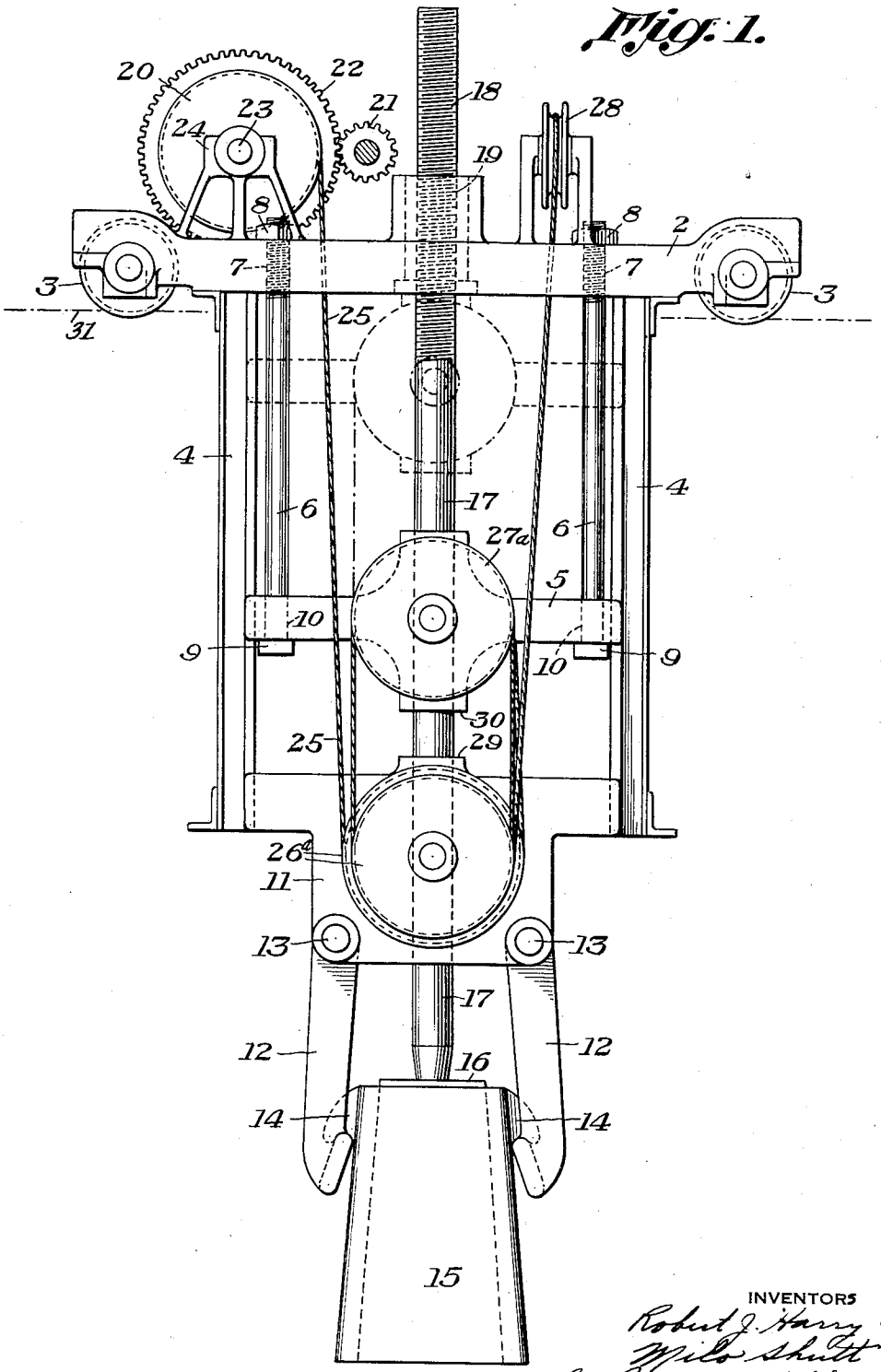
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STRIPPER

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Fig. 1.



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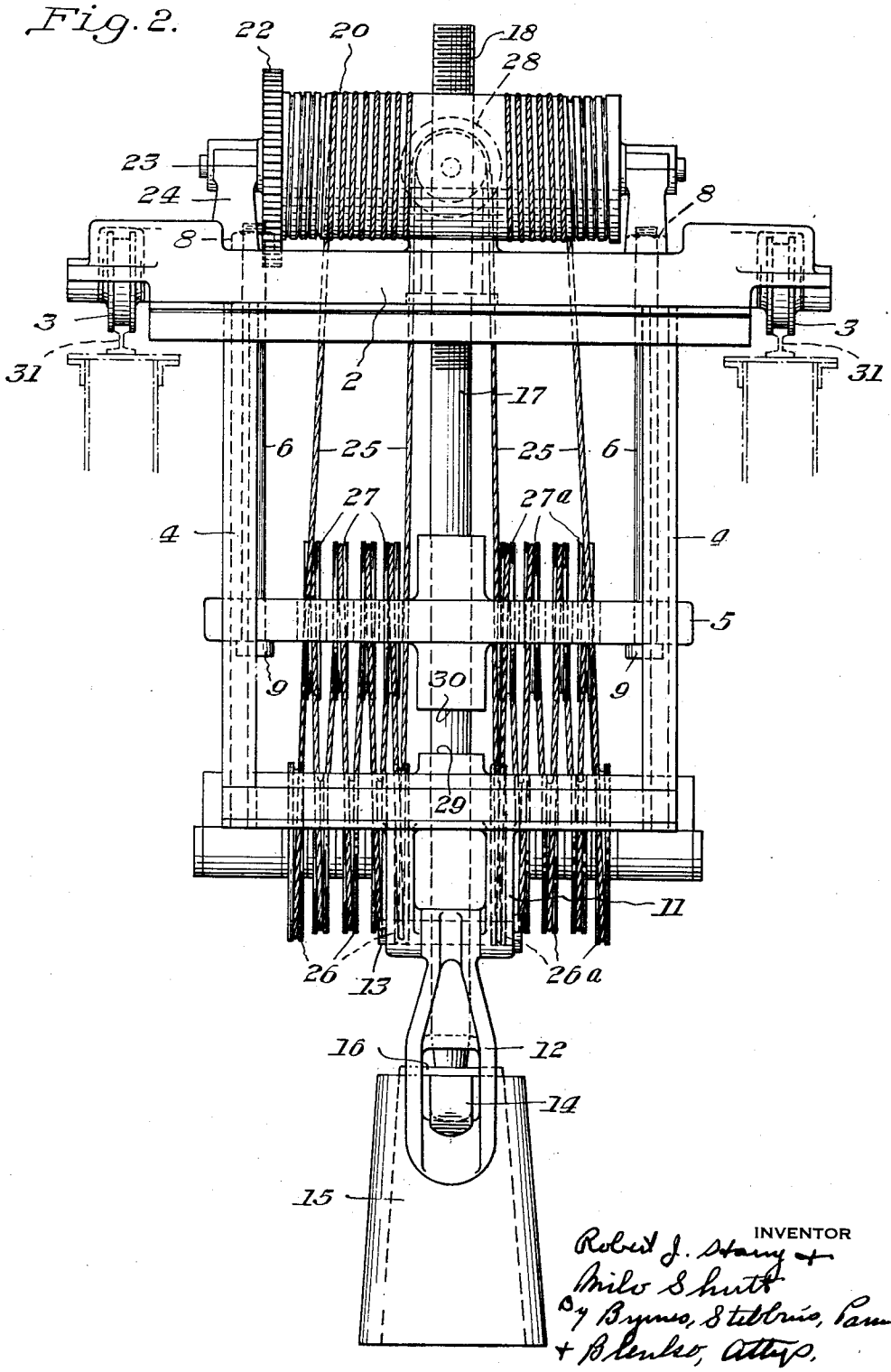
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Fig. 2.



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1,924,740

STRIPPER

Robert J. Harry and Milo Shutt, Alliance, Ohio, assignors to The Alliance Machine Company, Alliance, Ohio, a corporation of Ohio

Application October 21, 1930. Serial No. 490,221

5 Claims. (Cl. 22—95)

The present invention relates broadly to stripping mechanism, and more particularly, to an improved form of stripping crane and is herein described as applied to the stripping of moulds from ingots.

Owing to the fact that both the ingot and the mould to be stripped therefrom are tapered, the large forces necessary to break the mould loose from the ingot need be exerted over but a very short distance, as a movement of the mould relatively to the ingot for merely a few inches provides sufficient clearance between the two. After a clearance has been provided between the mould and the ingot, it is desirable to cut down the amount of force exerted by the stripping mechanism and to speed up the movement of the mould relatively to the ingot.

By our invention, we provide means for obtaining the force necessary to produce a small clearance between the sides of the mold and the ingot at a slow speed and for increasing the speed of the stripping mechanism after said clearance has been obtained. This greatly increases the rate of stripping.

In the accompanying drawings, we have shown for purposes of illustration only, a preferred embodiment of our invention.

In the drawings,

Figure 1 is a side elevation of a crane embodying our invention; and

Figure 2 is an end elevation of the structure shown in Figure 1.

In the drawings, there is shown a main frame or trolley 2 having wheels 3 thereon adapted to cooperate with rails 31 on the usual movable crane bridge. Guide columns 4 are attached to and extend downwardly from the main frame and are for the purpose of guiding the sheave blocks hereinafter described.

An upper sheave block 5 is suspended from the main frame or trolley 2 by means of tension bolts 6. The block is slidable on the bolts 6, the bolts extending through holes 10 and the heads 9 of the bolts limiting such sliding. Each tension bolt has a threaded portion 7 on the upper end adapted to receive a nut 8. This permits a vertical adjustment of the tension bolts with the resultant adjustment of the position which the sheave block 5 occupies when resting on the heads 9 of the bolts 6.

A lower sheave block 11 is provided and is adapted for movement vertically along the guide columns 4 of the frame. This lower sheave block has tongs 12 pivotally attached thereto at 13 which are adapted to engage the lugs 14 of the mold 15 which is to be stripped from the ingot 16.

A ram 17, having a screw portion 18 threaded into an opening 19 in the main frame or trolley 2, extends downwardly through the sheave blocks 5 and 11 and engages the upper portion of the ingot 16 to be stripped, holding the ingot down as the sheave block 11 is raised and the mold stripped from the ingot. The upper end of the ram is threaded in order that it may be adjusted vertically so as to be capable of use with ingots of various sizes.

A motor (not shown) is provided for driving the drum 20 through gears 21 and 22. The drum 20 is carried on an axle 23 mounted in bearings 24 carried by the trolley 2.

One end of the cable 25 is dead-ended on one side of the drum 20 and reeved over sheaves 26 mounted on the lower sheave block 11, and over sheaves 27 mounted in the upper sheave block 5. The cable 25 then passes over an equalizing sheave 28 carried by the trolley 2. After passing over the equalizing sheave 28, the cable 25 passes downwardly and is reeved over sheaves 26*a* and 27*a* mounted on sheave blocks 11 and 5, respectively, on the other side of the ram 17, as shown in Figure 2. The cable then passes upwardly around the drum 20 and the other end dead-ended thereon.

When an ingot is to be stripped, the position of the sheaves at the beginning of the stripping stroke will be as shown in solid lines in the drawings. When the driving mechanism is actuated, the cable is wound on the drum 20. The sheaves 27 and 27*a* remain in the lowermost position as determined by the bolts 6. The sheaves 26 and 26*a* are raised, carrying with them the block 11 and lifting the ingot mold. The ingot is engaged by the ram 17 and a powerful stripping action is exerted on the mold and the ingot.

At the end of the stripping stroke, the length of which can be adjusted by means of the tension bolts 6, the faces 29 and 30 of the blocks 11 and 5, respectively, come in contact with each other. As the drum 20 continues to revolve, the blocks 11 and 5 are raised together during the lifting stroke, during which stroke the mold is lifted clear of the ingot 16. At the end of the lifting stroke, the upper block 5 is in the position shown in dotted lines in the drawings and the lower block is immediately below it. The sheave block 11, of course, will be designed to clear the bolts 6 and pass between corresponding bolts on opposite sides of the frame 2.

During the stripping stroke, the maximum forces are exerted on the mold. At the end of

the stripping stroke when the faces of the upper and lower sheaves come into contact with each other, the effective ratio of the reeving is immediately changed. If the ratio of the reeving during the stripping stroke is 16 to 1, the ratio of the reeving during the lifting stroke, in the construction shown, will be 4 to 1; thus the ratio of the lifting speed to the stripping speed, in the construction shown, is 4 to 1. As may be readily seen, where the ratio of the stripping speed to the lifting speed is 1 to 4, the ratio of the force exerted on the mold during the stripping stroke to that exerted during the lifting stroke is 4 to 1.

The advantages which are obtained during the raising of the sheaves and the stripping of the mold from the ingot are also present when it is desired to lower the mold and place it on a buggy. During the first part of the lowering movement, the sheaves move at a rapid rate of speed. As soon, however, as the upper sheave comes in contact with the bolt heads 9 and the upper and lower sheaves part, the speed of the lower sheave carrying the mold is very materially reduced. This feature is important and of great advantage inasmuch as it prevents the mold from being dropped at such a rate of speed as will result in the breaking of the buggy upon which it is placed.

While we have shown and described a preferred embodiment of our invention, it is to be understood that we are not to be limited thereby and that the invention may be practiced within the scope of the following claims:

We claim:

1. An ingot stripper, comprising a supporting frame, upper and lower lifting blocks, a ram for engaging the ingot, means on the lower block for engaging the ingot mold, means for limiting the downward movement of the upper block, stop means for limiting the upward movement of the lower block relative to the upper block, power multiplying means connected with said blocks, and power means connected with the power multiplying means to first raise the lower block at a low speed and high power until the upward movement of the lower block is arrested by the stop means to strip the ingot, after which the two blocks with the ingot mold will be raised at high speed without increasing the speed of the power means.

2. An ingot stripper, comprising a supporting frame, upper and lower lifting blocks, guides for said blocks on which the blocks may be moved relative to each other, an adjustable ram for engaging the ingot, means on the lower block for engaging the ingot mold, an adjustable stop for limiting the downward movement of the upper block, stop means for limiting the upward movement of the lower block relative to the upper block, power multiplying means connected with said blocks, and power means connected with the power multiplying means to first raise the lower block at a low speed and high power until the upward movement of the lower block is arrested by the stop means to strip the ingot, after which the two blocks with the ingot mold will be raised at high speed without increasing the speed of the power means.

3. An ingot stripper, comprising a supporting frame, upper and lower lifting blocks, guides for said blocks on which the blocks may be moved relative to each other, a ram on the frame for engaging the ingot, means on the lower block for engaging the ingot mold, a stop for limiting the downward movement of the upper block, stop means for limiting the upward movement of the lower block relative to the upper block, power multiplying means connected with said blocks including sheaves and a connecting cable, and power means connected with the power multiplying means to first raise the lower block at a low speed and high power until the upward movement of the lower block is arrested by the stop means to strip the ingot, after which the two blocks with the ingot mold will be raised at high speed without increasing the speed of the power means.

4. An ingot stripper, comprising a supporting frame, upper and lower lifting blocks, guides for said blocks on which the blocks may be moved relative to each other, a ram on the frame for engaging the ingot, means on the lower block for engaging the ingot mold, a stop for limiting the downward movement of the upper block, stop means for limiting the upward movement of the lower block relative to the upper block, a plurality of sheaves on each block, a cable passing around said sheaves, winding means for said cable to move the blocks relative to each other during a portion of the winding and to cause the blocks to move as a unit during other portion of the movement of the blocks.

5. An ingot stripper, comprising a supporting frame, upper and lower lifting blocks, guides for said blocks on which the blocks may be moved relative to each other, a ram on the frame for engaging the ingot, means on the lower block for engaging the ingot mold, a stop for limiting the downward movement of the upper block, stop means for limiting the upward movement of the lower block relative to the upper block, a plurality of sheaves on each block, and a winding drum on the frame, and a cable extending from the winding drum about the sheaves on both blocks.

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