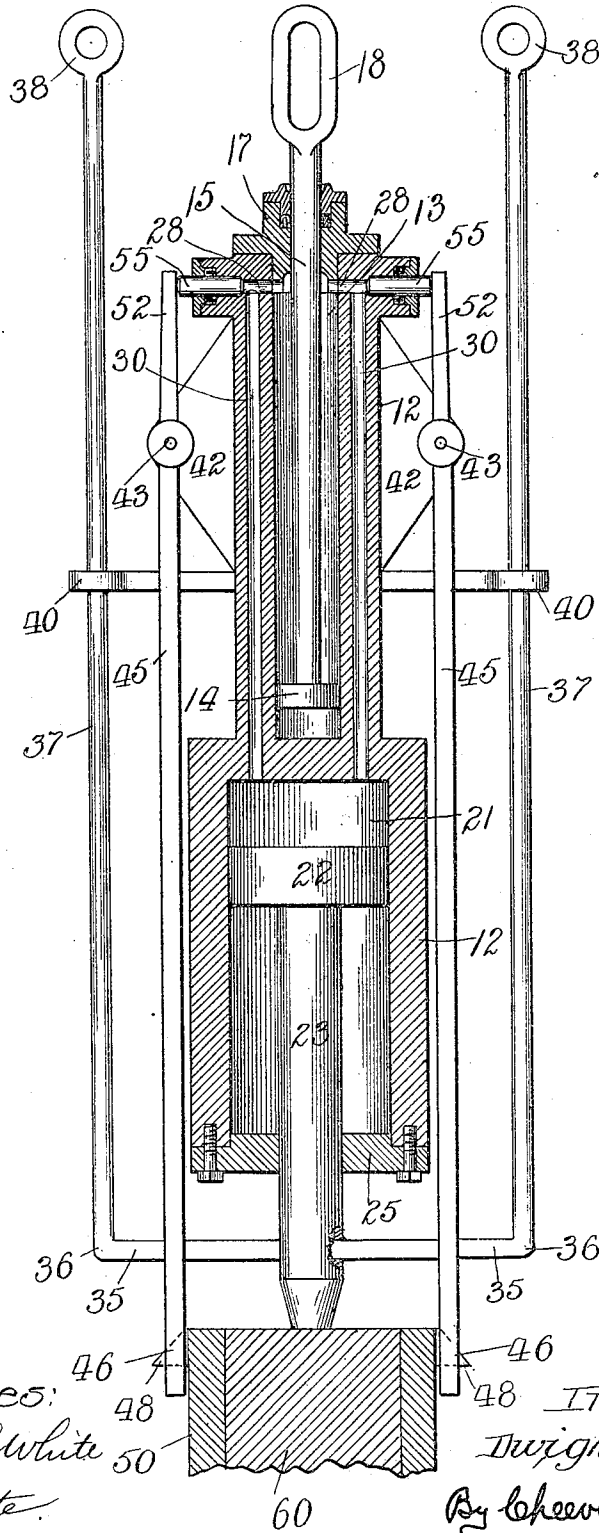


No. 801,136.

PATENTED OCT. 3, 1905.

D. B. CHEEVER.
INGOT STRIPPER.

APPLICATION FILED JAN. 23, 1905.



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UNITED STATES PATENT OFFICE

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INGOT-STRIPPER.

No. 801,136.

Specification of Letters Patent.

Patented Oct. 3, 1905.

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To all whom it may concern:

Be it known that I, DWIGHT B. CHEEVER, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Ingot-Strippers, of which the following is a specification.

My invention relates to hydraulic ingot-strippers with which the molds are stripped from ingots, the mold being held in position with reference to the stripping mechanism while the ingot itself is being stripped from the mold.

My invention is an improvement upon an invention for the same purpose covered by the application of John I. Blount, filed February 27, 1904, Serial No. 195,571.

As in that application, the object of my invention is to provide a hydraulic ingot-stripper with which a separate and distinct hydraulic pump and consequently all connections to such pump are entirely unnecessary, to provide such a mechanism which can be operated when desired by an ordinary overhead traveling crane, and which when not in use can be laid to one side while the crane is being used for some other purpose. My invention is an improvement upon the said Blount application specifically in the use of two internal pistons in a common cylinder, whereby a much closer proportioning of the power between the two pistons may be attained than is possible in the Blount structure, where one cylinder is external to the piston. For instance, where it is desired to transform the upward pull of the crane into a downward thrust on the ingot without varying the amount of power transmitted the two pistons must be made the same size, and this can be done much more easily, cheaply, and efficiently where both pistons are internal to the cylinder, as in my devices, than is possible where one external piston is used, as in the Blount device.

My invention also consists in the arrangements and combinations of parts, which will be hereinafter more fully described and claimed as the specification proceeds.

Referring to the single figure of the drawing, the numeral 12 indicates a cylinder usually made in external contour larger at one end (in the figure at the bottom) than at the other, though such external contour might

be made all of one size, if desired. In one end of this cylinder 12 is a piston-chamber 13, having slidably mounted in it a piston 14, mounted upon its piston-rod 15, extending out through stuffing-boxes 17, of ordinary construction. On the end of this piston-rod 15 is a loop 18 or other suitable mechanism adapted to be grasped by the hook of a traveling crane. In the opposite end of the cylinder 12 is another piston-chamber 21, having slidably mounted in it a piston 22, mounted on a piston-rod 23. This piston-rod 23 extends beyond the lower end of the cylinder through a guide-plate 25, which merely serves the purpose of guiding the piston-rod so that it will reciprocate up and down in a straight line and not cause the piston 22 to bind inside the cylinder.

In the Blount structure, hereinbefore referred to, the lower piston is mounted on the outside of the cylinder, the piston-bearing surface being thus exposed to the collection of dust and grit and also to accidental injury from knocks and blows, to which the device is liable to be subjected. By mounting the piston on the inside of the cylinder, as above described, I not only thoroughly protect the piston-bearing against accidental injury and against such wear as would result from an accumulation of dust and dirt, but also produce a more compact structure and one which may be more cheaply manufactured.

In the construction here shown the piston 14 is made considerably smaller than the piston 22, the intention being to communicate a relatively small power applied to the piston 14 through its piston-rod 15 and loop 18 to the piston 22, thereby causing that piston to move its piston-rod 23 a short distance with great power. Manifestly by so changing the proportions of these pistons so that they more nearly equal each other the proportionate increase in power will not be so great. By making the two pistons exactly the same size the exact amount of power and speed communicated to piston 14 would, friction being disregarded, be communicated to piston 22 and its piston-rod 23. As the mechanism here shown is, in the manner to be hereinafter described, adapted to always cause the pistons 14 and 22 to move simultaneously in opposite directions, the mechanism when modified, as just described, by making the pistons of the

same size is adapted to communicate power applied to the loop 18 to move it in one direction to the piston 23 to move it in the opposite direction with equal power and speed.

5 Entering the upper end of cylinder-chamber 13 are two horizontal ports or passage-ways 28, and in the wall of the cylinder 12, adjacent to the cylinder-chamber 13, are two vertical ports or passages 30, connecting the horizontal ports or passage-ways 28, just described, with the upper end of cylinder-chamber 21, from which it will be seen that liquid in the cylinder 12 above the piston 14 will pass through these passages 28 and 30 into the upper end of piston-chamber 21 and bear upon the upper side of the piston 22. As a constant quantity of liquid is maintained in the piston-chamber 13 above piston 14, in the ports and passage-ways 28 and 30, and in the piston-chamber 21 above the piston 22, it will be seen that lifting on the loop 18, and thereby pulling the piston 14 upward, will force this constant-quantity body of liquid through the ports and passage-ways 28 and 30 into the piston-chamber 21, and thereby force the piston 22 and its piston-rod 23 downward in the cylinder 12 with a force and speed determined by the relative areas of the pistons 14 and 22, as heretofore described. It will also be seen that by subjecting the piston-rod 23 to a source of power to move it and its piston 22 upward in the piston-chamber 21 this operation will be reversed and the constant-quantity body of liquid inside the cylinder will force the piston 14 downward in the piston-chamber 13.

Attached to the piston-rod 23, below the cylinder 12, are horizontal members 35, bent at 36 at right angles and extending upward parallel to the outside of the cylinder 12 in the form of suspension-rods 37. On the upper ends of these rods 37 are loops 38, to which a hook of a traveling crane may be attached, so that by elevating this hook of the crane a lifting force may be applied to the piston-rod 23 to move it upward, and consequently move the piston 14 downward in the manner heretofore described. The suspension-rods 37 are slidably mounted in guides 40, attached to the outside of the cylinder.

50 As more fully appears in the Blount application heretofore referred to, I place upon the sides of the cylinder 12 webs 42 and pivot to them at 43 long levers 45, having in their lower ends loops 46, adapted to fit over lugs 48 on the sides of the ingot-mold 50. These gripping-arms 45 also have short arms 52 extending upward toward the top of the cylinder 12. Slidably mounted in the upper portion of cylinder 12 are auxiliary pistons 55, having their outer ends bearing against these short lever-arms 52 and their inner ends entering the ports or passage-ways 28, so that they are in communication with and acted upon by the constant-quantity body of fluid within the cylinder heretofore referred to.

From this description it will be seen that when the fluid-body within the cylinder is under pressure these auxiliary pistons 55 will be moved outward, thereby moving the long lever-arms 45 inward toward the cylinder and causing the loops 46 to be clamped upon the lugs 48 of the mold 50, and that when pressure within the cylinder is released the levers 45 can be moved either by hand or by spring mechanism, such as is illustrated in the Blount application above referred to, in the opposite direction, thereby moving the loops 46 off from the lugs 48 and permitting the ingot-mold 50 to be removed from the device. The lower end of the piston 23 bears upon the ingot 60, as shown, so that when the ingot-mold 50 is held in the gripping-jaws 45, as heretofore described, and the device is operated by pulling upon the loop 18 to force the piston-rod 23 downward, as heretofore described, the ingot 60 is, assuming that the mechanism has been made of proper strength and sufficient power is applied, forced downward out of the ingot-mold 50.

In the general operation of the device the mechanism is placed upon an ingot-mold with the piston in about the position shown. One hook of the traveling crane is attached to the loop 18, while another hook of the crane is attached to the loops 38. The operator now lifts upon the first hook, thereby closing the jaws 45 upon the ingot-mold and stripping the ingot, as heretofore described, actually in practice lifting the ingot-mold off from the ingot and leaving it standing upon the floor. The crane is now moved as desired to place the ingot-mold in its new desired position. When this is accomplished, the pull upon the loop 18 is released, and the jaws 45 are thereby allowed to be opened to remove the ingot-mold, as heretofore described. A further releasing of the power upon the loop 18 causes the device by its own weight to settle upon the hook carrying the loops 38, which hook may or may not be in motion with reference to the crane. As soon as this settling takes place the weight of the cylinder and upper attached parts causes them to move down over the piston 22, or, in other words, causes the piston 22 to move upward inside the cylinder in the manner heretofore described, and thus restore the parts to their original position—that shown in the drawing.

I do not wish to be understood as limiting myself to exact details of construction, which may be varied within reasonable limits without departing from my invention.

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

1. In mechanism of the class described, the combination of a cylinder, a small piston and a larger piston, both mounted inside said cylinder and adapted to be moved backward and forward in the cylinder to communicate power

from one to the other, such power being communicated through a constant-quantity body of liquid within the cylinder.

2. In mechanism of the class described, the combination of a large piston, a small piston, and one cylinder inclosing both pistons with reference to which both pistons are adapted to be moved backward and forward, there being recesses and passage-ways so located within the cylinder that a constant-quantity body of liquid within the cylinder bears simultaneously on the same side of each piston with reference to one end of said cylinder.

3. In mechanism of the class described, the combination of a large piston, a small piston, and one cylinder inclosing both pistons with reference to which both pistons are adapted to be moved backward and forward, there being recesses and passage-ways so located within the cylinder that a constant-quantity body of liquid within the cylinder bears simultaneously on one side of each piston.

4. In mechanism of the class described, the combination of two pistons and one cylinder inclosing both pistons with reference to which both pistons are adapted to be moved backward and forward, there being recesses and passage-ways so located within the cylinder that a constant-quantity body of liquid within the cylinder bears simultaneously on the same side of each piston with reference to one end of said cylinder, so that moving one piston in one direction causes the other piston to move in the opposite direction with reference to the cylinder.

5. In mechanism of the class described, the combination of a piston having a piston-rod adapted to engage an ingot, a second piston having a piston-rod adapted to be engaged by a source of power, one cylinder containing both pistons, there being recesses and passage-ways so located within the cylinder that a constant-quantity body of liquid within the cylinder bears simultaneously on one side of each piston, a lever pivotally mounted adjacent to the outside of the cylinder, and a supplemental piston or plunger mounted in the cylinder adapted to be moved by the fluid within the cylinder to operate said lever.

6. In mechanism of the class described, the combination of a piston having a piston-rod adapted to engage an ingot, another piston of different size from the first having a piston-rod adapted to be engaged by the source of power, one cylinder containing both pistons, there being recesses and passage-ways so located within the cylinder that a constant-

quantity body of liquid within the cylinder bears simultaneously on one side of each piston, a lever pivotally mounted adjacent to the outside of the cylinder and a supplemental piston or plunger mounted in the cylinder adapted to be moved by the fluid within the cylinder to operate said lever.

7. In mechanism of the class described, the combination of a main cylinder having chambers at opposite ends in which pistons are adapted to be moved backward and forward, a partition in the cylinder between said piston-chambers, a piston in one of said chambers having a piston-rod extending outside the cylinder to engage an ingot, another piston in the other chamber having a piston-rod extending outside the cylinder adapted to be grasped by one hook of a traveling crane, a port or passage-way connecting the upper end of the first chamber above the first piston with the upper end of the second chamber above the second piston, whereby a constant quantity of fluid in said piston-chambers and said port or passage-ways bears simultaneously upon the upper side of each of said pistons, and lifting on the second piston-rod, forces the first piston-rod downward against the ingot.

8. In a mechanism of the class described, the combination of a main cylinder having different-sized chambers in opposite ends in which pistons are adapted to be moved backward and forward, a partition in the cylinder between said piston-chambers, a large piston in one of said chambers having a piston-rod extending outside the cylinder to engage an ingot, a smaller piston in the smaller chamber having a piston-rod extending outside of the cylinder adapted to be grasped by one hook of a traveling crane, a port or passage-way connecting the upper end of the first chamber above the first piston with the upper end of the second chamber above the second piston, whereby a constant-quantity body of fluid in said cylinder-chambers and said port or passage-way bears simultaneously upon the upper side of each of said pistons, and lifting on the second piston-rod, forces the first piston-rod downward against the ingot.

In witness whereof I have hereunto subscribed my name in the presence of two witnesses.

DWIGHT B. CHEEVER.

Witnesses:

DE WITT C. TANNER,
CAROLYN RAFTERY.