

No. 736,549.

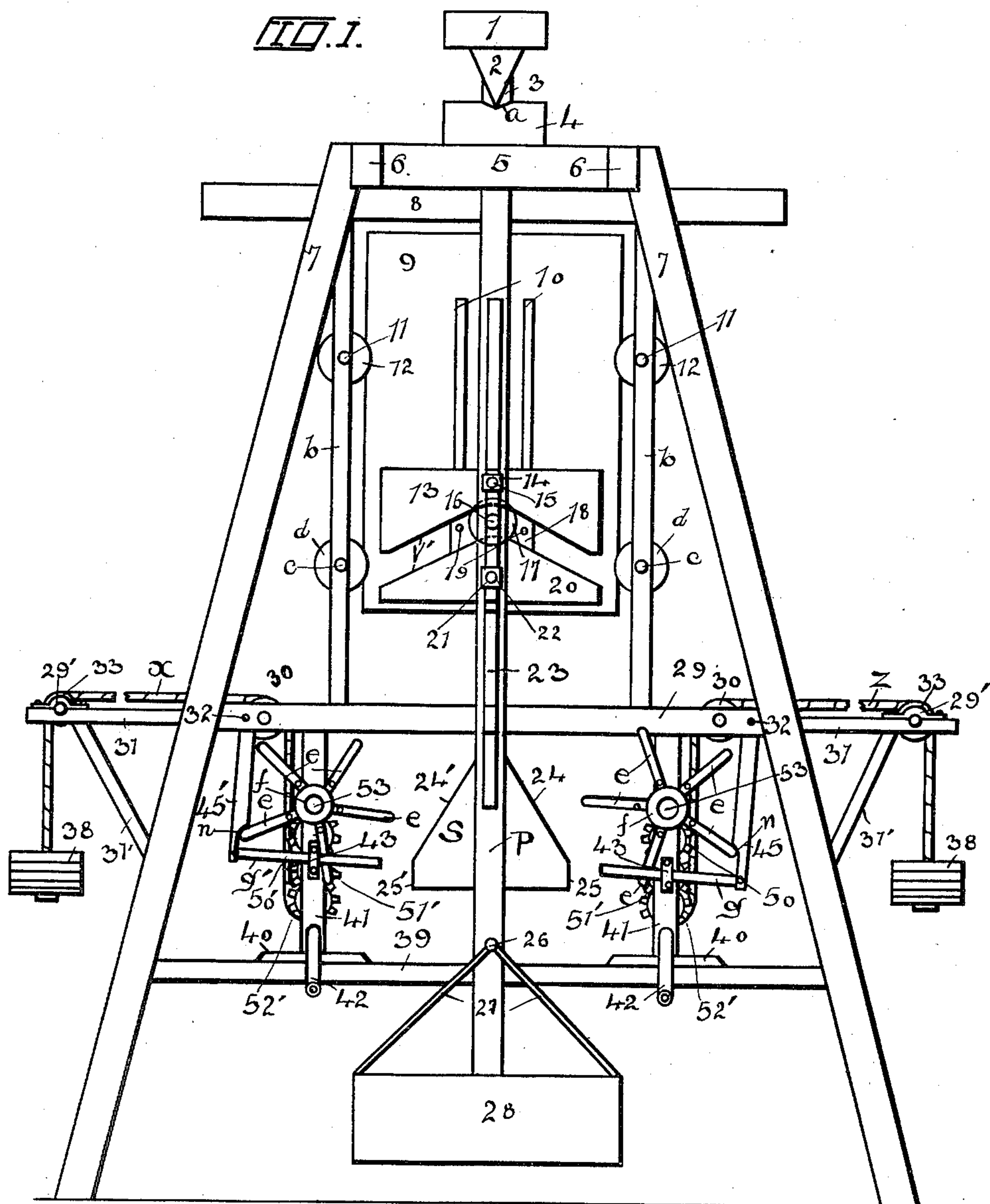
PATENTED AUG. 18, 1903.

F. L. ROBERTSON.
PUMPING DEVICE.

APPLICATION FILED APR. 8, 1903.

NO MODEL.

2 SHEETS—SHEET 1.



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PUMPING DEVICE.

SPECIFICATION forming part of Letters Patent No. 736,549, dated August 18, 1903.

Application filed April 8, 1903. Serial No. 151,601. (No model.)

To all whom it may concern:

Be it known that I, FRANK L. ROBERTSON, residing at Omaha, in the county of Douglas and State of Nebraska, have invented certain
5 useful Improvements in Pumping Devices; and I do hereby declare that the following is 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
10 use the same, reference being had to the accompanying drawings, which form a part of this specification.

This invention relates to a new and useful improvement in pumping devices, the object
15 of my invention being to provide a mechanism adapted to be secured to an ordinary pump-plunger, so that the plunger may be actuated to elevate the water; and my invention further embodies certain other combinations described more fully hereinafter.

In the accompanying drawings I have shown in Figure 1 a front elevation of a pumping mechanism embodying my invention with portions removed. Fig. 2 discloses
25 a modification of the pendulum connection. Fig. 3 shows a side elevation of one of the trains of driving-gears used in my invention. Fig. 4 shows a detail of the arm-hub used in my pumping device, while Fig. 5 discloses a
30 detail of the shifting pinion as used in my invention.

The aim of my invention is to provide a gear mechanism operated by means of a weight and which gear mechanism is ar-
35 ranged to expend its force in intermittently engaging and operating a swinging pendulum, which pendulum in turn imparts an up-and-down movement to a suitably-secured follower secured to an ordinary pump-plun-
40 ger to reciprocate the plunger in raising the water.

In carrying out the aim of my invention I construct an approximately A-shaped skeleton structure comprising four counterpart
45 vertical standards 7, united above by the transverse sills 6 and the end sills 5. In order to further strengthen this structure, I secure the sills 6 by means of one or more transverse stringers 8, as shown in Fig. 1.
50 The vertical members or standards 7 are reinforced below by means of the transverse braces 39 and 29, as disclosed in Fig. 1. Se-

cured above to the frame is a suitable bed-block 4, provided with angular seating *a*, and held within this bed-block 4 is a knife-
55 edged or V-shaped bearing 2, working or resting within its seating *a*, as is disclosed in Fig. 1, and this knife-edged bearing 2 is secured to a pendulum P, which pendulum
60 above is provided with the head-block 1, below which the bearing 2 is held. Below this pendulum P is provided with a receptacle 28, within which is placed sand, rocks, or other heavy material, and this receptacle 28 is
65 braced by means of the bars 27, secured by the pin 26. This pendulum is slotted, as shown at 23, and within this slot are held the bolts 15 and 22, the first of which sup-
70 ports the upper swinging bearing-block 13, the lower edge of which is V-shaped in outline, as shown in Fig. 1, while the second bolt 22 adjustably supports the lower swing-
ing bearing-block 20, approximately triangular in outline, these two swinging bearing-
75 blocks being held in juxtaposition, so as to form an inverted-V-shaped slot, as disclosed. These bolts 15 and 22 are secured by the nuts 14 and 21, so that these swinging bearing-
blocks may be carried upward and downward.

Extending upward from the transverse
80 frame member 29 are the two standards *b*, each being provided with a pin 11, and *c* supporting the grooved sheaves 12 and *d*, and held within these four sheaves 12 and *d* is a vertical reciprocated slotted panel 9, pro-
85 vided with the vertical slots 10, as disclosed. Adjustably secured to this panel 9 by means of suitable bolts 19 is a bolt 18, having a pin 16, supporting the sheave 17, adapted to operate
90 between the bearing-surfaces *v'* of the swinging bearing-blocks 13 and 20. For the sake of convenience the guiding edges *v'* of these blocks may be grooved, so that the sheaves 17 cannot become laterally displaced. In Fig. 1 the sheave 17 is shown in dotted
95 outline at the point where the sheave engages within the groove of these swinging bearing-blocks.

Held upon the transverse frame members
100 39 are the base-plates 40, each base-plate supporting a suitable frame, within which is held a train of driving-gears. In Fig. 3 a side elevation of one of these gear-holding frames, which are used in sets of twos, is disclosed.

Extending upward from the base-plate 40 are the end members 41 and 64 and 67, supporting the top members 65 and 66. The end member 64, it will be noticed, is somewhat shorter than the members 67 and 41. Depending from the top members 65 are the hangers 68 and 69, the structure being strengthened by means of the brace members 80, as shown.

Passing through suitable bearings within the end members 41 and 64 is a main driving-shaft M, provided with the operating-crank 42, and this main driving-shaft is provided with a longitudinal slot *v*, within which is held the pin *w* of the sliding pinion K, this pinion being shown in detail in Fig. 5. In order that this pinion K may be slid from one end to the other of the shaft M, the intermediate standard 67 is provided with a suitable opening through which this pinion K may pass.

Positioned above the main slotted shaft M is a drum-shaft 56, which has secured to it a number of gears, (marked 60, 61, 62, and 63,) each gear by means of a pawl and ratchet as is usual in connecting drums with gears, have secured to them a drum A, B, C, and D, so that these drums may be operated in one direction independent of their connecting-gears, as is common in structures where such winding-drums are used. Extending from each drum upward a suitable distance are suitable strands thus connected to the instrumentalities, as disclosed in Fig. 3, being marked *z*, *z'*, *z²*, and *z³*. In my invention I use two sets of counterpart train of gearing, as disclosed in Fig. 1, the strands extending from the remaining train of gearing being identified by the reference-letter *x*, as is disclosed. Each strand extending from a drum is guided over a suitable supporting-sheave 30 and 33, the latter being held within suitable bearings 29', and each strand finally is provided with a suitable weight 38.

In the structure as disclosed in Fig. 1 I contemplate using two independent sets of driving-gear mechanisms, each being provided with four weight-operated drums, as is disclosed in Fig. 3.

Positioned above the drum-shaft 56 are the shafts 55 and 54 and the arm-shaft 53, the shaft 55 being provided with the pinion 52, meshing with a gear 52' upon the drum-shaft 56, while the gear 51', secured to the shaft 55, meshes with the pinion 51 of the shaft 54, and the gear 50', secured to this shaft 54, in turn meshes with the pinion 50, secured to the arm-shaft 53, this arm-shaft 53 being provided with an arm-hub *f*, one of which is shown in detail in Fig. 4. To the arms are secured suitable bolts, preferably wooden projecting arms *e* in the drawings, five of such projecting arms being shown as secured to each arm-shaft 53.

The sheaves 29 are supported by the frame members 31, secured by means of the brackets 31', as shown.

Secured to the pendulum P is an approxi-

mately triangular-shaped block S, provided with the angular bearing-surfaces 24 and 24' and below with the flat bearing-surfaces 25 and 25', as is disclosed in Fig. 1.

Pendent from the frame member 29 are two hangers (marked 45 and 45') alike in structure, each being provided with a seating *n* so positioned that one of the arms *e* of each arm-shaft 53 will normally be in engagement with each hanger 45 and 45'. Extending from and pivotally secured to each hanger 45 and 45' are striker-arms *g* and *g'*, as is disclosed in Fig. 1. These striker-arms, it will be noticed, extend outward horizontally and are held within suitable ears 43, secured to the frame members 41, and these striker-arms *g* and *g'*, it will be noticed, are so positioned that they will come in engagement with the flat bearings 25 and 25' of the block S, secured to the pendulum P.

When all the working effects have been properly constructed and assembled, the operation of my device would be as follows: The receptacle 28 would first be filled with suitable material to provide the pendulum with the weight. The operator would then bring the shifting or traveling pinion K in engagement with the gear 63, when the operator would turn the shaft M to wind up the strand *z³* upon the drum D to raise the weight connected to the strand of this drum. This shaft 56, it should be remembered, is normally held stationary by means of the arm-shaft 53, having one of its arms D locked and engaged by its connected hanger 45 or 45', as the case may be. The first drum D having been wound, the operator would advance the traveling or shifting pinion K to engage the second gear 62 to wind up and raise the second weight, and so on. The weights used to drive the gear mechanism in my pumping device have been divided into a plurality of separate weights, as the combined weight would be so great that the same could not be wound up or raised on one operation. While this main slotted shaft M has been described and shown as being adapted to be raised by manual power, it should be understood that the weight secured to each drum-strand could be of considerable weight and that this shaft M could be operated by horsepower. It might here be stated that this pumping device is intended to be used especially in the dry stock-raising countries where water is scarce, but horse-power is cheap and plentiful, so that a portion of the stock could be made to operate my pumping device in order to provide sufficient water for drinking and irrigating purposes. All of the weights in connection with the driving mechanisms used in my invention having been wound up, the operator, who had previously connected the follower 9 with a suitable pump-plunger, would swing the pendulum P to bring one of the flat bearing-surfaces 25 or 25' in contact with the adjacent striker-arm *g* or *g'* to release the arm *e* in

contact with the connected hanger. This would permit the weight-operated shaft 53 to revolve until the next arm *e* following would come in engagement with the pendent hanger, which normally seeks a vertical position. In revolving the arm *e*, however, immediately adjacent the angular surface 24 or 24' would have come in engagement with the same and expend its force in pushing the pendulum in an opposite direction, the adjustment of the instrumentalities being so timed that this operating force of the arm *e* is exerted upon the angular block S at the instant when the same is ready to move backward. In its swinging movement in the opposite direction the opposite striker-arm would be engaged to release the opposite arm-shaft 53, so that the angular block S would again come in engagement with one of the arms *e* to be forced in an opposite direction, and this pendulum movement would be continued as long as the weights actuated the gear mechanisms.

It is of course understood that the number of driving-gear mechanisms could be increased and all made to operate upon suitable angular striker-blocks S, secured to the pendulum.

In Fig. 2 I have shown a modification in which the pendulum 70, provided with the weight 76, is connected to the panel 74 by means of the connecting-bar 72.

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

1. The combination with a suitable supporting-frame, of a pendulum secured to said supporting-frame, bearing-blocks secured to said pendulum to provide an angular bearing-slot, a vertically-reciprocating panel, a sheave adjustably secured to said panel and working between said bearing-blocks, a striker-block provided with two bearing-faces upon each side secured to aforesaid pendulum, a plurality of driving-gear mechanisms,

an arm-shaft operated by each of said driving-gear mechanisms, arms secured to each of said arm-shafts, adapted to come in engagement with aforesaid bearing-faces, and stops normally checking the movement of aforesaid arm-shafts, aforesaid striker-block being adapted to come in engagement with aforesaid stops to alternately operate the same to intermittently release said arm-shafts, all arranged substantially as and for the purpose set forth.

2. The combination with a suitable supporting-frame, of a pendulum supported by said frame, an upper bearing-block secured to said pendulum provided with a bearing edge, a lower bearing-block secured to said pendulum adjacent said upper bearing-block, a vertically-reciprocating panel, a sheave secured to said panel and working between aforesaid upper and lower bearing-blocks, a block secured to said pendulum provided with a plurality of bearing-faces, a plurality of driving-gear mechanisms, two arm-shafts operated by said driving-gear mechanisms, one shaft being positioned upon one side of said pendulum and the remaining upon the opposite side of said pendulum, arms secured to said driving-shaft adapted to come in engagement with the bearing-faces of aforesaid block, stops secured upon each side of said pendulum to normally secure and hold inoperative aforesaid driving mechanisms, said stops being alternately engaged by aforesaid block to intermittently release aforesaid driving-gear mechanisms, and means to operate said gear mechanisms, all arranged substantially as and for the purpose set forth.

In testimony whereof I affix my signature in presence of two witnesses.

FRANK L. ROBERTSON.

Witnesses:

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FRANK H. DUNLOP.