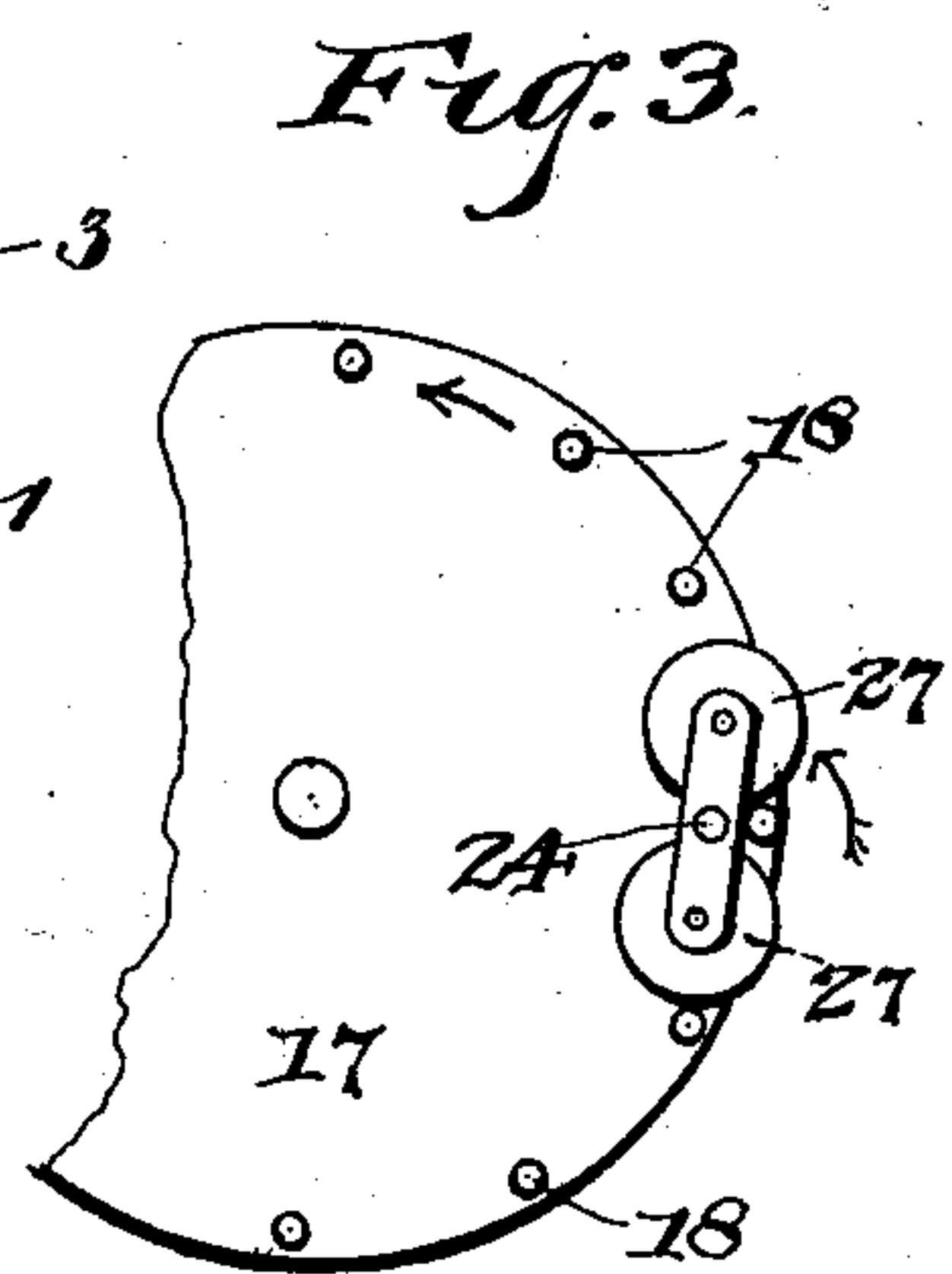
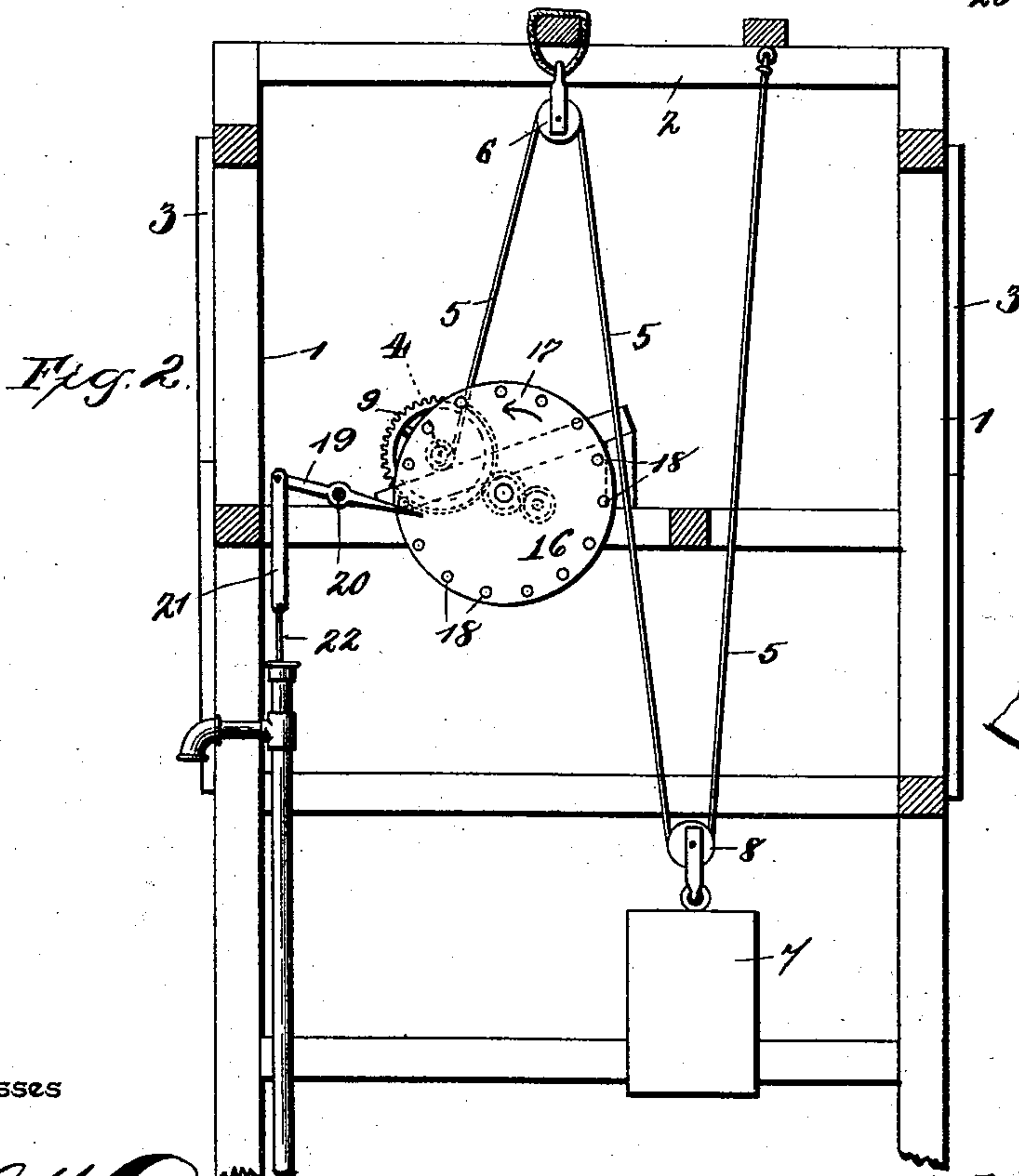
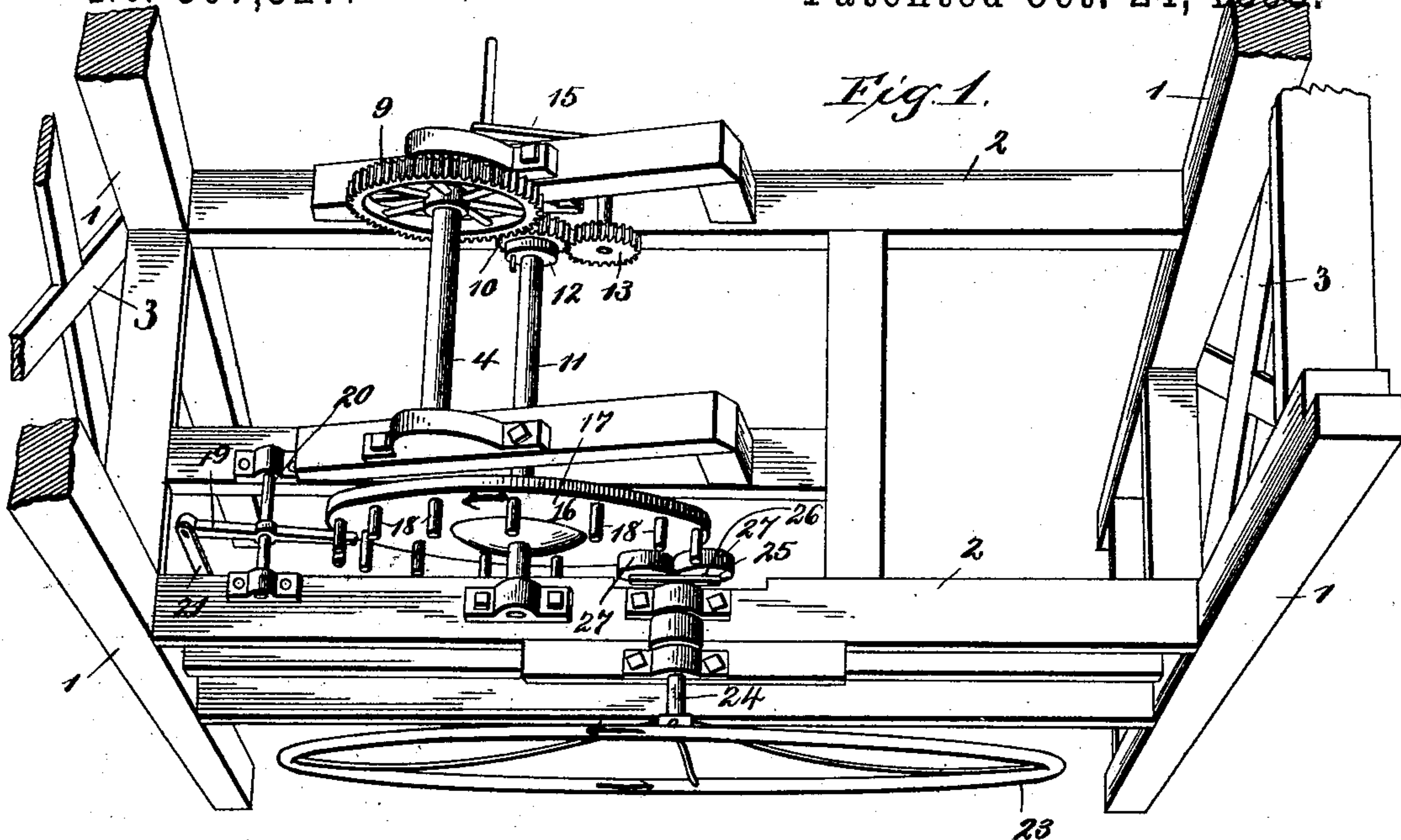


(No Model.)

B. L. PICKARD.
MOTOR.

No. 507,327.

Patented Oct. 24, 1893.



Witnesses

Inventor

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UNITED STATES PATENT OFFICE.

BIRTRUN L. PICKARD, OF CENTRALIA, WASHINGTON.

MOTOR.

SPECIFICATION forming part of Letters Patent No. 507,327, dated October 24, 1893.

Application filed May 11, 1893. Serial No. 473,785. (No model.)

To all whom it may concern:

Be it known that I, BIRTRUN L. PICKARD, a citizen of the United States, residing at Centralia, in the county of Lewis and State of Washington, have invented a new and useful Motor for Pumps, of which the following is a specification.

My invention relates to an improved motor for pumps, the objects in view being to provide means whereby the back stroke of the pump rod may be accomplished rapidly in order to economize time; and to provide means whereby a weight may be employed as the source of power, the same being applied in such a manner as to permit of the employment of speed multiplying means in order that a heavy and slow moving weight may be used.

Further objects and advantages of my invention will appear in the following description, and the novel features thereof will be particularly pointed out in the appended claims.

In the drawings—Figure 1 is a top perspective view of a machine embodying my invention. Fig. 2 is a vertical central sectional view of the same. Fig. 3 is a diagrammatic view showing the governor arranged in the position which it assumes when the wheel is momentarily checked.

Similar numerals of reference indicate like parts in all the figures of the drawings.

The supporting framework of my pumping machine may be of any suitable construction, but preferably consists of the uprights 1, connected at top and bottom and at intermediate points by the horizontal supporting-bars 2, and also connected by the inclined intersecting braces 3, such a structure being suitable for erection over the well in which the pump, operated, by my machinery is located.

4 represents a drum upon which is reeled the cable or other flexible connections 5, which extends over the pulley 6 connected to the upper timbers of the framework and is connected at its lower end to a weight 7. A supplemental pulley 8 is preferably connected to the weight and the end of the cable is secured to the framework, as shown in the accompanying drawings, whereby a prescribed movement of the weight will produce double that movement in the flexible connec-

tion or cable. The drum 4 is provided with a gear 9 which meshes with a pinion 10, which is loosely mounted upon the main shaft or arbor 11. The pinion 10 is connected to said shaft or arbor by means of a clutch 12 of the ordinary or any approved construction, whereby, when said pinion is rotated in the direction in which it is impelled by the unwinding of the cable from the drum 4, the shaft will be locked to said pinion and will rotate therewith. Winding devices comprising a pinion 13 carried by a shaft 14, having a crank arm 15, are employed as means of reeling the cable upon the drum.

The main shaft or arbor 11 carries a pin-wheel 16 which consists of a body portion 17 of any approved construction and lateral pins 18 projecting from the periphery of said body-portion, and 19 represents a rocking-lever which is fulcrumed at an intermediate point upon a pivot pin 20, is connected at one end by means of a pitman 21 to the upper end of the pump rod 22 and is reduced or tapered at the other end and projects into the path of the lateral pins 18.

From the above description it will be understood that the rotation of the pin-wheel caused by the unreeling of the cable from the drum will, by the successive engagement of the pins 18 with the tapered extremity of the rocking-lever, produce a vibratory motion of the latter. It will be understood, furthermore, that as the wheel descends upon that side which is adjacent to or in operative relation with the rocking-lever, the movement of the lever will be irregular—namely, its tapered extremity will be depressed slowly thus elevating its other extremity and the pump rod connected thereto, and when the tapered extremity is released it will ascend quickly until checked by the succeeding pin, thus allowing the pump rod to descend without loss of time.

Gravity or any preferred mechanical means may be utilized to depress the pump rod and the contiguous end of the lever 19, it being deemed unnecessary to illustrate such well known devices.

In order to present the pins 18 in such positions as to produce the longest possible stroke of the rocking-lever and allow it to return after each stroke with the shortest possible loss of time I provide means whereby the pin-wheel is given an intermittent movement.

Such means consist of a governor having a balance-wheel 23 attached to a stub-shaft 24 carrying a transverse bar or cross-head 25, which bar is provided with pivot pins 26 upon which are mounted the anti-friction rolls 27. The stub-shaft is so arranged with relation to the pin-wheel that during the rotation of the balance-wheel the anti-friction rolls are brought successively into the path of the pins 18 and from said pins derive the impulse by which the balance-wheel is driven. Thus, as the pin-wheel rotates it elevates one of the anti-friction rolls and at the moment that the tapered end of the rocking-lever is released from the pin by which it has been depressed the other anti-friction roll is in the path of the succeeding pin thus momentarily checking the rotation of the pin-wheel and holding it in such stationary position long enough for the released end of the rocking-lever to rise and be checked by the pin succeeding that one by which it was previously depressed. The direction of rotation of the pin-wheel is indicated by the arrows in the drawings, and as shown by the diagrammatic view, Fig. 3, the governor checks the rotation of the pin-wheel while the former is crossing the dead center or during the time that the pressure of the pin which is in engagement with the lower anti-friction roll is in the direction of the arm to which said roll is attached, or toward the shaft of the governor. Obviously, the checking of the pin-wheel is but momentary for the reason that the motion of the balance-wheel is continuous, and hence the anti-friction roll by which the pin-wheel was checked moves forward in the direction of rotation of the pin-wheel thus allowing the latter to rotate and at the same time receiving an additional impulse from the pin in contact therewith. Therefore, the pin-wheel rotates steadily, governed by the speed of rotation of the balance-wheel during the depression of the tapered end of the rocking-lever or the elevation of the pump rod, and as said lever is released from the pin by which it has been depressed the pin-wheel is checked a sufficient length of time to enable the pump rod to descend to the lowermost terminal of its stroke before the succeeding up-stroke is commenced.

Inasmuch as the governor receives its impulse from the pin-wheel its rotation will correspond in speed with that of the pin-wheel and the anti-friction roll during its ascent in engagement with one of the pins will move with the same speed as said pin. But as the anti-friction roll reaches the upper part of its path it moves out of the path of the pin, and at the same time the other roll moves into the path of the succeeding pin. When the pressure of the previous pin is removed from the roll with which it has been in contact the governor depends entirely upon momentum for its continued rotation until the second roll shall have passed out of alignment with the shaft of the governor and is in position

to receive the impulse of the pin wheel through the said succeeding pin. It is during the time that the said second roll is passing this dead center or point of alignment with the governor shaft that the pin-wheel is checked, inasmuch as the direction of movement of the said succeeding pin is in alignment with both rolls and the governor shaft.

It will be understood that various changes in the form, proportion, and minor details of construction may be resorted to without departing from the spirit of my invention or sacrificing any of the advantages thereof.

Having described my invention, what I claim is—

1. In a device of the class described, the combination of a rotary drive-wheel provided with spaced pins arranged perpendicular to its plane, a rocking lever having its axis of movement parallel with the axis of the drive-wheel, with one of its terminals arranged in the path of the pins carried by said wheel and adapted to be engaged successively thereby, means for imparting rotary movement to the wheel, and a speed controlling device operatively connected to the drive-wheel to derive motion therefrom and having a continuously rotating member provided with projections which successively intersect the path of the pins carried by the wheel, and adapted to engage said pins to produce an intermittent movement of the drive-wheel, substantially as specified.

2. In a device of the class described, the combination with a rocking-lever, of a rotary drive-wheel provided with spaced pins to engage said lever, means for imparting a rotary movement to said wheel, and a speed controlling device having a continuously rotating cross-head deriving motion from the drive-wheel and carrying anti-friction rolls which are brought successively into the path of the pins upon said drive-wheel whereby the latter is given an intermittent movement, substantially as specified.

3. In a device of the class described, the combination with a rocking-lever, of a drive-wheel provided with lateral spaced pins to engage said lever, means for imparting a rotary movement to said wheel, and a speed controlling device comprising a balance-wheel, a cross-head carried by the shaft of said balance-wheel, and anti-friction rolls mounted upon pins located eccentrically with relation to the balance-wheel and adapted to lie successively in the path of the pins carried by said drive-wheel and to receive therefrom the impulse necessary to rotate the balance-wheel, substantially as specified.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

BIRTRUN L. PICKARD.

Witnesses:

H. J. MILLER,
F. H. MILLER.