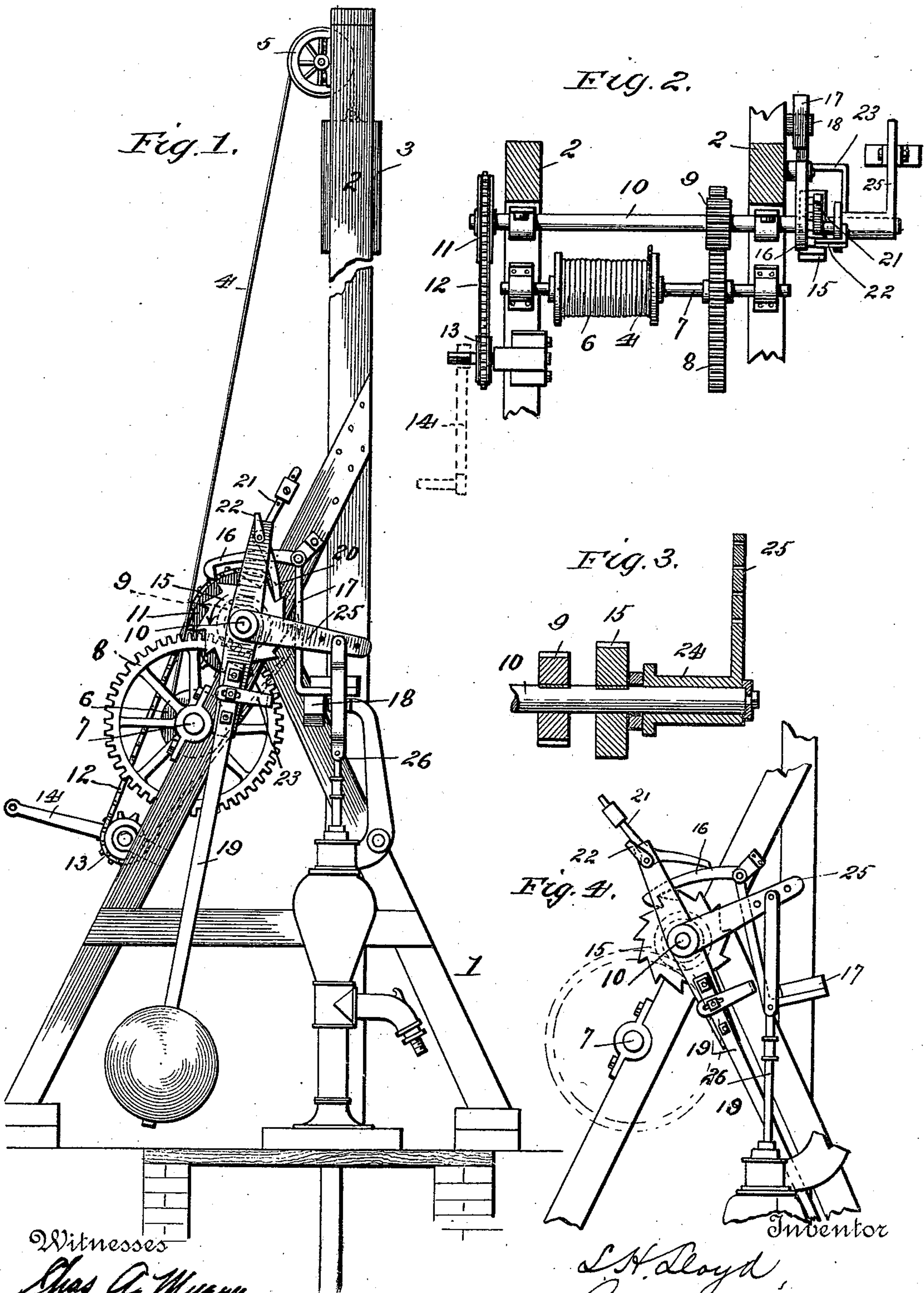


(No Model.)

L. H. LLOYD.
PUMP MOTOR.

No. 519,608.

Patented May 8, 1894.



Witnesses
Chas A. Munn
Frank R. Evans

Inventor
L. H. Lloyd
By *Alexander Davis*
Attorneys.

UNITED STATES PATENT OFFICE.

LOUIS HENRY LLOYD, OF LINCOLN, ILLINOIS.

PUMP-MOTOR.

SPECIFICATION forming part of Letters Patent No. 519,608, dated May 8, 1894.

Application filed January 3, 1894. Serial No. 495,550. (No model.)

To all whom it may concern:

Be it known that I, LOUIS HENRY LLOYD, a citizen of the United States, residing at Lincoln, in the county of Logan and State of Illinois, have invented certain new and useful Improvements in Pump-Motors, of which the following is a specification, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation of my improved motor. Fig. 2 is a plan view thereof, the vertical ways being shown in cross section, and Fig. 3 is a detail horizontal section hereinafter described. Fig. 4 is a detail side elevation showing the parts in a different position from that shown in Fig. 1.

This invention relates to a motor or mechanism for vertically reciprocating pump-rods, the design of it being to provide simple mechanism for utilizing the gravitating force of a suspended weight for imparting a regular movement to the pump-rod, the speed and regularity of the mechanism being governed and assisted by the swinging motion of a pendulum, as hereinafter fully described.

In the drawings annexed, the numeral 1 designates a suitable frame which supports a pair of vertical ways or guides 2, between which is adapted to vertically work a suitable weight 3. Attached to the weight is a cable 4, which passes up over a pulley 5, journaled at the upper ends of the ways, and then down and around a drum 6 secured on a shaft 7 journaled in said frame 1.

Secured on shaft 7 is a spur-gear 8, which meshes with a pinion 9 carried by a shaft 10, journaled above said drum, said shaft 10 being operated to wind the rope or cable upon the drum by means of a sprocket-wheel 11 secured on one of its ends, this sprocket-wheel carrying a sprocket chain 12 which also passes over a smaller sprocket-wheel 13 secured on a stub-shaft journaled in the frame below. The sprocket wheel 13 and the chain are driven by means of a hand-crank removably secured on the end of the stub-shaft.

Secured rigidly on the shaft 10 is a ratchet wheel 15, and pivoted on the frame adjacent to this ratchet wheel is a hook-pawl 16 which extends over the upper edge of the ratchet wheel and is normally kept out of engagement with the teeth thereof by means of a depending weighted-arm 17 extending below

the ratchet wheel and normally resting on a stop 18.

Pivotally swung on shaft 10 in front of the ratchet wheel is a pendulum 19, whose upper end extends above the ratchet wheel and carries a pivoted pawl 20, which is provided with an upwardly extending weighted arm 21. An adjustable stop 22 is secured on the upper end of the pendulum and extends into the path of the throw of said weighted arm 21 and serves to limit its movement. Carried by the pendulum below the ratchet wheel is a lateral arm 23 which is adapted to come in contact with the weighted arm 17 of pawl 16 at a predetermined point in the swing of the pendulum, said arm being adjustably secured to the pendulum in order that it may be set so as to strike the weighted arm at the proper instant. Carried by the pendulum and working on the end of shaft 10, in front of the ratchet wheel, is a sleeve 24 which carries at its outer end a lateral arm 25, which is provided with a series of holes to enable it to be adjustably connected to the pump rod 26. It will be observed that the tendency of the weight 3 is to rotate the ratchet wheel 15 in the direction of the arrow thereon, through the medium of the cable and the train of gearing, the rotation of the ratchet wheel being prevented by pawl 20.

To start the mechanism it is simply necessary to start the pendulum to swinging, which may be done by taking hold of the pendulum with the hand or by means of the crank and sprocket chain. As the pendulum swings to the right, arm 23, carried thereby, at the proper instant strikes arm 17 and engages pawl 16 with the ratchet-wheel and thereby locks the ratchet wheel against rotation; as soon as pawl 16 engages the ratchet wheel it releases pawl 20 from the pressure of the ratchet wheel, whereupon the weighted arm 21 falls against stop 22 by gravity and thereby disengages said pawl 20. The pendulum is then free to swing toward the left, in which movement it is assisted by the dropping or falling of the pump rod; as the pendulum swings to the left the pawl 20 is automatically thrown back into engagement with the ratchet wheel by means of the weighted arm 21 as soon as the pendulum passes the center. When the pawl 20 thus falls into engagement with the ratchet wheel it strikes the same with sufficient force

to relieve for an instant the pressure against pawl 16, whereupon said pawl 16 automatically and quickly swings up out of engagement with the ratchet wheel, thereby permitting the force exerted by the ratchet wheel through the medium of pawl 20 to swing the pendulum to the right and lift the pump rod. These operations are repeated, as the pendulum swings back and forth, until the weight reaches the limit of its downward movement. When the desired quantity of water is pumped, the operation of the mechanism is stopped by taking hold of the pendulum and holding it still an instant. It may be started again at any time by giving the pendulum a sufficient swing to the left to relieve pawl 16 and let it swing up out of engagement.

In order to increase the storage of power and thereby render the pump self-operating for a greater length of time, the machine may be so arranged that the weight may pass down into the well or into an opening at the side of the well, as is evident. In this way sufficient power may be stored up to last a comparatively long time, according to the quantity of water used.

It will be observed that the specific construction of the parts may be varied without departing from the spirit or scope of the invention.

Having thus fully described my invention, what I claim is—

1. In a device for imparting a reciprocating movement to a pump-rod or other device, the combination of a frame, a gravitating weight, a drum and cable connected to said weight, a ratchet wheel driven by said drum, a pendulum pivotally mounted adjacent to said ratchet wheel, an automatic pawl carried by said pendulum and movable thereon and engaging the ratchet wheel, whereby the force exerted by the ratchet wheel is communicated to the pendulum, an arm connected to the pendulum and adapted to be connected to the

pump-rod or other device, and means carried by the frame for automatically engaging the ratchet wheel and stopping its rotation when the pendulum reaches the limit or nearly the limit of its swing in one direction, substantially as described.

2. In a motor for imparting a reciprocating movement to a pump-rod or other device, the combination of a frame, a drum journaled thereon and a cable and weight for operating said drum, a ratchet wheel driven by said device, a pendulum swung concentrically with said ratchet wheel and extending above the ratchet wheel, a weighted pawl carried by the pendulum and adapted to be thrown in and out of engagement with said ratchet wheel as the pendulum passes the center, a pawl pivoted on the frame and normally held out of engagement, devices for forcing said pawl into engagement with the ratchet wheel to relieve the pressure against the other pawl, and an arm connected to the pendulum and adapted to be connected to the device to be operated, substantially as described.

3. In a motor for operating a reciprocating part or device, the combination of a drum and devices for imparting rotation thereto, a ratchet wheel driven by the drum, a pawl 16 provided with a depending arm 17 to normally hold it out of engagement with the ratchet wheel, a pendulum swung concentrically to the ratchet wheel, an arm 23 carried by the pendulum and adapted to strike said arm 17, a weighted pawl 20 pivoted on the pendulum and normally engaging the ratchet wheel, and an arm connected to the pendulum and adapted to be connected to the device to be operated, substantially as described.

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

L. HENRY LLOYD.

Witnesses:

G. G. TAYLOR,
W. W. FALLIS.