G. S. PETRY.

Motor.

No. 203,765. Patented May 14, 1878.

Fig. 1.

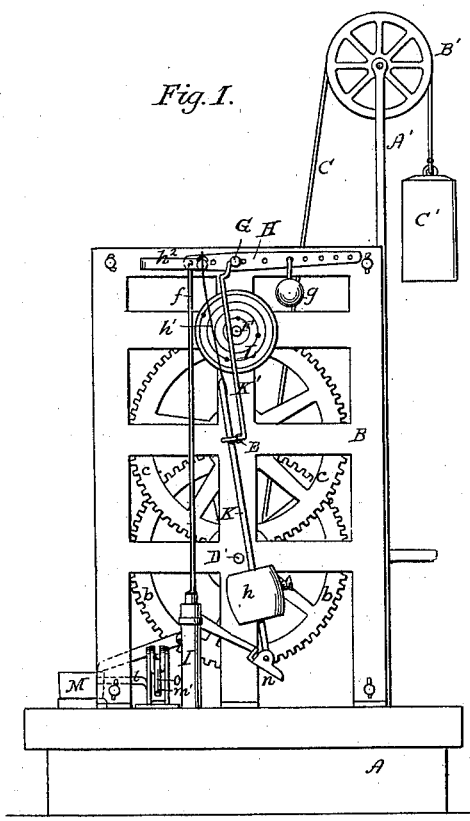



Fig. 2.

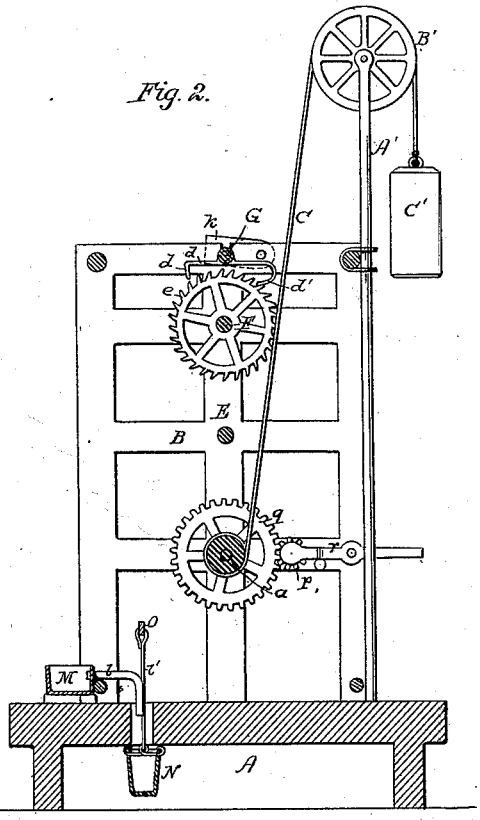



Fig. 3.

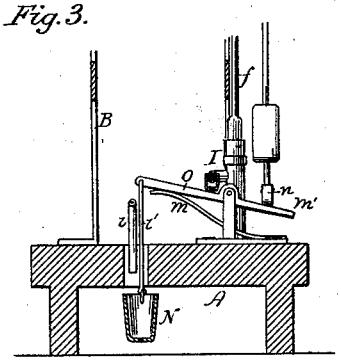



Fig. 4.

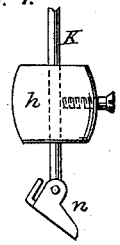



Fig. 5.

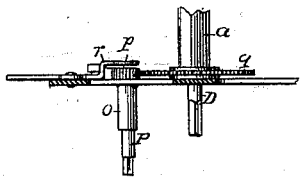
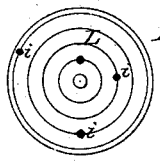



Fig. 6.




WITNESSES:

C. Clarence Poole

R. N. Dyer.

INVENTOR:

George S. Petry

by Geo. W. Dyer & Co.

attys.

# UNITED STATES PATENT OFFICE.

GEORGE S. PETRY, OF TROY GROVE, ILLINOIS.

## IMPROVEMENT IN MOTORS.

Specification forming part of Letters Patent No. **203,765**, dated May 14, 1878; application filed April 1, 1878.

*To all whom it may concern:*

Be it known that I, GEORGE S. PETRY, of Troy Grove, in the county of La Salle and State of Illinois, have invented a new and useful Improvement in Machines for Pumping Water; and I do hereby declare that the following is a full and exact description of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

The object I have in view is the production of a machine for pumping water by the use of weight-power, which will be simple in construction and efficient in operation; and my invention therein consists, first, in peculiar means for automatically stopping the operation of the mechanism and starting the same; second, in the means for adjusting the engagement of the pallets with the scape-wheel; and, further, in the devices for raising the weight, all as more fully hereinafter explained.

To enable others skilled in the art to make and use my machine, I proceed to describe the same, having reference to the drawing, in which—

Figure 1 is a side view of the machine complete; Fig. 2, a central section through the same; Fig. 3, a section through the base of the machine on the line of the lever which controls the operation of the pendulum; Fig. 4, a separate view of the lower end of the pendulum and the swinging-dog attached to the same; Fig. 5, a separate view of the devices for hoisting the weight; and Fig. 6, a separate view of the crank-plate to be used with heavy pumps.

Like letters denote corresponding parts.

A represents the base of the machine, preferably rectangular in form, and constructed in any suitable manner. Upon this base is erected the frame-work B, composed of standards and cross-pieces, and made either of wood or metal, or both, as may be found desirable in use. I prefer to build the frame-work with its greater length vertically, as shown, so it will take up the least amount of room, and also to give the weight sufficient space in which to move vertically without excavating. At one end of the frame-work B is placed upon the base a tall standard, A′, which rises above the frame-work, and is secured to one or more of the cross-pieces of the same. The upper end of this standard is forked, and in the arms of the fork is journaled a grooved wheel or pulley, B′. Over the wheel B′ is passed a rope or chain, C, and to the end of this rope is attached a weight, C′. The weight C′ is made sufficiently heavy to furnish the necessary power, varying according to the size of the pump, and the standard A′ can be made of such height as to allow the weight to fall any distance that may be found convenient and desirable in use.

The rope or chain C passes from the wheel B′ down within the frame-work to near the base, and is secured to and wound upon a drum, *a*. This drum is keyed to a shaft, D, journaled transversely in the frame-work. On the shaft D, against one end of the drum *a*, is sleeved a large cog-wheel, *b*, which carries a spring-pawl, engaging with a a ratchet on the drum, by which said drum can be turned in one direction to raise the weight independently of the cog-wheel, but moves with the cog-wheel in the opposite direction when revolved by the weight. Above the cog-wheel *b* is journaled in the frame-work another shaft, E, carrying a pinion, with which the said cog-wheel *b* meshes. This shaft has keyed upon it a large cog-wheel, *c*, which meshes with a pinion upon the upper or escapement shaft F.

It is evident that a longer train of gearing can be used, and that the several shafts can be connected by belting instead of the cog-wheels and pinions described; but I prefer the construction shown, since it is more compact and less liable to get out of order.

G is a rock-shaft, journaled in the frame above the escapement-shaft F, and carrying a transverse lever, *d*, provided at its ends with the pallets *d′*, which pallets engage with the teeth of a scape-wheel, *e*, on the shaft F. The rock-shaft G is extended through the frame-work, and has attached to it a walking-beam or lever, H, to one end of which walking-beam is connected a rod, *f*, for operating the pump I, situated upon the base below. Several holes are provided by which to connect the rod *f* to the walking-beam, so as to adjust the length of the stroke of the plunger to the pump. To the walking-beam, on the opposite end thereof, is attached a weight, *g*, which can be hung

in any one of a number of holes, so as to regulate the power and equalize the resistance, by assisting to raise the plunger, and by preventing a too rapid downward movement of the same. Without this weight the same amount of power would be expended on each stroke of the plunger, and, since it takes much less power to make the down than the up stroke of a lift-pump, the pump would work unevenly, and would be subjected to heavy shocks on the downstroke, and consequently would soon wear out.

K is the pendulum-arm, carrying the adjustable weight *h*, by which its motion can be varied. This pendulum is attached to a leaf-spring, $h^1$, at its upper end, which is in turn secured to an angle-arm, $h^2$, projecting from the frame-work. The spring $h^1$ allows the pendulum to oscillate freely from the arm $h^2$.

To the end of the rock-shaft G is secured a downwardly-projecting arm, K′, which has a horizontal loop on its lower end, embracing the pendulum-arm, so that as the pendulum oscillates the arm K′ and the rock-shaft G will be moved with it, and the pallets *d′* will be thrown alternately into and out of gear with the scape-wheel. Thus it will be seen that by the movement of the weight and the oscillation of the pendulum the walking-beam H and the pump-plunger will be operated.

For working heavy stock or other pumps, where greater power will be required to move the plunger, I have designed to use other means for connecting the mechanism with the pump. For this purpose the escapement-shaft F is extended through the frame-work, and has mounted on its end a face or crank plate, L. From this crank-plate, which is shown more particularly in Fig. 6, a pitman extends to the handle of the pump, so as to give the power a greater leverage with which to act. With this arrangement the escapement attachment and the pendulum would act only as a regulator to control the revolution of the crank-plate.

The crank-plate L is provided with a number of holes, *i*, by which to attach the pitman. These holes are at different distances from the center, so that the pitman can be adjusted to make longer or shorter strokes with less or greater power.

It may also be found desirable, with the crank-plate, to throw the pallets partially or entirely out of engagement with the scape-wheel, to make the pallets only engage with every second or third tooth, or even to pass over a greater number, so that the crank-plate will revolve more freely, or, in case of an entire disengagement of the pallets and scape-wheel, so that the crank-plate will revolve free of regulation, except so far as afforded by the resistance of pumping. This I effect by journaling one end of the rock-shaft G in a pivoted bearing, *k*, by the swinging of which the position of that end of the rock-shaft carrying the lever and pallets can be changed as desired.

The machine, as shown in the drawing, is arranged to pump water into a trough, M, which is provided with an overflow-pipe *l*. This overflow-pipe passes through the flooring of the base and terminates over a bucket, N, suspended below such flooring by a rod, *l′*, from a horizontal lever, O, pivoted in standards upon the base. The bucket, when empty or partially filled, is kept up to the mouth of the overflow-pipe by a spring, *m*, under the inner end of the lever O; but when the bucket becomes filled with water it overcomes this spring and pulls down the inner end of the lever, raising the outer end *m′* of the lever. This outer end of the lever, when raised, comes within the path of the movement of the lower end of the pendulum-arm, and strikes a pivoted shoe, *n*, on such pendulum. This shoe is of the form shown in Fig. 4, and is pivoted near one end, so as to pass over the arm *m′* of the lever in one direction, and to catch against the same on the return movement of the pendulum. When the trough is filled, and the bucket filled by the overflow, it will be seen that the operation of the mechanism will be stopped, since the pendulum will be held near one end of its movement, while one of the pallets is engaged with the scape-wheel. The bucket N is provided with a hole in its bottom or side, of suitable size, so that the water will slowly run out of it, allowing it to return to its first position and the pump to resume its operation.

To wind up the rope or chain C and raise the weight C′ when it has run down, the end of the shaft D is extended through the frame-work, and is squared to receive a crank; but the weight may be too heavy to be conveniently raised by this shaft, so I provide another squared shaft, P, Fig. 5, which is journaled in a sleeve, *o*, secured to the frame-work. The inner end of the shaft P carries a pinion, *p*, which meshes, when the shaft is in position, with a large cog-wheel, *q*, on the shaft D. A lever, *r*, when thrown up, holds the pinion *p* in gear with the wheel *q*; but they may be thrown out of gear, or the shaft P may be entirely removed from the machine, by lowering such lever and sliding the shaft in the sleeve *o*.

As thus constructed, my machine is quite simple in its parts as compared with other similar mechanisms, and is effective in operation, as well as conveniently and easily managed. It is evident that by very simple changes in the method of applying the power my machine could be used for other purposes than pumping water, such as elevating, &c., without departing from the spirit of my invention.

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

1. The combination, with the pendulum, of a lever, operated by the water in a trough, for automatically stopping the operation of the pendulum and the mechanism controlled by it, substantially as described and shown.

2. The pivoted foot *n* on the lower end of the pendulum-arm, substantially as and for the purpose set forth.

3. The combination, with the pendulum, having pivoted shoe *n*, of the spring-lever O, perforated bucket N, and overflow-pipe to water-trough, substantially as described and shown.

4. The combination of rock-shaft G, carrying pallets to engage the scape-wheel, with a pivoted bearing, in which one end of such rock-shaft is journaled, substantially as and for the purposes set forth.

5. The squared shaft P, journaled in sleeve *o* and carrying pinion to raise weight, in combination with lever *r*, substantially as described and shown.

This specification signed and witnessed this 22d day of December, 1877.

GEORGE S. PETRY.

Witnesses:

L. B. CROOKER,

FRANK P. SNYDER.