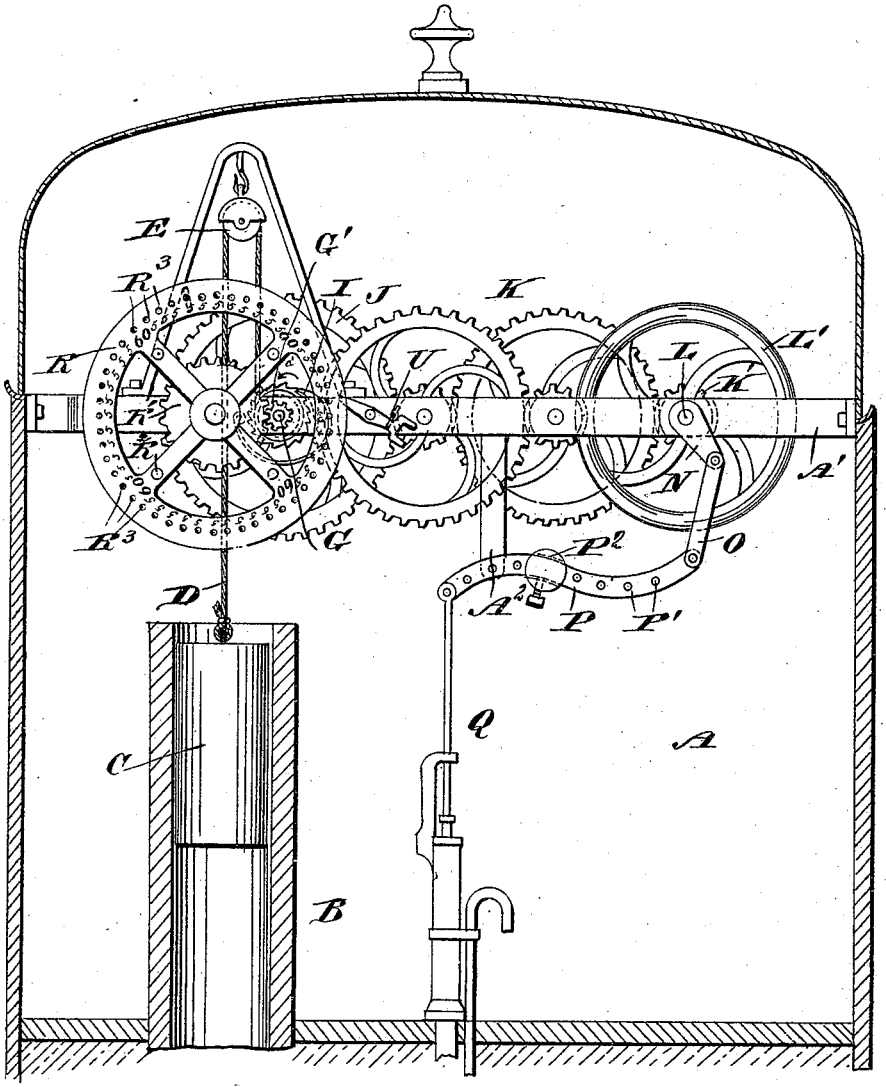
(No Model.)

J. G. BALL.

WEIGHT MOTOR.

No. 493,053. Patented Mar. 7, 1893.

Fig. 1.



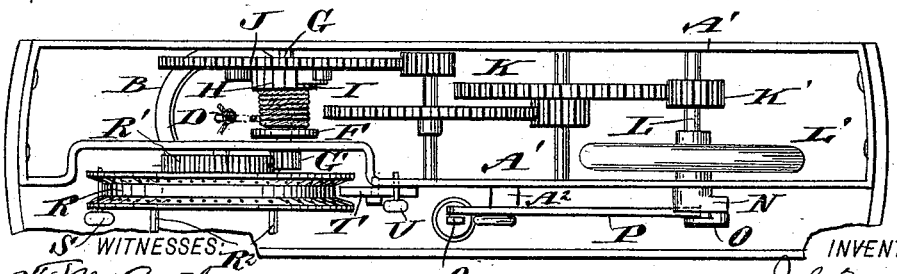


Fig. 2.

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JOHN G. BALL, OF CHESTERVILLE, OHIO.

WEIGHT-MOTOR.

SPECIFICATION forming part of Letters Patent No. 493,053, dated March 7, 1893.

Application filed June 3, 1892. Serial No. 435,366. (No model.)

To all whom it may concern:

Be it known that I, JOHN GREEGE BALL, of Chesterville, in the county of Morrow and State of Ohio, have invented a new and Improved Motor, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved motor adapted to be driven by weight power, and more especially designed for actuating pumps and other machinery, the motor being arranged to operate for a certain predetermined time and then stop automatically.

The invention consists of a lever connected at one end with the machinery to be driven, and at its other end pivoted to a pitman connected with a crank arm attached to a shaft belonging to a train of gear wheels connected with a drum on which winds a rope carrying a weight.

The invention also consists of certain parts and details and combinations of the same, as will be hereinafter described and then pointed out in the claims.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar letters of reference indicate corresponding parts in both the figures.

Figure 1 is a sectional side elevation of the improvement; and Fig. 2 is a plan view of the improvement with the casing cover removed.

The improved motor is provided with a suitably constructed casing A, in which is arranged a tube or cylinder B, of sufficient size to receive a weight C, free to travel up or down in the said tube or cylinder. The weight C is connected with one end of a rope D, passing over a pulley E, supported on a framework A′, arranged within the casing A. The rope D winds on a drum F, secured on a shaft G, extending transversely and mounted to turn in suitable bearings in the said framework A′.

On the shaft G is secured or formed a ratchet wheel H, engaged by a spring-pressed pawl I, pivoted on the gear wheel J, mounted to rotate loosely on the shaft G and connected with a pinion on a train of gear wheels K, arranged within the framework A′ and of any desired number. The train of gear wheels is so arranged that the first pinion carries a large gear wheel which meshes into a second pinion carrying a larger gear wheel, which again meshes into a pinion, and so on.

The last pinion K′ of the train of gear wheels K is secured on a shaft L, carrying a fly wheel L′, and at its outer end a crank arm N, pivotally connected by a pitman O, with a lever P, fulcrumed on a bracket A^2, projecting from the framework A′. This lever P is connected with the pump rod Q, of the pump, or other machinery to be driven.

It will be seen that when the rope D is wound up on the drum F so that the weight C is in an uppermost position, as shown in Fig. 1, then the weight will exert a pull on the rope D, thus rotating the drum F which, by the ratchet wheel H and the pawl I, transmits a rotary motion to the gear wheel J, and the latter sets the train of gear wheels in motion, so that the shaft L is rotated and the crank arm N on the said shaft imparts, by the pitman O, a swinging motion to the lever P, thus actuating the pump rod of the pump, or the other machinery connected with the said lever.

As shown in Fig. 1, the lever P is provided with a series of apertures P′ for changing the fulcrum of the pitman O and the fulcrum of the lever on the bracket A^2 according to the downward stroke intended to be given to the pump rod. A weight P^2 is held adjustably on the said lever P to compensate for the easy up-and-down stroke of the pump rod. It will be seen that the train of gear wheels K rotates the shaft L at a uniform rate of speed and at the same time, but a slight unwinding of the rope D takes place on the drum F, owing to the compound gearing, as above described.

When the weight C has run down, the shaft G is turned as hereinafter described, so as to again wind up the rope on the drum F, to hoist the weight C into an uppermost position for again starting the machine. It will be seen that on this winding up of the rope D the train of gear wheels, as well as the gear wheel J, remains stationary, as the pawl I glides over the teeth of the ratchet wheel H when the shaft G is turned in the direction of the arrow *a′* for winding up the rope.

In order to stop the machine after a certain length of time has elapsed, the following device is provided: On the shaft G is a pinion

G′ in mesh with a gear wheel R′ carrying a graduated time wheel R and mounted to turn in suitable bearings on the frame A′. The wheel R is provided on its front with arms R^2 for conveniently turning the wheel to rotate the shaft G by gear wheel R′ and pinion G′ to wind up the rope D on the drum F for the purpose above mentioned. In the wheel R is formed a series of equidistant apertures R^3 arranged in a circle and adapted to be engaged by a pin S passing through a groove in the rim of the wheel R, see Fig. 2. The apertures R^3 are numbered and represent five minute spaces, so that a full revolution of wheel R takes place in four hours. The pin S when inserted in one of the apertures moves in contact with a latch or detent T fulcrumed on the frame and extending with one end into the peripheral groove of wheel R. The latch or detent T is adapted to be locked in place by a pin U, inserted in an aperture in the frame A′ above the outer end of latch or detent T, as will be readily understood by reference to the drawings. The pin S is set into an aperture R^3 such a distance from the inner end of latch or detent T as corresponds to the time during which the machine is to work. For instance, if the pin S is inserted in wheel R diametrically opposite the inner end of latch or detent T and the machine is started, then the wheel R will make a revolution, which corresponds to two hours' time, before the pin is engaged by the inner end of latch or detent T extending into the path of the said pin S. Further rotation of the wheel R is thus prevented and the entire machine is locked after two hours' work.

Thus it will be seen that the machine can be set to run for a given predetermined length of time. If the pin is withdrawn entirely the machine will not stop working until the rope D has completely unwound itself from the drum F. The latch or detent may also be allowed to swing into a vertical position by withdrawing the pin U so that the inner end of the latch or detent is out of the path of the pin S.

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

1 The combination, with train of operating gearing, of a time wheel rotated therefrom, and a latch or detent to engage and stop the wheel and thus cause the gearing to cease operation at the end of any predetermined length of time, substantially as set forth.

2. A motor comprising a drum, a rope adapted to be wound thereon, a weight held on the said rope, a ratchet wheel carried by the said drum, a gear wheel mounted to rotate loosely on the shaft of the said drum and carrying a spring-pressed pawl engaging the said ratchet wheel, a train of gear wheels connected with the said drum shaft gear wheel, a crank arm held on the shaft of the said train of gear wheels, a lever connected at one end with the machinery to be driven and at its other end connected by a pitman with the said crank arm, a time wheel held on the said drum shaft and adapted to carry an adjustable pin, and a latch or detent mounted to move in or out of the path of the said pin, substantially as shown and described.

3. A motor comprising a drum, a rope adapted to be wound thereon, a weight held on the said rope, a ratchet wheel carried by the said drum, a gear wheel mounted to rotate loosely on the shaft of the said drum and carrying a spring-pressed pawl engaging the said ratchet wheel, a train of gear wheels connected with the said drum shaft gear wheel, a crank arm held on the shaft of the said train of gear wheels, a lever connected at one end with the machinery to be driven and at its other end connected by a pitman with the said crank arm, a time wheel held on the said drum shaft and adapted to carry an adjustable pin, a latch or detent mounted to move in or out of the path of the said pin, and a second pin for holding the said lever in place, substantially as shown and described.

4. The combination, with the train of operating gearing, of the time wheel rotated therefrom and having an adjustable pin on its rim, and a latch or detent movable into and out of the path of said pin, to lock the time wheel and the gearing and prevent further rotation substantially as set forth.

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Witnesses:
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JUDSON LEVERING.