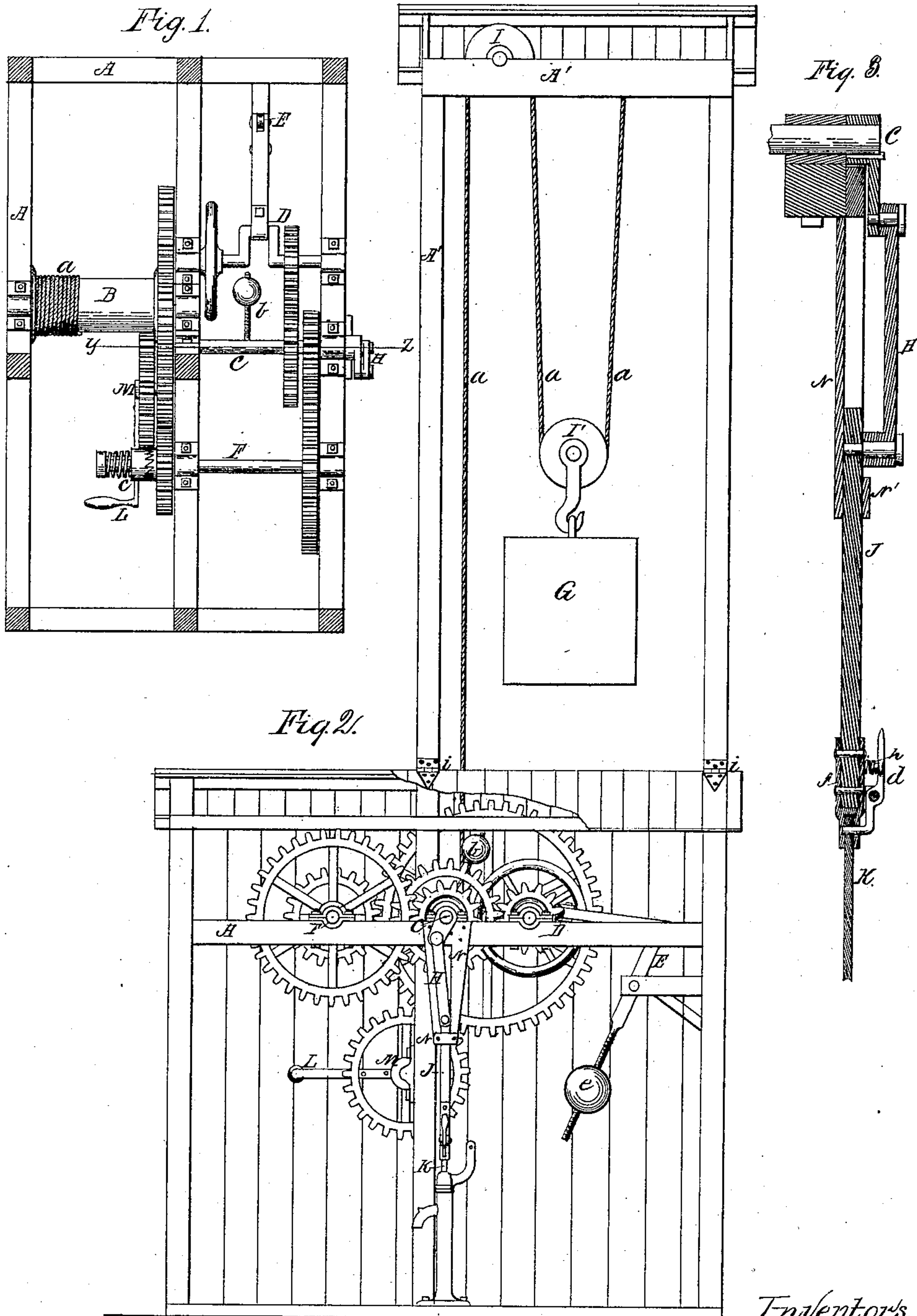


(No Model.)

C. HOFFMAN & H. R. LYMAN.
PUMPING MACHINE.

No. 324,026.

Patented Aug. 11, 1885.



Witnesses.
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CHARLES HOFFMAN AND HENRY R. LYMAN, OF FLEMINGVILLE, IOWA.

PUMPING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 324,026, dated August 11, 1885.

Application filed May 11, 1885. (No model.)

To all whom it may concern:

Be it known that we, CHARLES HOFFMAN and HENRY R. LYMAN, citizens of the United States, residing at Flemingville, in the county of Linn and State of Iowa, have invented certain new and useful Improvements in Pumping-Machines, of which the following is a specification.

The object of our invention is to utilize the power of gravitation for the purpose of pumping water; and the invention consists in the adaptation and arrangement of mechanism to this end, as will be hereinafter fully set forth.

In the accompanying drawings, forming a part of this specification, Figure 1 represents a plan view of the main frame and mechanism; Fig. 2, a side elevation of the invention, and Fig. 3 a vertical section of the pump-rod and its connections in the line *y z*.

Similar letters of reference indicate corresponding parts.

A is a simple frame upon which the mechanism is mounted, and is preferably built low enough so that all parts thereof are accessible from the ground. A tower, A', rising from that part of the frame carrying the cylinder, to which is attached the driving cord and weight, admits of the requisite vertical movement of the latter.

In the drawings, the weight G is represented as suspended by a single pulley-block, I', the cord *a* being attached at one end to the upper part of the tower, and passing over pulley I' to the drum or cylinder B in the lower frame-work.

Obviously the weight may be attached to the end of the cord instead, or the number of pulleys may be multiplied, the necessary changes in the height of the tower and the size of the weight being made accordingly.

From the drum B motion is communicated through a system of gearing to the shaft C, having a crank, which, through the connecting-rod H, imparts a reciprocal vertical motion to the pump-rod J K. This shaft is provided with a lateral weight, *b*, to counterbalance that of the pump-rod and its connections, and make the motion uniform. A pendulum-ball mounted on a pivoted stem, E, gives a steady and uniform stroke to the main crank through the medium of a crank, D, and connecting-rod. This crank may be on the same shaft as the main crank, or may be on a separate shaft

geared to the main shaft, as represented. To render the movement still more regular, this shaft may be also provided with a balance-wheel, as shown. Provision is made for adjusting the pendulum-ball and the counterbalance-weight by means of the threaded stem, upon which these parts are screwed. The machine is wound up by means of an idle-gear, M, meshing with the large gear-wheel of the drum. The gear M may be provided with a crank-lever, L, whereby the winding up may be done by hand, or may connect by suitable mechanism with horse-power and be operated thereby. It is preferably arranged so as to slip in and out of gear on its arbor, as indicated, so that when not in use it is disconnected from the operative mechanism. A ratchet-clutch, *c*, connects with shaft F by a feather and with the loose gear thereon, having a similar ratchet by the pressure of a coil-spring, as will be readily seen. The result of this is to impart a continuous movement to the shaft in one direction, and allow the machine to be wound up without reversing its movement according to the familiar principles of the ordinary clock.

The upper end of the pump-rod J slides in the vertical ways N. These are simple plates of wood or metal having parallel faces inside, connected by front and rear plates, N' N', and secured to the timber supporting the main shaft C. The pump-rod is thereby given an unvarying vertical movement and prevented from springing sidewise. The lower end of the rod J is provided with a coupling, which allows speedy connection and disconnection with the pump. To the side of the casting *f* is pivoted a dog, *d*, held in its normal position by spring *h*. The bolt at the bottom of the dog is disengaged from the hole in the valve-stem or lower part of the pump-rod K by pressure upon the handle portion of the dog.

The frame may be inclosed on all sides to protect the machinery from the elements. For convenience in getting access to it in oiling or otherwise, the sides of the roof may be made to raise on hinges, as shown. The tower being much lower than ordinary windmill-towers, there is less danger of its blowing down. We are confident, also, that the machine can be built more cheaply than a windmill of like capacity. The power required to wind it up may be applied for a comparatively short

time in the way of human or horsepower, and the machine then pumps gradually through the day the water, as may be required.

Having thus briefly described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In a machine for pumping water, the combination of weight *G*, cord or chain *a*, drum or cylinder *B*, crank-shaft *C*, having counter-balance *b*, pendulum *E*, having adjustable ball *e*, operated by crank *D* through a suitable connecting-rod, and all constructed and arranged substantially as set forth.

2. In a machine for pumping water, the combination of weight *G*, cord or chain *a*, drum or cylinder *B*, shaft *F*, having loose gear and a ratchet-clutch, *c*, main shaft *C*, having a crank to reciprocate the pump-rod, an auxiliary shaft having crank *D*, connecting with pendulum *E* *e* by a suitable connecting-rod, said shafts being provided with interconnecting gear-wheels, and all constructed, arranged, and adapted to operate substantially as specified.

3. In a machine for pumping water, the combination of the pump-rod, connecting-rod, and crank-shaft with mechanism adapted to impart uniform motion to said crank-shaft through the power exerted by a heavy weight regulated by a pendulum in a manner similar to clock-work, and substantially as specified.

4. In a machine for pumping water, the combination of pump-rod *J*, connecting-rod *H*, crank and shaft *C*, counter-balance *b*, auxiliary crank *D*, connecting with pendulum *E* *e*, shaft *F*, having loose gear and a clutch, *c*, adapted to hold said gear in one direction, drum or cylinder *B*, cord or chain *a*, pulleys *I* *I'*, weight *G*, and idle winding-up gear *M*, together with frame *A* and tower *A'*, all substantially as set forth.

5. In a pumping-machine, the pump-rod guide *N* *N'*, in combination with frame *A* and pump-rod *J*, substantially as specified.

6. In a pumping-machine, the pump-rod coupling consisting of the double socket *f*, having lateral lugs, the pivoted dog *d*, and spring *h*, substantially as shown and described.

In testimony whereof we affix our signatures in presence of two witnesses.

CHARLES HOFFMAN.
HENRY R. LYMAN.

Witnesses to signature of Charles Hoffman:

A. M. LAPHAM,
HENRY H. O'NEAL.

Witnesses to signature of Henry R. Lyman:

B. M. HILLIARD,
JAMES M. SQUIER.