(No Model.)

D. LINDAHL.

WEIGHT MOTOR.

No. 379,316. Patented Mar. 13, 1888.

Fig. 2.

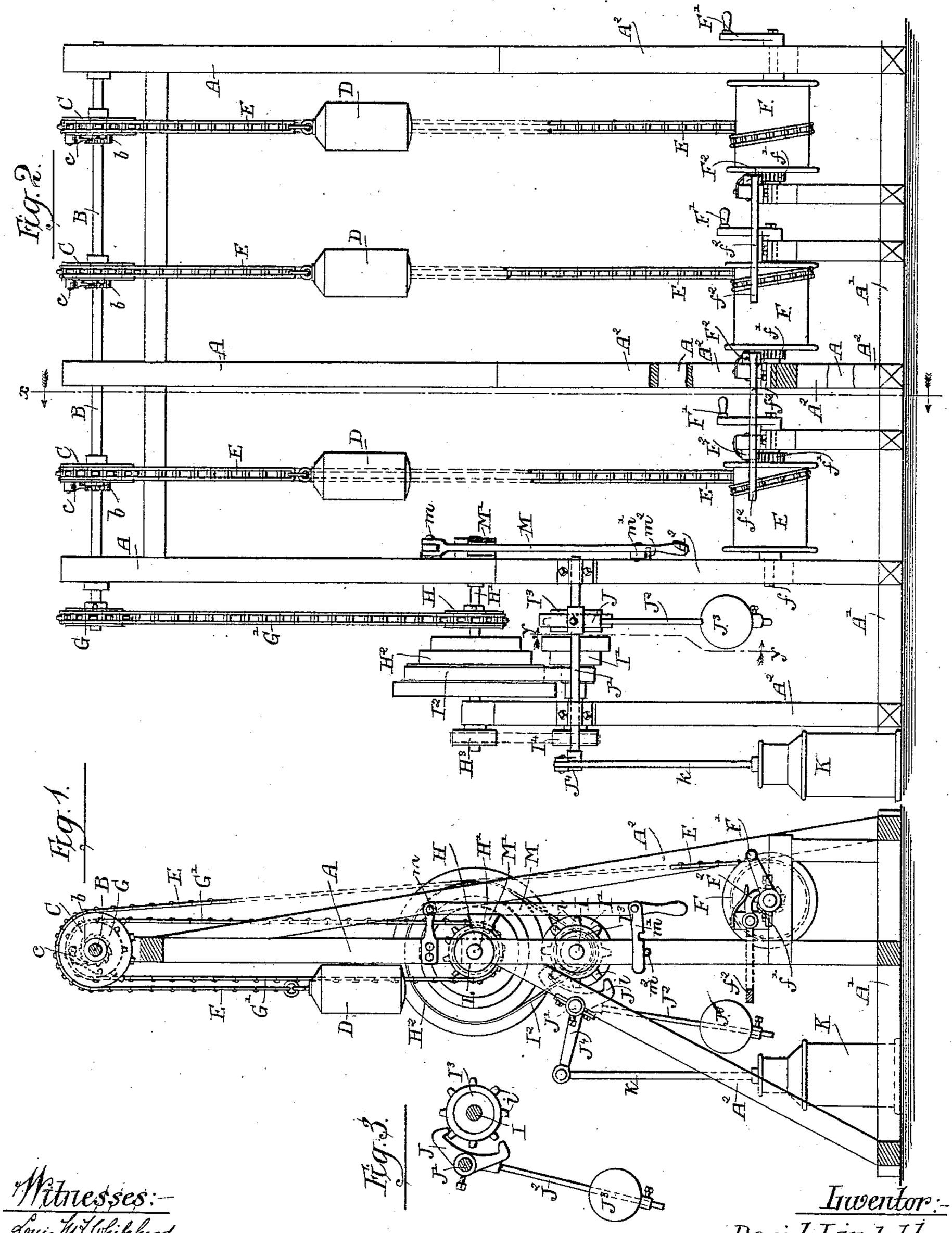

Fig. 1.

Fig. 3.

Witnesses:—
Louis M. T. Whitehead.
Charles P. Lovejoy.

Inventor:—
Daniel Lindahl.

by: Dayton & Poole
Attorneys

UNITED STATES PATENT OFFICE.

DANIEL LINDAHL, OF CHESTERTON, INDIANA.

WEIGHT-MOTOR.

SPECIFICATION forming part of Letters Patent No. 379,316, dated March 13, 1888.

Application filed February 21, 1887. Serial No. 228,300. (No model.)

To all whom it may concern:

Be it known that I, DANIEL LINDAHL, of Chesterton, in the county of Porter and State of Indiana, have invented certain new and useful Improvements in Weight-Motors; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to an improved weight motor or device whereby the power exerted by a descending weight may be employed continuously for a considerable length of time in doing light work, such as pumping or churning.

The invention consists in the matters hereinafter described, and pointed out in the appended claims.

The apparatus herein shown as embodying my invention consists in its main features of an elevated horizontal shaft carrying a sprocket-wheel mounted to turn on the shaft and connected by a pawl and ratchet with the latter, a chain passing over the sprocket-wheel, a weight attached to the chain, and a windlass or other equivalent device around which the free end of the chain is wound and by which the weight is lifted.

In connection with the main operative parts constructed as above set forth any suitable means may be employed for converting the rotative movement of the said shaft into a suitable reciprocatory or other movement that may be required for pumping, churning, or other purpose. Any suitable regulating device may be employed for controlling the speed of the parts under the action of the weight in cases where such regulating devices are necessary. One preferred form of regulating device is herein shown, comprising an oscillating pendulum applied to control the speed of rotation of a revolving shaft which is driven from the main shaft of the apparatus, as will hereinafter fully appear.

In the accompanying drawings, illustrating my invention, Figure 1 is a sectional view taken upon line *x x* of Fig. 2, illustrating a machine embracing one particular embodiment of my invention. Fig. 2 is a front elevation of the said machine. Fig. 3 is a detail section taken upon line *y y* of Fig. 2.

As illustrated in the said drawings, the frame of the apparatus comprises, mainly, vertical frame-pieces A A, a base-frame, A′, upon which the said frame-pieces are attached, and suitable inclined braces, A^2 A^2.

B is a horizontal shaft mounted to rotate in suitable bearings in the upper ends of the said frame-pieces A A.

C is a sprocket-pulley mounted upon said shaft B; D, an actuating-weight; E, a chain passing over said sprocket-pulley and attached to the weight, and F is a windlass about which the said chain is wound for lifting the weights. The said sprocket-pulley C is mounted to rotate upon said shaft B, and connected therewith by a pawl, *c*, upon the sprocket-pulley engaging a ratchet-wheel, *b*, upon the shaft. The windlass F is mounted upon a shaft, *f*, provided with a crank, F′, by means of which the windlass may be turned by hand for raising the weight.

In the operation of the device embracing the parts above described power is transmitted to the shaft by the action of the weight D, which pulls downwardly upon the chain passing over the sprocket-pulley C, and thereby causes a continuous rotation of the shaft during the descent of the weight. After the weight has descended the distance allowed by the height of the machine-frame, the windlass is then turned to wind up the chain and lift the weights, a backward movement of the shaft being avoided in this operation by the pawl-and-ratchet connection between the sprocket-pulley C and the said shaft. Means are herein illustrated for transmitting motion from the said shaft D to an oscillating shaft, to which a churn, pump, or other device requiring reciprocatory movement may be attached as follows:

G is a sprocket-wheel affixed on the shaft B, and H a second sprocket-wheel mounted upon a shaft, H′, which is sustained in suitable bearings upon the machine-frame at a point considerably below the top of the standards A A. A link belt, G^2, is placed over the wheels G and H for transmitting motion to the said shaft H′. Upon the shaft H′ is placed a cone-pulley, H^2, stepped or shouldered, as shown, to

receive a belt, and upon an adjacent parallel shaft, I, is placed a correspondingly stepped or shouldered smaller cone-pulley, I′, to which motion is transmitted from the pulley H^2 by means of a belt, I^2. By shifting the belt I^2 the shaft I may be driven at a greater or less speed, as desired. Upon the said shaft I is placed a spur-wheel, I^3, provided with spurs or teeth *i*, adapted for engagement with an escapement-lever, J, which is mounted upon a rock-shaft, J′, arranged at one side of and parallel with the shaft I. Upon the said shaft J′ is secured a rigid arm, J^2, to the lower end of which is affixed a pendulum weight, J^3, said pendulum weight and the lever J being constructed to allow an intermittent rotative movement of the shaft I in the swinging of the pendulum, in a manner heretofore commonly known.

For the convenient actuation of a device operated by a reciprocatory movement—as, for instance, a churn, K—the rock-shaft J′ may be provided with a horizontal arm, J^4, to the outer end of which is connected the rod or plunger *k* of the churn. In case, however, it is desired to transmit rotative motion to a machine by means of a belt from the motor, belt-pulleys H^3 I^4 may be placed upon the shafts H′ and I, respectively, over either of which pulleys a belt may be trained for the purpose stated, according to the speed or power required in any particular case. It will of course be understood that when power is taken from the motor by means of a belt placed over the pulley H^3 the belt I^2 will serve merely to connect the shaft H′ with the speed-controlling device.

A device embracing a single weight, D, chain E, and windlass F obviously forms a complete motor; but in cases where it is desired to have a motor adapted to operate for a longer time or for a short time with considerable power without necessitating the use of a very high frame or a very heavy weight several sets of weights, sprocket-wheels, chains, and windlasses may be placed side by side in the same frame, with the sprocket-wheels mounted upon a common shaft, B, in the manner illustrated in the drawings. This construction enables a much more powerful motor to be produced without other change than multiplying the said parts. In the use of a motor thus made all of the weights may obviously be put to work at once, in which case considerable power will be developed in the shaft, or one weight may be thrown into action after another, so as to produce a continuous action of the weights with relatively small power for a long time. In cases where the latter arrangement is employed it is obviously desirable to provide means whereby one weight may be automatically started or released after the adjacent weight has descended and finished its work, and for this purpose I have herein shown devices made as follows: Upon the shaft *f* of each of the windlasses F F, except that nearest the regulating device, is placed a ratchet-wheel, *f′*, engaged with spring-pawls F^2, mounted upon the frame, in the manner shown in the drawings. Said pawl is constructed to engage the upper part of the ratchet-wheel, and is provided with long arms or levers f^2, extending to a point beneath the weight D belonging to the adjacent windlass. The ratchets *f′* and pawls F^2 obviously operate to hold the windlasses from turning after the weights have been raised, so that said weights will remain immovable and will not operate until said pawls are released by the contact of a descending weight with the said arm f^2. In the operation of this device the weight nearest the regulating device is first released and allowed to descend until it reaches the lower limit of its movement, where it strikes the arm of the pawl belonging to the windlass nearest to it, thereby releasing said windlass and allowing the descent of the second weight. The second weight similarly releases the third weight, and so on until all of the weights present in the particular machine have been released and allowed to operate. It is entirely obvious that when several weights acted on by a single shaft are employed the pawl-and-ratchet connections between the sprocket-wheels and shaft will allow the said shaft to turn freely in the sprocket-wheels, which are held stationary by the chains belonging to the weights which are not in operation.

To provide means for stopping the motor when necessary, I have placed upon the shaft H′ a friction-pulley, L, which is acted upon by a brake-shoe, M′, attached to a brake-lever, M, pivoted at *m* to the frame, and provided with a catch, *m′*, which may engage a stud or projection, m^2, upon the frame, for holding the brake-shoe in contact with said pulley L.

I claim as my invention—

1. A weight-motor comprising a revolving shaft, two or more pulleys mounted upon the shaft, pawls and ratchets connecting the pulleys with the shaft, chains passing over the pulleys, weights attached to the chains, windlasses for the weights, means, consisting of a detent, for holding one of the windlasses from rotation, and means, comprising an arm extending into the path of a rotating part of an adjacent windlass, for automatically releasing said windlass upon the descent of the weight belonging to an adjacent windlass, substantially as described.

2. The combination, with the pulley-shaft and two sets of pulleys, chains, weights, and windlasses, of a ratchet and pawl holding one of said windlasses from rotation, and an arm attached to said pawl and extending into the path of the weight belonging to the other windlass, substantially as described.

In testimony that I claim the foregoing as my invention I affix my signature in presence of two witnesses.

DANIEL LINDAHL.

Witnesses:

C. CLARENCE POOLE,

CHARLES T. LORING.