

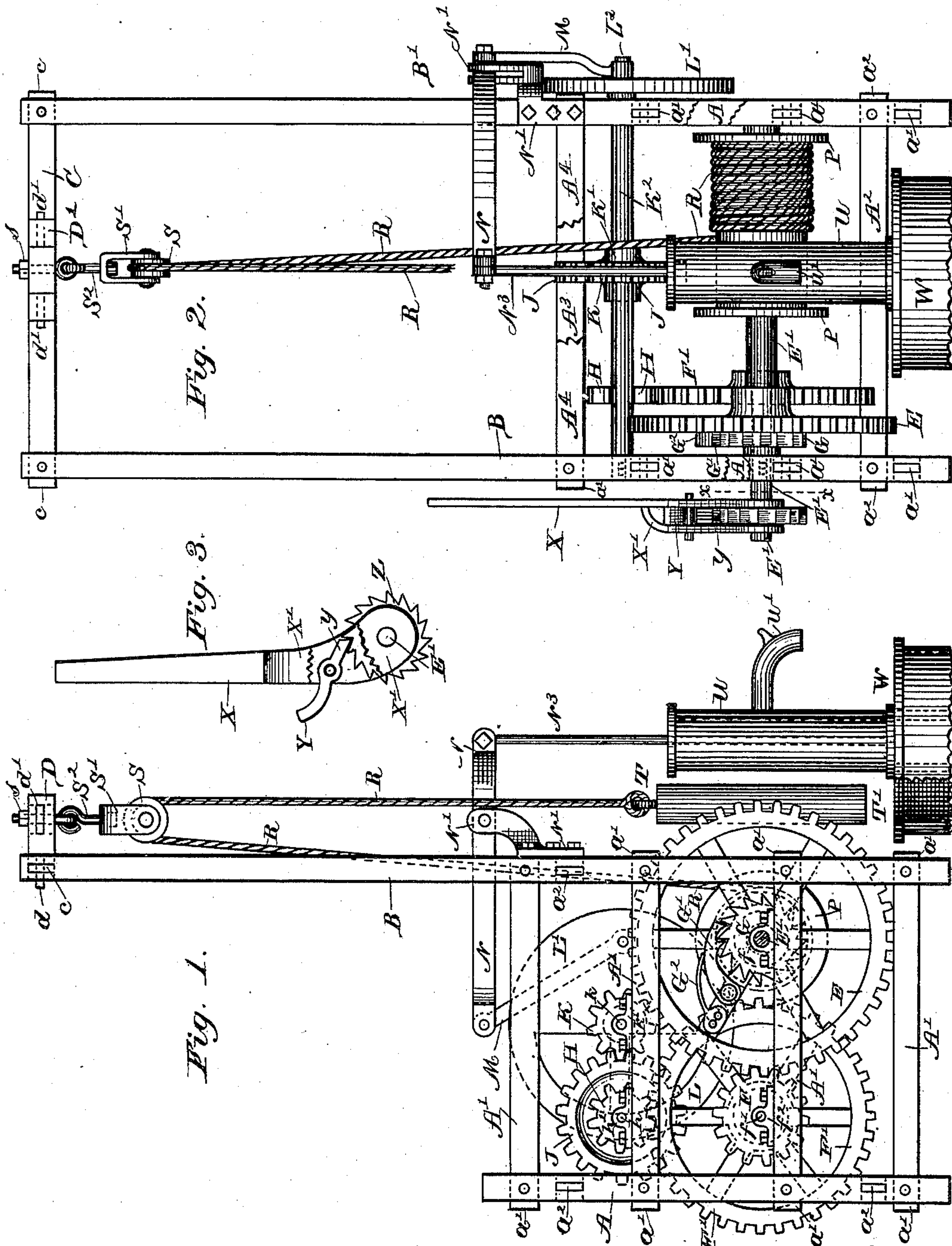
(No Model.)

2 Sheets—Sheet 1.

E. S. CAIN.  
WEIGHT MOTOR.

No. 313,708.

Patented Mar. 10, 1885.



Witnesses  
John C. Miller  
Roy C. Bowen

Edwin S. Cain  
Inventor  
by Robt. J. Murray,  
Attorney.

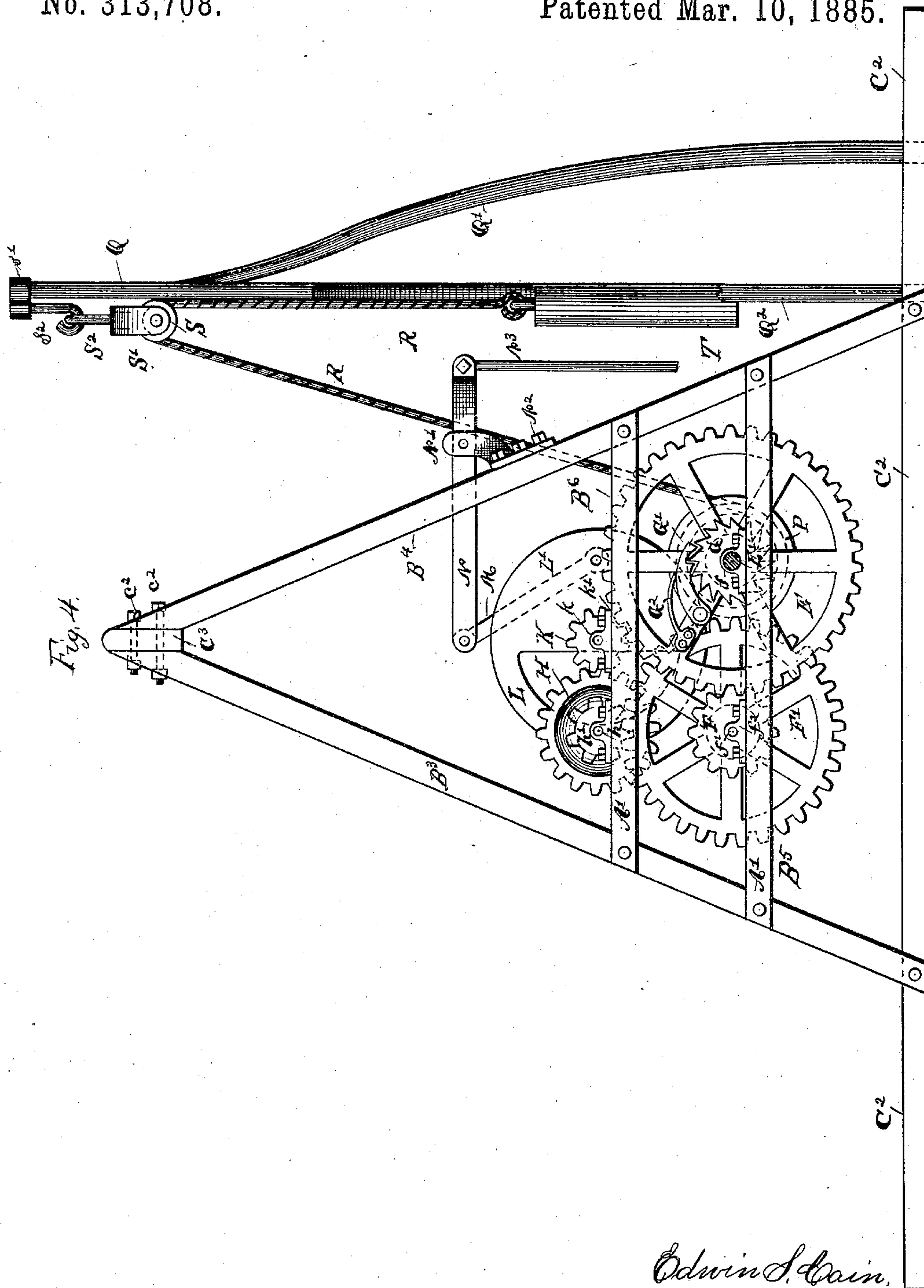
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Attorney.



# UNITED STATES PATENT OFFICE.

EDWIN S. CAIN, OF HILLSDALE, ILLINOIS.

## WEIGHT-MOTOR.

SPECIFICATION forming part of Letters Patent No. 313,708, dated March 10, 1885.

Application filed December 18, 1884. (No model.)

*To all whom it may concern:*

Be it known that I, EDWIN S. CAIN, a citizen of the United States, residing at Hillsdale, in the county of Rock Island and State of Illinois, have invented certain new and useful Improvements in Weight-Motors, of which the following is a specification, reference being had therein to the accompanying drawings.

The object of this improvement is a weight-motor of compact, economical construction and simple operation adapted to run a sufficient length of time to be advantageously applied to relieving the labor of churning and pumping. These results are attainable by the mechanism illustrated in the drawings herewith filed as part hereof, in which the same letters of reference denote the same parts in all the views.

Figure 1 is a side elevation, partly in section, representing a weight-motor embodying the features of my improvements. Fig. 2 is a front view more fully representing the construction of the same. Fig. 3 is a sectional detail view. Fig. 4 is a side view of a modified form of the supporting-frame and mode of application, the working parts and operation being in all respects the same.

Referring to Figs. 1 and 2, A A represent upright beams provided with mortises for the reception of tenons  $a^2$  of the transverse beams  $A^2$ , and tenons  $a'$  of horizontal side beams,  $A'$ , which connect the same with extended uprights B B', transversely connected, as shown, by the beam  $A^4$ , and at their upper ends by the beam C, tenoned or otherwise suitably affixed thereto, as shown at c. The beam C is provided with an annex or rectangular projection, D D, connected to the beam C by tenons  $d$ , and horizontally affixed together by a short beam, D', through tenons  $d'$ , or other suitable means.

E is a gear-wheel mounted on a shaft, E', having bearings in metal boxes  $f$ , secured to the horizontal beams  $A'$  by bolts or screws, substantially as seen in Fig. 1. The gear-wheel E, which, for a purpose hereinafter explained, is fitted loosely to the shaft E', meshes with a pinion, F, affixed to a shaft having journals  $f'$  secured by journal-boxes  $f^2$  to the same horizontal beams  $A'$  as the shaft E', by which it is obscured from view in Fig. 2.

F' is a gear-wheel secured to the same shaft

as the pinion F, on which it is located to mesh with a pinion, H, mounted on a shaft having journals  $h$ , secured by metal boxes  $h'$  to horizontal beams  $A'$ , next above those supporting the shaft E'. The shaft to which the pinion H is secured is further provided with a gear-wheel, J, arranged to mesh with a pinion, K K', affixed to the shaft  $K^2$ , secured by journals  $k$  and metal boxes  $k'$  to the horizontal beams  $A'$ , as shown. The shaft  $K^2$  is provided at one end with a crank-head or fly-wheel having the form of a wheel-rim, L, and having disk L', provided with a wrist-pin, L<sup>2</sup>, connected by means of an outwardly-curved pitman, M, with an outwardly and inwardly curved lever, N, having its fulcrum in a slotted metal addition, N', to the upright B', to which it may be secured by bolts or otherwise.

N<sup>3</sup> represents a pump-sucker rod flexibly connected at its upper end with the lever N.

P is a winding-drum affixed to the main shaft E', and provided with a rope or chain, R, which connects over a pulley, S, with a weight, T, the pulley being supported in a hanger, S', arranged to swivel or move more or less around, for a purpose hereinafter set forth, on a hooked rod, S<sup>2</sup>, secured by means of an eyebolt, s, to the annex D D'.

G is a ratchet-wheel rigidly secured to the shaft E', adjacent to but disconnected from the gear-wheel E, secured to an arm of which, as fully shown in Fig. 1, is a spring, G<sup>2</sup>, which connects with and presses against a pawl, G', affixed to the same arm and arranged to engage with the ratchet G, for a purpose to be presently explained.

X X' is a lever loosely fitted to the shaft E over a ratchet-wheel, Z, rigidly secured thereto.

Y y is a pawl which is held in gear with the ratchet Z, when necessary, by the gravity of its long end Y when the lever X X' is in the horizontal or nearly horizontal position necessary to its application, as hereinafter set forth, and the pawl will be held out of gear with the ratchet by the same means during the operation of the mechanism of the motor.

U is a pump having a spout,  $u^2$ , and W represents a well or cistern and cap or cover for the same. The rope R is wound on the drum P and the weight T elevated to the pulley S by means of the lever X X' and the pawl Y y



acting against the ratchet Z, which will turn  
 the ratchet G away from the pawl G' on the  
 arm of the wheel E and move the shaft E' and  
 the drum P without moving the wheel E and  
 5 its geared connections. The mechanism is  
 then put in operation by bringing the lever  
 X X' to a horizontal or inclined position, in  
 which the gravity of the pawl end Y will hold  
 the light end y out of connection with the de-  
 10 tents of the ratchet-wheel Z, when the force of  
 the weight T will move the shaft E', and by  
 thus moving the ratchet G against the pawl  
 G' on the arm of the wheel E put the latter  
 and its geared connections in motion, and so  
 15 give action through the pitman M to the lever  
 N and pump-rod N<sup>3</sup>, or suitably-connected  
 churn-dasher. By having a suitable opening  
 in the well cap or cover, as shown at T' in Fig.  
 1, the weight T will be allowed to descend into  
 20 the well, and the length of time that the mech-  
 anism will continuously operate may thus be  
 largely increased. By reason of the flexible  
 connection of the hanger S' to the suspending-  
 hook S<sup>2</sup> the pulley S will automatically take  
 25 a position agreeing with the unwinding coil  
 of the rope R on the drum P, and thus pre-  
 vent the rope from getting out of the pulley-  
 groove and rubbing or cutting against the  
 sides or corners of the hanger S.  
 30 Referring to Fig. 4, showing a modification  
 of the supporting-frame, B<sup>3</sup> and B<sup>4</sup> represent  
 inclined beams suitably secured to each side  
 of the base C<sup>2</sup>, longitudinally connected by  
 beams A', and transversely connected at the  
 35 top by a beam, C<sup>3</sup>, to which the inclined beams  
 B<sup>3</sup> B<sup>4</sup> are connected by bolts c<sup>2</sup> or other suita-  
 ble means.

Q Q' Q<sup>2</sup> represent a tripod provided with a  
 cap, s', at the top, to which is affixed a hook,  
 s<sup>2</sup>, for the purpose of suspending the pulley S, 40  
 as shown, and over which the weight and rope  
 will act in all respects the same as when con-  
 nected, as shown in Figs. 1 and 2, the only  
 difference in effect being that the arrangement  
 shown in Fig. 4 is better adapted to pumping 45  
 from bored wells. The frame may be covered  
 by sheet metal or other suitable material, and  
 the mechanism thus protected against the  
 weather.

Having explained the construction and op- 50  
 eration of my improvement, what I claim as  
 new, and desire to secure by Letters Patent,  
 is—

1. In a weight-motor, the combination of  
 the windlass-shaft E', provided with a loosely- 55  
 fitted gear-wheel, E, having a ratchet, G, pawl  
 G', and spring G<sup>2</sup>, secured to its side, as shown,  
 and with a rigidly-connected ratchet, Z, and  
 loosely-connected lever X X', provided with  
 a pawl, Y y, at its outer end for winding the 60  
 rope R, with the multiplying-gear F F' H J  
 K, the pitman M, lever N, and swivel pulley  
 S S', the whole constructed and arranged to  
 operate as specified.

2. In combination with a weight-motor con- 65  
 structed and arranged to operate as specified,  
 the tripod Q Q' Q<sup>2</sup>, provided with a swivel-  
 pulley, S S', as and for the purpose set forth.

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

EDWIN S. CAIN.

Witnesses:

E. D. SWEENEY,  
 C. L. WALKER.