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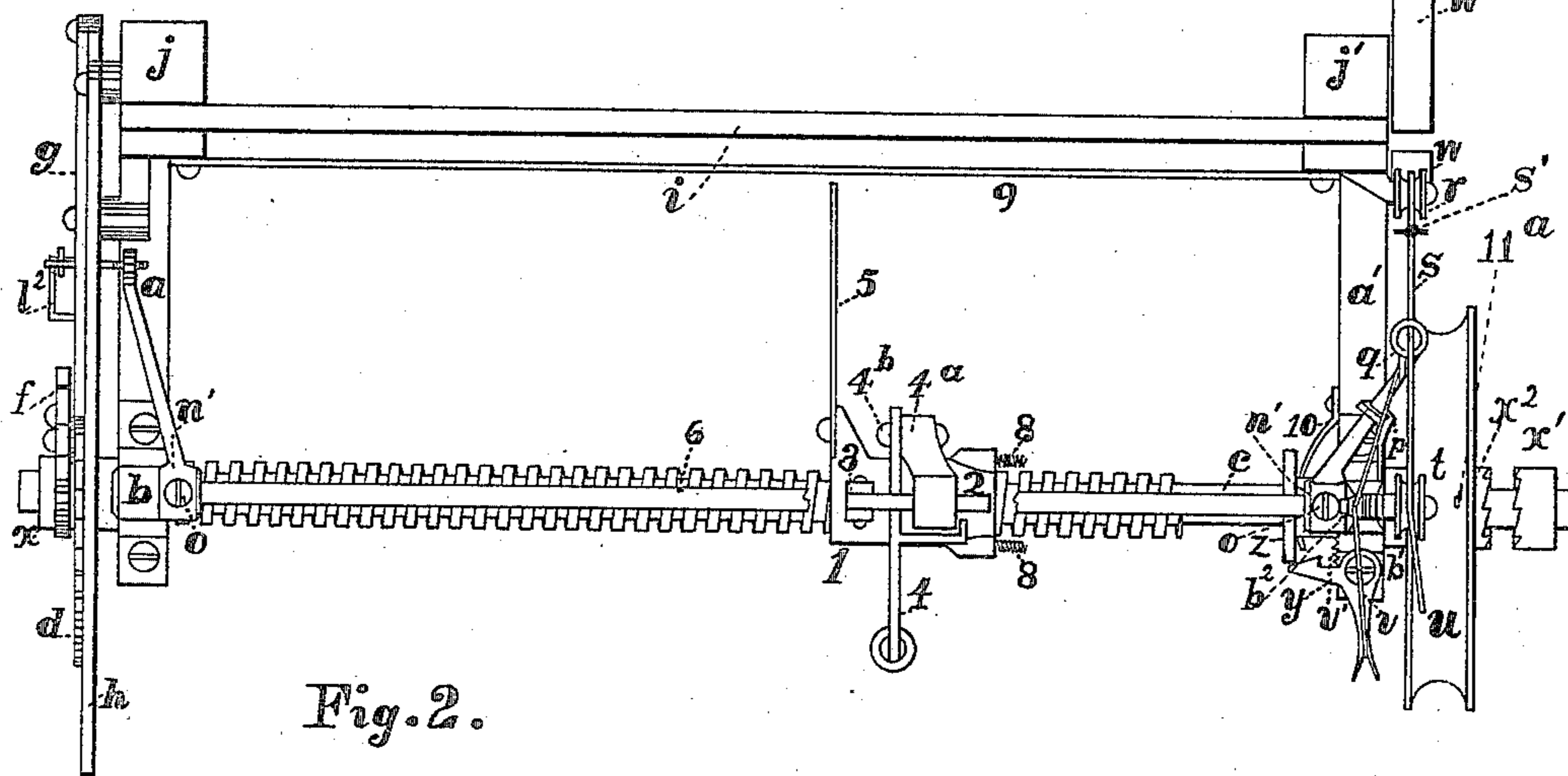
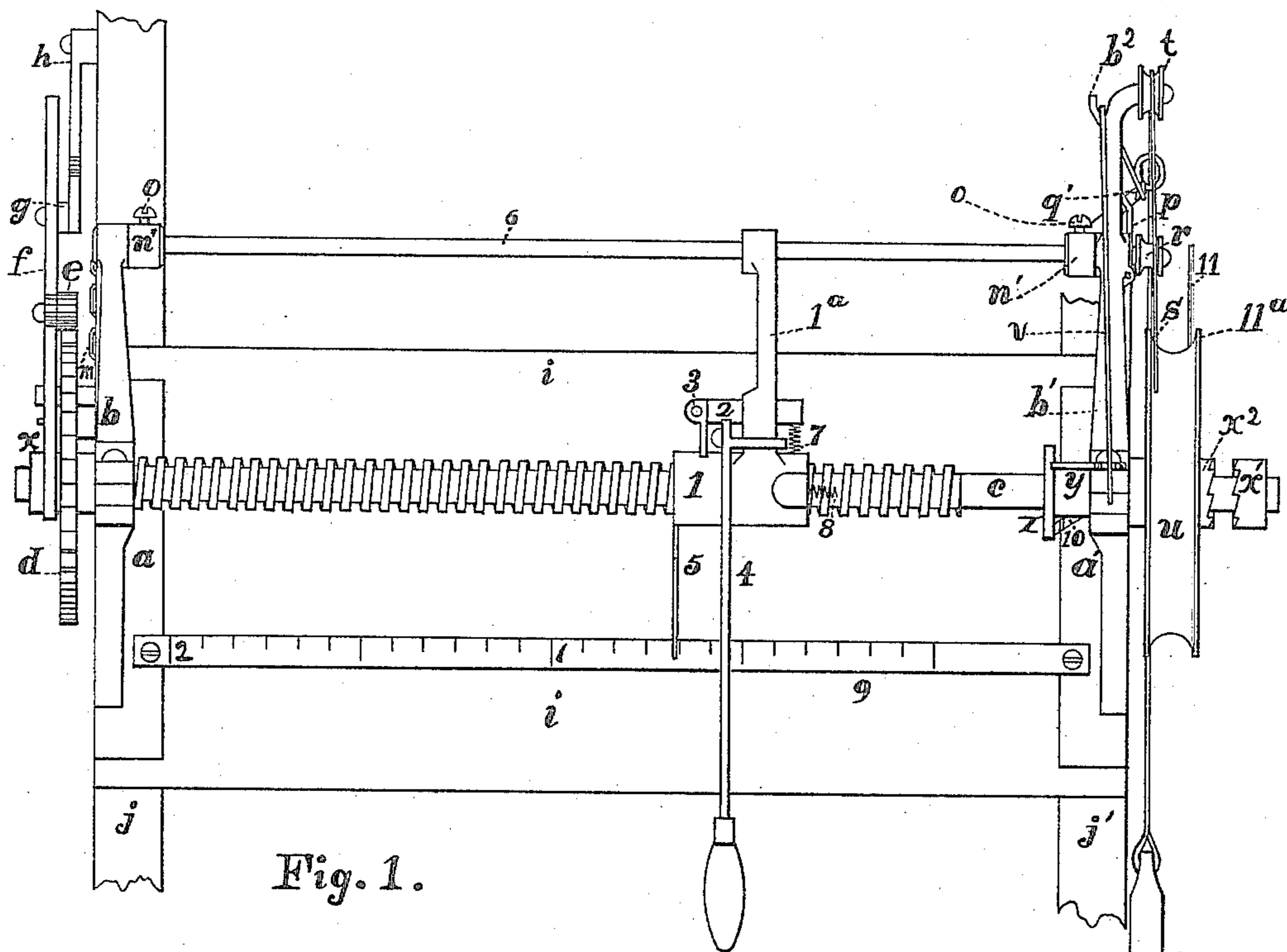
3 Sheets—Sheet 1.

A. O. MELAAS.

APPLIANCE FOR REGULATING THE ACTION OF WINDMILL PUMPS.

No. 446,410.

Patented Feb. 10, 1891.



Witnesses
J. E. Wakeley.
R. Keely

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By his Attorney L. J. Wakeley

(No Model.)

3 Sheets—Sheet 2.

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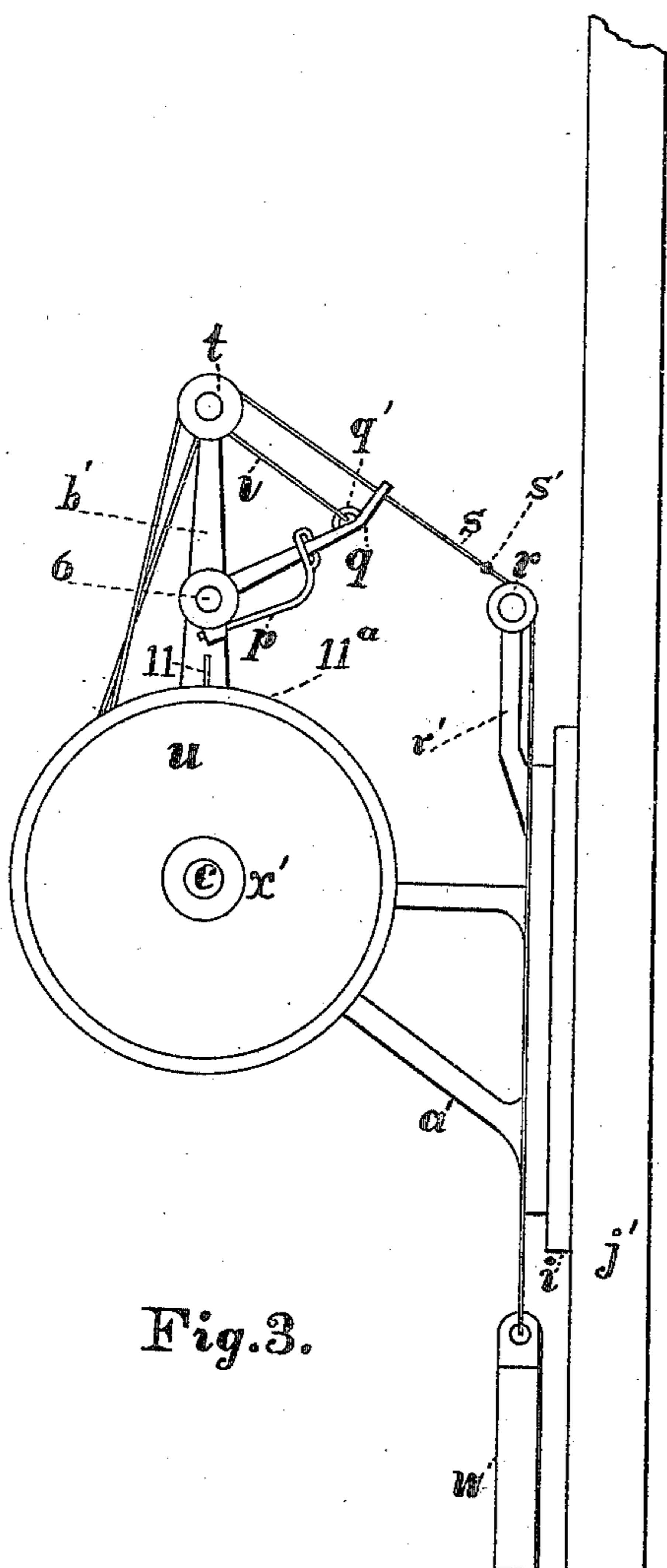


Fig. 3.

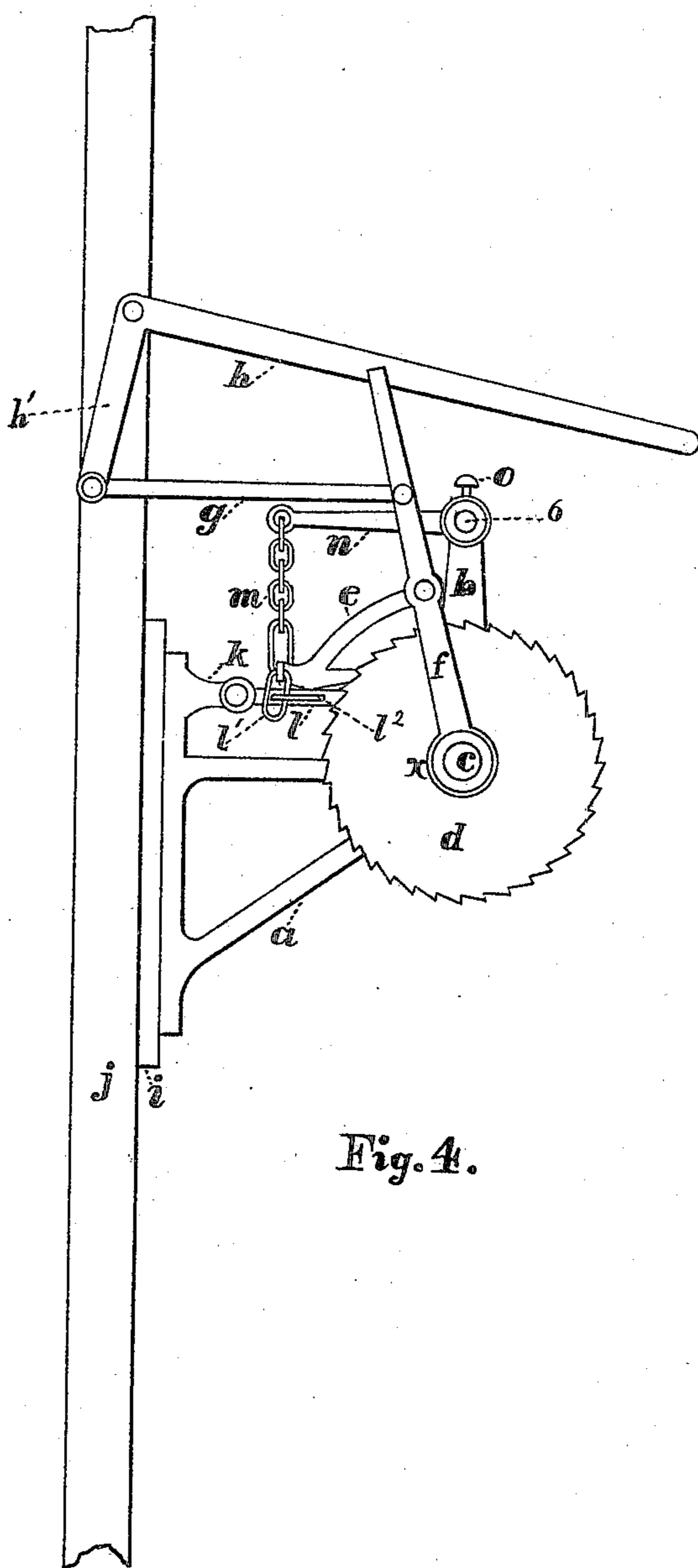


Fig. 4.

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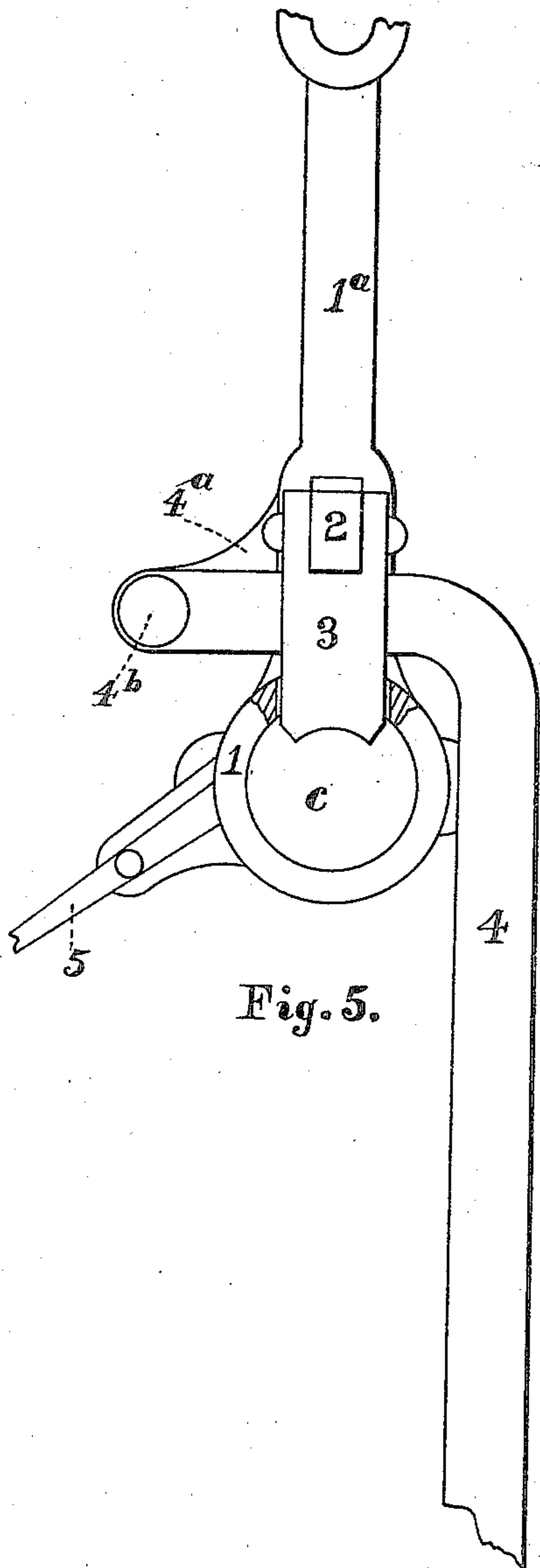


Fig. 5.

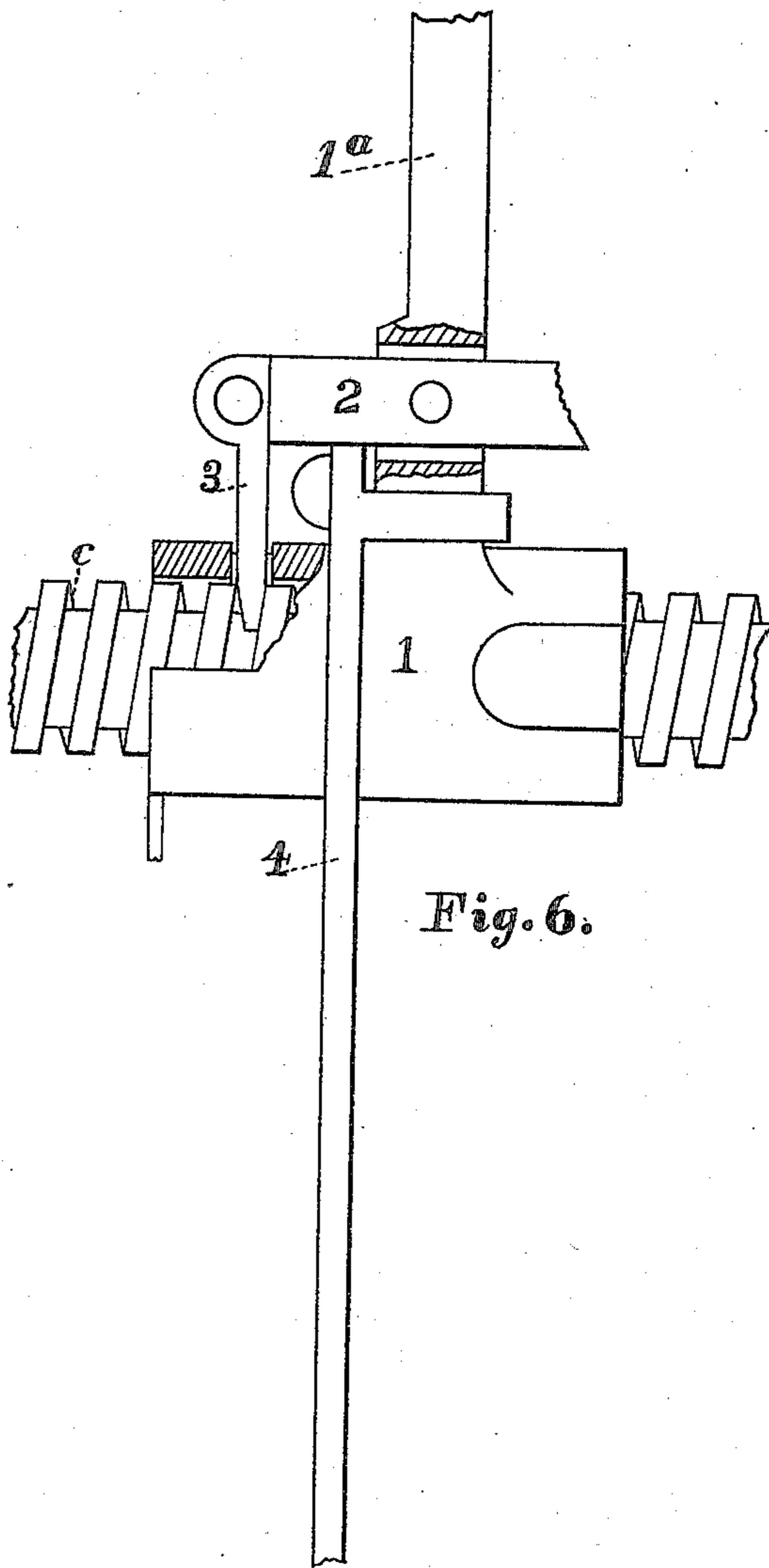


Fig. 6.

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UNITED STATES PATENT OFFICE.

ANDREW O. MELAAS, OF DOOR CREEK, WISCONSIN.

APPLIANCE FOR REGULATING THE ACTION OF WINDMILL-PUMPS.

SPECIFICATION forming part of Letters Patent No. 446,410, dated February 10, 1891.

Application filed September 13, 1890. Serial No. 364,827. (No model.)

To all whom it may concern:

Be it known that I, ANDREW O. MELAAS, a citizen of the United States, residing at Door Creek, in the county of Dane and State of Wisconsin, have invented certain new and useful Improvements in Appliances for Regulating the Action of Windmill-Pumps, of which the following is a specification.

My invention relates to appliances for regulating the action of windmill-pumps, so that the pump shall cease to operate as soon as the tank or receptacle has been filled; and while my invention is especially applicable to pumps actuated by a wind-engine it is to be understood that I contemplate its application to steam-engines or other motors for actuating such pumps.

In order that my invention may be fully understood, I will proceed to describe it with reference to the accompanying drawings, in which—

Figure 1 is a front elevation of a regulating mechanism constructed and arranged in accordance with my invention. Fig. 2 is a plan view of the same. Fig. 3 is an end elevation of certain of the connections at the right-hand side of Figs. 1 and 2. Fig. 4 is a similar view of the connections at the left-hand side of Figs. 1 and 2. Fig. 5 is an end elevation of the regulator-carriage. Fig. 6 is a front elevation of the same, partially broken away and in section.

In the said drawings, *a a'* designate two brackets, which are secured to corresponding sides of two vertical standards *j j'* by suitable bolts or screws passing through a backing-board *i*.

b b' designate two standards, which rest at their lower ends upon the outer ends of the brackets *a a'*, and which at their upper ends form the bearings for a guide-shaft 6, to be hereinafter more fully described. The upper or outer ends of the brackets *a a'* form the bearings for the ends of a horizontal screw-shaft *c*, while the lower ends of the standards *b b'* form the caps for said bearings. At one end the shaft *c* carries a ratchet-wheel or disk *d*, which turns with the shaft, and said shaft carries an arm *f*, which is outside of the wheel *d*, and which vibrates loosely on said shaft.

h designates an L-shaped lever, the extremity of the long arm of which is connected either to a loop upon the adjacent part of the usual vertically-reciprocating piston-rod of the windmill, or which, when a rotary shaft is driven by any other or similar motor, engages a cam or inclined strikers. In either event the long arm of lever *h* is caused to vibrate vertically. This movement of the long arm imparts a pendulum-like movement to the short arm *h'* of lever *h*, and a link *g*, which connects the extremity of said short arm *h'* with the upper part of lever *f*, causes the latter to vibrate forward and backward. The lever *f* carries a pivotal pawl *e*, the tip of which engages the teeth of the ratchet-wheel *d*, thus rotating said wheel and the screw-shaft *c* intermittently.

l designates a catch-pawl, the inner end of which is pivoted upon an offset *k* at the upper end of the base of the bracket *a*, and the outer end of this pawl engages the teeth of ratchet-disk *d* to prevent any reverse movement of the same. The head of pawl *e* is connected by a link *l'* with a staple or hook *l²* upon the catch-pawl *l*. The length of link *l'* is such as to permit the pawl *e* to move freely without normally affecting the action of the click or catch-pawl. A chain *m* connects the head of pawl *e* with the outer end of an arm *n*, which is carried by the adjacent stop *n'* on the guide-shaft 6. This arm is raised at times by a partial rotation of the shaft 6, as hereinafter more fully explained, and thus through the chain *m* and link *l'* raises both the pawl *e* and click *l* out of engagement with the ratchet-disk. The opposite end of the shaft *c* carries a rigid clutch-section *x'*, and within this clutch-section a loose pulley or sheave *u*, the outer end of the hub of which is formed with a companion clutch-section *x²*. The opposite portion of the hub of the pulley *u* is prolonged and terminates in an annular flange *z*. Upon the screw-shaft *c* is mounted a carriage 1, which is prevented from turning with said shaft by a guide-arm *1^a*, the upper end of which embraces the shaft 6, before referred to. The intermittent rotation of screw-shaft *c* impels the carriage 1 to the right through the medium of a pendent finger 3, which is pivoted to one end of a carrying-bar

2. This bar 2 is pivoted midway of its length in the guide-arm 1^a, and its opposite end is acted upon by a spring 7, which tends to hold the finger 3 into engagement with the thread of screw-shaft *c*. A lever 4 of inverted-L shape is pivoted by its short arm to an offset 4^a of the guide-arm 1^a, as shown at 4^b, and when the long arm of this lever is drawn outward its short arm engages beneath the bar 2 and lifts the finger 3 out of engagement with the thread of screw-shaft *c*. The guide-shaft 6 carries stops *n'*, which are held to the shaft by set-screws *o*, and which abut against the standards *b b'*, and thus prevent longitudinal movements of said shaft. At its end which is adjacent to the pulley *u* the shaft 6 carries an arm *q*, through the upper end of which runs a cord *s*. One end of this cord is attached to the periphery of the pulley *u* and the said cord runs over a pulley *t* on the upper end of the standard *b'*. From the pulley *t* the cord *s* extends through upper end of arm *q*, as before stated, thence over a pulley *r* on the upper end of an arm *r'*, which is carried by the upper end of the base of the bracket *a'*. The opposite end of the cord *s* carries a tension-weight *w*, which holds the cord in strained condition, and a knot or equivalent protuberance *s'* is formed in the cord intermediately of the pulley *r* and the upper end of arm *q*. Thus as the screw-shaft is intermittently rotated by the pawl-and-ratchet mechanism before described the carriage gradually approaches the flange end *z* of the hub of pulley *u*, and said carriage finally strikes the hub of the pulley and forces the clutch-section *x*² into engagement with the clutch-section *x'*, thus causing the pulley *u* to turn momentarily with the screw-shaft *c*. This rotation of the pulley causes the knot *s'* of cord *s* to engage with and lift the arm *q*, and consequently impart a partial rotation to the shaft 6. This movement of shaft 6 raises arm *n* and lifts the pawls *e* and *l* out of engagement with the ratchet-wheel *d*, and consequently stops the rotation of the screw-shaft *c*. The rotation of the pulley *u* serves, also, to trip the windmill-wheel through the medium of a cord 11, one end of which is attached to the periphery of the pulley, as shown at 11^a, while the opposite end is attached to a trip of the windmill-wheel or to a connection with the vanes. In case of a steam-motor the cord would be attached at this end to the throttle-valve; but in either event the movement of the pulley acting through the cord serves to instantly arrest the action of the motor. The carriage 1 carries a pair of buffer-springs 8, which come into contact with the flanged end of the hub of pulley *u*, and thus prevent jar from resulting when the carriage moves the clutch-sections *x' x*² into engagement, as above described. When the hub of pulley *u* has been thus moved, its flange *z* is engaged by a spring-catch *y*, the spring *v'* of which draws the head of the catch over the flange, and thus retains the clutches *x' x*² in engagement. The clutch-

section *x*² is normally held out of engagement with the clutch-section *x'* by a leaf-spring 10, which is secured to the bracket *a'*, and which acts against the outer side of the flange *z*, before referred to.

In order to set the carriage 1 accurately in such position that the motor and pump will be stopped when any given tank has been filled, a graduated bar 9 is secured horizontally upon the machine-frame, and a pendent bar or indicator-arm 5 is carried by said carriage. The bar 9 is preferably graduated to feet and inches and fractions of inches, beginning near the right-hand end of the bar and running to its left-hand end, as shown in Fig. 1; and thus, for example, if the tank will be filled while two feet is passed over by the indicator it is set at figure 2, and the setting of the indicator is similarly varied to accord with like variations in the capacity of the tank or receptacle. In any event the number of feet and inches necessary to fill the tank will be indicated by the original position of the indicator.

As above described, the cutting off or tripping of the motor is entirely automatic; but I have also provided for voluntarily accomplishing this result. For this purpose a cord *v* is connected to a loop *q'* at the upper end of the arm *q*, and extends thence over a fork *b*³ on the standard *b'*, and from thence downward to convenient position for manipulation by the attendant. Thus by pulling upon the cord *v* the arm *q* is raised, as before, a partial rotation being thus given to shaft 6, and the pawls *e* and *l* being lifted, so as to stop the rotation of the shaft *c*.

From the above description it will be seen that the device is simple and durable in construction and direct in its operation, and also that it is capable of both automatic action and voluntary manipulation.

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

1. In a regulating apparatus for pump-motors, the combination of a revoluble screw-shaft, a pawl-and-ratchet mechanism located at one end of said shaft and actuated by the motor, a carriage actuated by the screw-shaft so as to move longitudinally thereof, a clutch mechanism located at the opposite end of the screw-shaft and moved into engagement by the carriage, and a connection between the clutch mechanism and the motor operating to arrest the latter, substantially as set forth.

2. In a regulating apparatus for pump-motors, the combination of a screw-shaft, a carriage actuated by said shaft to move longitudinally thereon, a pawl-and-ratchet mechanism at one end of said shaft, a separable clutch mechanism at the opposite end of said shaft and actuated by the carriage, a rocking guide-shaft controlling the movement of the carriage, an arm at one end of said guide-shaft operatively connected to the pawl mech-

anism, an arm at the opposite end of the shaft, and a flexible connection attached to the clutch mechanism and operating upon the last-named arm to rock the guide-shaft and release the pawl mechanism from engagement with the ratchet mechanism, substantially as set forth.

3. The combination, with a screw-shaft and its actuating pawl-and-ratchet mechanism, of a carriage carrying a spring-pressed finger engaging the thread of said shaft and carrying also a lever engaging the pawl-carrier and operating to lift the pawl out of operative position, substantially as set forth.

4. The combination of a screw-shaft, a ratchet-disk carried thereby, a pawl and click loosely connected together and engaging said disk, and a lifting-arm connected by a flexible connection to said pawls, substantially as set forth.

5. The combination of a screw-shaft, a pawl-and-ratchet mechanism at one end of said shaft, a vibrating lever carrying one of said pawls, an actuating-lever operatively en-

gaged by the motor, and a link connecting the vibrating and actuating levers with each other, substantially as set forth.

6. The combination, of a screw-shaft, a clutch mechanism at one end of said shaft, a carriage actuated by the shaft and engaging one member of the clutch mechanism, a catch for holding the clutch members in engagement, and a spring for separating said clutch members, substantially as set forth.

7. The combination of a screw-shaft, a pawl-and-ratchet mechanism at one end thereof, an arm carried by a separate shaft and operatively connected to the pawl mechanism, a second arm carried by the said separate shaft, and a pull-cord connected to said arm and operating to rotate the shaft, and thus automatically release the pawl mechanism from the ratchet mechanism.

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Witnesses:

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