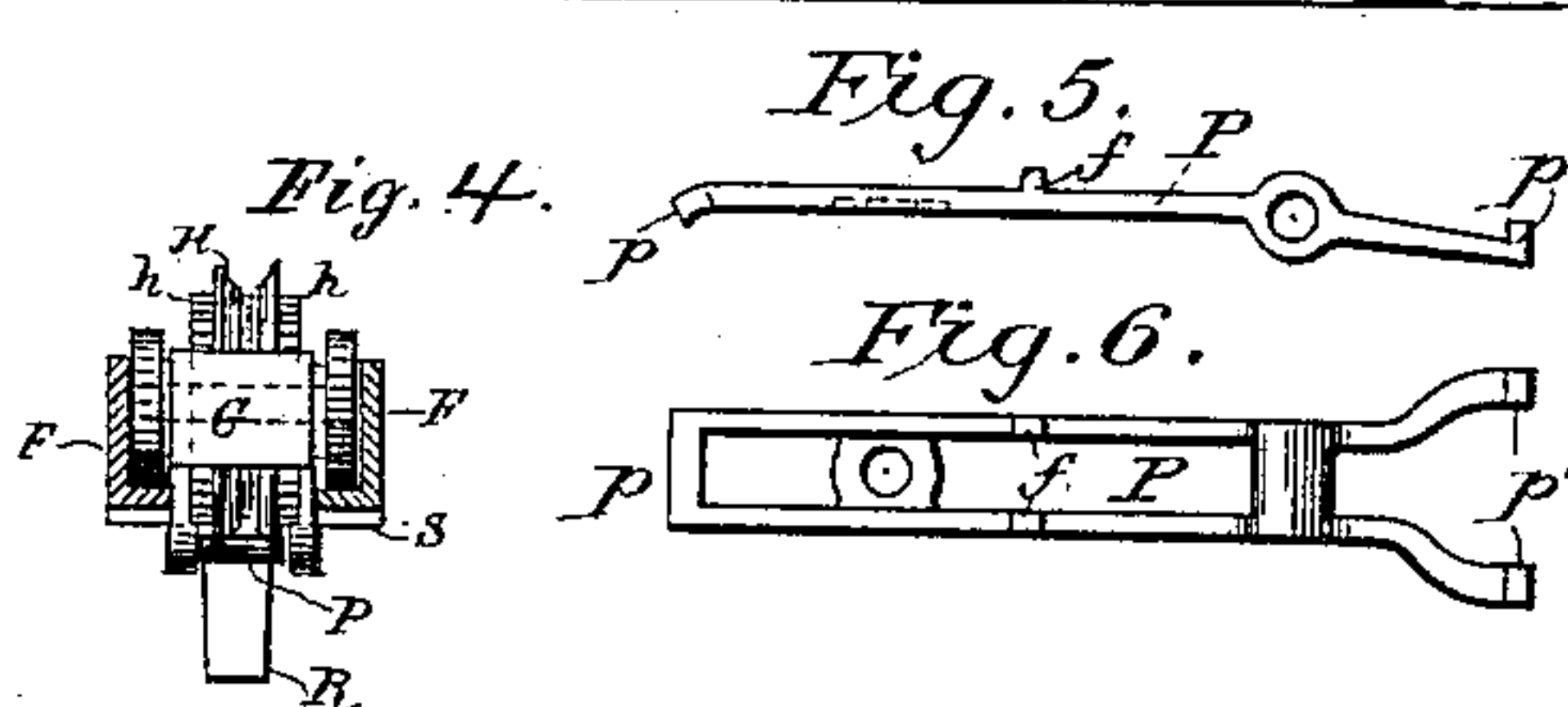
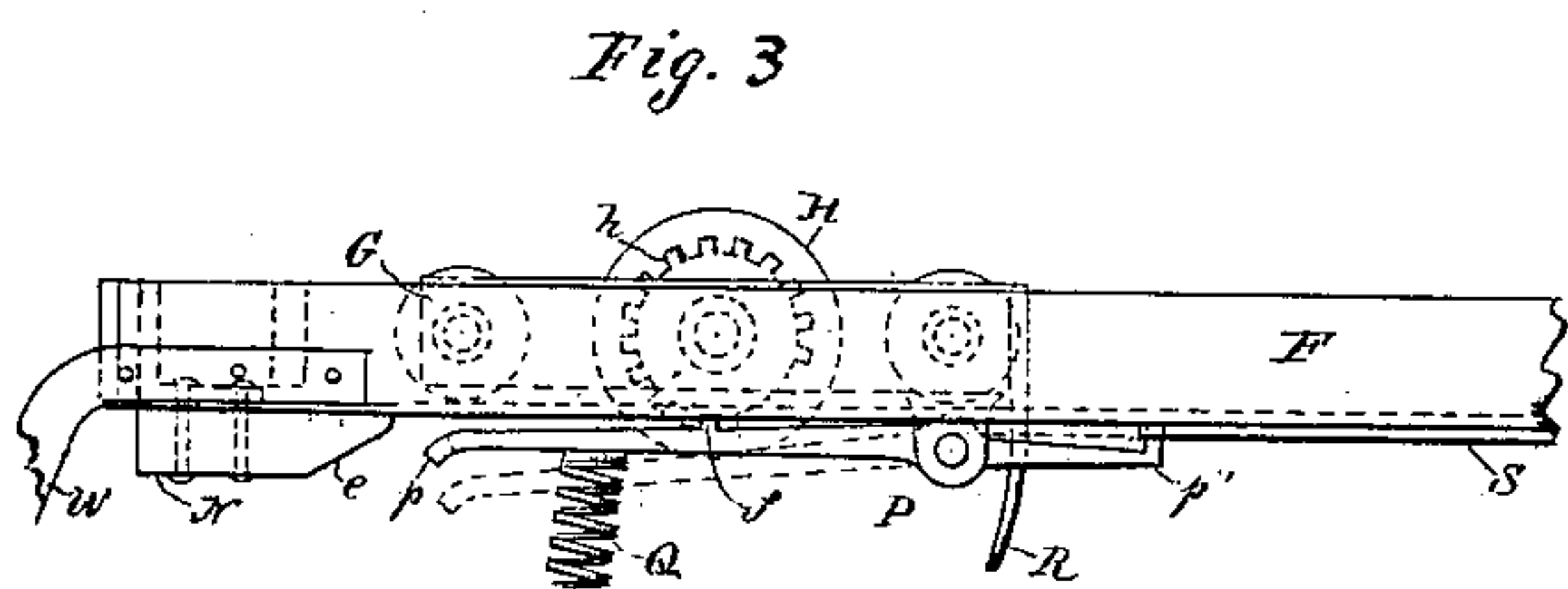
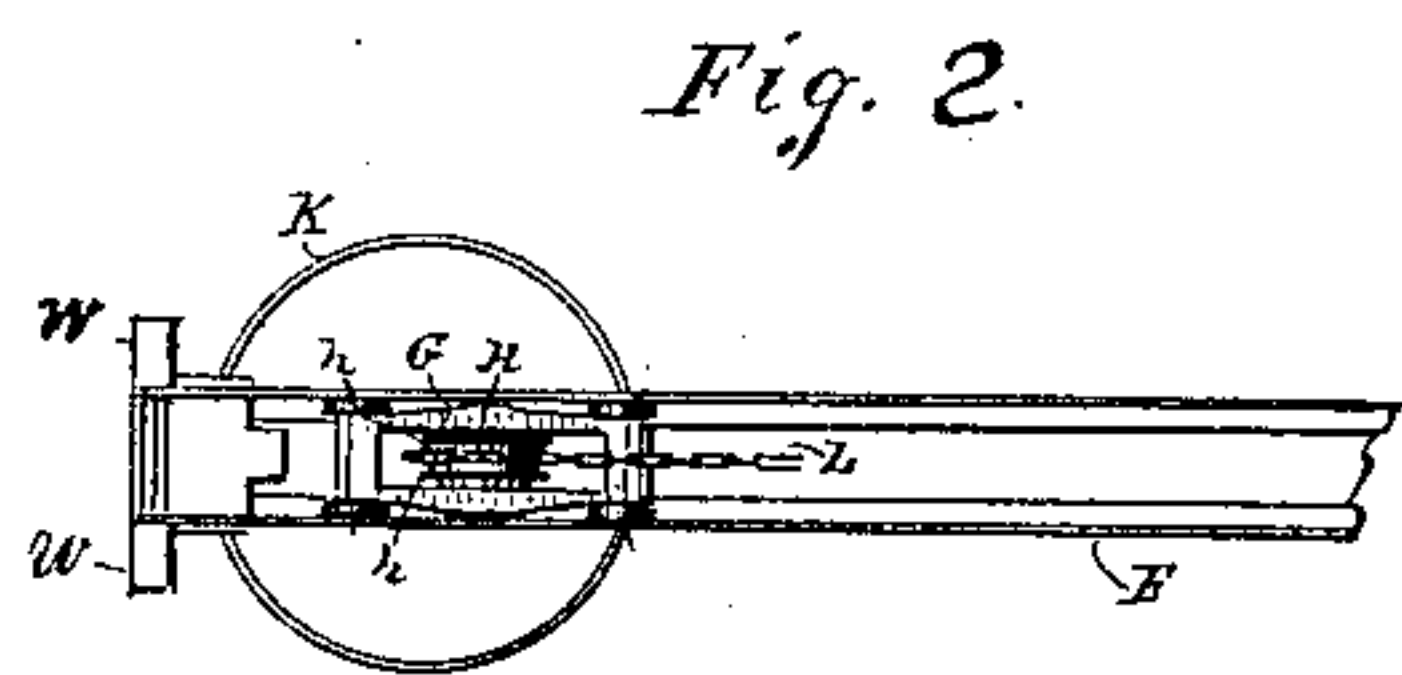
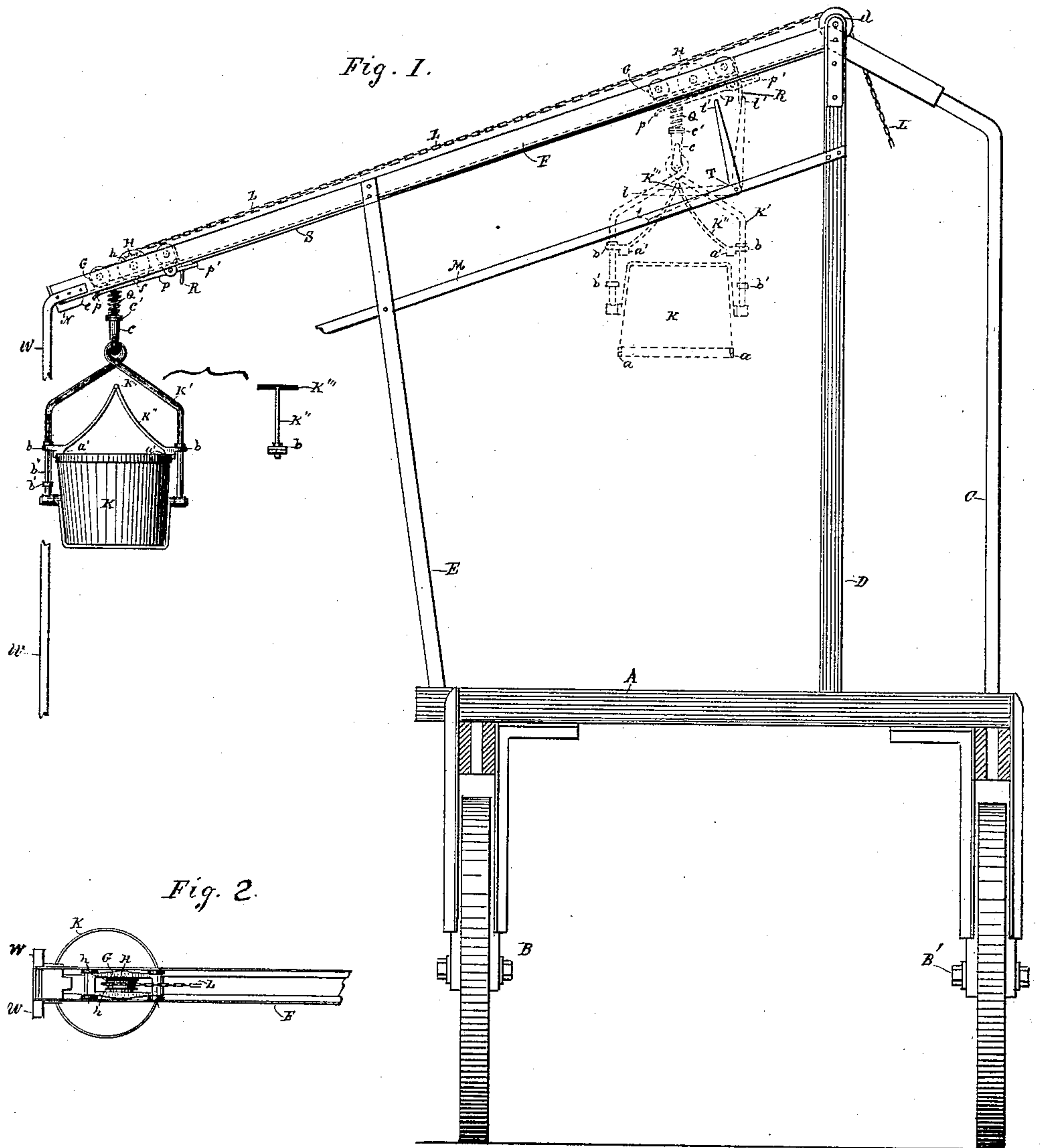


(No Model.)

N. E. GREEN.
LOADING AND UNLOADING MECHANISM.

No. 434,664.

Patented Aug. 19, 1890.



Witnesses

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UNITED STATES PATENT OFFICE.

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LOADING AND UNLOADING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 434,664, dated August 19, 1890.

Application filed February 27, 1888. Serial No. 265,459. (No model.)

To all whom it may concern:

Be it known that I, NELSON E. GREEN, a citizen of the United States, and a resident of the city of Minneapolis, county of Hennepin, State of Minnesota, have invented certain new and useful Improvements in Loading and Unloading Mechanism, of which the following is a specification, reference being had to the accompanying drawings.

My invention was designed for use in connection with the machine identified in my Letters Patent of the United States, granted April 23, 1889, under No. 402,016, and is in the nature of improvements on certain of the mechanism therein shown and described.

The invention consists in the construction hereinafter fully set forth, and particularly pointed out in the claims.

In the drawings, like letters referring to like parts, Figure 1 is an end view of a part of a machine embodying my improvements. Fig. 2 is a plan view of a part of the trolley-track with the trolley and bucket supported therefrom. Fig. 3 is a side elevation of the same with the bucket removed. Fig. 4 is a vertical cross-section of the trolley and its supporting-track, looking inward. Fig. 5 is a side elevation of the trolley-lock detached, and Fig. 6 is a plan view of the same.

A is the supporting-platform suitably mounted on independent wheels B B'. C, D, and E are parts of the upper frame-work.

F is the trolley-track consisting of a pair of rails having right-angled flanges on their inner and lower edges facing each other, attached to and supported by the frame-work D E, and extending outward on an incline over the side of the platform.

G is a trolley, movable on the track F. Its wheels rest and travel on the flanges of the rails of said track.

H is a sheave journaled in bearings on the trolley-frame and provided with notched hubs *h*.

K is a hoisting-bucket pivotally attached below its center of gravity to the bail K', and having upwardly-projecting lugs *a* on its rim.

K'' is a false bail having keepers *b*, sliding on the bail K' and adapted to engage the lugs *a*.

L is a hoisting-cable detachably connected at one end by a hook *c* to the bucket-bail K',

passing up over the sheave H and thence over a suitable sheave *d* on the main frame to a hoisting-drum. (Not shown.)

M is one of two guiding-bars constituting a bail-guide for directing the bucket to its dumping position. On the false bail K'' at right angles to the same is a cross-bar K''', projecting several inches on each side of the bail.

The construction so far described is substantially the same as in my patent.

To the under side of the lower end of the track F, I rigidly secure a block N, having a cam-face *e*.

To the under side of the trolley, at a point near the front end, I pivotally attach a lever P, having long and short arms *p* and *p'*, the short arm being at a very obtuse angle to the long arm. The long arm is curved downwardly slightly at its outer end, and the short arm is provided with a square hook-like head. On the upper surface of the long arm *p* is a projecting lug *f* in the proper position to engage with the notched hub *h* of the sheave H. This lever P is preferably made of parallel arms, one under each of the rails of the track F, connected together at their pivotal points and at the extremity of their long arms. To the under sides of the long arms of this lever is secured a stiff coiled spring Q. The cable passes through this spring, and the hook *c*, to which the lower end of the cable is attached, is provided with a disk-like head *c'* of larger diameter than the diameter of the spring. To the forward end of the trolley-frame is rigidly attached a cam-finger R, which projects downward below the level of the track and preferably curves slightly toward the sheave H.

To the under sides of the rails of the track F is rigidly secured a metallic rail S, extending from the upper end of the track to a point distant from the lower and slightly more than the length of the lever P, with the short arm of which it is adapted to engage.

T is a bell-crank tripping-lever having its elbow pivoted to the bail-guide M at a point slightly above the dumping position of the bucket K, and having one arm *t* when in its normal position parallel with the bail-guide and flush with the same and facing the bucket, and the other arm *t'* projecting upward into

the path of the cam-finger R on the trolley G. The arm *t* is slightly heavier than the arm *t'*, returning the lever to its normal position after use by gravity.

5 To the outer end of the track F is secured a down-guide W for directing the bucket in its descent to its filling position. This down-guide is shown as composed of a pair of rigid bars attached to the opposite rails of the track
10 and extending downward parallel to the path of the bucket; but it is evident that a tightly-stretched wire or rope would answer equally well. Its special function is to keep the bucket in its true vertical path. Otherwise,
15 when descending, it is liable to swing and do damage to the sewer and endanger the workmen. These changes in construction greatly improve the efficiency of my machine.

The operation is as follows: When the trolley is in its lowermost position on the track F, the short arm *p'* of the lever P engages behind the end of the rail S and prevents the trolley from moving up the track, the sheave H at the same time being unlocked and free
25 to turn. The instant that the disk *c'* on the hook *c* strikes the spring Q the pressure is communicated to the lever-arm of the lever P, forcing the lug *f* into engagement with the notched hub *h*, locking the sheave and raising
30 the short arm from behind the end of the rail S, unlocking the trolley from the track. The trolley is then free to move up the track, which it will do as the cable is wound up, carrying the bucket with it. As it approaches
35 its dumping position, the cam-finger R strikes the arm *t'* of the bell-crank lever T and forces the other arm *t* to strike the cross-bar K''', raising the false bail K'' on the bucket-bail K', releasing the lugs *a'* from their keepers,
40 allowing the bucket to dump by gravity. As the cable is unwound, the trolley will descend the sheave remaining locked until the lowermost limit is reached on the track F, when the curved part of the long arm *p* of the lever
45 P will come into contact with the cam-surface *e* on the block N, withdrawing the lug *f* from the notched hub *h* and forcing the end of the lever-arm *p'* behind the end of the rail S, thus unlocking the sheave and locking the
50 trolley to the track. The special function of the rail S, extending the whole length of the track, is to keep the sheave locked by positive action when the trolley is moving. The head of the short lever-arm *p'* bearing all the
55 time against the plate S, the lug *f* cannot either fall out of or be withdrawn from the notched hub. The spring Q has a special function, which is very material in the operation of this machine. It serves to assist in
60 the automatic disengagement of the sheave and prevents its locking when the trolley reaches its lowermost position. The spring must be of such tension as to resist the pull on the cable when the trolley is being drawn
65 up the track without being entirely compressed, so that when the trolley descends and the lever-arm *p* strikes the cam *e* the spring

may be further compressed sufficiently to allow the lug *f* to be withdrawn from the notched hub *h*. Otherwise the sheave will
70 not be automatically unlocked, as is required, when the trolley reaches its lowermost limit, and the bucket will stick at the end of the track. The spring should be made of such
75 tension that it will be not over one-half compressed by the pull on the cable. This will leave sufficient compressibility in the spring for the requisite movement in unlocking the sheave. This spring also serves the additional
80 functions of taking up any accidental slack in the cable which might happen to be given after the sheave had been locked and before the head of the short lever-arm *p'* had been moved beyond the possibility of engagement
85 behind the end of the rail S and of a buffer preventing unnecessary jarring and wearing of the mechanism.

What I claim, and desire to secure by Letters Patent of the United States, is as follows:

1. The combination of a hoisting-bucket
90 having a bail pivotally connected thereto below its center of gravity, a locking device for locking said bucket from turning on its bail, and a tripping-lever pivoted to a suitable
95 support adjacent to the bucket's dumping position adapted to be operated by the bucket to trip said locking device, substantially as described.

2. The combination, with a trolley-track, of a trolley movable thereon, a dumping-bucket
100 supported from said trolley having a bail pivoted below the center of gravity, a locking device for locking said bucket from turning on its bail, and a tripping-lever pivoted to a
105 suitable support adjacent to the bucket's dumping position, having one arm in a position to be moved by said trolley and the other in a position to trip said locking device for
110 unlocking said bucket, substantially as described.

3. The combination, with a dumping-bucket having a bail pivoted below the center of gravity and lugs on its rim, of a false bail on
115 said bucket-bail provided with keepers for engaging said lugs and locking said bucket from turning on its bail, a cross-bar rigidly attached to said false bail, and a tripping-lever pivoted to a suitable support adjacent to
120 the bucket's dumping position, and having one arm under the path of said cross-bar and adapted to be moved into engagement with the same for sliding said false bail and
125 unlocking said bucket, substantially as described.

4. The combination, with a trolley-track, of
125 a trolley movable thereon provided with a cam-finger projecting below said track, a dumping-bucket supported from said trolley provided with lugs on its rim and having a
130 bail pivoted below the center of gravity, a false bail sliding on said bucket-bail, having keepers engaging said lugs for locking said bucket from turning on its bail, a cross-bar rigidly secured to said false bail, and a trip-

ping-lever pivoted to a suitable support adjacent to the bucket's dumping position, having one arm in a position to be engaged by said cam-finger and the other in a position to strike said cross-bar and unlock the bucket, substantially as described.

5 5. The combination, with a trolley-track having a trolley-stop near its outer end for holding the trolley in a fixed position there-
10 on, of a trolley movable on said track, having a sheave provided with a notched hub, a combined sheave and trolley lock consisting of a lever pivoted between its extremities to the
15 under side of the trolley-frame having on one arm a lug adapted to engage said notched hub and on the other a head adapted to en-
20 gage with said stop, a cam-block fixed to the under side of the outer end of said track adapted to engage the long arm of said lever for unlocking said sheave, a resistance-spring attached to the under side of the long arm of said lever, and a hoisting-cable passing over

said sheave and provided with a projection adapted to engage with said spring, substantially as described.

25 6. The combination, with a trolley-track having a trolley-stop near its outer end for holding the trolley in a fixed position there-
30 on, of a trolley movable on said track, having a sheave provided with a notched hub, a combined sheave and trolley lock consisting of a lever pivoted between its extremities to the
35 under side of the trolley-frame having on one arm a lug adapted to engage said notched hub and a head on the other adapted to en-
gage with said stop, and a cam-block fixed to the under side of the outer end of said track adapted to engage the long end of said lever and unlock the sheave, substantially as de-
scribed.

NELSON E. GREEN.

In presence of—

JAS. F. WILLIAMSON,
EMMA F. ELMORE.