

(Model.)

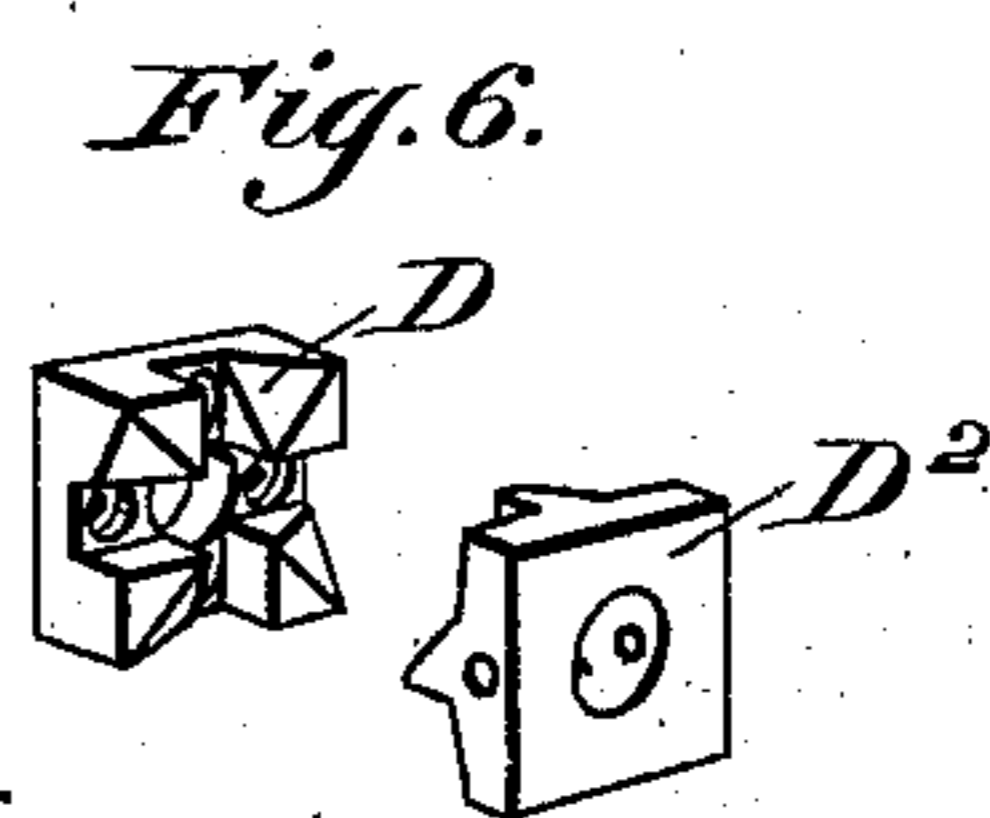
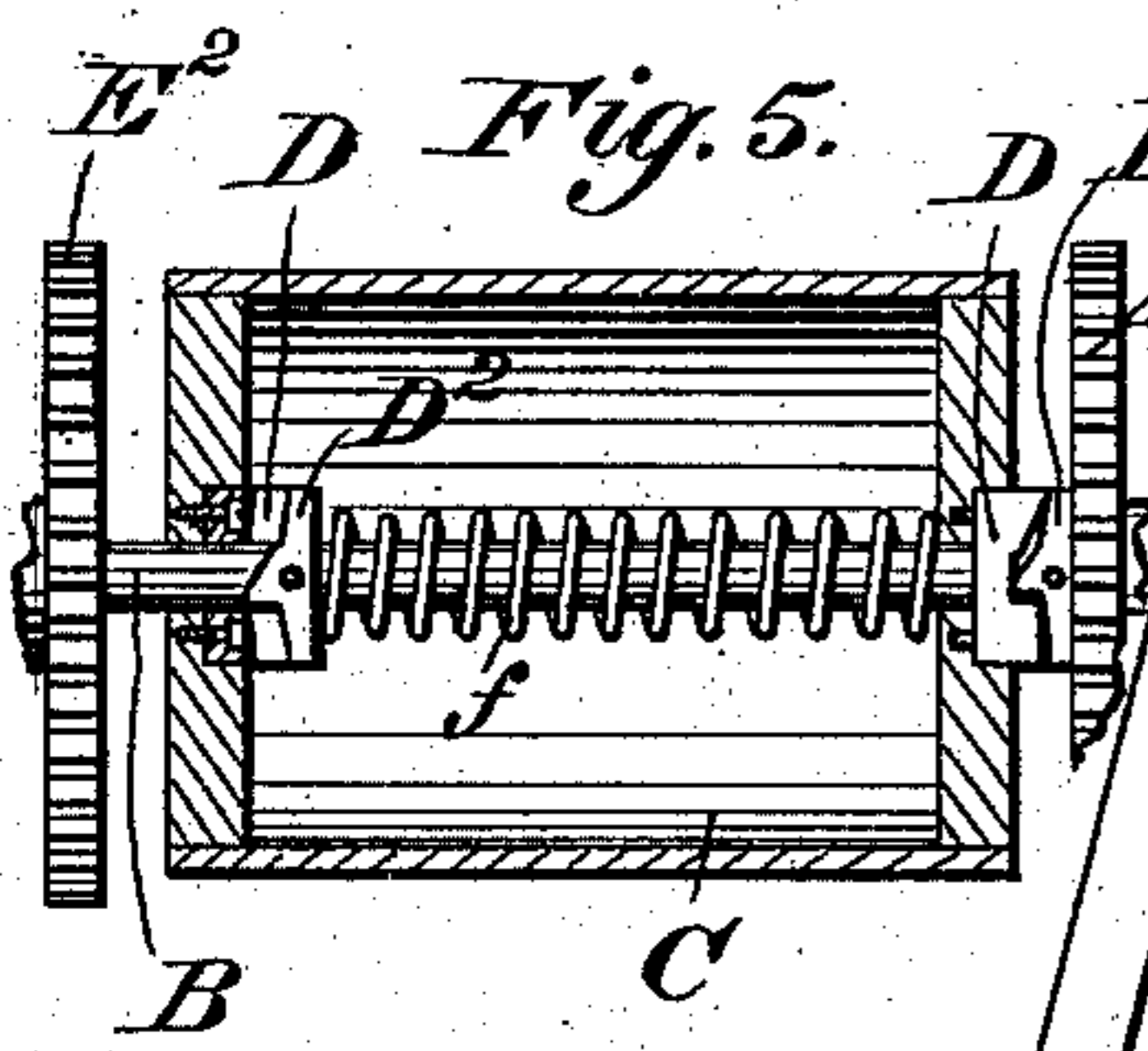
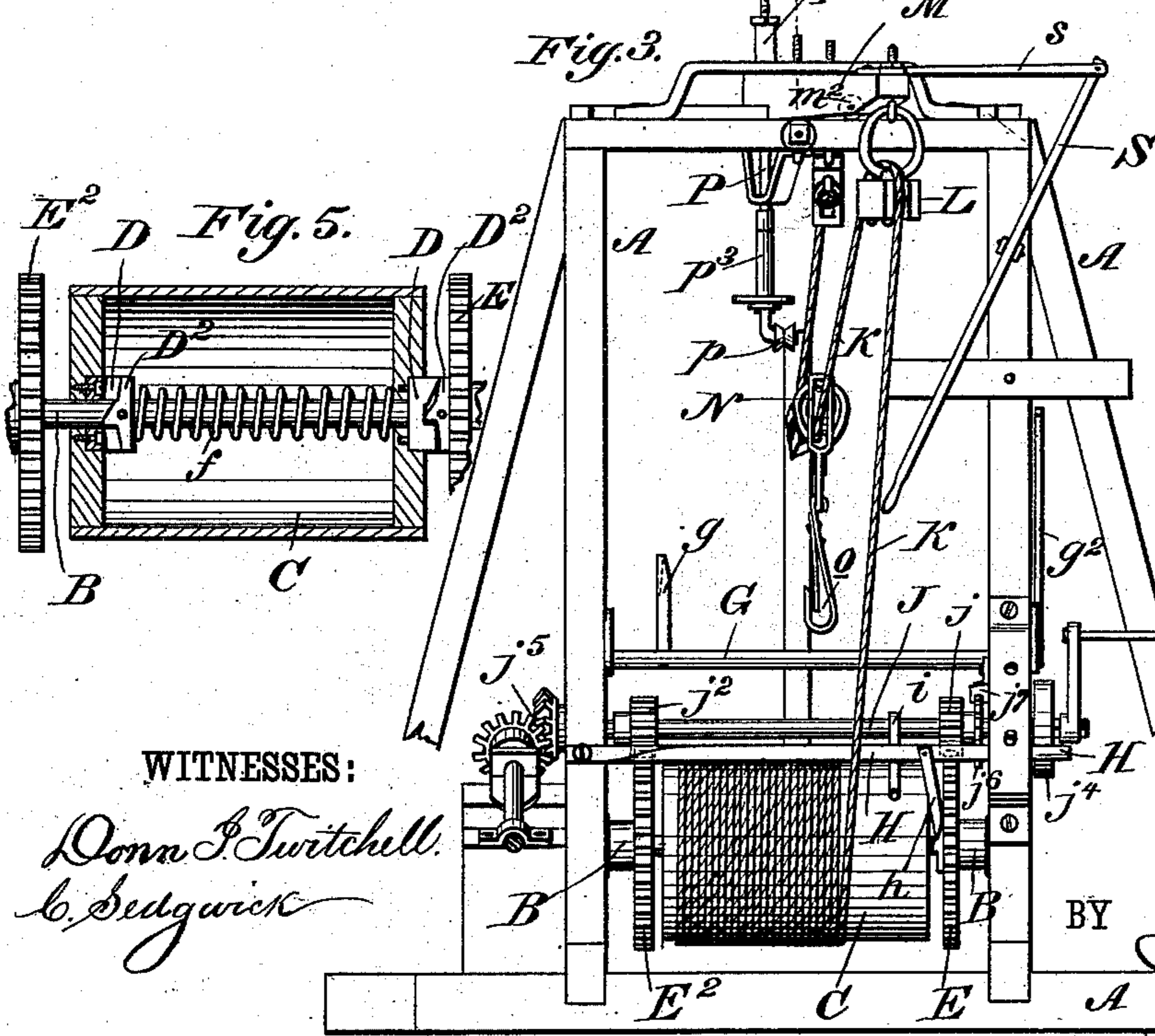
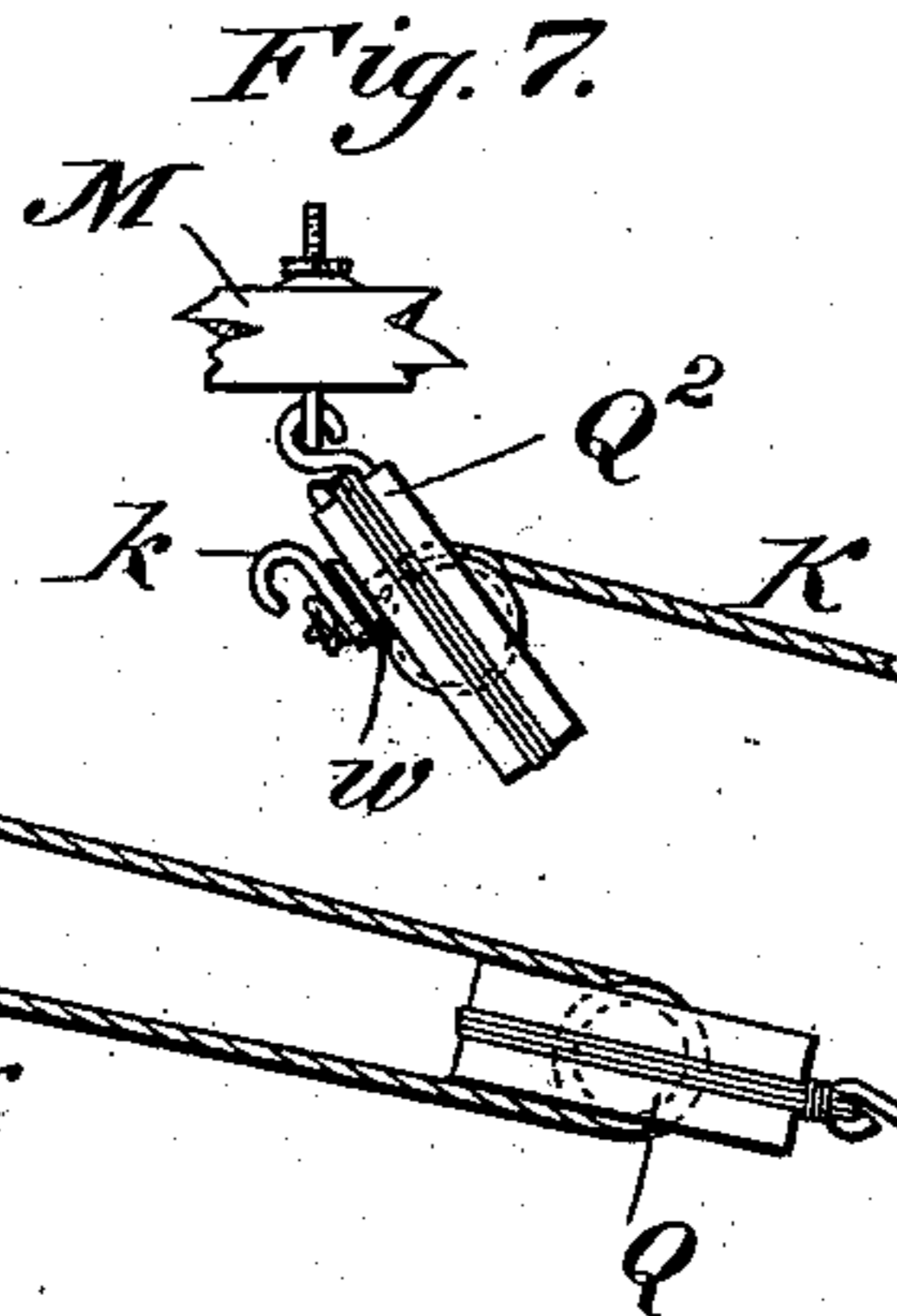
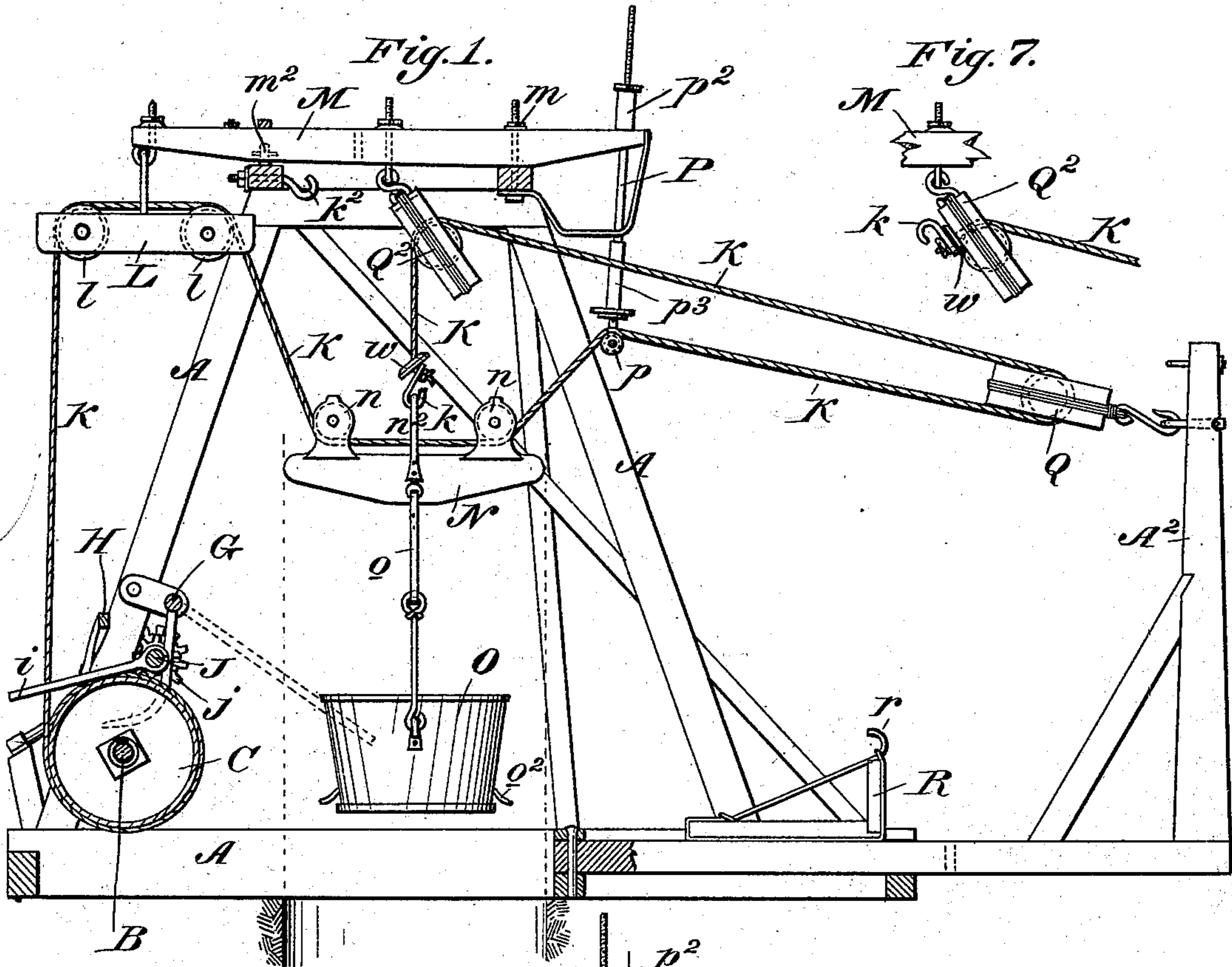
2 Sheets—Sheet 1.

T. C. HISTED.

Hoisting Apparatus for Mining Shafts.

No. 235,681.

Patented Dec. 21, 1880.



WITNESSES:

Donna P. Twitchell.
C. Sedgwick

INVENTOR:

T. C. Histed

BY

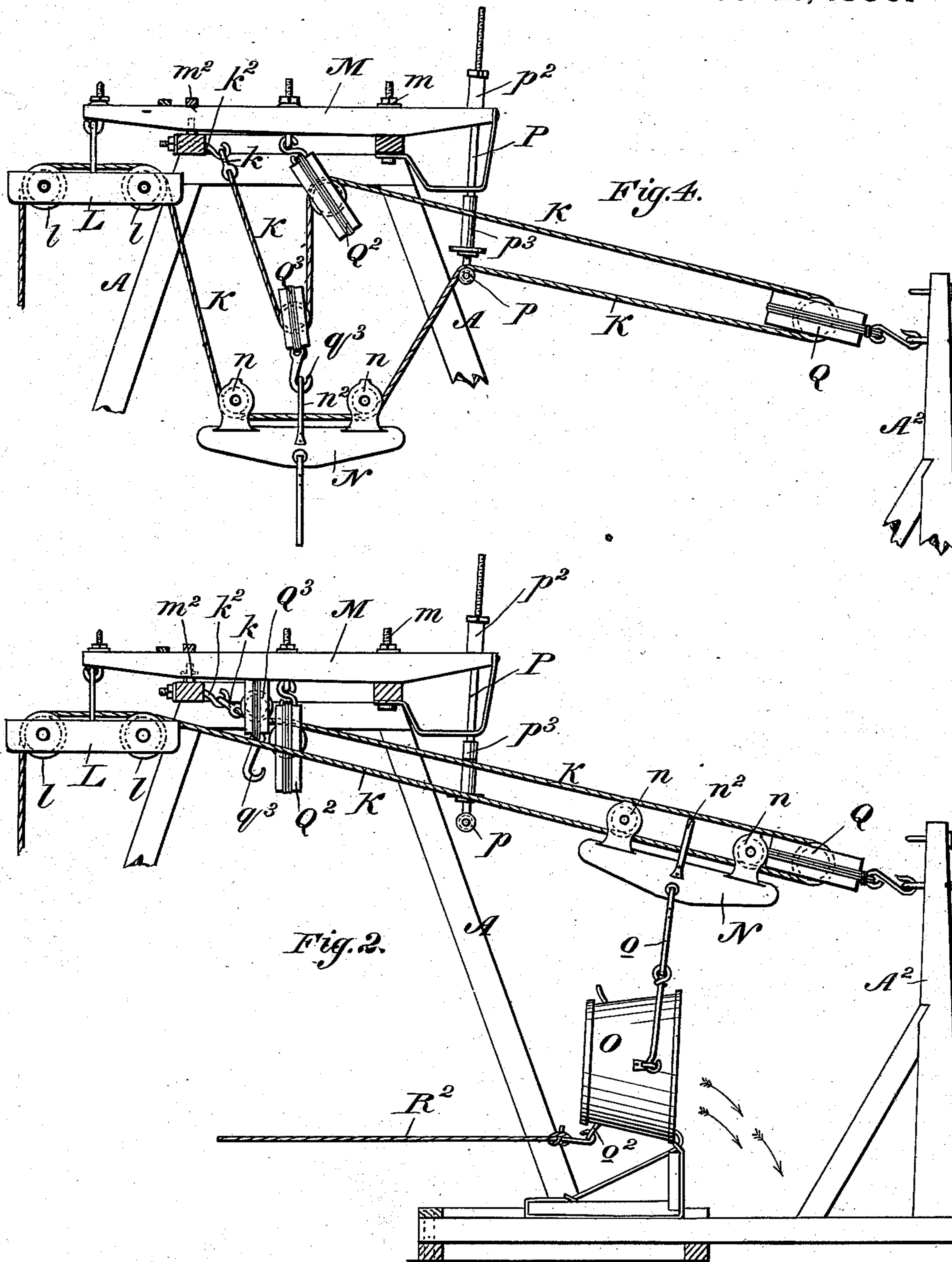
ATTORNEYS.

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WITNESSES:

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UNITED STATES PATENT OFFICE.

THADDEUS C. HISTED, OF JUNCTION CITY, KANSAS, ASSIGNOR OF ONE-HALF TO ANSON W. CALLEN, OF SAME PLACE.

HOISTING APPARATUS FOR MINING-SHAFTS.

SPECIFICATION forming part of Letters Patent No. 235,681, dated December 21, 1880.

Application filed May 3, 1880. (Model.)

To all whom it may concern:

Be it known that I, THADDEUS C. HISTED, of Junction City, in the county of Davis and State of Kansas, have invented a new and useful Improvement in Hoisting Apparatus for Mining-Shafts, of which the following is a specification.

My invention consists in certain novel details of construction and arrangement of the windlass, the tackle, and devices connected therewith, whereby provision is made for facilitating the operation of the apparatus, as hereinafter particularly described.

The invention is particularly intended for use in mineral and other mines for hoisting the excavations from the mine-shafts; but it may be employed for various other purposes. It will here be described as used in connection with a mine.

In the accompanying drawings, Figure 1 is a side view, partly in section, showing the apparatus with the parts in position for raising or lowering the bucket. Fig. 2 is a side view, showing the bucket in the act of being tilted to empty its contents. Fig. 3 is an end view of the apparatus. Fig. 4 is a side view, hereinafter referred to. Fig. 5 is a sectional view of the drum. Figs. 6 and 7 are detail views, hereinafter referred to.

Similar letters of reference indicate corresponding parts.

The various working parts of the apparatus are arranged and supported in a frame-work, A, which may be of any suitable construction. This frame may be secured to the ground by means of pins or stakes; and it may also, if desired, be provided with a post, A², for hitching a portion of the tackle, as shown.

In the lower part of the frame-work A, near one end, is journaled a shaft, B, which carries the drum C. This drum (see Fig. 5) is hollow, and is connected to the shaft by a clutch, so as to revolve therewith, but may be disconnected, so as to turn freely thereon. The clutch is of the construction shown in Fig. 6, and consists of two plates, D D², provided with notches and ratchet-teeth. Two of these clutches are employed in the drum.

At one end of the drum a plate, D, is at-

tached to the inner side of the drum-head, and a plate, D², is fixed to the shaft B. At the other end of the drum a plate, D, is attached to the outer side of the drum-head, and a plate, D², is fixed to a gear-wheel, E, which, in turn, is fixed to the shaft B.

When the clutches are engaged the turning of the shaft B will cause the drum C to turn, and when the clutches are disengaged the shaft may be turned without turning the drum.

For keeping the clutches engaged I employ a coiled spring, f, surrounding the shaft B, and having one end bearing against the clutch-plate D on the shaft B, at the inner side of one end of the drum, and the other end bearing against the inner side of the drum-head at the opposite end of the drum, so as to have a tendency to keep the drum pressed toward the right-hand side of Fig. 5. To assist in keeping the parts thus engaged I employ a shaft, G, journaled in the frame A above the drum, and provided with a wedge-shaped arm, g, which may be inserted between the left-hand end of the drum and a gear-wheel, E², fixed on the shaft B. At the opposite end of the shaft G from the arm g is a lever, g², for raising and lowering said arm g when desired.

For disengaging the clutches when desired in order to allow the drum to turn freely to unwind the rope, I employ a lever, H, pivoted at one end to the frame A, and carrying near its other end a wedge-shaped arm, h, which may be inserted between the right-hand end of the drum and the inner side of the gear-wheel E.

For retarding the speed of the drum when unwinding I employ a brake consisting of a lever, i, pivoted at one end and arranged so that it may be made to bear on the face of the drum.

Motion may be applied to the drum in any suitable manner. As shown herein, the means employed consists of a shaft, J, journaled in the frame A above the drum, and provided with two pinions, j j², meshing into the gear-wheels E E². This shaft may be turned by hand-power by means of a crank, j³. It may also be provided with a pulley, j⁴, so as to receive motion through a belt from an engine; or

it may be provided with bevel-gearing j^5 , so as to receive motion through a tumbling-shaft from a horse-power. The shaft J is provided with a ratchet, j^6 , and pawl j^7 , to prevent retro-

grade motion of the windlass.
The hoisting-rope used with this apparatus may be arranged in various ways in connection with pulleys, so as to employ two, three, or four strands for hoisting, according to the weight of the load to be raised.

As shown in Fig. 1, the rope K passes from the drum C upward and over two pulleys, l l , in a bar, L, suspended from one end of a bar, M, on the top of the frame A, thence downward and under two pulleys, n n , in a carrier, N, from which the bucket O is suspended by a snap-hook, o , thence over a pulley, p , at the lower end of a rod or arm, P, carried by the other end of the bar M, and adjustable vertically therein by means of a nut, p^2 , thence around a pulley, Q, hooked to the post A^2 , thence back again and over a pulley, Q^2 , suspended from the bar M, and thence its end is attached to the carrier N by means of a hook, k , on the rope, and a link, n^2 , on the carrier. Thus the weight and strain of the load are divided between three strands of the rope, and great power is obtained.

As shown in Figs. 2 and 4, the end of the rope is hooked to a staple or hook, k^2 , in the upper part of the frame A, and an intermediate pulley, Q^3 , is interposed between the pulley Q^2 and the end of the rope, so as to produce four strands of rope, and thus still greater power is obtained.

By dispensing with the pulley Q^3 and attaching the end of the rope to the hook or staple k^2 on the frame, the weight is sustained by two strands of rope, as shown in Fig. 3, and as will be understood on referring to Fig. 4.

The operation of hoisting the bucket is the same in all cases, whether two, three, or four strands of rope are used. The drum having been turned until the bucket is as high as it can be raised, and the rope K is taut throughout its entire length, the portion of the rope between the pulleys l and the pulley Q is then perfectly straight and forms an inclined track, down which the carrier N runs with the bucket, as shown in Fig. 2.

The apparatus is provided with a tilting device at the point where the contents of the bucket are to be emptied, which device consists of a frame, R, provided with two hooks, r r , said frame being adapted to be attached to the frame A at any suitable point by means of a bolt. When the bucket O has been raised to its fullest height and is ready for the carrier N to run down the inclined track, a tilting-rope, R^2 , is hooked to a loop or staple, o^2 , on the outside of the bucket O, near the bottom thereof. When the carrier N reaches the end of the track the tilting-rope R^2 is pulled, so as to oscillate the bucket on the pivots of its bail and tip it over, so that its top edge on one

side catches in the hooks r , and thus the contents of the bucket are discharged in the direction indicated by the arrows in Fig. 2. The carrier may then be run back on the track by pulling on the rope R^2 .

The rod P is provided with a friction-roller, p^3 , just above its pulley p . This allows the portion of the rope K between the pulleys Q and Q^2 to run freely when passing in contact with said roller.

The rope K is provided with a loose washer, w , just above its hook k . When the rope is arranged in the manner shown in Fig. 1, as the bucket reaches its highest elevation and the rope K becomes taut, the hook k is disengaged from the link n^2 , and the washer w prevents the rope from escaping through the pulley-block Q^2 , as illustrated in Fig. 7.

When the rope is arranged as shown in Figs. 2 and 4, the link q^3 of the pulley-block Q^3 is detached from the link n^2 as the rope becomes taut, and said pulley-block Q^3 then assumes the position shown in Fig. 2.

The bar M, heretofore referred to, is attached to the top of the frame-work A by a bolt, m , so that it may be oscillated in a horizontal plane. The bolt m passes through one of the top rails of the frame, and the bar is provided with a friction-roller, m^2 , riding on one of the top rails at the opposite side of the frame.

A lever, S, is pivoted in a swivel-fulcrum on one of the upright posts of the frame A, and the upper end of said lever is connected by a rod, s , with the bar M, by which means said bar is readily oscillated. When the bucket O is in the act of being lowered or hoisted, the bar M is placed in a position nearly parallel with the direction of travel of the rope. When the bucket has reached its highest position, and while the carrier is running to and fro on the rope, the bar M is swung to one side, as shown in Fig. 3, so as to throw the rope off from the pulley p and allow the carrier N to clear the same and the rod P.

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

1. The shaft G and wedge-shaped arm g , in combination with the drum C and gear-wheel E^2 , substantially as and for the purpose herein described.

2. The lever H and wedge-shaped arm h , in combination with the drum C and gear-wheel E, substantially as and for the purpose herein described.

3. The combination of the drum C, rope K, pulleys l l , carrier N, adjustable rod P, pulley p , friction-roller p^3 , and pulley-blocks Q Q^2 Q^3 , arranged as shown and described, for the purpose specified.

4. The combination of the bar M, lever S, and connecting-rod s , as shown and described, for the purpose specified.

5. The combination, with the hoisting-rope K, of the bar L, suspended from the bar M

and carrying the pulleys l l , the carrier N , provided with the pulleys n n and having its ends projecting beyond said pulleys, and the vertically-adjustable rod P , carrying the pulley p and friction-roller p^3 , as shown and described, for the purpose specified.

6. The tripping or tilting device consisting of the frame R and hooks r r , in combination with the bucket O and tilting-rope R^2 , as herein shown and described.

7. The combination, with the hoisting-rope K and the carrier N , provided with the link

n^2 , of the hook k and washer w and the pulley-block Q^2 , as shown and described, for the purpose specified.

8. The combination, with the hoisting-rope K , carrier N , and pulley-block Q^2 , of the intermediate pulley-block, Q^3 , as shown and described, for the purpose specified.

THADDEUS CONSTANTINE HISTED.

Witnesses:

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J. H. FRANKLIN.