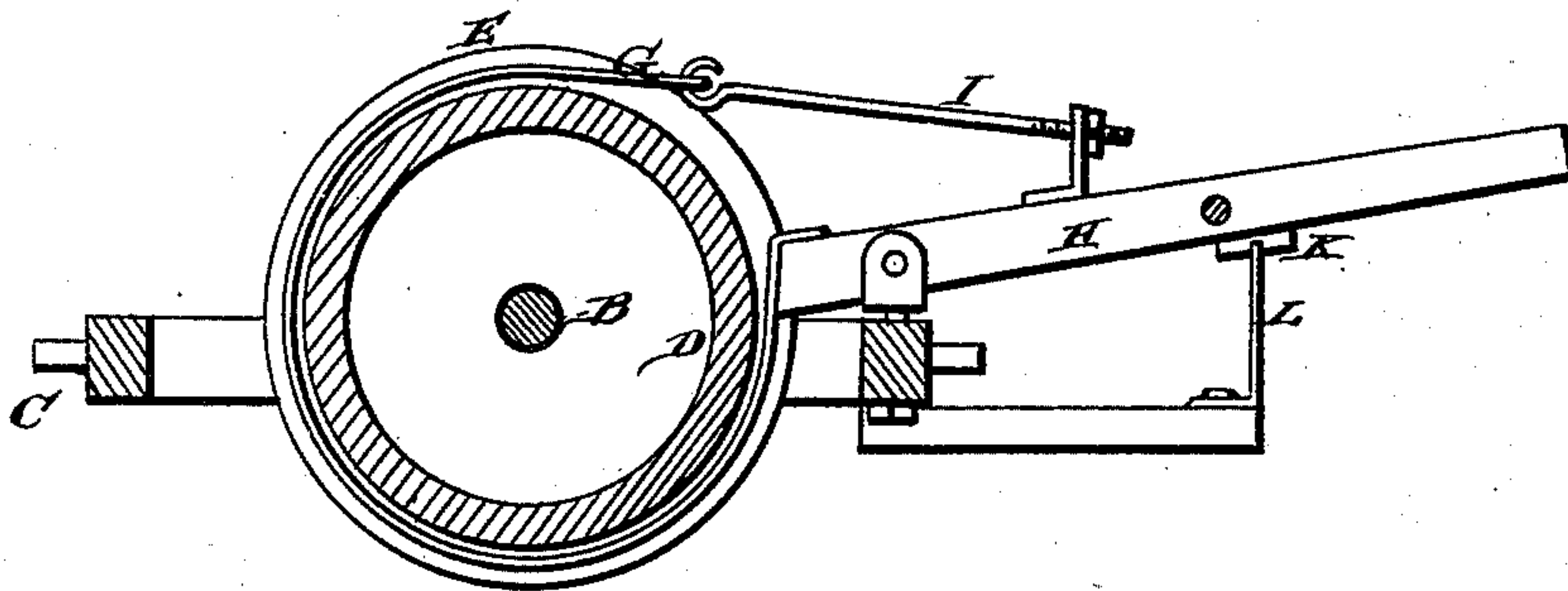


T. N. DAVEY.  
Hoisting-Machine.

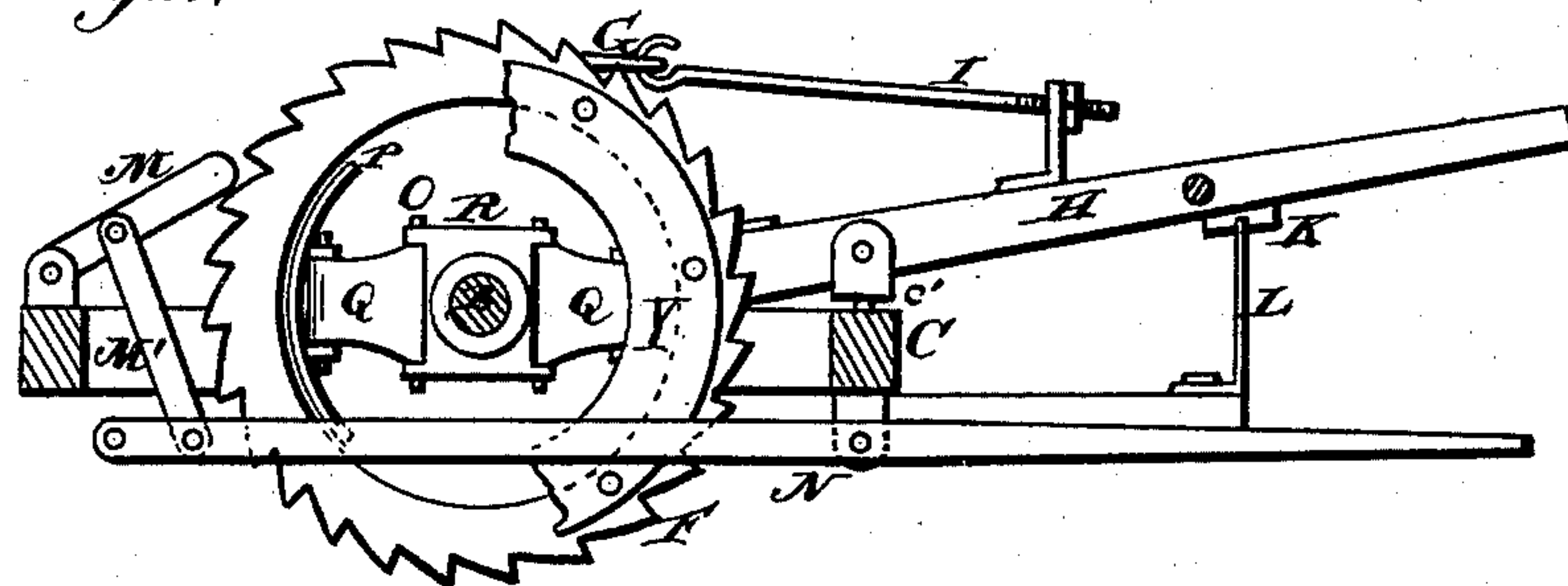
No. 222,675.

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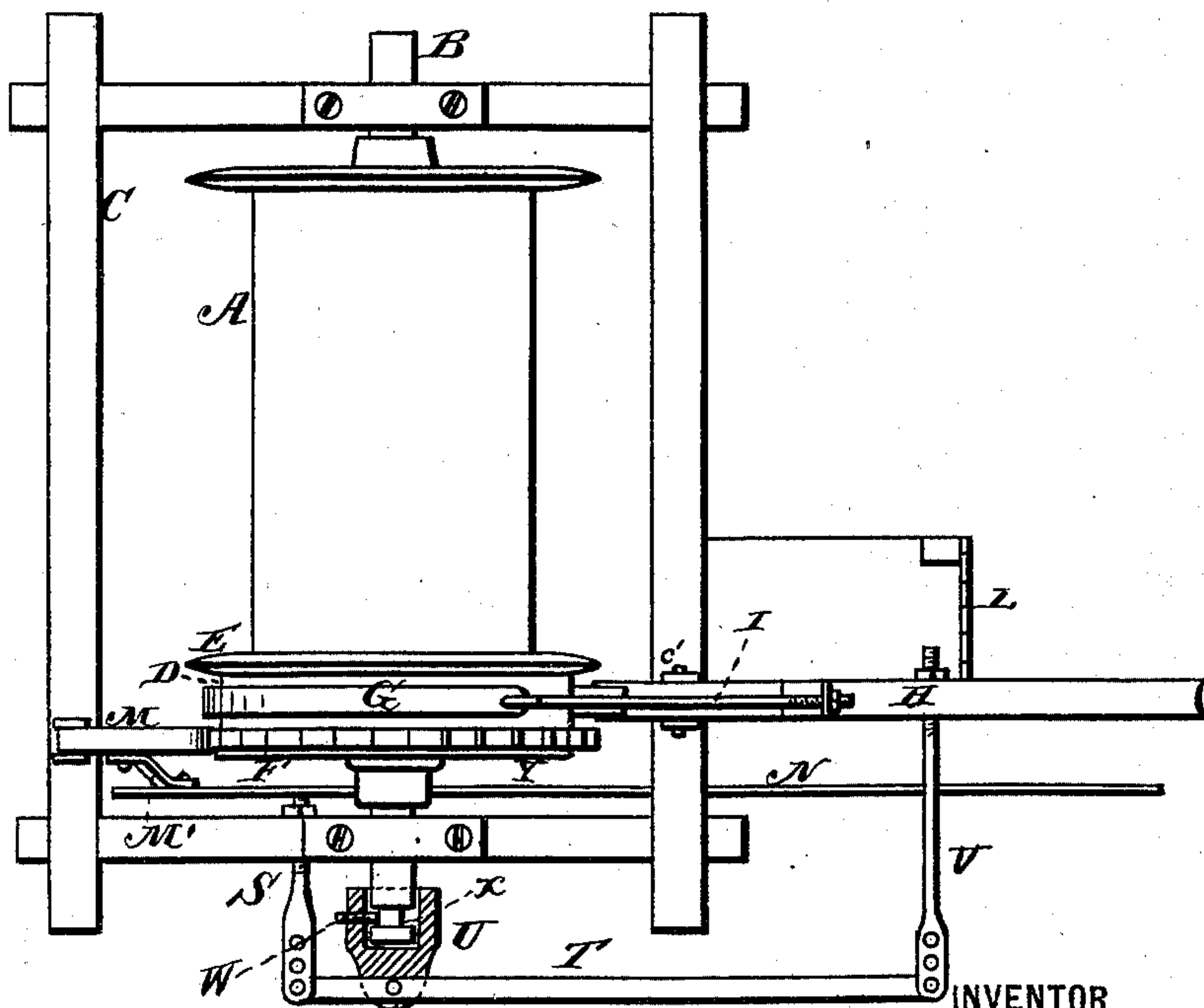
*Fig. 1.*



*Fig. 2.*



*Fig. 3.*



WITNESSES

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# UNITED STATES PATENT OFFICE.

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## IMPROVEMENT IN HOISTING-MACHINES.

Specification forming part of Letters Patent No. **222,675**, dated December 16, 1879; application filed October 18, 1879.

*To all whom it may concern:*

Be it known that I, THOMAS N. DAVEY, of the city of Carthage, in the county of Jasper and State of Missouri, have invented certain new and useful Improvements in Hoisting-Machines; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, and to the letters and figures of reference marked thereon.

Figure 1 of the drawings is a representation of a vertical section of my hoisting-machine. Fig. 2 is a side-elevation view, partly in section; and Fig. 3 is a plan view.

The nature of this invention relates to hoisting-machines, for mining and other purposes, in which means are employed for either retarding or positively checking the rotation of the rope-drum.

My improvement relates especially to Patent No. 215,102, granted to me May 6, 1879; and it has for its principal objects, first, to admit of the rotation of the drum being controlled by a brake-band and a toggle-jointed friction-clutch, both arranged to be operated by one and the same lever, whereby, in case of accident to one of the said checking devices, the other may be immediately brought into action without requiring the windlass-band to grasp at another lever, which, in the confusion arising from accidents, is sometimes forgotten until too late; secondly, to provide a knuckle-jointed pawl for engagement with a ratchet-wheel upon the drum, whereby all rotation of the drum in the direction to unwind the rope will be prevented until the pawl is disengaged by depressing a lever-bar, and, also, whereby, when the said operating lever-bar is disengaged, the pawl will automatically engage with the ratchet-wheel; thirdly, to provide an expansible toggle-jointed friction-clutch, so arranged that the faces of its shoes will adjust themselves to the inner face of a friction-drum irrespective of the angles at which the parts of the clutch are set by the operating-lever, all as fully described in the following specification, and particularly pointed out in the claims.

Referring by letter to the drawings, A designates the rope-drum, which is loosely mounted upon a shaft or axis, B, within a suitable frame, C, the said shaft being arranged so as to slide in its bearings, as presently explained.

The rope-drum is provided at one of its ends with a hollow friction-drum, D, which is formed with an annular flange, E, and a ratchet-wheel, F, the two being at sufficient distance apart to leave a bearing-surface for the friction-brake strap or band G. This brake-band is connected at one end with the end of a lever, H, and at its other end with a hooked rod, I, which is adjustably connected to the lever H. This lever is swiveled at its fulcrum bearing *c* upon the frame, so as to have a horizontal as well as a vertical movement, and it is provided upon its under side with a catch, K, adapted to engage with the rack L.

M designates a pawl, which engages with the ratchet-wheel upon the friction-drum, and which is connected with the lever-bar N by means of a knuckle-joint, M'.

O designates the expansible friction-clutch, which is composed of the long shoes P, fitted to the inner face of the friction-drum and hinged to the links Q. These links are in turn hinged to a hub, R, which is rigidly secured upon the sliding shaft B. The mechanism for operating this clutch is composed of a rod, S, secured to the frame, a lever-bar, T, which is pivoted to the rod S and to a fulcrum-block, U, upon the end of the shaft B, and a rod, V, which is pivoted to the said lever T, and also connected to the lever H, which, as above stated, is also arranged to operate the brake-band. The fulcrum-block U is mounted loosely upon the shaft B, and held thereon by means of a pin, W, which works in an annular groove, X, formed in the shaft.

By means of the pawl and ratchet the drum will be locked so as to prevent the unwinding of the rope, and the consequent descent of the bucket or cage in the shaft, and it will be unlocked only so long as the end of the rod which actuates the pawl is depressed. By reason of the knuckle-joint which connects the pawl with said rod, the pawl may be more readily disengaged from the ratchet under a load than if but a single joint were employed. If at any



time during the ascent of the bucket or cage the friction-gear should become disarranged, the pawl will prevent the drum from rotating backward.

The expansible toggle-jointed friction-clutch is operated by moving the brake-lever horizontally, which, through the medium of the connecting mechanism hereinbefore described, will cause the shaft B to shift endwise, so as to cause either a contraction or an expansion of the links Q. When these links are expanded the shoes which are hinged to the same will be forced against the drum, so as to check the loose rotation thereof on shaft B. The faces of these shoes always adjust themselves to the inner face of the drum, irrespective of the angles of the links, by reason of the hinge-joints.

In order to maintain the shoes within the friction-drum the said drum is provided with an annular flange or ring, Y, as shown; but one brake-lever is used for hoisting or lowering purposes, and hence there will be no possibility of the operator grasping the wrong lever, as often occurs where two are employed. In lowering, should the brake-band become disarranged, the friction-clutch can be immediately applied by a side movement of the brake-lever.

For convenience I arrange the rod by which the pawl is operated so that it can be depressed by the workman's foot, and hence the moment it is relieved from such pressure the pawl will automatically engage with the ratchet-teeth upon the friction-drum.

The operation of my improved hoisting-machine is as follows: When power is applied to the shaft to hoist, the operator pushes the lever horizontally, so as to expand the friction-clutches against the inner face of the drum in

which they are arranged, thereby connecting the rope-drum with the shaft, so as to wind up the rope. In lowering, the lever is pushed back horizontally in a direction reverse to the above, thus disengaging the friction-clutches, and at the same time the operator also depresses the rod N with his foot, disengaging the pawl thereby, and allowing the rope-drum to revolve so as to unwind the rope, the speed of said drum being controlled by raising or lowering the lever which acts on the brake-band.

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

1. In a hoisting-machine, the combination of the friction-drum D, brake-band G, levers N H, and friction-clutch O, having the brake-shoes P, and hinged links Q, connecting the same with a sliding shaft, B, substantially as and for the purposes specified.

2. The rope-drum A and friction-drum D, provided with a ratchet-wheel, F, in combination with the pawl M, connected with the lower bar, N, by means of a knuckle-joint, M', substantially as shown and specified.

3. The friction-drum D, brake-band G, brake-lever H, rack L, expansible friction-clutch O, and the mechanism connecting the fulcrum-block upon the end of the sliding shaft with the brake-lever, substantially as specified.

In testimony that I claim the above I have hereunto subscribed my name in the presence of two witnesses.

THOMAS NICHOLAS DAVEY.

Witnesses:

JOHN F. HAMPTON,  
WM. McMILLAN.