No. 631,653. Patented Aug. 22, 1899.

G. W. MORGAN.

WINDLASS.

(Application filed May 16, 1899.)

(No Model.) 2 Sheets—Sheet 1.

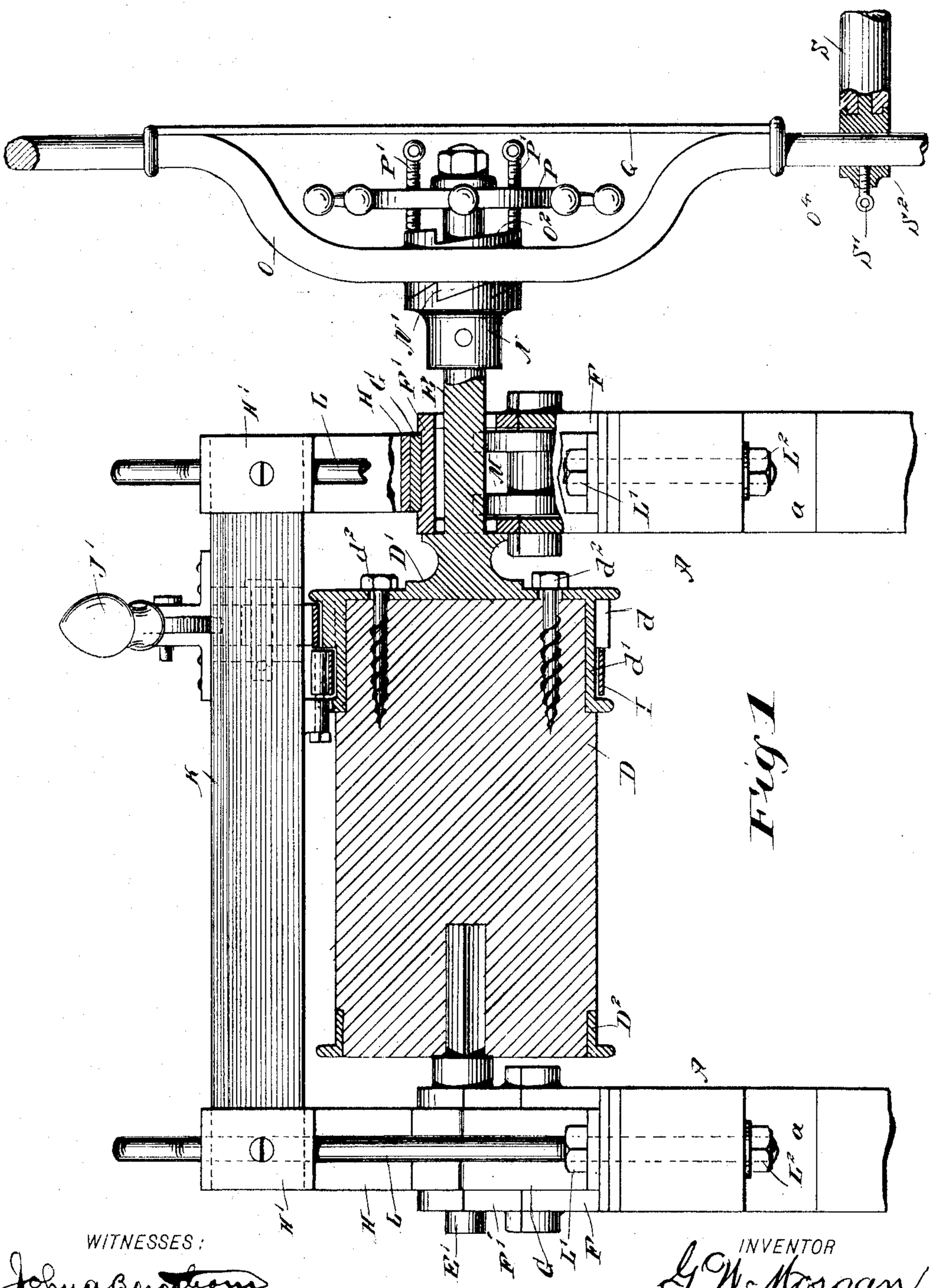

Fig. 1.

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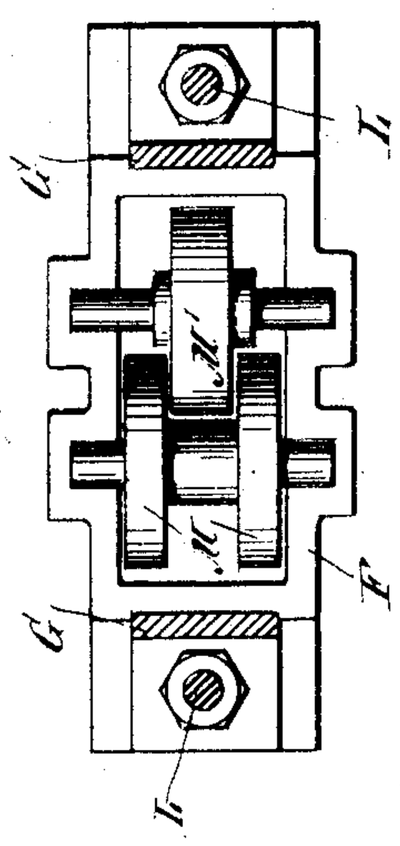

Fig. 3

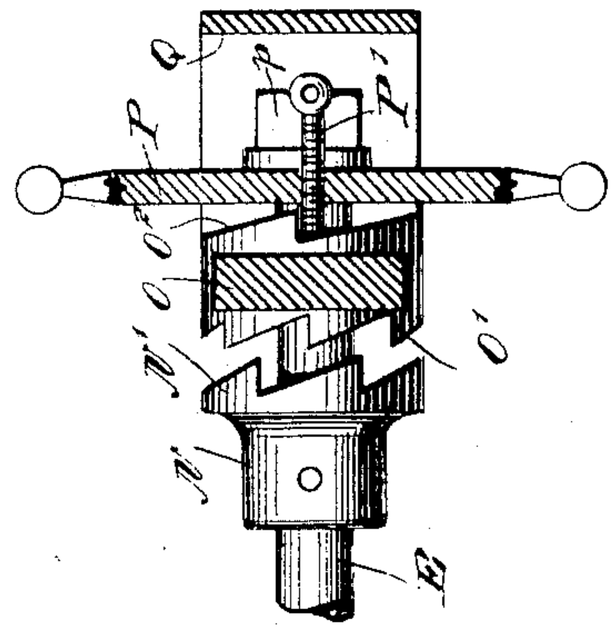

Fig. 5

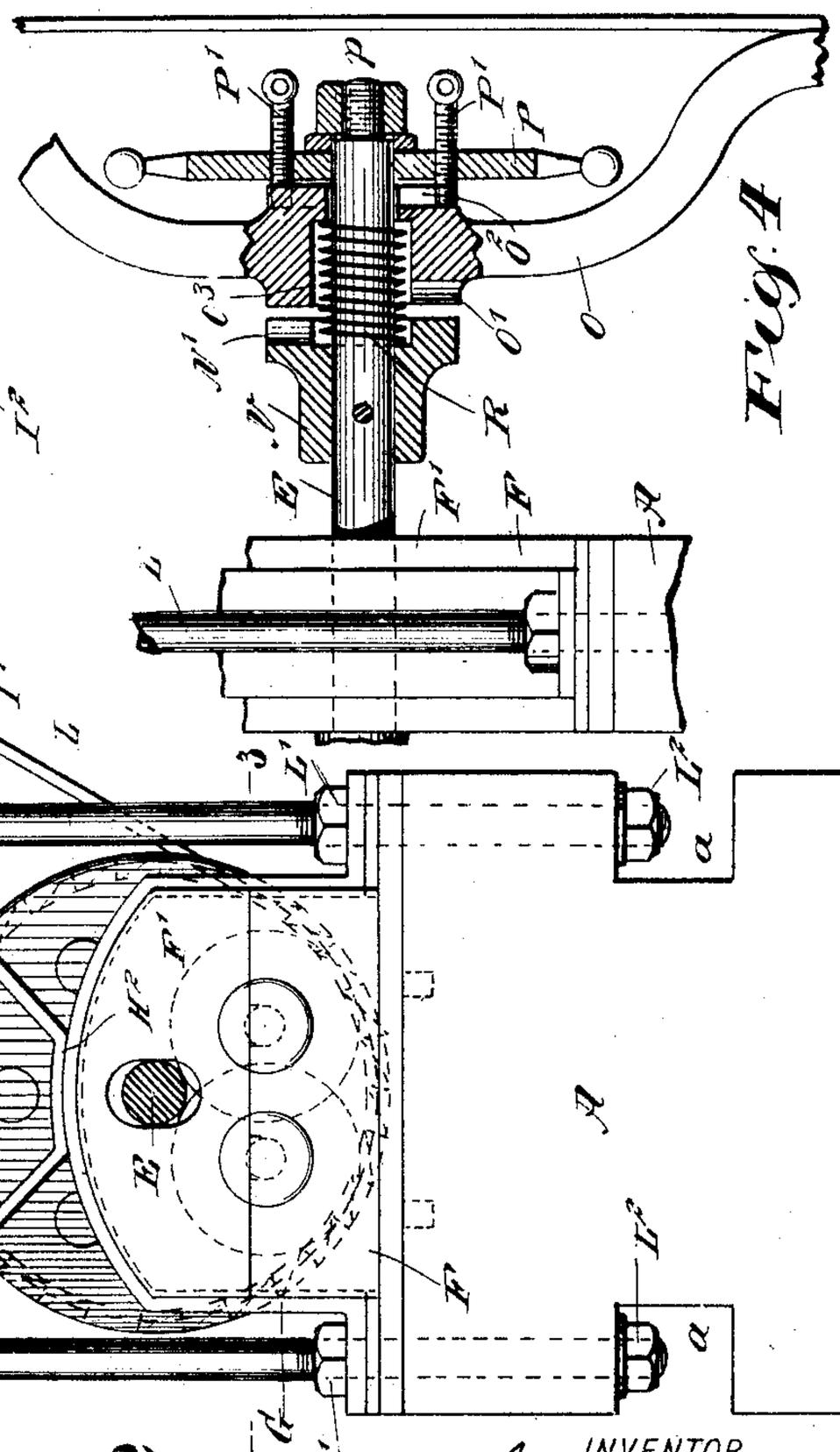

Fig. 4

Fig. 2

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GEORGE WASHINGTON MORGAN, OF DAWSON, CANADA.

WINDLASS.

SPECIFICATION forming part of Letters Patent No. 631,653, dated August 22, 1899.

Application filed May 16, 1899. Serial No. 716,999. (No model.)

To all whom it may concern:

Be it known that I, GEORGE WASHINGTON MORGAN, of Dawson, Northwest Territory, Dominion of Canada, have invented a new and Improved Windlass, of which the following is a full, clear, and exact description.

My invention relates to an improvement in windlasses by which the windlass is made of a more simple and light construction than ordinarily and by which also the windlass-crank is automatically freed from the drum if the latter suddenly starts backward, whereby the accidents which are of frequent occurrence from this cause are prevented.

My invention comprises the novel features which will be hereinafter described and claimed.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a longitudinal elevation, partially in section, of my device. Fig. 2 is an end elevation thereof. Fig. 3 is a sectional plan showing the roller-bearing for the windlass-drum. Fig. 4 is a sectional elevation of a clutch connection between the crank and the drum-shaft. Fig. 5 is a plan of the clutch connection for the crank and a clutch-controlling wheel partly in section.

In using windlasses about mines and similar places it often happens that the crank-handle will slip out of the operator's hands or in other ways the windlass will suddenly be freed, so that the weight which is suspended thereon will revolve it rapidly backward, in which case the crank, if it should strike the operator, is liable to cause very serious damage.

The principal object of my invention has been to connect the crank with the drum of the windlass in such manner that if it is suddenly freed from any cause the crank will be released from the drum of the windlass, and accidents due to this cause may be averted.

Another object has been to make the essential parts of the windlass which cannot be provided near where the windlass is to be used of such shape and construction that they may be light and easily transported.

The windlass as herein shown is designed to be supported upon the upper ends of two posts A, which have notches *a* formed in opposite sides and adapted to receive the nuts L^2, which are placed upon the lower ends of the frame-bars L. One of these posts is placed at each side of the shaft-opening, and the frame-bars L, which are of an inverted-U-shape and made of round iron, have their lower ends inserted through holes bored in the upper end of the posts and terminating in the notches *a*. The lower portions of the frame-bars L are threaded so as to receive nuts L′ and L^2, which are placed respectively at the upper end of the post and in the notches *a*. Upon the upper ends of the posts are placed the lower halves F of a casing which contains the roller-bearings for the windlass-shaft. Within this casing are placed two shafts carrying, respectively, the double rollers M and the single roller M′, which are adapted to support the shaft E in the valley between the upper portions of said adjacent rollers. This bearing is in many respects similar to the bearing often used for grindstones. The upper casing F′ is placed above the rollers and has holes adapted to receive the shaft E. The upper casing-section F′ has slight flanges at its edges adapted to retain the strap G, which is made of flat bar-iron and passes about the two casing-sections and is held down upon the post A by means of the nuts L′.

A brace-bar H, which is constructed of flat bar-iron, is bent at each end, so as to form an open clip H′, the ends of said clips being provided with holes adapted to receive the two vertical members of the frame-rod L. The central portion of this bar H is bent downwardly and has a short section H^2 bearing upon the strap G, which is above the journal-casing F′. The length of the vertical members of the frame-bars L is adjusted by the nuts L′ L^2, so that the bends in their upper portions engage with the extreme ends of the brace-bars H, and thus hold them firmly. The opening provided by the clip H′ formed in each end of each brace-bar is adapted to receive an end of a longitudinal bar K, which extends from one of the posts across to the opposite one, thus connecting them and holding them firmly together by the clamping action of said clips. The parts described which form the frame of the windlass may all be held

together and drawn up snugly by the nuts L′ and L² upon the lower ends of the frame-bar L.

Upon one of the bars K which extends longitudinally of the windlass is mounted a dog J, which engages ratchet-teeth *d*, formed upon a cap or band which surrounds one end of the windlass, thus preventing its flying backward unless the pawl is disengaged. This pawl is operated to release the windlass by means of a lever J′, which is pivoted upon one of the longitudinal bars K. The windlass-drum is formed of a round log D or in any other convenient manner and may be made of a length to correspond with the requirements of each particular case. At one end it is provided with a band D², which prevents the log from splitting, said band being preferably provided with a flange, which will retain the rope in place. The other end of the drum is placed within a cap D′, which consists of a plate having a ring or flange divided into two sections, one of which is provided with the ratchet-teeth *d*, before mentioned, and the other section *d′* rendered smooth and adapted to receive a friction brake-band I. This cap is firmly secured to the windlass-drum by means of lag bolts or screws *d²* or in any other convenient manner.

The cap D′ has a shaft E extending therefrom and resting upon the rollers M and M′, forming the bearing at this end of the windlass. This shaft extends through said bearing, and on the projected portion a boss N is secured thereto, forming one half of a toothed clutch, the teeth N′ formed on the end face of which are sloping in one direction, so that when turned in direction of the slope of the teeth it will slide upon the other half of the clutch without rotating it, but will engage it firmly when turned in the opposite direction. The other half of the clutch is formed upon the hub of the crank-arm O and is provided with teeth O′ similar to the teeth N′ and meshing therewith. This crank-arm is mounted loosely upon the shaft E and is engaged with the shaft to turn it by being forced toward the boss N. The hub of the crank-arm is hollow, as shown in Fig. 4, and within this hollow is placed a spirally-coiled spring R, which is so adjusted as to normally hold the two parts of the clutch separated. Outside of the crank-arm O is a wheel P, which is mounted loosely upon the shaft, but is prevented from sliding longitudinally upon the shaft beyond a certain point by means of a nut *p* placed upon the end of the shaft.

The outer face of the hub of the crank-arm has inclined surfaces O², forming cams which are adapted to be engaged by the ends of set-screws P′, which pass through the wheel P. These surfaces are inclined in the same direction as the teeth upon the opposite face of the hub. By reason of this construction if the wheel P is turned so that the ends of the set-screw lie at the bottom of the inclines the spring R will force the crank-arm away from the boss N, and thus release it from the windlass-drum, while if the wheel P be turned so as to cause the ends of the set-screws to ride upward on the inclines the crank-arm will be forced toward the boss N and the teeth O′ and N′ engaged so as to lock the crank-arm to the windlass. By reason of the relative inclination of the surfaces O² and the teeth O′ if the windlass is given a sudden start backward the inertia of the wheel P will cause it to lag behind the motion of the crank-arm and the ends of the set-screws P′ will slide down the inclines, thus permitting the spring R to disconnect the crank-arm from the windlass-shaft. The windlass will then run down without the crank being turned by it, and many accidents which are caused by such action of ordinary windlasses will be prevented. A bar Q is shown as extending from the crank-arm over the face of the wheel P, so that the same is protected against disturbance while in use. A friction band-brake is provided by connecting one end of the iron band I to one of the longitudinal bars K and carrying it about the smooth portion of the cap D′. At its free end it is provided with a handle I², by means of which it may be operated.

The form of frame herein described, it will be seen, is very light. At least that portion which must be transported to the point where the windlass is to be used is very light. It is possible in most locations to find wood from which the wooden portions of the windlass may be constructed.

The end of the windlass-drum D which is opposite the crank is provided with a gudgeon E′, which may be inserted in its end and form the journal upon which it turns. The end O⁴ of the crank has a handle S thereon, adjustable to accommodate people of different sizes. The opening in the eye S² of the handle and the end O⁴ of the crank are not completely circular in cross-section, so that the handle will not turn about the crank, and the handle may be secured in any position by a set-screw S′. By this means the length of handle may be readily adjusted to suit persons of different stature, and thus contribute much to the comfort of the operator and enable him to accomplish more in a given time.

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

1. A windlass, having a crank mounted loosely on its shaft and provided with a face ratchet or clutch connection with the drum, means acting to separate the parts of said clutch when unrestrained, the outer face of the crank-hub having cam-inclines corresponding in direction of slope with the teeth upon its inner face, and a wheel journaled upon the outer end of the shaft and having projections adapted to engage said cam-inclines, substantially as described.

2. A windlass, having a crank loosely journaled upon its shaft, the crank and shaft being provided with face ratchets or clutches,

means for normally disengaging the clutches, a clutch-locking member rotated in a direction opposite that of hoisting to lock the two together, and adapted to free crank and windlass by its inertia upon a sudden backward rotation of the windlass, substantially as described.

3. A windlass having a crank loosely journaled upon its shaft, the crank and shaft being provided with face ratchets or clutches and the crank having cam-inclines upon its outer face sloping in a similar direction to the teeth upon its inner face, means for holding the clutches disengaged, a wheel journaled on the shaft outside the crank, and set-screws passing through said wheel and engaging the cam-inclines, substantially as described.

4. A windlass, having a crank loosely journaled upon its shaft, the crank and shaft being provided with face ratchets or clutches, the hubs of said clutch members being hollow, a spring in said hollow normally holding them separated, a clutch-locking member rotated relative to the crank and in a direction opposite that of hoisting to lock the crank and windlass together, and adapted to free them by its inertia upon a sudden backward rotation of the windlass, substantially as described.

5. A windlass, having a crank loosely journaled upon its shaft, the crank-shaft being provided with face ratchets or clutches, the hubs of said clutch members being hollow, a spring in said hollow normally holding them separated, the crank-hub having cam-inclines upon its outer face sloping in a direction similar to that of the teeth upon its inner face, a wheel journaled on the shaft outside the crank, and set-screws passing through said wheel and engaging the cam-inclines, substantially as described.

6. A windlass-frame, comprising journal-boxes formed of upper and lower parts, standards for the ends each composed of an inverted-U-shaped bar, a longitudinal bar for each side, and a brace-bar having its ends bent to encircle three sides of said longitudinal bars and having holes receiving the vertical members of the standard just within the longitudinal bars, the central portion of said brace-bar engaging the upper journal-box and means for binding the ends of the bar forming the standard down to a suitable support, substantially as described.

7. A windlass-frame, comprising two standards, one for each end, consisting of an inverted-U-shaped rod provided with means for securing its ends to a suitable support, and a brace-bar having its ends bent to form clips each adapted to receive a frame-bar and having holes located upon each side of the opening of the clip and adapted to receive a vertical member of the U-shaped bar, the center of said brace-bar bending downward to engage the upper journal-box, substantially as described.

8. A windlass-frame, comprising two standards, one for each end, consisting of an inverted-U-shaped rod, and a brace-bar having its ends bent to form clips each adapted to receive a frame-bar and having holes located upon each side of the opening of the clip and adapted to receive a vertical member of the U-shaped bar, the center of said brace-bar bending downward to engage the upper journal-box, and a bar passing over the journal-box and having holes in its ends receiving the vertical members of the U-shaped bar, said U-shaped bar being threaded at its ends and passing through windlass-supports, and nuts thereon above and below its supports, substantially as described.

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Witnesses:
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