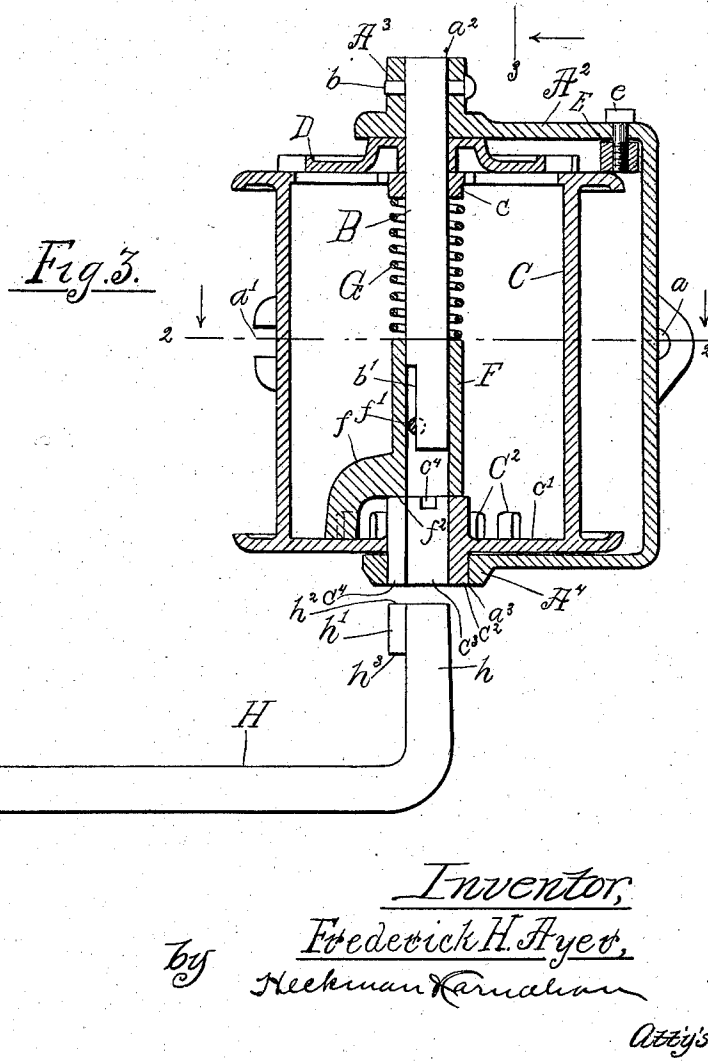
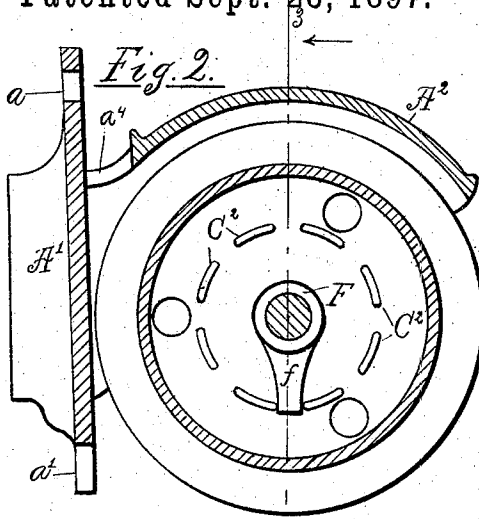
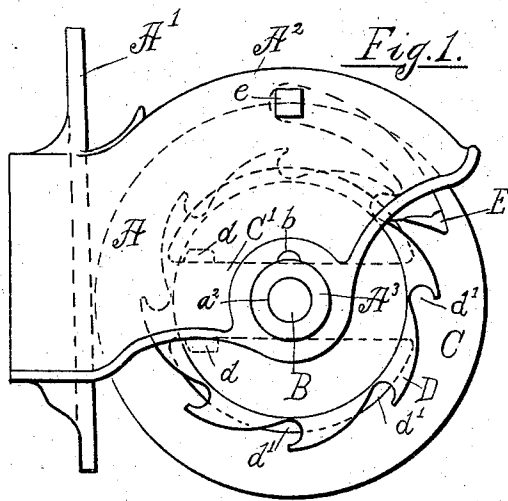


(No Model.)

F. H. AYER.
WINDLASS.

No. 590,940.

Patented Sept. 28, 1897.



Witnesses.
F. H. Ayer
H. H. Ayer

Inventor,
Frederick H. Ayer,
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UNITED STATES PATENT OFFICE.

FREDERICK H. AYER, OF DOWNER'S GROVE, ILLINOIS.

WINDLASS.

SPECIFICATION forming part of Letters Patent No. 590,940, dated September 28, 1897.

Application filed July 10, 1895. Serial No. 555,499. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK H. AYER, a resident of Downer's Grove, in the county of Du Page and State of Illinois, have invented certain Improvements in Windlasses; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to windlasses, and has reference more particularly to an improved self-locking windlass especially designed for use in raising and lowering electric lights, although well adapted for general use.

The object of the invention is to provide a windlass of simple, strong, and durable construction, provided with an inaccessible internal locking mechanism which operates to automatically lock the drum thereof from rotation upon the removal of the crank-handle.

The invention consists in the matters hereinafter described, and more particularly pointed out in the appended claims, and will be readily understood from the following description, reference being had to the accompanying drawings, in which—

Figure 1 represents an end elevation of my improved windlass. Fig. 2 is a transverse vertical sectional view taken on line 2 2 of Fig. 3 and looking in the direction of the arrows. Fig. 3 is a longitudinal sectional view taken on line 3 3 of Fig. 2 and looking in the direction of the arrows.

As shown in said drawings, A designates as a whole a combined bracket-support and housing consisting of a vertical back plate A', herein shown as made concave transversely, so as to fit against the side of an ordinary light-supporting pole, and provided at top and bottom with bolt-apertures a a' , respectively, the latter having the form of an open-ended slot. The housing proper, A², is in the form of a semicylindrical hood, formed integral with the back plate A' and provided in each end with shaft-apertures a^2 a^3 , formed through thickened hub portions A³ A⁴, located at the opposite ends of the housing.

B designates a supporting-shaft or elevated bearing-stud secured rigidly within the aperture a^2 by means of a rivet b , extending

transversely through the hub A³ and shaft or bearing-stud B therein. The length of the bearing-stud B is somewhat less than the width of said housing, so as to terminate at its inner end some distance within the opposite inner side of the housing and in axial alinement with the aperture a^3 thereof.

C designates a winding-drum mounted to rotate within the housing A, one end thereof c being mounted upon the bearing-stud B, while the opposite end c' is provided with a trunnion c^2 , which is journaled within the aperture a^3 of the housing.

D is a ratchet-disk rigidly secured upon the end c of the drum exterior to the latter and between it and the adjacent end of the housing, the means of securing the ratchet-disk to the drum shown herein consisting of lugs d d' , which engage opposite sides of an integral end cross-bar C' of the said drum. (Shown in dotted lines in Fig. 1.) Within the periphery of the disk D are formed a plurality of deeply undercut ratchet-notches d' , with which is adapted to engage a gravity-pawl E, mounted upon the inner upper side of the housing by means of a screw-stud e .

C² indicates a plurality of stop-lugs arranged in an annular series, so as to project inwardly from the end c' of the drum C. Upon the inner end of the shaft B is mounted a sliding sleeve F, provided with a radial and outwardly-curved arm f , adapted to fit between and engage the stop-lugs C², said sleeve being normally forced outwardly into engagement with the end of the drum by means of a coiled spring G, interposed between the inner end of the sleeve and the opposite end c of the drum. In order that the said sleeve F may be held from rotation and at the same time be permitted to slide endwise upon the shaft B, the end of the latter is flattened at one side within said sleeve, as at b' , and a key f' is inserted transversely through the sleeve F in position to engage with its side the said flattened portion b' .

H designates the crank-handle, the shank portion of which h is adapted to enter a bore or aperture c^3 , formed centrally through the hub or trunnion c^2 of the end c' of the drum.

h' indicates a spline or feather mounted upon the shank h of the crank and adapted to enter a corresponding keyway c^4 , formed

in one side of the bore c^3 . The inner end h^2 of the spline h' is adapted to engage with the outer end f^2 of the sleeve F , thereby forcing the latter back and releasing its arm f from engagement with the stop-lugs c^2 as the shank H is forced inward into operative position.

c^4 designates a rectangular notch formed in the inner end of the hub c^2 , adapted to receive the outer end h^3 of the spline h' when the latter has been forced inward through the keyway and the crank rotated so as to bring said spline into register therewith. The spring G , acting through the medium of the sliding sleeve F , serves to automatically force the spline into engagement with said notch, thus locking the crank positively to the drum. The depth of the notch c^4 is not sufficient to permit the arm f of the sliding sleeve to re-engage the lugs while the spline is interposed in the manner described, and the drum may therefore be rotated freely in the direction permitted by the ratchet and in the reverse direction also when the pawl is lifted free from the ratchet-notches.

a^4 indicates a slot formed through the upper side of the housing A^2 for the passage of the winding-cable, said slot extending transversely the full width of the winding-drum.

It will be noted that the number of stop-lugs C^2 and the number of ratchet-notches in the disk D are equal, and they are so arranged with reference to each other that when the arm f is engaged with any pair of stop-lugs the pawl will be fully entered within the corresponding ratchet-notch. The drum being at this time locked from movement, it will be impossible to lift the pawl because of the undercut form of the ratchet-notches. This construction has the advantage of simultaneously locking the drum from rotation and the pawl within the ratchet-notch and prevents any possibility of breaking the lock by first lifting the pawl and then jerking or pulling upon the cable.

It will be seen from the foregoing that the locking and unlocking of the windlass is accomplished automatically by the removal and insertion of the crank, and it is to be noted also that not only must a crank be of peculiar construction in order to operate the windlass, but that it will be very difficult, if not impossible, to insert or remove the crank unless the construction of the lock is understood.

From the above description it will be seen that I have provided a simple and strong windlass which will automatically lock itself in any position upon the removal of the handle and which cannot be operated or tampered with by unauthorized persons. The construction whereby the drum is provided with an overhanging housing is also deemed

a feature of importance, inasmuch as the drum is thereby protected from sleet and snow and interference therefrom avoided.

Obviously the details of construction may be varied to some extent without departing from the spirit of the invention. I do not, therefore, wish to be limited to the precise details shown herein, except as claimed.

I claim as my invention—

1. In a windlass, the combination of a supporting-frame, a drum-spindle, a hollow winding-drum mounted upon said spindle, a non-rotatable detent mounted to slide endwise upon the spindle within the drum and adapted to engage the interior of one end of the drum, a spring arranged to normally force said detent into engagement and a crank-handle adapted to be inserted in the end of the drum and to simultaneously disengage the detent from the drum and itself positively engage the latter.

2. In a windlass the combination of a supporting-frame, a drum-spindle, a hollow winding-drum mounted upon said spindle, a non-rotatable detent mounted to slide endwise upon said spindle and provided with an arm adapted to engage with a series of notches in the end of the drum arranged concentrically with the axis of the latter, a crank adapted to enter the end of the drum, and force back the detent out of engagement with the winding-drum, a spline upon the shank of the crank adapted to engage with a corresponding notch in the end of the drum when said shank is moved outwardly toward that end through which it is entered, and a spring tending to normally force the detent into engagement with the drum and also through the medium of said detent to force the shank into engagement with the drum when in position within the latter.

3. In a windlass, the combination of a supporting-frame, a winding-drum and handle, an inaccessible locking device within the drum for locking the latter from rotation, a series of ratchet-notches arranged concentrically with the axis of rotation of the drum, said ratchet-notches being of undercut form, and a pawl adapted to cooperate with said ratchet-notches to prevent the turning of the drum in one direction, the relation of the inaccessible locking device to said ratchet-notches being such that when the drum is locked the pawl will be prevented from being disengaged from the ratchet.

In testimony that I claim the foregoing as my invention I affix my signature in the presence of two witnesses.

FREDERICK H. AYER.

Witnesses:

JAMES HECKMAN,
CHARLES C. CARNAHAN.