(No Model.)

J. B. MORRIS & G. VOLL.

DEVICE FOR ELEVATING AND LOWERING ELECTRIC LAMPS.

No. 428,401. Patented May 20, 1890.

Fig. 1.

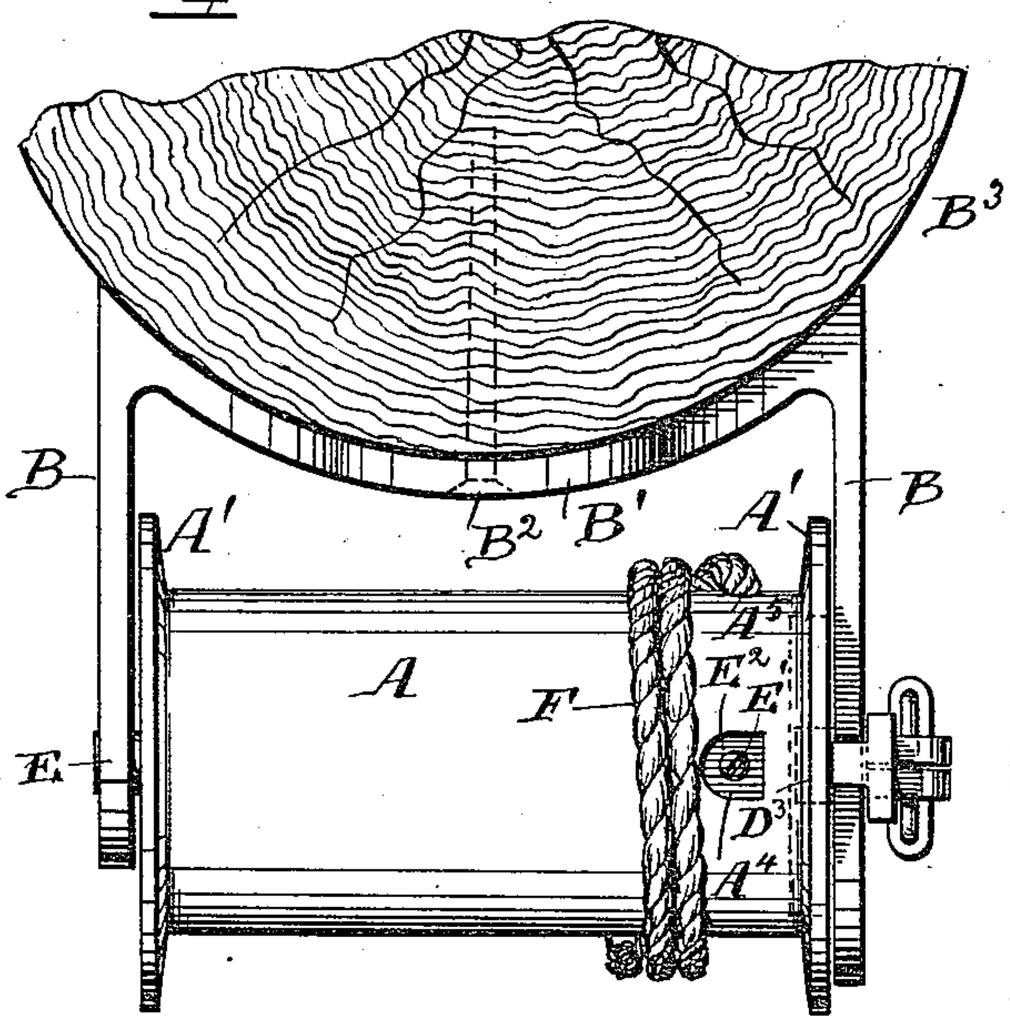

Fig. 2.

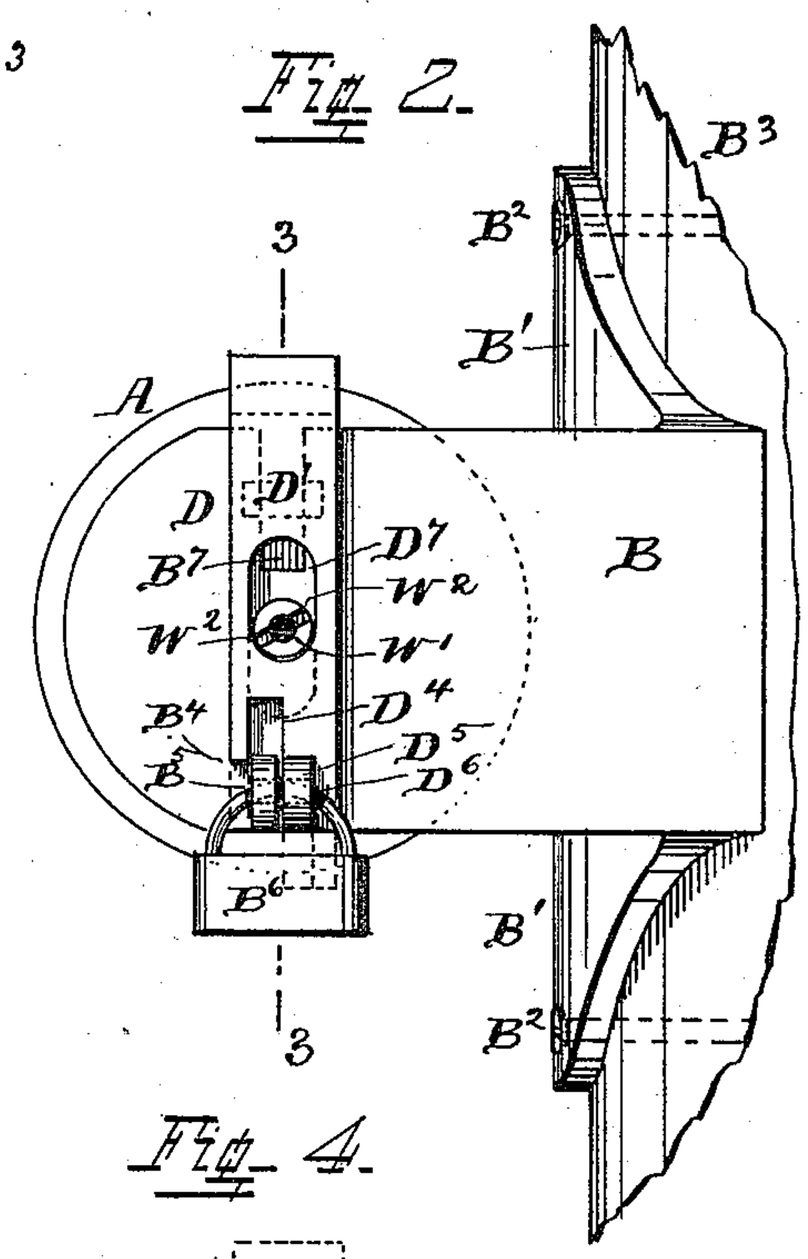

Fig. 3.

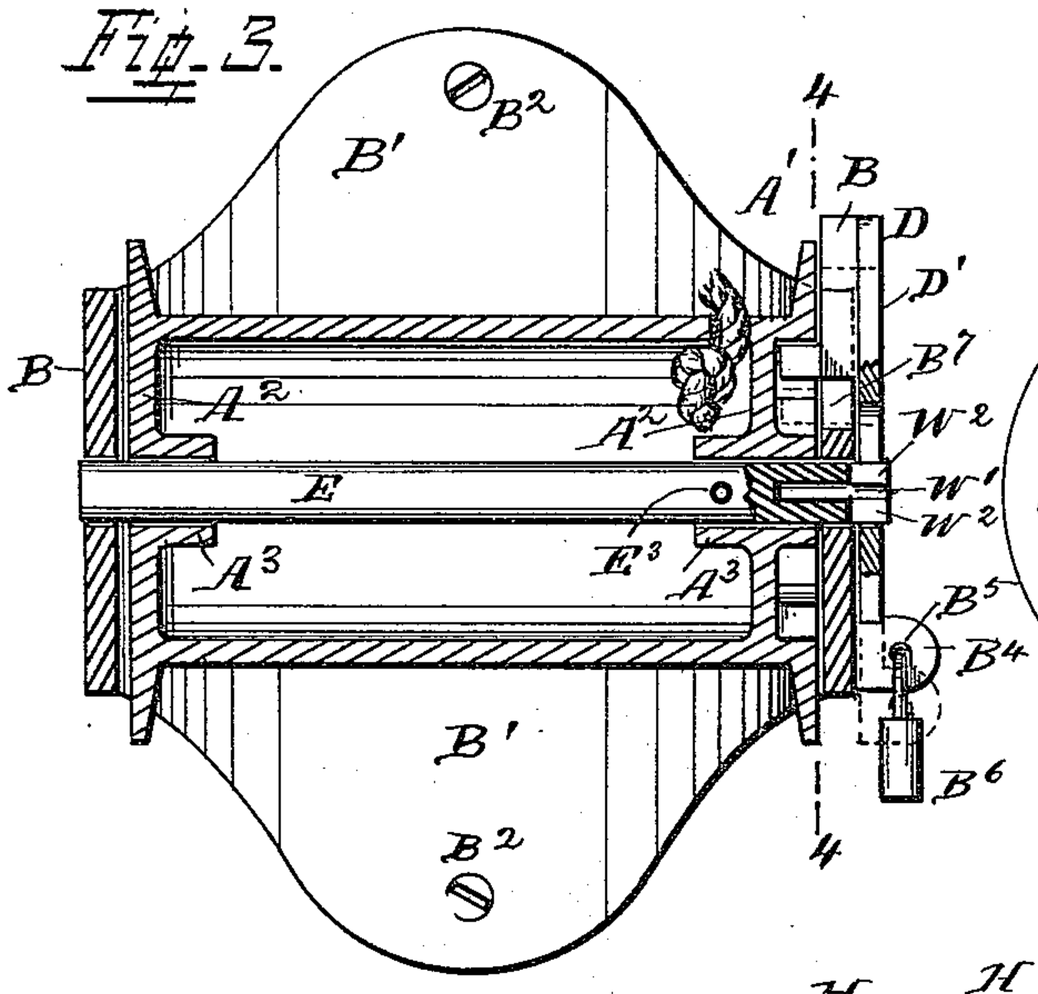

Fig. 4.

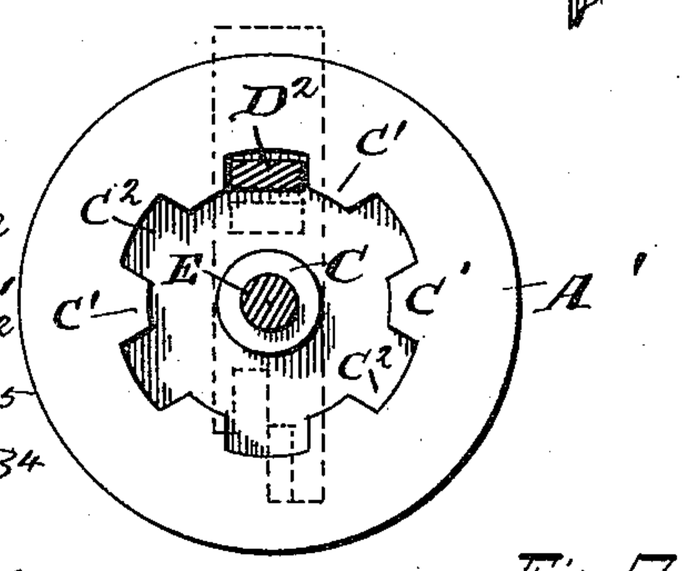

Fig. 7.

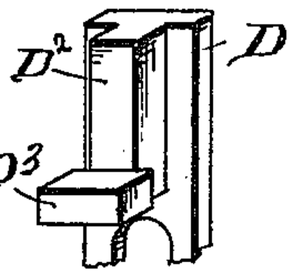

Fig. 5.

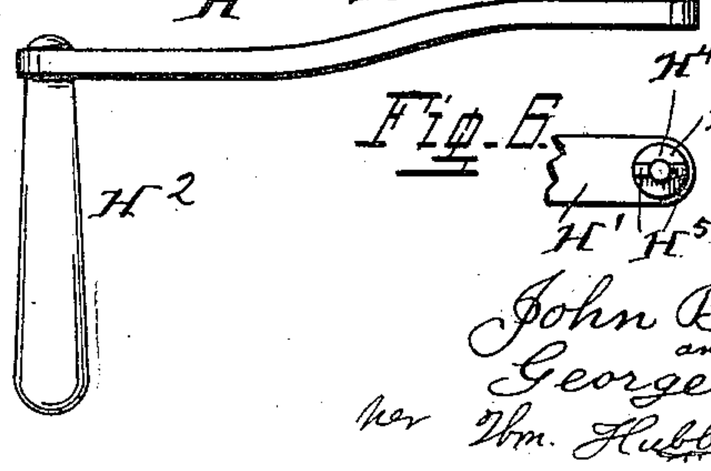

Fig. 6.

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UNITED STATES PATENT OFFICE.

JOHN B. MORRIS AND GEORGE VOLL, OF CINCINNATI, OHIO; SAID VOLL ASSIGNOR TO SAID MORRIS.

DEVICE FOR ELEVATING AND LOWERING ELECTRIC LAMPS.

SPECIFICATION forming part of Letters Patent No. 428,401, dated May 20, 1890.

Application filed February 1, 1890. Serial No. 338,933. (No model.)

To all whom it may concern:

Be it known that we, JOHN B. MORRIS and GEORGE VOLL, citizens of the United States of America, and residents of the city of Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Devices for Elevating and Lowering Electrical Lamps, of which the following is a specification.

The various features of our invention and the several advantages resulting from their use, conjointly or otherwise, will be apparent from the following description and claims.

In the accompanying drawings, making a part of this application, and to which reference is hereby made, Figure 1 is a top view of a windlass and its accompanying mechanism embodying our improvements. This figure also illustrates a common means for sustaining our invention—viz., a telegraph-pole—and also shows the preferred mode of attaching our improved windlass to said pole. In this figure the upper part of the pole is cut off, so as to the better illustrate the mode of applying our improved windlass to said pole. Fig. 2 is a side elevation of the windlass and its accompanying mechanism and of the portion of the pole shown in Fig. 1. Fig. 3 is a vertical central section of the same, taken in the plane of the dotted line 3 3 of Fig. 2, and looking toward that face of the section which faces toward the left in Fig. 2. Fig. 4 is a vertical transverse section taken in the plane of the dotted line 4 4 of Fig. 3, and looking toward the adjacent end of the windlass, and showing in section the axial shaft actuating said windlass, and showing also in section the tooth of the dog, which at will engages the circular rack at the other end of the windlass. The dotted lines on this figure indicate the sliding dog, whose tooth engages the rack of the windlass. From this view the supports of the windlass and the poles aforesaid are omitted. Fig. 5 shows an elevation of the adjustable clutch for operating the windlass and of the handle for operating the clutch, and Fig. 6 shows an elevation of the free end of the clutch and of a part of the said handle. Fig. 7 is a view in perspective of the side and rear of the upper portion of the dog, which at will engages the rack of the windlass.

It is here stated for the benefit of those needing information that the electric light or lamp, known ordinarily as the "arc light," is held aloft at an elevation desirable for the best utilization of the light by a wire rope running over a pulley or equivalent device and extended down to within easy reach of a person standing upon the floor or pavement. This wire is there wound upon a windlass. To lower the lamp the windlass is turned so as to unwind the rope from the windlass, and to elevate the lamp the windlass is turned so as to wind up the rope.

As heretofore constructed, a common pawl was pivoted at one end to a fixed part of the frame, the free end of this pawl engaging a common ratchet on the exterior of the periphery of a wheel or ring attached to the windlass. This old device was very imperfect and defective, as unless protected by an encompassing-box or other defensive inclosure it was insecure from manipulation by persons unauthorized to operate it. Children or thoughtless or mischievous adults in passing would lift the pawl, thereby freeing the windlass therefrom. The weight of the arc lamp pulling on the rope would then cause the unfettered windlass to turn and unwind the said rope. The arc light would at the same time rapidly descend, thereby not only endangering its own integrity, but also putting in jeopardy the lives of passers-by who accidentally might come into such contact with the electrical current passing through the lamp as to form a part of a direct electrical circuit or a powerful induced circuit.

Our invention not only obviates the above disadvantage, but presents other and novel advantages, hereinafter set forth.

A indicates the windlass, having an axial shaft E fixed thereto and extending beyond each end of the windlass. Beyond the rear end of the windlass this shaft is journaled in a bearing piece or arm B, and in front of the front end of the windlass the shaft is there journaled in another bearing or arm B. The shaft E passes through this last-named arm B, and the end portion of the shaft, formed as hereinafter described, projects in front of said arm B. . The arms B are suitably supported. They are preferably, as shown, rig-

idly united to a back piece B′. Ordinarily this back piece B′ and the arms B are cast together and are integral.

Where the windlass and its accompanying mechanism is to be supported by a telephone or telegraph post, or, like post B^3, circular in cross-section, the rear surface of the piece B′ will be concave, as shown, so as to fit the convexity of the post. The back piece B′ being placed against the side of the post at a suitable height thereon, it is secured to the post by screws B^2 B^2 passing through the back piece and into the post. A screw-hole in the upper part of the back piece B′ receives one of these screws B^2, and a screw-hole in the lower portion of the back piece receives another screw B^2. It is not necessary, however, that the securing of the back B′ to the post B^3 be limited to any particular mode. The back B′ is preferably made sufficiently long to extend up some distance above the windlass and down some distance below the latter, first, for the purpose of giving the back a greater bearing on the post, thereby securing the windlass more firmly in position, and, secondly, for the purpose of enabling the screws respectively located in said upper and lower portions of the back piece to be conveniently reached for insertion or withdrawal.

The windlass A is a hollow one. At the central portion of each end A^2 of said windlass, where the shaft E passes through it, it is preferably provided with an annular flange A^3, extending from the end A^2 of the windlass inward toward the opposite end thereof. These flanges A^3 afford a larger bearing on the shaft and strengthen the windlass at its point of junction with the shaft. One of these flanges A^3 (in the present illustrative instance the forward one) is also at E′ perforated radially to the longitudinal axis of the windlass, and this perforation is interiorly provided with a screw-thread and receives a set-screw E^2 engaging the screw-thread of the perforation. The shaft being placed in position in the windlass, as shown more particularly in Fig. 3, the set-screw E^2 is screwed through the perforation E and into a screw-threaded recess E^3 (see Fig. 3) in the shaft. The head of this screw E^2 is seen in position through opening A^5 in Fig. 1. The shaft is thus secured in position and the windlass is thereby rigidly connected to the shaft, so that the rotation of the shaft will rotate the windlass. An annular flange, similar to the flange A^3, is preferably also extended beyond the forward end of the windlass as far as the front face of the adjacent peripherial rim A′ of the windlass and gives additional strength to the windlass in the neighborhood of the shaft. The set-screw E^2 is reached and turned through an opening A^4 in the peripheral shell of the windlass. This opening A^4 also performs another function soon to be mentioned. A second opening A^5 is present in the shell, preferably in about the same vertical plane (when the axis of the windlass is horizontal, as shown) as the opening A^4. The opening A^5 is just large enough to allow the passage through it of the wire or other rope or cord F which is to be used on the windlass. The opening A^4 is large enough to allow the knotted end of said rope F to pass through it.

In practice, the proper length of rope, including its knot, to be used having been ascertained, the cord is cut of such length. Its free end next the windlass is now passed into the windlass through the opening A^5, closely fitting the latter, and is then passed up out of the windlass through the opening A^4, and drawn out a sufficient extent to enable a knot to be made out of this free end of said rope. The knot being formed on this end of the rope, the latter is pulled upon above the opening A^4 and the knot pulled through opening A^4 and into the interior of the windlass, and there remains, as it is too large to pass out through the opening A^5 of the windlass. The rope is thus securely and quickly fastened to the windlass, and at the same time the securing-knot is out of the way and cannot interfere with the coiling of the rope on the windlass or the uncoiling of said rope therefrom. The rope may obviously be quickly untied from the windlass when it (the rope) is uncoiled, and is relieved of the weight of the arc light it ordinarily sustains.

The forward end of the windlass is provided with a circular rack C, having teeth C′ and recesses C^2, the adjacent teeth being separated by a recess C^2. The number of teeth will preferably vary with the change in the diameter of the windlass. The circles between which those ends of each recess C^2 which are nearest to and farthest from the shaft E are located are concentric with the longitudinal axis of shaft E, and the same is true of the circle in which is located that end of each tooth which is nearest the shaft E. This rack, for the sake of compactness and strength, occupies a recess in the front end of the windlass, and the front end A^2 of the windlass and its annular flanges around the shaft are set back, as shown, while the annular rim A′ of the windlass is kept forward, so that its front face is flush with that side or face of each tooth C′ which faces toward the front arm B. This rim A′ is connected to the peripheral shell of the cylinder or an extension thereof, substantially as shown.

The peripheral shell of the windlass and the rims A′ and ends A^2, annular flanges A^3, and rack C are preferably cast in one piece, and hence are integral.

At the lower portion of the front face of the arm B is an extension or lug B^4 for enabling the sliding dog D, hereinafter mentioned, to be locked to the arm B. The main part D′ of this dog D slides against the front of the arm B, and in the present position of the parts the movement is a vertically reciprocating one. An arm D^2 of this dog D extends through a vertical slot B^7 in the arm B, and the rear end of this arm D^2 at and close

to the inner face of the arm B carries a tooth D^3. This tooth D^3 is wider than the slot B^7—that is to say, extends to the right beyond the right edge of said slot and to the left beyond the left edge of said slot. Hence it cannot, when in the position shown, pass through the said slot B^7; but it slides up and down on the inner face of the arm B when the arm D^2 slides in slot B^7, and the main part D′ of the dog D slides on the outer face of the arm B. The main part D′ of the dog is at its lower end provided with a vertical recess D^4, located directly over the lug B^4 of arm B, and of a size to receive said lug B^4.

Below the recess D^4 and to one side of the vertical plane thereof a lug D^5 is rigidly secured to and extends forward from the front face of the portion D′ of the sliding dog D. The object of this lug D^5 is to enable the dog to be locked to the arm B. Through this lug is a horizontal opening D^6, large enough to receive the hasp of the padlock or equivalent lock aforementioned. The recesses C^2 are substantially of the same width. The tooth D^2 is of a size to readily slide within any of the recesses C^2 and to closely fit against the sides of the same, these sides being the sides of the adjacent teeth C′. When the dog is elevated, the tooth has entered one of said recesses and the rotation of the windlass is prevented. The location of the lug D^5 on the dog D is such that when the dog is elevated, its tooth engaging the ratchet, the lug D^5 is alongside of the lug B^4 of the arm B and the perforation D^4 of the lug D^5 is opposite the perforation B^5 of lug B^4. The hasp of a padlock difficult to pick being passed through these openings and the padlock being locked, the windlass is securely locked in position and cannot be moved unless the padlock is picked by an experienced locksmith, or the windlass or its accompanying part broken by the blows of a sledge or other heavy instrument. When the padlock is unlocked and removed and the windlass turned to wind up the cord sufficiently to take the pull or tension of the rope, and consequently the pressure of the windlass and rack C from the tooth D^3 of the dog D, the latter will fall, and the tooth D^3, coming out of the recess C^2, the windlass is then free to rotate and the cord to unwind. When the dog D falls, the lug B^4 of the arm B comes within the recess D^4 of the dog D, thereby steadying the latter and also preventing the further descent of the dog. In the main portion D′ of the dog is a vertical slot D^7 of a width just sufficient to admit the front end portion of the shaft E, and this slot is sufficiently long to allow the dog D to reciprocate vertically, as far as already described. The shaft thereby aids in steadying the dog in its vertical movement.

In the front end of the shaft E is an axial recess W′. In this end of the shaft are also one or more recesses W^2. These recesses are preferably of less depth than the recess W′, and are located around the recess W′. Two of said recesses W^2 are amply sufficient. A crank-handle H, consisting of shank H′, carrying at one end a suitable handle H^2 and at the other the clutch portion H^3, is of use in connection with the recesses W′ W^2 of the shaft E. The length of the handle H^2 and clutch portion H^3 are at right angles to the length of the shank and are preferably located on the opposite sides thereof. The clutch portion H^3 consists of the central axial projection H^4 and the wings or lugs H^5. There are as many lugs H^5 as there are recesses W^2 of shaft E. Each of these lugs fits any one of the recesses W^2 of the shaft E, and the axial projection H^4 fits the axial recess W′. When the windlass is to be rotated, the padlock being unlocked and detached, the clutch portion H^3 is fitted to the front or clutch end of the shaft E, the parts H^4 H^4 respectively fitting the respective recesses W^2 and the axial projection H^4 entering the axial recess W′. This projection H^4 holds the positive and negative parts of the clutch in line. The dog being dropped and its tooth being disengaged from the rack C, the windlass, by means of the crank H, is rotated in the desired direction. When the rope is subjected to a tension from the weight of the arc light and the windlass is thus urged to rotate, the pressure of the windlass and rack upon the tooth of the dog will check its ready descent until a pressure is applied to the handle of the crank in the direction of winding up the rope on the windlass equal to the tendency exerted by the tension of the rope to turn the windlass in a direction to unwind it. The pressure of the rack C upon the tooth D^3 of the dog is thereby relieved, and the dog will fall by its own weight. Thereupon the windlass can be rotated as desired. The dog D is then elevated and thus engages the rack C. The hasp of the padlock is passed through the openings in lugs D^5 and B^4 and the padlock locked. The windlass is now securely locked in a stationary position.

It will be observed that our invention is compact in construction, simple and effective in operation, secure from manipulation of those not authorized to handle the windlass, and cheap of manufacture. It will also be observed that the parts co-operate in a very simple and novel manner to accomplish a number of valuable functions.

While the various features of our invention are preferably employed together, one or more of them may be employed without the remainder, and in so far as applicable one or more of them may be employed in connection with windlasses other than the one herein specifically set forth.

What we claim as new and of our invention, and desire to secure by Letters Patent, is—

1. The windlass and shaft supported on bearing B B, and circular rack carried by the windlass, and dog D, having a portion D′ located at the front side of bearing B, arm D^2, sliding in slot B^7 of said bearing and carry-

ing the tooth D^3, located at the inside of said bearing B and wider than said slot, and means, substantially as described, for holding the said tooth in engagement with said rack, substantially as and for the purposes specified.

2. The windlass and shaft supported on bearings, and circular rack connected to said windlass, and reciprocating dog upheld by arm B, the tooth of the dog when advanced engaging said rack, the dog carrying lug D^5, and the arm having lug B^4 for the reception of the locking bolt or hasp of a lock, substantially as and for the purposes specified.

3. The windlass having circular rack whose teeth point toward the axis of the windlass, a shaft on which said windlass is axially secured, bearings for said shaft, one of which bearings carries dog D, one part of which slides outside of said bearing, the dog having the arm D^2 located in a slot in said bearing and carrying tooth D^3, located at the inner side of said bearing for engagement with said rack, the outer portion D^5 of the dog being provided with lug D^4 and recess D^7, and the bearing B, carrying lug B^4, substantially as and for the purposes specified.

4. The windlass having circular rack whose teeth point toward the axis of the windlass, a shaft on which said windlass is axially secured, bearings for said shaft, one of which bearings carries dog D, one part of which slides outside of the said bearing, the arm D^2, located in a slot in said bearing and carrying tooth D^3, located at the inner side of said bearing for engagement with said rack, and means for locking the dog in position, substantially as described, the dog being provided with slot D^7, through which passes the front end of the windlass-shaft, the latter being there formed for engagement with a crank, substantially as and for the purposes specified.

5. The combination of the windlass, shaft thereof, bearings, circular rack, reciprocating dog having slot D^7, through which passes the said shaft, the dog having recess D^4 and lug D^5, and the arm B, having lug B^4, the shaft at its front end having axial recess W′, and recess or recesses W^2, and the crank having clutch portion H^3, having axial extension H^4, and extension or extensions H^5, substantially as and for the purposes specified.

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