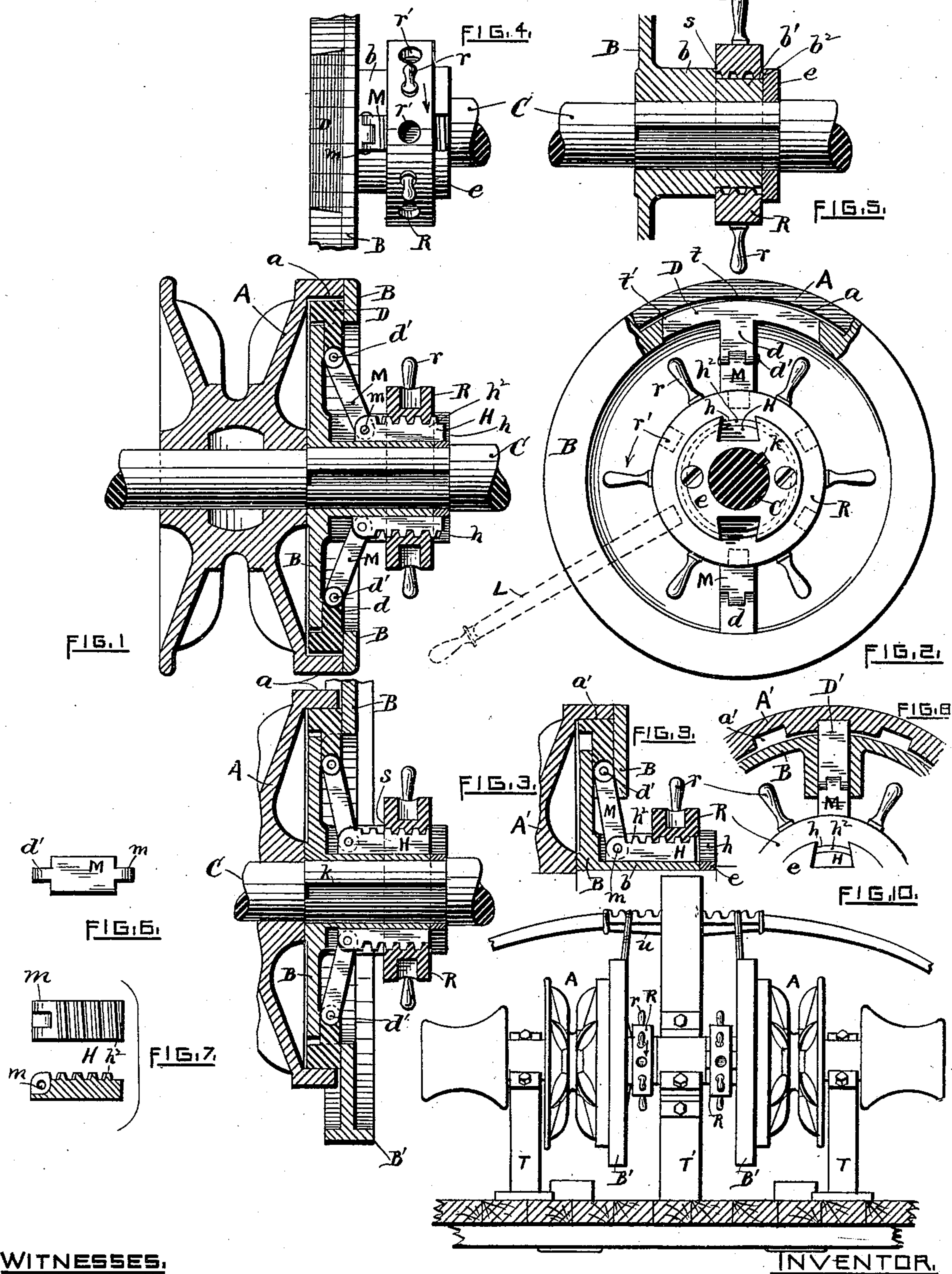


(No Model.)

F. A. GRATER.
LOCKING GEAR FOR WINDLASSES.

No. 316,259.

Patented Apr. 21, 1885.



WITNESSES.

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LOCKING-GEAR FOR WINDLASSES.

SPECIFICATION forming part of Letters Patent No. 316,259, dated April 21, 1885.

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To all whom it may concern:

Be it known that I, FRANCIS A. GRATER, a citizen of the United States, residing at Providence, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Locking-Gear for Windlasses; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

15 This invention relates to an improved device for connecting and disconnecting the loosely-mounted chain-wheel or wild-cat of a windlass with the driving mechanism; and it consists, essentially, in providing the hub of the driving-head (which is firmly secured to the windlass-shaft) with one or more exterior longitudinal grooves, each being fitted with a sliding key having a partial screw-thread thereon and connected by a short link, which in turn connects with the locking key or shoe, also mounted within said driving-head. An annular nut is loosely mounted upon the grooved hub between suitable thrust-collars for the purpose of engaging with the screw-threaded keys, whereby in "taking in" the chain cable the operator, by simply turning said nut, causes the locking-key (or keys) by means of the threaded key and link to move in an outward or radial direction and engage with the overhanging rim of the wild-cat, all as will be more fully hereinafter set forth and claimed.

By means of my improved locking-gear, which embodies the principle of the screw and toggle-jointed lever, the operator is enabled to exert a greater effective force or pressure than has been heretofore attainable in machines of this class. The device is equally adapted to be used to connect the driving-head and wild-cat by frictional contact, or, with slight modifications, by the common block-key.

The object of my present invention is to provide a windlass with more efficient means for controlling the wild-cats both in taking in the chain cable and "paying out" the same, the windlass when frictionally connected as shown enabling the operator, by means of the

annular nut, to regulate the speed of the out-running cable. The device also enables me to dispense with the friction-bands, stands, and connections therefor as commonly employed, thereby materially reducing the cost of such machinery.

In the accompanying sheet of drawings, Figure 1 represents a vertical longitudinal sectional view through the wild-cat and its driving-head of one side of a windlass, the locking device being disconnected from the loosely-mounted wild-cat. Fig. 2 is a front view of the same, a portion thereof being broken away to shown the locking-key which engages frictionally with the wild-cat. Fig. 3 is a view similar to Fig. 1, the wild-cat, however, being represented as connected or locked to the driving-head. Fig. 4 is a partial plan view of the driving-head and locking device. Fig. 5 is a similar view in section. Fig. 6 is a view of the link. Fig. 7 covers both a plan and sectional view of the screw-threaded key. Fig. 8 is a reduced partial front view corresponding to Fig. 2, but showing a block-key in lieu of the friction-block. Fig. 9 is a partial longitudinal sectional view of the same, and Fig. 10 is a front elevation of a pump-brake windlass as provided with the improved locking device.

The following is a more detailed description of the improvements shown and claimed herewith.

Again, referring to the drawings, A designates a common form of wild-cat mounted loosely upon the windlass-shaft C.

B represents the "driving-head," so called, rigidly secured to said shaft, the head being disk-shaped and partially covered by the overhanging rim *a* of the wild-cat. *b* is the hub of the driving-head, having two oppositely-formed longitudinal grooves or slots, *h h*, therein. The outer end of said hub is reduced in diameter at *b'*, (see Fig. 5,) and forming the shoulder *s*, a collar, *e*, being secured to the face of the hub, and also forming a shoulder, *b*².

H H designate keys, which slide freely within the slots *h*, the top or peripheral surface of said keys having a series of partial screw-threads, *h*², formed thereon.

D D designate T-shaped locking-blocks, each fitted within a corresponding recess of the head B, (see Figs. 2 and 4,) the outer periph-

eral surface of said blocks conforming to the curvature of the inner surface of the ring *a*, forming a part of the wild-cat. *d* is a stem or tongue extending from and forming a part of said key D, the lower or inner end thereof being connected with the link M by means of the pin *d'*, the link in turn connecting with the inner end of the key H, before described, thereby uniting all said parts together.

R designates an annular nut, its inner surface having a screw-thread formed thereon for the purpose of engaging with the threads *h*² of the keys H. Said nut is mounted upon the neck portion *b'* of the hub, and upon which it is adapted to freely revolve, said shoulders *s* *b*² serving to retain the nut in position longitudinally. The nut is further provided with handles *r*, which alternate with a series of holes, *r'*, the latter adapted to receive the operating-lever L. (Shown in dotted lines, Fig. 2.)

In Figs. 8 and 9 the wild cat A' is represented having its rim *a'* provided with a series of interior notches or pockets, the latter being adapted to receive the free end of the locking block or key D' in lieu of the frictionally-connected wild-cat shown in the other views. In the former cases, however, the pitch of the screw-thread may be made coarser, if desired.

The operation of locking or connecting the loosely-mounted wild-cat to the driving-head of a windlass, whereby said parts are made to revolve in unison, may be substantially described as follows: The nut R is first revolved in the arrow direction by means of the handles *r*, thereby forcing the keys H along the grooves *h* and toward the wild-cat. This movement of the keys, by means of the links M, forces the friction-blocks D outwardly or radially to engage the inner surface of the rim *a* of the wild-cat, the bar L serving, when necessary, as a lever to increase the pressure or force of said blocks against the wild-cat, the thrust or reaction upon the nut being borne by the shoulder *b*². The wild-cat thus being secured to the driving mechanism adapts the windlass now to be used in taking in the chain or for other purposes common to this class of machinery, the arrangement also enabling the operator to have full control of the wild-cat in paying out the cable by means of said frictional contact of the parts, thereby dispensing with friction-bands and their connections, as commonly constructed.

It is obvious that the top surface of the locking-key D may be lined with wood or other material, if desired. Its form also may be made A-shaped. In such case, however, the inner circumferential surface of the rim *a* should have a corresponding V-shaped groove.

My improvement is adapted to be used both in pump-brake and capstan windlasses. When applied to the former class, I prefer to enlarge the driving-head B, and provide the same with the rim B', (see Figs. 3 and 10,) thereby reducing materially the distance between the bits T T.

I am aware that it is not new to operate one or more keys simultaneously for the purpose of locking the wild-cat to the driving-head, as well as for disconnecting the same. Therefore I do not claim such, broadly; but

What I do claim, and desire to secure by United States Letters Patent, is—

1. In a windlass, the combination, with a wild-cat loosely mounted on the main or driving shaft, of a driving-head rigidly secured to the shaft and having one or more locking-blocks, each connected by a suitable link with a screw-threaded key arranged in the hub of the driving-head, said keys engaging with an annular nut mounted upon said hub and provided with means for operating the same, whereby the axial movement of the nut causes the locking-blocks to move in an outward or radial direction, substantially as shown, and for the purpose set forth.

2. The combination, with a wild-cat mounted on the driving-shaft, of the locking device herein described, consisting of one or more locking-blocks, D, screw-threaded keys H, links M, connecting said blocks, and nut R, having handles *r* and sockets *r'* therein, said nut engaging with the keys H and mounted on the hub of the driving-head between suitable thrust-collars, said device being mounted within the driving head of the windlass, all substantially as shown, and for the purpose set forth.

3. In a windlass having a wild-cat loosely mounted on the driving-shaft and a driving-head secured to said shaft, the combination therewith of one or more locking-blocks and screw-threaded keys mounted within the head, said keys being connected with the locking-blocks and provided with a suitably-arranged nut for operating the same, substantially as shown and described.

4. The locking device herein described, consisting of one or more locking-blocks, D, screw-threaded keys H, links M, connecting said blocks and keys, and nut R, engaging the keys H, the whole combined and arranged within the driving-head of a windlass, whereby said nut in its axial movement is adapted to slide the blocks D in an outward or radial direction, as and for the purpose set forth.

5. The locking device herein described, consisting of one or more locking-blocks, D', screw-threaded keys H, links M, and nut R, the whole combined and arranged within the driving-head of a windlass, whereby said nut in its axial movement causes the blocks D' to slide in an outward or radial direction for the purpose of interlocking with the pockets *a'* of the loosely-mounted wild-cat A', substantially as shown and set forth.

In testimony whereof I have affixed my signature in presence of two witnesses.

FRANCIS A. GRATER.

Witnesses:

GEO. H. REMINGTON,
CHARLES HANNIGAN.