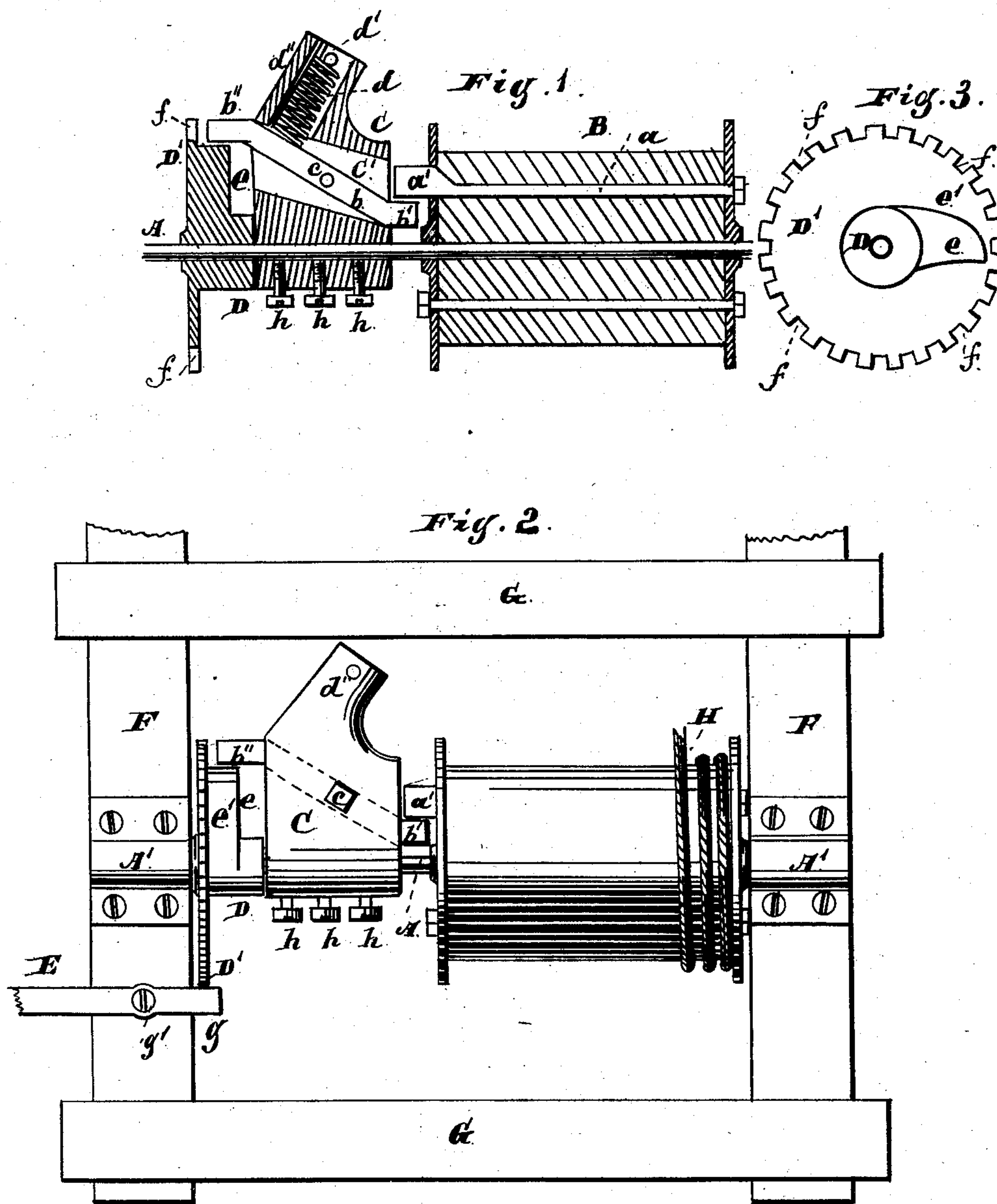


(No Model.)

M. T. CHAPMAN.  
WINDING DRUM.

No. 258,889.

Patented June 6, 1882.



Witnesses:  
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# UNITED STATES PATENT OFFICE.

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## WINDING-DRUM.

SPECIFICATION forming part of Letters Patent No. 258,889, dated June 6, 1882.

Application filed November 5, 1881. (No model.)

*To all whom it may concern:*

Be it known that I, MATTHEW T. CHAPMAN, residing at Aurora, in the county of Kane and State of Illinois, and a citizen of the United States, have invented new and useful Improvements in Winding-Drums, of which the following is a full description, reference being had to the accompanying drawings, in which—

Figure 1 is a vertical longitudinal section through the drum, lock-block, cam, and adjusting-disk; Fig. 2, a side elevation, showing the drum, lock-block, cam, adjusting-disk, and disk-lever in position on a frame, the side pieces of the frame being broken off.

This invention relates to winding-drums, and has for its object to construct and arrange devices automatically operating to engage the drum with or disengage it from the driving-shaft, and combine therewith devices for changing the point or time of disengagement, and cause the drum to wind and unwind to a greater or less extent, as desired; and its nature consists in providing a winding-drum mounted loosely on a driving-shaft, and having a stationary catch or lock arranged to engage with a movable catch or lock carried by a block or head mounted on and firmly secured to the shaft, and a lifting or raising cam for operating the movable catch or lock automatically; in providing a lifting or raising cam located on or connected with a movable plate or disk which can be rotated or turned to vary the position of the cam in its relation to the drum and change the time of disengagement of the lock or clutch; in providing a lifting or raising cam located on or connected with a movable plate or disk having notches or openings on its edge or periphery to coact with a lock or lever and retain the cam in position when adjusted; and in the several parts and combination of parts hereinafter set forth as new.

In the drawings, A represents a driving-shaft; A', the journal-boxes for supporting the shaft; B, a winding-drum loosely mounted on the shaft; C, the head or block carrying the movable catch or lock; C', the opening for the movable catch or lock; D, the hub or collar of the raising or lifting cam; D', the plate or disk; E, the lever for locking the plate or disk; F, the side bars of the frame; G, the

cross-bars; H, the rope or cable to be wound; a a', the stationary block or catch; b b' b'', the movable lock or catch; c, the pivot of the movable lock or catch; d, the coil-spring for returning the movable lock or catch; d', the opening for the spring d; d'', the lug or boss inclosing the spring and holding it in place; e, the lifting or raising cam; e', the acting face of the cam; f, the notches or openings in the plate or disk D'; g, the engaging end of the lever E; g', the pivot of the lever; h, the set-screws for locking the head or block C to the shaft.

The driving-shaft A is rotated in any suitable manner, and is mounted or has its bearings in suitable journal-boxes or supports, A', located on a frame or other support in such manner as to bring the drum and other devices carried by the shaft in proper position for use. As shown, the frame or support consists of side pieces or bars, F, and cross pieces or bars G; but other forms of construction for such frame or support can be used, the form depending somewhat on the work to be performed by the drum.

The drum B may be constructed as shown, or in other manner suitable for winding purposes. This drum is mounted loosely on the shaft A, and at one end is provided with a catch or lock, a', projecting beyond the plane of the end a sufficient distance to furnish an engaging-surface. This catch or lock a' is stationary, and may be formed as shown, or of some other form suitable for the purpose. As shown, it is formed of two parts—a stem or body, a, and the projecting or catch portion a'—and is held or fastened in place by passing the stem or body a through the drum and securing it by a nut or otherwise; but it may be secured in some other manner and by other means.

The head or block C is located on the shaft A, so as to leave a space between its end and the end of the drum sufficient to clear the end of the catch or lock a', and this head or block is secured firmly to the shaft, so as to be stationary thereon and revolve therewith by means of set-screws h, as shown, or in any other suitable manner. This head or block C may be formed as shown, or in some other manner, adapted to be attached or locked to the shaft



A and to furnish a support for a lock or catch to coact with the lock on catch  $a'$ . As shown, it has a longitudinal opening near its periphery on one side for the passage of the shaft A, leaving its main body or portion projecting or standing out from the shaft, and this main body is provided with a diagonal or inclined opening,  $O'$ , in which is located the catch or lock. This catch or lock, as shown, is formed from a bar or piece having a main or body portion,  $b$ , and end portions,  $b'$   $b''$ , the end  $b'$  forming a catch or lock to coact with  $a'$ , and the end  $b''$  forming a means for disengaging such catch or lock. The main or body portion  $b$  lies within the recess or opening  $O'$ , and is pivoted therein by a pin or pivot,  $c$ , passing through  $b$  and the body or sides of the head or block C, so that its ends can be raised and depressed, and the ends  $b'$   $b''$  each project beyond the respective ends of the head or block a sufficient distance for the end  $b'$  to engage the end  $a'$ , and for the end  $b''$  to be engaged by the lifting device and raised, the raising of the end  $b''$  depressing the end  $b'$  and disengaging it from  $a'$ . The end or lock  $b'$  is returned to position to engage the end or lock  $a'$  by a coil-spring,  $d$ , as shown, but may be returned by a flat spring or in some other suitable manner. The returning-spring  $d$  shown is located in an opening,  $d'$ , formed in a side extension or boss,  $d''$ , on the head or block C, one end of the spring bearing against the main portion or body  $b$  and the other against a pin or other stop at the outer end of the opening  $d'$ , so that as the end of  $b$  against which the spring bears is raised by raising  $b''$  the spring will be compressed, and its recoil, when the end  $b''$  is released, will act to return  $b$  into position for the ends or locks  $a'$   $b'$  to engage.

The lifting or raising cam  $e$  is attached to or formed with a plate or disk,  $D'$ , having a hub or projection,  $D$ , the cam, plate, and hub being formed, as shown, of a single piece; but the cam and hub might be formed of a single piece, or the cam might be a separate piece and attached to the plate. The plate  $D'$ , with the cam thereon, is mounted on the shaft A in such manner as to bring the cam adjacent to the end face of the head or block C, and in such relation to the end  $b''$  as that with each revolution of the head or block the end  $b''$  will engage the face  $e'$  of the cam and be raised thereby, the face  $e'$  of the cam being so formed that as the end  $b''$  passes thereover it will be gradually raised. This plate  $D'$ , with its cam  $e'$  is mounted on the shaft A so as to be free thereon, so that it can be adjusted or turned and bring the cam in different positions in relation to the head C and the tripping devices, and cause it to act at different periods in reference to the winding, according to its adjustment, and when adjusted it is to be locked or held in its adjusted position, so as to be immovable and allow the shaft A to revolve freely.

As shown, the edge or periphery of the plate

$D'$  is provided with recesses or notches  $f$  to receive the end  $g$  of a lever or arm, E, which lever or arm is pivoted to the frame or support on which the windlass, as a whole, is mounted, and when engaged with the disk this lever or arm E may be locked and kept in engagement by any suitable means. Instead of the lever or arm E, some other device or means can be used to lock and hold the plate D in position when adjusted.

In operation the shaft A, as it is driven, imparts a rotary movement to the head or block C, which is fastened thereto, so as to rotate therewith. As this head or block rotates it carries around with it the movable latch or lock  $b'$   $b''$ , imparting a rotary movement to the drum by the engagement of the latch or stop  $b'$  with the latch or stop  $a'$ . With each complete revolution of the shaft the end  $b''$  is brought into engagement with the face  $e'$  of the cam  $e$  and is raised thereby, depressing the latch or stop end  $b'$  and disconnecting the head or block C and the drum B, allowing the drum to rotate independent of the shaft and in the opposite direction, unwinding the rope or cable H, which has been wound thereon, which unwinding will continue until the latch or stop ends  $a'$   $b'$  are again brought into engagement by the backward rotation of the drum and the forward rotation of the shaft A, the latch or stop end  $b'$  having been returned to position to engage the latch or stop end  $a'$  by the action of the spring  $d$  as soon as the end  $b''$  leaves the cam  $e$ . This connecting and disconnecting will occur with each revolution of the shaft A, and as long as the cam  $e$  remains unchanged in relation to the head or block the same length of rope or cable will be wound and unwound at each operation.

When it is desired to increase the wind the plate  $D'$  is released from its holding device and turned forward or in the direction of the rotation of A the distance required for the amount of wind and again locked, bringing the latches or stops  $a'$   $b'$  into engagement before the drum has discharged the full amount of the wind previously made, which engagement causes the drum to rotate with the shaft, as before described, winding the rope or cable thereon, which winding will continue until the latches or stops  $a'$   $b'$  are released by the cam  $e$ , as before described; and inasmuch as this cam has been advanced in relation to the point where the disengagement formerly took place it will be seen that an increase in the wind must be had, which increase is equal to the distance or amount of rotation of the drum over that which it previously had.

When a decreased wind is desired the cam  $e$  is released and turned backward or against the rotation of the drum the distance required and again locked, bringing the latches or stops  $a'$   $b'$  into engagement at a point back of the one previously had, allowing an increased amount of unwind to be had before the drum is again rotated to wind thereon, which wind-



ing will continue until the latches or stops  $a'$   $b'$  are released by the action of the cam  $e$ , and inasmuch as this cam has been receded in relation to the point where the former disengagement was had it will be seen that a decrease in the wind must follow by reason of the change in time of unlocking, which decrease is equal to the distance the cam has been receded as compared with its former position, there being that decrease in the rotation of the drum when the disengagement takes place. By this arrangement it will be seen that an increase or decrease in the wind can be easily had, as all that is necessary to be done is to change the relative position of the cam. This arrangement can be used for any purpose where the rotation and release of the drum are desired, so as to wind thereon and unwind therefrom automatically at stated intervals.

When it is desired to have the drum wind without tripping at each revolution of the shaft the cam  $e$  is released from its locking device, by which means the end  $b''$  will engage the face of the cam at the base thereof, and the cam and its plate or support will rotate with the head or block C and the drum, the cam becoming thereby inoperative or non-acting, so that the locks or catches will remain in engagement. When the required amount of wind has been had the cam can be locked or held until the end  $b''$  has passed thereon sufficiently far to unlock the latches or locks  $a' b'$ , at which time it can be unlocked or released, again allowing the cam and its plate to rotate with the head or block by the frictional contact between the face of the cam and the end  $b''$ , while the drum is free to rotate in the opposite direction, so as to unwind, the head and drum being disconnected by the depression of the latch or lock  $b'$  through the engagement of the end  $b''$  with the cam.

When the unwinding is to cease and the winding be again commenced the cam can be locked or held until the end  $b''$  passes therefrom, when it is again unlocked or released, allowing the end  $b''$  to engage the face thereof at the base, causing the cam, head or block, and drum to revolve together, as first described. It will be readily seen that this locking and unlocking can be made to occur at any time, or for any given revolution after the first one, by simply unlocking or releasing the cam and again locking or holding it temporarily at the time required.

Instead of using a fixed cam, a heart or other shaped cam pivoted to the face of the

plate at the proper point to be turned, so as to be out of the way of the end  $b''$  and allow the head or block to revolve without releasing the latches or catches, or to be turned so as to engage the end  $b''$  and release the latches or locks as the head or block revolves, could be used, such pivoted cam having the proper acting face for the work to be done, and having suitable catches or other retaining devices by which it could be locked in position to be acting or non-acting.

In place of using notches on the periphery of the disk to lock it fast, recesses, notches, openings, or ratchet-teeth located on the face of the disk could be used in connection with springs, pawls, pins, or other devices which would coact therewith and lock the plate or disk.

What I claim as new, and desire to secure by Letters Patent, is as follows:

1. The loose winding-drum B, having a stationary catch or lock and stationary head or block C, carrying a movable catch or lock, in combination with an adjustable cam for operating the movable catch or lock and releasing the drum, substantially as and for the purposes specified.

2. The loose winding-drum B, having a stationary catch or lock and stationary head or block C, carrying a movable catch or lock, in combination with a raising or lifting cam,  $e$ , and adjustable plate  $D'$ , carrying the cam for changing the position of the cam relative to the drum and automatically tripping the catch or lock to release the drum, substantially as and for the purposes specified.

3. The loose winding-drum B, having a stationary catch or lock,  $a a'$ , stationary head or block C, carrying a movable catch or lock,  $b b' b''$ , and returning-spring  $d$ , in combination with a raising or lifting cam,  $e$ , adjustable in relation to the drum for automatically engaging and disengaging the catch or lock to cause the drum to wind or unwind, substantially as specified.

4. The loose winding-drum B, having a stationary catch or lock,  $a a'$ , stationary head or block C, carrying a movable catch or lock,  $b b' b''$ , and returning-spring  $d$ , in combination with a raising or lifting cam,  $e$ , plate or disk  $D'$ , having notches  $f$ , and lever E, substantially as and for the purposes specified.

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Witnesses:

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