

(No Model.)

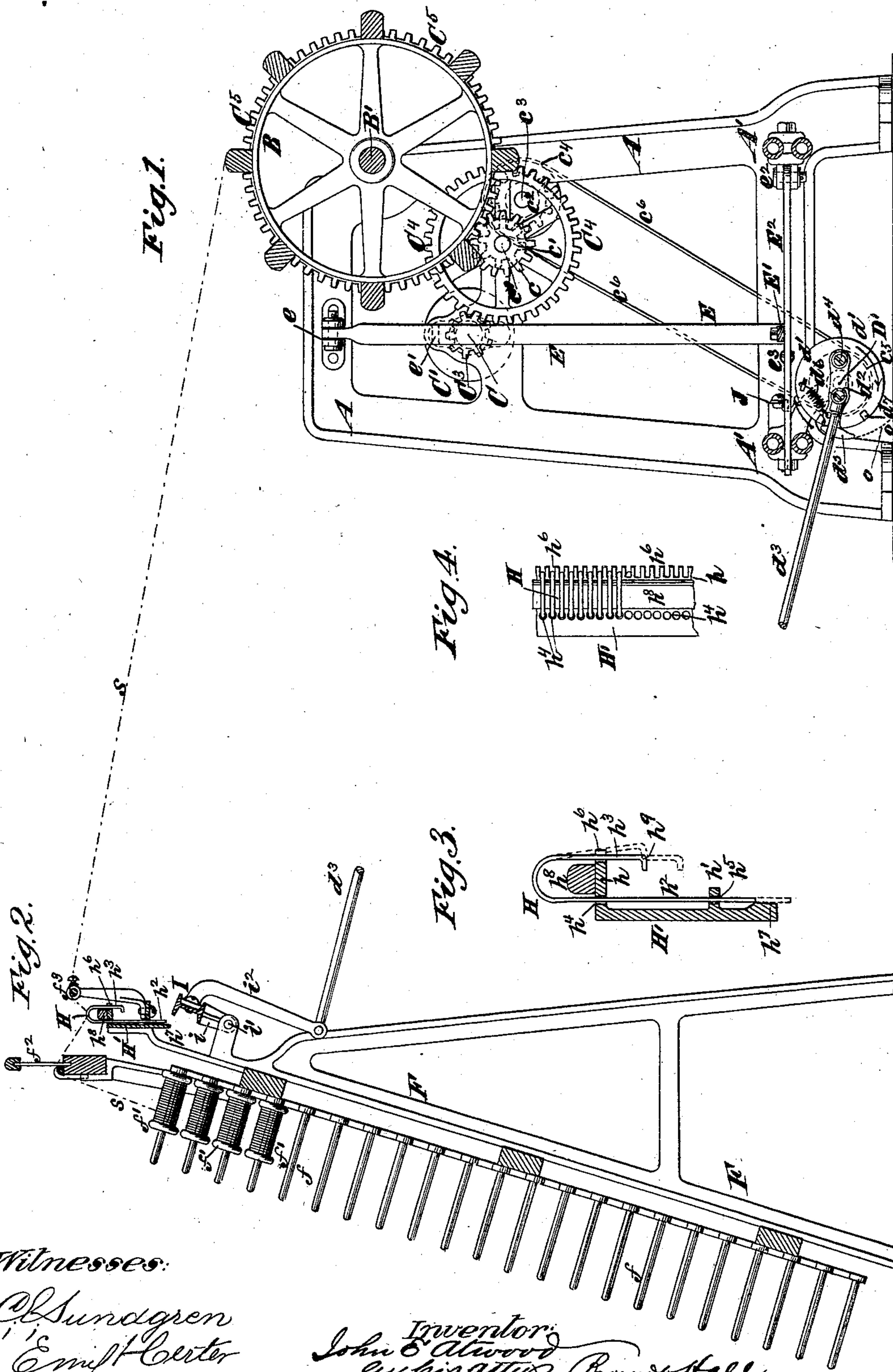
2 Sheets—Sheet 1.

J. E. ATWOOD.

STOP MECHANISM FOR REELING MACHINES.

No. 376,571.

Patented Jan. 17, 1888.



Witnesses:

Chasundgren
Emil Carter

Inventor:
John C. Atwood
by his attys Grounds Hall

(No Model.)^{*}

2 Sheets—Sheet 2.

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Fig. 5.

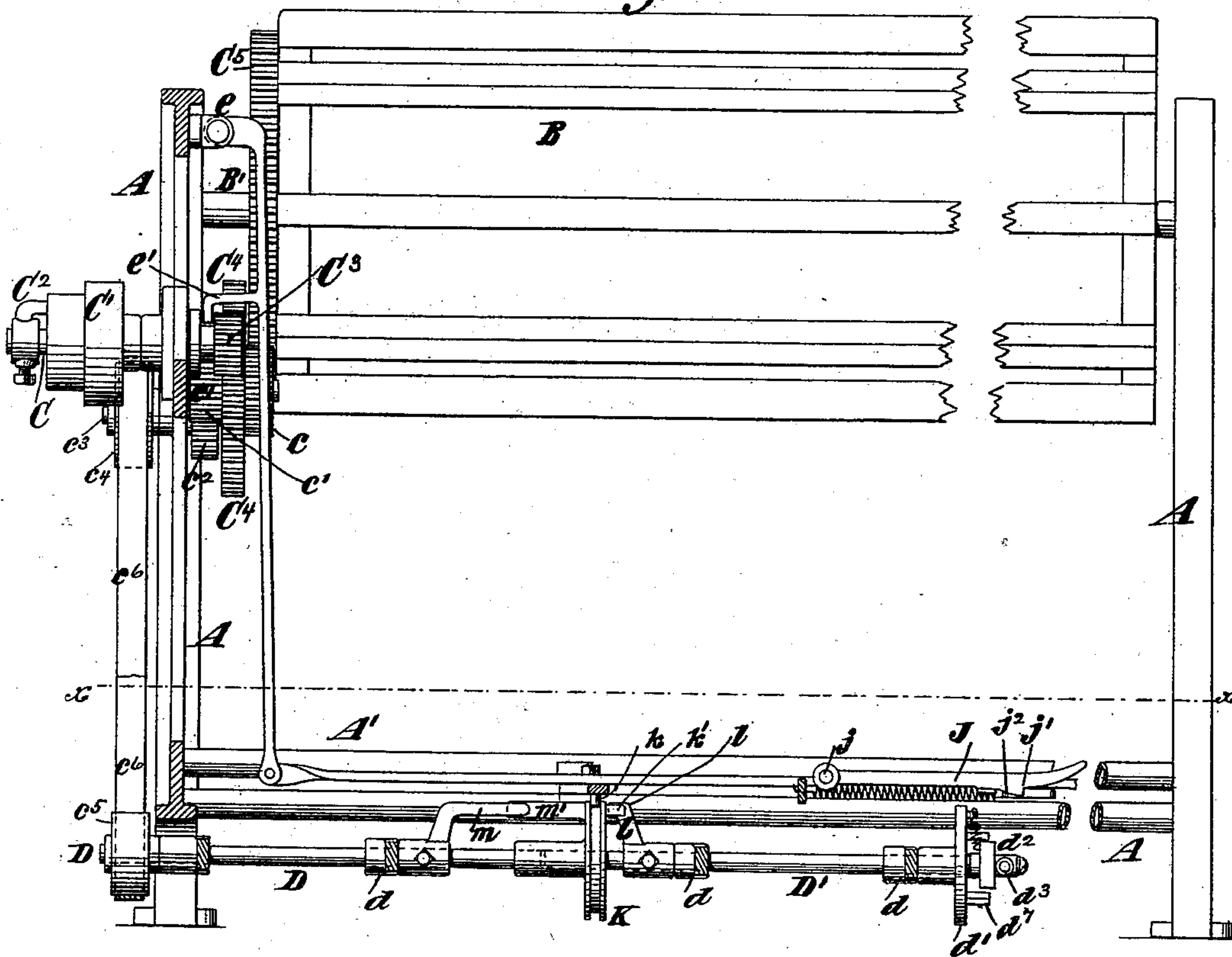
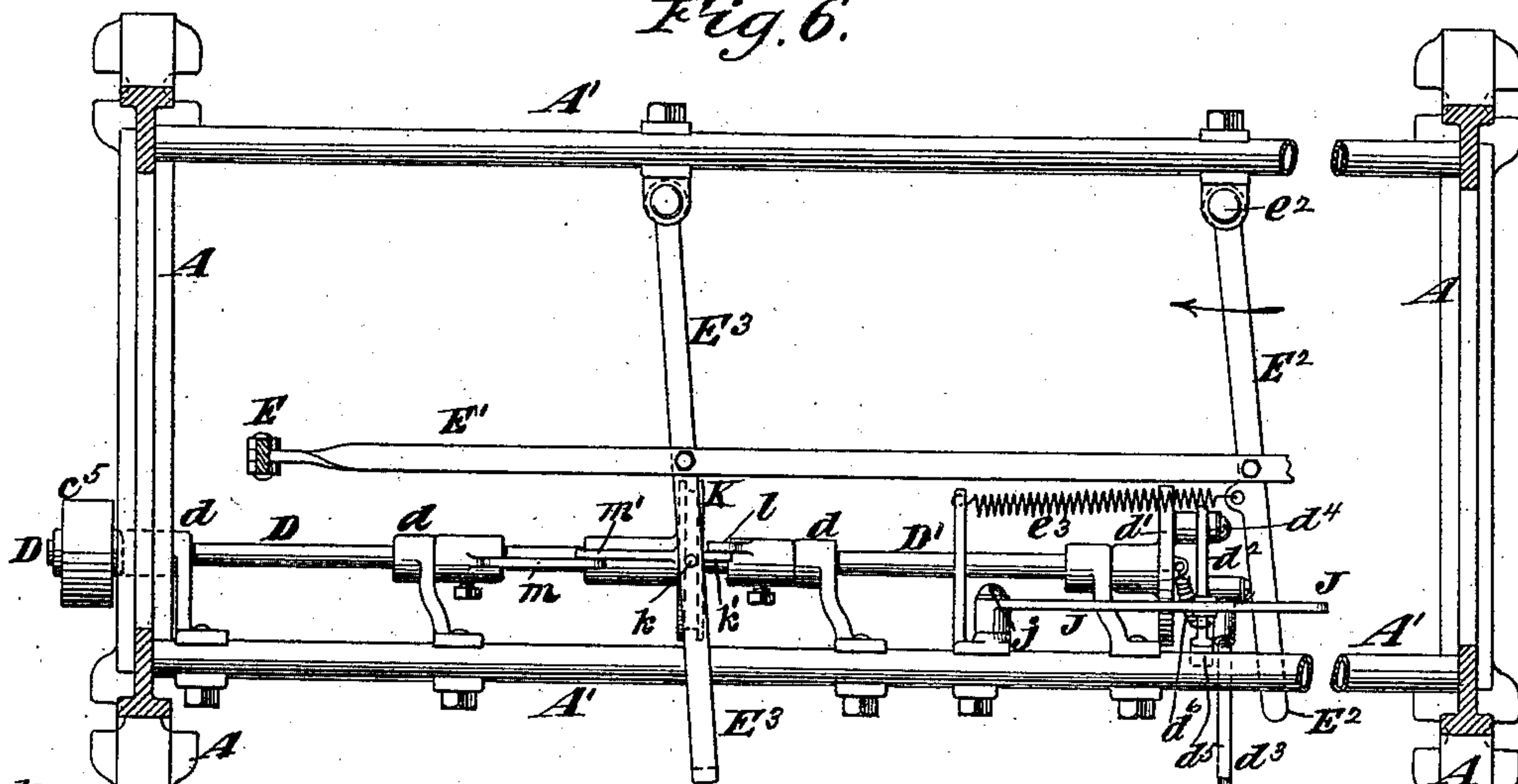


Fig. 6.



Witnesses:

Ossundgren
Emil Hertter

Inventor:

John E. Atwood
by his attys
Brown & Hall

UNITED STATES PATENT OFFICE.

JOHN E. ATWOOD, OF STONINGTON, CONNECTICUT.

STOP MECHANISM FOR REELING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 376,571, dated January 17, 1888.

Application filed October 27, 1886. Serial No. 217,311. (No model.)

To all whom it may concern:

Be it known that I, JOHN E. ATWOOD, of Stonington, in the county of New London and State of Connecticut, have invented a new and
5 useful Improvement in Stop Mechanisms for Reeling-Machines, of which the following is a specification.

My invention, although applicable in general to machines for reeling various fibrous
10 materials, is more particularly intended for warping-machines for reeling silk warp, and possess great advantages when embodied in such machines. It may, for example, be advantageously employed in connection with a
15 machine for reeling silk warp, which forms the subject of an application, Serial No. 216,388, filed October 16, 1886, by Edward E. Bradley, and in the accompanying drawings my invention is illustrated as employed in connection
20 with such a warping-machine.

The invention relates to that class of reeling-machines in which the driving mechanism is held operative by a trigger or catch or latch to drive the reel, and in which the mechanism
25 is moved into inoperative position by a spring or equivalent weight through its shipper or lever when released from the latch or catch, and in such machine the fallers or faller-wires, when allowed to drop by the breakage of a thread,
30 descend in the path of a bar or member having a definite range of movement, and by blocking the movement of such bar or member cause the shipper to be released from the latch or catch and be moved by the spring or equivalent weight to stop the machine.

In carrying out my invention the fallers are arranged in a suitable holder or frame, which comprises an abutment below which the movable member of the stop mechanism works,
40 and when the faller is released by the breaking of a thread it falls below the abutment and into the path of the movable bar or member. The movable bar or member may be advantageously supported by pivots at its ends,
45 so as to receive a rocking motion, and the fallers are combined in a novel and peculiar way with their holder or frame, so as to permit their ready detachment therefrom when desired. I also employ a rotary stop-motion

shaft which carries upon it a crank-arm connected, by a rod or other suitable connection, with the rocking-bar of the stop mechanism, and this crank-arm is so connected with its carrier that when an unusual resistance is opposed to the movement of the rocking-bar by
55 the dropping of a faller in its path the crank will yield upon its carrier and a cam provided upon the crank-arm will be projected, so that in the revolution of the stop-motion shaft it will act to throw off a latch or hook, whereby
60 the shipper-lever or analogous device of the reel is maintained in operative condition. I also prefer to construct the stop-motion shaft in two sections arranged end to end and connected by a clutch which provides for lost
65 motion between them. The first section of the stop-motion shaft will then be rotated synchronously with the reel, and upon the starting of the machine the reel will be rotated immediately and the first section of the stop-motion shaft will receive a partial rotation before
70 it transmits any movement whatever to the second section of the stop-motion shaft from which the rocking-bar of the stop mechanism is operated.

The invention consists in novel combinations of parts, which are hereinabove briefly referred to and are hereinafter described, and pointed out in the claims.

In the accompanying drawings, Figure 1 is
80 a transverse section of such portions of a warping-machine as are necessary to illustrate my invention, and which correspond to the machine described and shown in the aforesaid application of Edward E. Bradley. Fig. 2 is a vertical section of a creel from which the reel of the machine takes its threads and to which my stop-motion is applied. Fig. 3 is a transverse vertical section, upon a larger scale, of the holder or frame for the fallers, showing, also, the fallers arranged therein. Fig. 4 is a plan of a portion of such holder or frame with fallers arranged therein. Fig. 5 is a front elevation and partial vertical section of such portions of the machine as are necessary to illustrate my
85 invention, a part of the machine between the ends being broken away to reduce the length of the drawings; and Fig. 6 is a horizontal sec-
95

tion on the plane of the dotted line xx , Fig. 5.

Similar letters of reference designate corresponding parts in all the figures.

A A designate the end standards or frames of the warping-machine, which are connected by horizontal rails or stretchers A' .

B designates a reel, comprising a shaft, B' , to which rotary motion is imparted by mechanism similar to that illustrated in the aforesaid application of Edward E. Bradley.

C designates the driving-shaft of the machine, upon which is represented a pulley, C' , and which has a clutch-connection, C^2 , with the pulley, as described in the aforesaid application. Upon the inner end of the shaft C is represented a pinion, C^3 , which engages with a wheel, C^4 , and concentric with the wheel C^4 are two other pinions, c and c' , which may be connected with the wheel C^4 , so as to rotate in unison therewith upon a stud or fixed journal. The pinion c engages a large spur-wheel or circle of spur-teeth, C^5 , upon the reel for driving it, and the pinion c' engages a second pinion or wheel, c^2 , which is mounted upon a counter-shaft, c^3 . By means of pulleys c^4 and c^5 and a belt, c^6 , or any other equivalent arrangement of gearing, rotary motion is transmitted from the counter-shaft c^3 to the stop-motion shaft or to the first section, D, of said shaft, and this stop-motion shaft will be hereinafter described more in detail.

By the movement of the driving-shaft C lengthwise its clutch is engaged with and disengaged from the pulley C' , and by disengaging said clutch from the pulley the reel B will be instantly stopped. In this example of my invention the clutch is shifted by a lever, E, which may be pivoted at its upper end, e , and which has an arm or hook, e' , engaging the shaft C.

I will now particularly describe the portions of my stop-motion which are upon the creel, and which are shown in Figs. 2, 3, and 4.

F designates the main frame of the creel, which is provided with numerous spindles or pins f , on which are the spools f' , and from these spools the threads s pass through a reed, f^2 , thence through fallers H, thence over a bar or rod, f^3 , and to the reel B. The fallers and their arrangement in the holder or frame H' , in which they are supported and guided, are best shown in Figs. 3 and 4. The holder or frame H' consists of a bar or beam, which may be of metal, and has at the top a laterally-extending flange, h , and nearer its lower edge a second flange or rib, h' . In this example of my invention the fallers H each consist of a piece of wire bent into U-shaped form, and having legs h^2 and h^3 , the leg h^2 being longer than the leg h^3 . The longer leg, h^2 , of the faller is fitted to move freely vertically in guiding-holes h^4 and h^5 , while the shorter leg, h^3 , is fitted to a guide or guiding-notch, h^6 , formed in the edge of the flange h . The faller H can therefore rise and fall freely in its holder or frame, and the lower end of the shorter leg, h^3 , is bent inward or

shouldered, as at h^7 , in order to form a stop, which, by coming against the under side of the flange h , limits all upward movement of the faller. If it be desired, however, to disengage the faller from its holder or frame for any reason, it may be readily done by bending or deflecting the shorter leg, h^3 , of the faller outward, as shown by dotted lines in Fig. 3, as by so doing the shouldered or bent end of said leg is enabled to pass upward over the flange h . The lower edge portion of the holder or frame H' forms an abutment, h^7 , as will be hereinafter described.

I designates a bar or member, which extends approximately horizontal and parallel with the abutment h^7 , formed by the lower edge portion of the holder H' , and the bar I is so mounted or supported that it is capable of a to-and-fro movement transversely to its length and across the plane of the abutment. In the present example of my invention the bar I has downwardly-extending arms i , which are pivoted at i' , and upon these pivots the bar or member I rocks to and fro immediately beneath the abutment h^7 .

In the normal operation of the machine, and while the threads s are intact, the threads themselves hold the fallers in the elevated position shown in Fig. 3, and the lower ends of the legs h^2 are above the abutment h^7 . On the breaking of a thread, however, its faller H will fall until its upper portion strikes the rail h^8 , in which position the leg h^2 will project below the lower edge of the abutment h^7 , as shown by dotted lines in Fig. 3, and directly in the path of the rocking or swinging bar I. The faller will therefore form an obstruction which will arrest the movement of the bar I, and which, through mechanism hereinafter described, will react through the connections which operate the bar to release the driving mechanism and cause it to be thrown off or shifted to stop the reel.

I have here represented the stop-motion shaft as composed of two sections, D and D', arranged in line and serving a purpose hereinafter described, and the second section, D', imparts motion to the rocking bar I by mechanism which I will now describe, and which is shown in Figs. 1, 5, and 6. The sections of the shaft D and D' are mounted in suitable bearings, d , and upon the end of the section D' is a carrier, d' , here shown as made in the form of a disk, and which carries a crank-arm, d^2 . From the crank-arm d^2 a rod, d^3 , or other suitable connection, extends to the creel, and is jointed to an arm, i^2 , on the rocking bar I. But very little force is required to rock the bar I in the normal operation of the machine, and the crank-arm d^2 is so connected with its carrier d' that when any unusual resistance is opposed to the movement of the bar I, as will be produced by the protruding of a faller in its way, said crank-arm d^2 will yield relatively to the carrier. I have here shown the crank-arm d^2 as pivoted at d^4 to the carrier plate or disk d' and

as having at its opposite end a cam, d^5 . Near its free end, at which is the cam d^5 , the crank-arm d^2 is connected by a spring, d^6 , with the carrier-disk d' . The rod d^3 is connected to the crank-arm d^2 at a point which is eccentric to the center of the stop-motion shaft on which the carrier d' is mounted, and hence it will be seen that when the stop-motion shaft and carrier d' are rotated in the direction indicated by the arrow in Fig. 1 the arm d^2 will act as a crank to transmit to the rod d^3 a reciprocating movement equal in length to double the distance between the center of the stop-motion shaft and the point of connection of the rod d^3 with the crank-arm d^2 . During such normal operation the spring d^6 will of course be slightly extended, but as the resistance is uniform the cam end d^5 of the crank-arm d^2 will have about the projection from the edge of the disk d' , which is shown in Fig. 1.

The clutch-lever E is connected by a horizontal rod, E' , with a foot-lever, E^2 , which is fulcrumed at e^2 to swing in a horizontal plane, and which has connected with it a spring, e^3 , for moving it in the direction indicated by the arrow in Fig. 6. In this example of my invention the longitudinal rails or stretchers A' , forming a part of the framing of the machine, are composed each of two tubes arranged one above another, and the lever E^2 may be guided at its free end between the two tubes composing one of the stretchers or rails A' , as shown in Fig. 1. In case of any other construction of the framing the said lever should of course have at its free end some other suitable guide or support.

It is obvious that in the absence of any stop or latch to prevent, the spring e^3 will move the lever E^2 in the direction indicated by the arrow in Fig. 6, and through the rod E' and lever E will throw off the clutch which connects the shaft C with the driving-pulley C' , and therefore stop the reel and the stop-motion shaft D D'. To prevent this throwing off of the driving mechanism, I employ a latch or movable stop, and I have here represented such a latch, J, as pivoted at j , and having near its free end a shoulder, j' , and in rear of said shoulder an incline, j^2 . It will be understood that when the lever E^2 is moved so that the shoulder j' of the latch drops in front of it, as shown in the drawings, the driving mechanism will be maintained in operative condition, and that when the latch J is lifted so as to carry its shoulder j' clear of the lever E^2 said lever will be at once moved by the spring e^3 and will throw off the driving mechanism. The latch J, as here shown, is approximately parallel with the stop-motion shaft D D' and projects across and above the circular path described by the cam d^5 of the crank-arm d^2 . In the normal operation of the machine the cam d^5 has so little projection beyond the edge of the carrier-disk d' that it clears the latch J at each revolution; but when the bar I is obstructed by a faller dropping in front of it the

undue resistance which is opposed to the movement of the crank-arm d^2 will extend the spring d^6 and the cam d^5 will be thrown out and will describe the path indicated by the dotted line o in Fig. 1. The cam will then have such projection beyond the edge of the carrier-disk d' that when it is brought by the rotation of said disk to the latch J it will make contact therewith and lift the latch J, so as to release the lever E^2 . The driving mechanism will then be instantly thrown off, so as to stop the reel until the broken thread is joined and the machine again started. I have also shown a second lever, E^3 , similar to the lever E^2 , as connected with the rod E' , and by means of this lever E^3 , the rod E' and lever E with the lever E^2 , may be moved in a reverse direction to that indicated by the arrow on the lever E^2 in Fig. 6, so as to bring the lever E^2 again into position for the latch J to engage with it, and thus start the machine.

The section D of the stop-motion shaft rotates synchronously with the reel, and it is important to have said shaft formed in two sections, as described, and to have the two sections connected by a clutch which provides for lost motion between them, because the reel and first section, D, of the shaft will then rotate for a short interval without imparting any motion to the second section, D', of the shaft from which the bar I receives motion. Under such conditions the reel will make a part of a turn before the bar I commences its movement, and by such initial turning of the reel the threads s will all be drawn taut and the fallers H will all be lifted out of the reach of the bar I before it commences its operation.

In this example of my invention the clutch consists of a disk, K, which has a grooved periphery engaged by a pin, k , on the lever E^3 , and which receives within its bore the end of the shaft-section D'. The disk K has a projection, k' , which engages an arm, l , on the shaft-section D', and which, when these sections are in the relative position in which they are stopped, permits a partial revolution of the section D before any movement is transmitted to the section D'.

In this example of my invention the disk K slides upon the shaft-section D and has projecting from its one side an arm, m' , which is engaged by the arm m , secured on the shaft-section D by a set screw. The arms m' serve as a simple means of driving the disk K from the shaft-section D, and still permitting the disk to slide on said shaft-section D. On the shaft-section D' is secured an arm, l , and by sliding the disk K a projection, k' , thereon may be engaged with or disengaged from the arm l , so as to drive the shaft-section D' or not, as may be desired.

Upon the carrier disk d' of the crank-arm d^2 I have represented a stop projection, d^7 , which limits the movement of the crank-arm relatively to the disk.

It will be observed that E constitutes the

shipper or lever for rendering the driving mechanism operative or inoperative. J designates the latch or hook by which the lever is held with the clutch in operative position, and e^3 is the spring whereby the clutch is moved into inoperative position when the latch is thrown off.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination, with the flanged beam H' , constituting the faller-holder, and having the guiding-holes h^1 and the guides h^6 , of the fallers H , having the legs h^2 h^3 , respectively, fitted to slide in the said guiding-holes and guides, substantially as herein described.
2. The combination, with the flanged beam H' , constituting the faller-holder, and having the guiding-holes h^1 and the guiding-notches h^6 , of the fallers H , having the long legs h^2 , entering the guiding-holes h^1 , and the shorter legs h^3 , entering the guiding-notches h^6 and shouldered at the ends to prevent undue upward movement of the fallers, substantially as herein described.
3. The combination, with a reel and driving mechanism therefor, having a controlling shipper or lever, a hook or latch, whereby the shipper or lever is maintained in operative position, and a spring for moving the shipper or lever into inoperative position when released from the hook, of stop mechanism for threads to be wound on the reel, having a member which has a definite range of movement, a stop-motion shaft and mechanism, substantially as described, for driving it with a positive rotary motion, a yielding crank-arm carried by said shaft and rotating in the path of the latch or hook, and a connection between said crank and the said movable member of the stop mechanism, whereby when undue resistance is opposed to said movable member of the stop-mechanism the crank-arm will yield to allow it to come into contact with and throw off the said hook or latch, substantially as herein set forth.
4. The combination, with a reel and driving mechanism therefor, having a controlling shipper or lever, a hook or latch whereby the shipper or lever is maintained in an operative position, and a spring or equivalent weight for moving the shipper or lever into inoperative position when released from the latch or hook, of stop mechanism for the threads to be wound having a member which has a definite range of movement, a stop-motion shaft, and mechanism, substantially as described, for driving it, a crank-arm, d^2 , provided with a cam, d^3 , a carrier, d' , therefor upon said shaft, a connection between said crank-arm and said movable member of the stop mechanism, and a spring connecting the said crank-arm to its carrier, and which will permit the said crank-arm to yield, and thus change the path described by its cam when an usual resistance is opposed to the said movable member of the stop mechanism, substantially as herein set forth.

5. The combination, with a faller-holder having an abutment and fallers movable in said holder, of the rocking bar I and its supports, the stop-motion shaft and mechanism, substantially as described, for driving it, the spring-supported crank-arm d^2 and its lifting-cam d^3 , a rod connecting said crank-arm and rocking bar, a reel and driving mechanism therefor, substantially as described, a shipper for controlling the driving mechanism, a latch or hook, J , whereby the shipper is held in operative position, and a spring for moving the shipper when released from the latch or hook, substantially as herein set forth.

6. The combination, with a reel and driving mechanism therefor, substantially as described, of stop mechanism for the threads to be wound having a member which has a definite range of movement, a stop-motion shaft composed of two sections, and a clutch connecting said sections and having its engaging members constructed to afford lost motion between them in a circular direction, gearing whereby the first section of the stop-motion shaft is rotated synchronously with the reel, and connections, substantially as described, whereby the second section of the stop-motion shaft operates the movable member of the stop mechanism, substantially as and for the purpose herein set forth.

7. The combination, with a reel and driving mechanism therefor, substantially as described, of the stop-motion shaft composed of the sections D D' and a clutch connecting them and constructed with play or lost motion in a circular direction between its engaging parts, gearing for operating the section D synchronously with the reel, the crank-arm d^2 , provided with a cam, d^3 , the carrier d' on the shaft-section D' , and with which the crank-arm is connected by a pivot and a spring, a lever, E^2 , and connections, substantially as described, whereby it controls the driving mechanism, and a latch or hook, J , which engages said lever to hold the driving mechanism operative, substantially as herein set forth.

8. The combination, with the two shaft-sections D D' and an arm on the section D' , of a disk, K , free to slide on the section D , and provided with means for locking it to turn with the section D , and having a projection for engaging the said arm on the section D' , substantially as herein described.

9. The combination, with the two shaft-sections D D' and an arm on the section D' , of a disk, K , free to slide on the section D , and also receiving in its bore the section D' , the said disk being provided with means for locking it to turn with the section D and with a projection engaging the said arm on the section D' , substantially as herein described.

10. The combination, with the two shaft-sections D D' , of the arms m l , secured, respectively, to said sections, and the disk K , free to slide relatively to said sections, and having an arm, m' , engaging the arm m , and a projection,

k', for engaging the arm l, substantially as herein described.

11. The combination, in a reeling-machine, with a reel, of stop mechanism having fallers
5 and a member having a definite range of movement, and in the path of which the fallers are obtruded on the breaking of threads, and mechanism, substantially as described, for op-

erating the reel and the movable member of the stop mechanism, and which provides for 10 lost motion between the two, substantially as herein set forth.

JOHN E. ATWOOD.

Witnesses:

E. E. BRADLEY,
WM. R. PALMER.