

(No Model.)

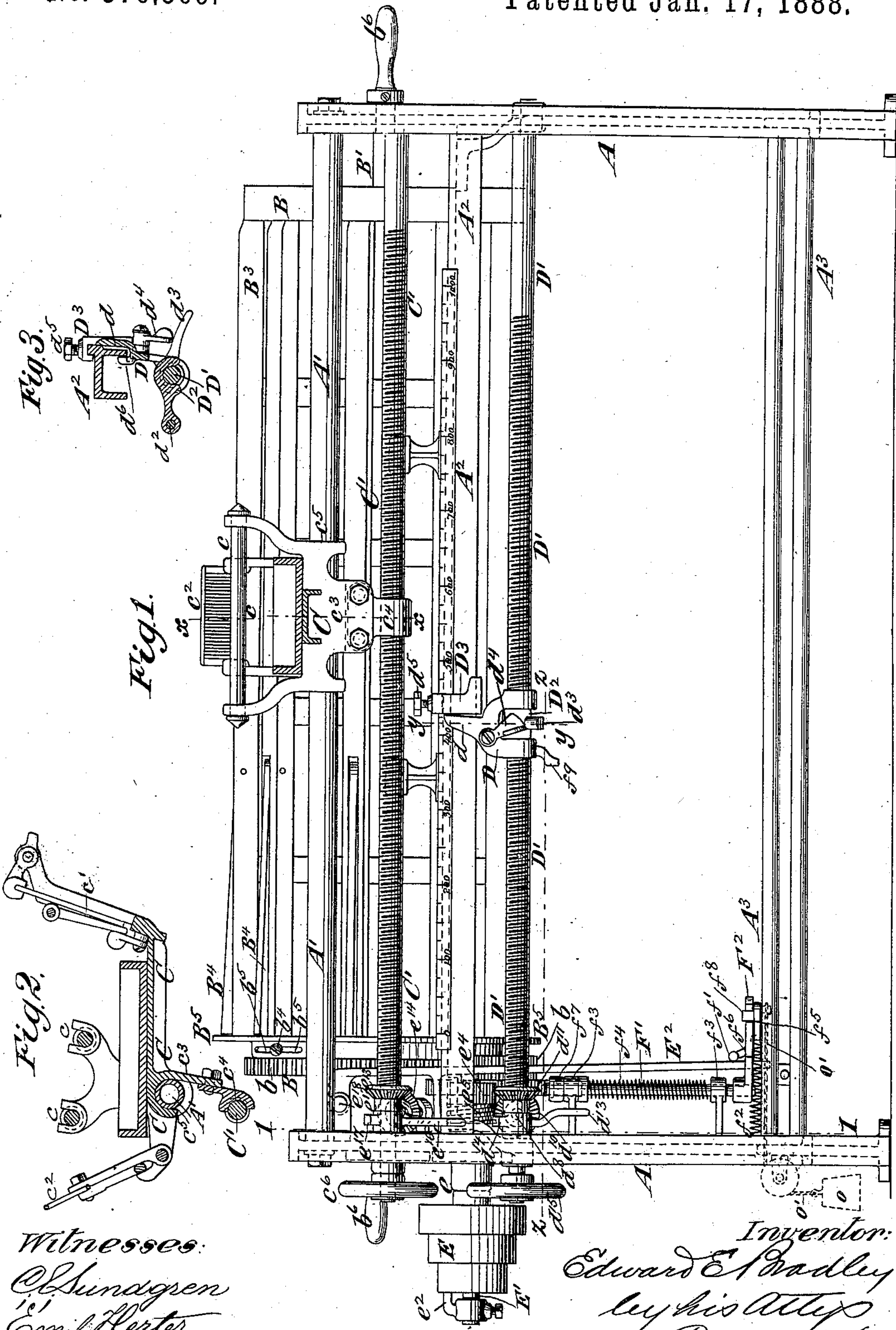
3 Sheets—Sheet 1.

E. E. BRADLEY.

REELING MACHINE.

No. 376,509.

Patented Jan. 17, 1888.



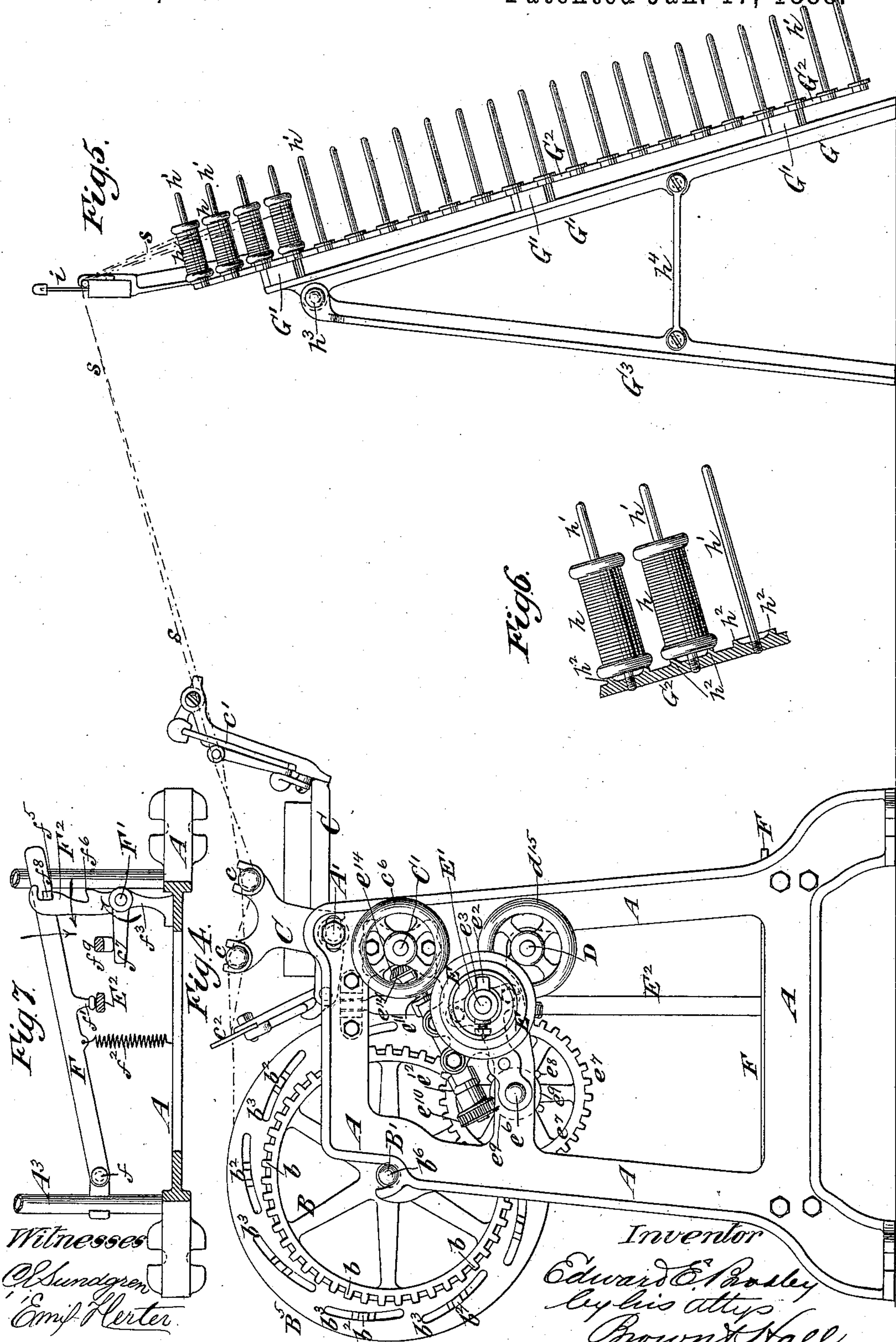
(No Model.)

3 Sheets—Sheet 2.

E. E. BRADLEY.
REELING MACHINE.

No. 376,509.

Patented Jan. 17, 1888.



(No Model.)

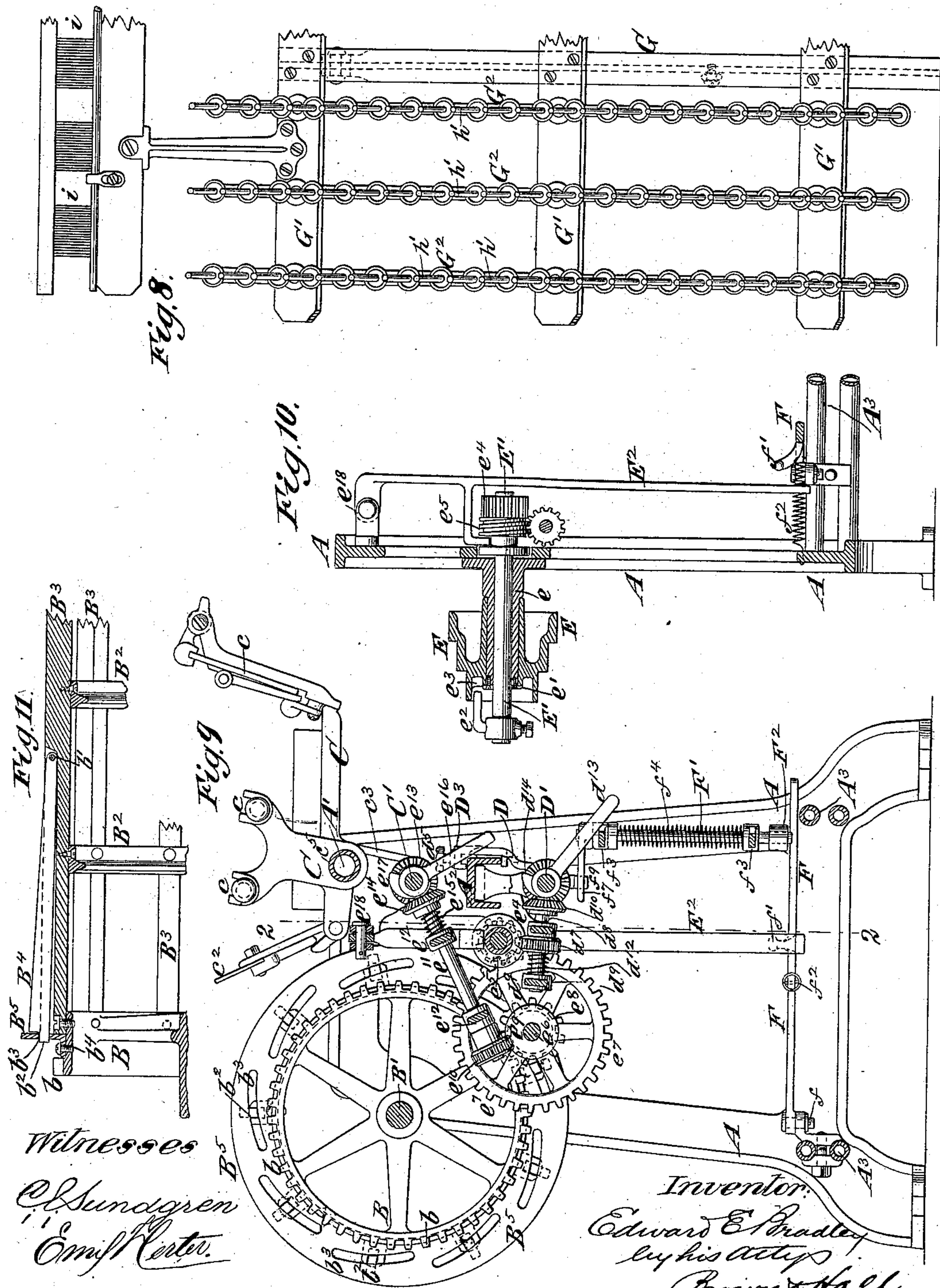
3 Sheets—Sheet 3.

E. E. BRADLEY.

REELING MACHINE.

No. 376,509.

Patented Jan. 17, 1888.



Witnesses
O. Sundgren
Emil Renter.

Inventor:
Edward E. Bradley
by his attys
Brown & Hall

UNITED STATES PATENT OFFICE.

EDWARD E. BRADLEY, OF STONINGTON, CONNECTICUT, ASSIGNOR TO JOHN E. ATWOOD AND EUGENE ATWOOD, BOTH OF SAME PLACE.

REELING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 376,509, dated January 17, 1888.

Application filed October 16, 1886. Serial No. 216,388. (No model.)

To all whom it may concern:

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

My invention, or some of the features thereof, may be embodied in machines for reeling various fibrous materials; but the invention
10 as a whole and in the form in which it is illustrated in the accompanying drawings is intended more particularly as a warping-machine for reeling silk warp. In such a machine there is employed a carriage having a
15 traverse motion imparted to it, and by which the reeds through which the threads are conducted are traversed to and fro across the face of the reel. In machines of this character the reel and the carriage which supports the
20 reeds and the parting-bars are operated by driving mechanism which is controlled by a shipper or lever which may be thrown off or disconnected to stop the machine, and it usually comprises a clutch and a movable locking
25 device or trip whereby the clutch is held operative to drive the machine. Such machines also frequently have an indicator whereby the operator may at any time ascertain the quantity of warp which has been wound upon the
30 reel, and which may be constructed and combined with the disconnecting mechanism, so that after a predetermined quantity of warp has been wound the movable lock or trip will be thrown off and the shifting driving mechanism will be thrown out of operation to stop
35 the machine by the action of a spring or equivalent weight. In warping-machines the bars or lags of the reel have usually combined with them elevating blades or bevels, which
40 are pivoted at their one end in the bars or lags, and are at their other ends capable of movement radial to the axis of the reel for the purpose of varying their inclination relatively to the bars or lags. The adjustment of
45 the elevating-blades has been accomplished by means of an annular flange adjustable circumferentially upon the reel and provided

with oblique slots receiving the free ends of the elevating-blades.

My invention relates to the means employed
50 for supporting and operating the reed-carriage; also, to a novel construction of the indicator, and the combination, with the indicator, of the mechanism for operating it and a scale or index upon which it registers; also,
55 to the novel construction and arrangement of the parts through which the indicator acts to release the shipper or lever and produce the stopping of the machine when a predetermined quantity of warp has been wound; also,
60 to novel features of construction and combinations of parts in the driving mechanism by which the reel, the traverse-screw for operating the reed-carriage, and the indicator-screw
65 are operated, which provides for readily releasing the traverse-screw and the indicator-screw from the mechanism which directly drives them, in order that said screws may be
turned or set by hand.

Heretofore in many cases the annular flange
70 or ring, which is adjustable circumferentially on a head of the reel for adjusting the elevating-blades by its oblique slots, has had formed integral with it the gear-wheel or circle of gear-teeth through which the reel is driven. Consequently in starting the reel the devices which
75 secure the annular flange or ring on the head will sometimes slip and the first driving action will be to turn the flange or ring on the reel-head and shift the elevating-blades, thereby straining or loosening the silk. To avoid
80 this I secure or form the gear-wheel or circle of gear-teeth with which the driving-pinion engages directly on the reel body or head and entirely independent of the adjustable flange
85 or ring.

The several combinations of parts which are included in my invention and hereinabove briefly referred to will be hereinafter described, and pointed out in the claims. 90

In the accompanying drawings, Figure 1 is a front elevation of a machine embodying my invention and designed for reeling silk warp, a portion of the reed-carriage being in section.

Fig. 2 is a transverse vertical section upon the plane of the dotted line xx , Fig. 1, of the reed-carriage, with the parts which it supports, a round girth connecting the end frames of the machine and on which the reed-carriage is supported, and a traverse-screw for operating the reed-carriage. Fig. 3 is a transverse vertical section on about the plane indicated by the dotted line yy , Fig. 1, of the indicator, the screw for operating it, and the scale or register on which the indicator registers. Fig. 4 is an end elevation of the machine, and Fig. 5 is an end elevation of the creel from which the machine takes the threads for winding upon the reel. Fig. 6 is a sectional elevation of a portion of the creel upon a larger scale than the preceding figures. Fig. 7 is a horizontal section upon about the plane of the dotted line zz , Fig. 1, of parts through which the indicator acts to release the shifting driving mechanism and permit it to be thrown off or disconnected by its spring. Fig. 8 is an elevation of a portion of the length of the creel. Fig. 9 is a transverse vertical section of the warping-machine on about the plane indicated by the dotted line 1 1, Fig. 1. Fig. 10 is a vertical section through one end portion of the machine, including a driving-pulley and part of the driving mechanism, on about the plane indicated by the dotted line 2 2, Fig. 9; and Fig. 11 is an axial section of a portion of the reel.

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

A A designate end frames or standards forming a portion of the main frame of the machine, and $A' A^2 A^3$ designate stretchers or girths, or horizontal portions of the main frame, extending between the end frames, A. The reel is composed of heads or spiders B, secured upon a shaft, B' , and annular supports or rings B^2 , arranged between the heads, and bars or lags B^3 , extending parallel with the shaft B' and secured to the annular supports or rings B^2 and the heads B. Upon one of the heads B is a circular series of gear-teeth, b , through which the reel is driven and which may be termed a "gear-wheel."

B^4 are elevating blades or bevels, which are pivoted at one end, b' , in the bars or lags B^3 of the reel, and at their free ends are provided with pins or projections b^2 , which enter oblique slots b^3 in the annular flange or ring B^5 . The head B of the reel, on which is the gear-wheel b , has a cylindric periphery, and upon this cylindric periphery the annular flange or ring B^5 is secured by means of screws b^4 or other means. The screws b^4 pass through slots b^5 in the flange or ring B^5 . The slots b^5 are oblique or inclined relatively to a true circle, as best shown in Fig. 9; and it will be obvious that when the screws b^4 are loosened the annular flange or ring B^5 may be adjusted circumferentially upon the head B, in order to move the free ends of the elevating-blades B^4 to vary the inclination of said blades relatively to the bars or lags B^3 , with which they are combined. By making the flange B^5 independent of the

head of the reel and of the lags or bars B^3 it will be obvious that the flange may be shifted to change the inclination of the blades B^4 without changing the relation of the reel to its driving mechanism.

From the above description it will be understood that even if the reel be started with a jerk the driving-power will have no tendency to shift the flange or ring B^5 circumferentially on the head, as is the case when the circle of gear-teeth b is integral with the flange or ring B^5 , and consequently there is no liability of the blades B^4 being thrown in or out and the silk being loosened or strained.

The shaft B' of the reel has at opposite ends handles b^6 , whereby it may be lifted and removed from the machine.

As here represented, the girth A' is cylindric or round, and may consist of a tube of proper thickness, as is shown in Fig. 9. The girth A^2 is shown as consisting of a channeled beam, and the girths A^3 , at opposite sides of the machine and near the bottom thereof, are each formed of two tubes, but may be, of course, otherwise constructed.

C designates a carriage, which supports the parting-bars c and the crossing and distributing reeds $c' c^2$, and below and parallel with the girth A' is a traverse-screw, C' , whereby the carriage C may be operated. The screw C' is supported in bearings at opposite ends of the machine, and the carriage has a downwardly-extending arm, c^3 , provided with a sectional or half nut, c^4 , which bears upon the screw C' . The carriage C has, as here shown, a bearing, c^5 , whereby it is supported upon the girth A' , and the nut-section c^4 is held in engagement with the screw C' by reason of the center of gravity of the carriage C falling upon the outer side of or in front of the outer girth, A' . In this way the carriage C is combined in a very simple manner with its supporting-girth A' and its traverse-screw C' , and may be readily swung upon the girth A' in a plane transverse to the length thereof, and may also be entirely removed from the machine.

The indicator whereby the quantity of warp which is wound upon the reel is at any time indicated is best shown in Figs. 1, 3, and 9. The indicator D is fitted to slide freely upon a screw, D' , which extends parallel with the girth A^2 , as best shown in Fig. 1, and has an upwardly-projecting finger or arm, d , which bears against the front of the girth A^2 . The indicator also has a sectional or half nut, D^2 , which fits the thread of the screw, and is pivoted at d^2 to the indicator behind the screw D' , as best shown in Fig. 3. The nut D^2 has a forwardly-projecting horn or arm, d^3 , and the indicator has a button or pivoted latch, d^4 , which may be brought down over the horn or arm d^3 , as shown in Figs. 1 and 3, and serves to hold the nut D^2 in engagement with the screw D' . When the button or pivoted latch d^4 is swung aside out of range of the horn or arm d^3 , the sectional nut D^2 may be lifted out of engagement with the screw and the indicator D may

be slid along the screw and girth A^2 to the desired position. The girth A^2 has upon its front a scale or index, as shown in Fig. 1, upon which the upwardly-extending arm or finger d registers, and upon this scale or index is an adjustable stop-gage, D^3 , which may be moved along the scale or index and secured in any desired position by the set-screw d^5 , or other means. If, for example, it is desired to stop the machine after five hundred yards are reeled, the adjustable gage D^3 will be set at the five-hundred yard mark, and the indicator will then be brought with its finger against the gage and will be traversed to the left of Fig. 1 by the rotation of the screw. The indicator D may be held against turning on the screw by means of a lip or tongue, d^6 , engaging the inside of one of the flanges of the girth A^2 , as shown in Fig. 3.

The mechanism for operating the reel, the traverse-screw C' , and the indicator screw D' is best shown in Figs. 4, 9, and 10. Upon one of the end frames or standards, A , is an outwardly-projecting fixed sleeve or hub, e , upon which rotates freely a pulley, E , and this pulley is held against outward movement on the sleeve or hub e by means of a washer or flange, e' , at the outer end of the sleeve or hub. The sleeve or hub e is tubular, and through it extends a rod or shaft, E' , having upon its outer end a clutch arm or finger, e^2 , adapted to engage a recess or notch, e^3 , in the hub of the pulley. The shaft E' carries upon its inner end a spur-pinion, e^4 , and also a worm, e^5 .

Upon a stud, e^6 , in the end frame are mounted a spur gear-wheel, e^7 , a pinion, e^8 , and a worm or screw, e^9 , which are all connected so as to rotate as one. The wheel e^7 engages with and receives motion from the pinion e^4 . The pinion e^8 engages with the large gear-wheel b upon the end of the reel and transmits to the reel the motion which the wheel e^7 receives from the pinion e^4 . The worm or screw e^9 gears into the worm-wheel e^{10} upon a counter shaft, e^{11} , which is arranged at an inclination and mounted so as to slide in bearings e^{12} upon the end frame, A . On the traverse screw C' is a bevel-wheel, e^{13} , and on the end of the counter or diagonal shaft e^{11} is a corresponding bevel-wheel, e^{14} , which is held in engagement with the wheel e^{13} by a spring, e^{15} , applied to the shaft behind the wheel e^{14} , as shown in Fig. 9. Upon the end of the traverse-screw C' , outside the gear-wheel e^{13} , is mounted a lever, e^{16} , which is free to turn on the shaft, and has a cam-shaped head, e^{17} , adapted to bear against the end of the shaft e^{11} . By means of the cam-lever e^{16} the shaft e^{11} may be moved endwise so as to carry its wheel e^{14} out of engagement with the wheel e^{13} , and the traverse screw C' may then be readily turned by hand through a hand-wheel, e^6 , applied to its end, in order to accurately set the carriage C to the desired position.

The worm or screw e^5 on the driving-shaft E' engages a worm-wheel, d^7 , upon the counter-shaft d^8 , which is arranged to turn in suit-

able bearings, d^9 , and which carries a bevel-wheel, d^{10} , engaging with a bevel-wheel, d^{11} , upon the indicator-screw D' . The shaft d^8 is free to slide in its bearings d^9 , and is forced endwise in a direction to hold the wheels d^{10} d^{11} in engagement by a spring, d^{12} , applied to it, as shown in Fig. 9. Upon the end of the indicator-screw D' , outside the bevel-wheel d^{11} , is a lever, d^{13} , which has a cam-shaped head, d^{14} , and which may be turned to force the shaft d^8 endwise against the pressure of the spring d^{12} , so as to carry the wheel d^{10} out of engagement with the wheel d^{11} . When this is done, the indicator-screw D' may be turned by a hand-wheel, d^{15} , at its end in order to bring the indicator D against the gage D^3 . The shaft E' has a sufficient endwise movement to carry the clutch arm or finger e^2 into and out of engagement with the clutch-recess e^3 , and such movement may be produced by a lever, E^2 , arranged as shown in Fig. 10, and pivoted at its upper end, e^{18} , so that it may be swung in a plane parallel with the axis of the shaft E' .

I will now describe the parts whereby the lever E^2 is held so as to maintain the clutch operative, and whereby said lever is automatically released by the indicator D when a predetermined quantity of thread has been wound.

F designates a foot-lever, which is pivoted at f to a bracket upon one of the lower girths, A^3 , so as to swing in a horizontal plane, and which has an arm or projection, f' , adapted to bear against the outer side of the lever E^2 at the lower end thereof. To the lever F is attached a spring, f^2 , which when the lever F is released swings the lever in the direction indicated by the arrow in Fig. 7, and by such swinging of the lever F the lever E^2 is moved in the direction to throw off the clutch and disengage the shaft E' from the pulley E .

F' designates an upright shaft which is mounted in suitable bearings, f^3 , and has applied to it a spring, f^4 , which exerts a constant tendency to turn it in the direction indicated by the arrow adjacent to it in Fig. 7. The lower end of the shaft F' has fast upon it a trip, latch, or stop, F^2 , which is provided with notches f^5 f^6 , and upon the upper end of the shaft F' is an arm, f^7 , which projects rearward, as best shown in Figs. 7 and 9.

When the parts are operative, the lever F is swung into the position shown in Fig. 7, and is there held by the shoulder or notch f^5 on the trip F^2 engaging the shoulder or projection f^8 upon the lever, as shown in Fig. 7.

Projecting downward from the indicator D , as shown in Fig. 1, is an arm or bracket, f^9 , and as the said indicator, starting from the position shown in Fig. 1, is moved toward the left its arm or bracket f^9 after a predetermined quantity of material has been wound or reeled comes against the arm f^7 upon the upright shaft F' , and by turning said shaft turns the trip or movable stop F^2 in the direction of the arrow marked thereon in Fig. 7, thereby releasing the horizontal lever F and permitting the spring f^2 to move the lever F

in the direction of the arrow thereon in Fig. 7, thus effecting the swinging of the lever E^2 in the direction to throw off the clutch. The second shoulder, f^6 , upon the trip or movable stop F^2 serves to check the movement of the lever F after it has been swung by the spring f^2 a certain distance to throw off the clutch. The arrangement of connections described for throwing off or disconnecting the clutch is sure and sensitive, and but a very slight movement of the indicator is necessary to accomplish the purpose.

The threads or fibers of silk or other material, s , for winding upon the reel are taken from spools h , supported by pins or spindles h' upon a creel, which may be of any suitable or ordinary construction. The creel here shown has some points of advantage over those ordinarily employed and is included in my invention. It comprises upright bars or standards G , which are usually of metal, cross-rails G' of wood secured to the upright bars or standards, and upright strips or pieces G^2 , which are of metal and are secured parallel with each other at a little distance apart to the cross-rails G' , as shown in Fig. 8. The pins or spindles h' are secured in and project from the metal strips or bars G^2 , as best shown in Fig. 6, and each pin or spindle is surrounded by an annular seat or bearing-surface, h^2 , as best shown in Fig. 6, upon which the head of the spool h bears. The annular seats h^2 afford a very slight surface for the heads of the spools h to bear against, and hence offer but little frictional resistance to the free turning of the spools. The uprights or standards G are provided with legs G^3 , which are usually of metal, and which at their upper ends, h^3 , are pivoted to the uprights or standards G and are connected with said uprights or standards by braces h^4 near their lower ends. The braces h^4 may be of wire, and are detachably secured by screws or otherwise to the uprights G and legs G^3 . When the braces are disconnected from the legs G^3 , the latter may be swung into positions almost or quite parallel with the uprights G , and the creel may be thus compacted so as to occupy but little space and may be more readily boxed and shipped or stored away. At the top of the creel is a reed, i , as usual, through which the threads s pass.

In creels for warping machines as heretofore made the upright bars on which are the spindles or pins h' have been of wood, and the pins have been driven into them and have had washers placed over them for holding the spools out of contact with the wood. The pins or spindles have been liable to work loose in the wood, and the wide bars of wood have greatly obscured the passage of light through the creel. The metal strips G^2 afford a firm hold for the pins or spindles h' , and may be made so narrow that they will not obstruct the free passage of light.

In lieu of the spring f^2 for moving the lever F , I may employ a weight, o , and flexible con-

nection o' , as shown by dotted lines in Fig. 1, which would be the full equivalent of the spring.

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

1. The combination, with a reel and end frames or standards, of a round girth connecting the end frames or standards and a feed-screw extending parallel with and below the girth, a reed-carriage free to slide and turn on the girth, and having a downwardly-extending arm and a section of a nut on said arm, which by turning of the carriage on the girth is engaged with and disengaged from the screw, and mechanism, substantially as described, for operating the reel and screw, substantially as herein set forth.

2. The combination, with the reel, a screw, D' , and means, substantially as described, for operating them, of a flanged stretcher or bar, A^2 , having upon it a scale or index extending parallel with the screw, the indicator D , fitted to slide on the screw with its weight supported thereon, and having a projecting finger which bears on the scale or index, and a lip, d^6 , which engages a flange on the stretcher or bar and holds the indicator with its projecting finger in registering relation to the scale or index, and a nut, D^2 , pivoted to the indicator and engaging the screw, substantially as herein described.

3. The combination, with a reel, the screw D' , and mechanism, substantially as described, for operating them, of the scale or index A^2 , extending parallel with the screw, the indicator D , fitted to slide on the screw, and the pivoted nut-section D^2 and pivoted lock d^4 , substantially as herein set forth.

4. The combination, with a reel, a traverse-screw, and a driving device for operating them, which is movable to stop the machine, of a spring or equivalent weight for throwing off or disconnecting the driving device when released, and a trip whereby said device is held in operative position, an indicator-screw and the indicator fitted thereto and provided with a movable nut-section, an index or scale extending approximately parallel with said indicator-screw and on which said indicator registers, and mechanism, substantially as described, for operating the indicator-screw and whereby the indicator acts at the desired time to throw off the trip, substantially as herein described.

5. The combination, with a reel and a traverse-screw, and a driving device, substantially as described, for operating them, and which is movable to stop the machine, of a spring or equivalent weight for throwing off or disconnecting the device, the indicator-screw D' and indicator D , and a shaft provided with arms $F^2 f^7$, the former, F^2 , serving as a trip to hold the driving device operative, and the latter, f^7 , projecting in the path of the indicator, and gearing for operating the indicator-screw, substantially as herein set forth.

6. The combination, with the reel, a trav-

erse screw, and the driving device, substantially as described, for operating them, and which is movable to stop the machine, of a lever, E^2 , controlling the driving device, a lever, F , a spring or equivalent weight for operating said levers to throw off or disconnect the driving device, a movable trip for holding the said levers set with the driving device operative, an indicator-screw and an indicator moved thereby, and mechanism, substantially as described, through which the indicator is caused by the screw to throw off the trip and stop the machine at a predetermined time, substantially as herein set forth.

7. The combination, with a main frame and a reel and traverse-screw, and a fixed tubular sleeve or hub projecting from the main frame, of a pulley turning loosely on the sleeve or hub, a shaft extending through the sleeve or hub and provided with a clutch-arm engaging the pulley, gearing, substantially as described, for operating the reel and traverse-screw from said shaft, and a lever for sliding said shaft within the sleeve or hub to free it from and engage it with the pulley, substantially as herein set forth.

8. The combination, with the reel and its wheel b and the traverse-screw C' , of the shaft E' , provided with a pinion, e^4 , the gear-wheel e^7 , pinion e^8 , and worm e^9 , having concentric axes and rotating as one, the wheel e^7 being in engagement with the driving-pinion e^4 , and the pinion e^8 in engagement with the reel-gear b , and the counter-shaft e^{11} , having a worm-wheel, e^{10} , gearing with the worm e^9 and geared with the traverse screw, substantially as herein described.

9. The combination, with the indicator-screw D' , of the counter-shaft d^8 , geared therewith and provided with a worm-wheel, d^7 , and the driving-shaft E' , provided with a worm, e^5 , engaging said worm-wheel, substantially as herein described.

10. The combination, with the traverse-

screw C' and its bevel-wheel e^{13} , of the counter-shaft e^{11} , provided with a wheel, e^{14} , and means, substantially as described, for driving it, bearings wherein said shaft may slide, a spring for holding said shaft in operative position with the wheels e^{14} e^{13} in engagement, and a cam-lever, e^{16} , for forcing the shaft endwise to break engagement of said wheels and stop the screw, substantially as herein set forth.

11. The combination, with an indicator-screw, D' , provided with a gear-wheel, d^{11} , of the counter-shaft d^8 , provided with a gear-wheel, d^{10} , and means, substantially as described, for driving it, bearings wherein said shaft may slide, and a spring for holding the shaft in position with the said wheels in engagement, and a cam-lever, d^{13} , for forcing said shaft endwise to break engagement between said wheels and stop the machine, substantially as herein set forth.

12. The combination, with the heads and bars of a reel, and a gear-wheel or circular series of gear-teeth at one end thereof, of a driving-pinion engaging with said wheel or gear-teeth, elevating-blades pivoted at their one end in the bars, and an annular flange or ring fitting and provided with means for securing it on the periphery of one of the heads and adjustable circumferentially relatively to the head and the gear-wheel or circle of gear-teeth, the said flange or ring having oblique slots which receive the ends of the elevating-blades, substantially as herein described.

13. The combination, with the upright frames or standards of a creel and the cross-rails of wood connecting them, of the upright metal strips G^2 , secured to said rails and provided with pins or spindles h' , substantially as herein described.

EDWARD E. BRADLEY.

Witnesses:

WM. R. PALMER,

WM. A. GILBERT.