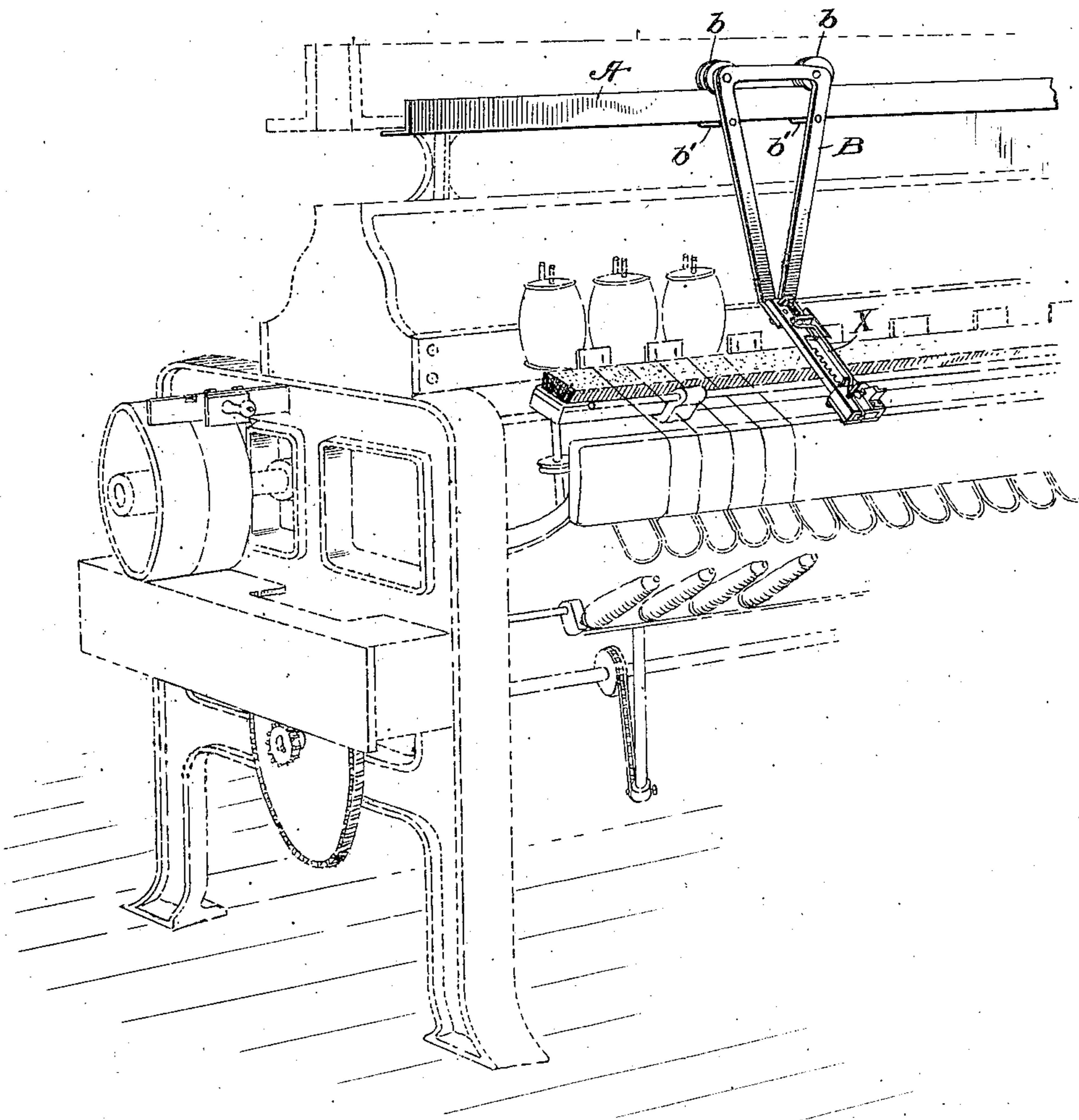


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KNOTTER FOR COP WINDING MACHINES.  
APPLICATION FILED NOV. 9, 1907.

916,883.

Patented Mar. 30, 1909.  
3 SHEETS—SHEET 1.

Fig. 1.



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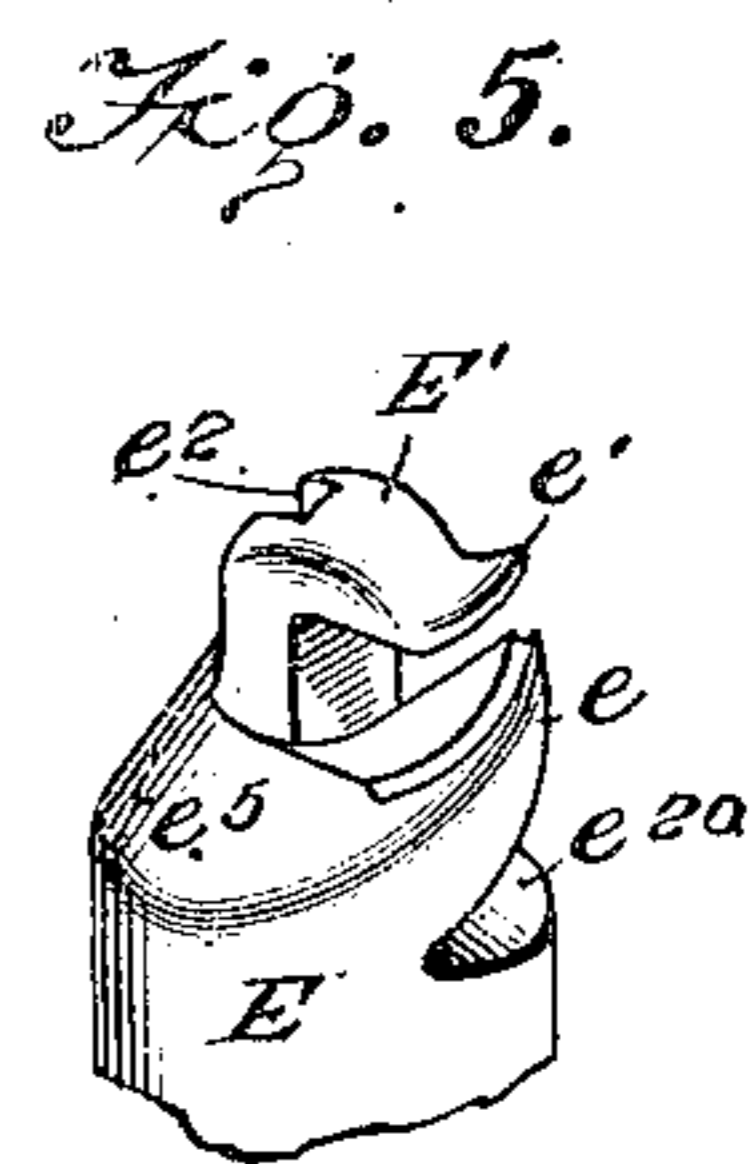
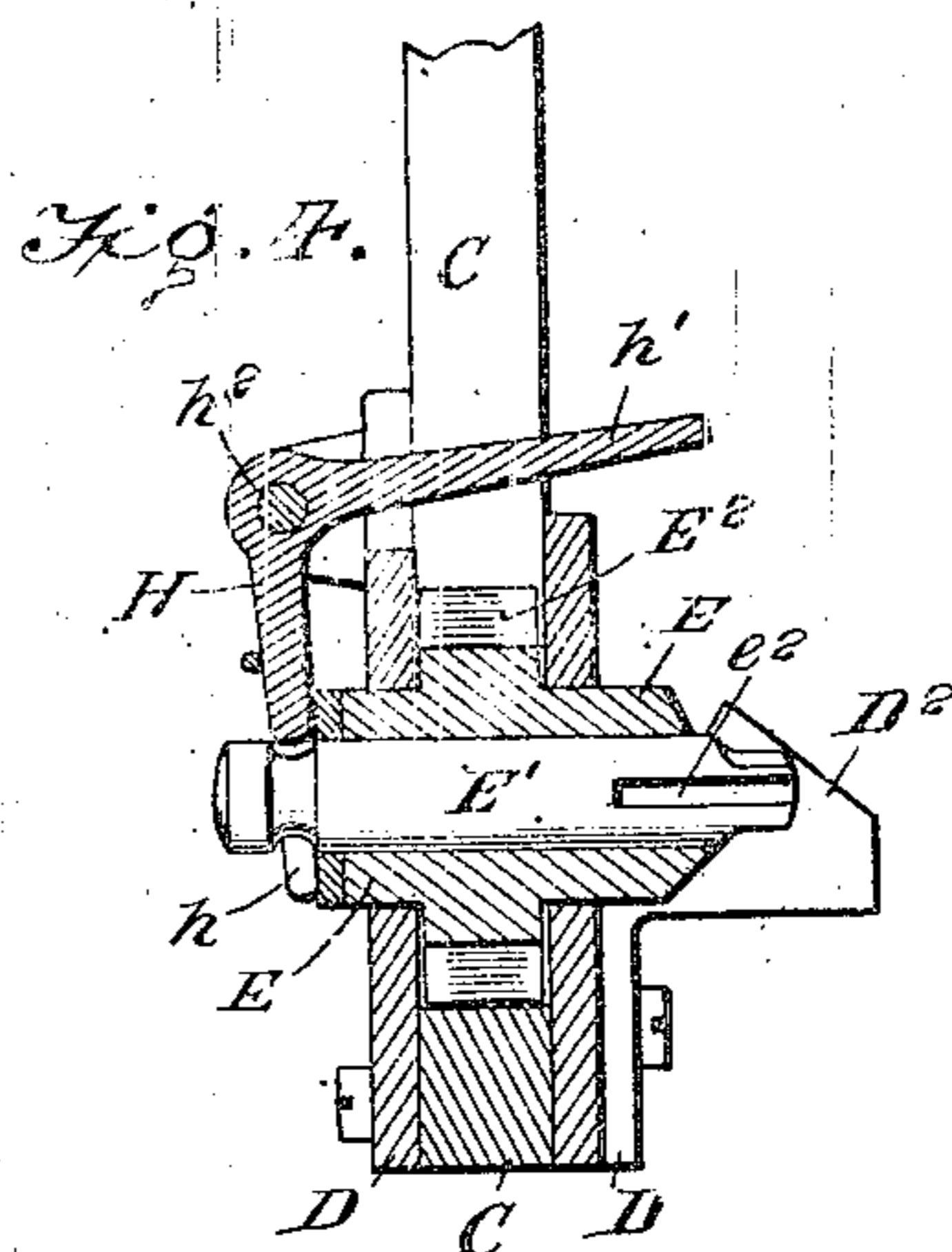
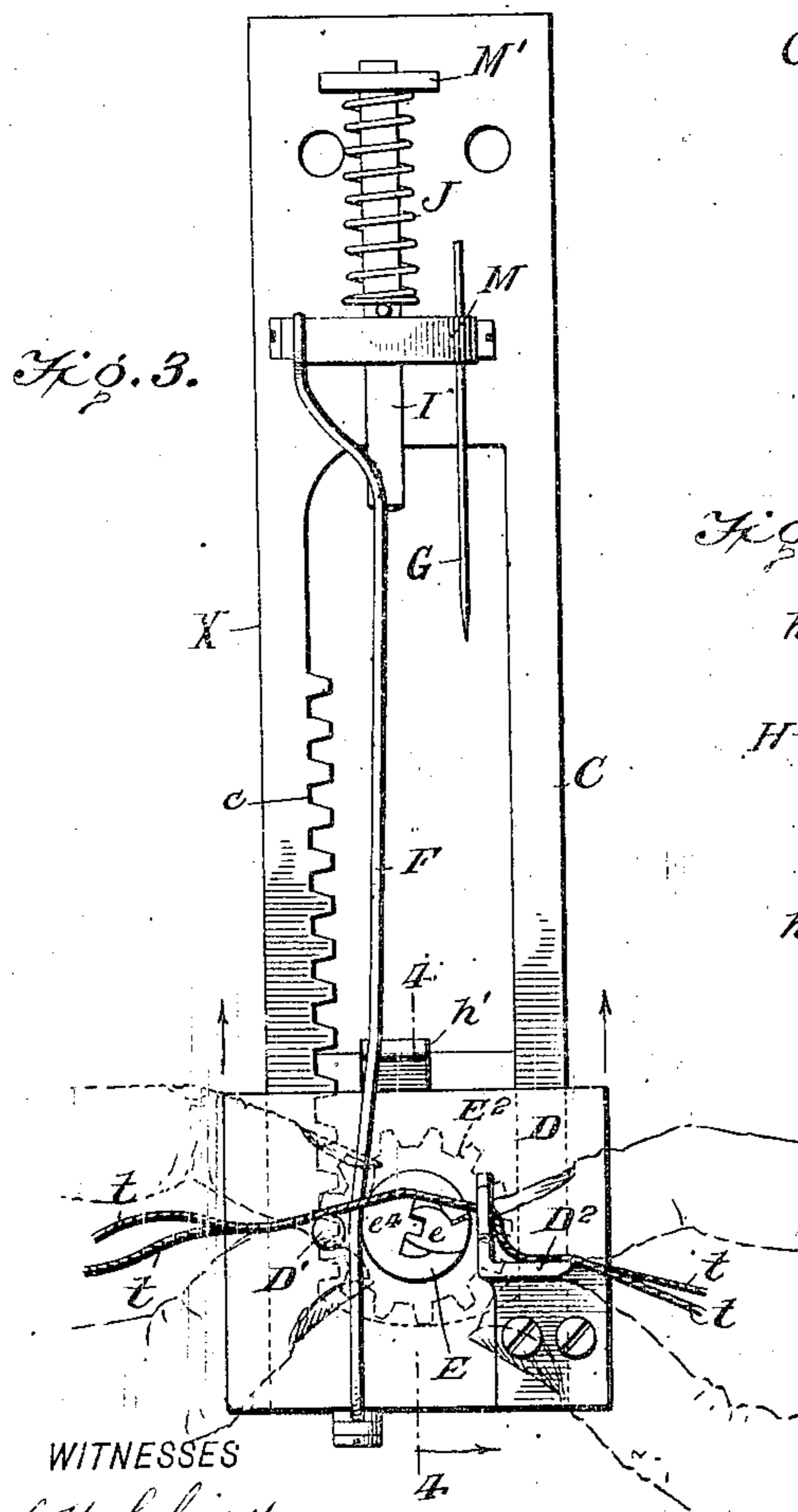
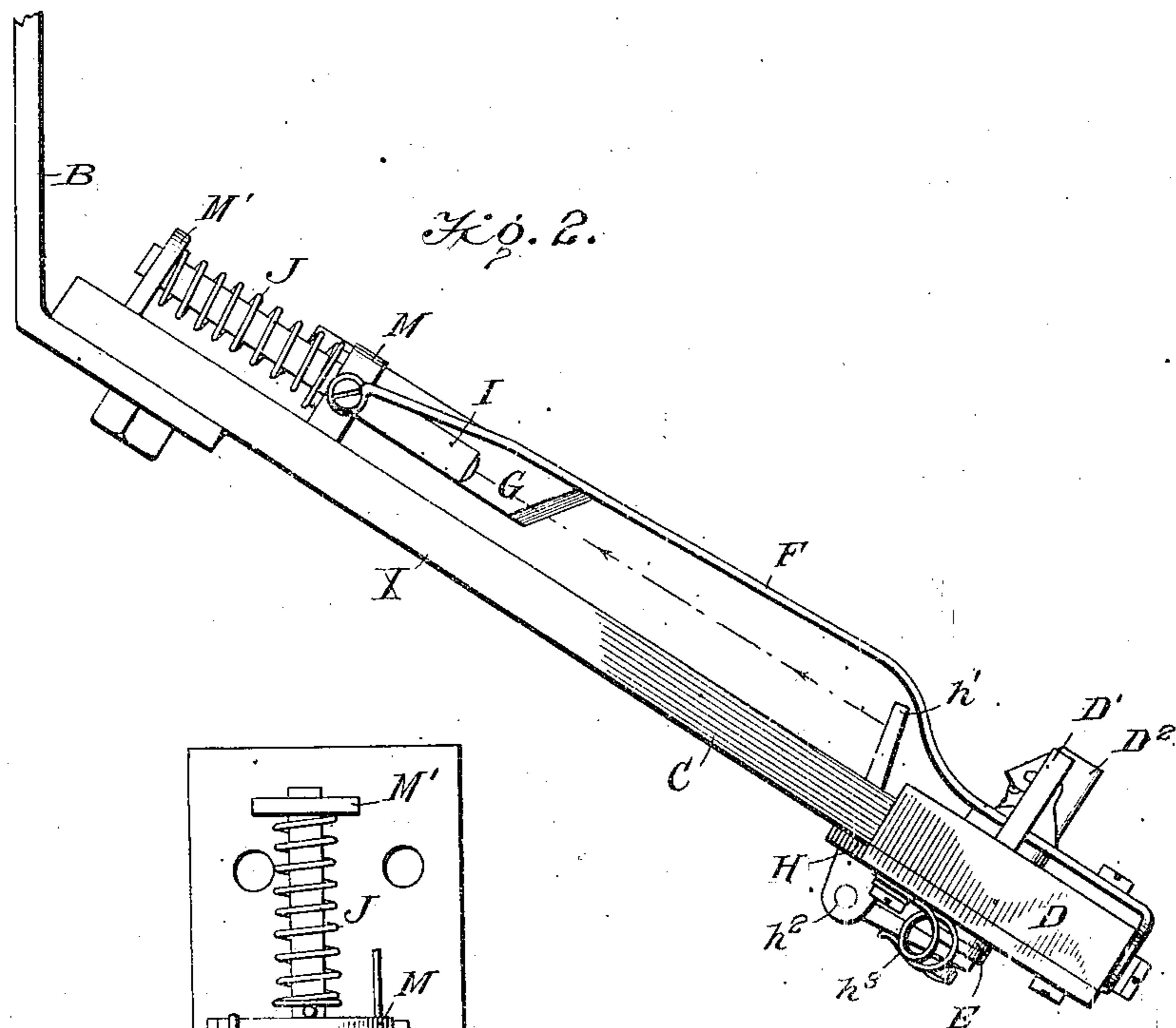
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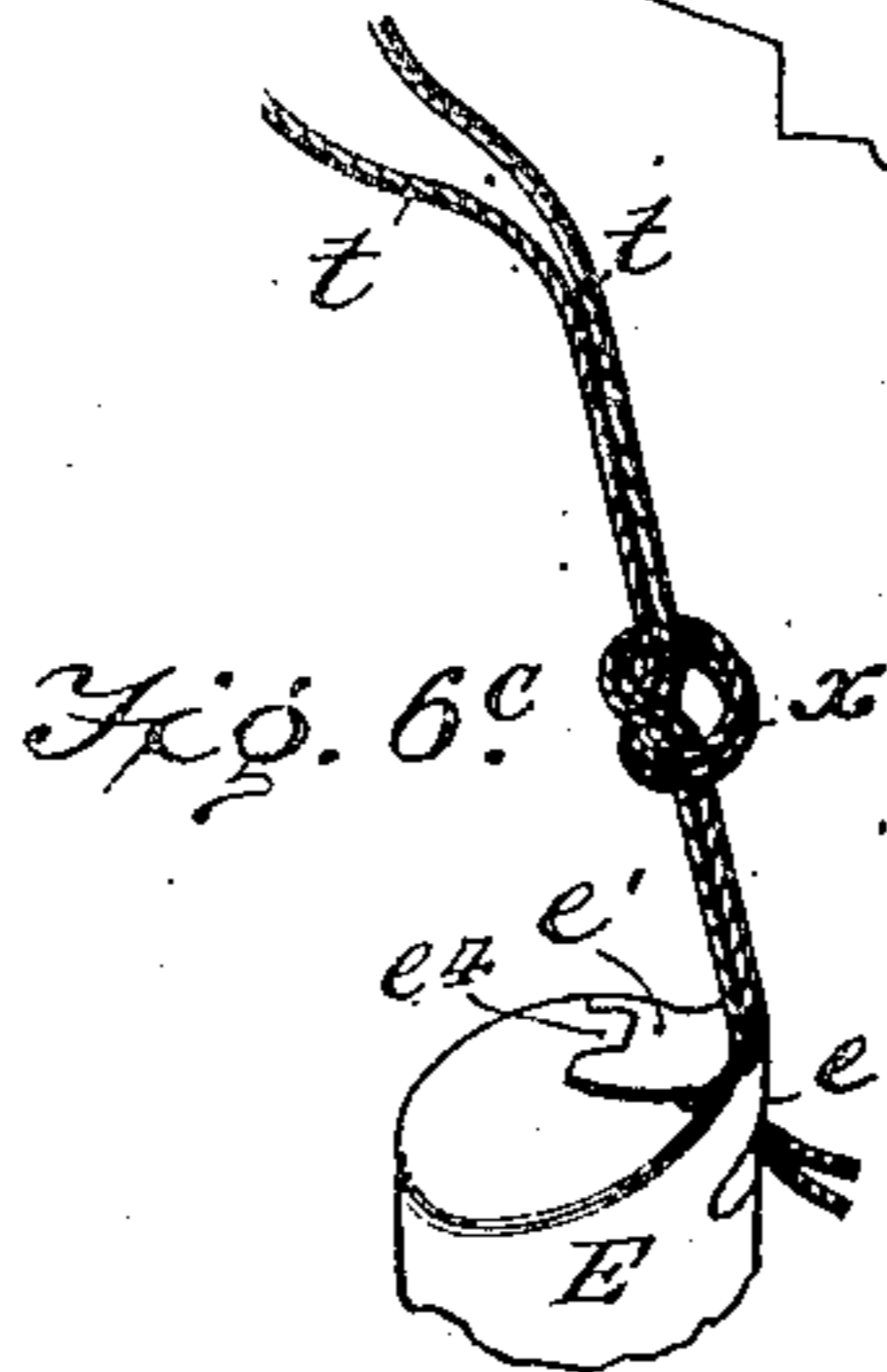
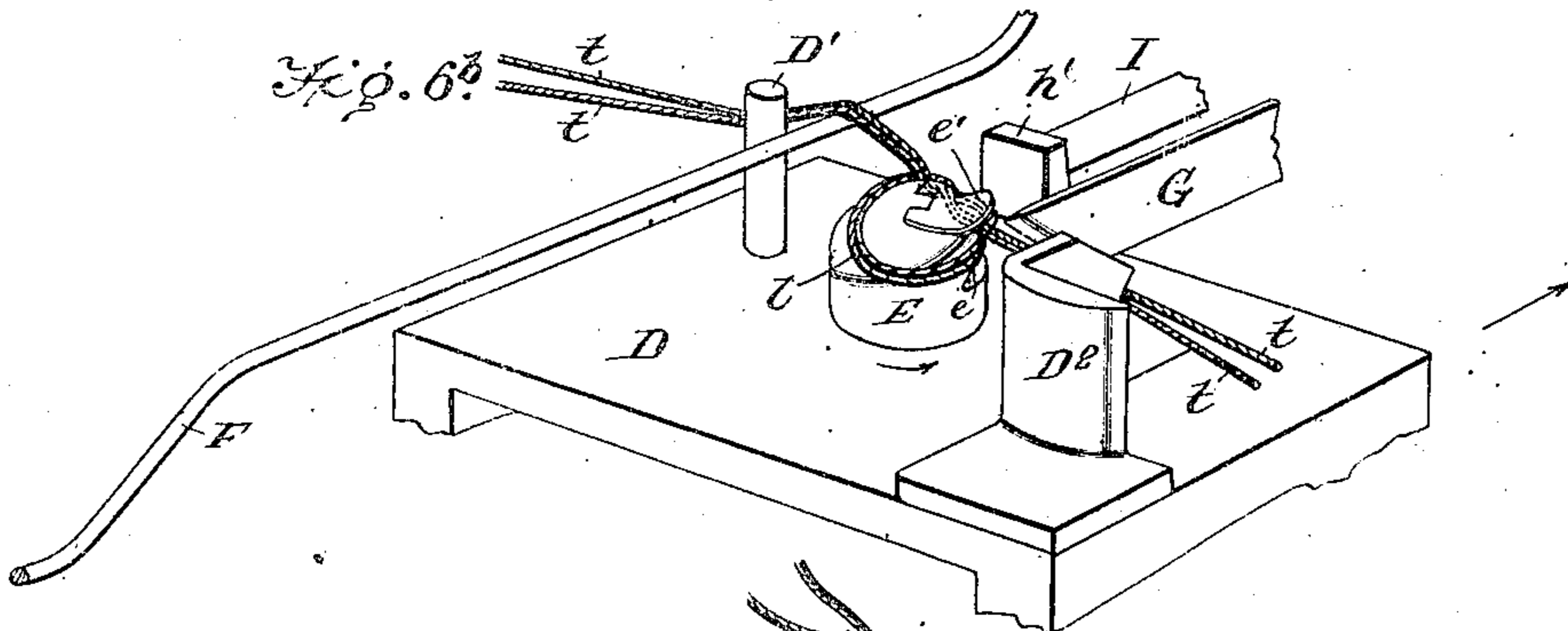
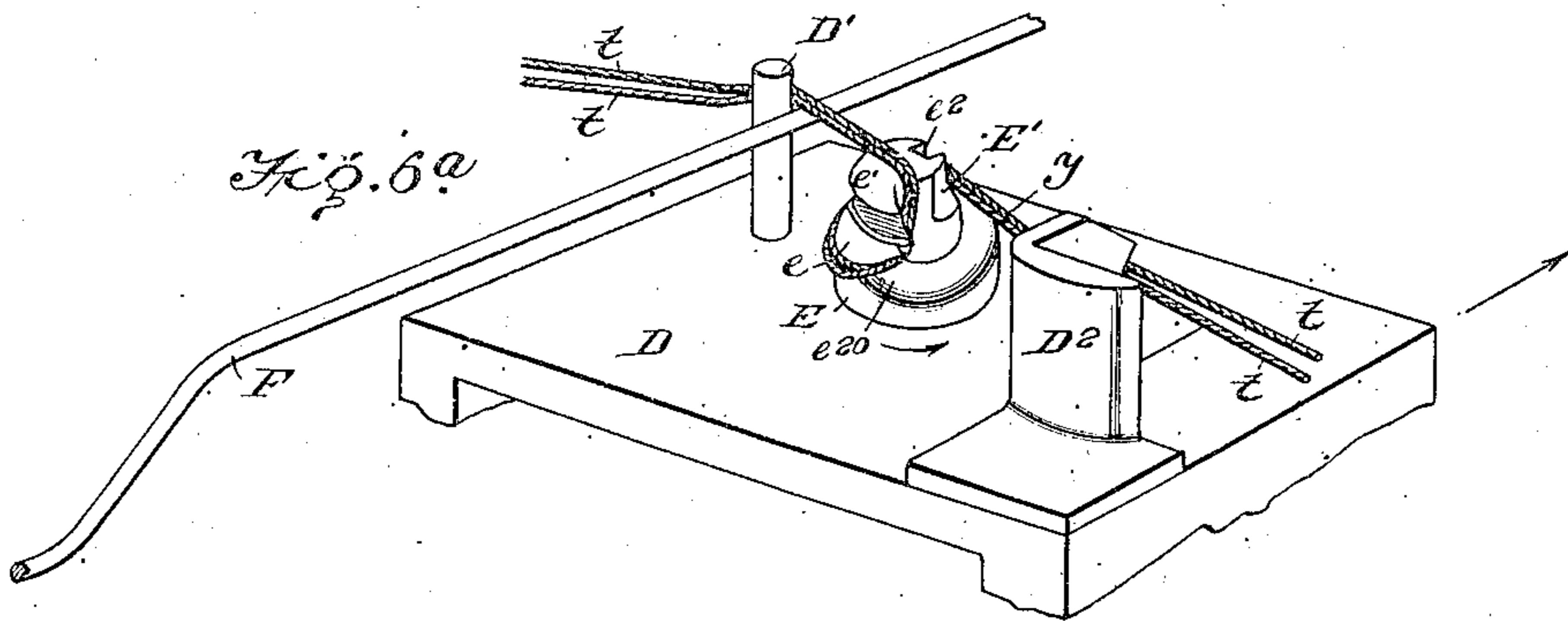
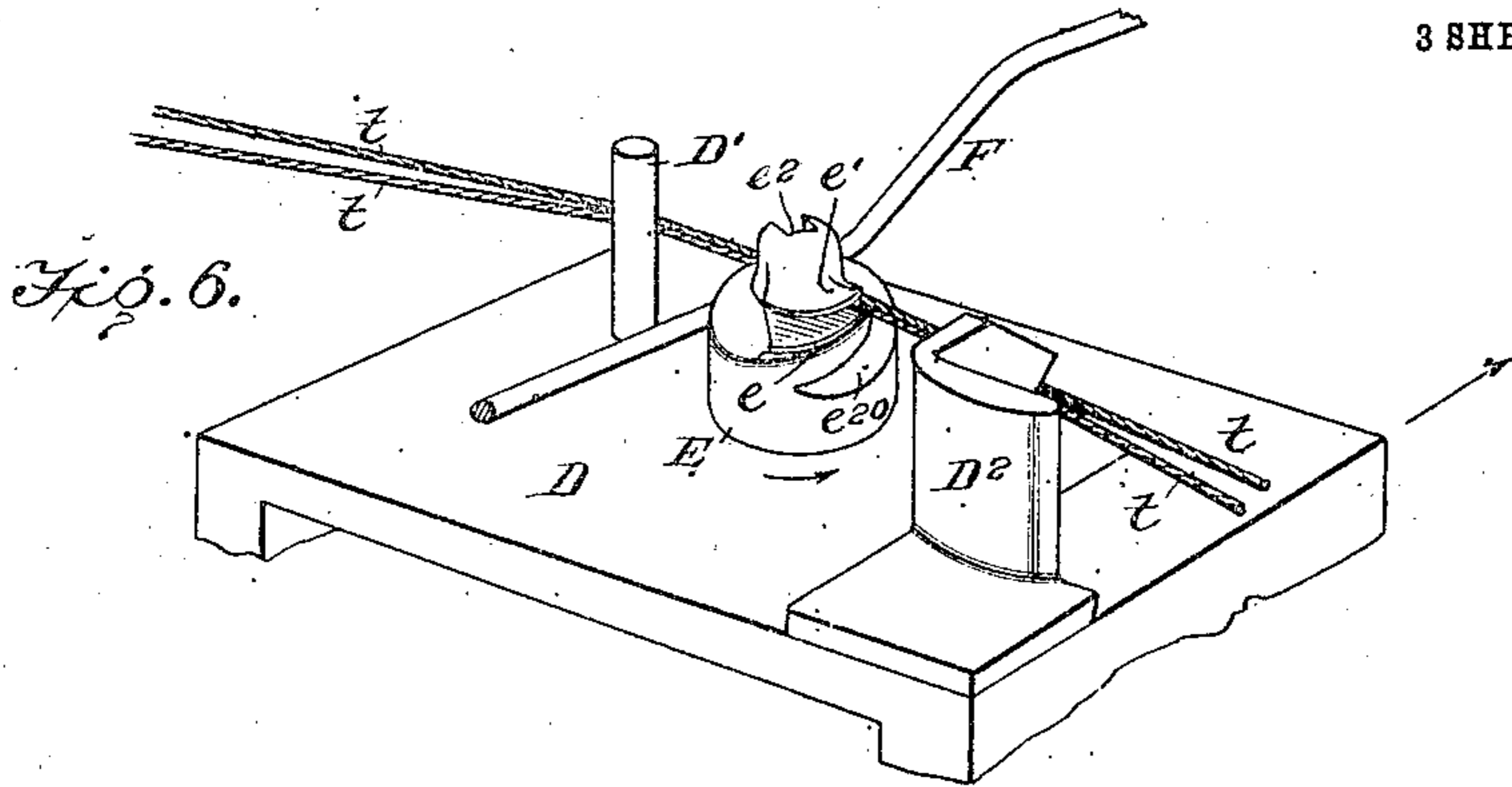
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3 SHEETS—SHEET 3.



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# UNITED STATES PATENT OFFICE.

STONEWALL JACKSON MARTIN, OF SALTILLO, MEXICO.

## KNOTTER FOR COP-WINDING MACHINES.

No. 916,883.

Specification of Letters Patent.

Patented March 30, 1909.

Application filed November 9, 1907. Serial No. 401,415.

*To all whom it may concern:*

Be it known that I, STONEWALL JACKSON MARTIN, a citizen of the United States, and a resident of Saltillo, Coahuila, Mexico, have  
5 invented certain new and useful Improvements in Knotters for Cop-Winding Machines, of which the following is a specification.

In cloth factories where cop winding machines are employed, it is necessary to join  
10 the ends of the thread to be wound on the cops, which operation is usually performed by hand by tying the ends together. This is a slow and tedious operation, the knots frequently coming untied, or the ends of the  
15 thread beyond the knot are not of uniform length.

My invention is designed to provide a knotter to be used as an attachment of the  
20 cop winding machine, which knotter ties knots in a safe and rapid manner with a uniform length of ends and without skilled labor, so that any inexperienced person may be able to quickly perform this service in a rapid and  
25 satisfactory manner.

The invention consists of certain novel constructions and combinations of parts as will be hereinafter fully described with reference to the drawing, in which—

30 Figure 1 is a perspective view of my knotter attachment applied to a cop winding machine which is shown in dotted lines. Fig. 2 is a side view, and Fig. 3 is a face view of the knotting devices. Fig. 4 is a section  
35 through line 4—4 of Fig. 3. Fig. 5 is a perspective view of the knotting bill or pinching jaws which hold the thread, and Figs. 6, 6<sup>a</sup>, 6<sup>b</sup> and 6<sup>c</sup> are views showing the successive position of the parts of the knotter and the  
40 progressive stages of tying the knot.

Referring to Fig. 1, A represents an angle bar attached to the upper structure of the cop winding machine in horizontal position. This angle bar forms an elevated track rail  
45 on which my knotter attachment is suspended and shifted laterally to any position in which it may be required for use. The attachment consists of the triangular hanger frame B having grooved pulleys *b*, *b* which  
50 ride upon the upper edge of the track rail and guard arms *b'*, *b'* which project below the rail and prevent the hanger frame from being accidentally dislodged. The lower convergent end of the hanger is bolted in an  
55 inclined position to the knotter X, shown in detail in Figs. 2, 3 and 4. This consists of

an elongated open frame C of generally rectangular shape having upon the inner edges of one of its side bars a row of rack teeth *c*. Sliding on the parallel side bars of this frame  
60 is arranged a carriage D which has a range of adjustment from the lower end to the upper end of the rectangular frame. Within this carriage D is arranged a rotary sleeve E having formed with it or attached to it a toothed  
65 pinion E<sup>2</sup> whose teeth mesh with the rack teeth *c* on the side bar of the frame and which pinion derives therefrom and imparts to the sleeve a rotary movement whenever the carriage D is slid longitudinally along the  
70 frame C. The rotary sleeve E has arranged centrally within it a sliding stem E', as seen in Fig. 4, which has a limited longitudinal movement within the sleeve but rotates rigidly with the sleeve. The sleeve E and stem  
75 E' are fashioned at their upper ends into the two parts of the knotting bill, as seen in Fig. 5. The sleeve E has a hook jaw *e*, and the sliding stem E' has a hook jaw *e'*. A longitudinal groove *e*<sup>2</sup> in the sliding stem receives  
80 a rib *e*<sup>4</sup> of the sleeve E, as shown in Figs. 3 and 5, which while securing independent longitudinal movement for the stem E' compels the rigid rotary movement of the sleeve E and the stem E' together. The rotary move-  
85 ment of the sleeve E and stem E' perform the function of laying the loop in tying the thread and the longitudinal sliding movement of the stem E' effects the seizing and holding of the thread and drawing it through  
90 the loop which is formed around the knotter, as composed of the sleeve E and stem E'. The sleeve E, has, see Fig. 5, below its hook jaw *e*, a slot *e*<sup>20</sup> which winds around the sleeve spirally and disappears into the curved face  
95 *e*<sup>5</sup>, and the upper surface of the upper jaw *e'* of the knotting bill, is rounded so that when said upper jaw is down or in its lowest position for pinching the thread the upper end of the knotting bill will present a well rounded  
100 surface coinciding with the beveled face *e*<sup>5</sup> to promote the casting off of the loop after the knotting bill has drawn the threads through the same, as will be more fully described hereafter.

The longitudinal sliding movement of the stem E' which controls the movement of the upper jaw *e'* of the knotting bill is imparted  
105 by an elbow lever H, see Fig. 4, pivoted at *h*<sup>2</sup> to the carriage D and having one arm embracing a grooved lower end of the stem E', and its upper end *h'* projecting up through  
110

the opening in the rectangular frame C into position to be struck by a tappet pin I when the carriage has moved to the limit of its upward stroke. The elbow lever H is provided with a spring  $h^2$  which normally holds its lower end, embracing the stem  $E'$ , in an elevated position with the knotting bill opened. The tappet pin I is arranged longitudinally in the frame C and is normally held down by the spiral spring J wound thereabout, but said pin yields upwardly in an elastic manner. This pin slides in guides M, M' attached to the upper end of the frame.

F is a loop-forming wire arranged in a generally longitudinal relation to the frame C and connected at its lower end to said frame and at its upper end to the bearing lug of the tappet pin. This loop-forming wire F at its lower end lies close down to the plane of the upper surface of the carriage D and as it proceeds upward rises away from the frame C, as seen in Fig. 2, for the purpose hereafter described.

The carriage D is provided on one side of the knotting bill with an upwardly projecting pin  $D'$  and on the opposite side of the bill has rigidly attached to it an upwardly projecting angle plate  $D^2$  formed with a notch in its side adjacent to the knotting bill adapted to receive the threads  $t, t$ , to be tied and to hold them down in a plane which compels them to enter the groove  $e^{20}$  below the lower jaw of the knotting bill. The pin  $D'$  and the angle plate  $D^2$  form thumb pieces which are grasped, respectively, by the thumb and forefinger of the right and left hand, as seen in Fig. 3 in dotted lines. The two ends of the thread to be tied are at the same time grasped between the forefinger and the stem  $D'$  on the one side and between the forefinger and the angle plate  $D^2$  on the other side, and the knotting movement when the thread is thus grasped is effected by the simple upward advance of the carriage D in the direction of the arrows as will be described more fully hereafter.

Attached to the bearing M at the upper end of the frame C there is a knife blade G, which is arranged in the plane of the space between the angle plate  $D^2$  and the knotting bill and the function of this knife is to sever the end of the cord at a definite distance from the knot which is tied, after said knot has been tied by the upward movement of the carriage.

In order that the operation of tying the knot may be better understood, I have shown in Figs. 6, 6<sup>a</sup>, 6<sup>b</sup> and 6<sup>c</sup>, the successive positions of the parts in the several degrees of progress in forming the knot. When the two ends of the thread  $t, t$  are laid upon the stem  $D'$  and angle plate  $D^2$ , and grasped by the fingers, as shown in Fig. 3, the plane of the thread  $t$  is in the plane of the groove  $e^{20}$ , as seen in Fig. 6, or beneath the lower jaw of the knotting bill. As the carriage D is moved

upwardly in the direction of the arrow in Fig. 6, two things take place, the knotting bill is rotated by the engagement of its pinion  $E^2$  with the teeth on the carriage and passes to the position shown in Fig. 6<sup>a</sup>. At the same time the ends of the thread  $t, t$ , have risen upon the higher portion of the loop-forming wire F and have carried the thread in an upward direction over the interior seat of the jaws  $e, e'$  of the knotting bill. At this stage of the operation, the upper jaw  $e'$  of the knotting bill it will be seen is open and the space between the upper jaw and the lower jaw is in alinement with that portion of the thread  $\gamma$  extending from the knotting bill to its seat in the angle plate  $D^2$  so that when the knotting bill by a further rotary movement advances toward the part  $\gamma$  of the thread, the thread will be received between the jaws  $e$  and  $e'$  of the knotting bill and when this takes place the longitudinal sliding movement of the stem bearing the upper jaw allows the upper jaw to descend and to pinch between it and the lower jaw the thread at the point  $\gamma$ . The action just described is shown as accomplished in Fig. 6<sup>b</sup> in which it will be seen that the loop is around the knotting bill and the knotting bill has seized the thread preparatory to pulling it through the loop or rather for holding it while the loop is cast from the same. The movement by which the knotting bill is closed is effected by the contact of the upper end  $h'$  of the lever H, see Fig. 4, against the tappet pin I, as seen in Fig. 6<sup>b</sup>. As will be seen from Fig. 4, when said end  $h'$  is thrust toward the knotting bill, the other end of the elbow lever pulls down the stem  $E'$  and closes said knotting bill. As the carriage D still advances by reason of the yielding character of the tappet I, the thread at the point between the knotting bill and the angle plate  $D^2$  is brought into forcible contact with the stationary knife G, as seen in Fig. 6<sup>b</sup>, and the thread is cut off at a uniform and definite distance from the knotting bill. It only remains now by an upward movement of the left hand portion of the thread  $t, t$ , to swing the loop over the pinched ends of the knotting bill, which forms a complete knot, as seen in Fig. 6<sup>c</sup>. When the threads are about to come in contact with the knife, the pinion  $E^2$  is disengaged from the rack and is held firmly by the pressure of the lever H, and in its return the pinion will gear in the same teeth. The object in holding the pinion and the bill stationary when cutting the threads is to facilitate cutting the threads close to the bills and also to make a clean cross cut of the threads, for if the pinion were to continue revolving, the ends or threads would be dragged across the knife and the threads would be left long and ragged.

I claim:

1. The combination with a cop winding

machine, of a track rail mounted in a horizontal position at the upper part of the same, a pendent hanger frame slidable thereon from side to side of the machine  
 5 and extending in inclined position downwardly and outwardly a slidable carriage adapted to reciprocate along said inclined portion, and a knotting bill carried by said carriage and arranged to engage the sides  
 10 of said inclined portion and to be actuated thereby.

2. A knot tying device for uniting thread ends, consisting of a stationary frame, a  
 15 slidable carriage movable along said frame and bearing a knotting bill, thread guiding means on opposite sides of said bill, means engaged by the sides of said frame for operating said knotting bill, and means for cutting off the thread ends.

20 3. A knot tying device for uniting thread ends, consisting of a stationary frame having inwardly projecting rack teeth, a sliding carriage movable along said frame and bearing a knotting bill having a pinion  
 25 engaging the rack teeth, a guide post on one side of said knotting bill, and a guide plate on the other, means for forming a thread loop on said knotting bill, means for detaching the loop from said bill, and means for  
 30 cutting off the thread ends.

4. A knot tying device for uniting thread ends, consisting of a stationary frame with parallel side bars, one of which has inwardly projecting rack teeth, a sliding carriage  
 35 movable along said frame and bearing a knotting bill having a pinion engaging the rack teeth, the knotting bill having a longitudinally movable upper jaw and attached sliding stem movable concentrically  
 40 through the knotting bill pinion, a spring pressed elbow lever having one arm connecting with said stem on the opposite end from the knotting bill and the other arm extending between the parallel frame bars,  
 45 and a tappet projection arranged in the path of the latter end of the elbow lever for deflecting said elbow lever when the carriage is moved upwardly.

5. A knot tying device for uniting thread ends, consisting of a stationary frame having  
 50 inwardly projecting rack teeth, a sliding carriage movable along said frame and bearing a knotting bill having a pinion engaging the rack teeth, the knotting bill having a longitudinally movable upper jaw  
 55 and attached sliding stem movable concentrically through the knotting bill, a spring pressed elbow lever for holding the knotting bill open, a tappet pin for deflecting said elbow lever when the carriage is moved  
 60 upwardly, and a stationary loop-forming wire arranged beside the path of the knotting bill and bent upwardly along its length to form the loop.

6. A knot tying attachment comprising  
 65 a rectangular frame having parallel bars, one of which has inwardly projecting rack teeth, a movable carriage with a knotting bill having a pinion engaging said rack teeth, said knotting bill having one of its  
 70 jaws fixed to a concentrically sliding stem extending through the pinion, a spring pressed elbow lever for holding the said knotting bill open, one arm of said elbow lever connecting with the sliding stem and  
 75 the other arm extending between the parallel bars, a yielding tappet pin arranged in the path of the latter arm for closing the knotting bill at the end of the upward movement, and a stationary knife arranged  
 80 to sever the thread at the knotting bill at the end of the tying movement.

7. A knot tying device comprising a pendent and laterally adjustable hanger frame, a manually operated sliding carriage  
 85 mounted on said frame to slide up and down and carrying a rotary knotting bill.

8. A knot tying device comprising a manually operated sliding carriage carrying a rotary knotting bill, and a stationary knife  
 90 toward which the carriage is advanced to sever the thread at the end of the movement.

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