

(No Model.)

3 Sheets—Sheet 1.

M. S. PALMER.

MACHINE FOR MAKING CORD AND ROPE.

No. 353,036.

Patented Nov. 23, 1886.

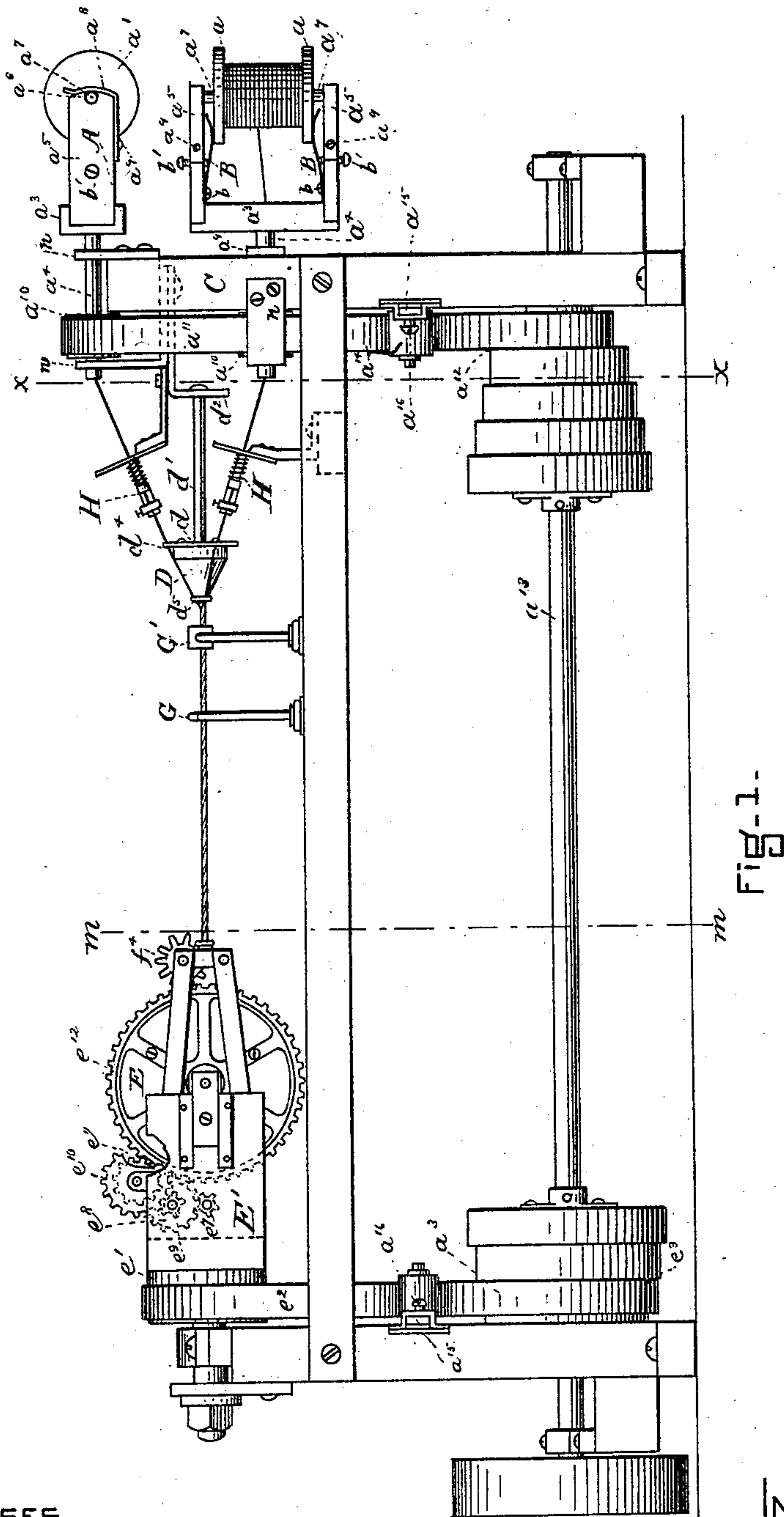


Fig. 1-

WITNESSES

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by his attys
Clark & Raymond

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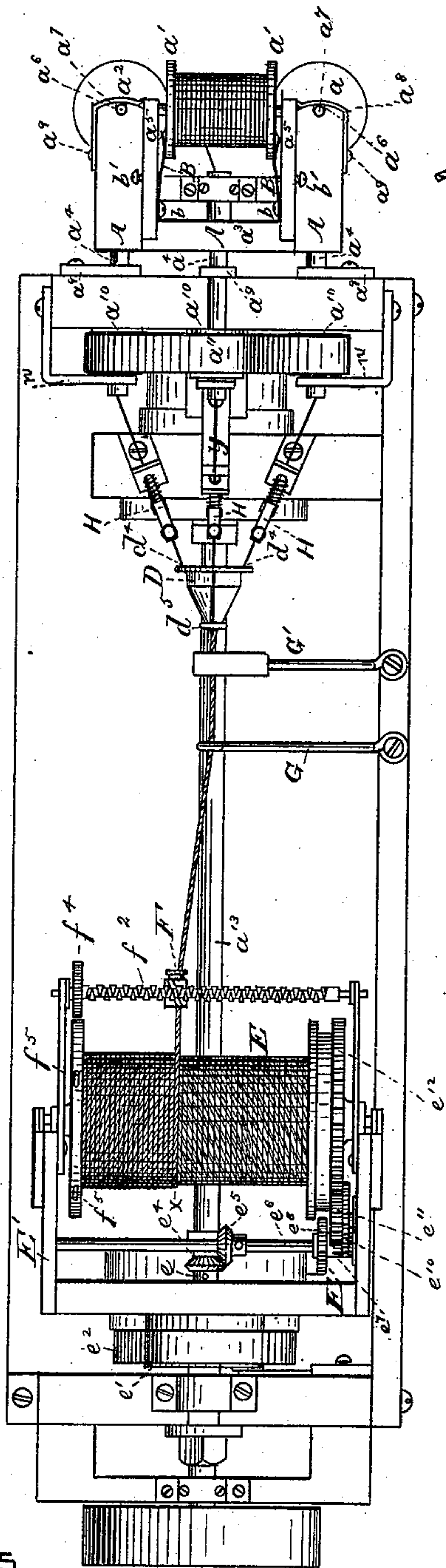


Fig-2-

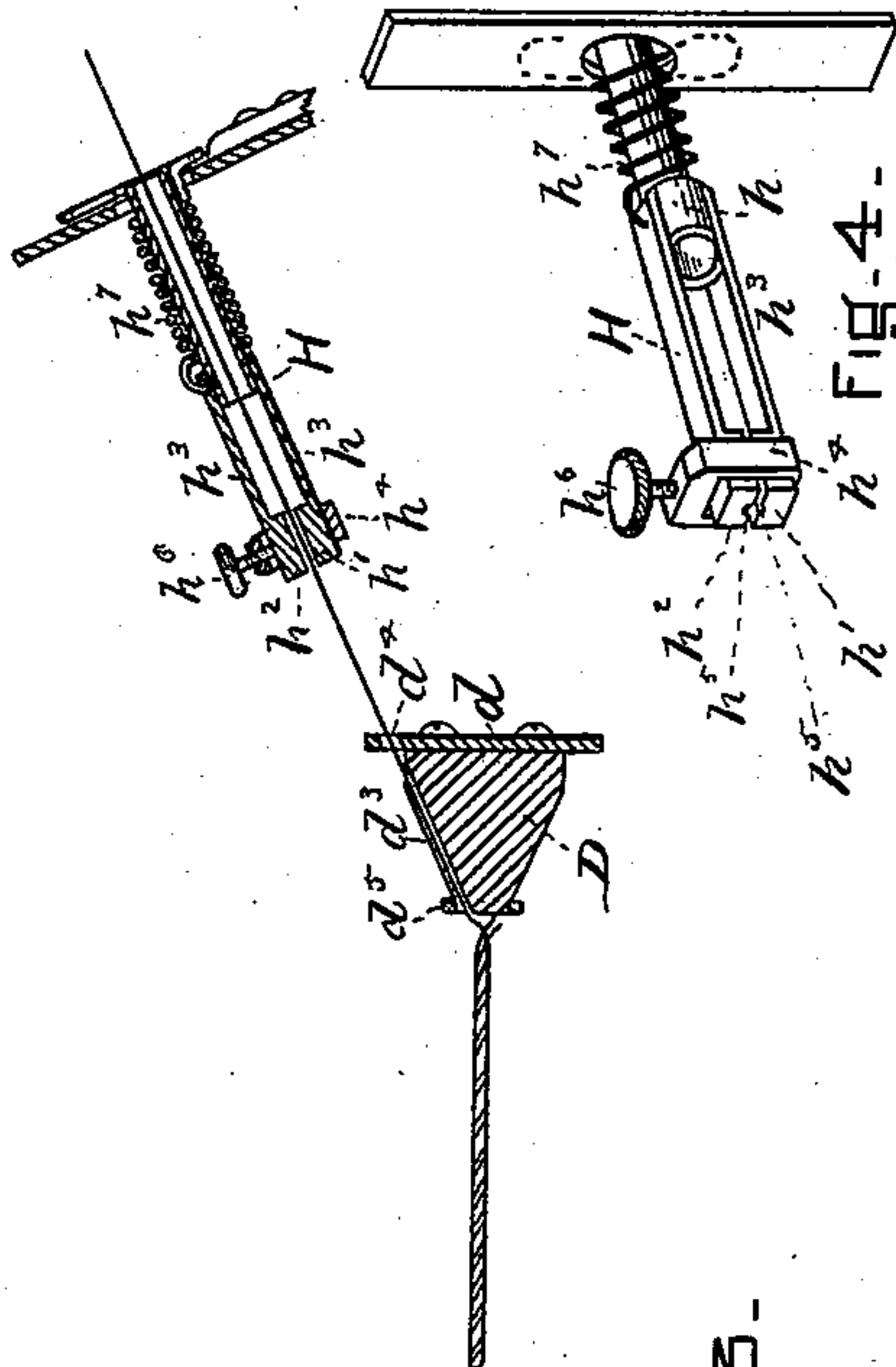
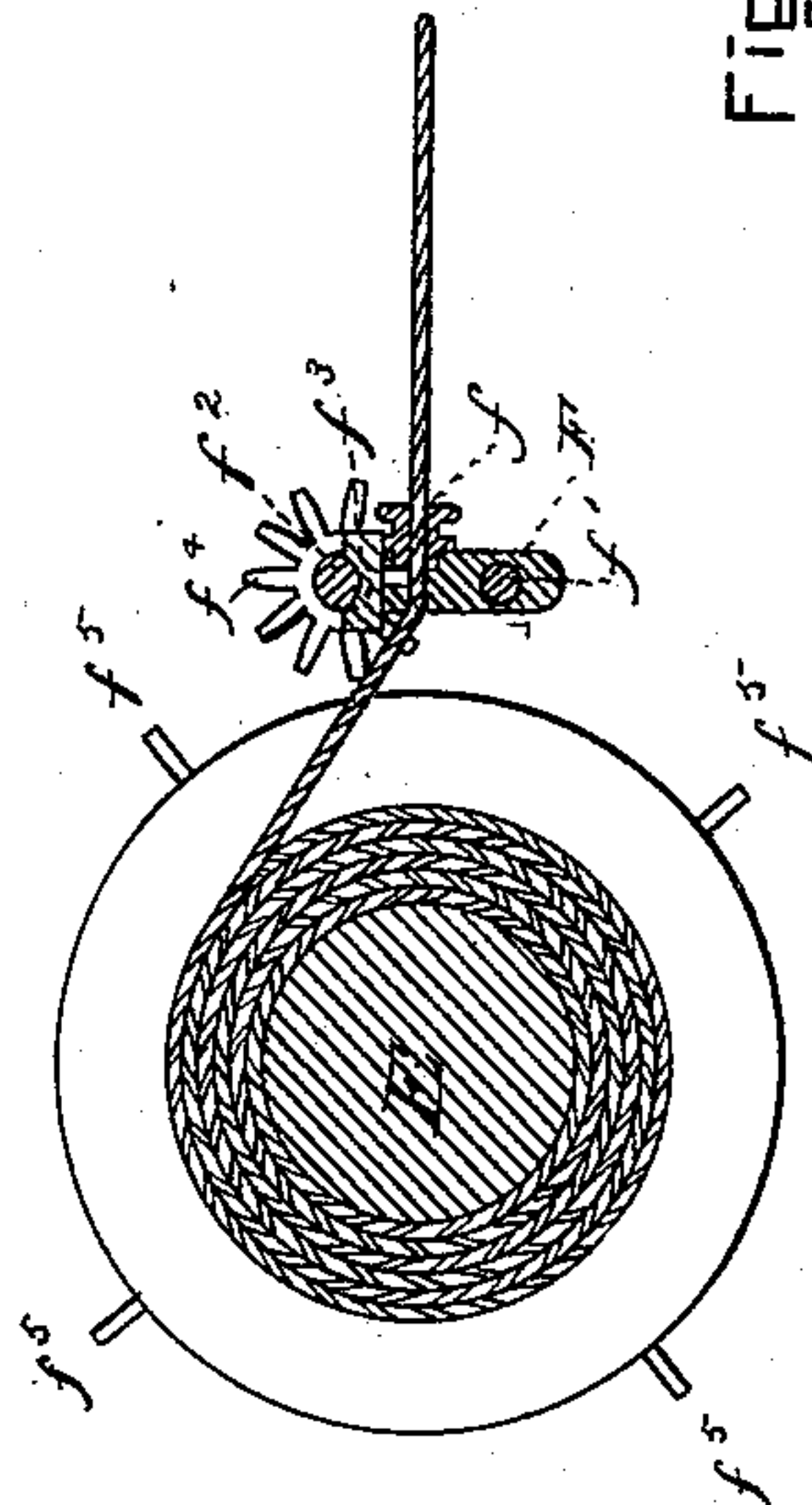


Fig-3-



WITNESSES

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3 Sheets—Sheet 3.

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Patented Nov. 23, 1886.

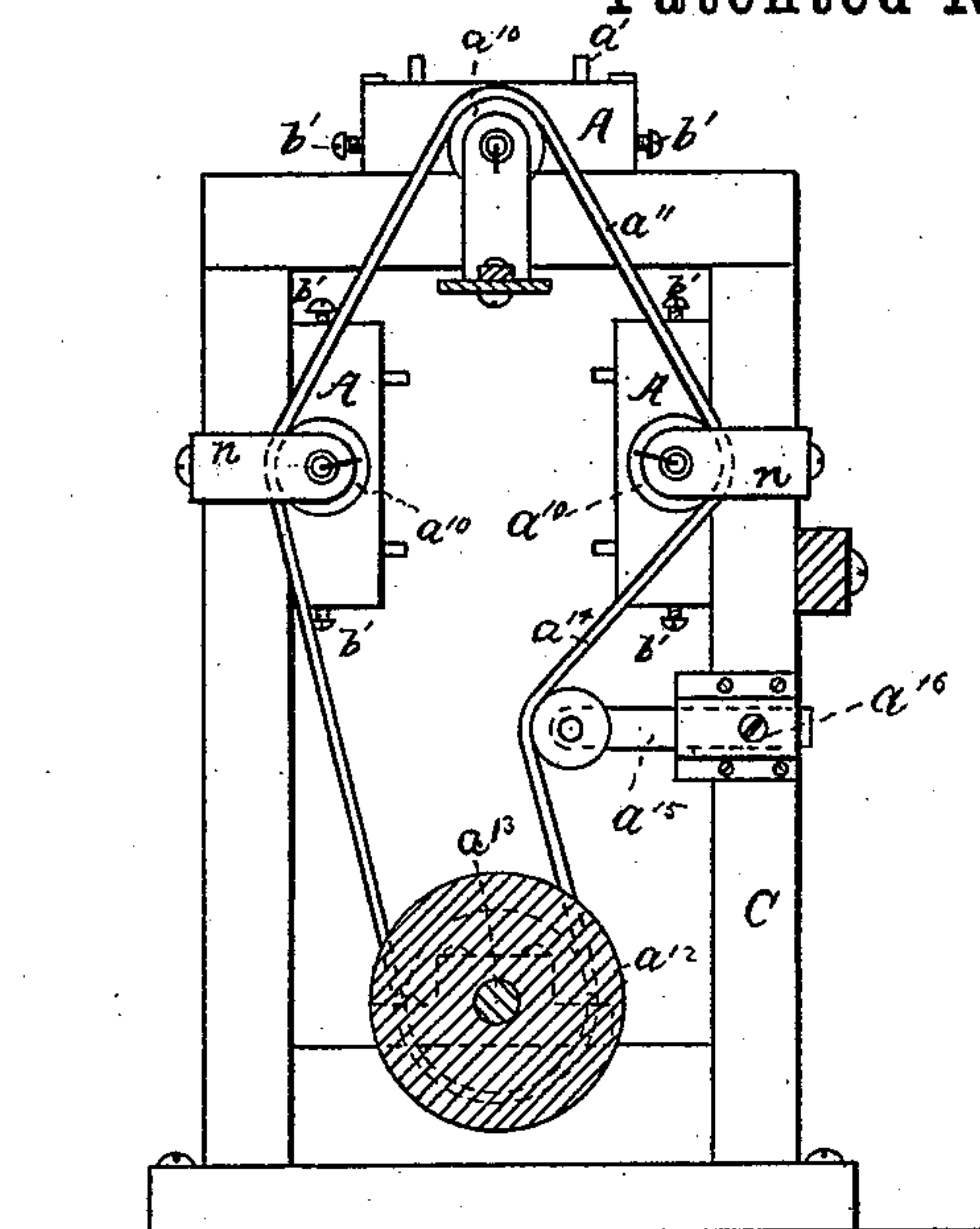


Fig. 5.

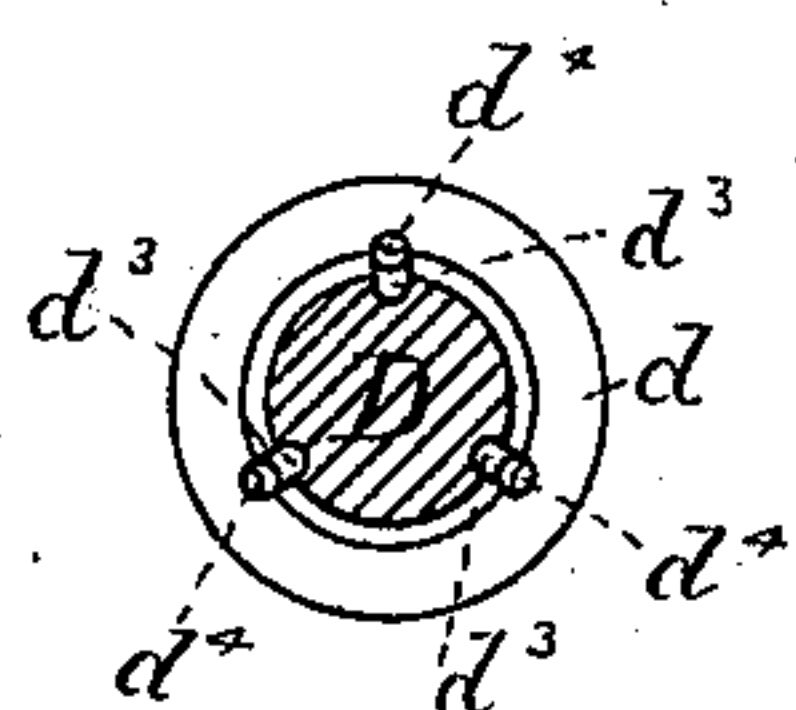


Fig-7-

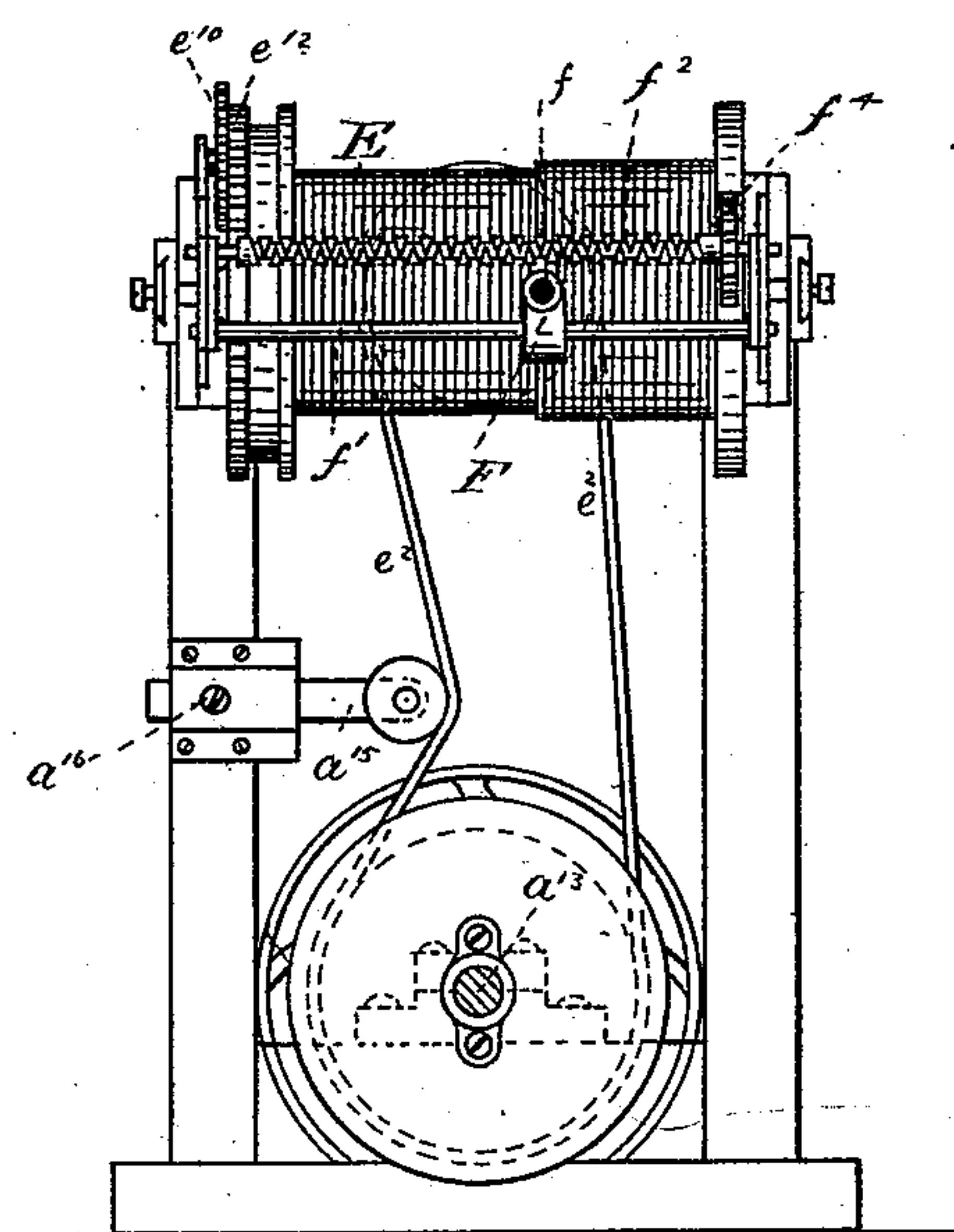


Fig-6-

WITNESSES

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UNITED STATES PATENT OFFICE.

MARK S. PALMER, OF READING, MASSACHUSETTS.

MACHINE FOR MAKING CORD AND ROPE.

SPECIFICATION forming part of Letters Patent No. 353,036, dated November 23, 1886.

Application filed September 4, 1884. Serial No. 142,176. (No model.)

To all whom it may concern:

Be it known that I, MARK S. PALMER, of Reading, in the county of Middlesex and State of Massachusetts, a citizen of the United States, have invented a new and useful Improvement in Machines for Making Cord and Rope, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification, in explaining its nature, in which—

Figure 1 represents in side elevation a machine containing the essential elements of my invention. Fig. 2 is a plan view thereof. Fig. 3 is a view in vertical section substantially following the central line of the cord from x to y , Fig. 2. Fig. 4 is a view in perspective of a tension-regulator, hereinafter specially referred to. Fig. 5 is a sectional elevation on the line $x x$ of Fig. 1. Fig. 6 is a sectional elevation on the line $M M$ of Fig. 1. Fig. 7 is a vertical section of the laying-head.

The invention relates to that class of machines in which the line, cord, or rope is twisted at short ratch, and it comprises a series of bobbins or spools upon which the strands, threads, or yarns forming the line, cord, or rope are wound, and which are adapted to be revolved, a laying-head of peculiar construction, and a revolving drum which twists, draws, and winds the line, cord, or rope at one operation.

It further relates to a novel tension device interposed between the laying-head and the spools or bobbins, and a traversing block for automatically guiding the winding of the line, cord, or rope on the reel or drum.

Referring to the drawings, $a a' a^2$ represent the spools or bobbins, each of which is supported by a frame, A , in a manner to revolve thereon and to be removed therefrom. Each frame A comprises the cross-piece a^3 , supported upon the end of the tubular shaft a^4 , through which the strand, yarn, or thread passes from its spool or bobbin, and the arms a^5 , which project at right angles from the cross-piece a^3 of the frame. These arms support the spool or bobbin, and preferably have the bearings a^6 for the bobbin or spool spindles a^7 at the outer ends, and these bearings are covered by the spring-plates a^8 , which are secured at one end by a screw, a^9 , or by any other suitable fastening to the arms a^5 . It will be observed that by this construction upon lifting or drawing

away the free ends of the spring-plates from the ends of the arms the bobbins or spools can be very quickly and readily placed and removed. Of course any other suitable bearings may be used in lieu of the ones described.

There is arranged to bear upon each head of the spool or bobbin a tension device to prevent its revolving too freely, and I have represented in the drawings the flat springs B , which are fastened in place to the arms a^5 by screws b , and their ends are arranged to come in contact with the outer surfaces of the spool-heads. The extent of tension exerted by these springs may be varied by means of the screw b' . Each of the three hollow shafts a^4 has suitable bearings in the arm or brackets n , attached to the frame C , and they each carry a pulley, a^{10} , by which they are positively revolved by means of the belt a^{11} , driven by the pulley a^{12} on the main shaft a^{13} .

To keep the belt a^{11} , and also the belt e^2 , hereinafter referred to, tight, I use an idler, a^{14} , carried or supported by a cap-plate fastened to the post, and it is automatically held in any position to which it is moved by means of the set-screws a^{16} , the ends of which bear against the sliding bar and press it against the side of the hole in which it slides, to hold it in place.

The laying-head D consists of a conical-shaped block attached to a disk, d , which is carried at the end of a rod or arm, d' , extending from the bracket d^2 , attached to the frame C . In this block are cut longitudinal grooves or passages d^3 , which converge at the point of the block, and which receive the threads, strands, or yarn and bring them together at the point of the block. The thread passes through a hole, d^4 , in the disk, and a ring, d^5 , near the nose or point of the block holds the threads or yarns in their respective grooves.

The drawing, twisting, and winding drum or reel E is mounted on the head E' . This head is supported by the rod or spindle e , upon which it is revolved by means of the pulley e' , fastened to the head E , the belt e^2 , and the pulley e^3 upon the main shaft a^{13} . Attached to the outer end of the rod e is the bevel-gear e^4 , which is stationary, and there is arranged to mesh with this bevel-gear a bevel-gear, e^5 , on the shaft e^6 , extending across the head E' . This shaft is revolved upon the revolution of the head by means of the pinion e^7 , intermediate

gear, e^8 , pinion e^9 , second intermediate gear, e^{10} , and pinion e^{11} , and gear e^{12} on the drawing or winding drum or reel E, and thereby causes the slow revolution of the drum or reel, so that the revolution of the head not only causes the threads or strands forming the line or rope to be twisted together, but also at the same time winds this line or rope, and thereby draws the line or rope as it is laid.

To feed the rope uniformly on the drum or reel, I have arranged immediately in front thereof the feed-block F, which has a hole, f , through which the line or rope passes, and which is mounted upon the rod f' , so as to be moved freely thereon by means of the screw f^2 , which engages with the cross-plate f^3 , swiveled in the lower end of the block F. This screw has a right and left thread, and is revolved to move the block by means of the spur-wheel f^4 and the pins f^5 , extending from one head of the drawing and winding roll E. When the block reaches the end of its movement, its motion is automatically reversed; but as this form of screw and reversing device is well known it is unnecessary to further describe its construction here.

In order that the change in the direction of the line or rope as it is wound may not interfere with its proper twisting or laying, I have arranged between its laying-head and the traveling block the guides G G, through which the twisted line or rope passes, and which are arranged in a line with the end of the laying-head, so that the change in direction of the line or rope is from these guides and not from the end of the laying-head.

As it is desirable to give each strand, yarn, or thread the same degree of tension, in order that the laying and twisting may be uniform, I have arranged between the bobbins or spools and the laying-head a tension device, H, for each cord, thread, or yarn. It comprises a sleeve, h , (see Fig. 4,) through which the strand passes, which carries a pair of jaws, h^2 , mounted on yielding arms h^3 , and a clamp, h^4 , for setting these jaws with more or less tension upon the strand. These jaws have the recesses h^5 in the opposing faces, for receiving the cord, and the clamping device comprises a band which incloses the jaws, and has a set-screw, h^6 , by which the jaws are forced together. It will be seen that by bringing these jaws together upon the strand any suitable degree of tension may be provided for. As, however, the strand or thread is liable to vary somewhat in size, it is desirable to provide the jaws with a slight movement in the line of the direction of the movement of the thread, in order that the strain upon the thread, which may be caused by the cord being a little fuller,

or by a knot, or for any other reason, may be relieved by the movement of the jaws. This I accomplish by connecting the sleeve holding the jaws to a stationary support by means of the coiled or other spring h^7 .

It will also be seen that with this device the tension upon the thread cannot be suddenly increased, for if the strand should increase in size sufficiently to increase the tension upon it the jaws will move with the thread toward the laying-head, and thus permit the tension to be very gradually increased, so that the effect of the increase of tension upon the line or rope is not made apparent, and after the section of the strand shall have passed the jaws the spring will return them to substantially their original position, to again operate, as before, in relieving the tension in case of necessity.

By this machine a line or rope of any length may be made. The strands are uniformly and firmly twisted, and are so laid and drawn that a very superior result is obtained. I prefer to use for running the belts a^{11} and e^2 cone-pulleys, and to provide them with a movement on the shaft a^{13} , to bring the proper section into place, as by so doing one cone-pulley can be used with an ordinary pulley and all the advantages of a connection employing two cone-pulleys be obtained.

Having thus fully described my invention, I claim and desire to obtain by Letters Patent of the United States—

1. The combination of the frame of the machine, C, the frames A, for supporting the bobbins or spools, the hollow shafts a^4 , the pulleys a^{10} , the belt a^{11} , the pulley a^{12} , the shaft a^{13} , the drum E, mounted upon the frame E', said frame E', the stud or post e , the pulley e' , the belt e^2 , the pulley e^3 , the bevel-gears e^4 e^5 , the shaft e^6 , gears e^7 e^8 e^9 e^{10} e^{11} , the spur-wheel e^{12} , the screw f^2 , the gear f^4 , pins f^5 , the traversing-block F, and the laying-head D, all substantially as described.

2. The combination of the drawing and winding reel with the laying-head, the frame C, and the frames or bobbin-supports A, the jaws h^2 h' , having the recesses h^5 , a band or ring surrounding each pair of jaws and an adjusting-screw, h^6 , carried thereby, the sleeves h , the hollow posts supporting them, and the springs h^7 , connecting said sleeves with a fixed support, the said jaws being arranged between the laying-head and bobbin holders or supports, substantially as described.

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Witnesses:

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FRED. B. DOLAN.