

No. 629,871.

Patented Aug. 1, 1899.

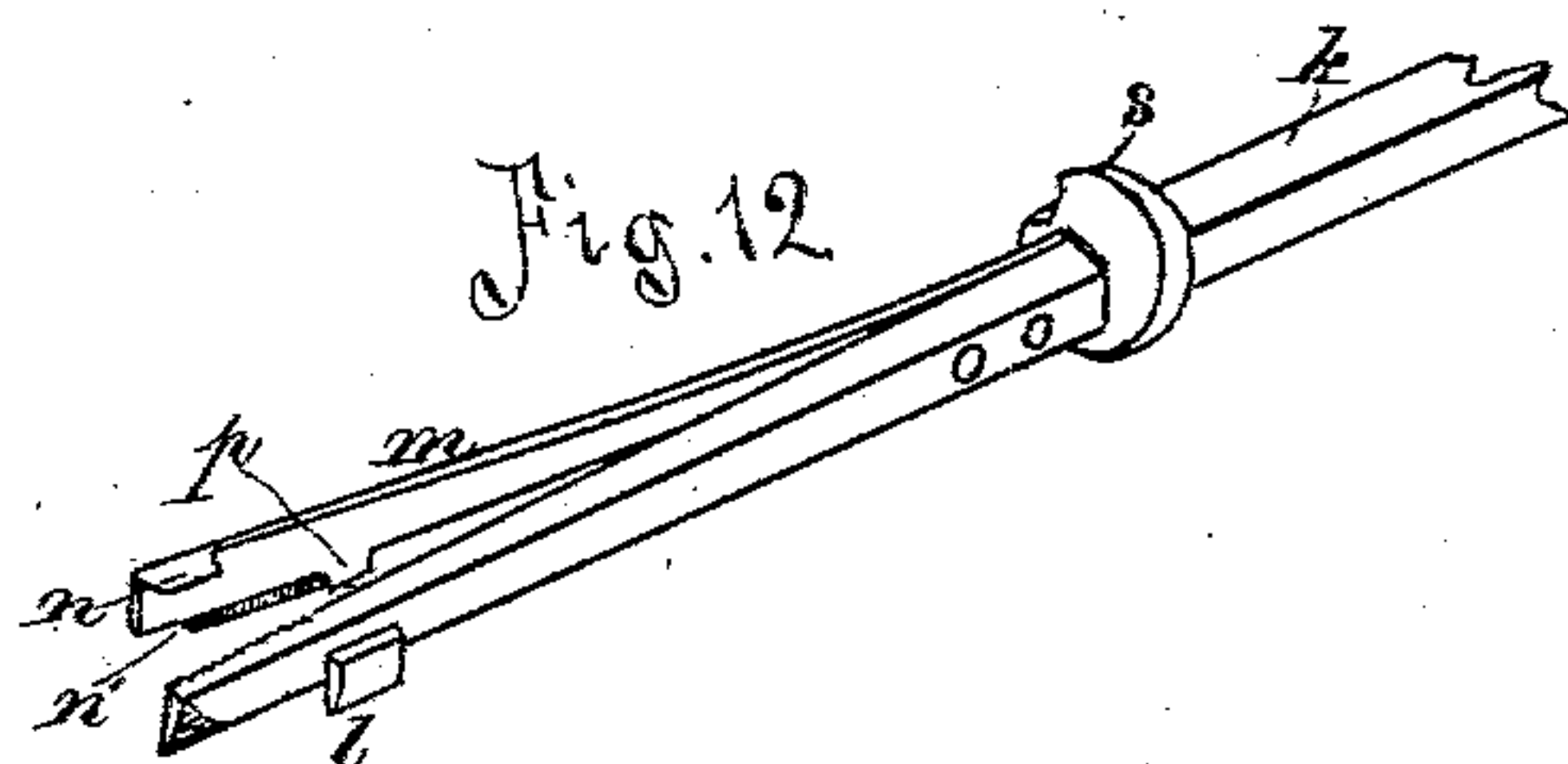
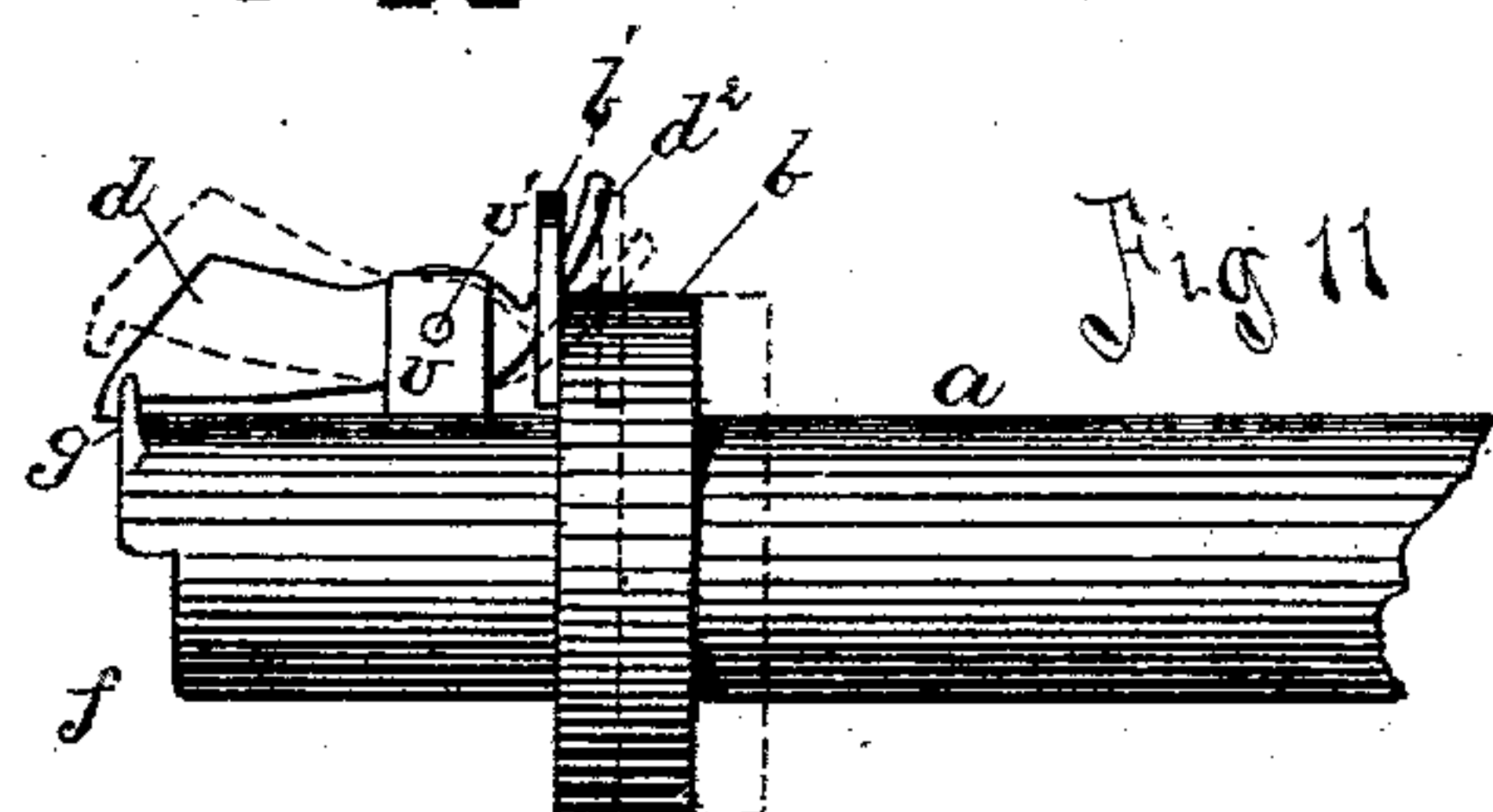
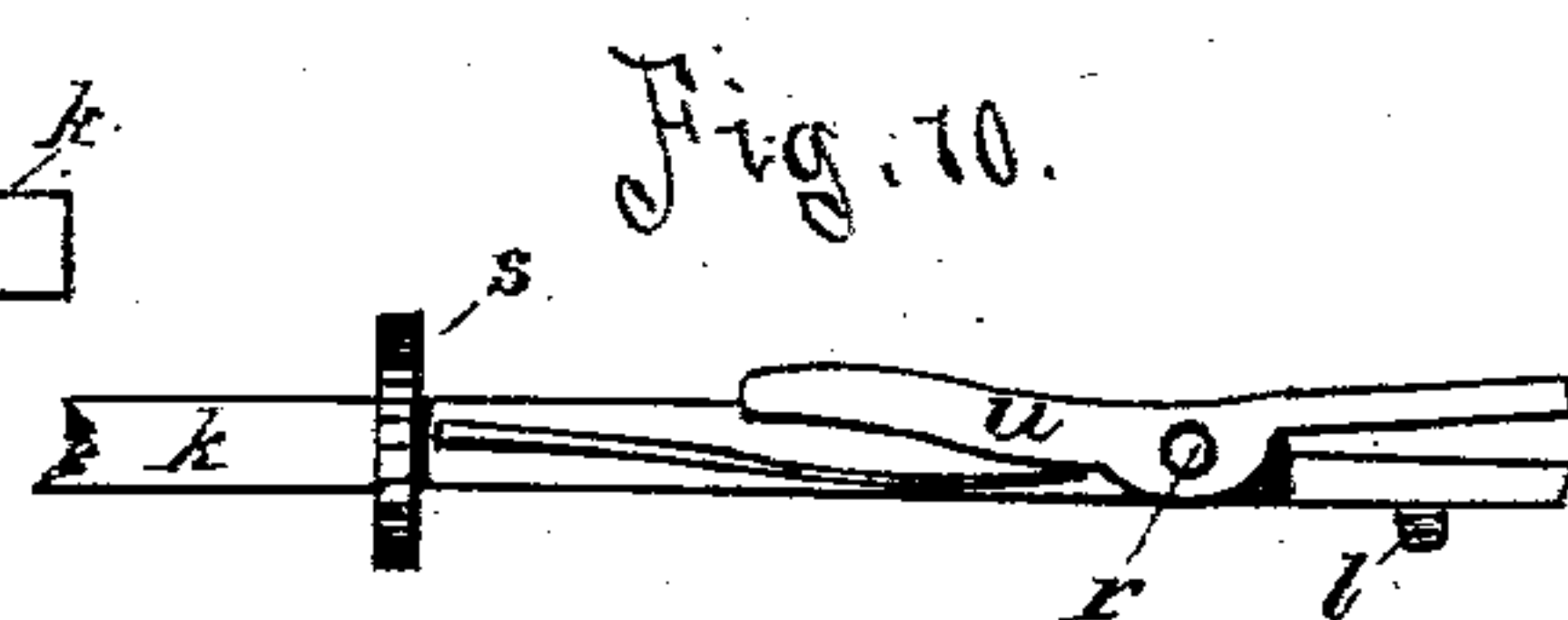
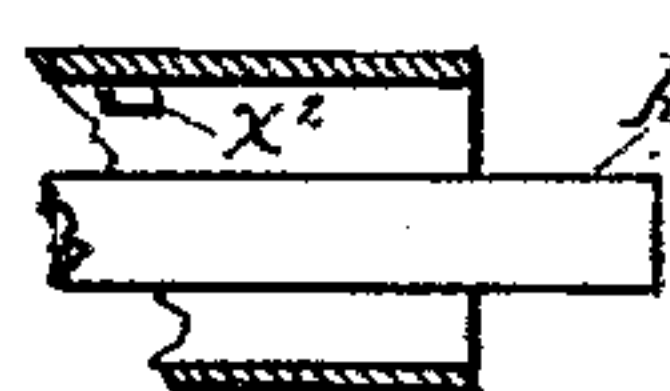
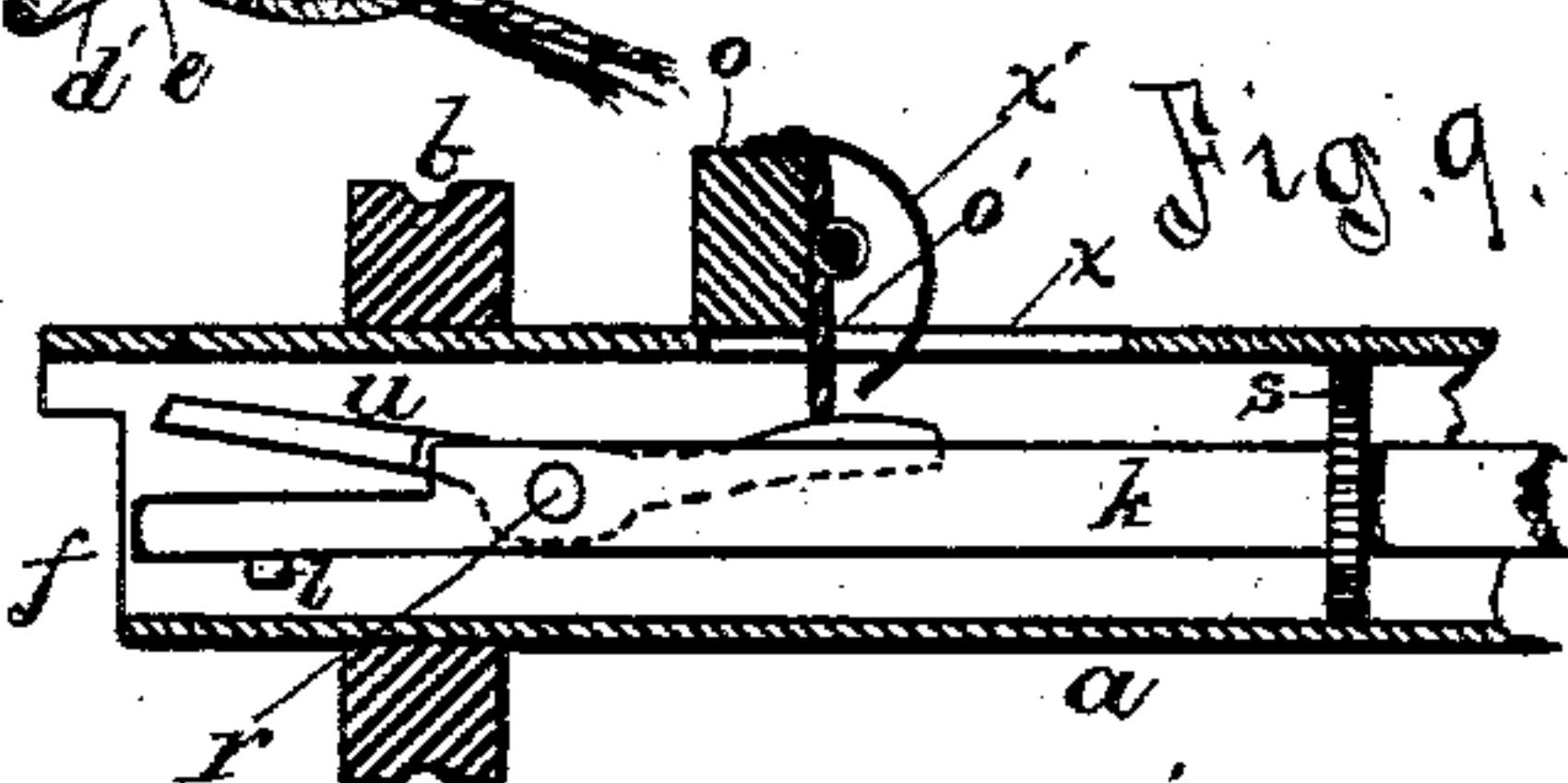
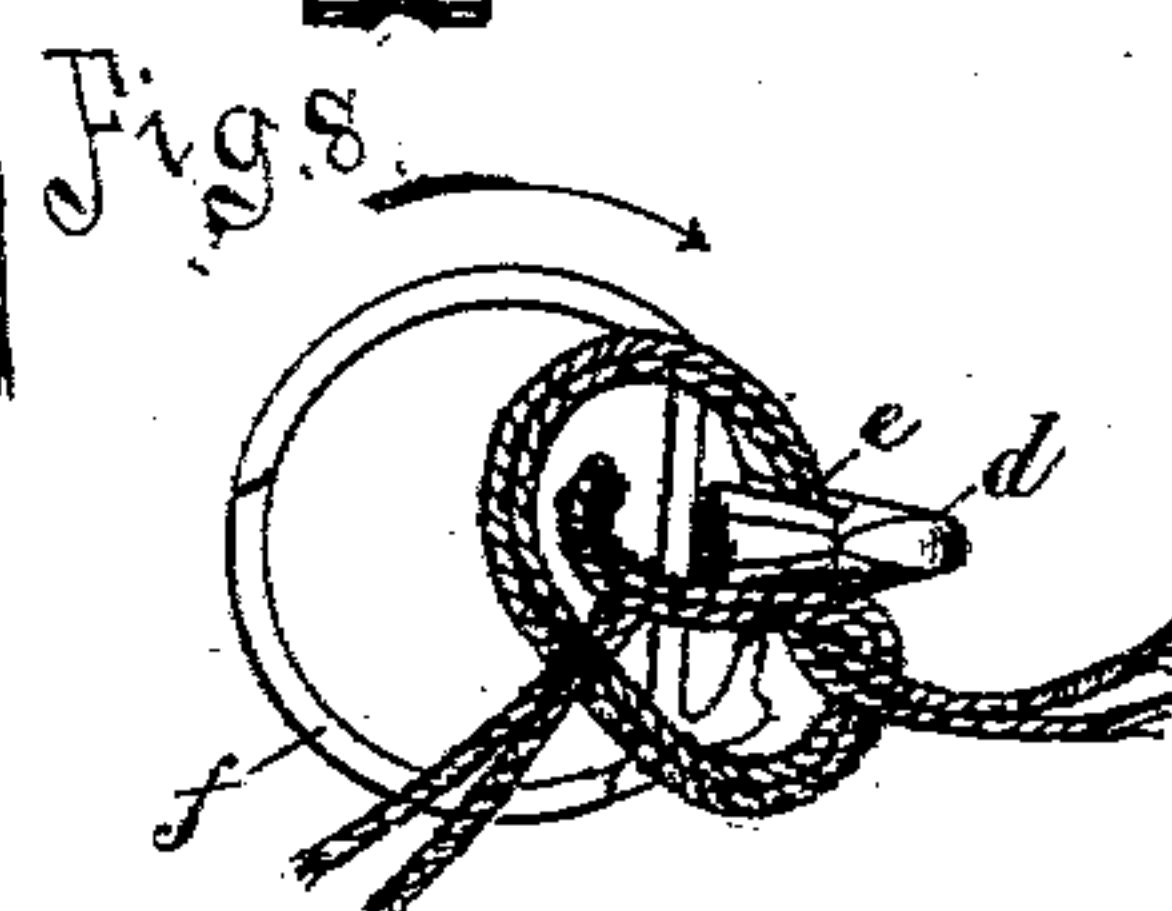
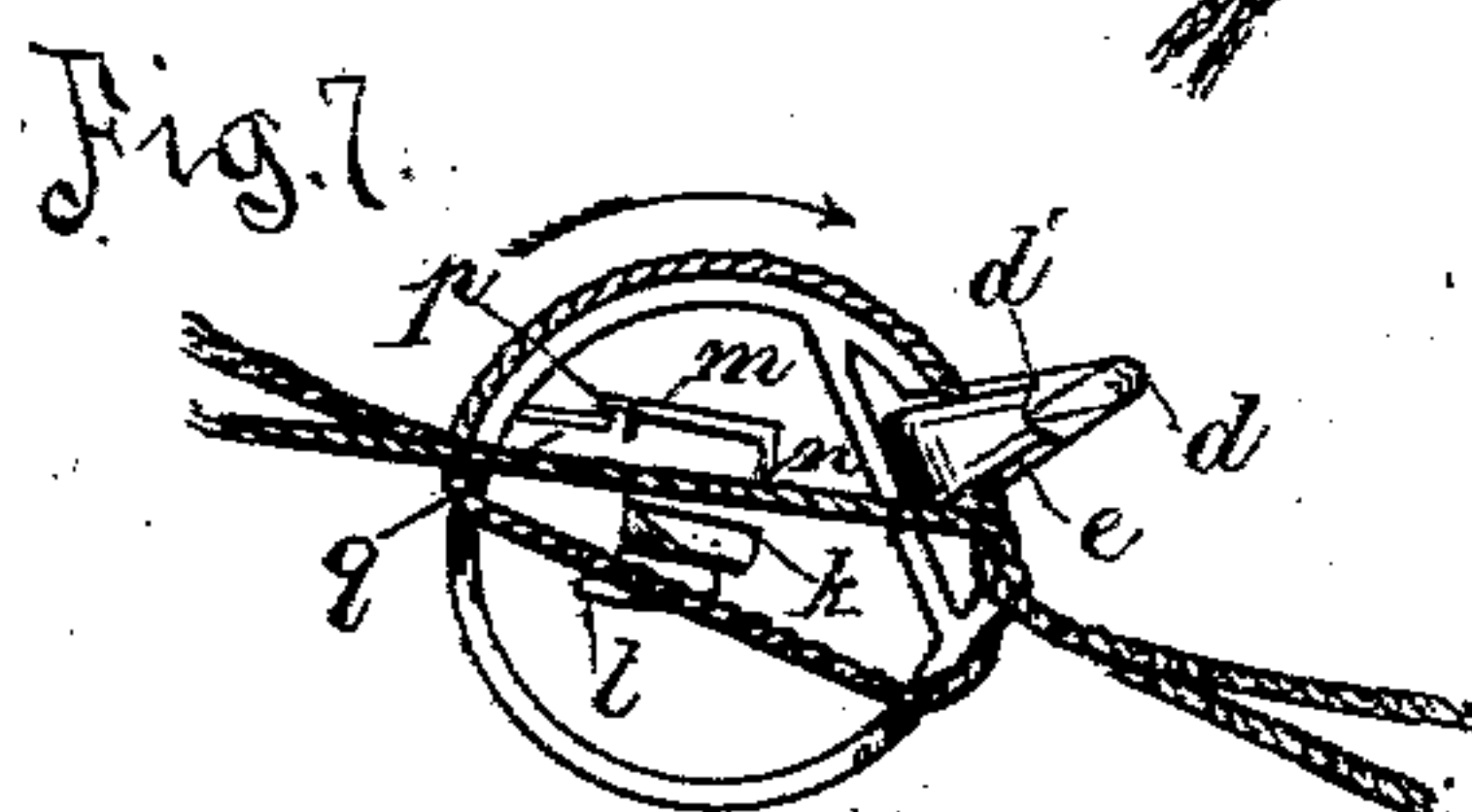
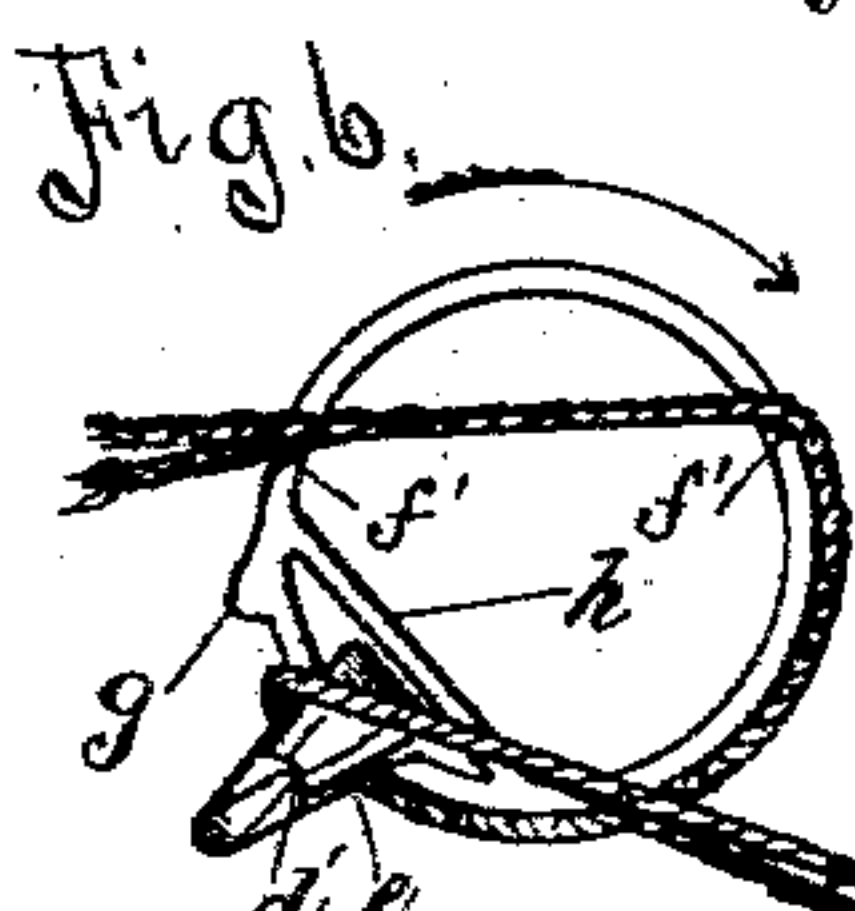
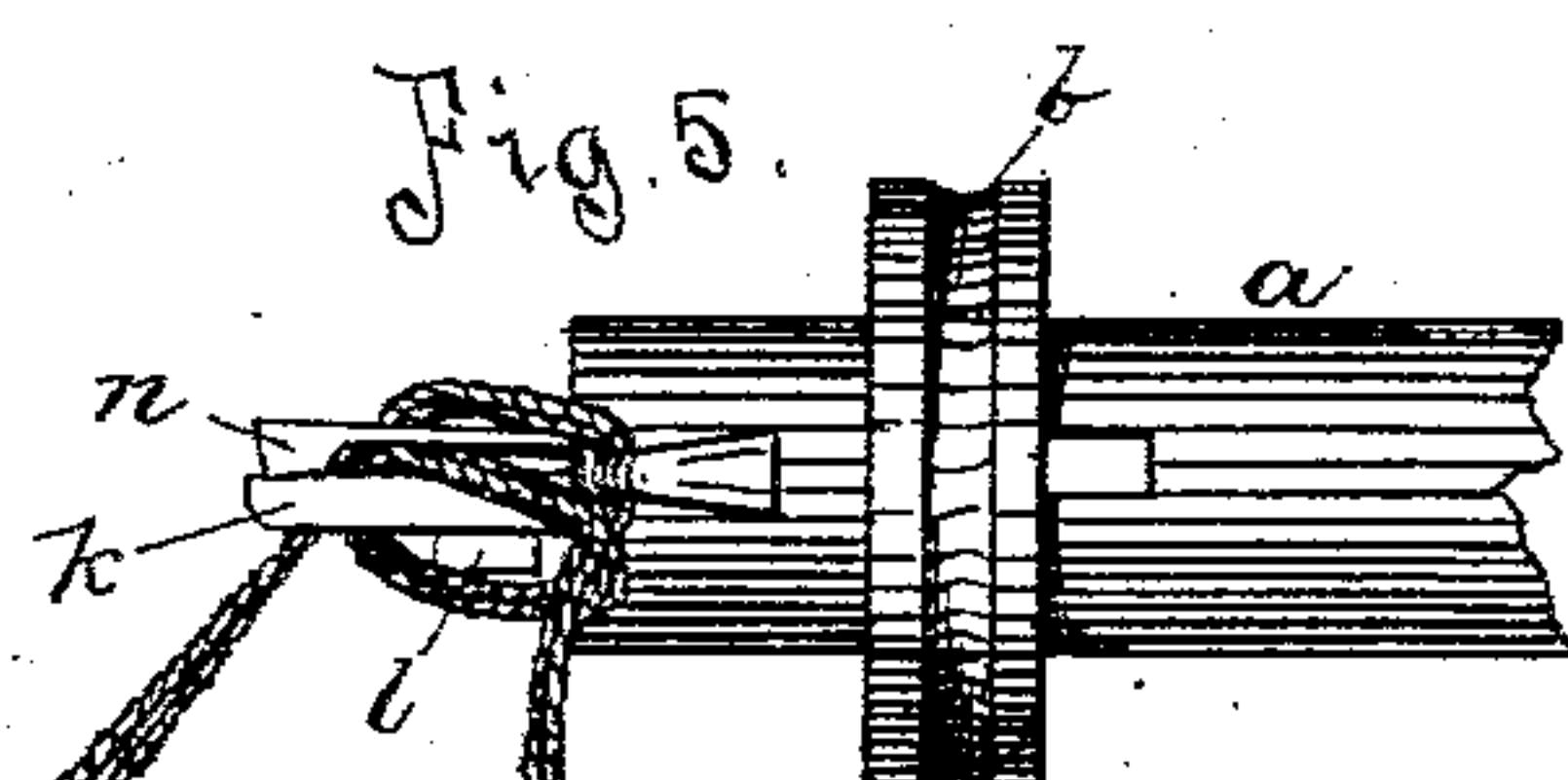
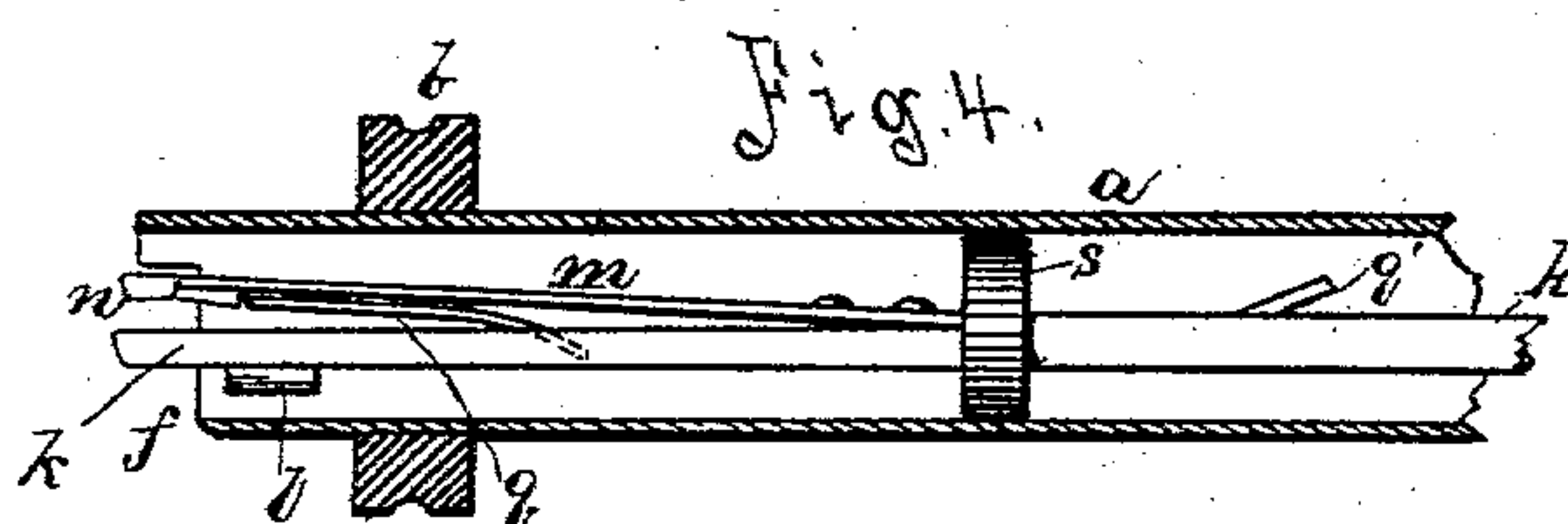
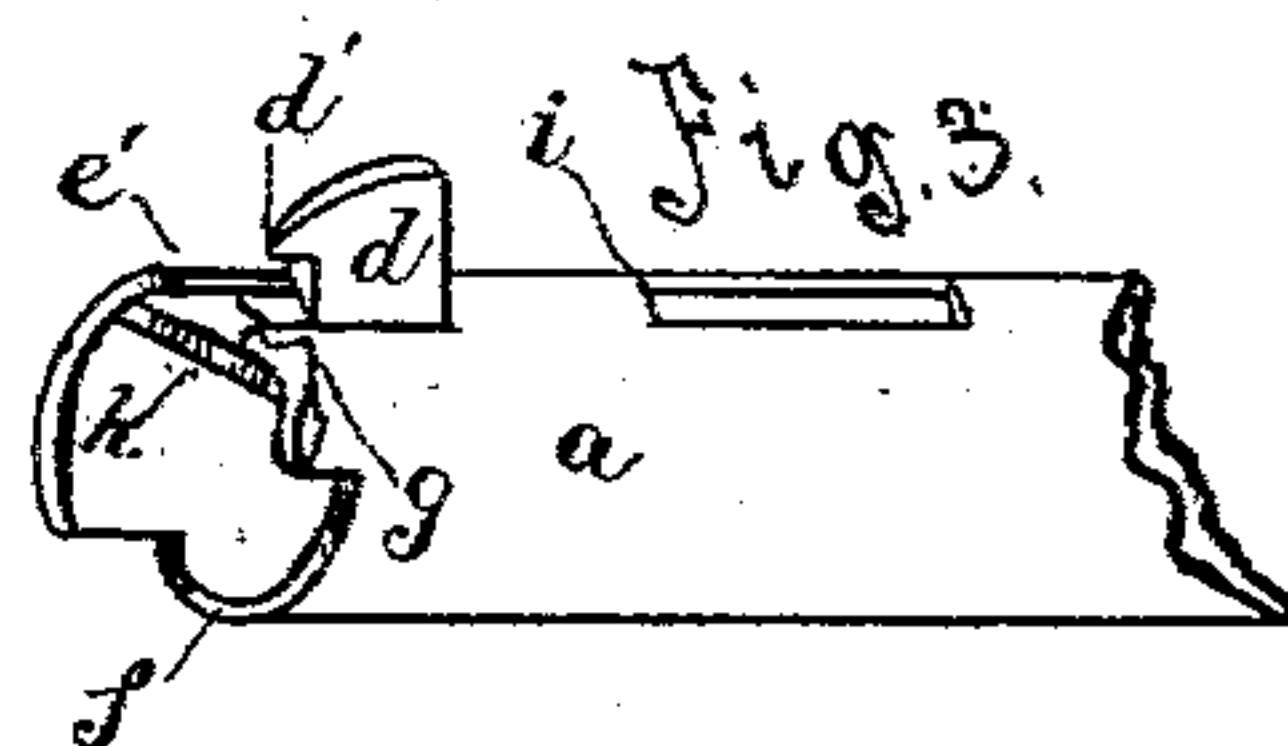
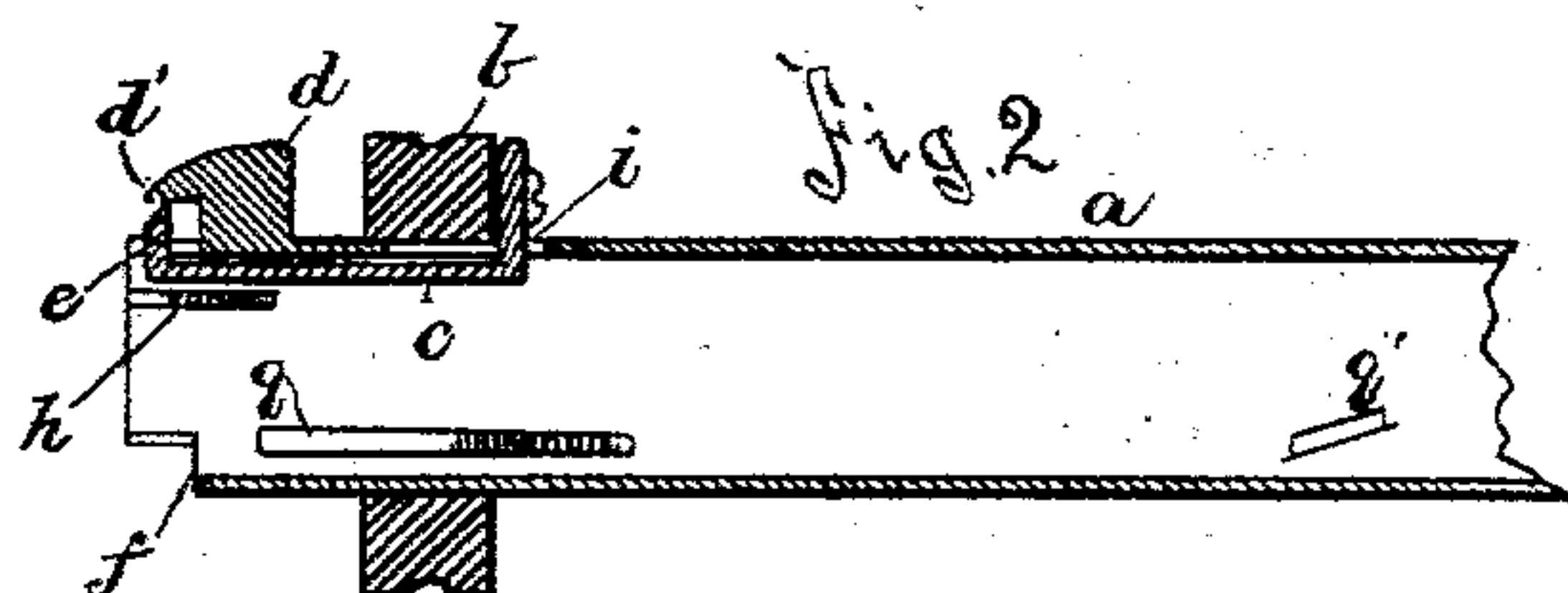
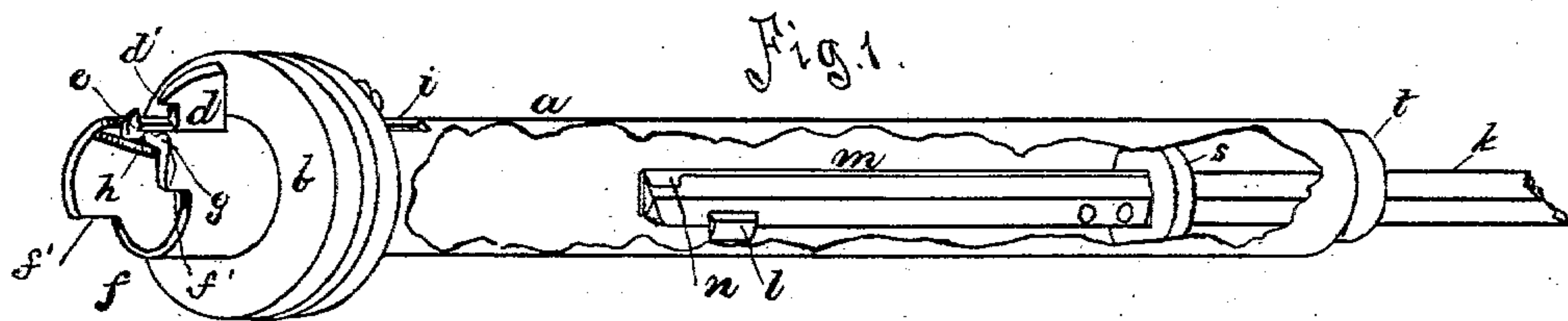
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CORD TYING DEVICE.

(Application filed Mar. 31, 1880.)

(No Model.)



Witnesses.

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UNITED STATES PATENT OFFICE.

CHARLES A. POSTLEY, OF AUSTIN, TEXAS; CHARLES E. POSTLEY, ADMINISTRATOR OF SAID CHARLES A. POSTLEY, DECEASED.

CORD-TYING DEVICE.

SPECIFICATION forming part of Letters Patent No. 629,871, dated August 1, 1899.

Application filed March 31, 1880. Serial No. 6,396. (No model.)

To all whom it may concern:

Be it known that I, CHARLES A. POSTLEY, a citizen of the United States, and a resident of Austin, in the county of Travis and State of Texas, have invented certain new and useful Improvements in Cord-Tying Devices; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

My invention relates to improvements in mechanical devices constructed for the purpose of tying automatically a knot in a cord, which are commonly known as "knot-tiers" and used ordinarily to unite the ends of a band encircling a bundle of grain.

My invention consists of a cylinder having stops or shoulders at its end, in combination with a notched and bevel-faced lug attached to the said cylinder near its said end and a vibrating hook, by means of which and the said lug the cord is gripped firmly and held during the formation of the loop and until the knot has been formed and drawn close.

It further consists of a vibrating rod united with certain parts so arranged, constructed, and operated that the end of the cord forming the loop is grasped, the said loop formed on the cylinder forced from off it, and the end of the cord which has been grasped drawn through the loop and within the cylinder, thus making a tight knot.

It further consists of certain other parts and combinations, which will be more fully hereinafter explained, and pointed out specifically in the claims.

The object of my invention is to supply a means for forming in a cord a knot which shall be made tight before the cord is released from the tier and which will require no subsequent employment of other instrumentality to take up slack for the purpose of making the knot firm and secure.

In the accompanying drawings, forming a part of this specification, Figure 1 is a perspective view of a tier constituting my invention, a portion of the cylinder being broken

away and the parts represented in the positions they occupy when at rest. Fig. 2 is a portion of the forward part of the tier shown in longitudinal section. Fig. 3 is a perspective view of certain detailed parts of the same. Fig. 4 represents a portion of the cylinder of the tier in longitudinal section with the clamping-jaws by which the end of the cord is drawn through the loop advanced to a position ready to grasp the said end of the cord. Fig. 5 shows a portion of the forward end of the tier, the end of the cord having been grasped by the clamping-jaws and the loop which was formed around the shouldered end of the cylinder being shoved therefrom. Fig. 6 is an enlarged end view of the tier, showing the cord partially wound around the end of the cylinder. Fig. 7 is another enlarged end view of the same, showing the cord wound around the end of the cylinder, the loop formed, the ends of the cord being against the stops or shoulders and across the mouth of the cylinder and the clamping-jaws advanced to a position similar to that represented at Fig. 4 ready to grasp it. Fig. 8 is a similar view of the tier, the cylinder being in a position like that represented in Fig. 5, but the clamping-jaws having receded the knot in the cord is about being drawn tight. Fig. 9 shows a longitudinal section of the cylinder forming a part of my invention, with a side elevation of a modification of the clamping-jaws represented in preceding figures. Fig. 10 is a reverse side view of the said modification of the clamping-jaws. Fig. 11 represents a modification of the means employed to retain the cord on the face of the cylinder at its shouldered end, the forward portion only of which is shown. Fig. 12 is a perspective view of the device for drawing the cord through the loop, having its spring-jaw shown in its abnormal or open position.

Similar letters, where they occur in all the figures, indicate like parts.

The letter *a* indicates a metallic cylinder which may be of any required length or diameter found best suited for the purpose for which it is designed. On the periphery of this cylinder *a*, near its end, is a bevel-faced lug *d*, having a projecting lip *d'*, that extends nearly to the end of the cylinder, as shown in

Fig. 2. Encircling the cylinder *a* back of the lug *d* is a sliding collar *b*, which has attached to it a rod *c*, working through slot *i* in the cylinder *a*. This rod *c*, which extends forward, as shown in Fig. 2, is sustained in place by a guide *h* within the cylinder *a* and has at its extremity a hook *e*, which when drawn back by the collar *b* enters a notch *e'*, cut in the end of the cylinder *a* immediately beneath the projecting lip *d'* of the lug *d*. The hook *e* and the beveled lug *d*, with its projecting lip *d'*, constitute the looping hook or jaw of my tier, by means of which the cord is grasped and held while the loop is being formed and the knot made.

The cylinder or tube *a* has at its forward end and on opposite sides two stops or shoulders *f' f'*, which may be formed, as indicated, by cutting away at *f* a portion of the cylinder to such a depth and extent as will best suit the requirements for which it is designed. Near the notch *e'* in front of the lug *d* at the end of the cylinder *a* is a projection *g*, projecting laterally from the periphery of cylinder *a* and tapering from its base to a rounded point. (See Fig. 6.)

Working freely within the tube *a* through a head *t* at its rear end is a rod *k*, on which near its forward end is a collar *s*, serving as a support and guide for it within the cylinder *a*. The forward part of rod *k* is made slightly tapering, and to it, adjacent to and in front of the collars, is attached by rivets or otherwise a spring-finger *m*, as shown in Fig. 12. On the end of the spring-finger *m* overlapping the rod *k* is a short flange *n*, and a little in the rear of it on the other side of the finger *m* is another flange *n'*, Fig. 12. Standing outward from the edge of spring-finger *m* is a lug *p*, located in the rear of the flange *n'*, Figs. 7 and 12. Within the cylinder *a*, near its forward end, is secured a spring-cam *q*, which is so attached to the cylinder that its rear end is left to vibrate freely, Fig. 4. The spring-finger *m*, together with the rod *k*, form a clamp, by means of which the end of the cord is seized and drawn through the loop and within the cylinder *a*, and the knot made tight after the loop around the projecting end of the cylinder has been shoved therefrom by the lug *l* on the forward part of rod *k*. (See Figs. 5 and 7.) The spring-cam *q* is set at an angle, the rear end being below the line of the edge of the finger *m*, while its forward end, which is fast to the inside wall of the cylinder, is arranged at a suitable distance above it. Within the cylinder *a* in line with the spring-cam *q* is a short cam *q'*, inclined in a reverse direction from the spring-cam *q*, as shown in Fig. 4. The object attained by the use of the cam *q'* and the spring-cam *q* will be best understood from a description of the operation of the tier.

To allow the collar *s* on rod *k* to pass the cam *q'* when the rod *k* is moved forward and back, a notch is cut in its periphery, as shown in Fig. 12.

To tie a knot in a cord by my invention, the operative parts may be worked by any mechanical means best suited for the purpose. The two strands of the cord having been brought to a position to be caught between the hook *e* on rod *c* and the projecting lip of the lug *d*, the collar *b* is moved back, thus drawing the cord against the lug *d* and confining it between the projecting lip *d'*, the hook *e*, and the periphery of the cylinder *a* and firmly holding it. When the parts would occupy the position shown in Fig. 2, the rod *k* need not be at this time advanced. The cylinder *a* is then revolved in the direction indicated by the arrows in Figs. 6, 7, and 8 and the cord is wound around and upon the forward part of the tube *a* until it reaches the cut-away portion *f*, when it crosses the open end of the cylinder in the manner shown in Fig. 6, resting upon shoulders *f'*, and is again wound around and upon the projecting end until forced to run over the end and again cross the open end, as before, by the beveled lug *d*. The loop thus formed is prevented from slipping off the end of the cylinder by the projection *g* and the part of the cord confined by the finger *e* and the lip *d'*. The rod *k* is now advanced, and the lug *p* on the finger *m* coming in contact with the free end of the flexible or spring-cam *q* rides upon it, thereby raising the finger *m* from off the rod *k*, as shown in Figs. 4 and 7. At nearly the same time as the cord recrosses the open end of cylinder *a*, as shown in Fig. 7, the clamping-jaws reach a position similar to that represented in Fig. 4, when the rod *k*, still continuing to move forward the lug *p* on finger *m*, slips from the cam *q* and the cord is grasped between the spring-finger *m* and rod *k*, the flange *n* being beyond the cord, as shown in Fig. 5, while the flange *n'*, pressing it sharply down on the side of the rod *k*, renders the hold of the jaws more secure. The cord leading from the spool to where it is held by the hook *e* and lug *d* is now severed within a short distance of the tier. The rod *k* having continued to advance, the lug *l* comes in contact with the cord stretched across the open end of the cylinder from the opposite shoulders *f'* and forces the loop off the end of the cylinder, as shown in Fig. 5. It is obvious that on the rod *k* being retracted the end of the cord held by the jaws of the rod will be pulled through the loop, as in Fig. 8, and the knot drawn tight around the end of hook *e*; but the instant that the knot is thus made tight around it the collar *b* is moved forward, and the knot consequently slips from the point of hook *e* and is drawn completely close and tight by the receding clamping-jaws. As the knot is thus drawn hard and tight, the rod *k* in receding brings the lug *p* in contact with the inclined cam *q'*, causing the spring-finger *m* to be again raised from the rod *k*, thus releasing the end of the cord from the clamping-jaws, within which it has been firmly held for reasons already stated until the knot was made secure.

Instead of the clamping-jaws described and shown in Fig. 12 a modification of the spring-finger *m* may be used, consisting of a lever pivoted at *r* to the rod *k*, as shown in Fig. 10, constituting with it what are commonly known as "tweezers," the jaws of which are held closed by a spring. In using these tweezers a standard *o* is arranged on the cylinder *a*, which has hinged to it the hanger *o'*, as at Fig. 9, working through a slot *x* in the cylinder and held in position by a spring *x'*. When the rod *k* is advanced, as already described, the tail *u* of the lever pivoted near its end will be depressed by the hanger *o'*, as in Fig. 9, thus causing the jaws of the tweezers to open and be so held until the end of the tail *u* has passed it, when they will be closed on the cord by the action of the spring. The loop being forced from off the tube *a*, as already described, and the rod *k* receding, the pivoted hanger *o'* gives way to the pressure of the end of the tail of part *u*, allowing it to pass, but is restored to position by the spring *x'*. The rod *k* continuing to recede for the purpose before described, the tail *u* comes in contact with a short inclined cam *x''*, Fig. 9, by which it is again depressed and the jaws of the tweezers opened, thus freeing the cord.

Instead of employing the hook *e* and lug *d* for grasping and holding the cord, as described, a lever pivoted at *v'* in a standard *v* on the cylinder *a*, as in Fig. 11, having the long forwardly-projecting hooked end *d* and short upwardly-curved tail *d''*, may be used. The hooked end will be raised from the face of cylinder *a*, as represented by the broken lines, or held firmly thereon by means of the collar *b*, having the standard *b'*, through a properly-formed slot in which the short tail *d''* works when the said collar is moved back or pressed forward.

It is apparent that the above-described modifications may be used either separately with the other parts of the tier or in combination with each other and an equally satisfactory result be obtained in tying a knot in a cord.

Should it be found desirable, it is obvious that lugs *p* may be formed on each side of spring-finger *m* and correspondingly-arranged cams *q* and *q'* be placed within the cylinder *a*.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a cord-tier the combination of the hollow rotary cylinder having shoulders or stops on the edge of its open end whereby the cord is caused to cross the open end of the cylinder when the loop is being formed, means for holding said cord on the outer surface of the cylinder, and reciprocating parts within said cylinder adapted to draw the cord through the loop and to force or push off the cord from the cylinder, substantially as set forth.

2. In a cord-tying device the combination of the revolving hollow cylinder having an

exterior gripper for holding the cord while the loop is being formed, a clamping device for drawing the cord through the loop and within the cylinder, a vibrating rod forming one member of said clamping device, having a suitable attachment by means of which the loop may be shoved off from the cylinder, and means for holding the cord across the end of the cylinder.

3. In a cord-tying device the combination of the rotary cylinder having an exterior gripper for holding the cord on the cylinder while the loop is being formed, an inclosed reciprocating rod having clamping-jaws for drawing the cord through the loop within the cylinder, a stripper on said rod by means of which the loop may be removed from the cylinder, and means for holding the cord across the end of the cylinder.

4. The combination of a cylinder *a* having mutilation *f*, lug *d*, and hook *e*, with means for drawing the cord within the cylinder, substantially as shown and described.

5. The combination of a cylinder *a* with its gripper and mutilated end, rod *k*, and spring-finger *m*, and means for actuating said parts, substantially as shown and described.

6. The combination of cylinder *a*, with its external locking-jaws, the rod *k*, the spring-finger *m*, the stripping-lug *l*, means for actuating said parts, and means for holding the cord across the end of the cylinder.

7. The combination of the cylinder *a*, the spring-cam *q*, the inclined cam *q'*, the spring-finger *m*, on the rod *k*, and means for holding the cord on the cylinder, substantially as shown and described.

8. The combination of tube *a*, lug *d*, hook *e*, a rod *k* having the spring-finger *m*, and the lug *l* and spring-cam *q*, means for actuating said parts, and means for holding the cord across the end of the tube.

9. The combination of lug *d*, hook *e*, and projection *g*, on tube *a*, and means for actuating the cylinder and drawing the cord within it, substantially as shown and described.

10. A rotary cylinder having thereon means for gripping the cord of the loop and stops or shoulders whereby the cord of the loop is caused to cross the open end of the cylinder during the formation of said loop thereon, in combination with an internal clamping-gripper for drawing in the crossed cord and making a tight knot.

11. In a cord-knotter the hollow cylinder having at its end a segment whereon the cord is looped and held with a portion of the cord of the loop across the open end of the cylinder during the formation of the loop thereon in combination with an externally-located clamp mounted on said cylinder and means for drawing the crossed cord through the said loop to form a knot.

12. In a cord-knotter the rotary cylinder whereon the cord is looped and held having shoulders whereby the cord of the loop is held across the open end of the cylinder during the

formation of the loop thereon, in combination with an externally-located clamp mounted on said cylinder and means for completing the knot and removing the loop from off said cylinder.

13. In a cord-knotter the rotary cylinder whereon the cord is held by an externally-located clamp mounted on and carried with said cylinder, shoulders on the cylinder whereby the cord of the loop is held across the open end of the cylinder during the formation of the loop thereon, in combination with means for drawing the cord through the loop to form a knot, and means for removing the loop from off said cylinder at a suitable time.

14. The combination with a suitable loop-forming device, of the rod *k*, the spring-finger *m* forming with said rod pincers for tightly grasping the cord, means for stripping the loop from its forming device, mechanism for actuating said parts, and means for laying the cord across the loop on the end of the cylinder.

15. In a cord-tier the combination of the rotary cylinder whereon the loop is formed, having shoulders on its end, the exterior gripping-jaws arranged thereon consisting of the sliding hook and the stationary lug projecting laterally from the cylinder and the clamp

employed for drawing the cord through the loop to form a knot, substantially as described and shown.

16. In a knotter the combination of a hollow rotary loop-former, external jaws thereon consisting of a stationary lug and longitudinally-sliding hook; means for stripping the loop from the cylinder; mechanism for drawing the cord through the loop; and devices for actuating said parts.

17. In a cord-knotter, the combination of a rotary loop-former, means for drawing the cord through the loop to complete the knot, and a gripper which grasps and holds the looped portion of the cord tightly between the bundle and the said cord-drawing means.

18. In a cord-knotter the combination of a rotary loop-former, means for drawing the cord through the loop to complete the knot, and a cord holder or gripper on the loop-former which grasps and holds the loop portion of the cord on said former until the knot is drawn tight.

In testimony whereof I affix my signature in presence of two witnesses.

CHARLES A. POSTLEY.

Witnesses:

E. C. WEAVER,

CHARLES E. POSTLEY.