

(No Model.)

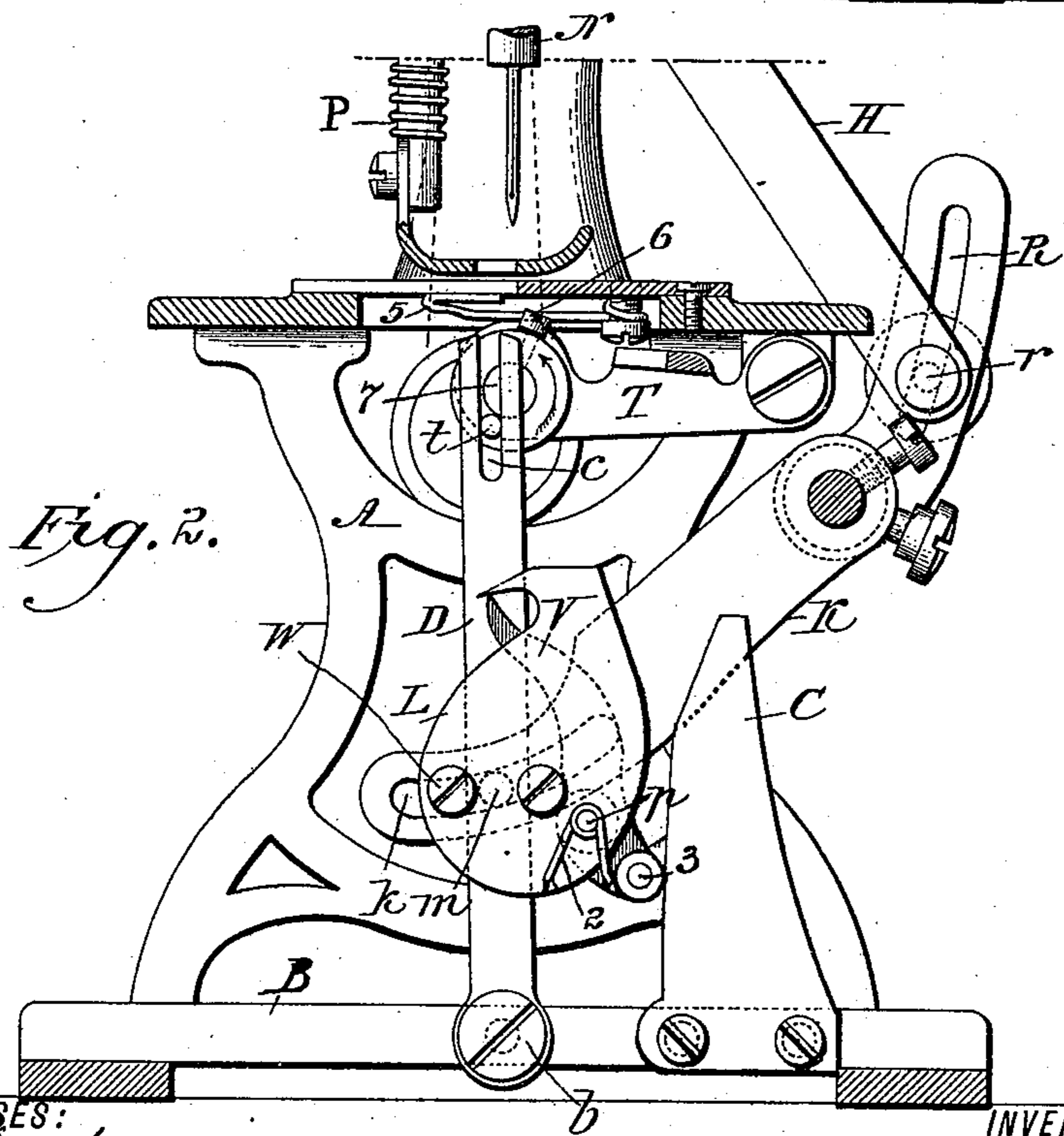
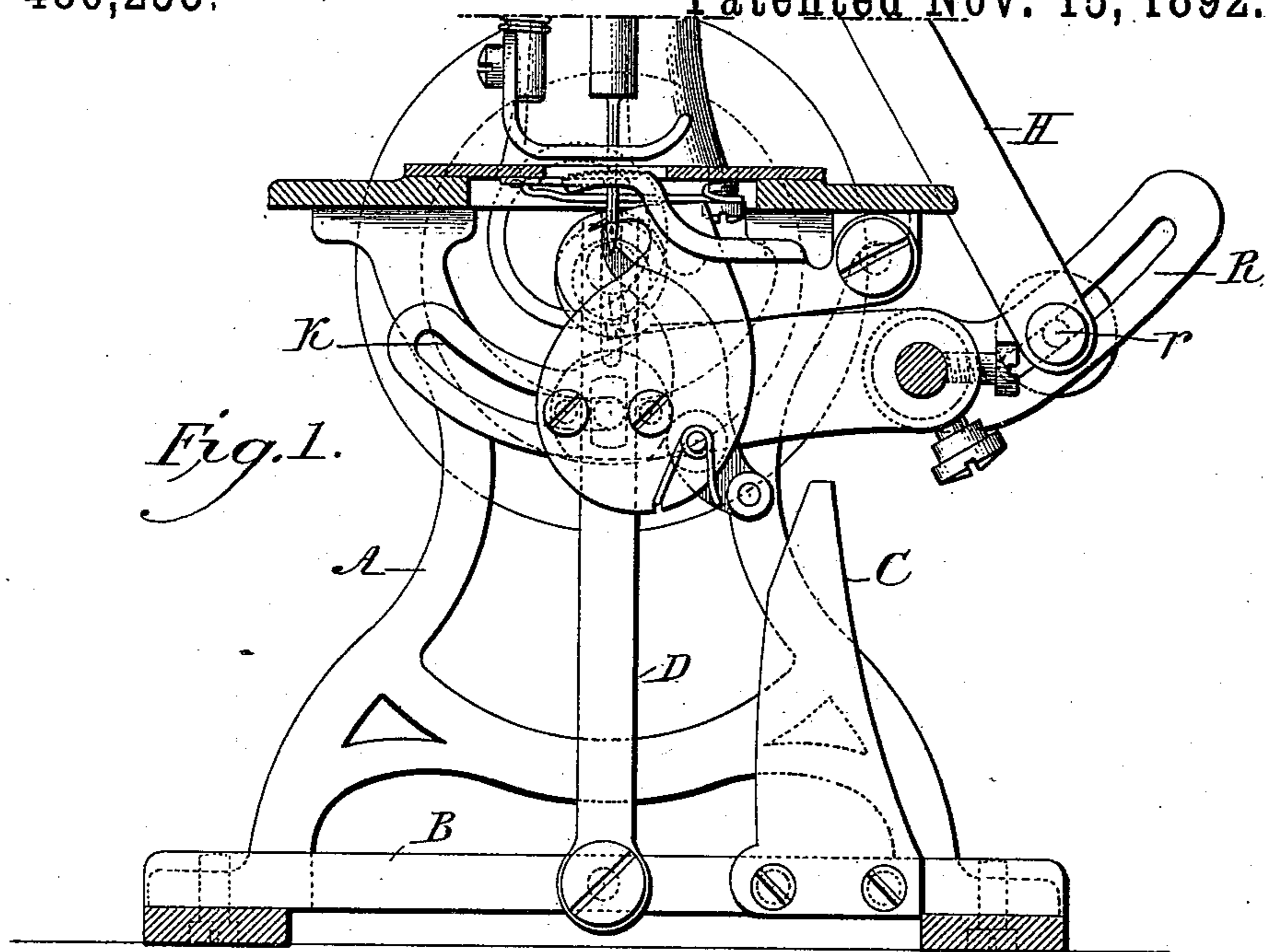
3 Sheets—Sheet 1.

F. HOFBAUER.

MACHINE FOR FORMING AND CUTTING FRINGE LOOPS ON EDGES
OF FABRICS.

No. 486,253.

Patented Nov. 15, 1892.



WITNESSES:
John A. Kahan
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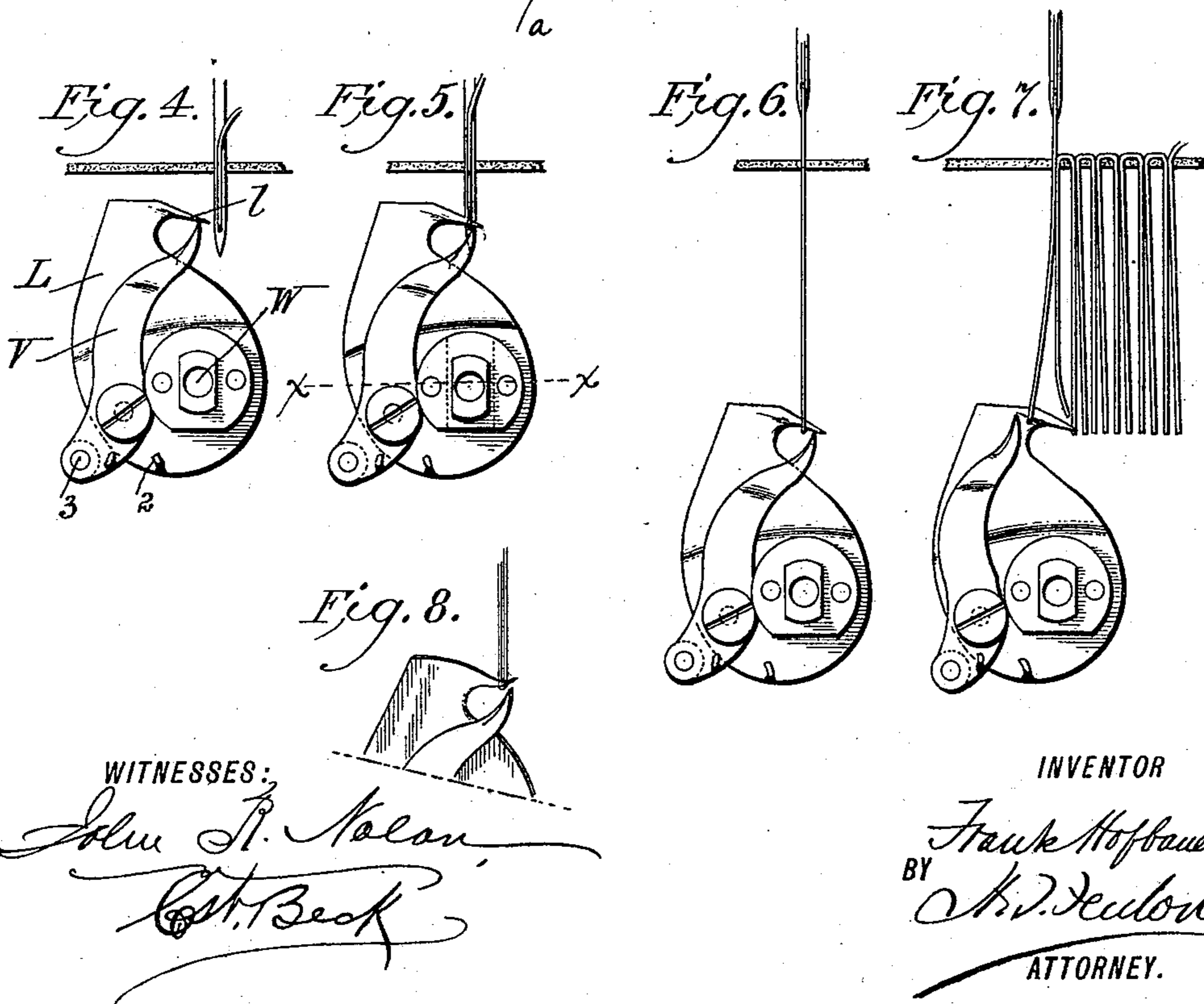
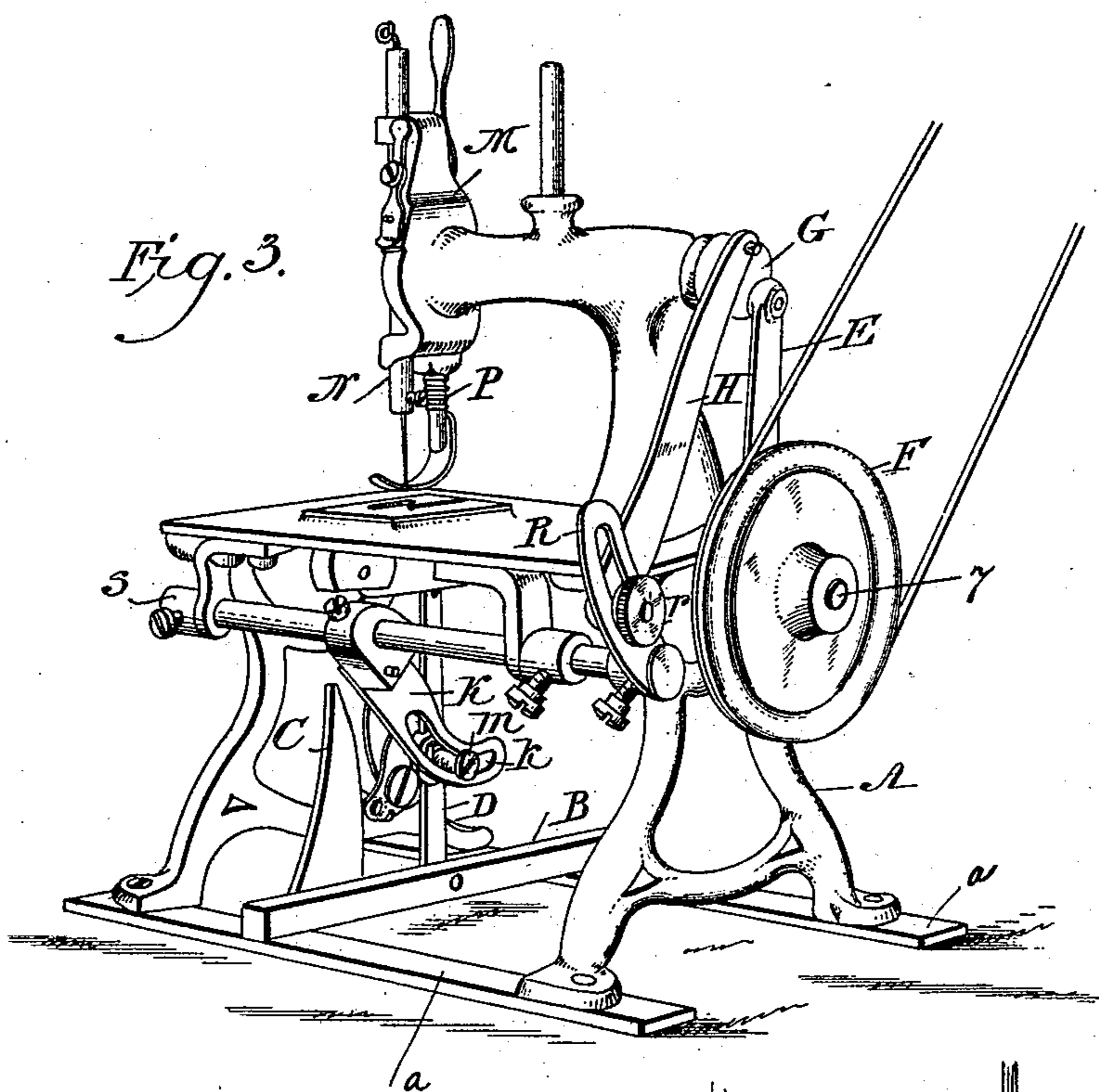
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3 Sheets—Sheet 2.

F. HOFBAUER.
MACHINE FOR FORMING AND CUTTING FRINGE LOOPS ON EDGES
OF FABRICS.

No. 486,253.

Patented Nov. 15, 1892.



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(No Model.)

3 Sheets—Sheet 3.

F. HOFBAUER.

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Fig. 9.

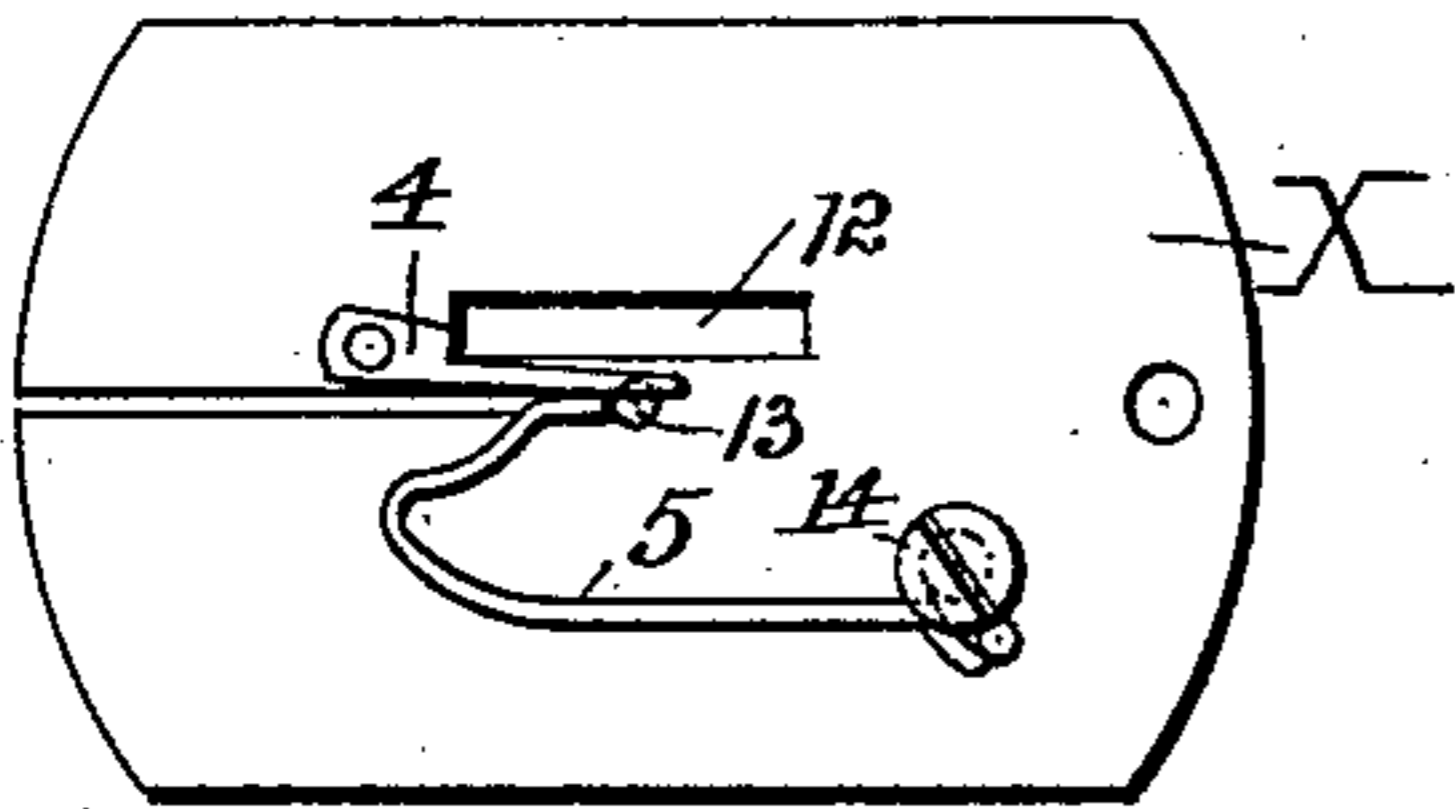


Fig. 10.

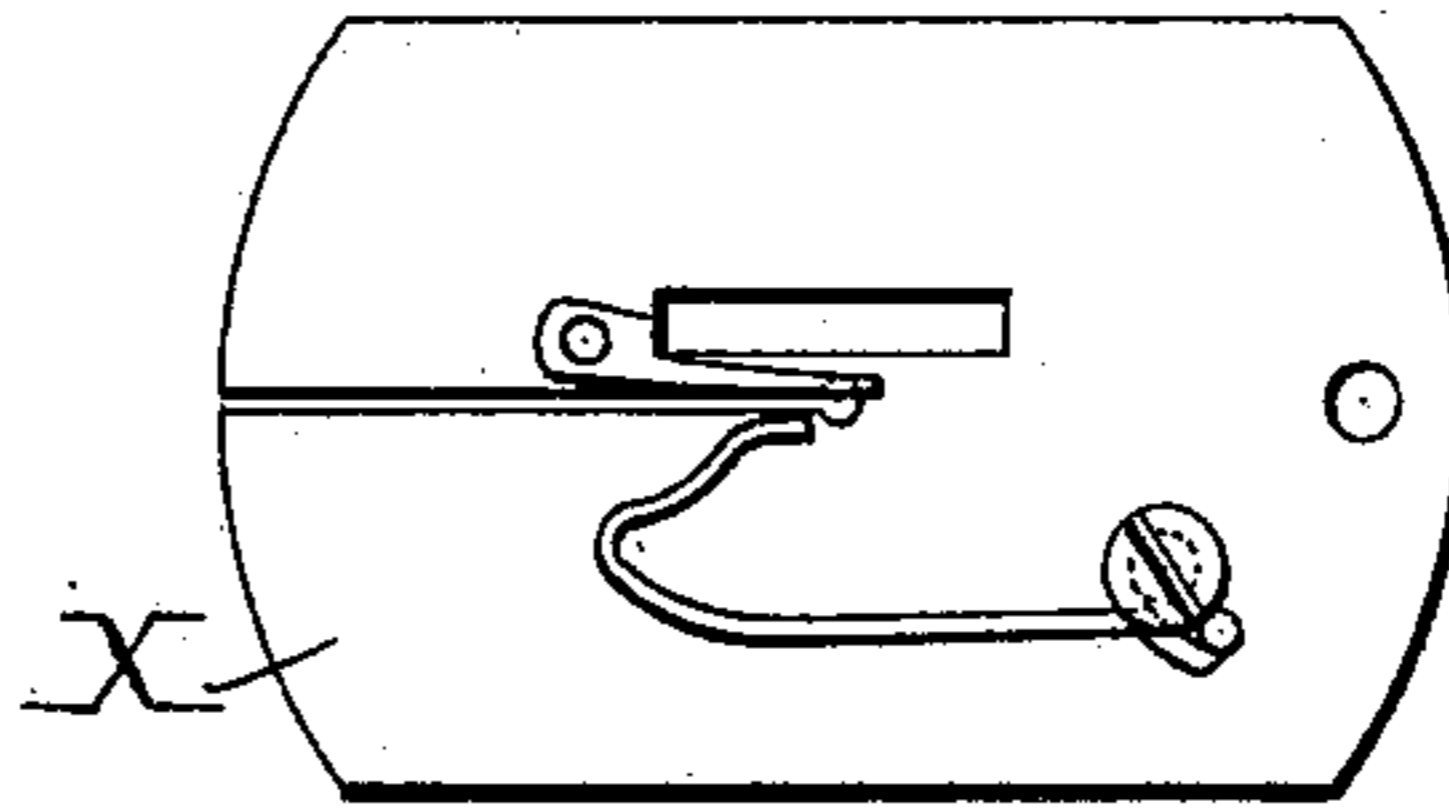


Fig. 11.

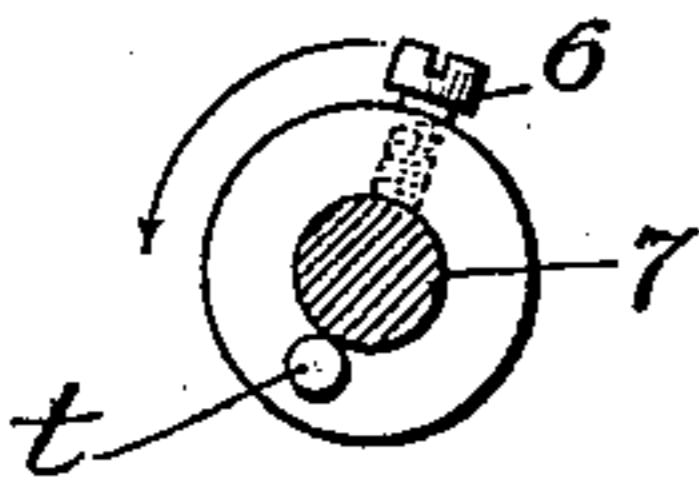


Fig. 12.

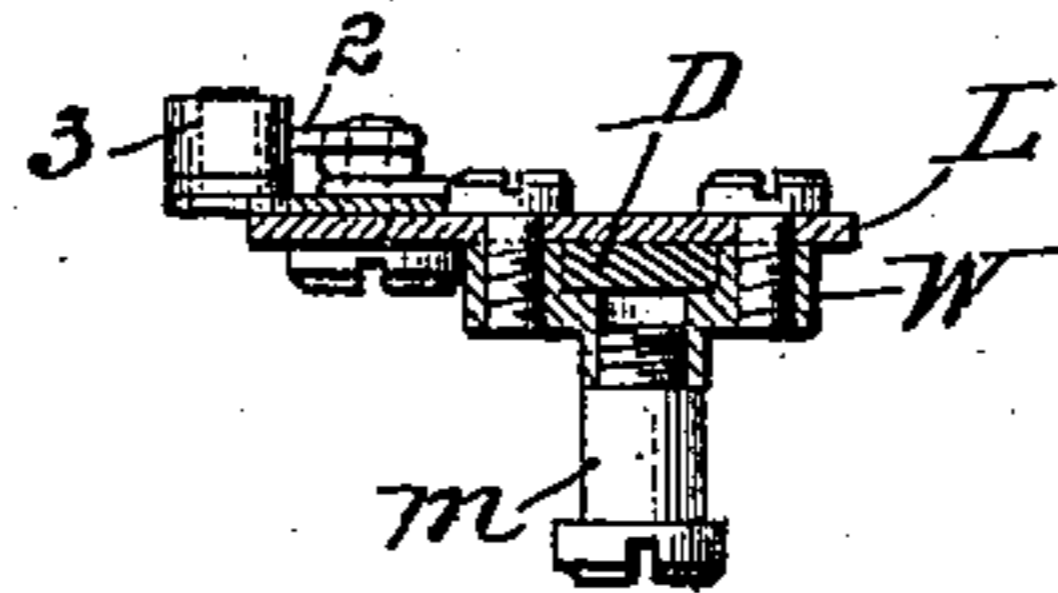


Fig. 13.

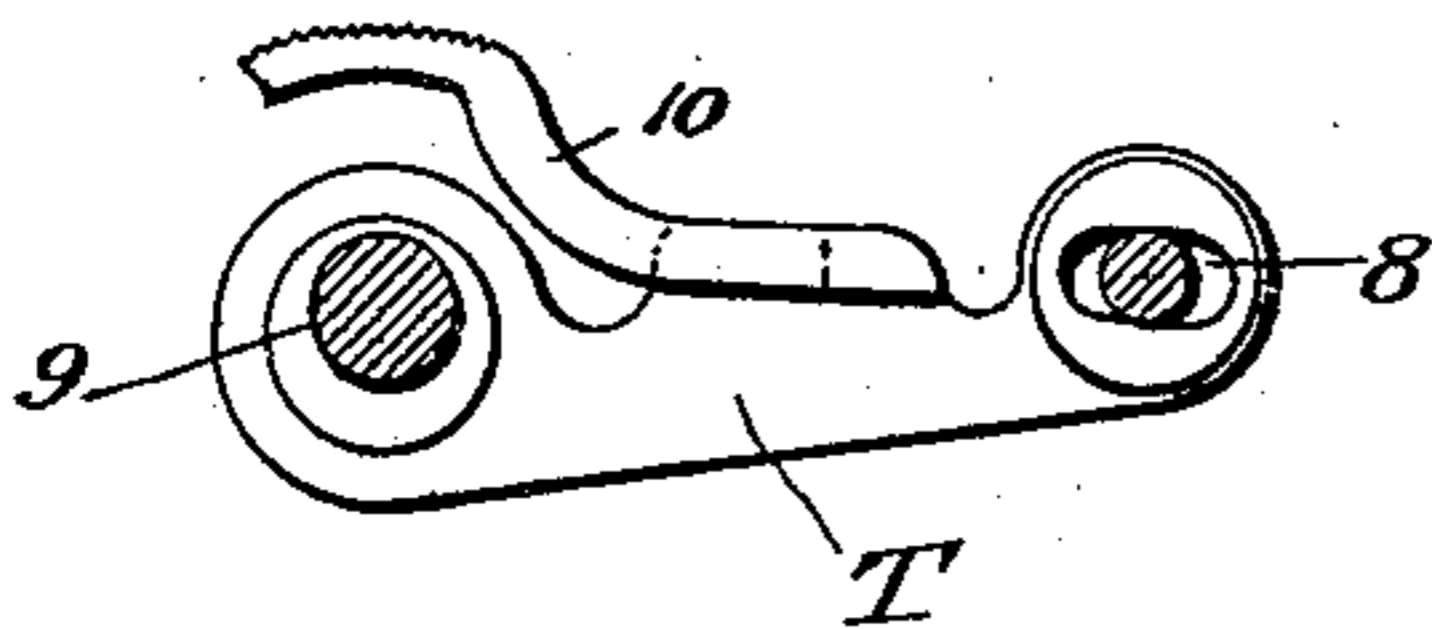
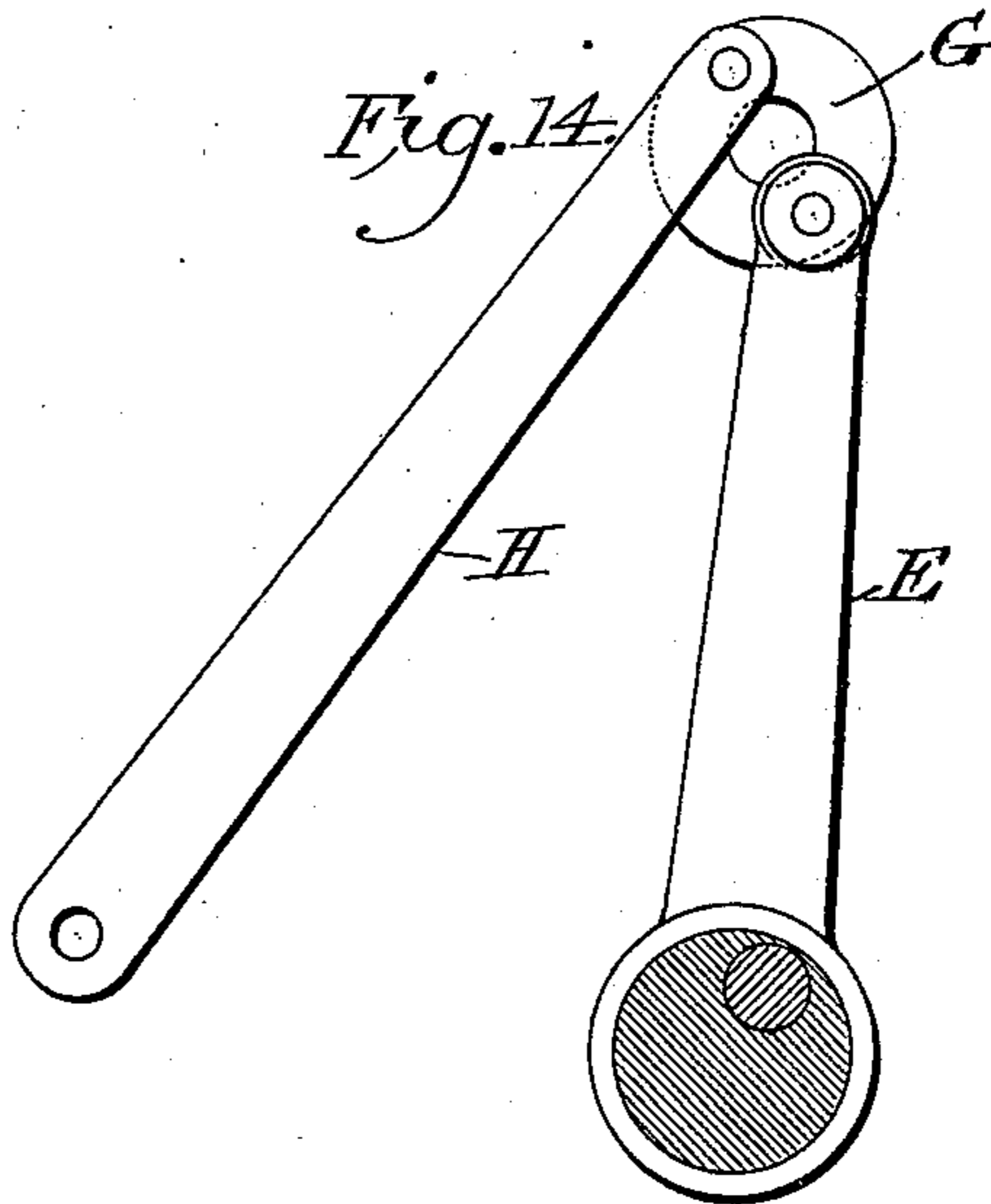


Fig. 14.



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UNITED STATES PATENT OFFICE.

FRANK HOFBAUER, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR OF TWO-THIRDS TO OSWALD LEVER AND WILLIAM S. GRUNDY, OF SAME PLACE.

MACHINE FOR FORMING AND CUTTING FRINGE LOOPS ON EDGES OF FABRICS.

SPECIFICATION forming part of Letters Patent No. 486,253, dated November 15, 1892.

Application filed December 30, 1890. Renewed June 28, 1892. Serial No. 438,258. (No model.)

To all whom it may concern:

Be it known that I, FRANK HOFBAUER, a citizen of the United States, residing in the city of Philadelphia, State of Pennsylvania, have invented certain new and useful Improvements in Machines for Forming and Cutting Fringe Loops on Edges of Fabrics, of which the following is a full, clear and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention has for its object the simultaneous formation and attachment of fringe loops on the edges of all such textile fabrics to which separately-made fringes are now usually applied by sewing and to the cutting of such loops as the same are successively formed on the fabric; and to that end my invention consists of the mechanisms for the said purposes, as hereinafter fully set forth.

In the accompanying drawings, Figure 1 is a sectional view of my machine mounted upon a suitable frame, showing the needle down after completion of the stitch and the looper in its elevated position and after having caught the thread above the eye of the needle. Fig. 2 is a like view showing the needle above the throat-plate and the looper in its lowest position on its vibrating guide-bar after forming the loop. Fig. 3 is a perspective view diagonally from the side and opposite end of the machine, intended more particularly to illustrate the construction and arrangement of the mechanism for regulating the length of the loop, and also the actuating mechanism for vertically reciprocating the looper upon its sliding guide-bar, as also the stationary cam-post which actuates the cutting mechanism when brought into contact therewith, said cutting-blade being mounted on the rear side of the looper and held in normal position thereon by a spring. Fig. 4 is a detached view from the rear side of the looper, blade, and needle, showing the position of the looper and shearing-blade at their limit of upward movement and before catching the thread above the eye of the needle. Fig. 5 is a like view on the beginning of the downward movement of the looper; Fig. 6, a like view after the looper has completed its downward movement, carrying the thread down with it which

forms the loop; Fig. 7, a like view after the shearing-blade has been brought in contact with the cam-post and moved forward on the face of the looper and cutting the end of the loop in said movement; Fig. 8, a detached view of the position of the looper and shearing-blade intermediate between that shown in Figs. 6 and 7. Figs. 9 and 10 are elevations of the throat-plate from the under side, intended to illustrate the spring mechanism by which the thread after it is carried beneath the throat-plate by the needle is caught and held while the looper carries it down to pull it from the spool instead of pulling on the last formed stitch, Fig. 9 showing the spring bearing against the finger and Fig. 10 the spring pushed back therefrom. Fig. 11 is a side view, in elevation, of the cam which vibrates the sliding looper-guide and which also operates the finger-spring to hold the thread while the loop is being formed. Fig. 12 is a view partly in section through the line *xx* of Fig. 5 and partly in elevation showing the looper, the shear-blade, the spring which controls the latter, and the connecting mechanism on the back of the looper and between it and the actuating-arm which vertically reciprocates it on the sliding guide. Fig. 13 is a side view of the arm which carries the feed-bar. Fig. 14 is an elevation of the connecting mechanism between the main shaft and the slotted arm of the rocking shaft which actuates the slotted arm, whereby the looper is vertically reciprocated.

The mechanism is mounted upon a suitable frame A, consisting of a table-plate with supporting-legs resting upon a base-plate or cross-bars *a*.

M is the head having bearings for the needle-bar N and presser-bar P. Suitable mechanism of the usual character is provided for operating the needle-bar from the main shaft, on the end of which is mounted the drive-wheel F. (See Fig. 3.)

To the face of the usual cam-wheel G on the end of the needle-bar-actuating shaft is affixed, in addition to the usual arm E, connecting it with the main shaft, a driving-arm H, which is secured by a set-screw *r*, passing through a slot in the arm R, which latter is bolted at its lower end to a rocking shaft S,

having its bearings in brackets affixed to the frame of the machine. This shaft S has also bolted to it an arm K, slotted at its lower end at *k*, through which slot passes a pin or other fastening *m*, projecting from the back of the looper L, and whereby the latter is actuated.

To a cross-bar B, resting upon the base-plate of the machine, is mounted by a loose screw *b* or other appropriate means an upright guide-bar D, slotted at its upper end at *c*. Upon this guide-bar the looper L is so arranged—such as at W, Figs. 2, 4, and 12—that it may slide freely up and down thereon, and it is vertically reciprocated on said sliding guide B by means of the slotted arm K, (see Fig. 3,) carried by the rocking shaft S, the looper being connected on its inner face to said arm K by means of a projecting pin *m*, as mentioned.

The chief feature of my invention as respects the looping mechanism is the construction of the looper and its actuating mechanism that the movement of the looper on its guide shall be a positive motion and draw the thread downward in a nearly-perpendicular line, and to this end the vertical reciprocation of the looper on its sliding guide is complete before the lateral vibration thereof is produced by the cam mechanism hereinafter described, this vibration being in one direction, in order that the hooked end of the looper shall catch the thread carried downward by the needle and in the other direction to operate the shearing-blade on its inner face. For the latter purpose it is so constructed as to enable it to carry upon its inner face a shearing-blade V, mounted upon a pivot-pin *p* and having its heel 3 extended beyond the face of the looper, so that by contact of said heel with the stationary cam-post C on the downward movement of the looper and blade the latter shall be moved forward against the inner face of the looper, which operates as the other blade of the shear and cuts the fringe loop caught by the hook of the looper and brought down with it in its descending movement. The construction and arrangement of the looper L and shearing-blade V and their relative arrangement, together with the action of the same in their several movements, are illustrated in Figs. 4 to 8, inclusive.

Upon the inner end of the main shaft 7 is mounted a cam-wheel (shown disconnected in Fig. 11) and is provided upon its periphery with a projecting pin or screw 6 and upon its face with a projecting pin *t*. The latter fits in the slot *c* of the upright sliding guide D. (See Fig. 2.) The rotation of the main shaft and its cam-wheel 7 is in the direction of the arrow, as shown in Fig. 11. The said projecting pin *t* upon the face of this cam-wheel 7, rotating in the direction stated and fitting in the slot *c* of the sliding guide-bar D, acts to vibrate the said guide-bar laterally and is so arranged relatively thereto that the vibratory movement in one direction will occur at the termination of the upward movement of the

looper upon this bar and the downward movement of the needle, the eye of which at that point is thus brought immediately below the hook *l* of the looper, as shown in Fig. 4. The completion of the lateral vibratory movement of the looper in that direction upon this guide-bar brings the said parts in the position shown in Fig. 5, after which the cam-pin *t* ceases to act upon the guide-bar, and the rocking shaft S actuates the slotted arm K, secured through its slot to the inner face of the looper, and carries the latter down in its vertical reciprocation on the sliding guide-bar D to the full limit of the vibratory movement of the arm K, at which point the pin *t*, acting in the slot of the sliding guide-bar D, vibrates it laterally in the opposite direction and brings the projecting heel 3 of the shearing-blade V in sliding contact with the stationary upright cam-post C, which thus tends to bring the sharp end of the shearing-blade inward against the sharpened face of the hook *l* of the looper L, upon which the loop has been caught. The position of the looper and blade relatively to each other at the completion of that movement is as shown in Fig. 7 of the drawings. The normal relative position of the looper and shearing-blade is as shown in Figs. 2 and 4, the said shearing-blade being held in that position by means of a spring 2, secured to its bearing upon the looper-face, one end of said spring being fastened to the looper-face and the other end bearing against the projecting heel 3 of the shearing-blade.

The feed mechanism is shown disconnected in Fig. 13. It consists of the usual feed-bar 10, having the usual motion, and is mounted upon a feed-arm T, one end of which is slotted at 8 and has its bearing upon a small projecting pin secured to the frame of the machine. The other end is provided with a recess, through which passes a cam 9, adjusted upon the main shaft between the cam-wheel 7 (see Fig. 11) and the face of the bar T, slightly projecting into the recess of the latter.

An important feature of my invention is the mechanism to hold the thread while the loop is being formed. It is constructed as follows: To the under side of the throat-plate X and contiguous to and between the feed-slot 12 a needle-hole 13 is arranged and a stationary finger 4 secured to the throat-plate X, and also secured to said throat-plate by a screw at 14 is a bent spring 5, the outer end of which is brought immediately contiguous to the needle-hole 13 and in its normal position pressing against the finger 4. The parts are so arranged (see Fig. 2) that the projecting pin 6 on the periphery of the cam-wheel 7 presses against the side of said curved spring 5 and separates it from contact with the finger 4 upon the upward movement of the needle and releases it again upon the completion of said upward movement, so that upon the subsequent downward descent of the needle and the carrying with it of the thread the latter will be caught between the

face of the finger 4 and the end of the spring 5, thus holding the thread so that a quantity of it will be pulled off the spool to form the next loop.

5 The operation of the machine is as follows: The edge of the material to which the loop-formed fringe is to be applied is placed upon the table of the machine and the presser-foot applied as usual with sewing-machines, when
 10 upon the application of power with the main shaft the needle-bar is reciprocated and the thread carried downward through the material and through the throat-plate, the parts being so disposed that the looper is on its upward movement while the needle is making
 15 its descent through the throat-plate, and at the completion of these movements the said parts assume the position shown in Fig. 4. At that point the other mechanisms described
 20 operate to vibrate laterally the sliding guide-bar upon which the looper is mounted, the result being that the hook of the looper passes between the thread and the needle above the eye of the latter, and at the completion of
 25 this movement the slotted arm actuated by the rocking shaft then carries the looper down in its downward movement, drawing with it the thread and forming a loop, while during
 30 this latter movement of the parts the spring 5 remains pressed against the finger 4, holding between them the thread of the previously-formed loop. At this point, which is the completion of the downward movement of the
 35 looper, the cam-pin *t*, acting in the slot *c* of the sliding guide-bar *D*, vibrates the latter in the opposite direction, so as to carry the heel 3 of the shearing-blade against the cam-post *C* and move said shearing-blade inward against the sharpened face of the hook *L* of
 40 the looper, catching the ends of the loop in its passage and cutting the same, as shown in Fig. 7. The next revolution of the main shaft carries the needle down and the looper upward in its vertical reciprocation, again
 45 catching another section of the thread and drawing it down, as before, to form the second loop, and so on to the end.

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

1. The combination, in a machine for forming fringe loops, with a reciprocating needle, of the upright guiding slide-bar *D*, pivotally fixed at its lower end to adapt it to be vibrated
 55 in an arc of a circle, a vertically-reciprocating loop-forming hook *L*, mounted on said bar *D* in such manner that while carried thereby it shall be free to slide vertically thereon, and separate and independent mechanisms operating, respectively, to vertically reciprocate
 60 said loop-forming hook, as aforesaid, and to vibrate said guide-bar *D* in an arc of a circle in one direction simultaneous with the upward throw of the looper and in the opposite direction simultaneous with the downward movement thereof, substantially as described.

2. The combination, with the reciprocating

needle, of an upright pivoted guide *D*, slotted at its upper end, a vertically-reciprocating hooked looping device mounted thereon, 70 the slotted arm *K*, carrying said looper and its actuating-shaft *S*, the main shaft and its cam-wheel 7, mounted on the end thereof, and connections between the cam-wheel 7 and guide *D*, operating to vibrate said guide *D* in 75 an arc of a circle at the terminus of the upward throw of the looper, substantially as described.

3. The combination, with the needle, of the pivoted guide *D*, the looper *L*, means to vertically reciprocate the same on the pivoted 80 guide, means to vibrate said guide on the terminus of the upward throw of the looper, a cam-post *C*, and a shearing-blade *V*, mounted on said looper and having its heel 3 extending 85 beyond the face thereof and abutting against the cam-post *C*, and a spring 2, supporting said shear-blade in normal position on the face of the looper, substantially as described. 90

4. The combination, in a machine for forming and cutting fringe loops, with a reciprocating needle, of the pivotally-fixed upright guide-bar *D*, the looper-hook *L*, carried thereby and adapted to slide vertically thereon, mechanism to vertically reciprocate said looper-hook as aforesaid, mechanism to vibrate the 95 bar *D* in an arc of a circle in one direction simultaneous with the upward movement of the looper and in the opposite direction simultaneous with its downward movement, a 100 shear-blade *V*, mounted on said looper and having a heel 3 extending beyond the face thereof, and mechanism independent of the looper and its carrying guide-bar adapted to 105 actuate said blade on the terminus of the downward throw of the looper and after the full formation of the loop, substantially as described.

5. The combination, with the reciprocating 110 needle and a stationary finger 4, secured to the under side of the throat-plate and contiguous to the needle-slot, of a spring 5, also mounted on said throat-plate, and mechanism consisting of the eccentric 6, operating on said spring 115 to cause it to catch the thread and press it against the finger 4 after the needle has passed through the slot and to release it after the needle has completed its movement, and a hooked looper, with mechanism to adapt it 120 to catch the thread and draw it down after the needle passes through the slot on its descending movement, substantially as described.

6. The combination, with the reciprocating 125 needle, of an upright pivoted guide-bar, with mechanism to vibrate the same in an arc of a circle in unison with the movements of the loop-forming device, a looper-hook mounted on said vibrating guide-bar in such manner as to be free to slide vertically thereon, with 130 mechanism to so actuate the looper, consisting of the slotted arm *K*, its actuating-shaft *S*, a slotted arm *R*, mounted thereon, and a connecting arm *H*, actuated from the main shaft to

vibrate said slotted arm, with a set-screw between said slotted arm R and connecting-arm II, whereby the vibratory movement of the arms K and R may be adjusted and the length
5 of the loop regulated, substantially as described.

In testimony whereof I have hereunto af-

fixed my signature this 19th day of December, A. D. 1890.

FRANK HOFBAUER.

Witnesses:

JOHN R. NOLAN,
H. T. FENTON.