

E. DONALDSON.

BLINDSTITCHING ATTACHMENT FOR SEWING MACHINES.

APPLICATION FILED AUG. 12, 1902.

NO MODEL.

3 SHEETS—SHEET 1.

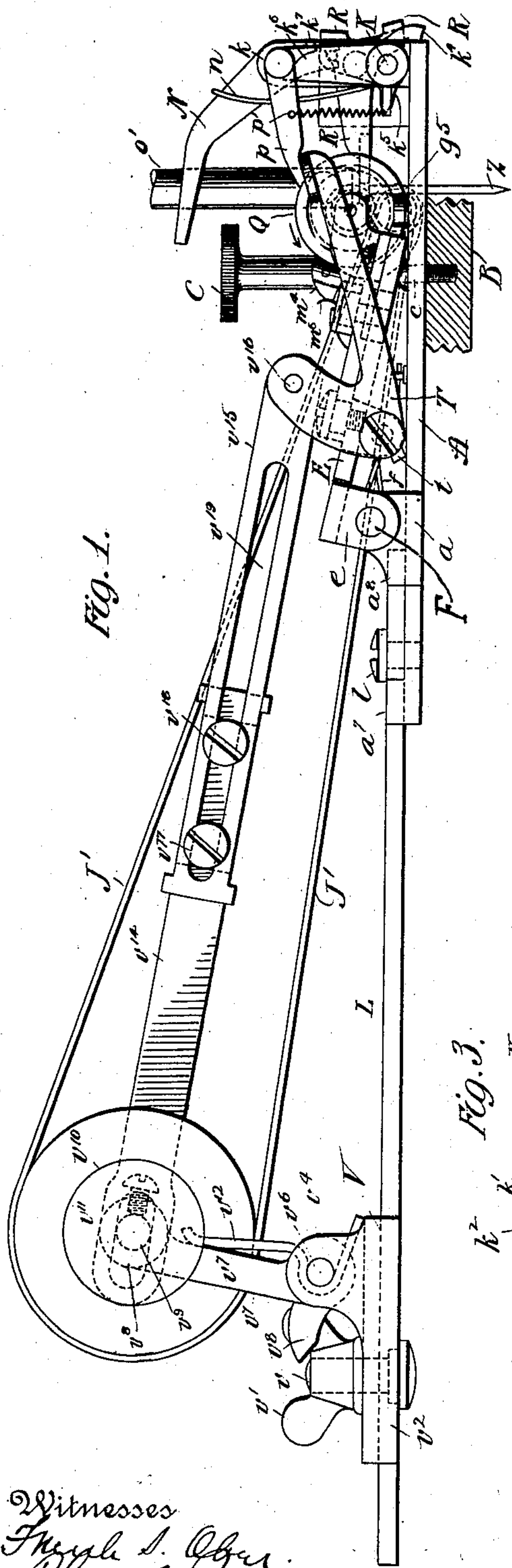


Fig. 1.

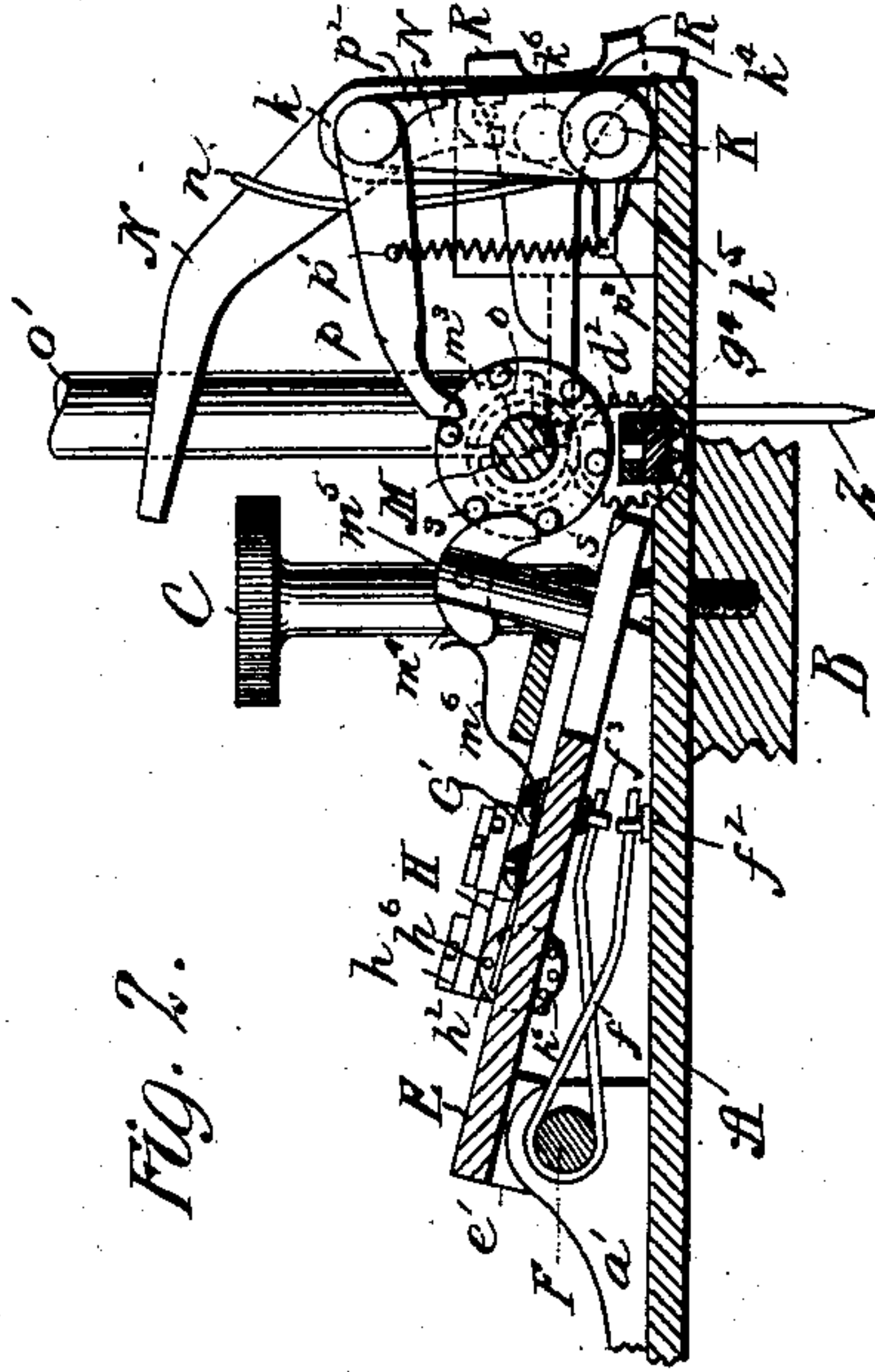


Fig. 2.

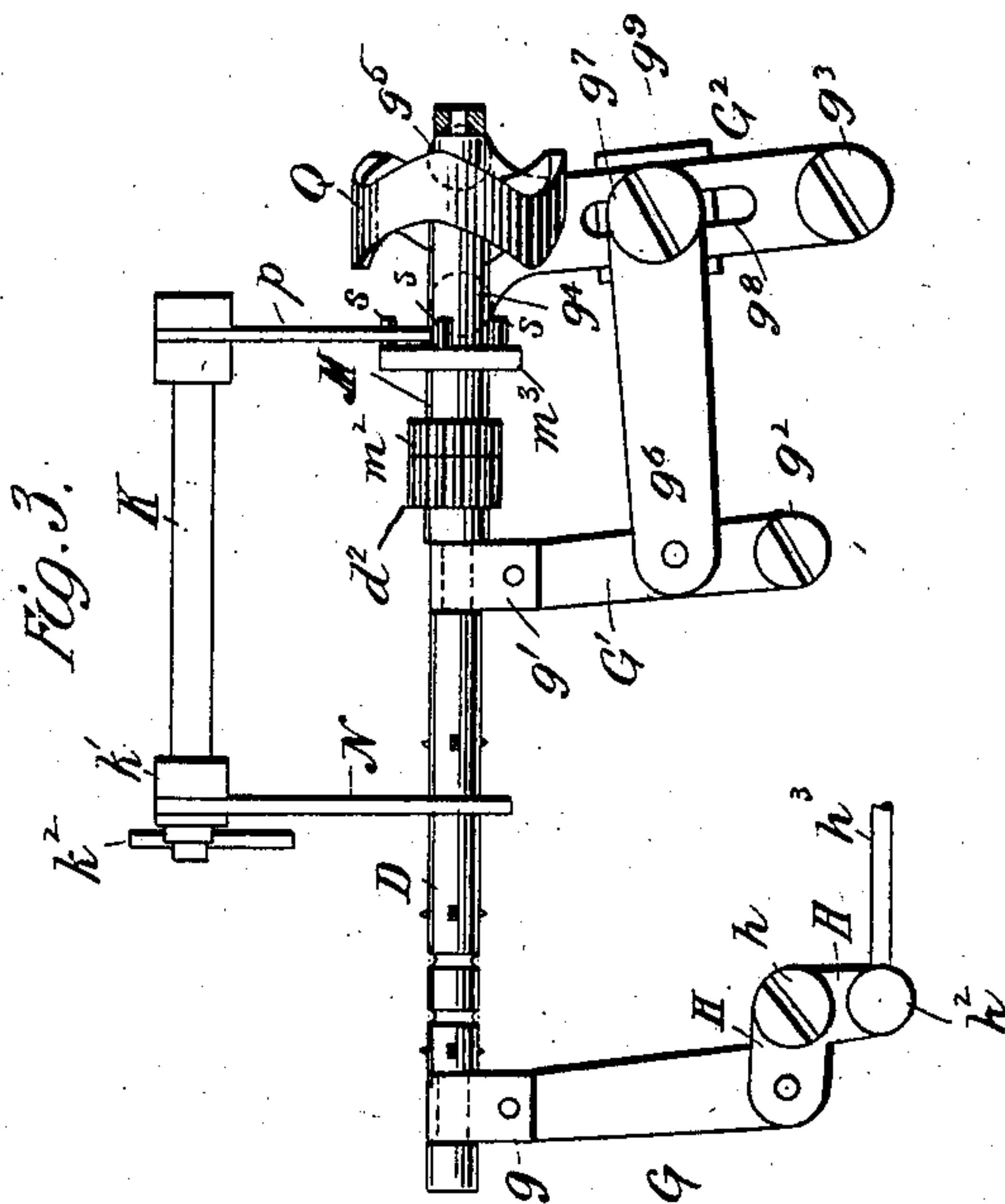


Fig. 3.

Witnesses
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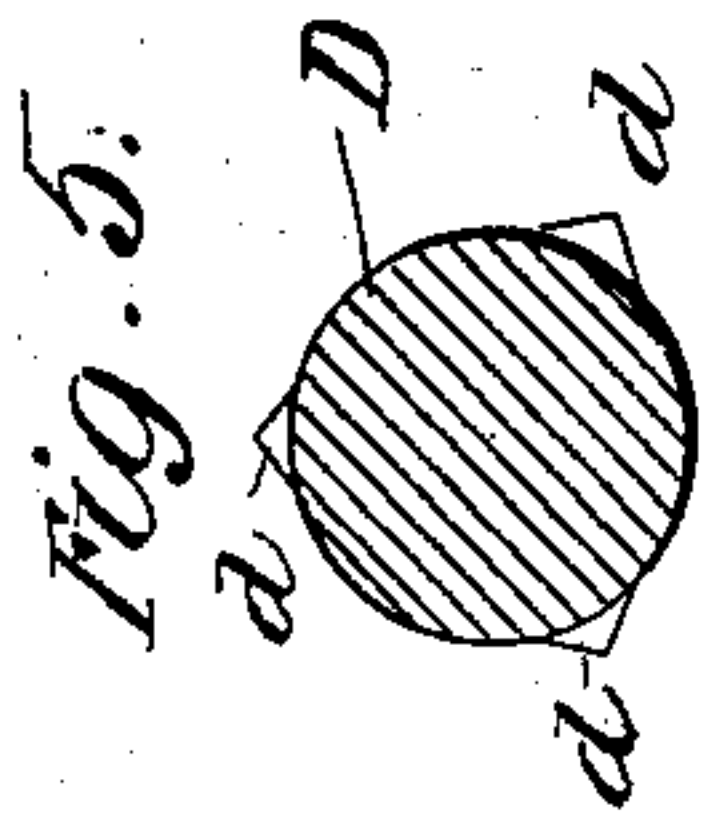
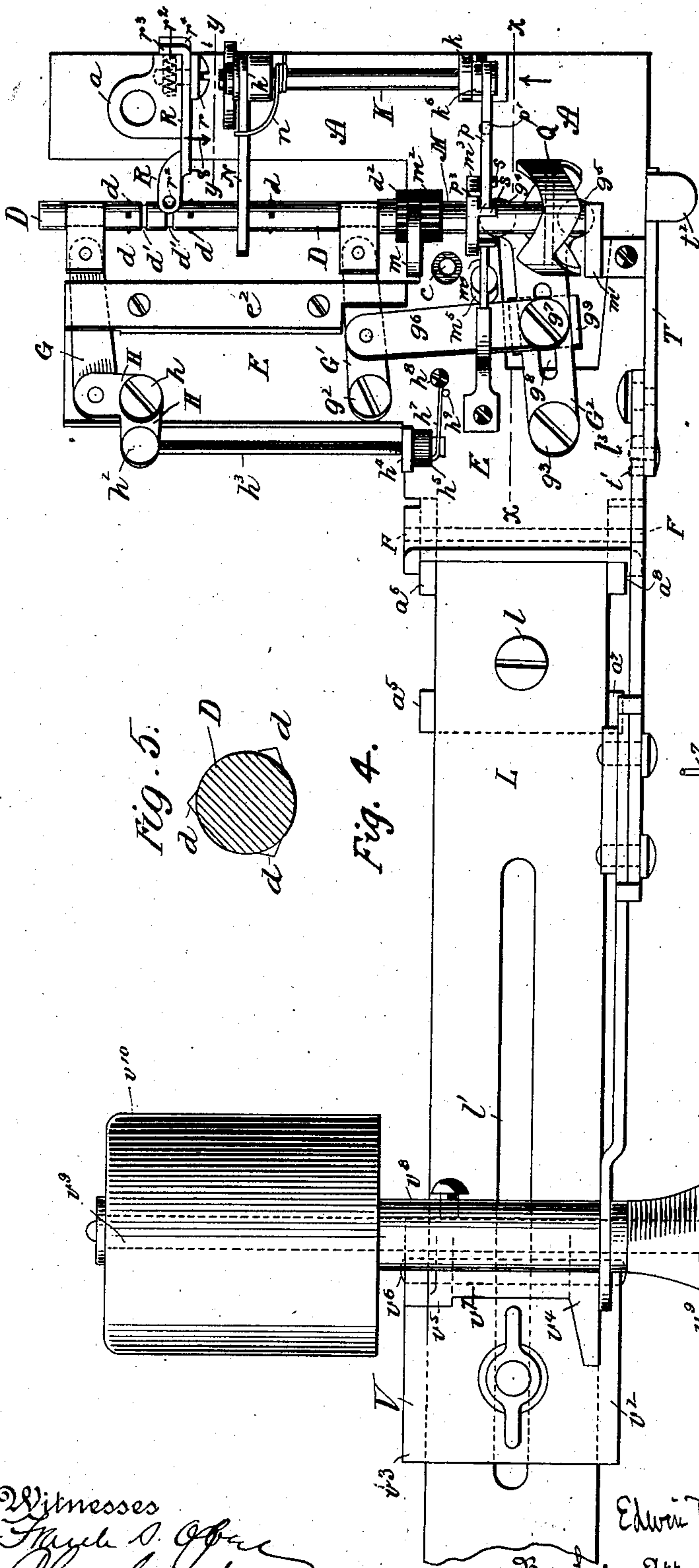


Fig. 4.

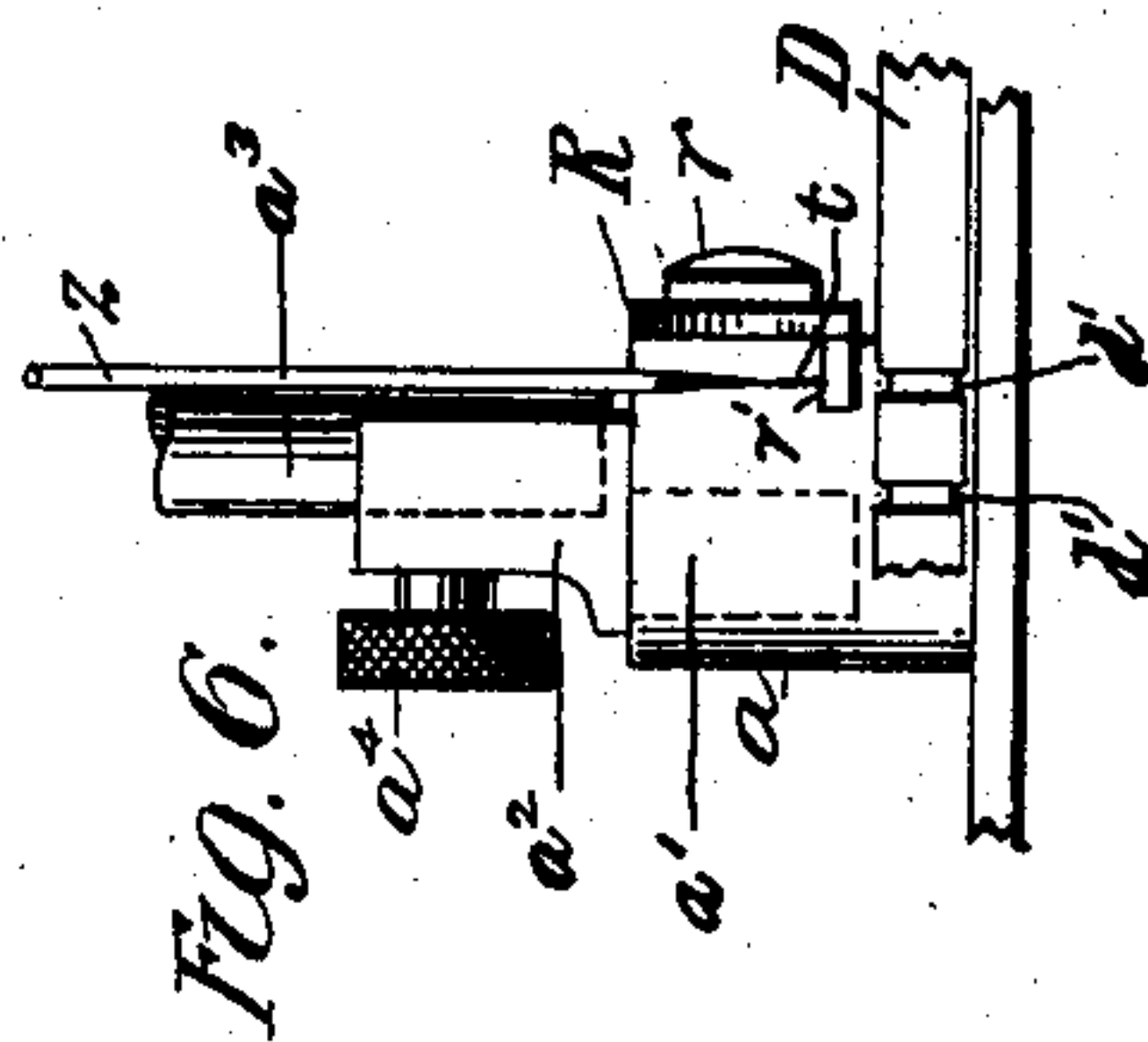
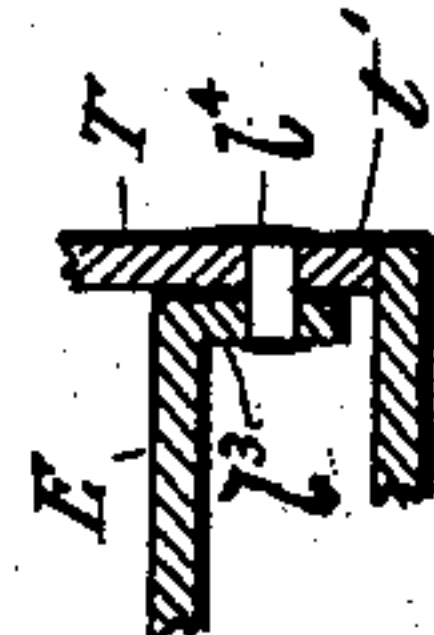


Fig. 6.

Fig. 9.



Witnesses
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No. 746,303.

PATENTED DEC. 8, 1903.

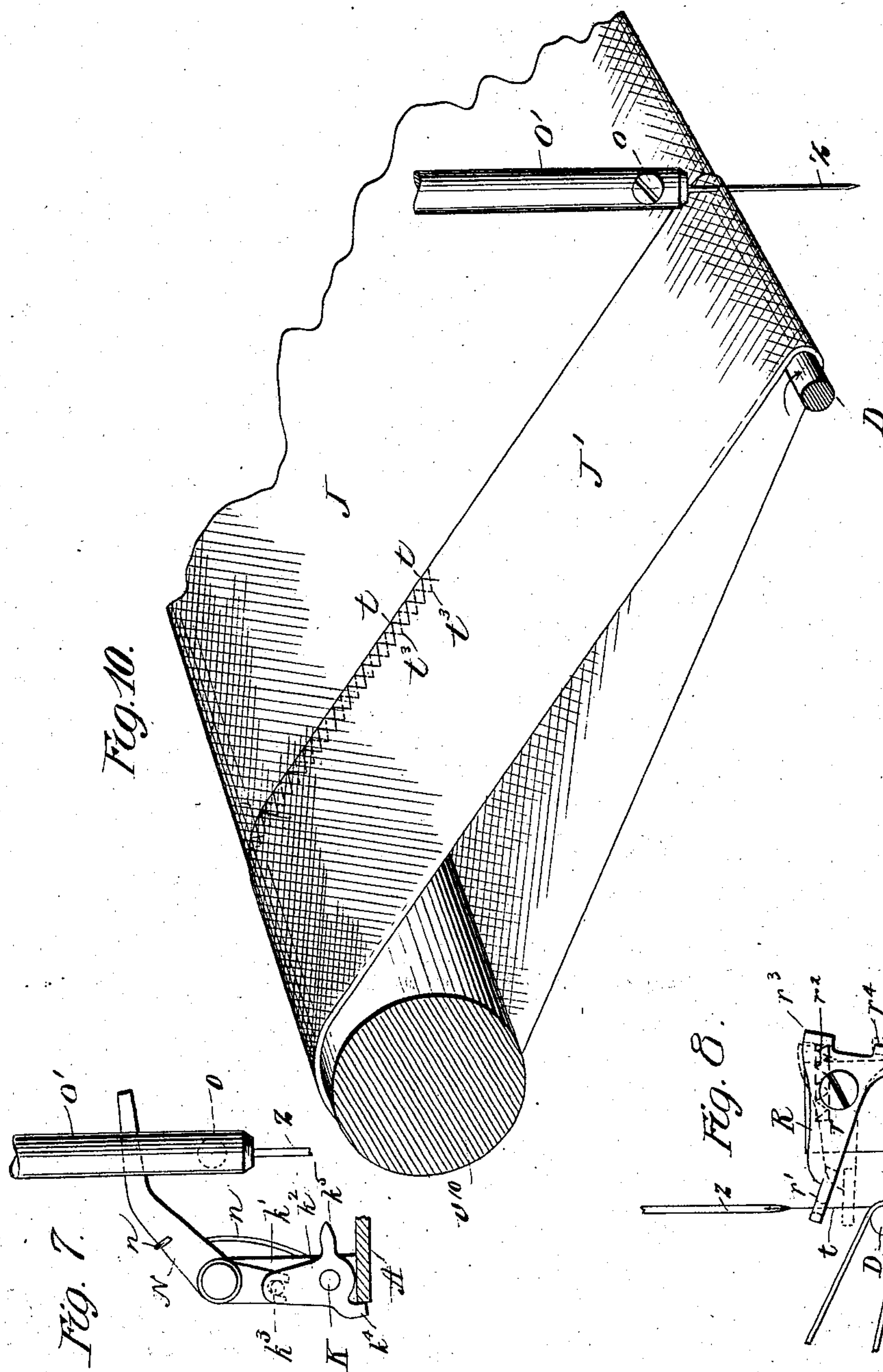
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3 SHEETS—SHEET 3.



Witnesses
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UNITED STATES PATENT OFFICE.

EDWIN DONALDSON, OF BROOKLYN, NEW YORK, ASSIGNOR OF ONE-FIFTH
TO DANIEL T. WORDEN, OF NEW YORK, N. Y.

BLINDSTITCHING ATTACHMENT FOR SEWING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 746,303, dated December 8, 1903.

Application filed August 12, 1902. Serial No. 119,373. (No model.)

To all whom it may concern:

Be it known that I, EDWIN DONALDSON, a citizen of the United States, and a resident of the borough of Brooklyn, city of New York, county of Kings, and State of New York, have invented certain new and useful Improvements in Sewing-Machine Attachments for Blindstitching, of which the following is a specification, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation of my attachment with its accessories; Fig. 2, a side view of front part of the attachment, showing certain parts in section, taken on the line xx of Fig. 4 and seen in the direction of the arrow nearest that line. Fig. 3 is a detail, being a plan view of certain parts; Fig. 4, a plan or top view of the attachment and its accessories generally; Fig. 5, an enlarged sectional view of the arbor and its spurs; Fig. 6, a detail elevation of certain parts; Fig. 7, a detail showing lever N and connections from opposite side to that shown in Figs. 1 and 2; Fig. 8, a detail side view of thread-controlling device; Fig. 9, a detail sectional view of certain parts; Fig. 10, a perspective view of parts of the arbor and mandrel, showing position of the fabric as applied thereto during operation of the attachment.

Similar characters refer to similar parts.

A is the base of the attachment, to which are secured directly or medially the other parts of the device and which is itself movably secured to the bed or work plate B of the machine by thumb-screw C and also by the following-described means, viz: A lug or post a , having a vertically-disposed cylindrical recess, is secured to the base of the attachment. (See Fig. 6.) Within this recess and adapted to be moved vertically therein is a cylindrical extension or pin a' , (indicated by dotted lines in Fig. 6,) attached to and projecting from a coupler-piece a^2 , Fig. 6, the upper part of which contains a cavity or recess fitted to and adapted to receive the presser-foot bar a^3 of the sewing-machine, (the presser-foot being removed; see Fig. 6,) the said bar and coupler-piece being secured together when the attachment has been adjusted to the required position by means of the presser-foot thumb-screw a^4 , as will be

readily understood. This means of coupling the attachment to a fixed part of the sewing-machine is advantageous, inasmuch as it permits of the attachment being first placed in any position most convenient for the accomplishment of the coupling and thereafter swung around horizontally into its final location, in which the thumb-screw C , passing through the perforation c , Fig. 4, in the base A , is brought to register with a suitably-threaded perforation in the bed-plate B of the machine and the attachment secured in its fixed and final position by turning the said thumb-screw down to place.

The fabrics to be sewed are while under suitable tension, hereinafter described, fed, presented to, and moved laterally relatively to the needle Z and to the direction of the feed by the rotating and oscillating arbor D . Said arbor is provided with a plurality of radially-disposed spurs d . The central axis of each spur should avoid pitch or angle relatively to the radius of a cross-section of the arbor, and the exterior of the spur is preferably cone-shaped. Said spurs engage and control the fabrics not only for the purpose of feeding the same, but also during the lateral or transverse movements imparted thereto by the oscillation of the arbor. It should also be noted that three of said spurs equidistantly disposed on the same cross-section of the arbor, as shown in Fig. 5, are sufficient for the purposes required of them and give the best results. The arbor D is also provided with two circumferentially-disposed recesses d' for the accommodation of the needle.

The arbor D is supported and actuated as follows: A plate E , normally inclined during the operation of the attachment to the plane of the base A , (see Figs. 1 and 2,) is hinged to the latter by means of a shaft F , journaled in lugs e on said plate and in lugs a' , secured to the base A . The plate E is movably held in its normally inclined position by the stress of a spring f , helixed around shaft F and having one of its extremities inserted in an eye f^2 , secured to base A , and the other in an eye f^3 , secured to plate E . (See Fig. 2.)

G G' are a pair of vibrating arms, each pivotally connected at one of its extremities, as

hereinafter more fully described, with the plate E and each provided at its opposite extremity with an extension $g g'$, pivotally secured thereto and carrying journaled therein 5 reduced or circumferentially-recessed portions of the arbor D, said portions being shown by the dotted lines in Figs. 3 and 4. G' is pivotally secured to the plate E by the screw g^2 . The arm G is adjustably secured 10 to the plate E, as follows: The inner extremity of arm G is pivotally secured to one arm of a bell-crank lever H. H is by means of the screw h pivotally mounted upon a post (not shown in the drawings) secured to and 15 rising from the plate E. To the opposite arm of H is secured a downwardly-extending post h^2 . To the post h^2 is secured one extremity of a rod h^3 . Said rod h^3 is supported near its opposite extremity by passing through a retaining piece or collar h^4 , Fig. 4, secured to 20 plate E, and within which retaining piece or collar the rod h^3 is loosely journaled. This end of h^3 extends beyond the collar h^4 into a slot or recess in plate E and is threaded. 25 The threaded portion of h^3 within the said recess coacts with a correspondingly-threaded knurl-nut h^5 , which turns upon said rod h^3 within the said recess. By turning the nut h^5 rod h^3 is moved relatively to plate E, the 30 bell-crank lever H is correspondingly actuated, also the arm G, and the arbor D thus caused to change as required its position relatively to the needle.

The knurl-nut h^5 is provided on its outer face 35 with a plurality of small circular depressions $h^6 h^6$, annularly disposed. A detent-spring and h^7 is secured to the plate E by a screw h^8 . A pin h^9 , secured in plate E, presses the extremity of said spring normally into contact with 40 the face of the nut h^5 and causes the end of the spring to enter in turn as knurl-nut h^5 the said circular depressions $h^6 h^6$, whereby the knurl-nut h^5 is locked against movement 5 under ordinary pressures and the rod h^3 and its connected parts held at the required adjustment.

e^2 , Fig. 4, is a guide-plate secured to the plate E, as shown, and having at both extremities elevated extensions overlying the 45 arms G G' , which vibrate underneath the same and are thereby held down against upward displacement. The arbor D is provided at one end with a geared extension d^2 .

A shaft M is journaled in lugs $m m$, secured 50 to and projecting upwardly from the plate E. m^2 is a geared portion of shaft M, superimposed over and intermeshing with the geared extension d^2 of the arbor D. m^3 is a trundle-wheel secured to shaft M and provided with a plurality of projecting arms (in the present instance six) $s s$, &c. Rotary motion is communicated to the said trundle-wheel m^3 , shaft M, and so to arbor D, as follows: Rock-shaft K is journaled in lug k and 55 in post k' , secured to and rising from the base A of the attachment. To the upper end of post k' is pivotally secured a two-armed lever

N, so disposed that its superior arm projects, as shown in Figs. 1 and 2, over the set-screw 60 o of the needle-bar o' of the sewing-machine, the said set-screw being sufficiently extended to insure when the needle rises its engagement against the one side of said superior arm of lever N, whereby said lever is caused 65 to rock upward. Said superior arm of lever N is maintained in normally depressed position by the spring n , bearing at one extremity against the top thereof and near its other end loosely helixed around rock-shaft K and 70 bearing at its opposite extremity against base A. (See Fig. 4.) The inferior arm of lever N is forked, as shown by dotted lines in Figs. 2 and 7. Fixedly secured to one end of said 75 rock-shaft K is an upwardly-projected lever k^2 . (See Figs. 2 and 7, Fig. 7 being an elevation of the parts in question as seen from the section taken on the dotted line $y y$ of Fig. 4 looking in the direction of the arrow marked 80 8'.) A horizontally-projecting pin k^3 is secured to lever k^2 and engages with the bifurcation of the inferior arm of the lever N. 85 When the superior arm of the lever N is raised by the needle-bar, lever k^2 is consequently caused to rock in one direction and in the opposite direction by the return of 90 lever N to normal position under stress of spring n . The extent of rock movement imparted as aforesaid to lever k^2 is limited by projections or studs $k^4 k^5$, secured thereto and which in turn engage against base A and 95 respectively check its movement in opposite directions. To the opposite end of rock-shaft K is rigidly secured an upwardly-projecting arm or lever k^6 , to the upper extremity of 100 which is pivotally secured a pawl p , maintained in normally depressed position by spring p' , secured to said pawl and to a projection p^8 on arm k^6 and restrained against undue depression by engagement of a rearward projection p^2 against a stud k^7 on the 105 arm k^6 . The pawl p is provided with a pin p^3 , which contacts intermittently with the rim of the trundle-wheel m^3 and prevents the pawl from dropping too far between the arms $s s$. It will be understood from the foregoing 110 that at each inward movement of rock-shaft K the pawl p is caused to engage against one of the arms $s s$ and to turn the trundle-wheel m^3 , together with shaft M and also the arbor D, one-sixth of a revolution, the arbor 115 being turned in the opposite direction to the shaft M, shaft M turning in the direction of the arrow shown in Fig. 1 and arbor D in the direction of the arrow shown in Fig. 2.

Trundle-wheel m^3 is prevented from over- 120 running by a detent m^4 , loosely pivoted to a post m^5 , secured to the incline plate E. A spring m^6 , secured to plate E, presses against one side of detent m^4 to cause it constantly to press against arms $s s$ of trundle-wheel m^3 , 125 and the edge of the detent contacting with said arms is so curved and shaped, as shown in the drawings, as not only to facilitate the arms passing over or by such edge, but also

so as to prevent after one arm has once passed it its return in the opposite direction, the detent thus serving not only as a yielding but also as a positive brake upon the trundle-wheel m^3 .

The required oscillation is imparted to arbor D as follows: A vibrating arm G^2 is pivotally secured to the inclined plate E by a screw g^3 . The opposite end of arm G^2 is bifurcated, each bifurcation being provided with an upwardly-extending horizontally-rotating cam-roller g^4 g^5 , (indicated by dotted lines in Figs. 3 and 4,) one of them, g^4 , shown in section in Fig. 2 and in side elevation in Fig. 1. The vibrating arms G' G^2 are connected by a link g^6 , pivotally secured to arm G' and adjustably to arm G^2 by screw g^7 passing through said link, through slot g^8 in arm G^2 , and coacting with a plate or nut g^9 , provided with a correspondingly-threaded aperture to receive said screw and underlying arm G^2 within a recess in plate E. (See Fig. 4.) By this means, as will be readily understood, the connection between G' and G^2 may be somewhat extended or shortened at will and the extent of transverse throw or oscillation of arbor D correspondingly regulated.

Rigidly secured to shaft M and rotating between the cam-rollers g^4 g^5 is a cam-wheel Q, having two cam-faces, each respectively bearing against one of the said cam-rollers. These cam-faces are computed and shaped so as to impart to the arbor D, through the connecting means before described, one complete movement in the line of oscillation in one direction at one rise of the needle-bar and in the opposite direction on the next successive rise of said needle-bar, and so on indefinitely.

Special thread-controlling means are provided. The rotation and oscillation of arbor D, carrying with it the fabrics, would otherwise carry the thread with it between the eye of the needle and the last stitch backward and forward in directions angular to the vertical line of the needle. It is desirable to control the thread and keep it as closely as possible to the fabric during the upward rise of the needle. A slightly-vibrating arm R is loosely secured by screw r to side of post or stationary part a . One end of said arm R is provided with an aperture or eye r' , normally disposed so as to be entered and passed through by the needle on latter's descent. Arm R is maintained movably in its normal upwardly-rocked position (shown in Fig. 8) by a spiral spring r^2 , housed in post a and indicated by dotted lines in Figs. 4 and 8, said spring r^2 pressing against a lug r^3 , projecting transversely from a rearward extension of arm R. Vibration of arm R downwardly is limited by engagement of lug r^3 against the rear of post a . Vibration of arm R upwardly is limited by engagement with rear of post a of another lug, r^4 , projecting transversely from a downward extension of arm R. The needle on descending enters eye r' of arm R, carrying with it the thread, and

vibrates arm R downward into the position shown in Figs. 1 and 2. After the fabrics have been split by the needle and the stitch formed the needle rises out of eye r' , spring r^2 causes arm R to vibrate upwardly into the position shown in Fig. 8, and the simultaneous oscillation of arbor D carrying with it the fabrics and the last stitch therein secured laterally and transversely of the vertical line of the needle, the thread is, nevertheless, by reason of its engagement against the side of eye r' maintained at a more acute angle than would occur were it not for the interposition of the thread-controlling arm R, and there is thus secured a condition and control of the thread of important advantage. In Fig. 6 is illustrated the operation of the devices in the particulars last mentioned, the thread t being shown held as described, while arbor D (fragment of which is indicated in the drawing by dotted lines) is moving in the rotary and oscillatory directions respectively indicated by the arrows. Means are also provided for raising the inclined plate E to a horizontal position to facilitate the presentation and application of the fabrics to the arbor D. A lug l^3 , (shown in section in Fig. 9 and by dotted lines in Fig. 4,) downwardly projecting from one side of inclined plate E, is movably secured by pivot l^4 to a lever T, provided with a rearward extension t' and a convenient finger-piece t^2 . On raising lever T projection t' presses against the top of base A and as the lever is rotated upward causes the inclined plate E to rise to horizontal position.

Many articles of fabrics adapted to be stitched by the use of my attachment are tubular—as, for instance, particularly, trousers-legs, the lower edges of which are required to be inwardly folded and seamed on the inside of the leg by so-called “blindstitching,” so that the stitches shall not appear on the outside. In Fig. 10 is illustrated the lower part of a trousers-leg J, the remainder of the trousers being broken away and the lower part of the fabric J' being, as shown, folded over to constitute the bottom plait or hem. Means are provided for facilitating the presentation and application of such articles to the arbor D and their automatic maintenance under requisite tension during stitching. The rear of base A is provided with upwardly-projecting flanges a^5 a^6 a^7 a^8 . Fitting between said flanges and resting upon the said rearward extension of base A and secured rigidly thereto by screw l is a rearwardly-extending supplementary plate or base L, provided with a slot l' . To the rear of supplementary plate L is movably secured a movable base V by means of headed screw v passing loosely through slot l' and through base V and co-operating with thumb-nut v' to clamp the parts together, thus providing for the adjustment and securing of base V at such point on plate L as may be required. Base V is provided on each side with downwardly-pro-

jecting flanges $v^2 v^3$, bearing against the sides of plate L, and by which base V is guided in its movements relatively to plate L and rotary movement around screw v is prevented.

5 The movable base V is provided with two upwardly-projecting lugs $v^4 v^5$. Within suitable journals in these lugs $v^4 v^5$ is rotatively secured an axle v^6 , to which axle is rigidly secured an upwardly-extending arm v^7 . To

10 upper end of arm v^7 is rigidly secured a sleeve v^8 . Supported and rotating within said sleeve and projecting from each end thereof is an axle-rod v^9 , upon one projecting end of which rotates a mandrel v^{10} , sleeved thereon, and

15 on the other end a handle v^{11} . A spring v^{12} , helixed around axle v^6 and pressing at one of its extremities against upwardly-extending arm v^7 and at the other against base V, as shown in Fig. 1 partly in dotted lines, operates constantly to press backward away

20 from the attachment the arm v^7 and mandrel v^{10} , connected therewith, as aforesaid. A backwardly-extending projection or lug v^{13} , rigidly secured to arm v^7 , limits the backward

5 movement of the latter under stress of spring v^{12} by bearing against base V when arm v^7 is forced backward sufficiently for that to occur. A rod v^{14} is secured at one of its extremities to the axle-rod v^9 and at the other

10 end is adjustably connected with a rod v^{15} , which latter rod is pivotally secured at v^{16} to an upwardly-projecting arm of the lever T. The adjustable connection between the rods v^{14} and v^{15} is effected by headed screws v^{17}

5 and v^{18} in the former, the shanks of which screws pass through an extended slot v^{19} in the latter and which when screwed tightly in place clamp the rods v^{14} and v^{15} together and when loosened permit them to be moved

10 relatively to each other and their combined length extended or shortened, as will be readily understood.

The operation of the devices described is as follows: The attachment having been secured in the required position to the bed-plate of the machine, as before described, the fabrics to be stitched (taking for illustration the lower part of a trousers-leg to be seamed, as before described) are first folded, as required—for instance, as at J' in Fig. 10. The inclined plate E is brought into horizontal position, as before described, thus lifting arbor D conveniently for the application thereto of the goods. The operator next inserts the arbor D into the end of the trousers-leg and so that the fabric is bent over the arbor, as shown in Fig. 10. The operator next presses forward the mandrel v^{10} against stress of spring v^{12} toward the needle until the mandrel is brought into a position such as to enable it to be inserted conveniently into the opposite side of the end of the trousers-leg, as shown in Figs. 1 and 10. On the operator's releasing the mandrel v^{10} the stress of spring v^{12} will force the mandrel backward toward normal position as far as the fabric will permit, as shown, for instance, in Fig. 1,

and the goods are thus subjected to and automatically held at the required tension for stitching. The sewing-machine is then set in motion, the needle descending passing through the fabric by splitting it without passing completely through to the opposite side thereof. The thread as the needle rises forms temporarily a loop below the perforation of the fabric, through which another thread is passed, as by a shuttle or in any convenient manner. As the needle rises the set-screw or other projection of the needle-bar engages with the lever N, and thereby causes, as before described, the arbor D not only to rotate one-sixth of a revolution, but also and simultaneously to oscillate in one direction, the spurs $d d$ engaging with the fabric, and the fabric is thus fed forward around the arbor, the rotation of mandrel v^{10} enabling the fabric to accommodate itself readily to its new position, and the fabric is also simultaneously carried sidewise or transversely relatively to the feed by the oscillation of the arbor D. When the needle next descends, it punctures the fabrics, as before, but in a new place in advance of the previous stitch and located diagonally thereto when viewed in relation to the general direction of the seam or feed. The continued operation of the machine repeats the results described indefinitely or until the same is finished, a zigzag line of stitches being produced, as shown in Fig. 10, the needle-thread being represented by $t t$ and the under thread by b .

After the seam is finished the goods are removed from the attachment, as follows: The operator first pushes forward toward the needle the mandrel v^{10} . He then pulls the mandrel backward, which latter being connected, as aforesaid, with the lever T raises the plate E to horizontal position and elevates the arbor D, so that the goods may be readily removed therefrom.

The fabrics while being stitched may be automatically supported and tensioned, as described, or the requisite support and tension may be afforded by hand or in any other convenient manner, and the devices described may be secured directly and permanently to a sewing-machine instead of being organized as a separate attachment, all without departing from my invention.

Instead of spurs $d d d$ other projections from the arbor D may be employed to engage and hold the fabrics in the required relation thereto, and the requisite oscillation of the fabrics and arbor D relatively to the needle may be secured by other means than those specifically pointed out, or the feeding may be accomplished by means other than the engagement of the spurs on the arbor with the fabrics.

What I claim as new, and desire to secure by Letters Patent, is the following, viz:

1. An attachment for a sewing-machine comprising a rotating and oscillating arbor, to bend, feed and oscillate the fabrics relatively

to the needle, means to support said arbor in required relation to the needle, and means to rotate and move said arbor longitudinally.

2. An attachment for a sewing-machine comprising a rotating and oscillating arbor having radially-disposed projections to engage, bend, feed and oscillate the fabrics relatively to the needle, means to support said arbor in required relation to the needle, and means to rotate and move said arbor longitudinally.

3. In a sewing-machine the combination of a stitching mechanism including a reciprocating needle-bar, a rotating and oscillating arbor to bend, feed and oscillate the fabrics relatively to the needle, means to support said arbor in required relation to the needle and mechanism operatively connecting said arbor with said needle-bar.

4. An attachment for a sewing-machine comprising a rotating and oscillating arbor to bend, feed and oscillate the fabrics, means to support said arbor in relation to the needle and to withdraw said arbor from the needle, and mechanism to operatively connect said arbor with the needle-bar of the machine.

5. An attachment for a sewing-machine comprising a rotating and oscillating arbor to bend, feed and oscillate the fabrics relatively to the needle, a movable inclined plate, means carried by said plate to support said arbor in required relation to the needle, and mechanism to operatively connect said arbor with the needle-bar of the machine.

6. An attachment for a sewing-machine comprising a rotating and oscillating arbor to bend, feed and oscillate the fabrics relatively to the needle, a movable inclined plate, oscillating arms carried by said plate and supporting said arbor, and mechanism to operatively connect said arms and said arbor with the needle-bar of the machine.

7. An attachment for a sewing-machine comprising a rotating and oscillating arbor to bend, feed and oscillate the fabrics relatively to the needle, means to support said arbor in required relation to the needle, a gear upon said arbor, a shaft rotatably supported in proximity to said arbor, a gear upon said shaft intermeshing with the gear upon said arbor, a cam carried by said shaft, an arm oscillated by said cam and operatively connected with said means supporting said arbor, and mechanism to operatively connect said shaft with the needle-bar of the machine to rotate said shaft.

8. An attachment for a sewing-machine comprising a rotating and oscillating arbor to bend, feed and oscillate the fabrics relatively to the needle, means to support said arbor in required relation to the needle, a gear upon said arbor, a shaft rotatably supported in proximity to said arbor, a gear upon said shaft intermeshing with the gear upon said arbor, a cam carried by said shaft, an arm oscillated by said cam and operatively connected with

said means supporting said arbor, a trundle-wheel upon said shaft, a pawl intermittently actuating said trundle-wheel and mechanism to operatively connect said pawl with the needle-bar of the machine to rotate said shaft.

9. An attachment for a sewing-machine comprising a rotating and oscillating arbor to bend, feed and oscillate the fabrics relatively to the needle, means to support said arbor in required relation to the needle, a gear upon said arbor, a shaft rotatably supported in proximity to said arbor, a gear upon said shaft intermeshing with the gear upon said arbor, a cam carried by said shaft, an arm oscillated by said cam and operatively connected with said means supporting said arbor, a trundle-wheel upon said shaft, a pawl intermittently actuating said trundle-wheel, a rock-shaft provided with an arm carrying said pawl and mechanism to operatively connect said rock-shaft with the needle-bar of the machine.

10. An attachment for a sewing-machine, comprising a rotating and oscillating arbor to bend, feed and oscillate the fabrics relatively to the needle, means to support said arbor in required relation to the needle, a gear upon said arbor, a shaft rotatably supported in proximity to said arbor, a gear upon said shaft intermeshing with the gear upon said arbor, a cam carried by said shaft, an arm oscillated by said cam and operatively connected with said means supporting said arbor, a trundle-wheel upon said shaft, a pawl intermittently actuating said trundle-wheel, a rock-shaft provided with an arm carrying said pawl, another arm upon said rock-shaft, and mechanism to operatively connect said last-mentioned arm with the needle-bar of the machine.

11. An attachment for a sewing-machine comprising a rotating and oscillating arbor to bend, feed and oscillate the fabrics relatively to the needle, means to support said arbor in required relation to the needle, a gear upon said arbor, a shaft rotatably supported in proximity to said arbor, a gear upon said shaft intermeshing with the gear upon said arbor, a cam carried by said shaft, an arm oscillated by said cam and operatively connected with said means supporting said arbor, a trundle-wheel upon said shaft, a pawl intermittently actuating said trundle-wheel, a rock-shaft provided with an arm carrying said pawl, another arm upon said rock-shaft, a post, a lever movably pivoted to said post and engaging at one end with the needle-bar of the machine and at the other with said last-mentioned arm.

12. An attachment for a sewing-machine comprising an arbor provided with a plurality of conical radially-disposed spurs each having its central axis coincident with a radius of a vertical cross-section of the arbor to hold the fabrics and impart thereto the movements of the arbor, means to support said arbor in required relation to the needle, and means to

operatively connect said arbor with the needle-bar of the machine to cause said arbor to rotate and move longitudinally.

13. An attachment for a sewing-machine comprising an arbor provided with circumferential recesses for the accommodation of the needle, means to support said arbor in required relation to the needle, and means to operatively connect said arbor with the needle-bar of the machine to cause said arbor to rotate and move longitudinally.

14. An attachment for a sewing-machine comprising an arbor provided with a plurality of conical radially-disposed spurs each having its central axis coincident with a radius of a vertical cross-section of the arbor to hold the fabrics and impart thereto the movements of the arbor, and with circumferential recesses for the accommodation of the needle, means to support said arbor in required relation to the needle, and means to operatively connect said arbor with the needle-bar of the machine to cause said arbor to rotate and move longitudinally.

15. An attachment for a sewing-machine comprising a rotating and oscillating arbor to bend, feed and oscillate the fabrics relatively to the needle, means to support said arbor in required relation to the needle, mechanism to operatively connect said arbor with the needle-bar of the machine to cause said arbor to rotate and move longitudinally, a rotatory mandrel to automatically support and tension the fabrics relatively to said arbor, and means to support said mandrel and force it constantly away from said arbor.

16. An attachment for a sewing-machine comprising a rotating and oscillating arbor to bend, feed and oscillate the fabrics relatively to the needle, means to support said arbor in required relation to the needle, mechanism to operatively connect said arbor with the needle-bar of the machine to cause said arbor to rotate and move longitudinally, a rotatory mandrel to automatically support and tension the fabrics relatively to said arbor, an arm at one of its ends rotatively supporting said mandrel and at its opposite end pivotally secured to a post stationarily fixed relatively to said arbor, and a spring actuating against said arm to rotate it upon its said pivotal connection away from said arbor.

17. An attachment for a sewing-machine comprising a rotating and oscillating arbor to bend, feed and oscillate the fabrics relatively

to the needle, means to operatively connect said arbor with the needle-bar of the machine, a stationary part vertically disposed, and a vibrating arm pivoted to said stationary part, and provided with an eye disposed to receive the needle and control the thread.

18. An attachment for a sewing-machine comprising a rotating and oscillating arbor to bend, feed and oscillate the fabrics relatively to the needle and mechanism to operatively connect said arbor with the needle-bar of the machine, said mechanism comprising a pair of oscillating arms supporting said arbor and pivotally secured, a bell-crank lever pivotally supported and having one of its arms pivoted to one of said first-mentioned oscillating arms, a fixed collar, a rod secured to the other arm of said bell-crank lever and passing through said collar, a threaded portion beyond said collar and a knurl-nut coacting with said threaded portion of said rod.

19. An attachment for a sewing-machine comprising an arbor provided with a plurality of conical radially-disposed spurs each having its central axis coincident with a radius of a vertical cross-section of the arbor and the sides of its cone, to hold the fabrics and impart thereto the movements of the arbor, means to support said arbor in required relation to the needle, and means operatively connecting said arbor with the needle-bar of the machine to cause said arbor to rotate and move longitudinally.

20. An attachment for a sewing-machine comprising a rotating arbor having radially-extending projections to bend, engage and feed the fabrics relatively to the needle of said machine, means to support and rotate said arbor in required relation to said needle and means to move the arbor longitudinally.

21. An attachment for a sewing-machine comprising an arbor to bend and support the fabrics under tension relatively to the needle, mechanism to feed said fabrics relatively to said arbor and needle, and means, operatively connecting said arbor with the needle-bar of the machine, to move the arbor longitudinally alternately in opposite directions transversely of the direction of feed between each descent of the needle.

EDWIN DONALDSON.

Witnesses:

PHILIP C. PECK,
WILLIAM STAHL.