

(No Model.)

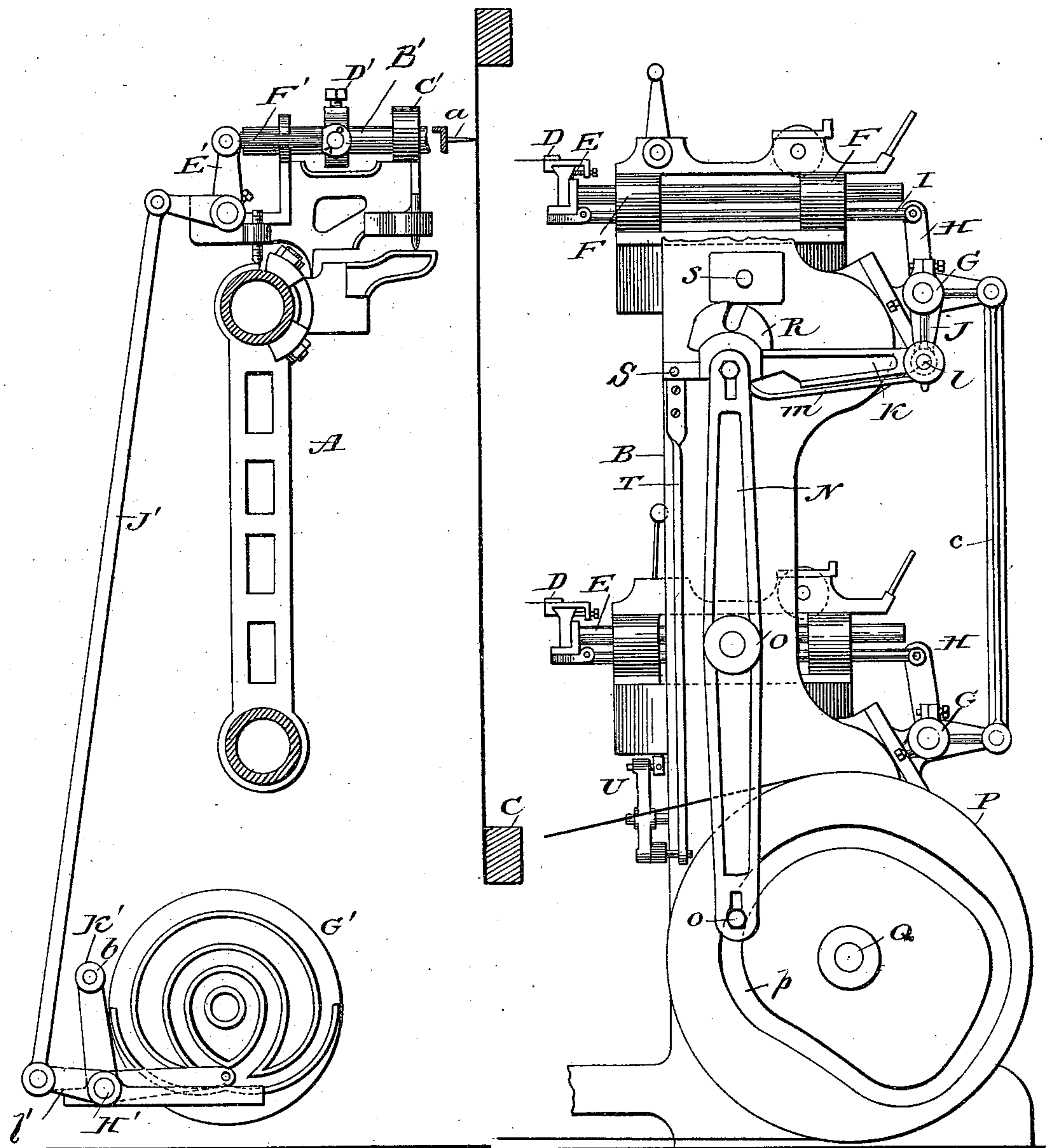
3 Sheets—Sheet 1.

J. A. GROEBLI.
EMBROIDERING MACHINE.

No. 556,145.

Patented Mar. 10, 1896.

Fig. 1.



Witnesses.

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(No Model.)

3 Sheets—Sheet 2.

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Fig. 2.

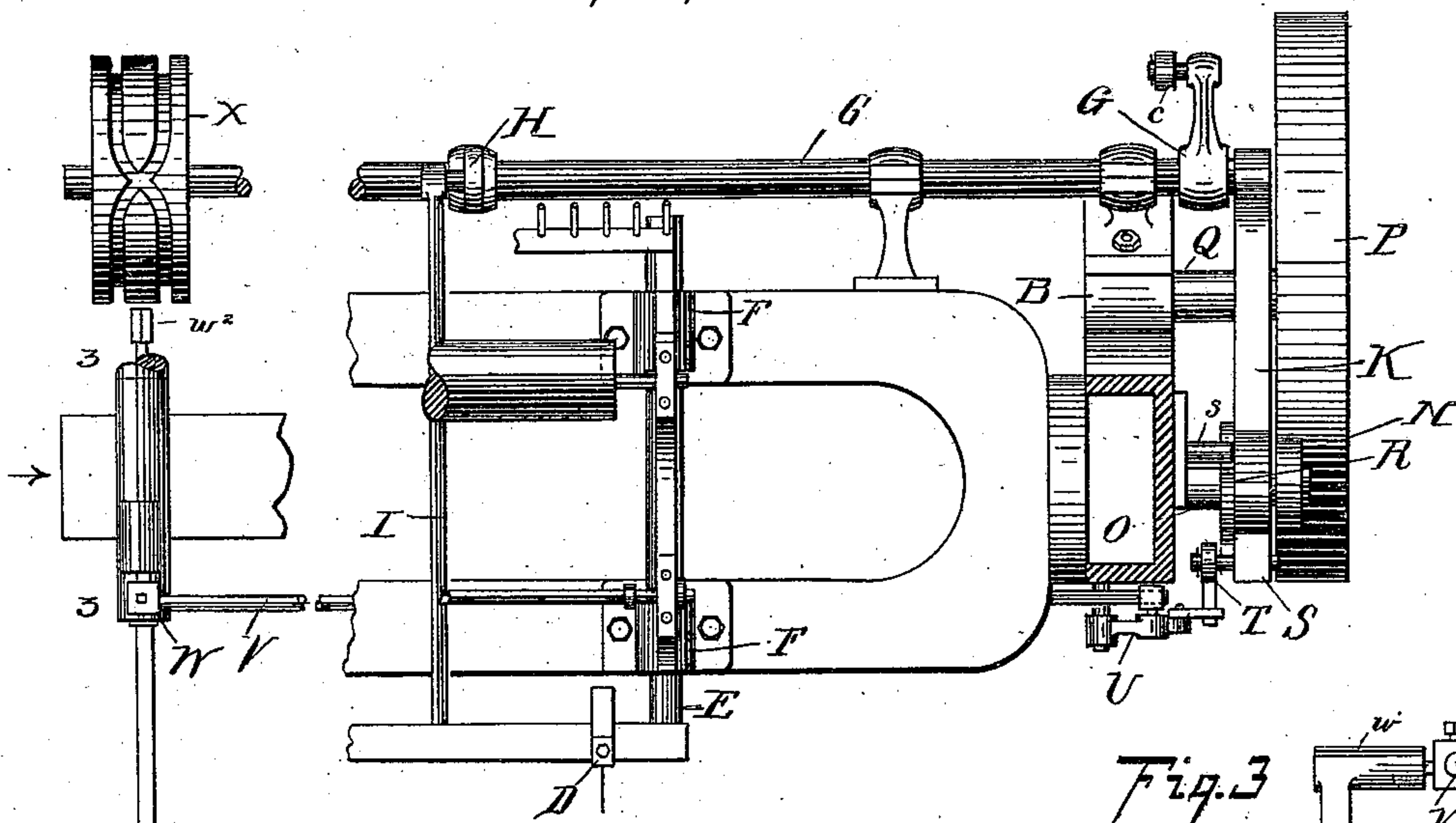


Fig. 3.

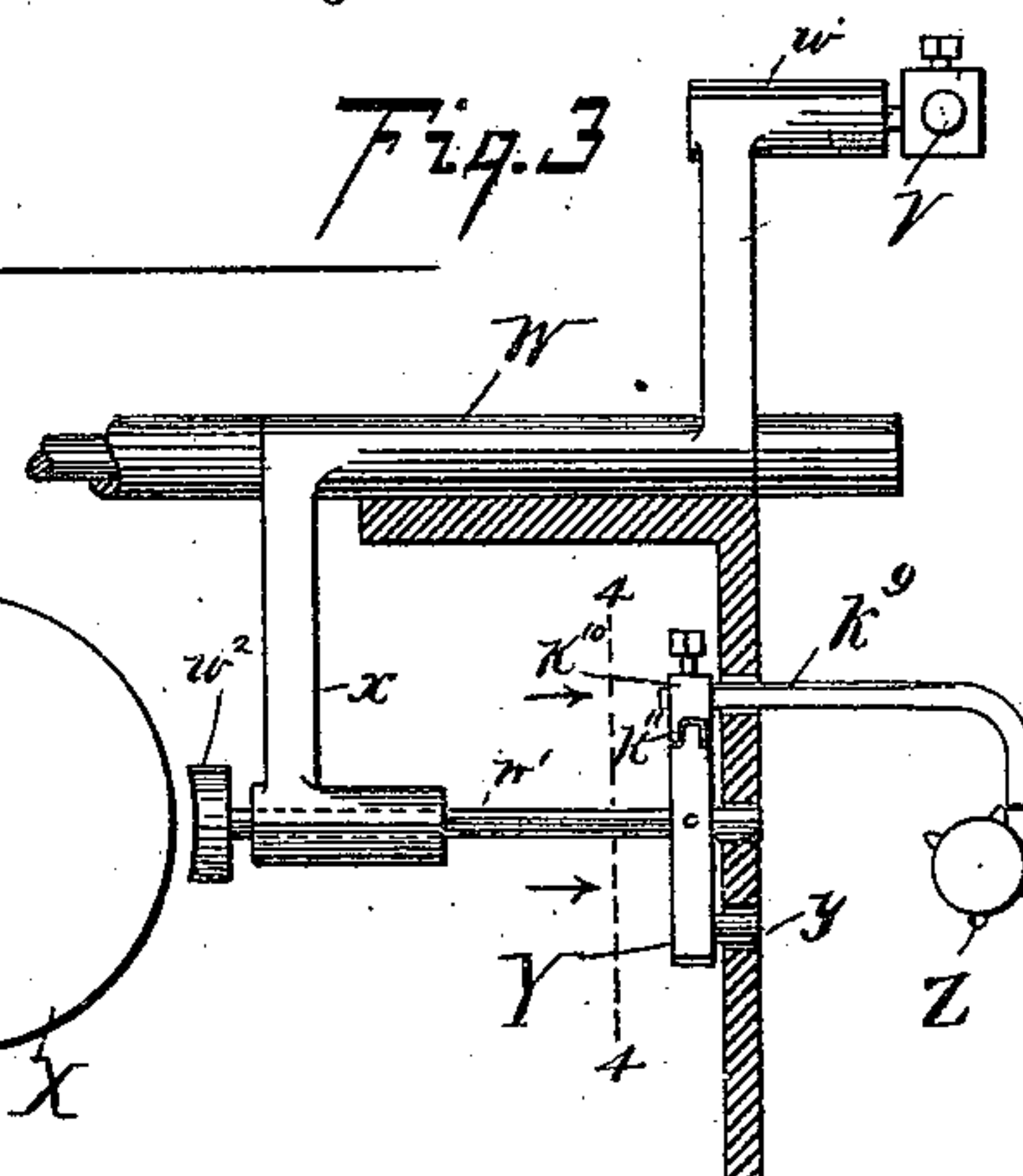
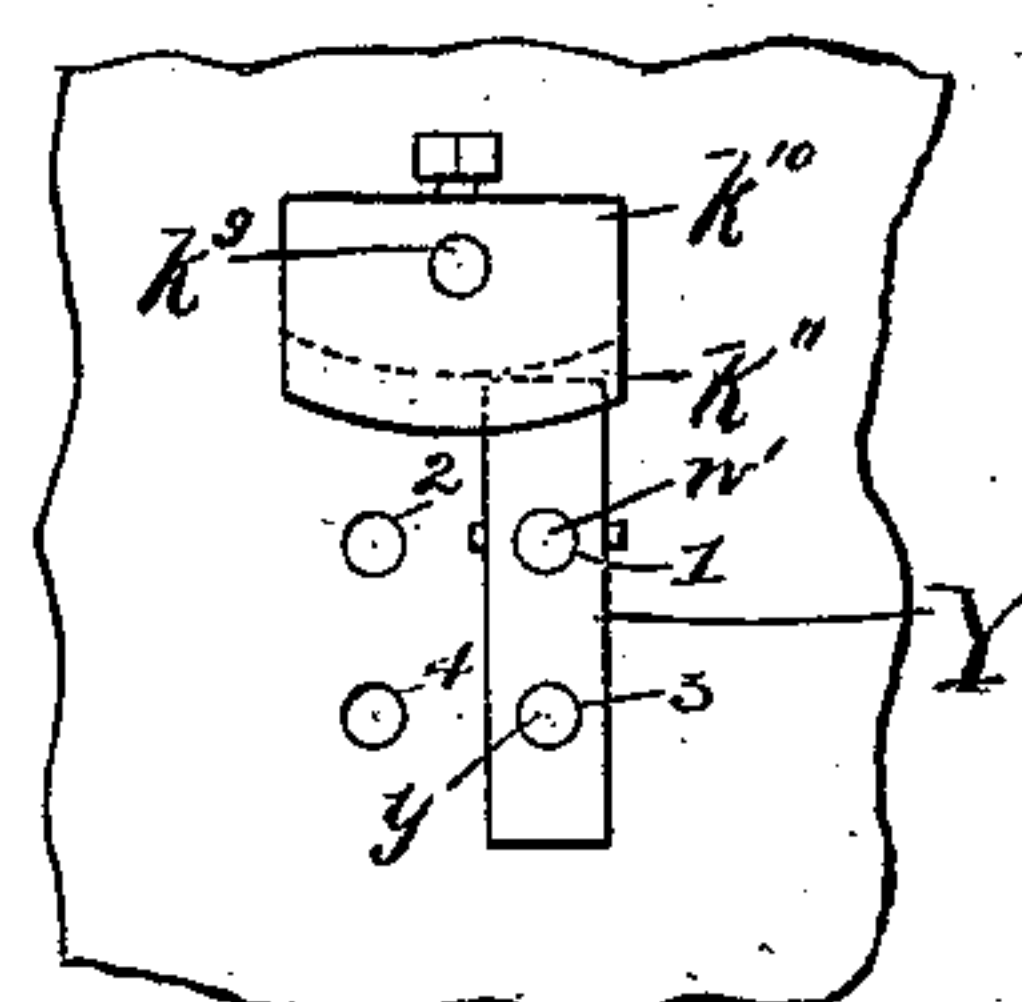


Fig. 4.



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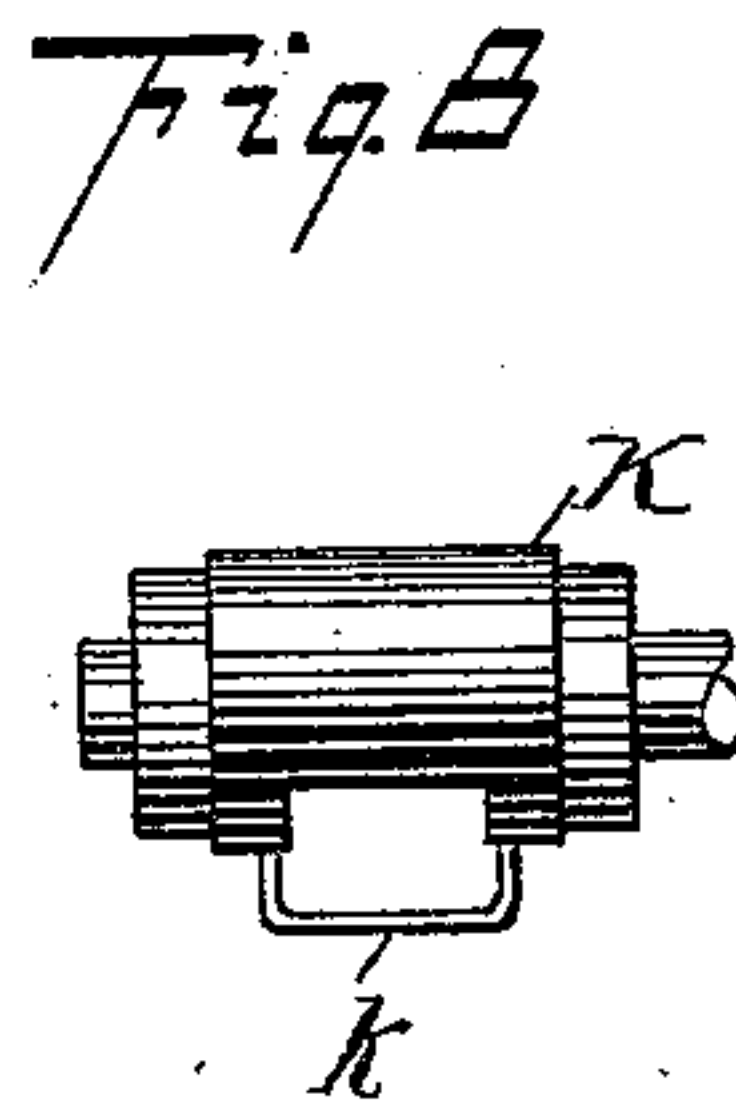
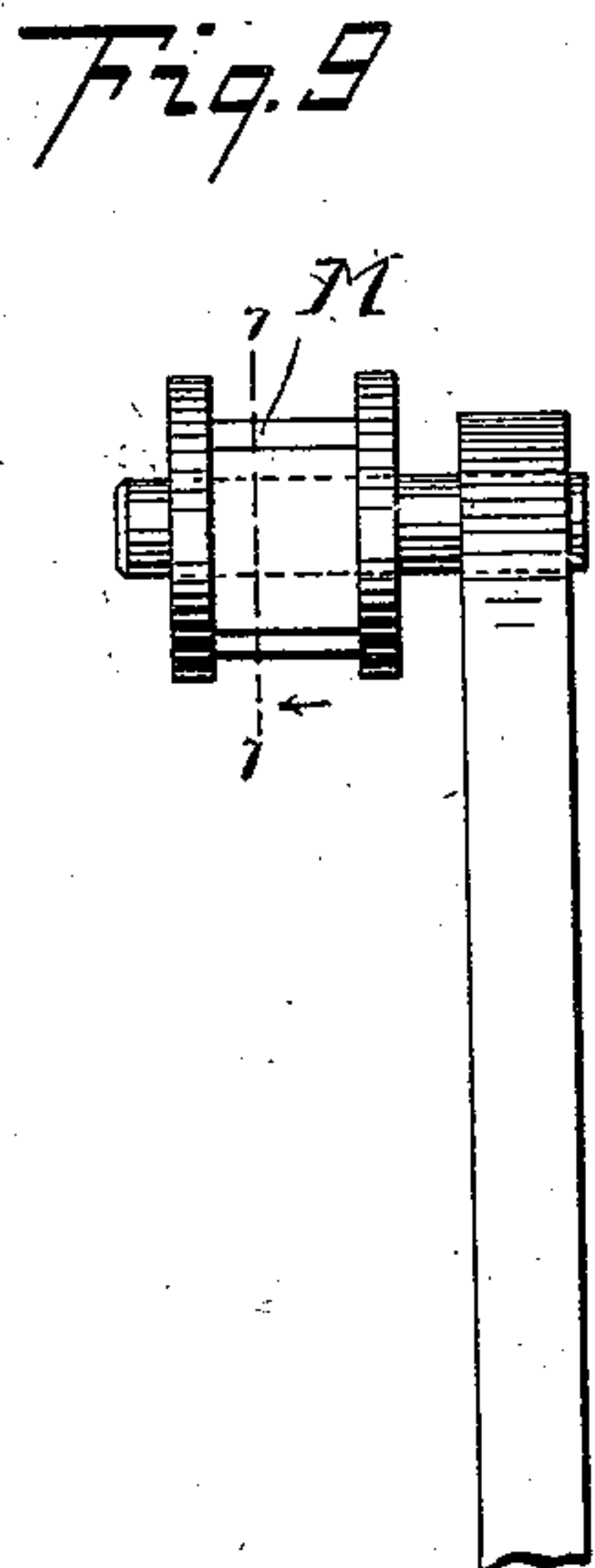
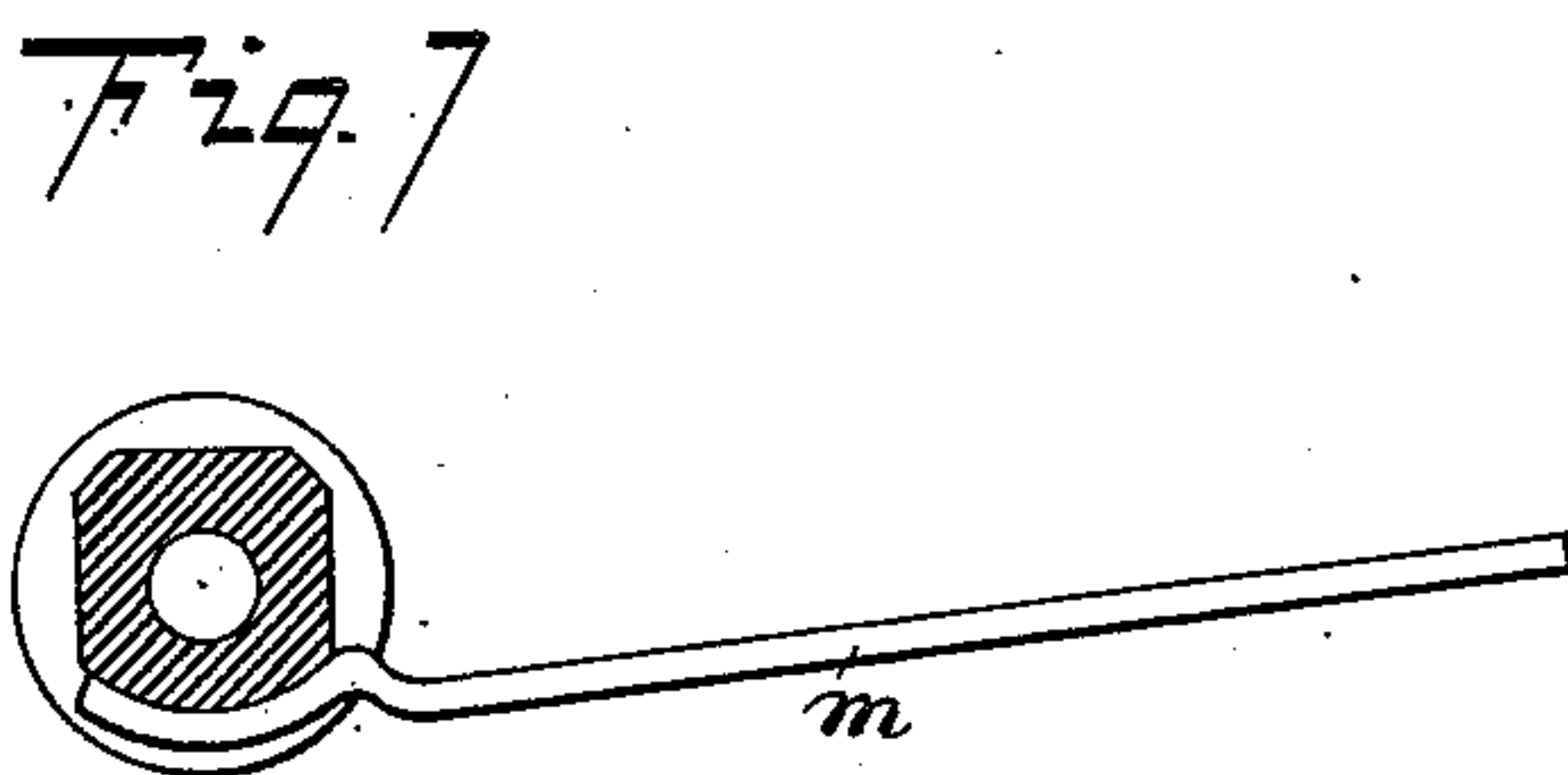
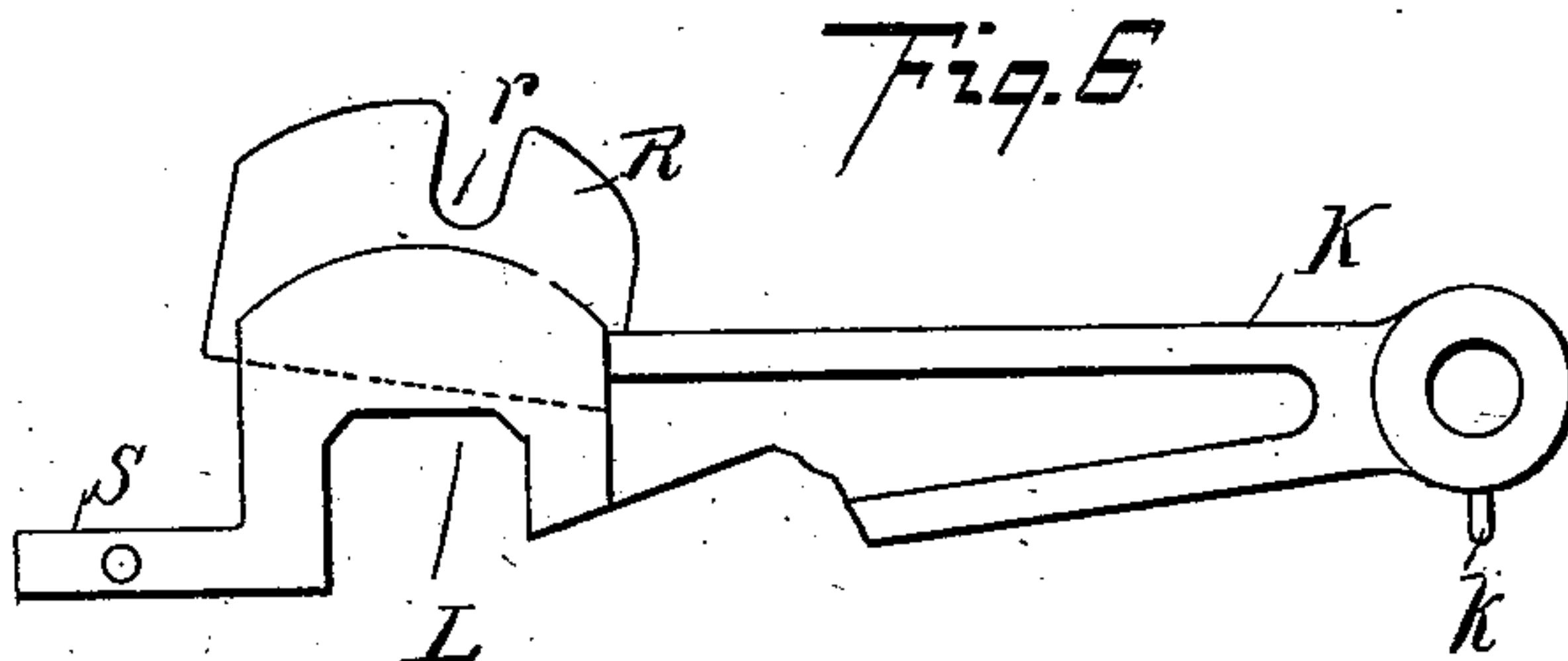
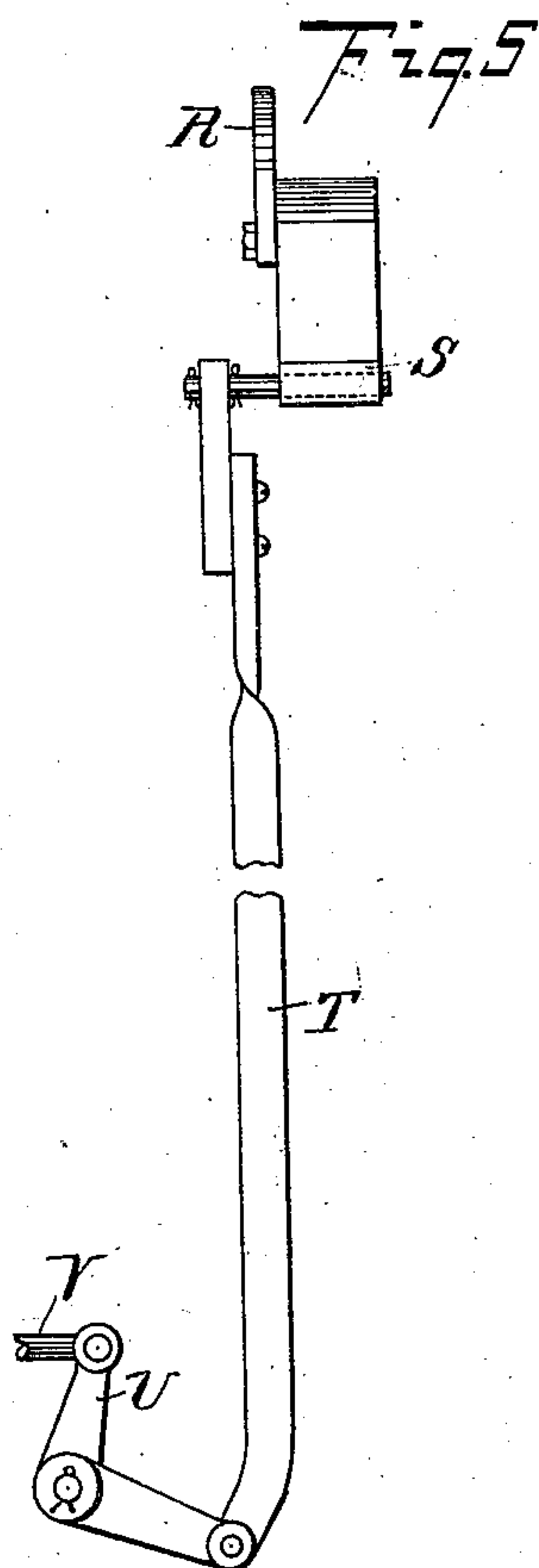
(No Model.)

3 Sheets—Sheet 3.

J. A. GROEBLI.
EMBROIDERING MACHINE.

No. 556,145.

Patented Mar. 10, 1896.



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UNITED STATES PATENT OFFICE.

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EMBROIDERING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 556,145, dated March 10, 1896.

Application filed April 17, 1895. Serial No. 545,989. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH ARNOLD GROEBLI, a resident of the city, county, and State of New York, have invented certain new and
5 useful Improvements in Embroidering-Machines, of which the following is a specification.

My invention relates to embroidering-machines, and has for its object to improve the
10 construction of such machines, having especial reference to mechanism for connecting and disconnecting the embroidering mechanism from its operating mechanism.

My invention has also special reference to
15 combining a boring mechanism with the sewing mechanism in such manner that fabrics, in the course of being embroidered, may be bored or perforated to form open-work embroidery or lace.

To this end my invention consists in mechanism for effecting the disconnection of the
20 embroidering mechanism from its operating mechanism and piercing or boring mechanism operating upon the fabric in conjunction therewith and controlled and operated with the aid of a pattern.

My invention further consists in the special matters hereinafter pointed out and claimed.

My invention will be understood by reference to the accompanying drawings, forming
30 part hereof, in which—

Figure 1 is a fragmentary end elevation of an embroidering-machine embodying my invention. Fig. 2 is a broken-away plan view
35 thereof, some of the parts being displaced for the purpose of clearer illustration. Fig. 3 is a fragmentary detail elevation, partly in section, of a part of the mechanism for engaging the needle-bar with its operating mechanism
40 and disengaging the needle-bar from its operating mechanism. Fig. 4 is a detail view of a moving piece, which is actuated from the pattern. Fig. 5 is a detail view of the mechanism directly connected to the needle-bar.
45 Fig. 6 is a detached detail view of a rocking arm which connects the needle-bar with its reciprocating mechanism. Fig. 7 is a detail view of a guide hereinafter referred to. Fig. 8 is an end view of the arm shown in Fig. 6

when looked at from the right of the said figure, and Fig. 9 is a detail view of the part hereinafter referred to.

In the drawings, A B are portions of the frame of an embroidering-machine. C is the tambour-frame thereof, upon which is
55 stretched the usual fabric which is to be operated upon. This tambour-frame may be moved in any suitable manner to position the fabric for the operation of the needles, the preferred mode of moving the fabric-frame
60 being with the aid of jacquard-controlled moving mechanism, such as set forth in my Letters Patent, No. 528,632, dated November 6, 1894.

D is the needle-bar, which may be mounted
65 upon a suitable reciprocating slide E moving in guides F.

G is a rock-shaft running longitudinally of the machine and having thereon an arm H, which is connected to the needle-bar by
70 means of a link I, which link serves to transmit the motion of the rock-shaft to the needle-bar. This motion of the rock-shaft, as is well known, will be a swinging or oscillating movement, which movement will be trans-
75 mitted into a reciprocating movement of the needle-bar. The rock-shaft G is also provided with another arm J, with which is connected a moving arm K, (see Fig. 6,) which is recessed at L for the reception of a squared
80 pin M hung loosely in one end of a swinging lever N pivoted at O, and whose lower end is provided with a pin o, which enters a cam-groove p in a cam-wheel P. The cam-wheel P is mounted upon a suitable rotating shaft
85 Q, preferably the main shaft of the machine.

From the foregoing it will be obvious that as the shaft Q rotates the cam P will swing the lever N upon its pivot O, which, when the arm K is connected with the pin M, will cause
90 the said arm to have a reciprocating movement, which reciprocating movement will be converted into a rocking movement of the rock-shaft G and transmit it to the needle-bar D, which will receive an oscillating motion.
95 Mounted upon the arm K is a jaw R provided with a slot r, which slot is adapted to be engaged with a holding or locking pin s to hold

and prevent the shaft G from being accidentally moved while the arm K is elevated and the jaw R and pin s have been engaged.

S is an extension of the arm K, with which
5 is connected a link T connected by a bell-crank lever U and a link V with one arm w of a rocking lever W, whose remaining arm x is provided with a sliding bolt w' , upon which is carried a cam-piece w^2 , which engages with
10 a cam-wheel X, which when the cam-piece w^2 is engaged therewith serves to rock the arm W. This cam-piece w^2 is controlled by a Jacquard or other pattern and entered into and withdrawn from the cam-wheel X with
15 the aid of the jacquard, so that the engagement or disengagement of the needle-bar with its operating mechanism may be effected with the aid of a jacquard—that is to say, when the cam-piece w^2 is engaged with the cam-
20 wheel the cam-wheel acting thereon will cause the rocking lever W to swing, thus pulling upon the rod V, rocking the bell-crank lever U, lifting the link T and the arm K to engage the jaw R with the holding or locking pin s.
25 This raising of the arm K, as before explained, will disengage the said arm K from the swinging lever N, and the lever N will now rock freely without reciprocating the arm K, with which it is no longer connected, so that the
30 reciprocations of the needle-bar may be stopped for any desired period of time.

Y is a moving piece carried upon the bolt w' provided with a locking-pin y and connected with the Jacquard mechanism by a
35 Jacquard rod or connector k^9 . The connection may be variously made; but I prefer to use a connector consisting of a block k^{10} , secured rigidly to the rod k^9 and provided with a slot k^{11} , in which is guided the tail of the
40 moving piece Y. (See Figs. 3 and 4.) It will be obvious that some means must be resorted to to prevent the accidental displacement of the cam-piece w^2 when the said cam-piece is not entered into the cam X. To this end I
45 provide upon the frame of the machine four holes 1 2 3 4 (see Figs. 3 and 4) to effect the locking of the moving piece Y when the cam-piece w^2 is not entered into the cam. It will be obvious that some means must also be pro-
50 vided to prevent the square pin M from turning when the said pin is disengaged from the arm K. This I effect by providing upon the pin a guide m , which guide passes through a stirrup k upon the arm K, when it will be
55 obvious that when the arm K is lifted free from the lever N the guide m sliding in the stirrup k will keep the pin M always properly positioned to be entered into the recess of the arm K.

60 Having now fully and in detail described the parts and interactions of the parts of the needle-bar-disconnecting mechanism, I will now proceed to describe the general operation thereof. We will suppose the parts to
65 be in the position shown in the figures and that it is desired for some reason to disconnect the sewing mechanism so that the nee-

dles will no longer enter the fabric. The necessity for this may arise from a variety of causes, chief among which are the necessity
70 for shifting the tambour-frame a considerable distance, which would occupy a space of time greater than the interval between successive strokes of the needle-bar, or it may be, as in the present case, that boring mechanisms are provided in order to complete the
75 operation of embroidering by boring out parts of the fabric. In this latter case it will be necessary to stop the motions of the needle-bar, so that the fabric may be shifted for the
80 purpose of being bored without being stitched, for the reason that the fabric-frame or tambour-frame requires a distinctly different set of movements when the boring is being done than when the stitching is being done.
85

Supposing, now, as aforesaid, that it is desired to disconnect the needle-bar from its reciprocating mechanism, the connector k^9 is actuated by the pattern Z and moved to the left, (see Fig. 3,) when the bolt w' and
90 locking-pin y will be withdrawn from the holes 1 and 3, respectively, and the cam-piece w^2 will be entered into the cam. As the cam revolves, the arm W will be swung and the rod V pulled upon, which motion will be
95 transmitted to the bell-crank lever U, which will raise the link T and swing the arm K upon its pivot l , disengaging the said arm from the rocking lever N and engaging the jaw R with the locking-pin s. As before
100 explained, the rocking lever N now rocks freely and does not reciprocate the needle-bar D, since the said needle-bar is no longer connected with the rocking lever. When these motions have been effected, the mov-
105 ing piece Y has been swung to the left by the movement of the arm W into such position that the bolt w' and locking-pin y may be entered into the holes 2 and 4, respectively, in the frame. This entrance is effected upon
110 the next stroke of the jacquard, and the moving piece will be thereby locked in its new position and the cam-piece w^2 will be disengaged from the cam. The needle-bar being
115 now disconnected may be allowed to remain so for any specified or desired time, the re-engagement of the needle-bar with its reciprocating mechanism being effected with the aid of the jacquard by re-engaging the cam-
120 piece w^2 with the cam X, when the arm x will be swung in the direction opposite to its previous swing and the parts will be restored to their initial positions, when the needle-bar will proceed with its work. It will be quite
125 obvious that the needle-bar may be thus connected or disconnected during any desired predetermined periods of time.

I will now proceed to describe the boring mechanism which co-operates with the needle-bar-disconnecting mechanism and may be
130 controlled by the jacquard, if desired. This mechanism may be variously constructed, but in the present instance is shown as consisting of a boring-bar A', upon which is mounted a

borer or borers *a*. This boring-bar *A'* is carried by suitable reciprocating slides *B'* which work in guides *C'* upon the frame *A* of the machine. Mounted upon one or more of the reciprocating slides *B'* is a collar *D'* which is connected with a swinging bell-crank lever *E'* by a link *F'*.

G' is a cam-wheel which serves to reciprocate the borers and with which the reciprocating mechanism for the borers is connected or disconnected by a Jacquard mechanism. Mounted adjacent to the cam *G'* is a rock-shaft *H'* upon which is carried an arm *I'* which is connected with the swinging bell-crank lever *E'* by a link *J'*. Carried also by the rock-shaft *H'* is an arm *K'* provided with a roller *b* which may be engaged with a cam 5 on the back of the cam-wheel. This engagement is preferably effected by means of an arm *M'* mounted upon the rock-shaft *H'* and provided with a bifurcated end *N'*, in which works a sliding bolt *O'* which carries a crescent *P'* and a block *Q'*. The inner end of the sliding bolt *O'* is adapted to be entered into a locking device *R'*.

S' is a connector which is moved by the pattern and slides freely in a slide *T'* and is provided with a jaw *U'* which takes over the block *Q'*. By this mechanism the engagement of the roller *b* with the cam 5 is effected. Thus the pattern actuates the rod *S'*, which, moving to the left, carries the bolt *O'* with it through the interaction of the jaw *U'* and block *Q'* and enters the crescent *P'* into the cam 6 of the cam-wheel *G'*. The cam-wheel *G'* is carried upon a rotating shaft 7, and as soon as the crescent has been entered into the cam 6 it is immediately engaged to swing the arm *M'* to thereby rock the rock-shaft *H'* and engage the roller *b* with its cam. As soon as the engagement of the roller with its cam is effected the pattern mechanism withdraws the crescent *P'* from its cam and engages the sliding bolt *O'* with its locking mechanism. As the shaft 7 continues to revolve the cam 5 will impart a rocking movement to the rock-shaft *H'*, which will cause a reciprocation of the link *J'*, a rocking or swinging of the bell-crank lever *E'* and a reciprocation of the slides *B'* and boring-bar, which will cause the boring-points to bore the fabric, the fabric being meantime moved by moving the tambour-frame, which movement, as aforesaid, may be effected, if desired, with the aid of the Jacquard mechanism. As soon as the boring has been effected the pattern mechanism again operates to withdraw the bolt *O'* from its locking mechanism, thus entering the crescent *P'* into its cam and causing the roller *b* to be thereby disengaged from its cam.

Having described the various operations, I will now set forth the general operation of the organized mechanism, supposing that it is desired to produce an open-work-embroidered fabric.

The fabric is stretched upon the tambour-frame *C* and thus suspended in position. The

machine is started up and the needle-bar set in motion, thus stitching the fabric, which fabric is shifted by the jacquard to position the stitches. When now it is desired to bore the fabric, the pattern causes the cam-piece *w*² to be entered into its cam, thus disengaging the needle-bar from its reciprocating mechanism and subsequently locking the cam-piece *w*² and arm *K* in their positions of rest. At the same time or subsequently the pattern shifts the crescent *P'* and enters the same into its cam 6, which, as before pointed out, will effect the reciprocation of the boring-bar and a boring of the fabric, the fabric being moved to have the perforations in the desired places. As soon as the fabric has been bored to the desired extent, the boring mechanism is stopped and the needle-bar reconnected to its reciprocating mechanism.

Now, while I have described my invention in positive terms and *in extenso*, I would have it understood that I do not mean to thereby limit myself to the construction and arrangement herein shown and described, as it will be obvious to any one skilled in the art that the details may be greatly varied without departing from the spirit of my invention. I would also have it understood that while I have herein made use of specific terms both in the specification and in the claims I would have it understood that by the use of such terms I do not mean to limit myself to the precise device ordinarily understood by such terms, but that I wish to be understood as meaning thereby any equivalent devices to which I may be entitled in view of the prior art, as it is obvious that this invention is generic in character, and the details of the machine may be changed by those who may desire to enjoy the fruits of my invention.

What I claim, and desire to secure by Letters Patent, is—

1. In an embroidering-machine, the combination of an embroidering mechanism and a pattern-controlled boring device, and mechanism for operating the same, with pattern mechanism for controlling the embroidering mechanism so as to keep the needles out of the fabric while the boring device operates, substantially as described.

2. In an embroidering-machine, the combination of an embroidering mechanism and a boring device and mechanism for operating the same and a pattern device for controlling the sewing and boring operations alternately, substantially as described.

3. An embroidering-machine combined with a boring mechanism, a pattern device and means for controlling the boring mechanism with the aid of the pattern device, substantially as described.

4. An embroidering-machine, combined with a boring mechanism, means for disconnecting the needles of the embroidering-machine from their operating mechanism, and a pattern device for controlling the boring mechanism, substantially as described.

5. An embroidering-machine, combined with a boring mechanism, means for disconnecting the needles of the embroidering-machine from their operating mechanism, and
 5 a pattern device for effecting the disconnection of the needles and the operation of the boring mechanism alternately, substantially as described.
6. The combination in an embroidering-
 10 machine, of a needle-carrier, an arm as K for operating the needle-carrier, a swinging lever as N with which the arm K is adapted to be connected, and a pattern device for effecting the connection and disconnection of
 15 the arm K and lever N, substantially as described.
7. In an embroidering-machine, the combination of a needle-carrier, an arm as K for operating the needle-carrier, a lever as N with
 20 which the arm K is adapted to be engaged, a cam X and mechanism intervening between the cam and the arm K, whereby the arm may be disconnected from the lever N, and a pattern device for engaging the cam and the
 25 mechanism intervening between the cam and arm K.
8. In an embroidering-machine, the combination of a needle-bar, an arm K connected thereto, a swinging lever N, means for connecting and disconnecting the arm K and
 30 swinging lever N, substantially as described.
9. In an embroidering-machine, the combination of a needle-bar, an arm K for operating the same, a swinging lever N, means for connecting and disconnecting the arm K
 35 and lever N, a jaw R carried upon the arm K, and a pin as s for engaging the jaw R when the arm K is disconnected, substantially as described.
10. In an embroidering-machine, the combination of a needle-carrier, an arm K for moving the needle-carrier, a swinging lever N provided with a squared collar M with
 40 which the arm K is adapted to be engaged and disengaged, and a guide as m attached to the collar, whereby the collar is positioned for engagement with the arm K.
11. In an embroidering-machine, the combination of a needle-carrier, an arm K for moving the same, a pivoted swinging lever N
 50 with one end of which the arm K is adapted to be engaged, a cam P engaging the free end of the lever N, and pattern mechanism for connecting and disconnecting the arm K and lever N, substantially as described.
12. The combination of a needle-carrier, mechanism for operating the same, a boring device, mechanism for operating the same, and pattern mechanism for controlling the
 55 operating mechanism for the needle-carrier and the operating mechanism for the boring device, substantially as described.

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Witnesses:

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