

No. 618,458.

Patented Jan. 31, 1899.

J. A. GROEBLI.  
EMBROIDERING MACHINE.

(Application filed Jan. 15, 1898.)

(No Model.)

2 Sheets—Sheet 1.

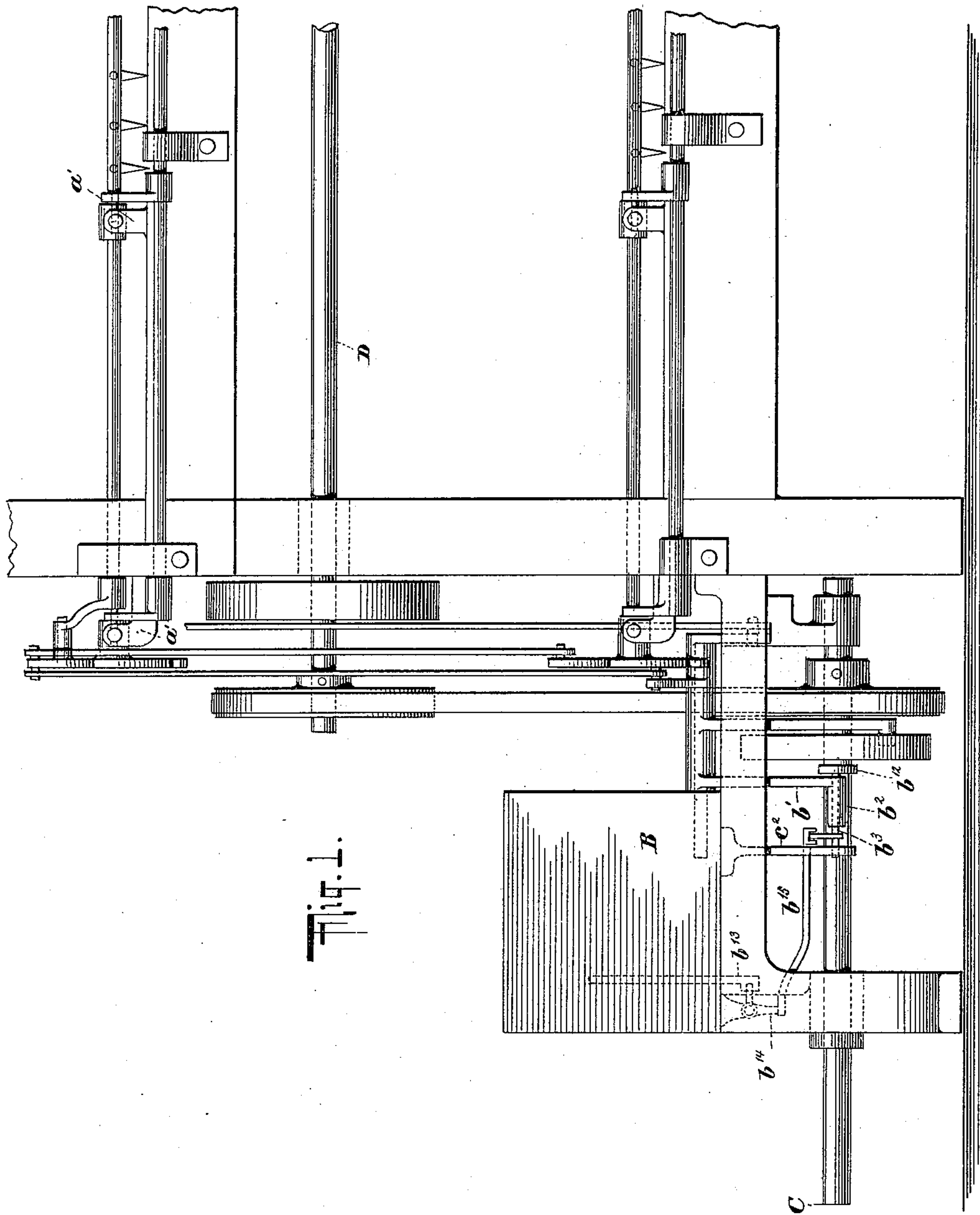


Fig. 1.

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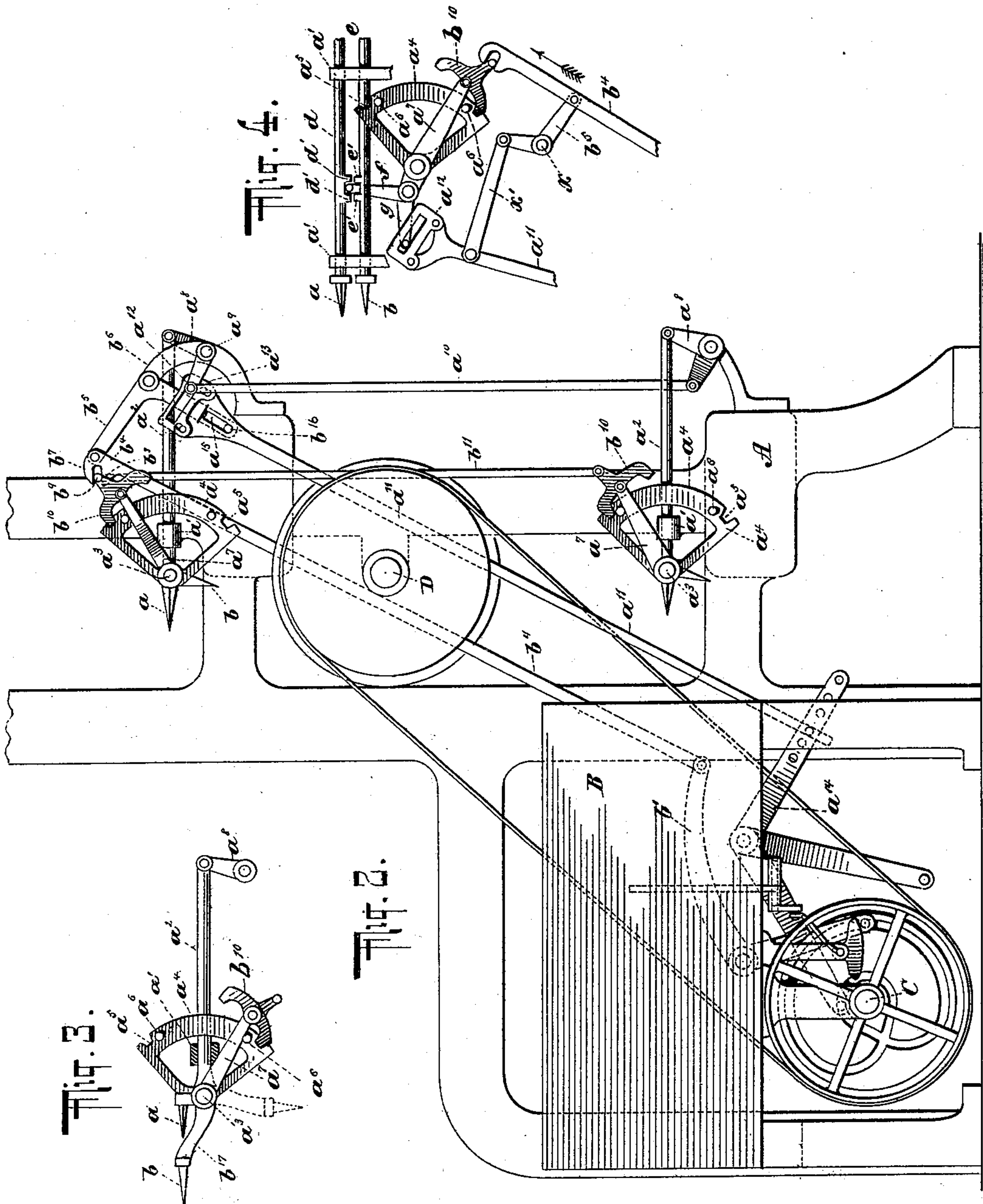
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# UNITED STATES PATENT OFFICE.

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## EMBROIDERING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 618,458, dated January 31, 1899.

Application filed January 15, 1898. Serial No. 666,768. (No model.)

*To all whom it may concern:*

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

My invention relates to embroidering-machines, and has for its object to produce a means for automatically controlling and regulating the action of boring apparatus from a pattern mechanism.

To this end my invention consists in the special matters hereinafter particularly claimed.

My invention will be understood by referring to the accompanying drawings, in which—

Figure 1 is a side elevation of the end of an embroidering-machine embodying my invention. Fig. 2 is an end elevation of the parts shown in Fig. 1. Figs. 3 and 4 are side elevations of modified forms of boring apparatus.

In embroidering fabrics it is frequently necessary during the operations to bore or pierce fabric, sometimes by actually cutting the threads of the fabric and at other times by simply forcing them aside. In the machine which I have illustrated I have provided two forms of boring or piercing apparatus, one (indicated by the letter *a*) being of a prismatic form and provided with cutting edges whereby the cutting edges will operate to cut the threads of the fabric. The other bore-point *b* is smooth or unprovided with cutting edges and is intended merely to enter between threads of the fabric and to force them apart. It will be understood, however, that there may be and generally are several bore-points *a* placed in a row, likewise several bore-points *b* similarly placed. With these bore-points are combined actuating mechanism and pattern mechanism for bringing one or the other into a position for operation.

Referring particularly to Figs. 1 and 2, A is the frame of the embroidering-machine. B is a suitable pattern mechanism, such as a Jacquard mechanism. C is the main shaft of the Jacquard mechanism, which is belted to the shaft D, which is the main driving-shaft of the embroidering-machine. This

shaft, as will be understood, drives the needles and other essential parts of the stitch-forming mechanism. With these functions I am not immediately concerned in this application.

The framework of the machine carries suitable bearings *a'*, in which slide rods *a*<sup>2</sup>. The rods *a*<sup>2</sup> carry shafts *a*<sup>3</sup>, which are rotatable, as will be explained, and in the present instance carry the bore-points. The rods *a*<sup>2</sup> likewise carry arcs *a*<sup>4</sup>, provided with notches *a*<sup>5</sup> and abutments *a*<sup>6</sup>. An arm *a*<sup>7</sup> is likewise secured to the shaft *a*<sup>3</sup>. The arc *a*<sup>4</sup> is stationary with respect to the shaft *a*<sup>3</sup>. Motion is communicated to the rods *a*<sup>2</sup> by bell-crank levers *a*<sup>8</sup>, carried on rock-shafts *a*<sup>9</sup> and joined by a link *a*<sup>10</sup>. Motion is communicated to the bell-crank levers by means of a link *a*<sup>11</sup>, which is provided at its extremity with a cam-piece *a*<sup>12</sup>. A bowl or pin *a*<sup>13</sup> of the bell-crank lever *a*<sup>8</sup> enters the slot in the cam *a*<sup>12</sup>, as will be explained. The link *a*<sup>11</sup> derives its motion from an arm *a*<sup>14</sup>, which is driven from the cam C' on the Jacquard-mechanism shaft C.

It will be understood that the bore-points receive a back-and-forth movement by means of the mechanism just described, so that the fabric will be bored or pierced at predetermined desired times. The cam-piece *a*<sup>12</sup> on the link *a*<sup>11</sup> is adjustable. By this means the initial location of the bowl *a*<sup>13</sup> may be determined, and thereby the locality of the bore-points, so that in case the bore-points are changed or become worn down, and thus do not occupy the proper initial or normal plane, the cam may be shifted, so as to bring the bowl *a*<sup>13</sup> into such a spot as to bring the bore-points into the normal plane. In order, however, that all the operations may be automatic, I have devised means for bringing one or the other of the sets of bore-points into an operative position automatically by the action of the Jacquard or other pattern mechanism.

It will be observed that in the position shown in Fig. 2 the bore-points *b* are out of operation and the bore-points *a* positioned for operation. In order to bring the bore-points *b* into position for operation, it will be necessary to swing the shafts *a*<sup>3</sup> so as to bring the bore-points *b* into a horizontal po-

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sition, or substantially so. This operation I effect by the following mechanism: A bell-crank lever  $b'$ , having a sleeve  $b^2$ , in which a rod  $b^3$  works, is connected by means of a link  $b^4$  with a bell-crank lever  $b^5$ , pivoted on an arm  $b^6$ , which link  $b^4$  is provided with a toe or jaw  $b^7$ , which coöperates with a toe or jaw  $b^8$  on the same link or rod  $b^4$  to embrace a pin  $b^9$  upon a double pawl  $b^{10}$ , pivoted to the end of the arm  $a^7$  of the upper gang of bore-points, the arm  $a^7$  of the lower gang being provided with a similar pivoted double pawl  $b^{10}$ , which is connected by a link  $b^{11}$  with the double pawl  $b^{10}$  of the upper gang or set of bore-points. The rod  $b^3$  carries a crescent  $b^{12}$  and is operated from the Jacquard or pattern mechanism by means of the lifter  $b^{13}$ , acting upon the same through the medium of the bell-crank lever  $b^{14}$  and the link or rod  $b^{15}$ . The bell-crank lever  $b^5$  is provided with a bowl or pin  $b^{16}$ , which enters a slot  $a^{15}$  in the link  $a^{11}$ , so as to swing the upper end of the said link laterally in order that the cam  $a^{12}$  may bring the bore-points into their predetermined normal plane.

The operation of the parts just described is as follows: At the predetermined time determined by the pattern the lifter  $b^{13}$  is actuated and serves to enter the crescent  $b^{12}$  in the cam, at the same time withdrawing the rod  $b^3$  from the aperture in the fixed bracket  $c^2$ , in which it slides. When the crescent has been entered in the cam, the lever  $b'$  is swung, thereby pulling down upon the link  $b^4$ . As the link  $b^4$  descends it performs the following functions: It causes the jaw  $b^7$  thereof to pull down upon the double pawl  $b^{10}$ , thereby disengaging it from the slot  $a^5$ , with which it is engaged, and swinging it over the arc, carrying with it the arm  $a^7$  and rocking the shaft  $a^3$  to bring the bore point or points into, say, a horizontal position, the limit of the swing of the bore-point being determined by the arm  $a^7$  coming against the fixed abutment  $a^6$ , in which position the pawl  $b^{10}$  enters the lower slot  $a^5$  of the arc, the pawl  $b^{10}$  being then in a position similar to that shown in Fig. 3. By this means the bore-points  $b$  are positioned for operation. It will be understood that the pawl  $b^{10}$  of the lower gang of bore-points is similarly operated, so as to swing that set of bore-points into an operative position. The bell-crank lever  $b^5$  likewise swings the upper end of the link  $a^{11}$ , thereby, by means of the cam  $a^{12}$ , moving the rod  $a^{10}$ , if necessary, and moving the bore-point-carrying mechanism to bring the bore-points into the desired normal plane, so that the initial normal plane or location of the bore-points is determined by the shape and position of the cam  $a^{12}$ . The bore-points  $b$ , having been brought to an operative position and into the normal plane, may thereupon be operated *ad libitum*. When it is desired to change over again to the bore-points  $a$ , the jacquard again comes into action and reverses the operations just described.

The changing over from one set of bore-

points to the other may be variously accomplished by various mechanisms. For instance, as shown in Fig. 3, instead of having the bore-points on the same shaft  $a^3$  one set of bore-points  $a$ , for instance, may be carried by the reciprocating mechanism and may be rigidly and fixedly mounted thereon, as shown, and the other set of bore-points  $b$  may be carried upon an arm  $b^{17}$ , secured on the rock-shaft  $a^3$ . In this case a downward movement of the link  $b^4$  (not shown in this figure) would swing the pawl  $b^{10}$  downward in the manner before described and swing the bore-point or gang of bore-points  $b$  into place in advance of the bore-points  $a$ , thus positioning the bore-points  $b$  for operation. The cam  $a^{12}$  operates as before to bring the points into the desired normal plane.

In Fig. 4 I have shown another arrangement, wherein the bore-points  $a$  and  $b$  are carried upon sliding rods  $d$   $e$ , respectively, between which the bowl or pin of a bell-crank lever  $f$  is received. This bell-crank lever  $f$  is carried by the arm  $a^7$  and has an arm  $g$ , having a pin or bowl entering the cam  $a^{12}$ . The arms  $b^4$  and  $a^{11}$  are connected by means of the usual bell-crank lever  $b^5$ , pivoted at  $x$ , and a link  $x'$ , connecting the bell-crank lever  $b^5$  with the link  $a^{11}$ .

The operation of the device is as follows: In the position shown the bore-point-actuating apparatus is effective to move the bore-points  $a$ . When it is desired to move the bore-points  $b$ , the pattern mechanism is actuated to thrust the link  $b^4$  in the direction of the arrow, thereby swinging the pawl  $b^{10}$  from the lower notch  $a^5$  of the arc  $a^4$  to the upper notch  $a^5$  of the said arc, thereby swinging the arm  $a^7$  upward, pulling down on the bell-crank lever  $f$  to engage its pin with the abutments  $e'$  of the sliding rod or slide  $e$ , carrying the bore-points  $b$ , the said upward thrust on the link  $b^4$  operating to displace the upper end of the link  $a^{11}$  to thereby bring the bore-point into the normal plane.

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

1. In an embroidering-machine, the combination of sets of borers and their actuating-mechanism and pattern mechanism for bringing either of the sets of borers into operative position.

2. In an embroidering-machine, the combination of a set of cutting-borers  $a$  and a set of borers  $b$  adapted to spread the threads of the fabric apart, actuating mechanism for the borers, and automatic means for positioning one or the other set of borers for operation.

3. In an embroidering-machine, the combination of movable sets of borers with actuating means and automatic means for positioning the mechanism so that any predetermined set of borers will be operative to bore or pierce the fabric.

4. In an embroidering-machine, the combi-



nation of a shaft  $a^3$ , sets of borers carried by the said shaft  $a^3$  and adapted to operate upon the fabric independently, operating means for operating the said borers and automatic means  
5 for swinging the said shaft to bring either set of borers into position for operation.

5. In an embroidering-machine, the combination of sets of borers and operating mechanism for same, pattern-controlled mechanism  
10 for causing either set of borers to become operative and a mechanism for bringing the operative row of borers to a normal position.

6. In an embroidering-machine, the combination of sets of borers and operating mechanism for same, an arm  $a^7$ , a double pawl  $b^{10}$   
15 and connection controlled by pattern mechanism

anism for causing either set of borers to become operative.

7. In an embroidering-machine, the combination of sets of borers, operating mechanism for the same, comprising a cam-piece  $a^{12}$ ,  
20 and means for moving the same to operate the bore-points, and mechanism for shifting the cam-piece, thereby compensating for any difference in the positions of the rows of  
25 borers.

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