

No. 876,975.

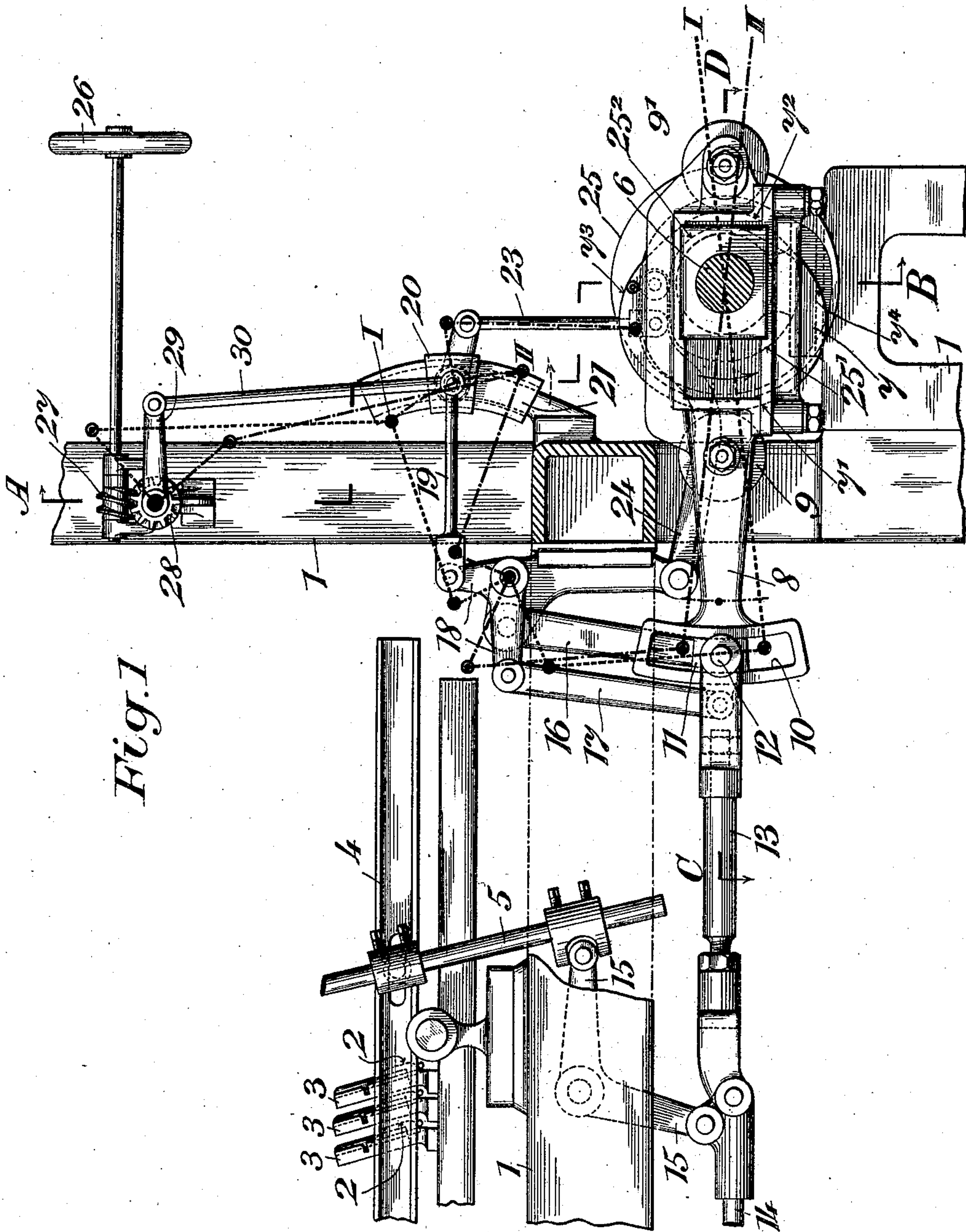
PATENTED JAN. 21, 1908.

V. KOBLEK.

SHUTTLE EMBROIDERING MACHINE.

APPLICATION FILED JULY 9, 1906.

4 SHEETS—SHEET 1.



Witnesses:

B. Rommers
R. W. Helff

Inventor:

Victor Kobler
by Henry Orth *attys.*

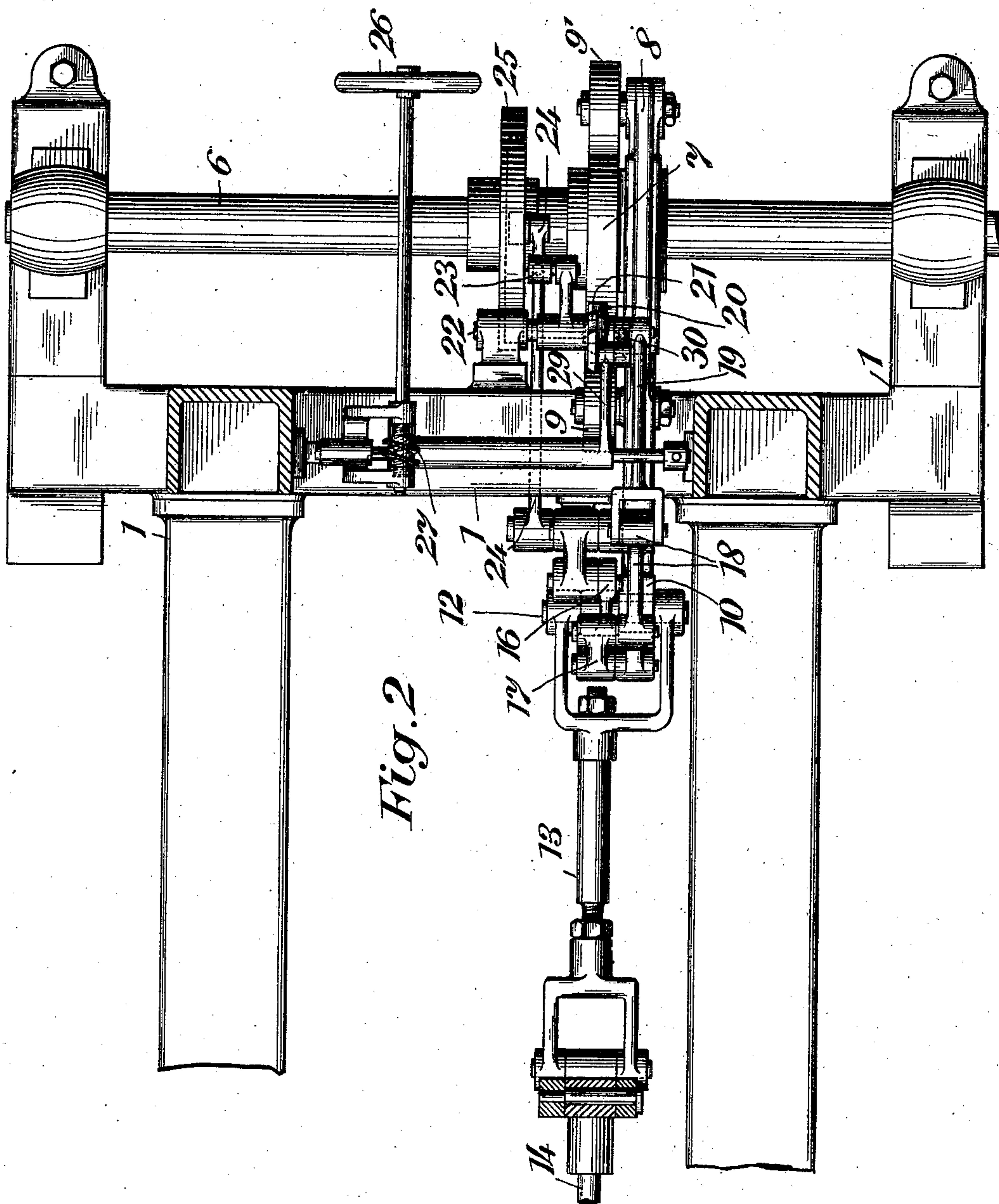
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Witnesses:

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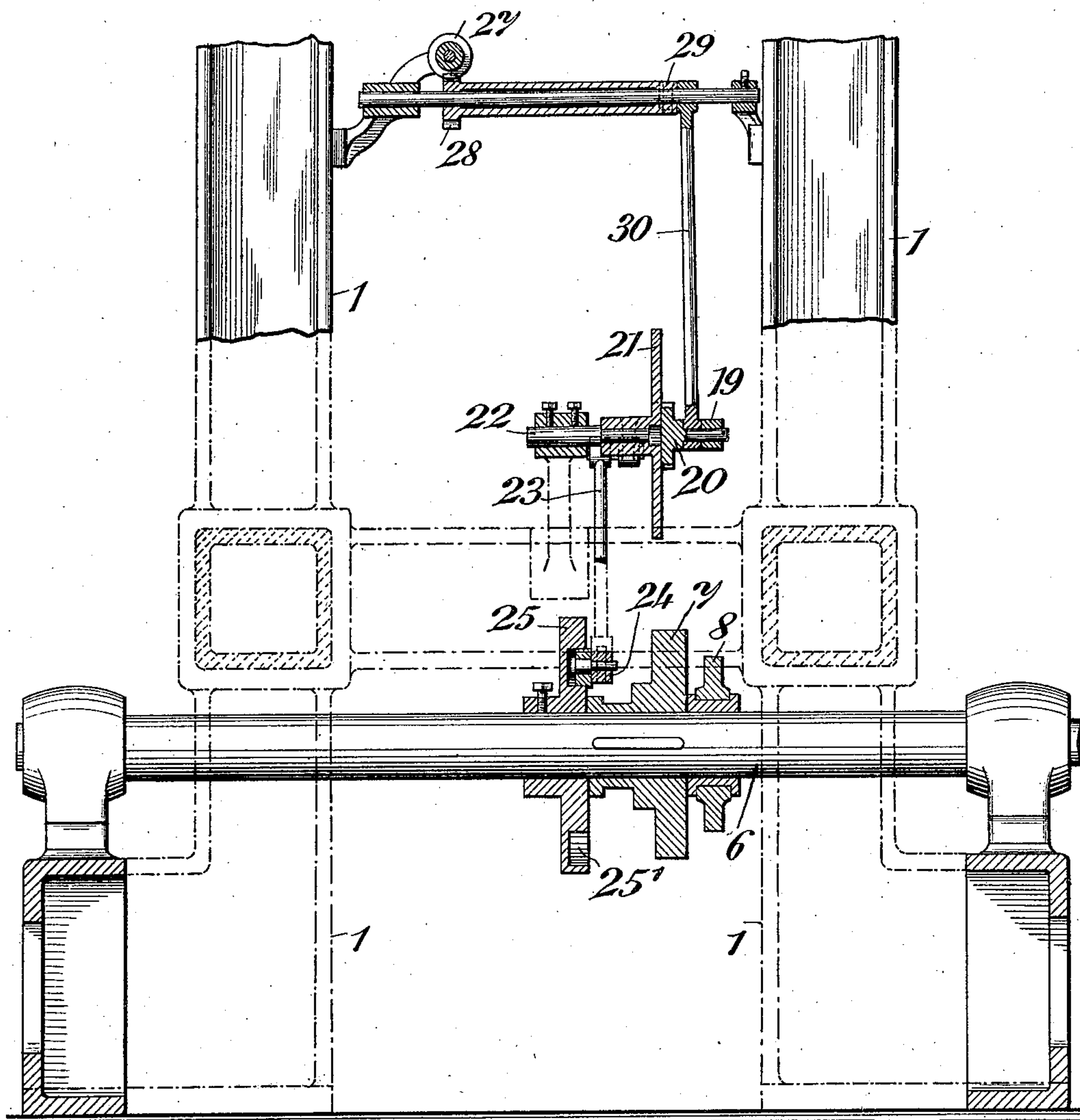


Fig. 3

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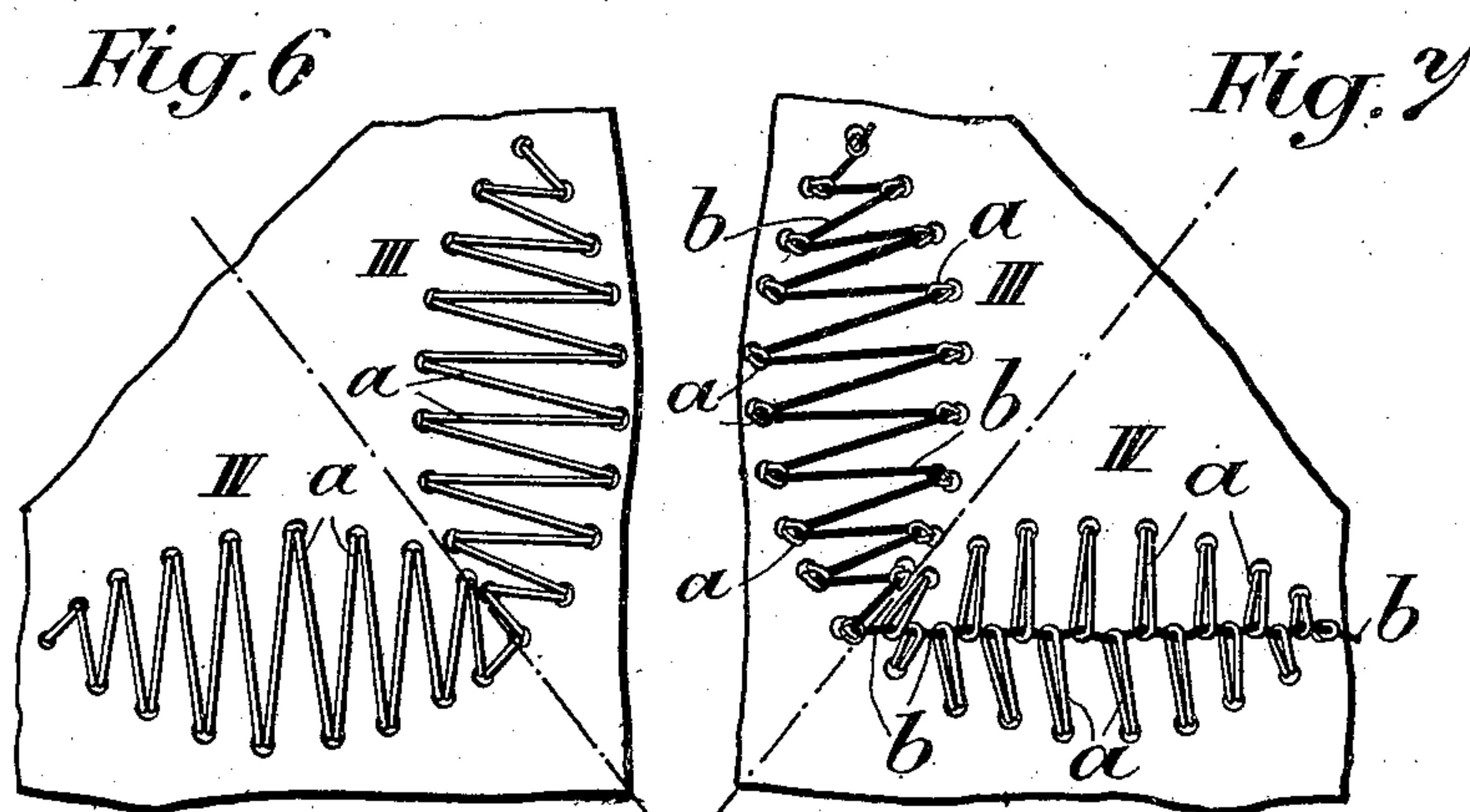
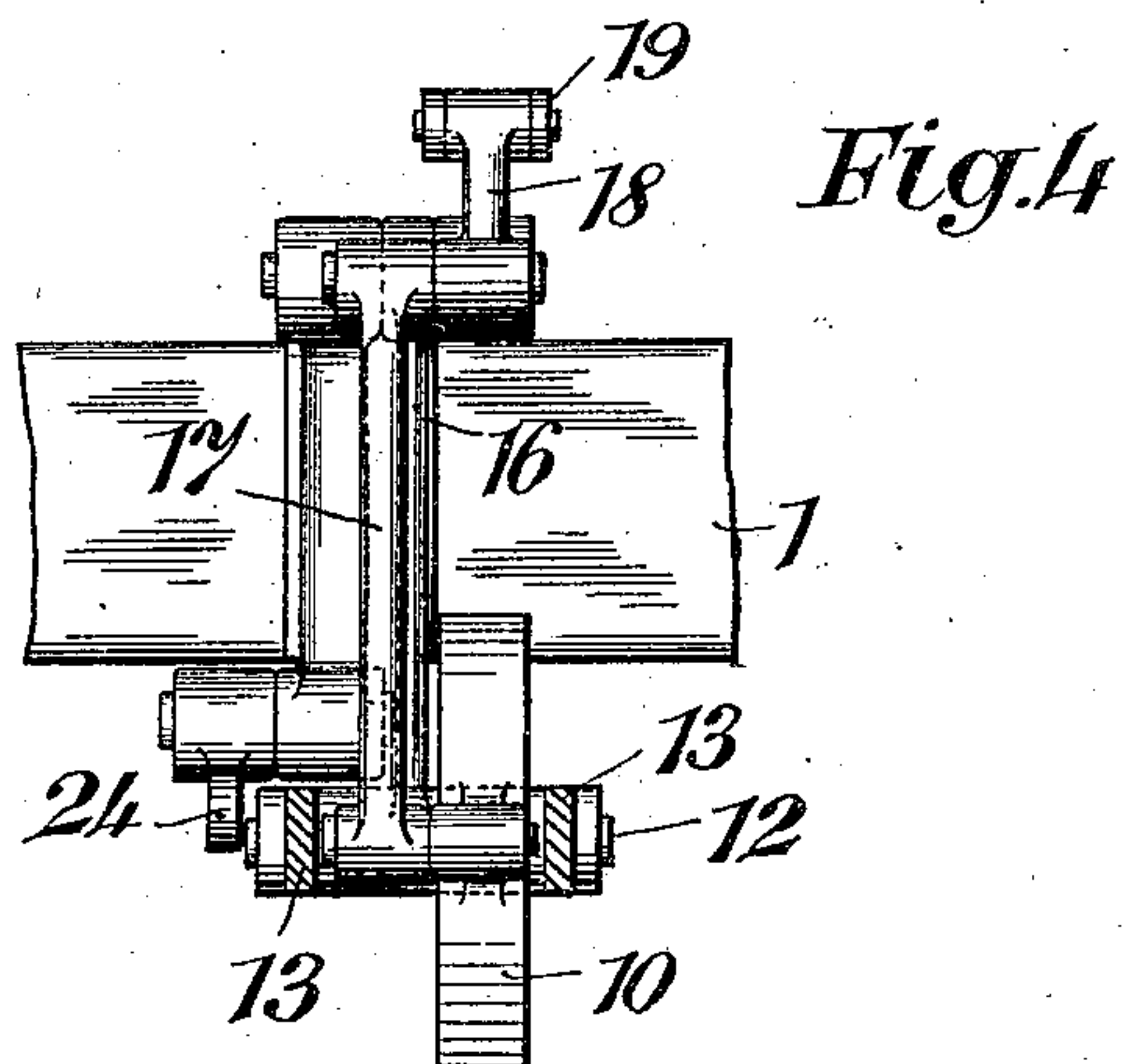
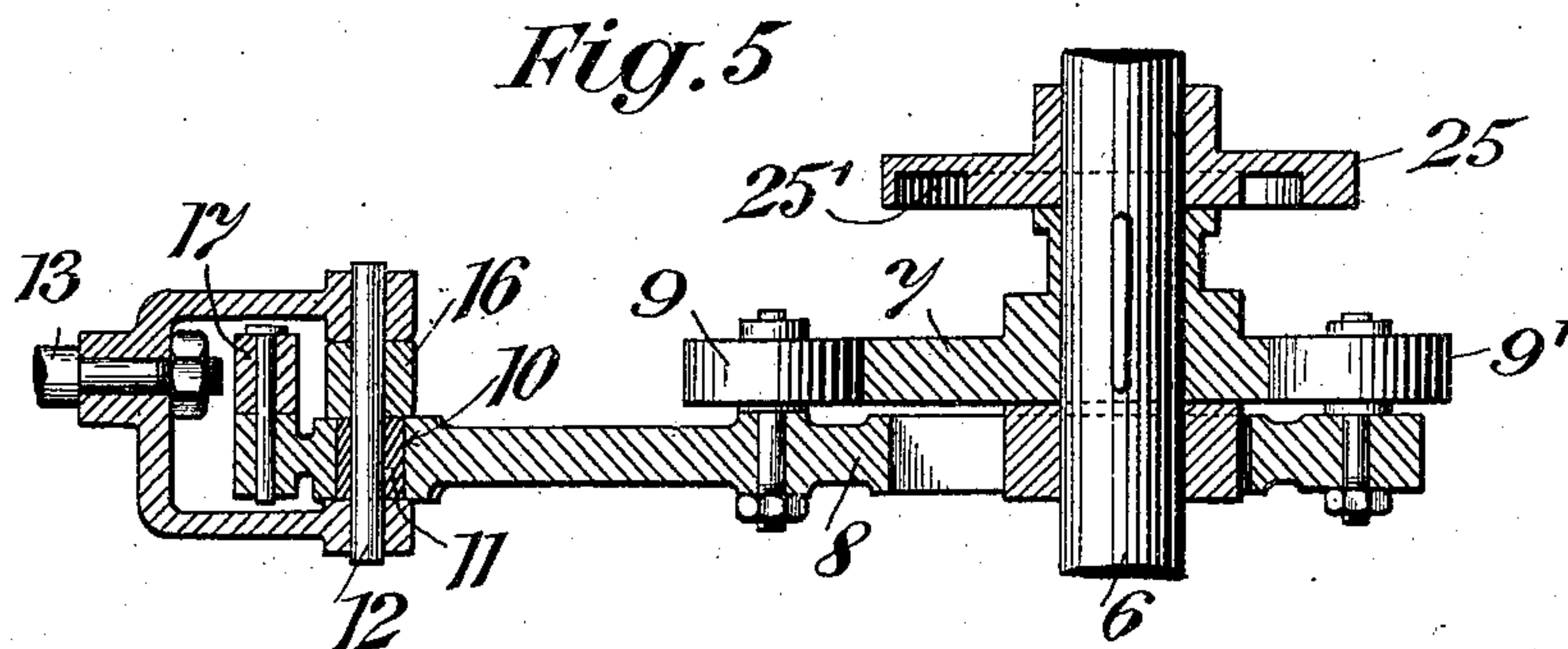
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4 SHEETS—SHEET 4.



Witnesses:

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UNITED STATES PATENT OFFICE.

VICTOR KOBLER, OF RORSCHACH, SWITZERLAND, ASSIGNOR TO THE FIRM OF ADOLPH SAURER, OF ARBON, SWITZERLAND.

SHUTTLE-EMBROIDERING MACHINE.

No. 876,975.

Specification of Letters Patent.

Patented Jan. 21, 1908.

Application filed July 9, 1906. Serial No. 325,407.

To all whom it may concern:

Be it known that I, VICTOR KOBLER, a citizen of the Republic of Switzerland, residing at Rorschach, in Switzerland, have invented certain new and useful Improvements in Shuttle - Embroidering Machines; 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 or figures of reference marked thereon, which form a part of this specification.

The subject of the present invention is a device or means to regulate the movement of the shuttles in shuttle embroidering machines, or in other words to regulate the changing operation from backstitch to running stitch, by which device the deficiencies in existing machines will be obviated.

The accompanying drawings illustrate the manner of putting into practice the present invention, and the illustrations show—

Figure 1 a vertical section Fig. 2 a horizontal section Fig. 3 a section on line A—B of Fig. 1 Fig. 4 a side-view of part of Fig. 1 and Fig. 5 a section on line C—D of Fig. 1. Fig. 6 shows on a larger scale two patterns, representing the effects of both backstitch and running stitch, seen from the face of the embroidery work. Fig. 7 represents the same patterns seen from the reverse of the embroidery work.

1 is the frame of the embroidering machine, 2 are the shuttles, 3 the shuttle slide tracks in an inclined position, 4 is the shuttle guide holder bar, 5 is one of the drawing rods guided in a straight line and engaging in the slide bars 4.

6 is the driving shaft of the shuttles. Upon the shaft 6 is adjusted a cam 7 which has two concentric portions 7¹ and 7², and two eccentric peripheral parts 7³ and 7⁴ connecting the portions 7¹ and 7². Close to the cam 7 is fitted a drawing rod 8, which by means of its frame and tightening key surrounds the shaft 6, and has two rolls 9 and 9¹ that engage the periphery of the cam at two diametrically opposite points. The drawing rod carries at one extremity, opposite the rolls, a connecting link of segment form, the middle of whose arc coincides with the center of the drawing rod frame, and in which a slide block 11 is fitted. By means of an axle 12, passing

through the block 11, the drawing rod 8 is connected with one of the forked ends of a link 13 (Fig. 5) which latter is coupled by its other forked end with a bar 14. Bar 14 connects the arms of one side of the bell-crank levers 15, whose other arms engage in the drawing rods 5, which latter connect with the shuttle guide holder bar, (the drawing shows only one of the bent levers 15 and also only one of the rods 5). The block 11, together with the link 13 and rod 14 are supported on the frame 1 by a link 16 (Figs. 1 and 5) through whose lower end passes the axle 12, in such a manner that the block and the rods, when the drawing rod 8 is in operation, are being kept more or less at the level of the shaft 6.

The connecting link 10 is attached at the middle of its total length to a rod 17 (Figs. 1, 4 and 5) which is coupled with one of the arms of a bell crank lever 18 mounted on the frame 1, while by its other arm this bell crank lever 18 is connected by means of a rod 19 with a slide 20. The slide 20 is movable along the segmental guide track 21 which by means of a hub, disposed in its longitudinal center, may swing round an axle 22 which is fixed in a bracket on the frame 1, the hub of the guide 21 is also provided with an arm, which, by means of a rod 23, is connected with a lever 24, pivoted at one end to the frame 1, and the other end of the lever 24 carries a roller which projects into the lateral cam groove of a disk 25, mounted beside the eccentric 7 on the shaft 6. The cam groove has two concentric parts 25¹ and 25², of which the first named has a greater radius than the latter, and both of which are connected together at their ends by straight parts (Fig. 1). For moving the slide 20 along its guide 21, a worm wheel mechanism 27, 28, is employed, which is mounted in bearings on frame 1 and is moved by a hand wheel 26. The worm wheel 28 has on its lengthened hub an arm 29, which by means of a rod 30 is jointed with the slide 20 (Figs. 1, 2 and 3.)

In Figs. 6 and 7, III represents the backstitch pattern, IV the pattern of running stitch, *a* the needle threads and *b* the shuttle thread.

The manner in which the above described mechanism operates is as follows: It being supposed that the shaft turns in the direction indicated by the arrow in Fig. 1, and that the position I of the slide 20 and of the drawing

rod 8 corresponds to the machine when producing a backstitch, and the position II of the same parts corresponds to the position of the parts when producing a running stitch; and it being further supposed that the position of these parts as shown, and of their intervening mechanisms 17—19, represents them as occupying their central line between the two positions I and II; on rotating shaft 6, the immediate result of the action of the peripheral parts 7⁴ and 7³ of the eccentric 7 upon the rolls 9¹ and 9 of the drawing rod 8 will be, that said drawing rod, together with the parts 15, 5 and 4 cause an upward motion of the shuttles, and through the action of the parts 7¹ and 7² upon the rolls 9¹ and 9 the shuttles will be caused to remain stationary in their uppermost position, while, vice versa, the ensuing action of the parts 7⁴ and 7³ upon the rolls 9 and 9¹ effects a descending motion of the shuttles, and the action of parts 7¹ and 7² upon the rolls 9 and 9¹ will cause the shuttles to remain stationary in their undermost position.

While the parts 20 and 8 are in the position I the machine will turn out backstitch, *i. e.*, the needle threads *a* will be stretched first and prior to the shuttle threads *b* and the latter will be pulled by the needle threads towards the stitch holes (Fig. 7), by which operation the pattern III of Figs. 6 and 7 is obtained, in which the shuttle threads *b* form a zigzag line. If now, it is desired to change from backstitch to running stitch, *i. e.*, if it is desired to obtain the pattern IV Fig. 7, the slide 20 is moved by hand wheel 26 along its guide bar 21 towards its lower end, viz. from position I into position II (Fig. 1), and this is conveniently done while the shuttles are progressing in their upward motion and as soon as they are at a momentary stand still in their uppermost position, which will be the case whenever the peripheral parts 7⁴, 7³ and 7¹, 7² bear alternately against the rolls 9¹ and 9. During this process, the roller of the lever 24, which started from part 25² has moved into parts 25¹ of the curved groove of the disk 25, and in consequence of this movement the guide 21 swings with its lower part, which carries the slide 20 in the direction of the dotted arrow (Fig. 1); by this swinging motion of slide 20 and by the aid of the auxiliary parts 9, 118 and 17, the connecting link 10 is pulled upward, which operation removes the drawing rod 8 from position I into position II (Fig. 1). The drawing rod 8 will remain in this latter position, as long as the roller of the lever 24 travels through the curve groove part 25¹ of the disk 25, and since in this position of the drawing rod 8 its rolls 9 and 9¹ are respectively above and below the axis of shaft 6 and block 11, it is natural that by further revolving the shaft 6, the peripheral parts 7⁴ and 7³ will act earlier upon the rolls 9 and 9¹ than with the drawing

rod 8 in position I, which latter position of the parts produces the backstitch; coincident with this position of the parts an earlier upward movement of the shuttles is caused, and thereby an earlier stretching of the shuttle threads is obtained, in opposition to the needle threads, and by which process the pattern IV of Figs. 6 and 7 is obtained, in which the needle thread *a* is pulled from the stitch holes by the shuttle thread *b* and drawn toward the longitudinal center of the pattern (Fig. 7). While the shuttles remain stationary for a short time in their lowermost position, *i. e.*, while the peripheral parts 7¹ and 7² of the cam 7 are acting on rolls 9 and 9¹, the roller of the lever 24 is released from the curve groove part 25¹ and drops back into part 25² and through this the guide 21, together with slide 20, swing back into their former position, in which position they are held stationary during the ensuing upward movement of the shuttles to swing forth again in the direction of the arrow, whenever the said upward motion approaches its end and the shuttles reach their uppermost position, where they will remain stationary for awhile. With each revolution of the shaft 6, the above-described working operation is repeated. If it is desired to change again from running stitch to backstitch, the slide 20 will be moved by means of the hand wheel 26 from its position II and replaced into its position I (Fig. 1).

From the foregoing it will be seen that, according to whether the slide is being shifted more or less downward in its guide 21 and in the direction from position I to position II, the descent of the shuttles will be in a greater or less degree premature, and the initial stretching of the shuttle threads may therefore be regulated entirely at the discretion of the operator, whereby a variety of patterns of running stitch may be obtained between the two extremes indicated in Fig. 7. For the purpose of dislocating the slide 20 the machine may be thrown out of action, if it is so desired.

I claim

1. In a shuttle embroidering machine, the combination with mechanism for moving the shuttles the same extent at all times; of means adjustably connected thereto to advance and retard the movements of the shuttles at will, to time the drawing of the shuttle threads and thereby vary the stitch from a backstitch to a running stitch.

2. In a shuttle embroidering machine, the combination with the shuttle reciprocating devices; of a drawing rod to actuate the same, means to adjustably connect the rod to the shuttle reciprocating devices to maintain an equal movement of the shuttles at all times, a cam to actuate the drawing rod and mechanism to shift the drawing rod with respect to the cam and to the reciprocating de-

vices to advance or retard the movement of the shuttles and thereby vary the stitch from a running stitch to a backstitch and vice versa, and to any modification between the two stitches.

3. In a shuttle embroidering machine, the combination with the shuttle reciprocating devices and a driving shaft; of a cam on the shaft, a drawing rod actuated by the cam and having a link at one end thereof, a block in the link and means to connect the same with the shuttle reciprocating devices, and hand-operated mechanism to move the link and drawing rod to advance or retard the reciprocations of the shuttles.

4. In a shuttle embroidering machine, the combination with the reciprocating devices and a driving shaft; of a cam on said shaft, a drawing rod, oppositely disposed rollers thereon acted upon by the cam, a link at one end of the rod, a block therein connected to the shuttle reciprocating devices, and hand-operated mechanism to raise and lower the link and thereby shift the rollers with respect to the cam.

5. In a shuttle embroidering machine the combination with the shuttle reciprocating means; of a driving shaft, a cam thereon, a driving rod having a link at one end and rollers at the other end acted upon by said cam, means to connect the link and shuttle, and reciprocating means, a swinging segmental guide, a slide on the guide, hand-operated means to position the slide along the guide, and levers connecting the slide and drawing rod, whereby the rod is moved to position the rollers about the cam.

6. In a shuttle embroidering machine, a drawing rod and mechanism operated by the rod to reciprocate the shuttles; of a driving shaft, a cam thereon, a segmental guide, a slide on the guide, hand-operated mechanism to raise and lower the slide with respect to the guide, a bell-crank lever, a rod connecting one arm thereof with the slide and a rod connecting the other arm to the drawing rod to rotate said drawing rod about the shaft with respect to the cam.

7. In a shuttle embroidering machine, the means for altering the time of movement of the shuttles, comprising the combination of a drawing rod, a cam to actuate the same and devices adjustably connected to the drawing rod to raise and lower the shuttles, with hand-operated mechanism to cause said cam to reciprocate the rod and devices the same extent at all times and at earlier or later periods at any time during the operation of the shuttles.

8. In a shuttle embroidering machine the combination with a cam, a member actuated by the cam, and movable about the same, a link slidably connected to the member and devices connected to the link to actuate the shuttles; of hand operated means to adjust the member with relation to the cam and slide the same with respect to the link.

In testimony that I claim the foregoing as my invention, I have signed my name in presence of two subscribing witnesses.

VICTOR KOBLER.

Witnesses:

MARY FALCONER,
KLARA NÖP.