

No. 748,044.

PATENTED DEC. 29, 1903.

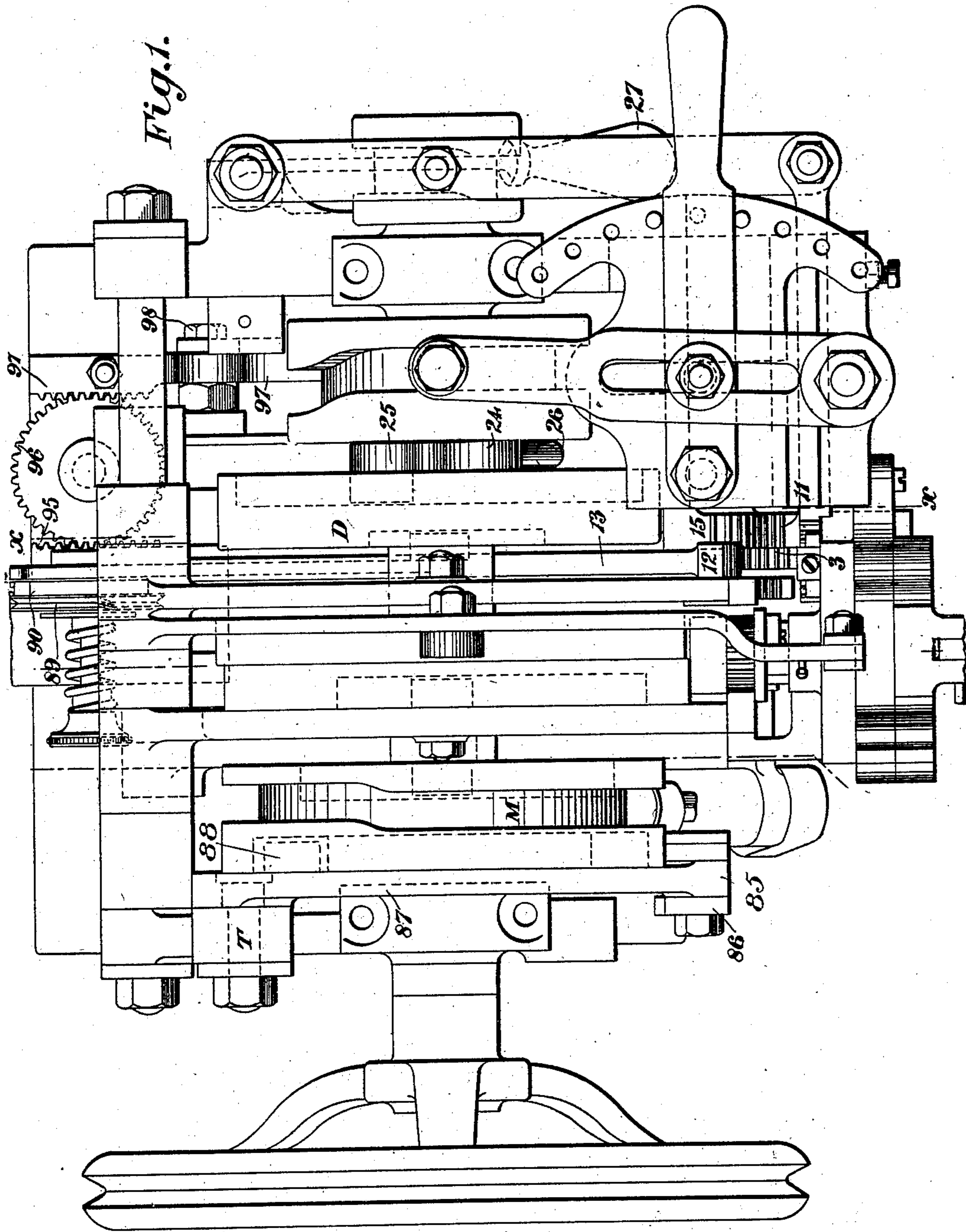
H. K. BRIDGER & G. H. SCETRINI.

SHOE SEWING MACHINE.

APPLICATION FILED OCT. 9, 1897.

NO MODEL.

4 SHEETS—SHEET 1.



Witnesses.

Samuel Percival
Albert Jones

Inventors.
George Harry Scetrini
Herbert Hynston Bridger
By their Attorneys.
Wheatley & Mackenzie

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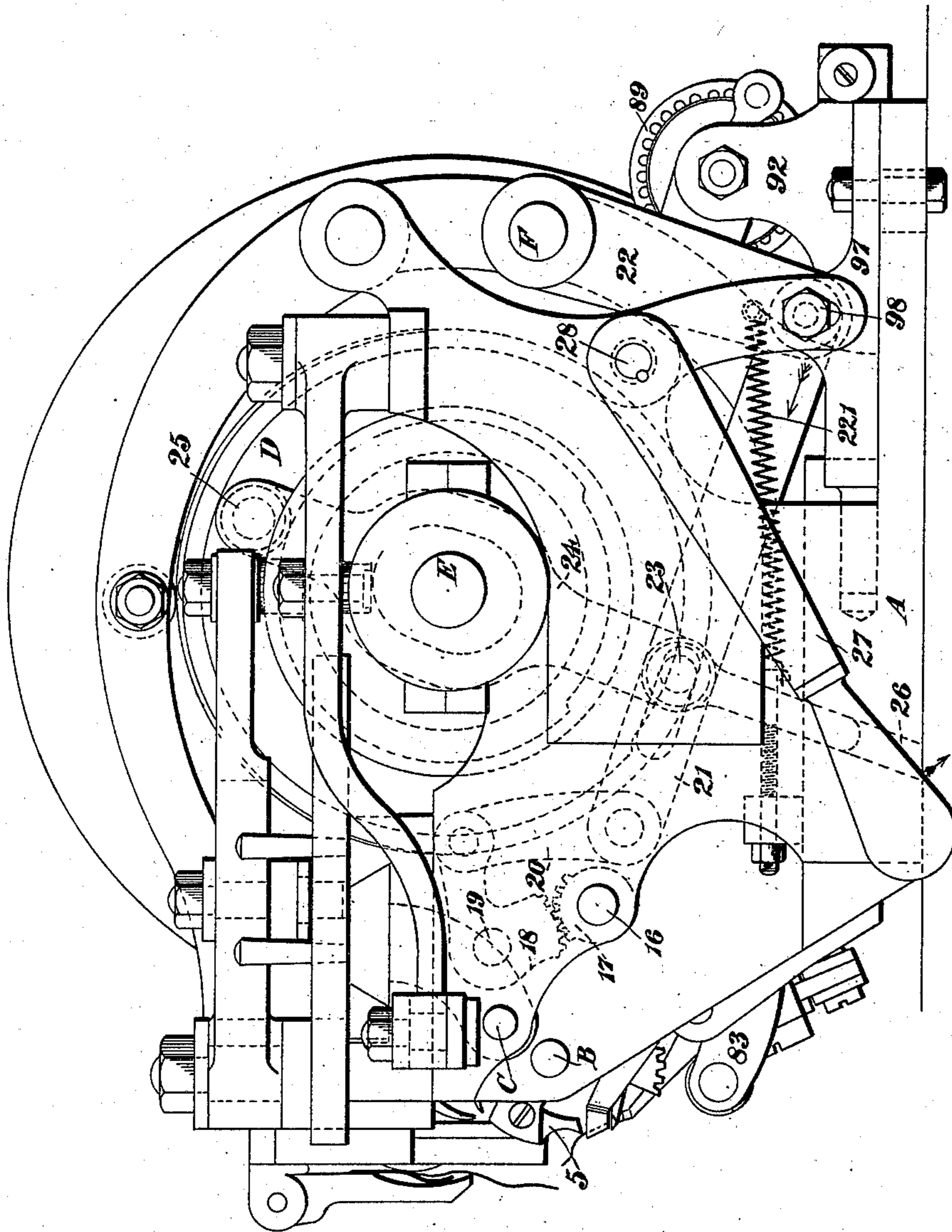
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4 SHEETS—SHEET 2.

Fig. 2.



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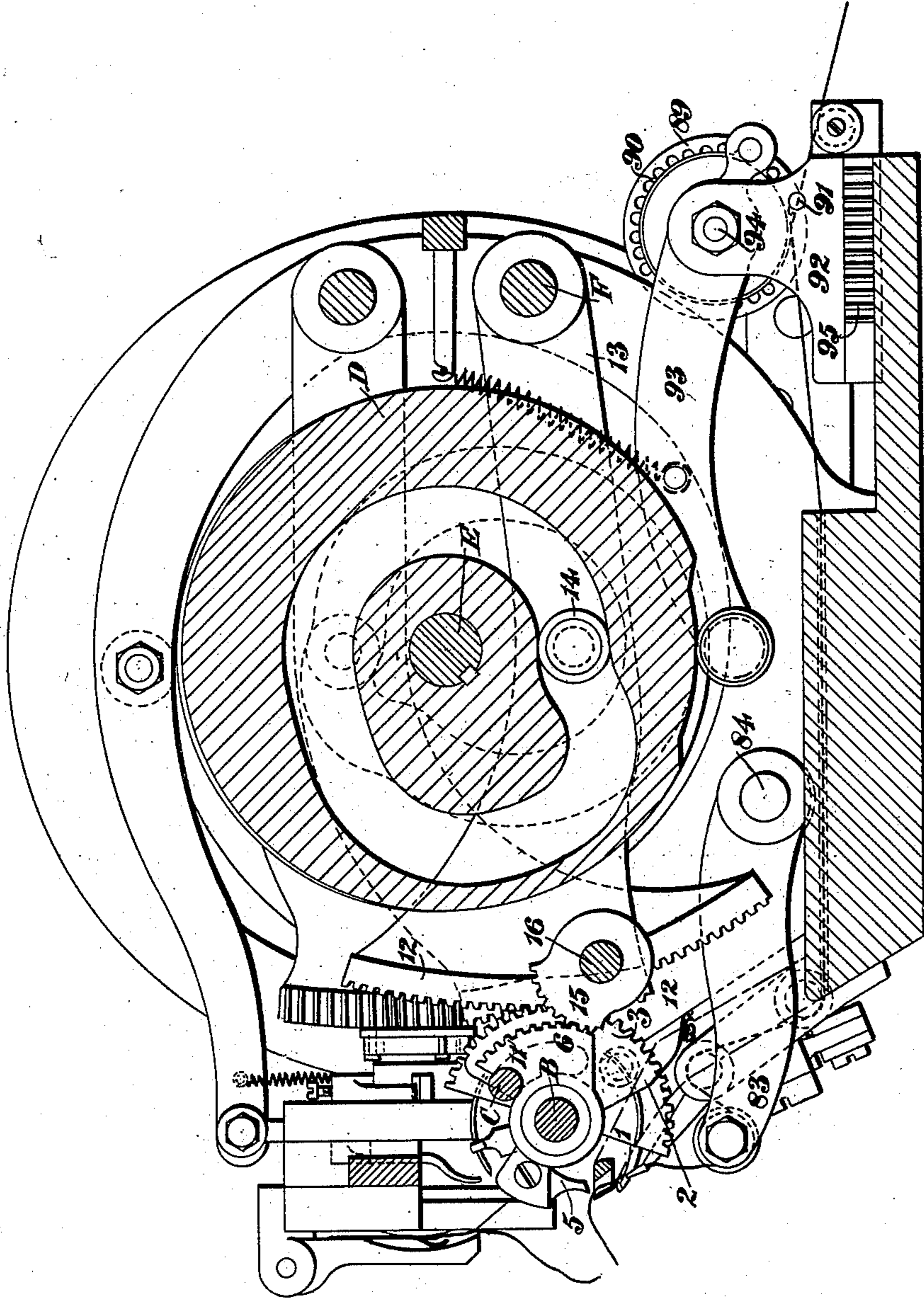
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4 SHEETS—SHEET 3.

Fig. 3.



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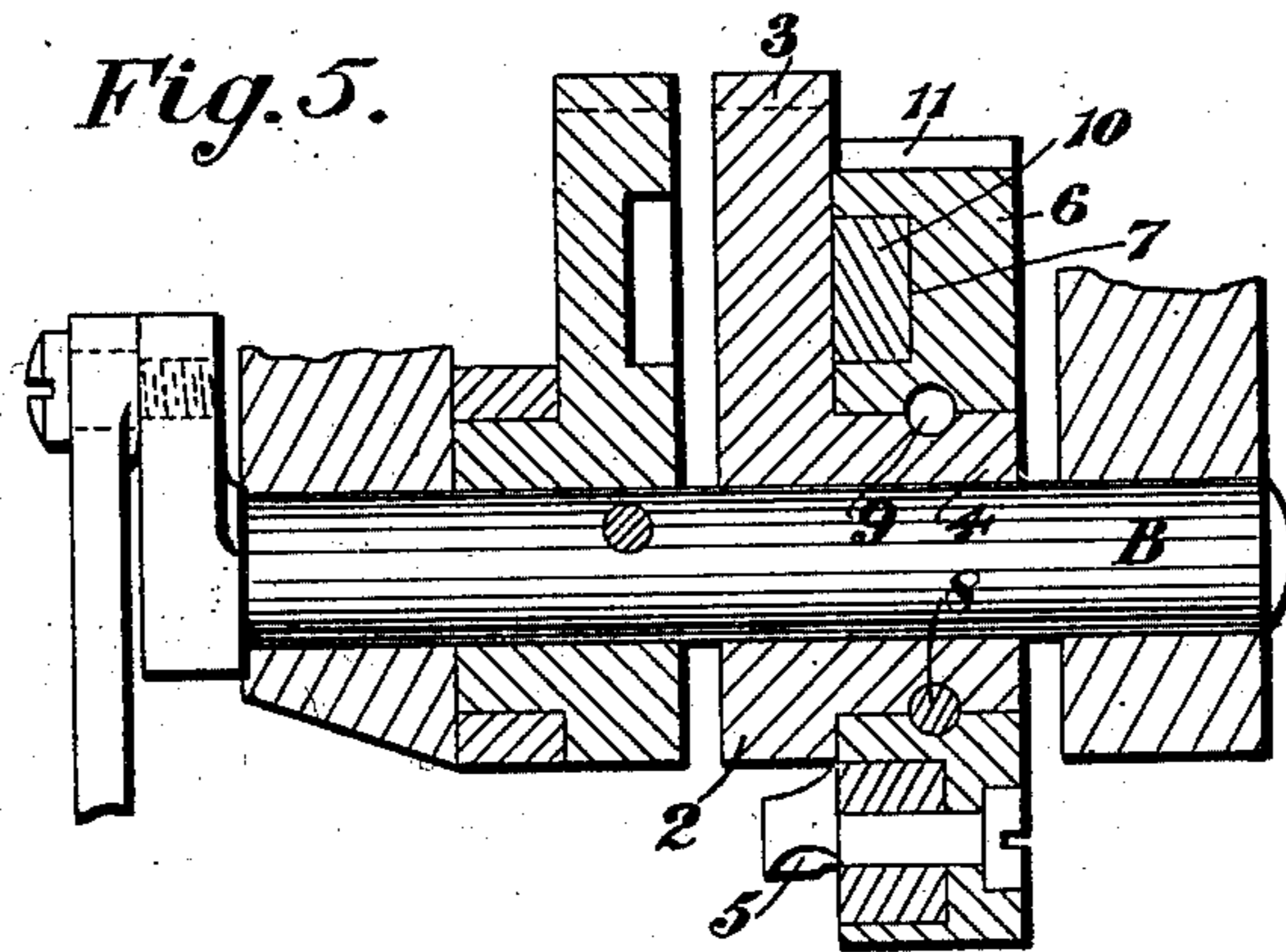
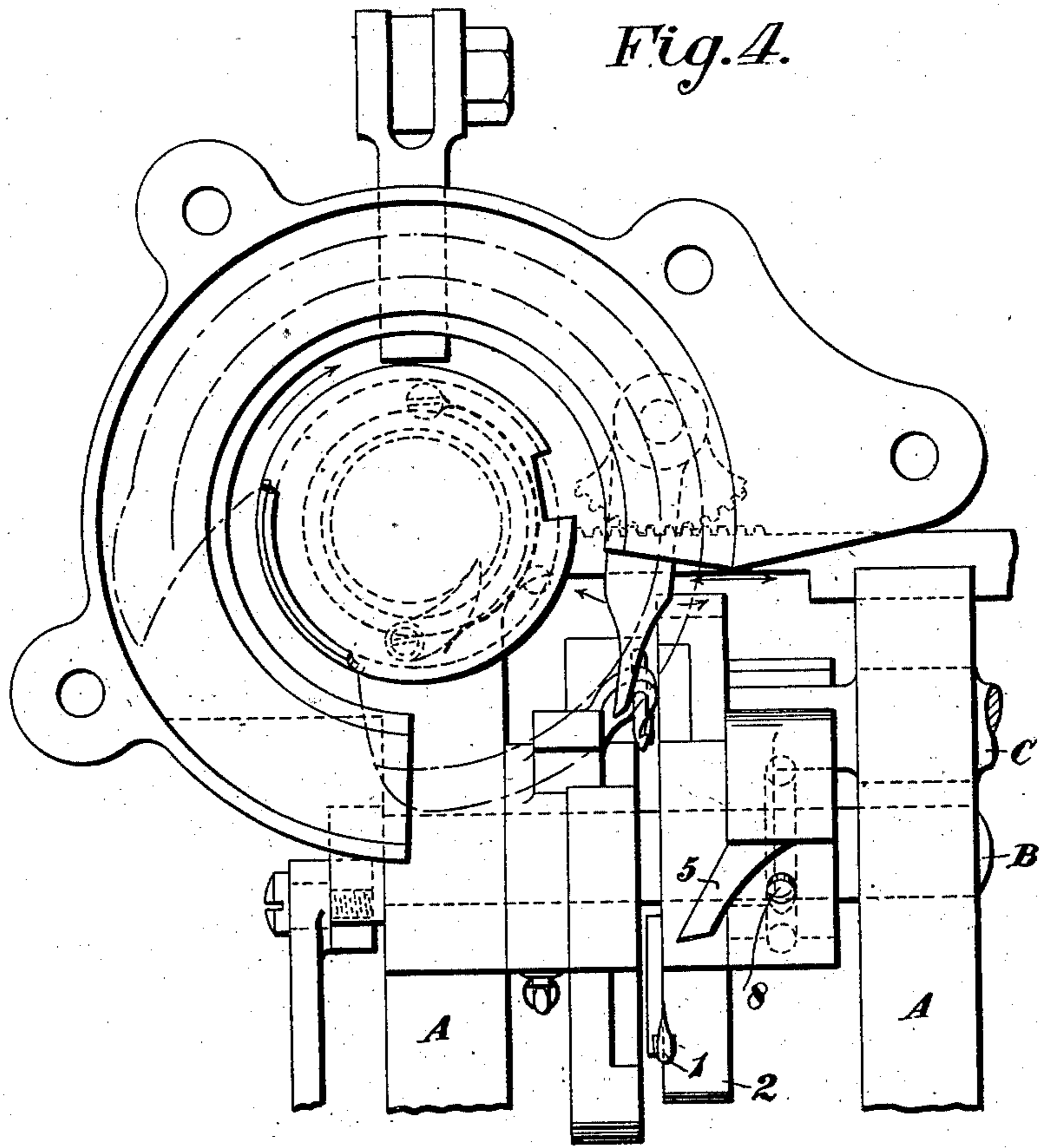
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4 SHEETS—SHEET 4.



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UNITED STATES PATENT OFFICE.

HERBERT KYNASTON BRIDGER, OF LONDON, AND GEORGE HARRY SCETRINI, OF STRATFORD, ENGLAND; SAID SCETRINI ASSIGNOR TO SAID BRIDGER.

SHOE-SEWING MACHINE.

SPECIFICATION forming part of Letters Patent No. 748,044, dated December 29, 1903.

Application filed October 9, 1897. Serial No. 654,707. (No model.)

To all whom it may concern:

Be it known that we, HERBERT KYNASTON BRIDGER, residing at Danes Inn, Strand, London, and GEORGE HARRY SCETRINI, residing at Stratford, in the county of Essex, England, subjects of the Queen of Great Britain and Ireland, have invented certain new and useful Improvements in Sewing-Machines; and we 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.

This invention for improvements in sewing-machines specially applicable for stitching boot-soles has for its object to operate the awl and presser-foot in an improved manner and to lock the tension device while the take-up is working until the stitch is pulled in and then to unlock it.

In carrying out this invention as applied to a machine in which the shuttle and presser-foot are arranged above the table the awl and presser-foot carriers are mounted on a shaft on which they can be slid endwise and rotated. A curved arm clamped loosely in a segment of a circumferential groove between the awl and presser-foot carriers is connected to a slide that is traversed lengthwise of the machine through an adjustable lever determining the length of traverse by means of the race in a barrel-cam to feed the awl and presser-foot at the required times and to draw it back. The carriers are each formed with a segment of teeth, one being broad and the other narrow, and they gear respectively into narrow and broad teeth-segments, each driven through suitable mechanism from a race in a disk cam to give the required motions while allowing of the lateral feed motions. In the mechanism driving the presser-foot is a sliding piece that transmits the required motion, but slips when a certain pressure of the presser-foot is attained and is forced forward by a spring when the presser-foot is relieved of pressure. The cam-lever is guided and has a pin working in a slot in a lever guided by links and forced in the direction of its length by a spring. When the pressure on the presser-foot exceeds a certain

amount, the slotted lever slips back against the spring. It will be readily understood that the actual position of this sliding piece when the presser-foot is pressing on the leather is determined by the thickness of the leather. This sliding piece is connected to a weighted handle that, owing to its momentum, checks the action of the spring and serves also as a handle for raising the presser-foot. The take-up is actuated by the race of a disk cam and the tension is locked while the take-up is working, but is unlocked just before the take-up completes its motion. The exact time of the unlocking is determined by the position of the sliding piece of the presser-foot motion, and thus depends on the thickness of the leather. The sliding piece is connected by a suitable gearing to a cam-lever operated by the edge of a disk cam and moves it backward or forward to determine the point at which it is operated by the disk cam, and the lever operates a band-brake on one side of the double-tension pulley.

In the accompanying four sheets of illustrative drawings, Figure 1 is a plan of a boot-sewing machine constructed according to this invention. Fig. 2 is a right end elevation, and Fig. 3 a sectional elevation, on the line *xx* of the same. Fig. 4 is a front elevation of the shuttle-box and awl presser-foot and needle-carriers, and Fig. 5 is a section showing the manner in which the awl presser-foot and needle-carrier are mounted.

The awl 1 is fixed in a carrier 2, mounted on a shaft B, supported in bearings in the frame A of the machine. The awl-carrier 2 is provided with a segment of narrow teeth 3 and with a boss 4. The presser-foot 5 is fixed in a carrier 6, mounted on the boss 4 of the awl-carrier 2 and retained thereon by a pin 8, taking into a circumferential groove 9 in the boss 4. The presser-foot carrier 6 is provided with a segment 7 of a circular groove adapted to receive the segmental arm 10 of a shaft C, mounted in bearings in the frame A and free to slide axially. The segmental arm 10 is retained in the groove 7 by the face of the awl-carrier 2, and thus moves the awl and presser-foot carriers with it laterally for the feed motion, but leaves the carriers free to be ro-

tated on the shaft B. The presser-foot carrier 6 is provided with a broad segment of teeth 11. The narrow teeth 3 of the awl-carrier gear with a broad-toothed segment 12 on a cam-lever 13, fulcrumed to a shaft F and provided with a roller 14, working in the race cut in one face of the disk D, mounted on the main shaft E. The broad teeth 11 of the presser-foot carrier gear with a toothed segment 15 on a shaft 16, having another toothed segment 17 gearing with a toothed segment on a bell-crank lever 18, pivoted to the frame at 19, Fig. 2, and connected by the link 20 to the end of a rocking bar 21, connected by a link 22 to the shaft F and forced in the direction of the arrow by the spring 221. The rocking bar 21 is provided at its center, or nearly so, with a slot into which takes the pin 23 of a cam-lever 24, having at one end a roller 25, working in the race in the other face of the disk D and at the other end being guided in the hole 26 in the frame A.

The action is as follows: When the cam-lever 24 is forced downward by the disk race-cam D, the presser-foot is raised to allow of the return lateral feed motion. When the presser-foot is in this position, the resistance to its downward motion is removed by the presser-foot being withdrawn from the work, and the spring 221 forces the rocking bar 21 in the direction of the arrow, so as to insure that when next depressed the presser-foot will come down firmly on the work. When the cam-lever 24 is forced upward by the cam D, it forces the presser-foot down onto the work until the pressure of the foot on the work attains a certain amount. If this amount of pressure is attained before the cam-lever 24 is completely raised, the resistance of the presser-foot to further motion causes the rocking bar 21 to move in the direction opposite to the arrow, so as to prevent under the action of the cam further downward motion of the presser-foot and consequent increase of pressure. The presser-foot thus automatically adjusts itself to the thickness of the work. The pressure of the presser-foot is thus practically the same always and depends principally on the resistance of the rocking bar 21 to rocking motion and the angle of the link 20 and rocking bar 21. Normally while the stitch is being formed or the work being fed the parts occupy the position shown, and any pressure exerted on the presser-foot while the awl is piercing the sole is transmitted directly to the cam D, so that the sole is held rigidly, as such pressure is not sufficient to cause the rocking bar 21 to slip back in the direction opposite to the arrow. The function of the spring 221 is practically to force the rocking bar 21 longitudinally forward when the presser-foot is raised from off the work, so that even when working from thick to thin it shall always be brought to bear on the leather with the desired pressure; but it is also desirable to reduce this motion to the smallest amount con-

sistent with the efficient working of the machine, so as to render the working of the machine more smooth. This forward movement, which should be sufficient to compensate for slightly more than the greatest decrease in thickness in the leather to be sewed that is likely to occur in practice from one stitch to the next, depends on the speed of the machine, the inertia of the parts to be moved, the strength of the spring 221, and the angle of the link 22 and rocking bar 21. To regulate the amount of this forward motion, the inertia of the parts can be increased to the requisite degree by means of a weight acting on the rocking bar 21 in a suitable manner. This is conveniently effected by a weighted hand-lever at 27, that can also serve to raise the presser-foot by hand, for example, when inserting or removing work. The hand or bell-crank lever 27, pivoted to the frame at 28, has a slot engaging with a pin 98, screwing into the pivot connecting the link 22 to the rocking bar 21. On depressing the knob on the end of the lever 27 the rocking bar 21 is rocked in the opposite direction to the arrow and raises the presser-foot. On releasing the lever 27 the spring 221 causes the presser-foot to again descend. Any action of the spring to move the rocking bar in the direction of the arrow has to overcome the inertia of the weighted hand-lever. The amount the rocking bar 21 is moved forward by the spring 221 after each stitch, which, as before stated, depends on the velocity of the machine and the inertia of the parts, is in practice so small that it can barely be seen.

The take-up arm 83 is mounted on a shaft 84, mounted in the frame and having at its other end an arm 85, connected by a link 86 to a bell-crank cam-lever 87, fulcrumed on a pivot T and carrying at its free end a roller 88, working in a race in the face of the barrel-cam M.

The tension-pulley 89 is mounted on a sliding bracket 92 and has a band 90, fixed at 91 to the bracket 92, supporting the tension-pulley. The other end of the band 90 is connected to a cam-lever 93, fulcrumed at 94 to the bracket 92 and provided with a roller drawn by a spring 130 against the edge of the disk D, in which are cut the two races for the awl and presser-foot motions. The sliding bracket 92 has rack-teeth 95, gearing with an idle toothed wheel 96, itself gearing with the rack-teeth on a slide 97, provided with a short slot engaging with the pin 98, that connects the handle 27 to the rocking bar 21, so that it is moved with the rocking bar. The position of the rocking bar thus determines the position of the bracket 92, and consequently of the cam-lever and its roller. The cam acts on the band to cause it to break or release the tension-pulley, and according to the position of the roller, and thus to the thickness of the leather, the tension is released earlier or later. The take-up draws up the stitch in

the sole while the tension is locked, but the moment it is unlocked, which is arranged to take place when the stitch is drawn up sufficiently tight, any further thread required for the continued motion is drawn through the tension. It will thus be seen that the tension is locked during the take-up, but is unlocked just before the take-up completes its motion, the exact time of the unlocking being determined by the sliding piece of the presser-foot motion, and thus depends upon the thickness of the leather, the object being to unlock at the exact time that the stitch is completely drawn up.

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

1. In a boot and shoe sole sewing machine the means for operating and imparting the required pressure to the presser-foot or work-support, whatever the thickness of the work, consisting of a cam, mechanism for transmitting the motion of the cam to the presser-foot or work-support comprising a rocking bar or lever arranged in the said mechanism and transmitting the motion at an angle, links suspending the rocking bar so that it can move in the direction of its length, a sliding connection between the lever and its operating mechanism and a means for forcing the rocking lever in a direction of its length opposed to the pressure on the presser-foot or work-support.

2. In a boot and shoe sole sewing machine the means for operating and imparting the required pressure to the presser-foot or work-support whatever the thickness of the work, consisting of a cam, a guided cam-lever, a rocking bar or lever suspended at one end from a link and connected to the cam-lever so that it is left free to rock in the direction of its length, a mechanism transmitting the motion of the rocking lever to the presser-foot or work-support, a link connecting the said mechanism to the other end of the rocking lever at an angle, and a means for forcing the rocking lever in the direction of its length opposed to the pressure on the presser-foot or work-support.

3. In a boot and shoe sole sewing machine the means for operating and imparting the required pressure to the presser-foot or work-support, whatever the thickness of the work, consisting of a cam, mechanism for transmitting the motion of the cam to the presser-foot

or work-support, comprising a rocking bar or lever arranged in the said mechanism and transmitting the motion at an angle, links suspending the rocking bar so that it can move in the direction of its length, a sliding connection between the lever and its operating mechanism, a spring forcing the rocking lever in the direction of its length opposed to the pressure on the presser-foot or work-support and a counterweighted lever opposing the action of the spring.

4. In a boot and shoe sole sewing machine the means for operating and imparting the required pressure to the presser-foot or work-support whatever the thickness of the work, consisting of a cam, a guided cam-lever, a rocking bar or lever suspended at one end from a link and connected to the cam-lever so that it is left free to rock in the direction of its length, a mechanism for transmitting the motion of the rocking lever to the presser-foot or work-support, a link connecting the said mechanism to the other end of the rocking lever at an angle, a spring forcing the rocking lever in the direction of its length opposed to the pressure on the presser-foot or work-support and a counterweighted lever opposing the action of the spring.

5. The mechanism for locking and unlocking the tension consisting of a tension apparatus, a means for locking and unlocking the tension, a lever actuating the locking and unlocking mechanism, a cam actuating the lever, a movable carrier supporting the lever, and connected to the presser-foot mechanism so that the position of the carrier is determined by the thickness of the leather.

6. The mechanism for locking and unlocking the tension consisting of a tension apparatus, a brake acting on the tension, a lever actuating the brake, a cam actuating the lever, a slide carrying the fulcrum of the lever and a mechanism connecting the slide to the presser-foot mechanism so that the position of the slide is governed by the thickness of the leather.

In testimony whereof we have affixed our signatures in presence of two witnesses.

HERBERT KYNASTON BRIDGER.
GEORGE HARRY SCETRINI.

Witnesses:

ALBERT JONES,
WILMER M. HARRIS.