

No. 752,791.

PATENTED FEB. 23, 1904.

R. MITCHELL.
FEEDING MECHANISM FOR BOOK SEWING MACHINES,

APPLICATION FILED JUNE 14, 1902.

NO MODEL.

4 SHEETS--SHEET 1.

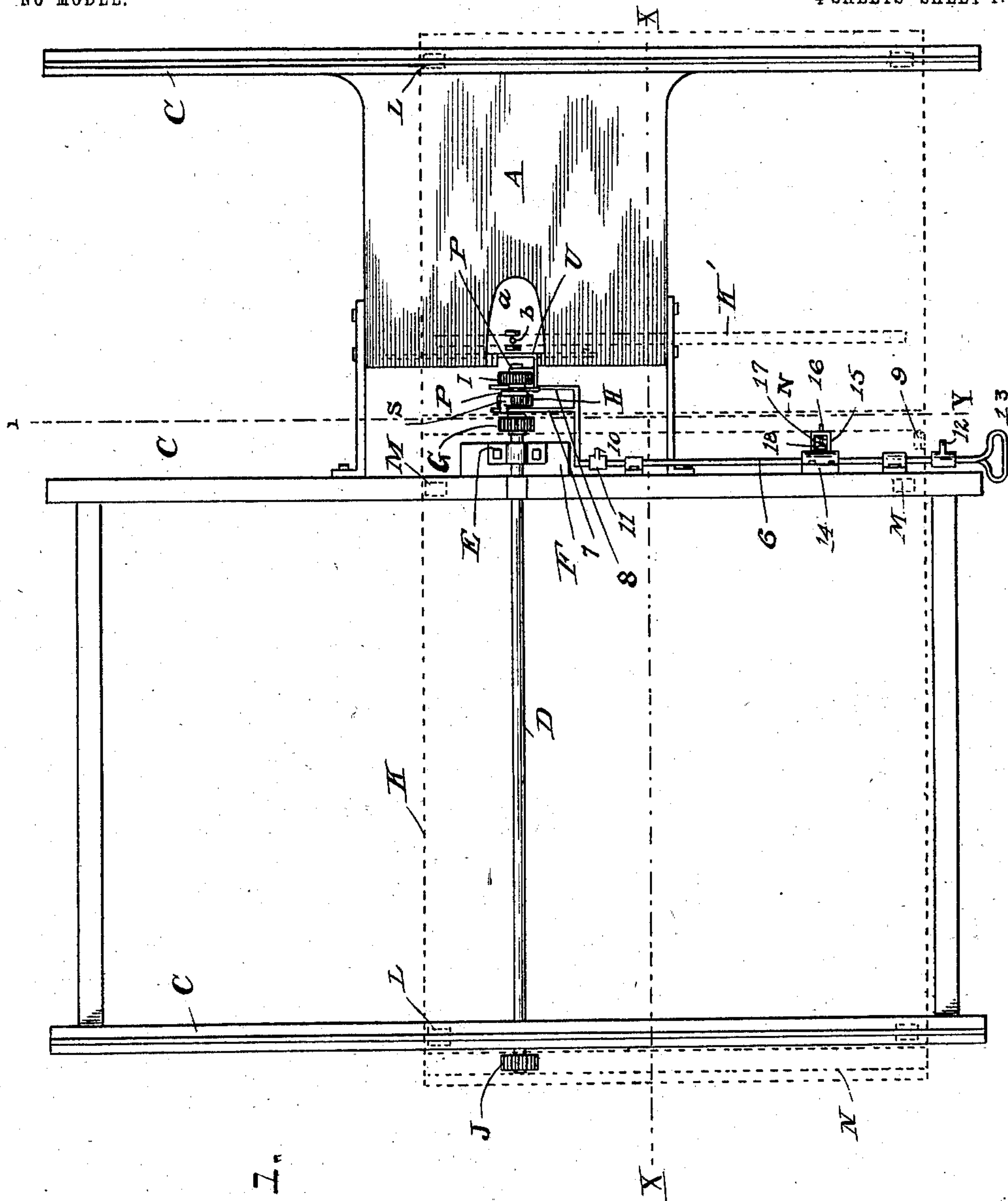


Fig. 1.

WITNESSES

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4 SHEETS—SHEET 2.

Fig. 2.

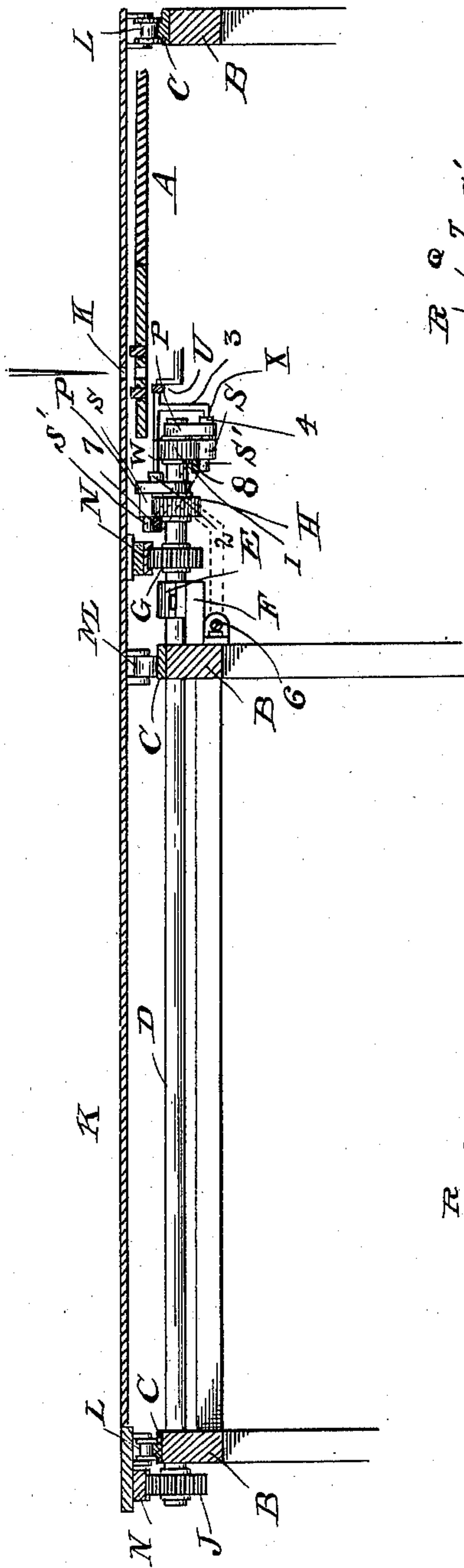


Fig. 3.

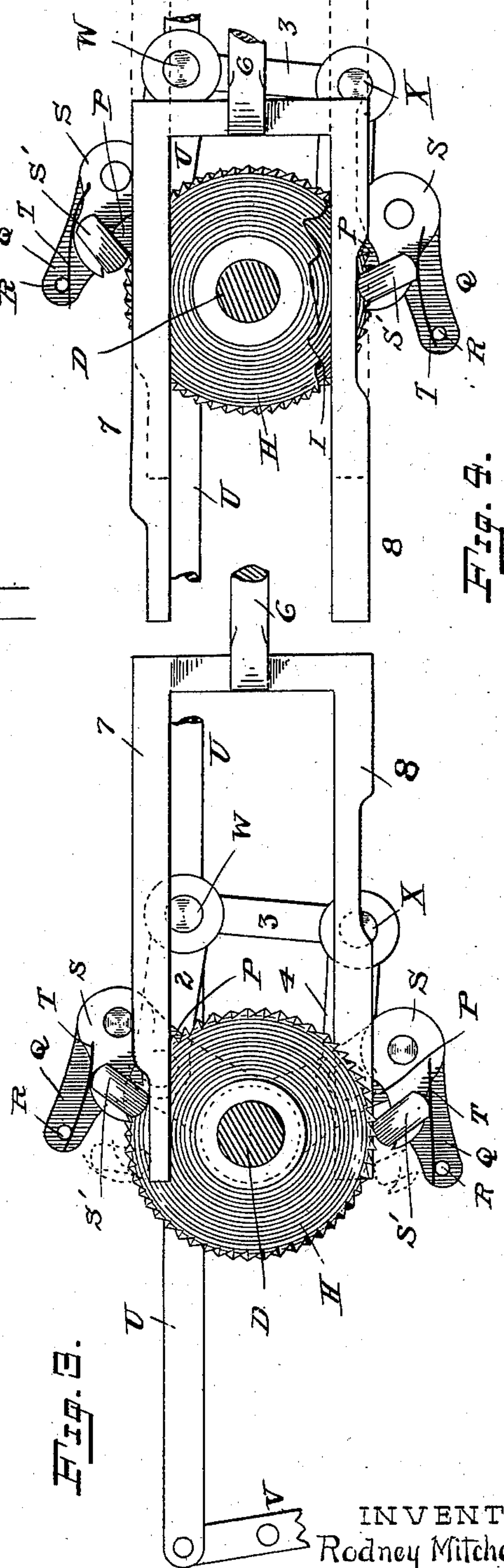


Fig. 4.

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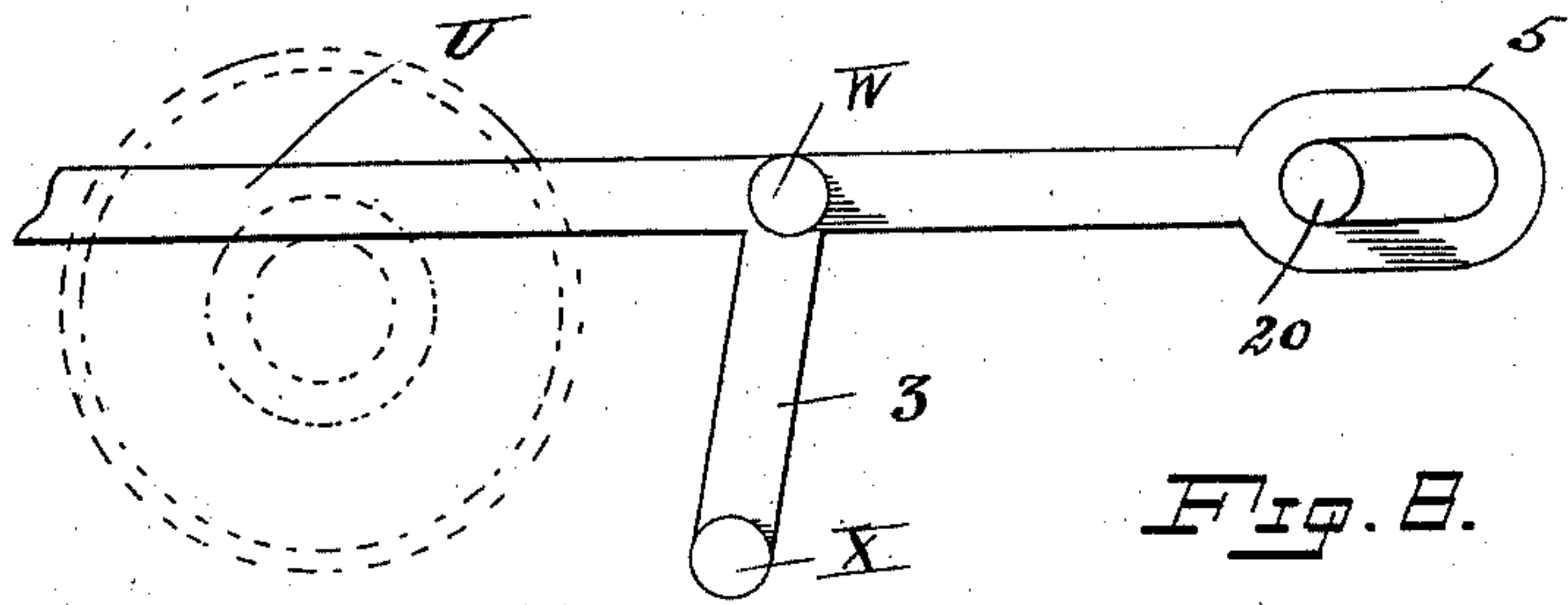
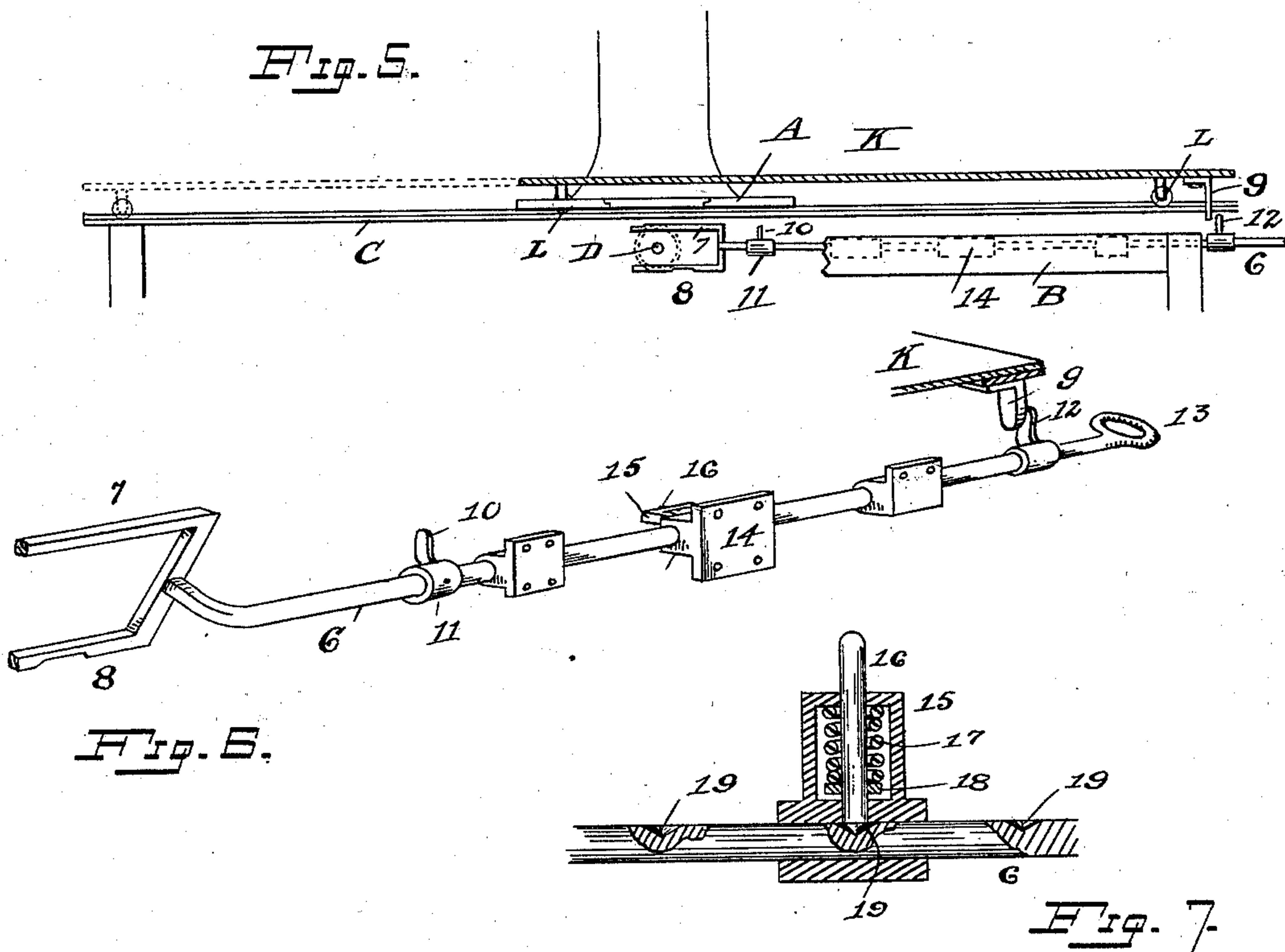
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4 SHEETS—SHEET 3.



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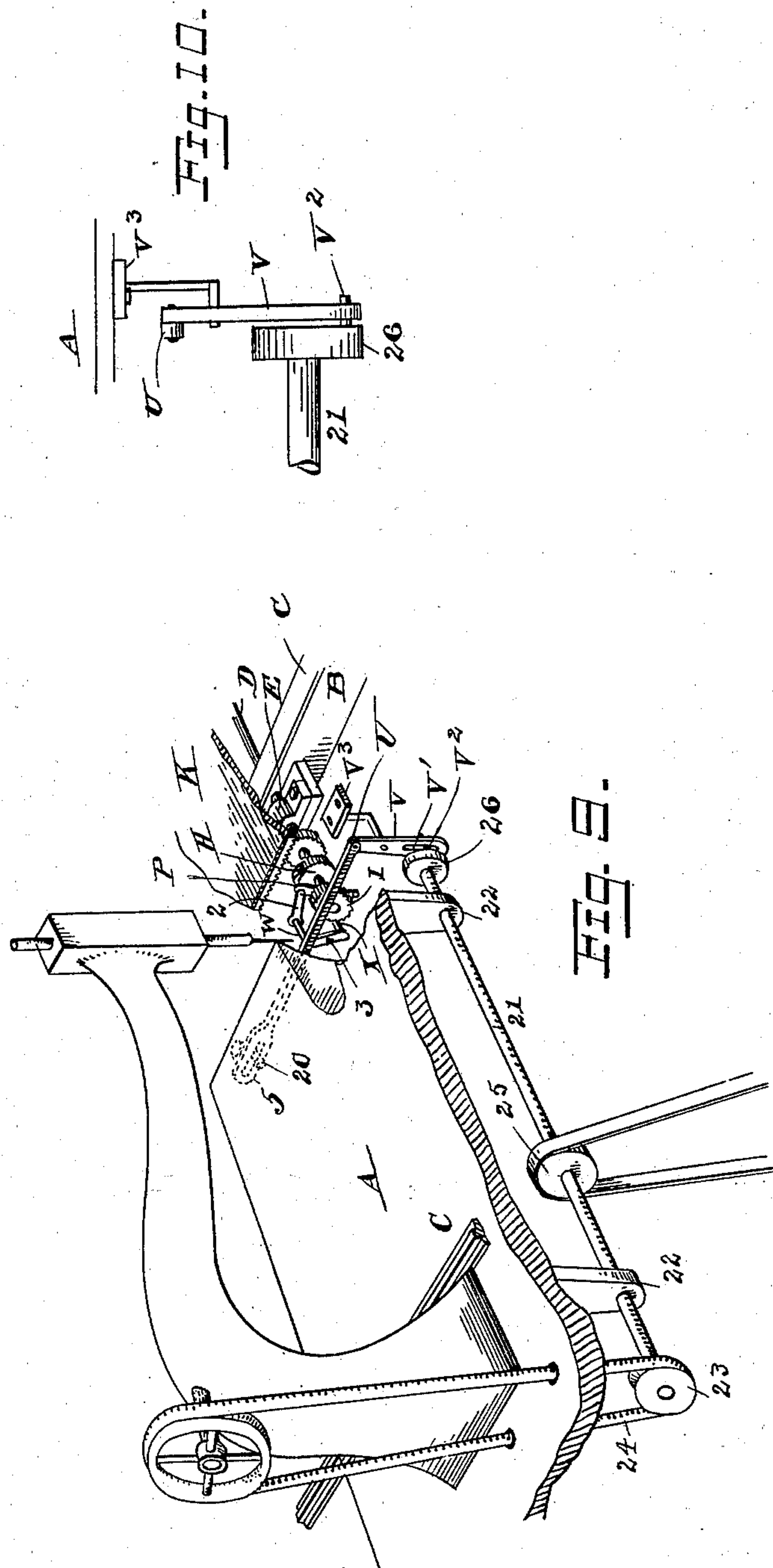
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4 SHEETS—SHEET 4.



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RODNEY MITCHELL, OF PEORIA, ILLINOIS.

FEEDING MECHANISM FOR BOOK-SEWING MACHINES.

SPECIFICATION forming part of Letters Patent No. 752,791, dated February 23, 1904.

Application filed June 14, 1902. Serial No. 111,790. (No model.)

To all whom it may concern:

Be it known that I, RODNEY MITCHELL, a citizen of the United States, residing at Peoria, in the county of Peoria and State of Illinois, have invented certain new and useful Improvements in Feeding Mechanism for Book-Sewing Machines; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

This invention pertains to sewing-machines for bookbinders' use.

The object of the invention is to provide a new means for automatically shifting the table which carries the work to be sewed.

A further object is to automatically propel said table beneath the needle and provide means for reversing it automatically at the end of the line of sewing or at any predetermined point and carry it back in the opposite direction, so as to retrace the stitches already set.

A further object is to provide a table for carrying the entire work to be sewed, so that it cannot become disarranged, all of which will be pointed out hereinafter.

A still further object is to provide means for releasing the table, so that it can be moved by hand independent of the operating means.

I am aware that some of the above objects have been accomplished in various ways; but it is my aim to provide a more simple mechanism than heretofore used.

In the accompanying drawings, Figure 1 is a plan view of a portion of the machine and an adjoining framework for carrying a table which carries the work. Fig. 2 is a longitudinal elevation of the same on line X X, Fig. 1. Fig. 3 is cross-section of a shaft on line Y Y, Fig. 1, showing the means for shifting the table. Fig. 4 is the same view with some of the parts in a slightly-different position. Fig. 5 is a transverse sectional elevation of the machine on line Y Y, Fig. 1. Fig. 6 is a perspective view of a shifting rod used to operate pawls and by the action of which the said pawls are either thrown into or out of ratchet-wheels which operate the table. Fig. 7 is detail view of a locking device for the shifting

rod described above. Fig. 8 is a face view of an arm which operates the pawls described in the description of Fig. 6 above. Fig. 9 is a perspective view of the arm of the sewing-machine, together with a portion of the table for carrying it and showing the operating mechanism. Fig. 10 is a detail view of a portion of the mechanism shown in Fig. 9.

In the figures, A represents the machine-table, which remains in a stationary position, but forms no part of my invention.

B B B indicate the frame of a table-support, upon which is mounted three tracks C C C, two of which are formed with a central raised portion, as shown in Fig. 2 in elevation. Opposite the middle of the table A is a shaft D, at right angles to the tracks, as shown in Fig. 1, and mounted in bearings, one of which is indicated at E, near the middle of the machine upon a bracket F. The end of said shaft adjacent to the table A carries a cog-wheel G, adjacent to the bearing E described. Fastened to the shaft next to said cog-wheel are two ratchet-wheels H and I, while at the opposite end of the shaft is a cog-wheel J similar to G.

At K in Figs. 2 and 5 is a shifting table, also indicated in Fig. 1 in broken lines. Said table K carries at each corner a grooved wheel L, which fits over the raised tracks at each end of the machine and serves to guide the table in a straight line. At about the middle of the table K, at or near each edge, is a flat-faced roller M to roll upon the middle track adjacent to the bearing E.

At N N, Fig. 1, are represented in broken lines toothed racks secured to the under side of the table K and with which the cog-wheels G and J are adapted to mesh. Adjacent to each ratchet-wheel is an arm P, whose one end is loosely carried on the shaft D or upon the hubs of the said ratchets and whose other ends have a right-angled projection or arm Q, having a pin R, as shown. A pawl S is pivoted to the said arm P and engages with the ratchet-wheel, as shown in Fig. 3. A spring T is let into a slit in the pawl, and the free end thereof bears beneath the said pin R. The spring is so constructed that it tends to force the pawl into the teeth of the ratchet-wheel. By reference

to Figs. 1 and 2 it will be seen that one of the said arms P is placed between the ratchet-wheels H and I and the other outside the wheel I. There is no peculiarity in this arrangement of the arms; but attention is called to it merely to clearly locate the positions. It will be further observed that one of the arms extends up from the shaft, while the other extends down, as in Figs. 3 and 4. Movement is imparted to said arms and their pawls by means of a reciprocating arm U just beneath the machine-table A, as shown in Figs. 1 and 2, the details of which are seen in Figs. 3, 4, and 8.

An arm V, Figs. 3, 9, and 10, is pivotally carried on a bracket V³, secured to the table A, and its upper end is pivotally connected to the arm U described. The lower end of the said arm V is slotted at V' and receives a pin V², carried on a crank-disk 26 on the end of a driving-shaft 21, carried in bearings 22 beneath the said table A. The shaft is driven by means of a belt-pulley 25 and imparts motion to the machine-head mechanism through a pulley 23 and belt 24, as shown. The said arm U has a post W, carrying a link 2, pivoted to the upper arm P. (Described and shown in broken lines in Fig. 3.) Depending from U is an arm 3, carrying at its lower end a stud or post X, upon which a link 4 is carried and whose one end is pivotally connected to the lower arm P. An inclosed slot 5 on the free end of the arm U travels back and forth on a stud 2, affixed to the table A in any good manner. Evidently when the rod U is given a reciprocating end movement the arms P, which are loose on their support, will also be moved, and if either pawl is in engagement with its ratchet-wheel said wheel will be revolved in proportion to the amount of movement imparted to the pawl which engages with it. By a continued back-and-forth movement the pawl will constantly turn the wheel a portion of a revolution, together with the shaft D, to which it is secured. Now since the cog-wheels G and J are also turned a like distance and are in mesh with the racks of the movable table K the latter will necessarily be moved along the tracks in a series of short progressions corresponding with the length of stitches desired. By my arrangement I am able to carry the table along in the above manner, and when desired I can automatically reverse the movement and carry the table back in the opposite direction. This is accomplished by providing the two ratchet-wheels, the teeth of which extend in opposite directions, as shown in Fig. 4, wherein the nearest wheel is broken away at the bottom to show the one beyond. The pawls must of necessity move in the same manner by reason of their both being secured to a rigid member, which is the arm U. In order to control the pawls so that but one of them is in use at the same time, I employ a controller composed of a shifting rod 6, carrying a fork, the fin-

gers of which are indicated by the numerals 7 and 8. In Fig. 2 the finger 7 is shown above the shaft and lying adjacent to the ratchet H, and the finger 8 is below the shaft and adjacent to the ratchet I. Each pawl carries a lug S', which overhangs the fingers just described and, in fact, rests upon them. The upper finger is cut out on top at the end, as shown in Figs. 3 and 4, so that when the fork is in the position shown in Fig. 3 the pawl is permitted to engage the wheel below it; but when the said fork is positioned as in Fig. 4 the pawl will be raised, as shown in said figure; also, in Fig. 3 the lower pawl is thrown out of its ratchet-wheel by reason of the position of the finger 8, while in Fig. 4 a depression in such finger allows the pawl to reach its ratchet, as shown. An intermediate position of the fork, as indicated by broken lines in the figure last referred to, will hold both pawls out of action, as will be understood.

The operation of the device is as follows: When the table K is occupying the position shown in Fig. 1 in broken lines, the machine is started. The needle descends through its opening b in the plate a of the table A and at the same time through the slot K' in the table K, and when withdrawn the reciprocating arm U is caused to move, and thus impart movement to the pawls. At this time the fork 6 occupies the position shown in Fig. 3, so that the pawl of the wheel H is engaging the latter. By the movement of the rod U, as above described, the pawl is carried forward, and in consequence the shaft D is turned and the table K carried forward for a short distance, where it stops abruptly and the needle again descends, after which the same movement takes place, and so on as long as the machine is kept in operation and until the said table K reaches its limit of movement across the tracks. When such limit is reached, a depending lug 9 on the table, Fig. 5, strikes an upwardly-projecting finger 10 on a sleeve 11, secured on the shifting rod 6, and pushes the latter rod along in the direction in which the table K is moving. In thus shifting the rod the fork is pushed to the position shown in Fig. 4, where the upper pawl, which has been in engagement, is now lifted out of the ratchet-teeth and the lower pawl allowed to operate. Now since the ratchet-wheel I has its teeth set in the opposite direction to those of the wheel H and the pawl is moved the same as the upper one it must follow that the shaft D will now be turned in a reverse direction, thereby changing the direction of movement of the table, which it propels. Said table now approaches the position shown in Fig. 1 referred to, and when reaching its limit the said stop 9 now strikes a finger 12, which corresponds with 10, and the fork is brought back to the initial position. The machine will continue to operate in this manner as long as the power is kept on, and the table will travel

back and forth, reversing at each end of the stitch. It is sometimes desirable to have both pawls free of their ratchets, so that the table K can be moved at the will of the operator to any position desired for the purposes of inspecting the work or placing short stitches independent of the gearing. When it is desired to do so, the shifting rod 6 is carried to a position between the extreme positions shown in the figures by means of a handle at 13, where the pawls will both be forced away from their ratchets, as has been described. In order to provide a means of holding the rod 6 in any of its three positions when so placed, I employ a housing 14, which is secured to the frame of the machine and has a guide 15, which carries a pin or plunger 16, surrounded by a spring 17. Upon the pin is a fixed washer 18, which by the action of the spring against it and the guide forces the pin 16 toward the shaft or rod 6, which plays through the housing. When the said rod is moved by the lug 9 on the table K, the notches 19 therein are caused to pass under the plunger 16 and the latter is forced into them; but the spring is not so strong that it will not easily permit the plunger to be forced out of such notches as the rod is moved back and forth by force. In the position shown in Fig. 7 the plunger is holding the rod at the middle position or at that position where both the pawls are out of operation. At the other positions the table would be moving in one direction or the other. I desire to make it understood, however, that this spring-plunger device may not be used, and, in fact, I have not used it up to this time; but it is merely here shown to indicate how the rod 6 may be held, if desired.

It will be understood that at any time the operator may reverse the direction of the movement of the table K by simply shifting the said rod 6 so as to change the position of the pawls, as will be seen.

The lugs 10 and 12 may be adjusted along the rod 6, so that the table will be reversed at any predetermined point by striking them. Said table then will traverse a length of track corresponding to the distance between the lugs. In this way the table may be set to move the length of a book and then reverse and restitch the same. The idea is to so arrange the device that the length of the line of stitches may be set as desired.

By adjusting the parts to move the ratchet-wheels a greater or less portion of a revolution the length of the stitch itself may be altered at will, as will be fully understood.

I claim—

1. A stitching-machine for bookbinders' use comprising the sewing mechanism, a movable table for supporting and carrying the work to be sewed, a shaft beneath the table, cog-wheels on the shaft, toothed racks on the table for engaging the said cog-wheels, ratchet-wheels on the shaft each having its teeth extending

in an opposite direction from those of its neighbor, a pawl for each ratchet and means for operating said pawls to turn the said wheels, but one of which is in operation at a time, and a controlling device shifted automatically by the table for permitting one of the pawls to engage its respective ratchet-wheel while holding the other out of engagement.

2. In a sewing-machine of the character described, the combination with the shiftable work-carrying table therefor, of a shaft for imparting movement to said table in a step-by-step movement for the purposes indicated, racks on the table, gear-wheels on the shaft for engaging the racks, and a right and a left ratchet-wheel on said shaft, an arm P arranged to oscillate on the shaft adjacent to each of the ratchet-wheels, a pawl pivoted on each arm to engage one of the ratchets, a reciprocating arm pivotally connected with each of the arms P to oscillate the pawls to turn one or the other of said ratchets, a forked controller actuated to engage or disengage one or the other of the pawls as set forth, said controller being operated automatically by the moving table to reverse the position of the pawls and thereby reverse the direction of movement of the table.

3. In a sewing-machine, the shiftable work-carrying table therefor, a shaft beneath the same lying at right angles to the line of movement of such table, gears on the shaft, racks on the table for engaging the gears, ratchet-wheels on the shaft, the teeth of one extending in an opposite direction to those of the other, an arm pivotally carried in the region of each ratchet-wheel, a pawl carried on each arm, a rod pivotally connected to the arm for imparting an oscillating movement to the pawls, such rod receiving a reciprocating movement from the sewing-machine mechanism, a controller for changing the position of the pawls for the purposes set forth consisting of a rod shiftable in the direction of its length and in the direction of the line of movement of the table-fingers on one end of the rod for engaging the pawls, projections on the rod substantially as described and shown, and projections on the shifting table for contacting with the latter fingers for shifting the rod at each limit of movement of the table in its backward-and-forward movement as set forth.

4. In a stitching-machine for bookbinders' use, the sewing mechanism, a shifting table for carrying the work to be sewed, a shaft for moving said table, cogs on the shaft, a toothed rack on the table for engaging the cogs, ratchet-wheels H and I on said shaft, a pawl S for each ratchet, one above and the other below its respective ratchet, arms P for carrying the pawls, means for imparting movement to the pawls through said arms P whereby the ratchet-wheels are turned as described, and a controlling device consisting of the shifting rod 6 with the fingers 7 and 8 one of

which is placed beneath one of the pawls and arranged whereby in one position one of the pawls is in engagement with its ratchet and the other is out of engagement, and when in
 5 another position the positions of the pawls is reversed, and when in still another position both pawls are lifted out of engagement and the table is free to move independent of the entire mechanism, and a stop 12 on the table
 10 for engaging the shifting rod 6 for throwing the pawls into use and reversing the direction of movement of the shaft and table for the purposes set forth.

5. In a sewing-machine of the character described, a work-carrying table, tracks for carrying it, a shaft lying transversely of the line of movement of the table, racks secured to the table, gear-wheels on the shaft for engaging the racks to move the table, a pair of ratchet-
 20 wheels on the shaft the teeth of one ratchet facing in an opposite direction to those of the other, a pawl for engaging each ratchet-wheel, means for carrying the pawls, an arm journaled on the machine and having reciprocating movement in the direction of its length at right angles to the length of the shaft, connection between the pawls and the arm for imparting a to-and-fro movement to the said
 30 pawls to move the shaft in a series of partial turns for imparting a series of progressive movements to the carrying-table, a two-arm fork adapted for shifting movement in the direction of the line of movement of the pawls, each of the arms engaging one of the pawls
 35 to disengage it from or permit it to engage with its respective ratchet, said fork being operated automatically by contact of the moving table therewith to reverse the position of the pawls and consequently to change the
 40 direction of movement of the table.

6. In a sewing-machine of the character described, the combination of the moving work-table A, tracks C for carrying it, the shaft D journaled beneath the table at right angles to
 45 the tracks, toothed racks N N on the table, gear-wheels G and J on the shaft for engaging the racks, ratchet-wheels H, I, affixed to

said shaft D the teeth of each extending in opposite directions to those of the other, the
 50 pawls S for engaging the ratchets and arranged substantially as set forth, the reciprocating arm U operated by the machine for imparting a to-and-fro movement to the pawls, the shifting rod 6 having the arms 7 and 8 for
 55 engaging the pawls substantially as and for the purposes set forth and means on the table for engaging the rod 6 for changing its position to reverse the position of the pawls for reversing the direction of movement of the
 60 said table.

7. In a sewing-machine of the character described, the combination of the moving work-table A, tracks C for carrying it, the shaft D journaled beneath the table at right angles to the tracks, toothed racks N N on the table,
 65 gear-wheels G and J on the shaft for engaging the racks, ratchet-wheels H, I affixed to said shaft D the teeth of each extending in opposite directions to those of the other, the
 70 pawls S for engaging the ratchets and arranged substantially as set forth, the reciprocating arm U operated by the machine for imparting a to-and-fro movement to the pawls, only one of which is in engagement with its
 75 ratchet, the shaft 21, the eccentric plate 26 thereon, the arm V pivoted on the machine and operated by said plate 26 said arm V having pivotal connection with the said arm U for imparting the reciprocating motion there-
 80 to, the arms P loosely mounted on the shaft D and carrying the said pawls, the pins W and X carried by said arm U, the links 2 and 4 connecting said pins with the arms P, the rod 6, the fingers 7 and 8 thereon each en-
 85 gaging one of the pawls, the fingers 10 and 12 on the said rod 6, the lug 9 on the shifting work-table all arranged substantially as set forth and described.

In testimony whereof I affix my signature in presence of two witnesses.

RODNEY MITCHELL.

Witnesses:

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 A. KEITHLEY.