(Model.) 3 Sheets—Sheet 1.

B. T. STRING & S. MILLER.

MACHINE FOR SEWING ON BUTTONS.

No. 507,507. Patented Oct. 24, 1893.

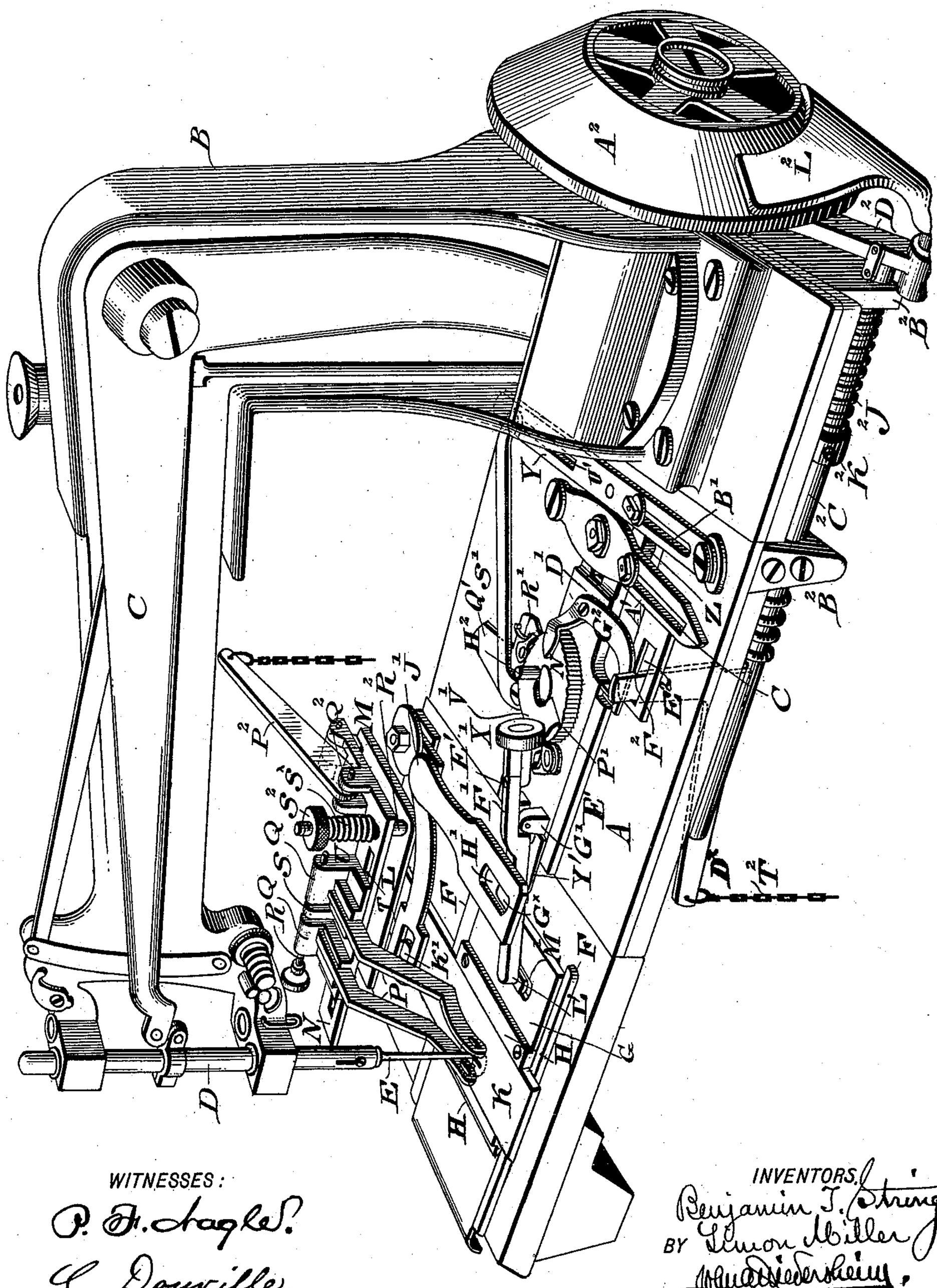

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Fig. 2.

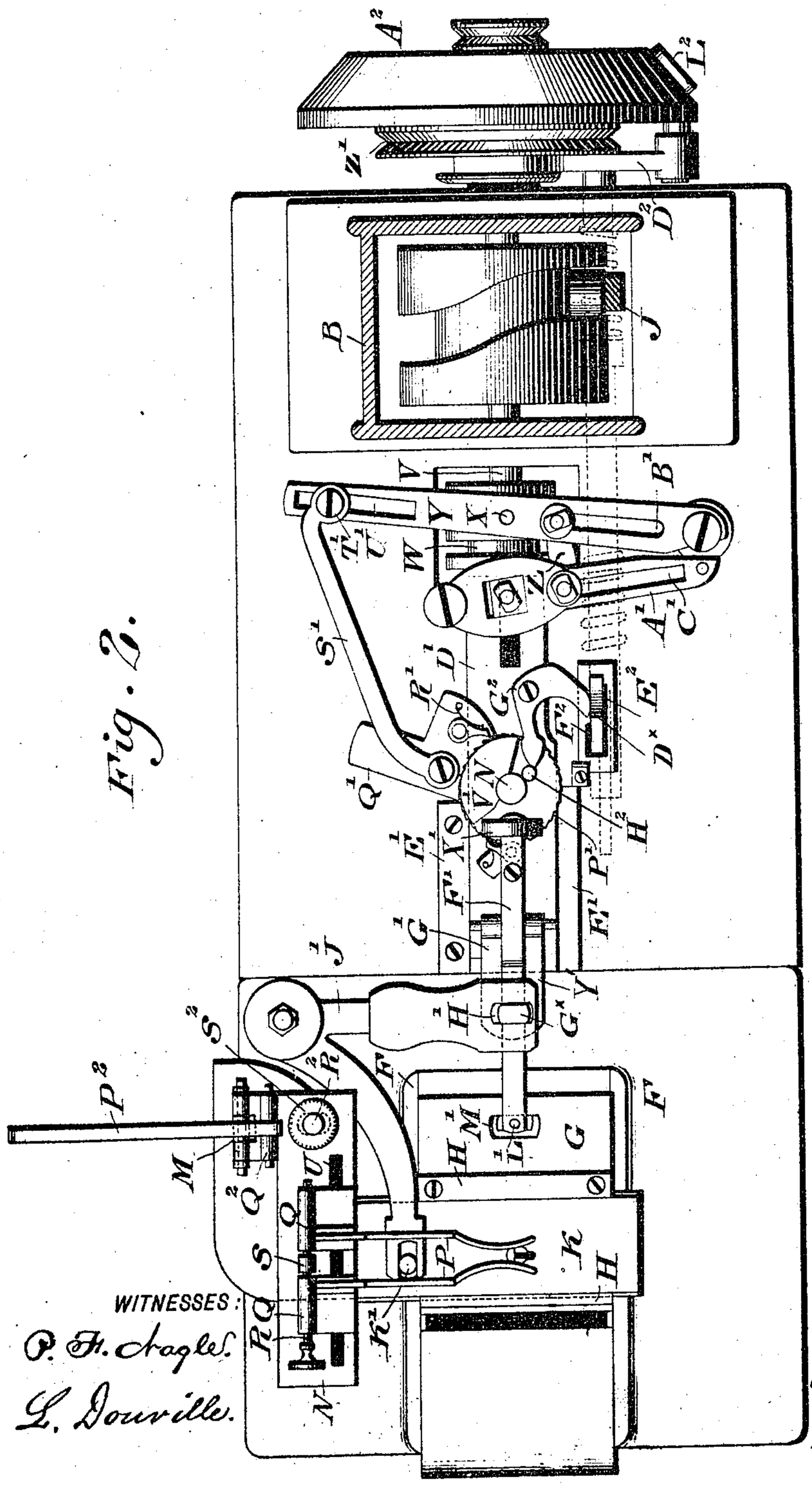

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Fig. 3.

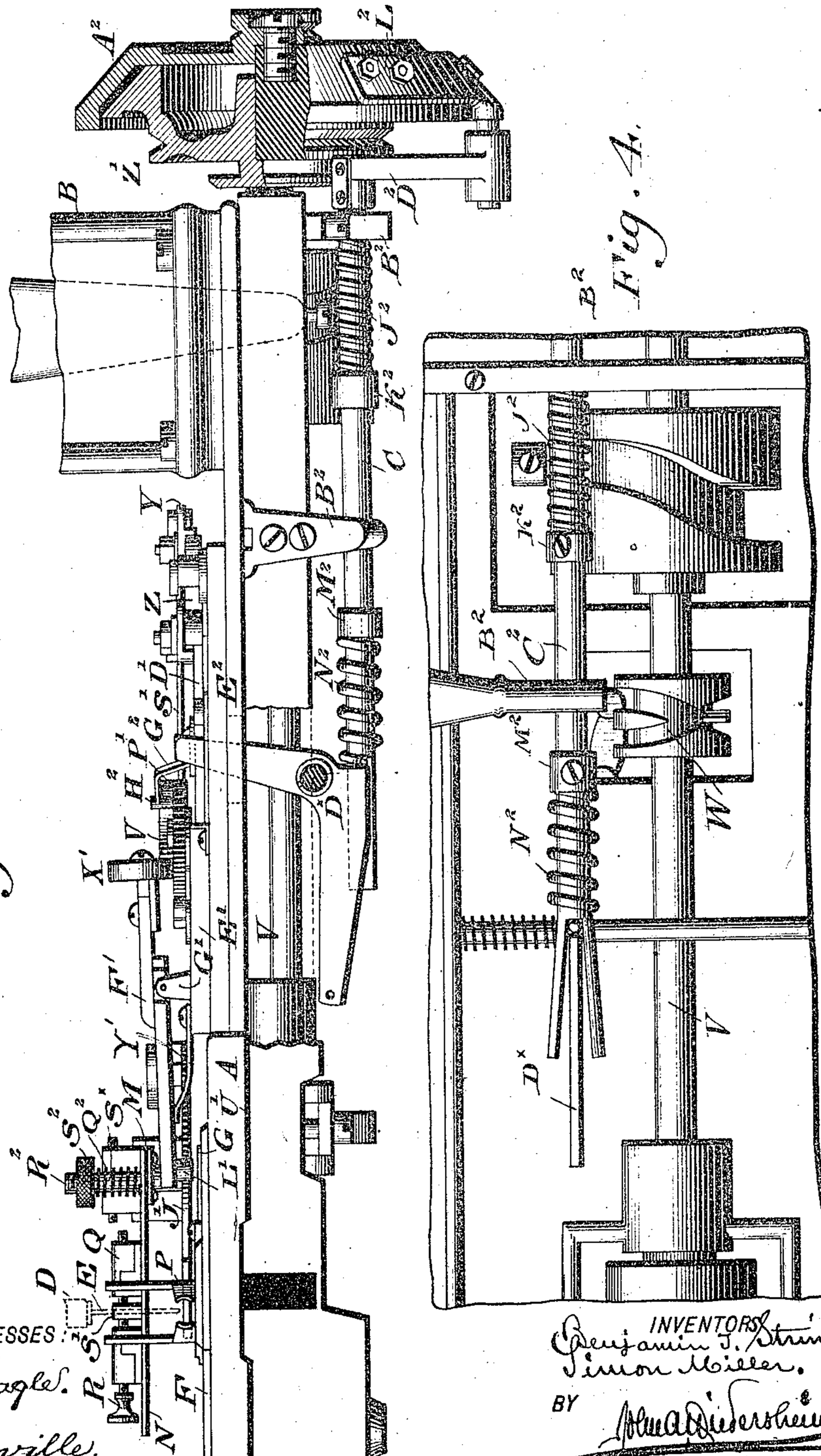

Fig. 4.

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UNITED STATES PATENT OFFICE.

BENJAMIN T. STRING AND SIMON MILLER, OF PHILADELPHIA, PENNSYLVANIA; SAID STRING ASSIGNOR TO SAID MILLER.

MACHINE FOR SEWING ON BUTTONS.

SPECIFICATION forming part of Letters Patent No. 507,507, dated October 24, 1893.

Application filed February 15, 1892. Serial No. 421,513. (Model)

To all whom it may concern:

Be it known that we, BENJAMIN T. STRING and SIMON MILLER, citizens of the United States, both residing in the city and county of Philadelphia, State of Pennsylvania, have invented a new and useful Improvement in Button-Sewing Machines, which improvement is fully set forth in the following specification and accompanying drawings.

Our invention relates to improvements in button sewing machines, and has for its object mechanism to "sew on" a button with a cross stitch, and for this purpose it consists first, of mechanism substantially as described and claimed for operating the button holder so as to present the different holes of the button at the proper time to the needle.

It further consists of means substantially as claimed for regulating the length of travel of said button holder so as to accommodate different buttons having holes therein at dif-ent distances apart.

It further consists of means substantially as claimed for regulating the number of stitches in each direction in the "sewing on" of the button.

It further consists in the combination of parts as hereinafter set forth.

Figure 1 represents a perspective view of a portion of a button sewing machine embodying our invention. Fig. 2 represents a plan view of the part of the machine shown in Fig. 1. Fig. 3 represents a partial side view partly broken away, and a partial sectional view of the same parts of the machine. Fig. 4 represents a bottom view of the mechanism below the bed plate of the machine embodied in my invention.

Similar letters of reference indicate corresponding parts in the several figures.

Referring to the drawings: A designates the bed plate of a sewing machine, B the goose-neck or overhanging arm; C the needle arm; D the needle bar and E the needle, said parts being of any usual and well known construction.

Longitudinally movable in ways F on the bed A, is the sliding plate G, and in ways or guides H on said plate G, and at right angles to the ways F, is a sliding plate K having secured thereto, at or near one end thereof, a plate L which is provided with a standard M. To said standard is pivoted or hinged a plate N, to which is secured the button holder P, said holder consisting of two spring arms connected to the blocks Q which are movable either toward or from each other on the plate N by means of the right and left threaded screw R, working in said blocks, and swiveled in a standard S on said plate N. Each of the said blocks is provided on its under face with a rib, which fits in a slot U in the plate N, so that the said blocks will move in a right line. The outer ends of the holder P are curved or indented to reliably hold a button between them, so that the same may be "sewed on" the article desired.

To operate the sliding plates G and K the following mechanism is employed: Mounted on the driving shaft V of the machine, and below the bed plate A, is a grooved cam switch W, in the grooves of which projects a stud X on the lever Y, which latter is pivoted at one of its ends to the bed plate A. The lever Y has a link Z connected with a lever A′ which is pivotally secured at its end, opposite from that of the lever Y, to the bed A, said link having its ends provided with studs which are adjustable in slots B′ and C′ respectively in said levers Y and A′. Secured to the lever A′ between its pivoted end and the link Z, by means of a block movable in a slot in said lever is a sliding plate D′, which is fitted in the guides E′ on the bed A, and has an arm F′ mounted on a standard G′ thereon, the said block also moving in a slot in the said plate. One end of the said arm F′ has on its upper face a stud $G^{\times}$ adapted to engage in a slot H′ in one limb of an elbow lever J′ pivoted to the bed A, and having its other limb with a bifurcated end embracing a stud K′ on the slide K, whereby the oscillation of said elbow lever imparts reciprocating motion to said slide K. On the under face of the same end of the arm F′, as the stud $G^{\times}$, is a stud L′ adapted to engage in a slot or opening M′ in the plate G, so that the reciprocating movement of said arm F′ may impart a reciprocating movement to said plate G. On a vertical stud N′ on the plate D′ is a rotary ratchet wheel P′, and also mounted on the same stud, is an arm Q′ carrying a spring-controlled

pawl R′. The said arm Q′ is connected with the lever Y by means of a link S′, said link being adjustably connected therewith by means of a stud or pin T′, which is secured in a slot U′ in said lever. A cam plate V′ is secured to the upper face of the ratchet wheel P′, so that during the rotation of said ratchet wheel, the adjacent end of the arm F′ which is provided with a roller X′, riding on said ratchet wheel and cam, may be raised so as to depress at the proper time the other end of the said arm, and thereby secure the stud L′ in the opening M′ and thereby the said arm to the plate G. A spring Y′ secured to the bed plate A, and bearing against the end of the arm F′ having the studs G× and L′ thereon, forces the said end upward when the roller X′ is riding on the ratchet wheel, so that the stud G× enters the opening H′ of the elbow lever J′ and thereby connects the arm F′ with the slide K, leaving the slide G free from the said arm. The shaft V is operated by means of the driving wheel Z′ which is loosely mounted thereon, and has its rim adapted to bear against a leather or other suitable gasket between it and the surrounding rim of the wheel A^2 rigidly secured on the said shaft, so that when desired the two wheels Z′ and A^2 may be clutched. Mounted in the hangers B^2 of the table A is a bar C^2 having one end secured to an arm D^2, which at one end is connected with the wheel Z′, so that while permitting its free rotation it is adapted to force it into contact with the wheel A^2. Bearing against the other end of the bar C^2 is one limb of an elbow lever or latch $D^×$ pivoted to a suitable depending attachment of the bed A, the other limb projecting through a slot E^2 in the said bed and adapted to fit in a recess F^2 in the side of said slot, when the wheel Z′ is clutched with the wheel A^2. On the plate D′ is pivoted an elbow lever G^2, one limb of which is adapted to be engaged by a pin H^2 on the ratchet wheel P′, and the other limb to bear against the upwardly projecting limb of the lever $D^×$ and release the same from the recess F^2, thus permitting the spring J^2 on the bar C^2 between the collar K^2 on the said bar and a hanger B^2 to so move the said bar as to release the piece D^2 from bearing against the wheel Z′, and at the same time bring a shoe L^2 on the said piece D^2 against the outer face of the wheel A^2, thereby locking the latter in place. Between and bearing against a collar M^2 secured to the bar C^2 and the lever $D^×$ is a coiled spring N^2, forming a spring connection for the said lever and bar. To raise the button holder P, so as to be able to remove the work from beneath the same, the plate N, which is pivoted to the standard M of the plate L, is provided with a lever P^2, which is mounted in a standard Q^2 on said plate N, and adapted to bear against the standard M as a fulcrum, whereby the plate N may be raised, thus lifting the holder P from the work. A stud K^2 secured to the plate L and freely passing through an opening in the plate N, has on its upper threaded end a nut S^2, between which and the plate N, a coil spring $S^×$ is located, the latter normally serving to keep said plate lowered, so that the button holder attached thereto will rest on the work placed on the bed A.

The manner of operating the machine is as follows: The button to be "sewed on" is placed in the holder over the needle opening in the plate K, so that the diagonal holes in said button are in line with the direction of the movement of the plates G and K. The driving wheel Z′ is operated to connect with the shaft V, so as to rotate the latter, by pulling down on the lever $D^×$ by means of the chain T^2 depending from one limb thereof. This movement of the lever locks its upper limb in the recess F^2 and forces the bar C^2 so that the arm D^2 bearing against the wheel Z′ clutches it with the wheel A^2, and at the same time releases the shoe L^2 from the outer face of the wheel A^2, so that the latter is free to rotate. Owing to the rotation of the shaft V with the cam switch W, the lever Y is oscillated thereby imparting reciprocating motion by means of the link Z to the lever A′ and thereby to the sliding plate D′. By means of the link connection of the arm Q′ with the lever Y, and the rotary motion of the ratchet wheel P′ with the cam plate V′ thereon, connection is either made by the arm F′ with the plate G by the stud L′, or with the plate K by the stud G× and the elbow lever J′, so that the said plates are moved, as desired and cross stitches made, securing the button to the cloth. The number of stitches made in one direction before a sliding plate is disengaged from its operating mechanism and the other plate is engaged thereby, is regulated by the connection of the link S′ with the lever Y. The nearer the end of the lever said link is secured, the greater the throw of the arm Q′ and the pawl R′, and the faster the rotation of the ratchet wheel P′ with the cam plate V′ thereon, thus lessening the time of travel of the roller X′ on the upper face of the ratchet wheel, and thereby the connection of the arm F′ with the elbow lever J′ and the plate K. When the roller travels on the cam plate V′, the arm F′ is released from the elbow lever J′, and the plate G is engaged, whereby stitches are made crosswise to those sewed while the plate K was operated. When the ratchet wheel P′ rotates so as to bring the pin H^2 against the lever G^2, the latter trips or releases the lever $D^×$ from the recess F^2, thereby permitting the spring J^2 to operate the bar C^2 so as to free the wheel Z′ from the wheel A^2, and at the same time clamp said wheel A^2 in fixed position by brake L^2, thus stopping the rotation of the shaft A in time to hold the needle clear of the work. As the holes or openings are at different distances apart in different buttons, the play or travel of the slides G and K is regulated by the connection of the link Z with the levers Y and A′, said connections being adjustable by

means of the fastening pins on the ends of the link being movable in the slots B′ and C′, as before stated, when the clamping nuts thereof are loosened.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. A button sewing machine having a button holder a sliding plate movable in guides on the machine bed, a second plate movable on the first plate, at an angle thereto, and carrying said button holder, a reciprocating sliding bar, a pivoted lever carried by said bar having a stud which engages said first plate, an elbow lever pivoted to the machine bed and to said second plate, and having a slot for engagement with a stud on the pivoted lever of the sliding bar, and mechanism substantially as described for operating said sliding bar, and pivoted lever said parts being combined substantially as described.

2. A button sewing machine having a button holder, a sliding plate movable in guides on the machine bed, a sliding plate movable on the first mentioned plate and at an angle thereto and carrying said button holder, a sliding bar movable in ways on the machine bed, a lever carried by said bar and adapted to engage said first plate, a lever connecting with said first lever and with the second plate, and mechanism substantially as described for operating said sliding bar, and mechanism for automatically connecting and disconnecting said levers, said parts being combined substantially as described.

3. A button sewing machine having a button holder, a sliding plate movable in guides on the machine bed, a sliding plate movable on said first plate and at an angle thereto, and carrying said button holder, a sliding bar movable in guides on the machine bed, mechanism for reciprocating said bar, a rotating wheel carrying a cam plate thereon, a pivoted lever supported on said bar and bearing on said rotating wheel, and an elbow lever connected with said second sliding plate, and having means for connecting it with said pivoted lever, the latter having means for connecting it with said first sliding plate, said parts being combined substantially as described.

4. A button sewing machine having a button holder two sliding plates, one of which carries the button holder and is movable on the other at an angle thereto, an elbow lever for operating one of said plates, a driving shaft with a cam switch, a lever operated by the rotation of said switch, a sliding bar having a pivoted lever connected with one of said first mentioned plates and said elbow lever, and a lever connected with said sliding bar and having a link connection with said operating lever, said parts being combined substantially as described.

5. In a button sewing machine, a button holder, two sliding plates one movable on the other, and carrying the button holder, a sliding bar with a pivoted arm connected with one of said plates, a lever connected with the other plate, and means whereby it may be connected with said pivoted arm, a rotating wheel with a cam thereon on which one end of said pivoted arm rides, and mechanisms for operating said sliding bar and rotating wheel, said parts being combined substantially as described.

6. In a button sewing machine, a button holder, two sliding plates, one of which carries said button holder, a sliding bar having a pivoted arm connected with one of said plates, a lever and means for connecting it with said arm and the other plate, mechanism for reciprocating said sliding bar, a rotating wheel on said sliding bar having a cam thereon, a vibrating lever and mechanism connected with said vibrating lever for regulating the movement of said rotating wheel, said parts being combined substantially as described.

7. In a button sewing machine, two sliding plates, one movable on the other and carrying a button holder, a reciprocating sliding bar having a rotating wheel with cam and pin thereon, a pivoted arm connected with said sliding bar and having one limb riding on the cam on said wheel, and the other limb connected with one of said plates, a lever connected with the other plate having means whereby it may be connected with said pivoted arm, mechanism for operating said reciprocating bar, and a trip lever and means for operating the latter from said pin, said parts being combined substantially as described.

8. In a button sewing machine, two plates, one movable on the other and carrying a button holder, a reciprocating bar having a rotating wheel with a cam and a pin thereon, a pivoted arm connected with said reciprocating bar and with one of said plates, a lever connected with the other plate, and having means whereby it may be connected with said pivoted arm, a lever pivoted to said reciprocating bar and engaged by said pin, a clutch mechanism, a trip lever released by the movement of the last mentioned lever and means operated by the movement of the said trip lever for operating said clutch said parts being combined substantially as described.

9. In a button sewing machine, a button holder consisting of spring arms having outer curved ends, blocks to which said arms are secured, a hinged plate to which said blocks are adjustably secured, a plate with a standard thereon, a lever mounted on a standard on the said hinged plate, said lever bearing against the standard on the other plate, and means substantially as described for normally keeping said hinged plate lowered, said parts being combined substantially as described.

10. In a button sewing machine, two sliding plates one movable on the other and carrying a button holder, an elbow lever with means connecting it with one of said plates, a sliding bar having a pivoted arm connected with said lever, an operating lever connected with a cam

wheel, a lever secured to said bar and a link connecting said operating and last mentioned levers, a driving shaft with fast and loose wheels thereon, a trip lever operated mediately by a pin on a rotary cam wheel on said sliding bar, and a clutch mechanism operated by said trip lever, said parts being combined substantially as described.

11. A button sewing machine consisting of a bed, two plates movable thereon at an angle to each other, a button holder on one of said plates, a reciprocating bar and mechanism connected therewith and with said plates for operating the latter, a rotating ratchet wheel on said plate with a cam and a pin thereon, a clutch mechanism and operating mechanism therefor, and trip mechanism operated by the engagement of said pin for operating said clutch operating mechanism, said parts being combined substantially as described.

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