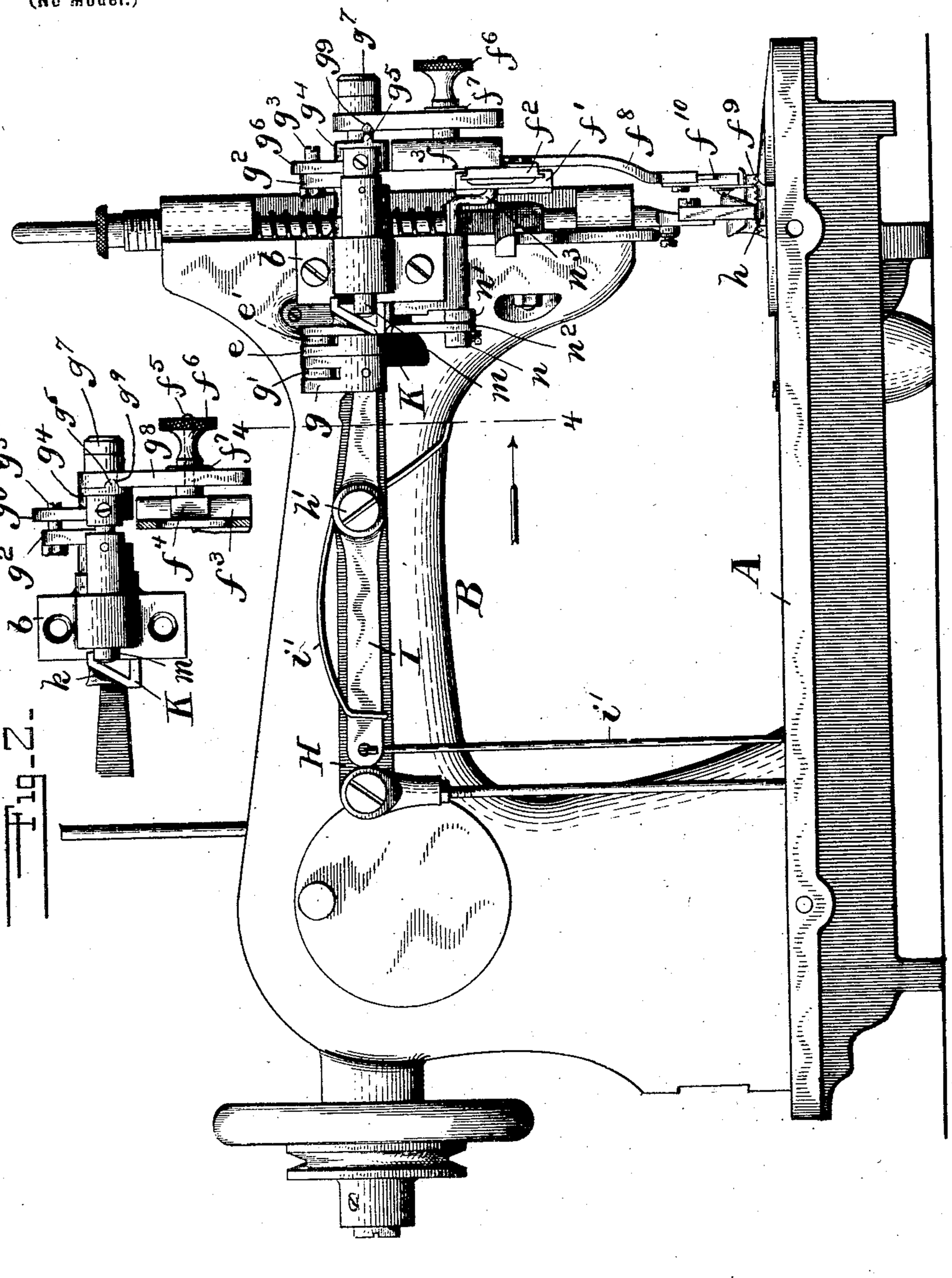
No. 703,049. Patented June 24, 1902.

J. DOUGLAS & V. HANSEN.

SEWING MACHINE RUFFLER OR GATHERER.

(Application filed Aug. 3, 1900.)

(No Model.) 3 Sheets—Sheet 1.



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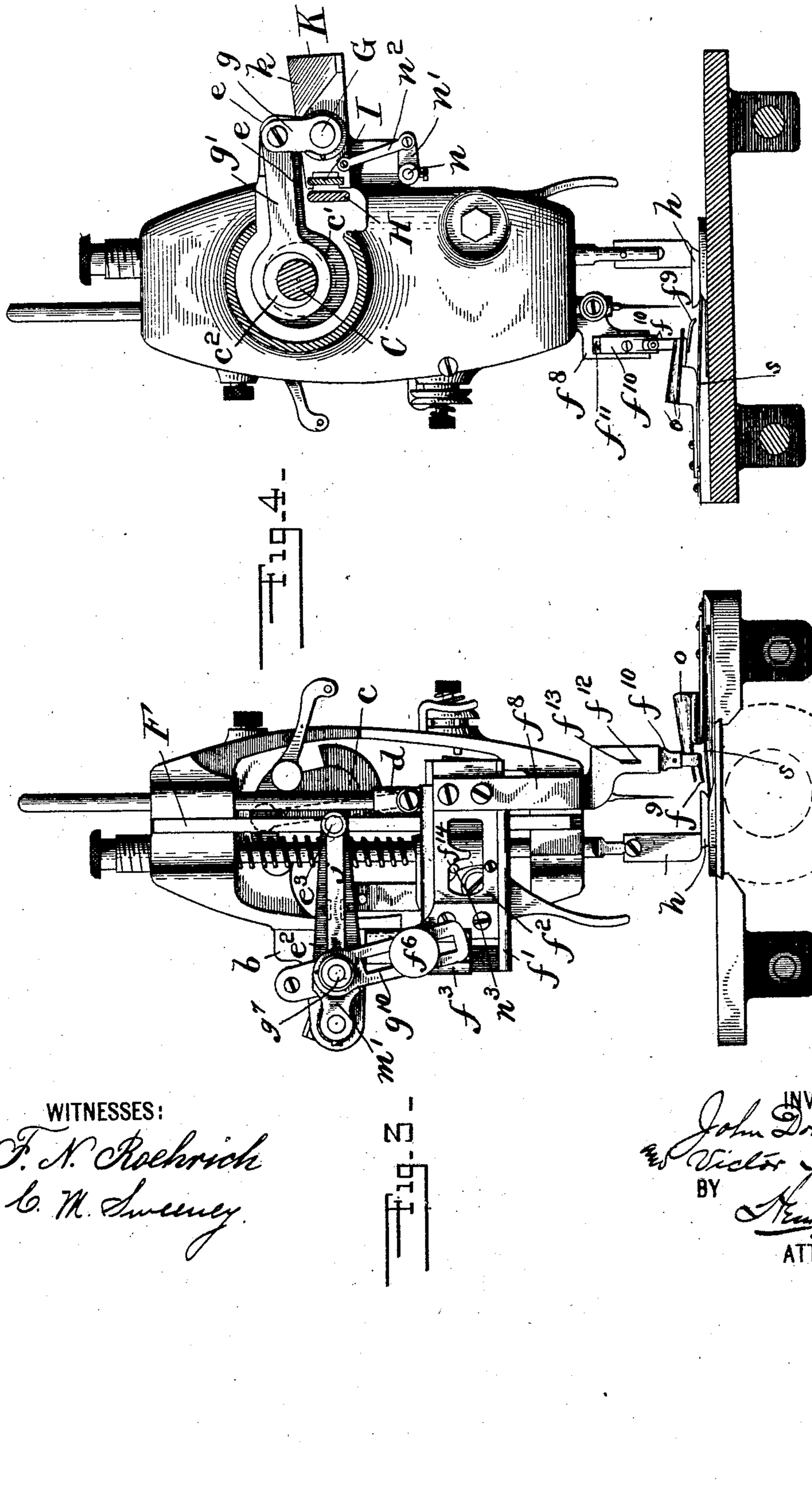

FIG. 1.

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Fig. 5.

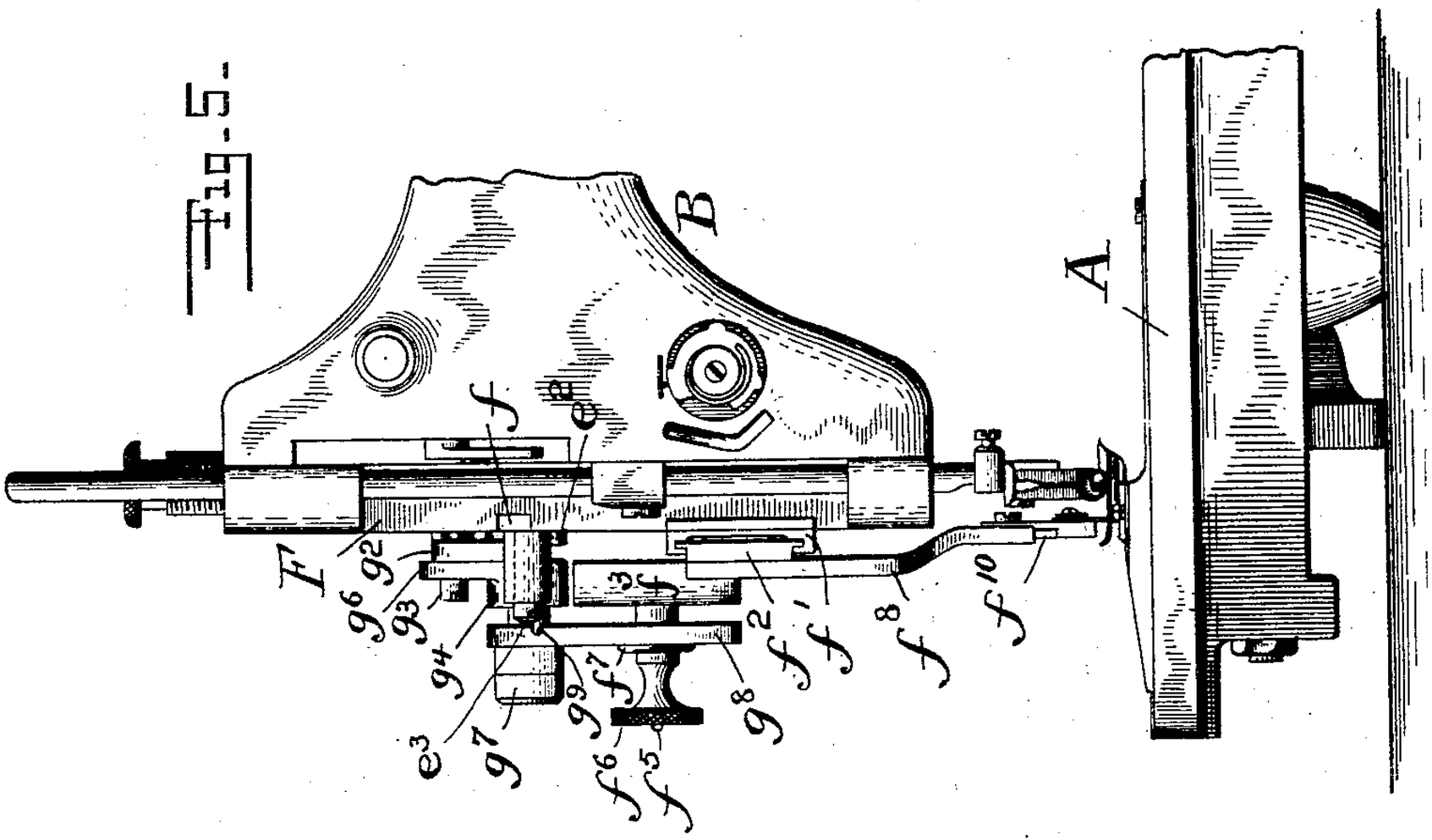

Fig. 6.

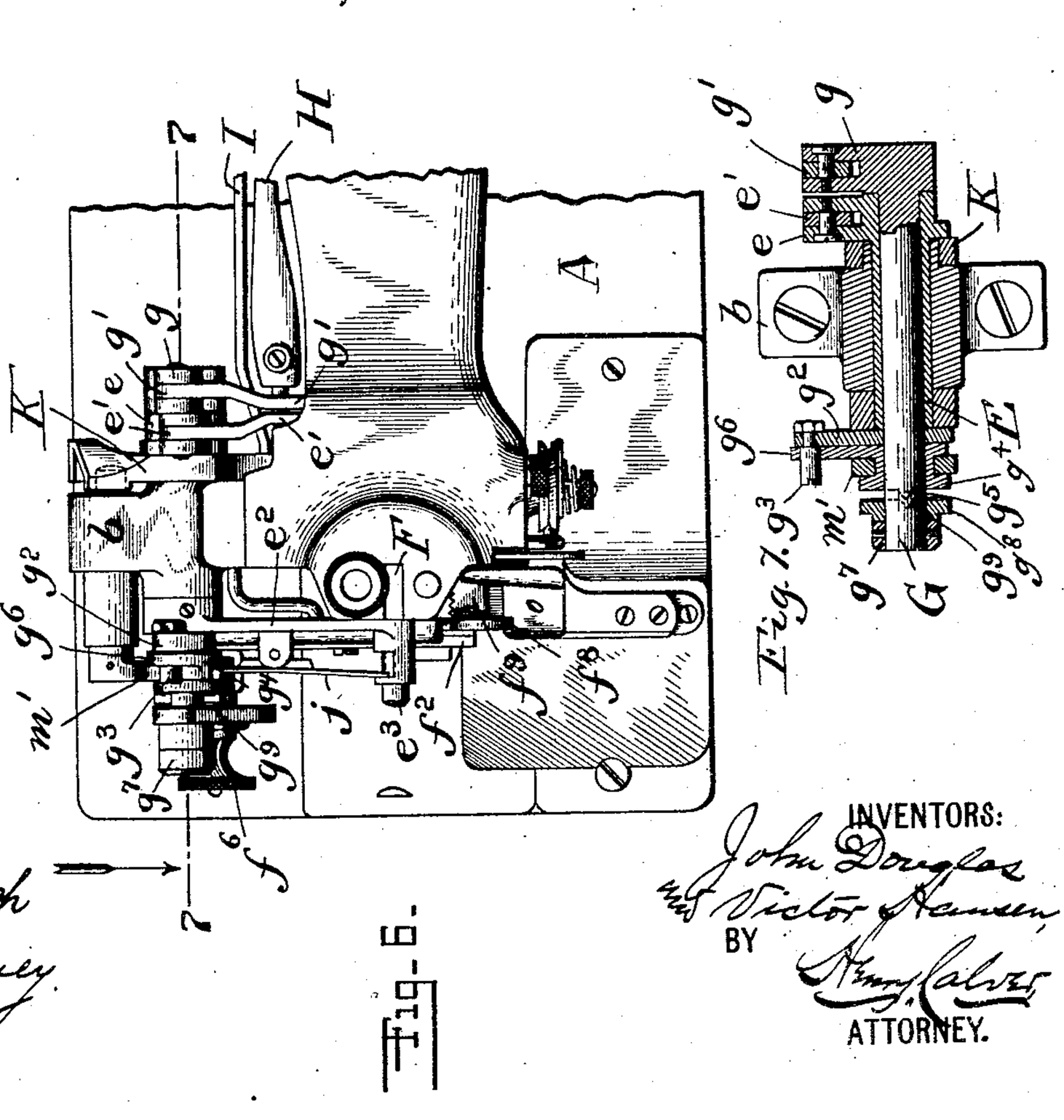

Fig. 7.

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UNITED STATES PATENT OFFICE.

JOHN DOUGLAS AND VICTOR HANSEN, OF ELIZABETH, NEW JERSEY, ASSIGNORS TO THE SINGER MANUFACTURING COMPANY, A CORPORATION OF NEW JERSEY.

SEWING-MACHINE RUFFLER OR GATHERER.

SPECIFICATION forming part of Letters Patent No. 703,049, dated June 24, 1902.

Application filed August 3, 1900. Serial No. 25,768. (No model.)

To all whom it may concern:

Be it known that we, JOHN DOUGLAS and VICTOR HANSEN, citizens of the United States, residing at Elizabeth, in the county of Union and State of New Jersey, have invented certain new and useful Improvements in Sewing-Machine Rufflers or Gatherers, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to that class of sewing-machine rufflers or gatherers adapted to be thrown into or out of operation while the machine is running, so that continuous seams which are plain in parts and which are ruffled or gathered in parts may be produced at the will of the operator, the invention having for its object to provide a device of the class referred to which will be convenient in use and strong and positive in operation.

In the accompanying drawings, Figure 1 is a rear side view of one style of "Singer" sewing-machine with the invention applied thereto. Fig. 2 is a detail view of parts shown in Fig. 1, but in different positions. Fig. 3 is a front end view of the same with the face-plate omitted. Fig. 4 is a section on line 4 4 of Fig. 1 looking in the direction of the arrows. Fig. 5 is a front side view of the head of the machine. Fig. 6 is a plan view of the forward end of the machine; and Fig. 7 is a detail section on line 7 7, Fig. 6.

Referring to the drawings, A denotes the work-plate, and B the arm, of the machine. Journaled in the upper part of the arm B is the rotating driving-shaft C, provided at its forward end with a rigidly-attached crank c, connected in the usual manner by a pitman d with the needle-bar D. The shaft C is also provided near its forward end with two eccentrics c' and c^2, which are preferably formed integral with and on the rear side of the said crank c.

The arm B is provided on its rear side with a bracket b, in which is journaled a rock-shaft E, having at its rear end an arm e, connected by a pitman e' with the eccentric c', said rock-shaft having at its forward end a second arm e^2, provided with a sliding coupling-pin e^3, arranged to enter a notch f in a vertical sliding bar F. The rock-shaft E is formed hollow, and journaled therein and passing therethrough is a second rock-shaft G, having at its rear end an arm g, connected by a pitman g' with the eccentric c^2, said rock-shaft G having at its forward end a rigidly-attached arm g^2, provided with a pin g^3.

Loosely mounted on the rock-shaft G so as to be capable of a sliding movement endwise of said shaft is a clutch-collar g^4, having clutch projections g^5, said collar having also an arm g^6, provided with a hole loosely receiving the pin g^3, carried by the arm g^2 of the rock-shaft G, so that said collar will be caused to rock with said shaft G. The rock-shaft G is provided at its outer end with a fixed collar g^7, and loosely mounted on said shaft between said fixed collar g^7 and the sliding clutch-collar g^4 is an arm g^8, the hub of which is provided with notches g^9, adapted to receive the clutch projections g^5 on said clutch-collar g^4.

The vertical sliding bar F is provided with a rigidly-attached cross-head f', provided with a slideway in which is mounted so as to reciprocate horizontally therein a slide f^2, to which is attached a slotted arm f^3, receiving an adjustable block f^4, having a pin f^5, passing through a slot g^{10} in the arm g^8, said pin being provided with a set-nut f^6, bearing against a washer f^7 to secure the pin f^5 in any desired position of adjustment in the said slot g^{10}, the adjustment of said pin in the said slot being for the purpose of varying the horizontal movements of the slide f^2 to regulate the ruffling or gathering movements of the ruffling-foot f^9, connected therewith, as will be understood.

Rigidly attached to the slide f^2 is a depending arm or bar f^8, which supports the ruffling or gathering blade or foot f^9, said blade or foot being preferably attached to a stock f^{10}, having a limited vertical movement in a guideway formed for its reception in the lower end of the bar f^8. The ruffling device or foot f^9 is pressed yieldingly downward by a small coil-spring f^{11}, located in the guideway-recess in the bar f^8 and bearing on the top of said stock f^{10}, the downward movements of said stock and foot being limited by a small pin f^{12}, carried by said stock and entering a slot f^{13} in said bar f^8.

The machine herein shown is preferably provided with an ordinary lifting-lever H for the presser-foot h, said lever H being operated in the usual manner from beneath the work-plate by a treadle or knee-lifter. Fulcrumed on the pivot-pin h' of the lever H is a lever I, also preferably operated from beneath the work-plate through the rod i, attached to the rear end of the said lever. The forward end of the lever I engages the inner end of a short transverse lever K, pivoted on a hub on the bracket b, surrounding the rock-shaft E and provided at its outer end with an incline or inclined portion k, engaging the rear end of a sliding pin m, mounted in the bracket b, and provided at its forward end with a forked arm m', engaging the sliding clutch-collar g^4, so that when the rear end of the lever I is depressed by the attendant the outer end of the lever K will be moved downward, as shown in Fig. 2, thus forcing the sliding pin m forward or outward, so as to move the rocking clutch-collar g^4 into clutching engagement with the arm g^8, which imparts positive horizontal ruffling or gathering movements to the foot f^9, and which foot will continue in operation so long as the rear end of the said lever I is thus held depressed by the attendant by means of a treadle or otherwise. When the lever I is released, the spring i' lifts the rear end of said lever and restores the parts to their normal position, (shown in Fig. 1,) with the clutch connection between the rocking collar g^4 and the ruffler-operating arm g^8 broken.

Pivoted on the arm g^2 of the rock-shaft G is a spring-lever j, the rear end of which enters a recess in the sliding clutch-collar g^4 and the forward end of which engages the sliding coupling-pin e^8 on the arm e^2 of the rock-shaft E, and thus when the said clutch-collar is moved outward into coupling engagement with the arm g^8 said coupling-pin will be pressed against the bar F, so that when the vibrating arm e^2 brings said pin into register with the notch f of the bar F said pin will enter said notch, and thus enable the said vibrating arm e^2 to impart vertical movements to said bar and to the ruffling-foot connected therewith. The spring-lever j also serves to retract the clutch-collar g^4 and the sliding pin m when the levers K and I are released. When the ruffling or gathering foot is thrown out of operation, it is desirable that it should be retracted away from the needle, and also that it should be slightly lifted or raised from the separator-plate s. To this end there is provided a small rock-shaft n, journaled in the lower part of the bracket b and provided at its rear end with an arm n', connected by a link n^2 with the inner part of the lever K, said rock-shaft having at its forward end an arm n^3 to engage a curved or inclined shoulder at f^{14} on the slide f^2, so that when the lever I is released the force of the spring i' will serve, through said lever I, the lever K, link n^2, and rock-shaft n, to move the ruffling-foot connected with said slide away from the needle and toward the attendant, as also to lift the said slide and the ruffling-foot connected therewith, and at the same time to lift the bar F through the cross-head f'.

The machine herein shown and described may for some classes of work be provided with a folder or hemmer, as o, but this is not essential.

The operation of the invention is as follows: When the machine is running and the attendant wishes the seam to be ruffled or gathered, the rear end of the lever I is depressed by its treadle connection to lower the outer end of the lever K, which by its incline k forces the sliding pin m forward or outward, so that its arm m' moves the rocking sliding clutch-collar g^4 outward into clutching engagement with the hub of the arm g^8, and thus set said arm in motion to impart horizontal movements to the slide f^2, with which the ruffling-foot f^9 is connected, so as to set said foot into ruffling or gathering operation. This movement of the lever K operates the rock-shaft n, so that the arm n^3 is released from the shoulder at f^{14} on the slide f^2 and the ruffling-foot f^9 is lowered to working position. The outward movement of the clutch-collar g^4 causes the spring-lever j to force the sliding coupling-pin e^8 inward, and thus when in the vibrating movement of the arm e^2 by which said pin is carried said pin comes into register with the notch f of the bar F vertical movements will be imparted to said bar and to the ruffling-foot connected therewith, the vertical movements of said foot being so timed relative to the horizontal or ruffling movements thereof that said foot will be lifted when it is retracted or moved backward, said foot thus having a four-motioned action. When the attendant releases the lever I, the spring i' and the spring-lever j instantly restore the parts to their former or non-operative positions, and as this can be done without stopping the machine a plain seam instead of a ruffled or gathered seam will be produced when the ruffling or gathering foot is thus thrown out of operation.

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

1. In a sewing-machine, the combination with the needle-bar-operating shaft located in the upper portion of the arm of the machine and provided near its forward end with two eccentrics, of a ruffling or gathering blade or foot, connections between said eccentrics and said blade or foot whereby positive four-motioned movements are imparted bodily to the latter, and means, controlled by the operator, for throwing said blade or foot into or out of action without retarding or arresting the operation of the stitch-forming devices.

2. In a sewing-machine, the combination with the needle-bar-operating shaft located in the upper portion of the arm of the machine and provided near its forward end with two

eccentrics, of a ruffling or gathering blade or foot, connections between said eccentrics and said blade or foot whereby positive four-motioned movements are imparted bodily to the latter, a lever operated from beneath the work-plate of the machine, and connections, controlled by said lever, whereby the said ruffling or gathering device may be thrown into and out of operation while the machine is running.

3. In a sewing-machine, the combination with the needle-bar-operating shaft located in the upper portion of the arm of the machine and provided near its forward end with two eccentrics, of a ruffling or gathering blade or foot, connections between said eccentrics and blade or foot, whereby positive four-motioned movements are imparted bodily to the latter, a lever operated from beneath the work-plate of the machine, connections, controlled by said lever, whereby the said ruffling or gathering device may be thrown into and out of operation while the machine is running, and means for lifting said ruffling device and for moving it away from the needle when it is thrown out of operation.

4. In a sewing-machine, the combination with the needle-bar-operating shaft located above the work-plate of the machine and provided near its forward end with two eccentrics, of a ruffling or gathering blade or foot, connections between one of said eccentrics and said blade or foot whereby positive forward-and-backward movements are imparted to the latter, and connections between the other of said eccentrics and said blade or foot whereby positive up-and-down movements are imparted to said blade or foot.

5. In a sewing-machine, the combination with the needle-bar-operating shaft provided with two eccentrics, of two rock-shafts operatively connected with said eccentrics, a vertically-movable bar provided with a support, a ruffling device or foot sustained by said support and horizontally movable relative thereto, disconnectible connections between said rock-shafts and said bar and device or foot and actuating means whereby said connections may be caused to operatively join said rock-shafts and said bar and ruffling device or to disconnect the same.

6. In a sewing-machine, the combination with the needle-bar-operating shaft provided with two eccentrics, the rock-shaft E operatively connected with one of said eccentrics and having the arm e^2 carrying the coupling-pin e^3, the rock-shaft G operatively connected with the other of said eccentrics, the sliding clutch-collar g^4 connected with said shaft G to rock therewith, the arm g^8 loosely mounted on said shaft G and having a hub constructed for operative connection with said clutch-collar, the spring-lever j connected with said clutch-collar and coupling-pin, the bar F notched to be engaged by said coupling-pin and having a cross-head f', the slide f^2 mounted on said cross-head and connected with the said arm g^8, the ruffling-foot connected with said slide, and means for moving the said clutch-collar lengthwise of the said shaft G.

7. In a sewing-machine, the combination with the needle-bar-operating shaft provided with two eccentrics, the rock-shaft E operatively connected with one of said eccentrics and having the arm e^2 carrying the coupling-pin e^3, the rock-shaft G operatively connected with the other of said eccentrics, the sliding clutch-collar g^4 connected with said shaft G to rock therewith, the arm g^8 loosely mounted on said shaft and having a hub constructed for operative connection with said clutch-collar, the spring-lever j connected with said clutch-collar and coupling-pin, the bar F notched to be engaged by said coupling-pin and having a cross-head f', the slide f^2 mounted on said cross-head and connected with the said arm g^8, the ruffling-foot connected with said slide, means for moving the said clutch-collar lengthwise of the said shaft G, the lever K provided with an incline, the sliding pin m engaged by said lever and having an arm engaging said clutch-collar and the lever I for operating the said lever K.

8. In a sewing-machine, the combination with the needle-bar-operating shaft provided with two eccentrics, the rock-shaft E operatively connected with one of said eccentrics and having the arm e^2 carrying the coupling-pin e^3, the rock-shaft G operatively connected with the other of said eccentrics, the sliding clutch-collar g^4 connected with said shaft G to rock therewith, the arm g^8 loosely mounted on said shaft G and having a hub constructed for operative connection with said clutch-collar, the spring-lever j connected with said clutch-collar and coupling-pin, the bar F notched to be engaged by said coupling-pin and having a cross-head f', the slide f^2 mounted on said cross-head and connected with the said arm g^8, the ruffling-foot connected with said slide, means for moving the said clutch-collar lengthwise of the said shaft G, the lever K provided with an incline, the sliding pin m engaged by said lever and having an arm engaging said clutch-collar, the lever I for operating the said lever K, and the rock-shaft n connected with the said lever K and having an arm engaging the said slide for the purpose of lifting the said ruffling-foot and moving it away from the needle when said foot is thrown out of operation.

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

JOHN DOUGLAS.
VICTOR HANSEN.

Witnesses:
HENRY J. MILLER,
W. IRVING HOUGHTON