

No. 724,109.

PATENTED MAR. 31, 1903.

G. KEYSER & J. M. WEBER.
OVEREDGE SEWING MACHINE.

APPLICATION FILED SEPT. 15, 1900.

NO MODEL.

5 SHEETS—SHEET 1.

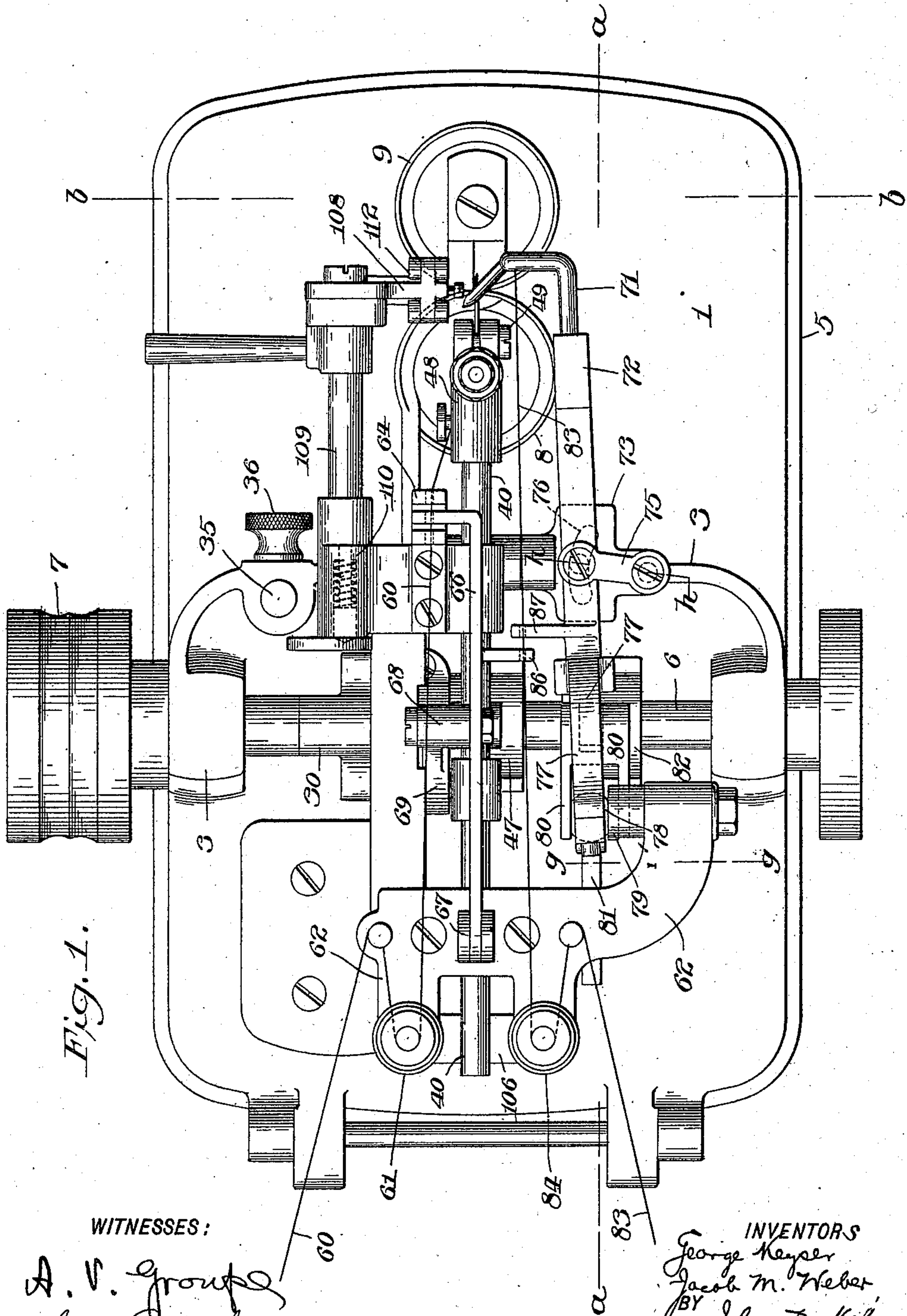


Fig. 1.

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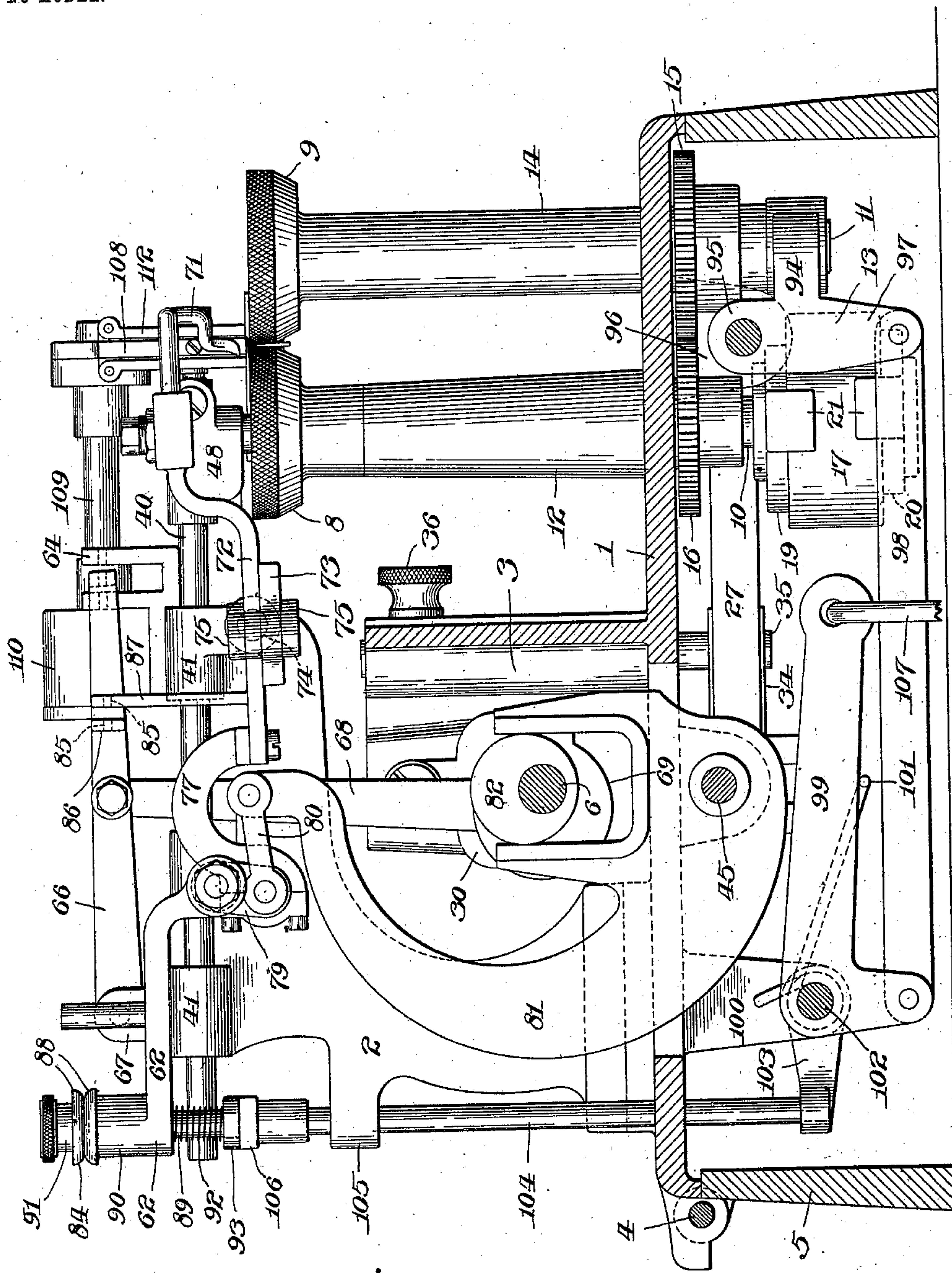
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5 SHEETS—SHEET 2.



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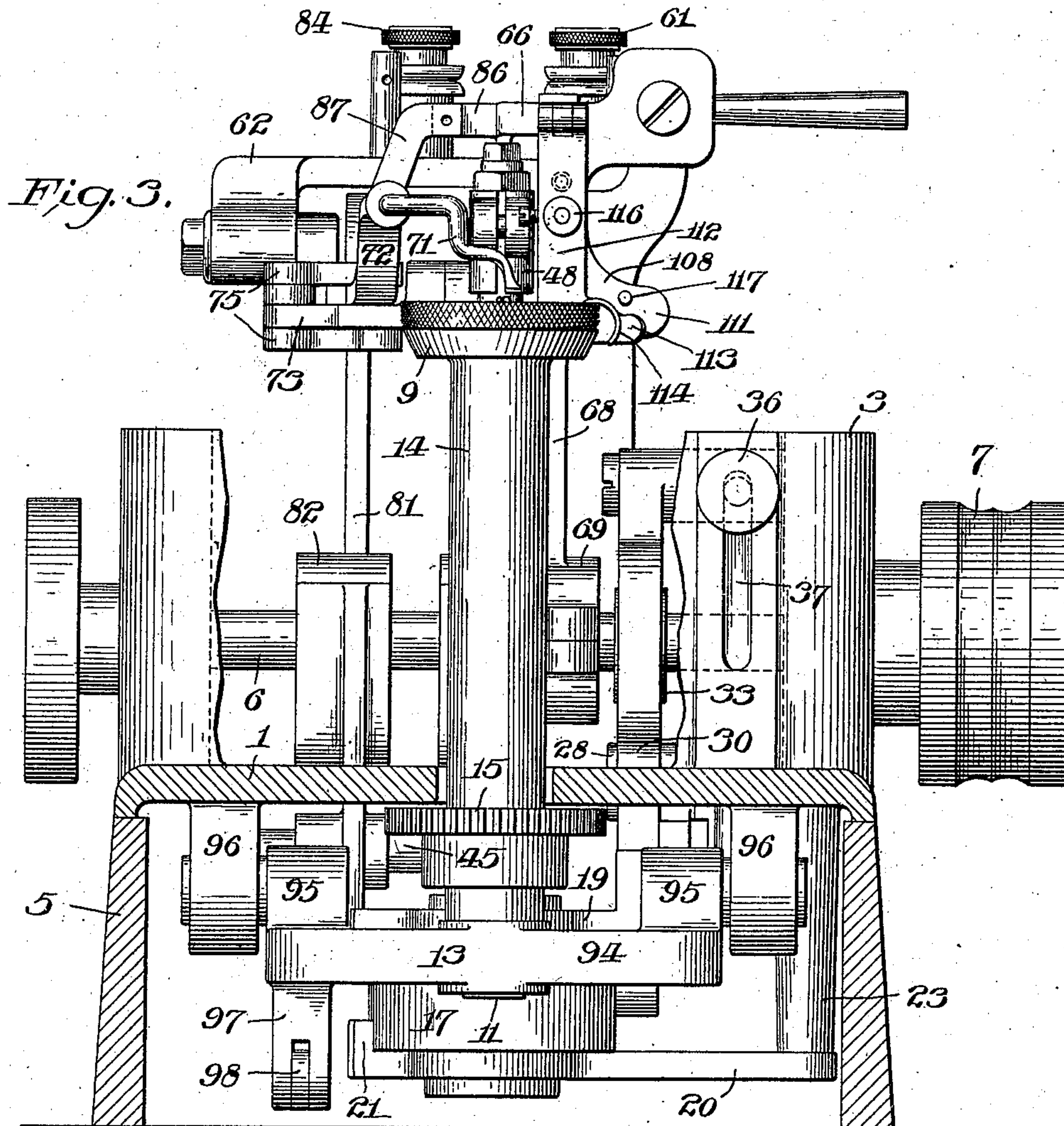
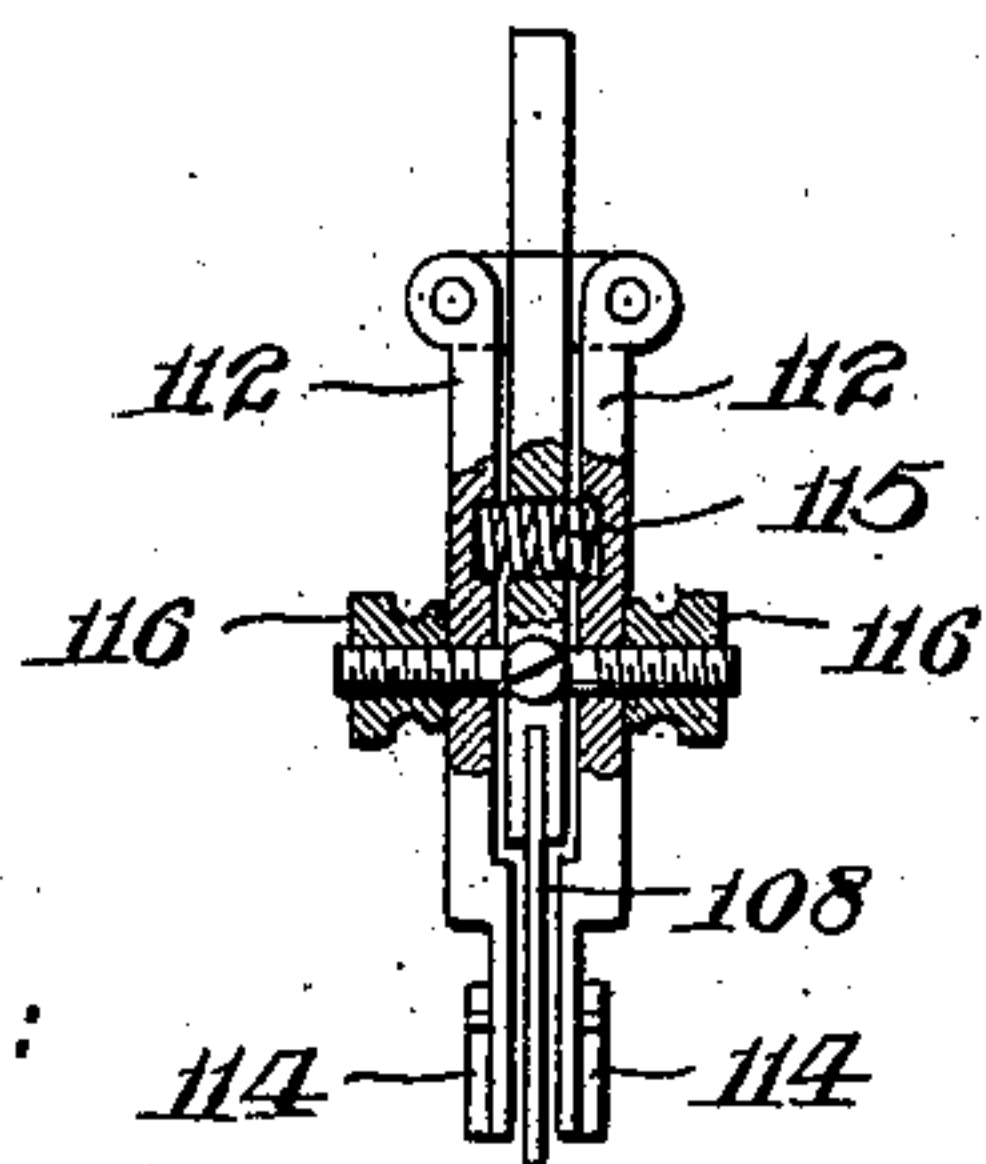


Fig. 5.

Fig. 4.



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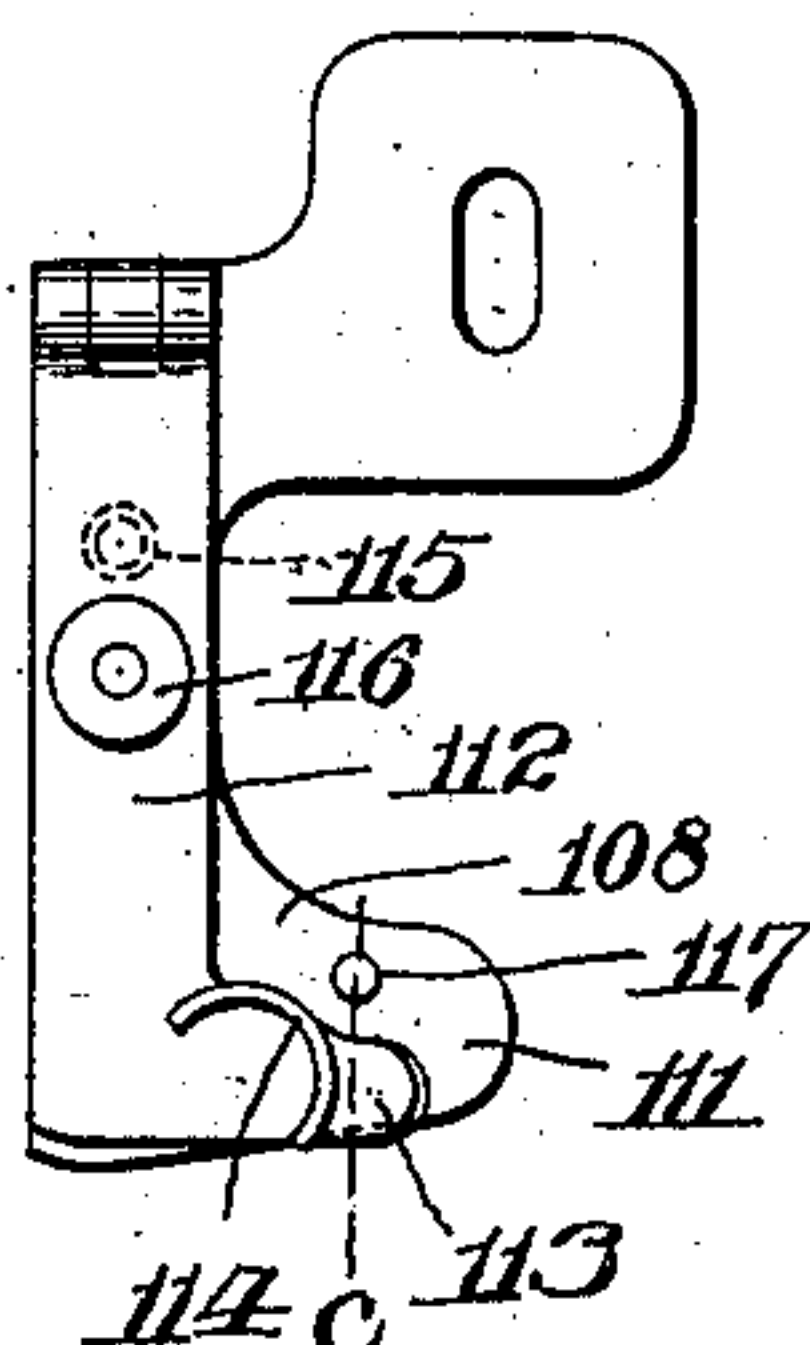
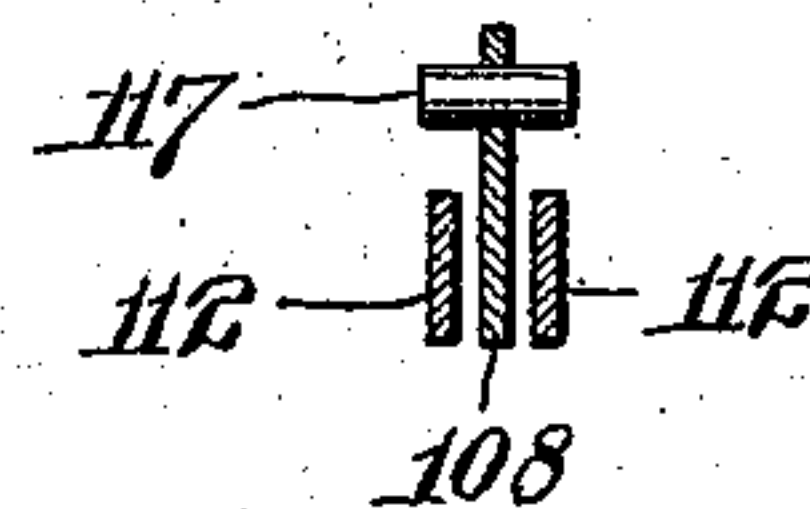


Fig. 6.



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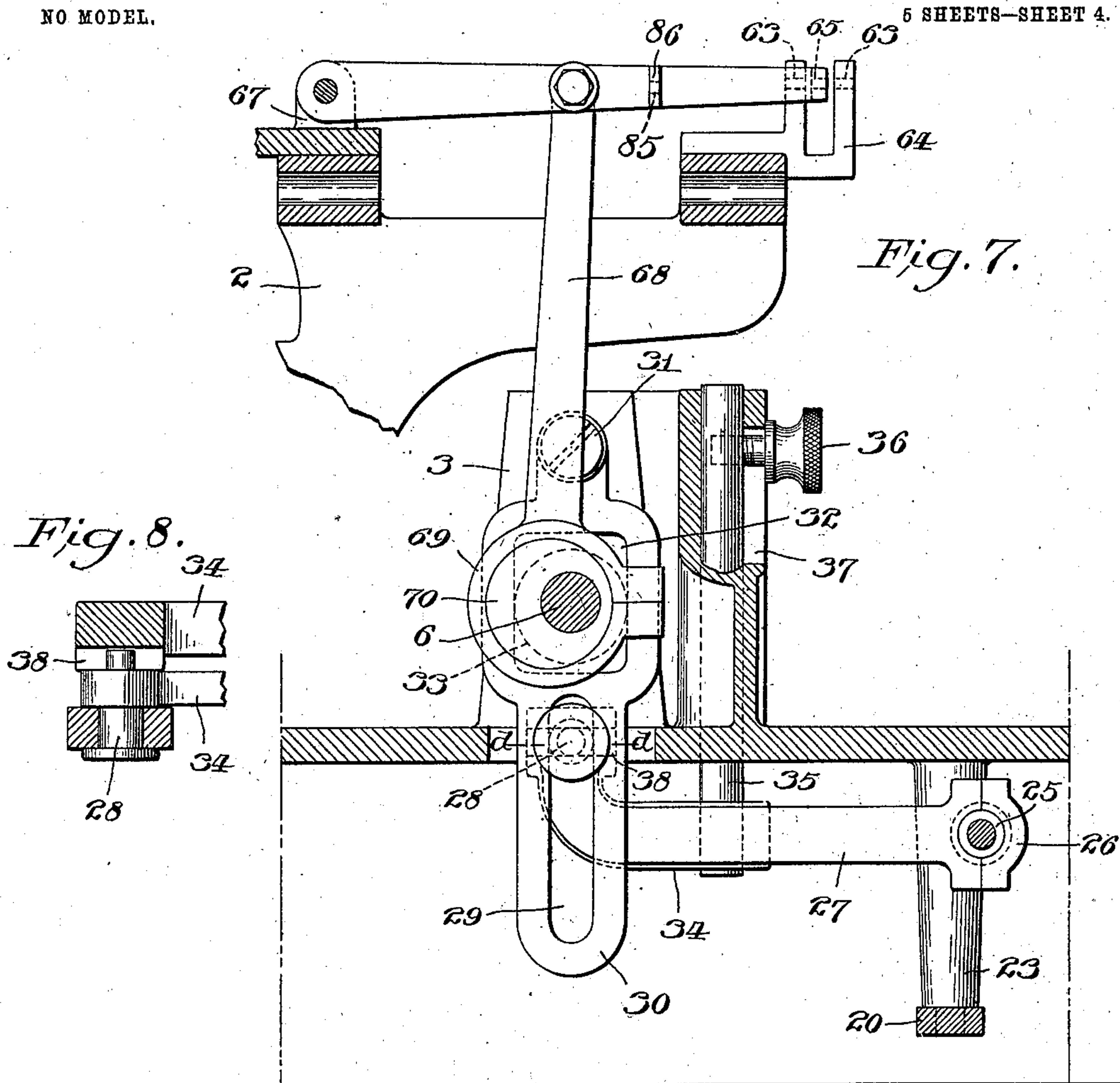
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5 SHEETS—SHEET 4.



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6 SHEETS—SHEET 5.

Fig. 11.

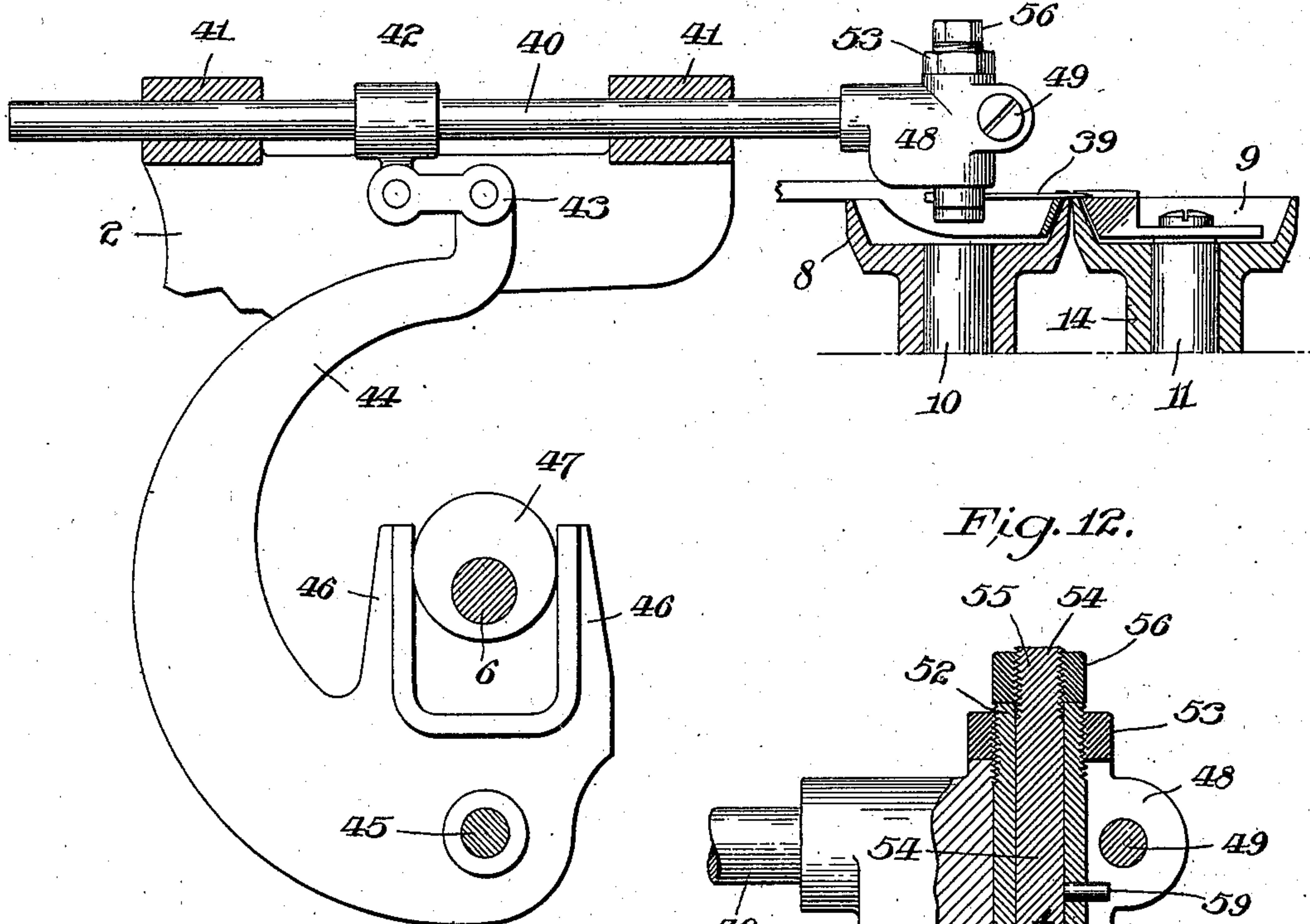


Fig. 12.

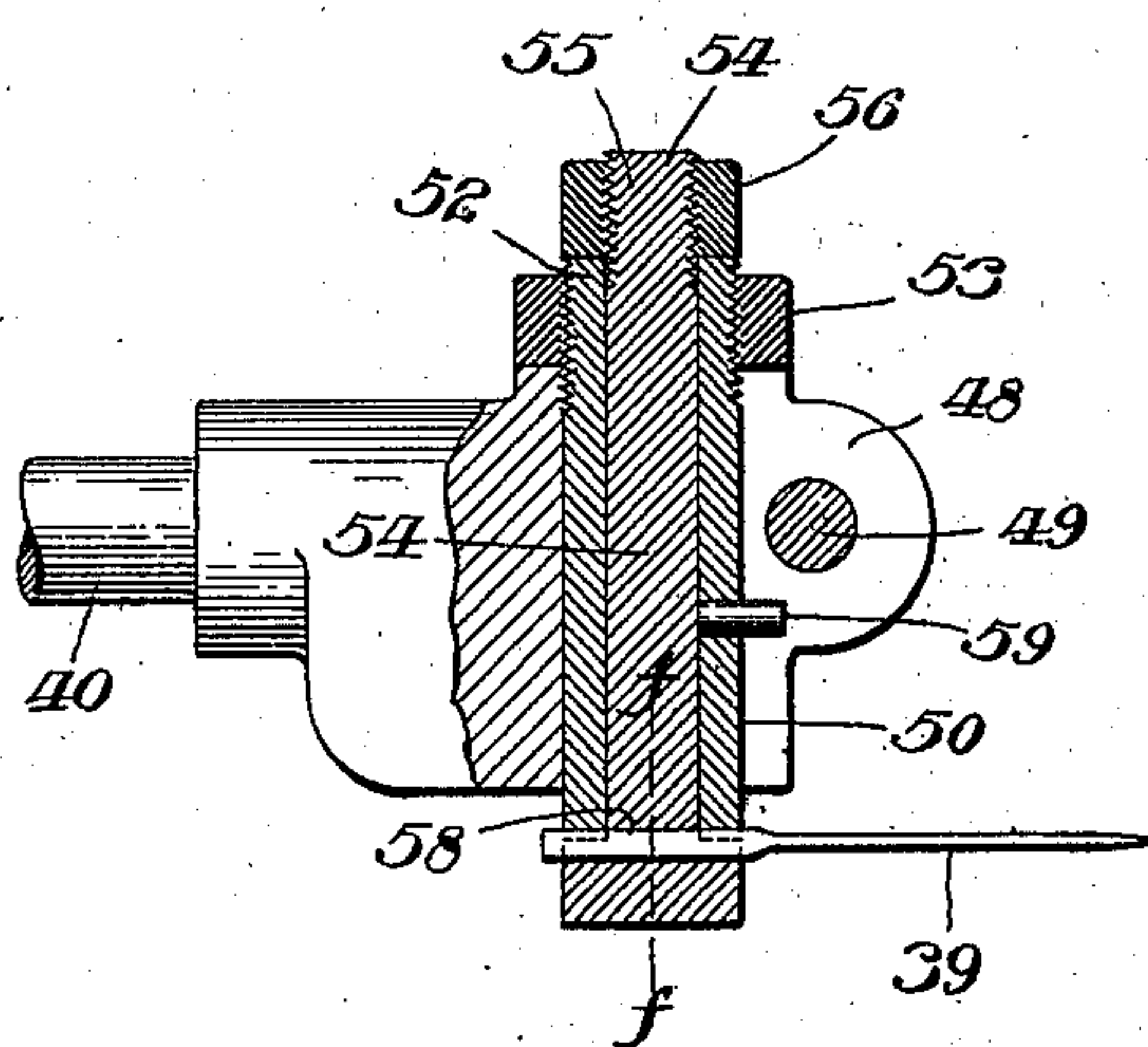


Fig. 13.

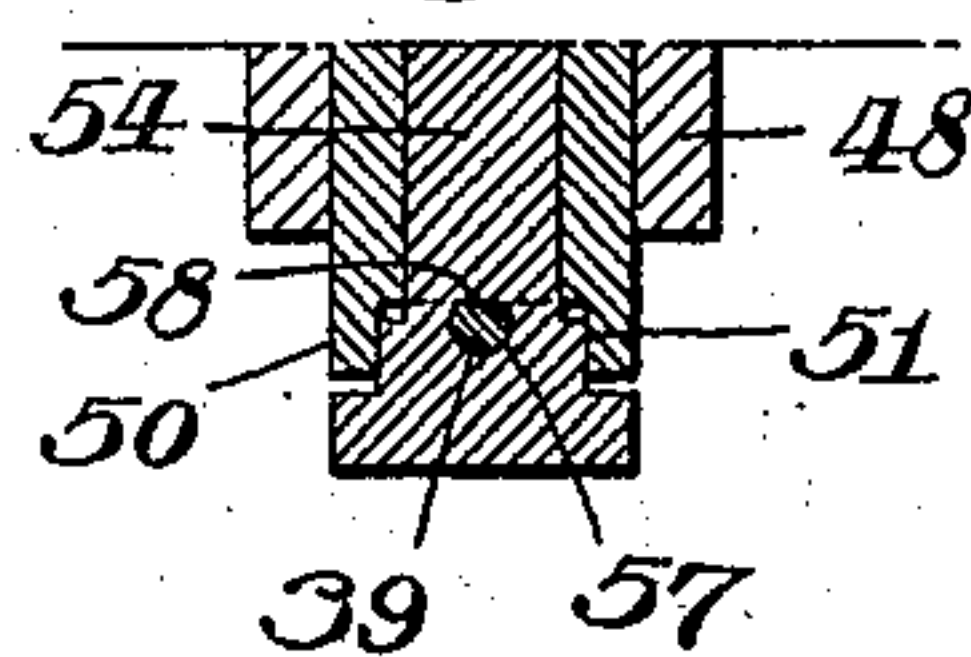


Fig. 14.

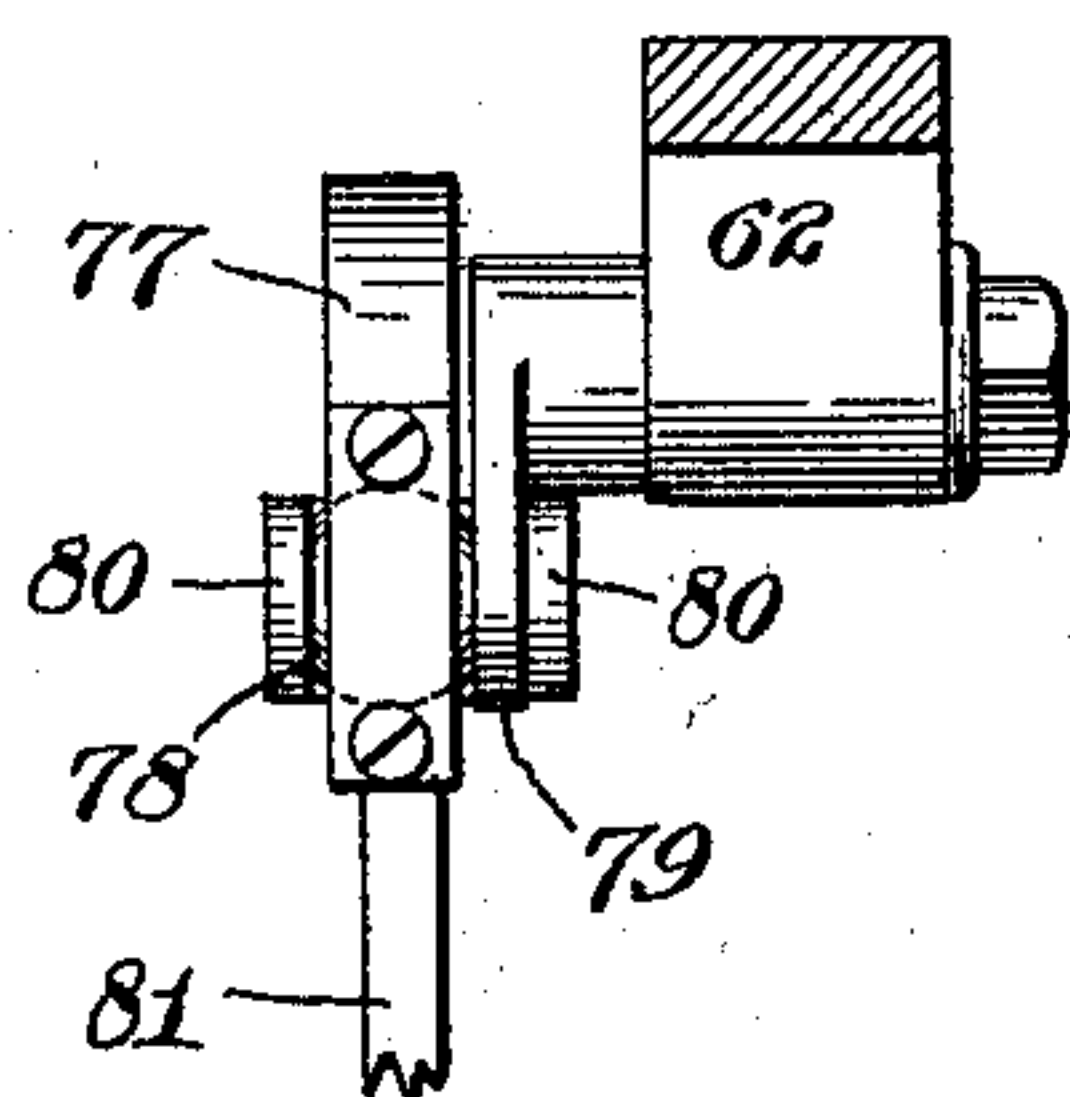
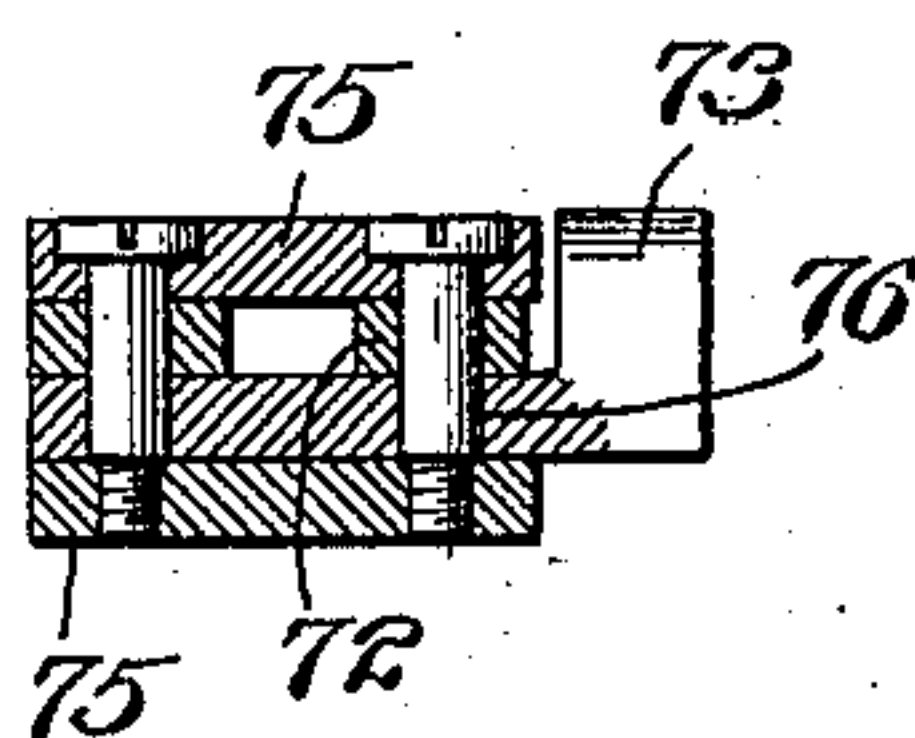


Fig. 15.



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GEORGE KEYSER AND JACOB M. WEBER, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNORS TO JOHN W. HEPWORTH, OF PHILADELPHIA, PENNSYLVANIA.

OVEREDGE SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 724,109, dated March 31, 1903.

Application filed September 15, 1900. Serial No. 30,092. (No model.)

To all whom it may concern:

Be it known that we, GEORGE KEYSER and JACOB M. WEBER, citizens of the United States, residing in the city and county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Overedge Sewing-Machines, of which the following is a specification.

This invention relates to overedge sewing-machines; and it has for its object to provide a simple and efficient construction and organization of mechanism whereby the relative operations of the needle and looper shall be effected by lever and link connections in a manner to insure increased speed and greater efficiency in the working of the machine and to provide various novel features of construction and combinations of parts which will be hereinafter described and claimed.

In the drawings, Figure 1 is a plan of an overedge sewing-machine embodying our invention. Fig. 2 is a longitudinal vertical section as on the line *a a* of Fig. 1. Fig. 3 is a transverse vertical section as on the line *b b* of Fig. 1. Fig. 4 is an elevation of the "uncurler" detached. Fig. 5 is an edge view thereof, partially in section. Fig. 6 is a sectional detail as on the line *c c* of Fig. 4. Fig. 7 is a sectional elevation of the take-up mechanism for the needle and looper threads, including the mechanism for actuating the clutch devices which impel the feed-disks. Fig. 8 is a sectional detail as on the line *d d* of Fig. 7. Fig. 9 is a plan of the clutch devices, partially in section. Fig. 10 is a vertical section as on the line *e e* of Fig. 9. Fig. 11 is a sectional elevation of the needle-bar, its needle, and the actuating mechanism thereof, including the feed-disks. Fig. 12 is a vertical section, enlarged, of the needle-clamp. Fig. 13 is a sectional detail as on the line *f f* of Fig. 12. Fig. 14 is a similar detail of universal-joint connection as on the line *g g* of Fig. 1. Fig. 15 is a like detail as on the line *h h* of Fig. 1.

The main frame comprises the bed-plate 1 and the standards 2 and 3 thereon. The bed-plate is preferably hinged at its rearward edge, as at 4, to a basal casing 5, in which the depending parts of the mechanisms are

covered and concealed when the machine is in working condition. By swinging the bed-plate upwardly the underlying parts thereon will be exposed and readily accessible as occasion may require.

The main shaft 6 has its bearings in appropriate boxes in the lateral members of the standard 3 and is provided with a driving-pulley 7, whereby it may be driven from a suitable source of power.

The usual feed cups or disks 8 9, by and between which the edges of the fabric to be united are progressively fed to the stitching mechanism, are supported upon vertical shafts 10 11, mounted at the forward end of the bed-plate. The shaft 10 is journaled in a column 12, rising from the bed-plate, while the other shaft 11 is affixed at its lower end to an oscillatory frame 13, mounted below the plate, for a purpose below described.

The disk 9 is provided with an elongated hub 14, which extends through an opening in the bed-plate and carries a gear-wheel 15, which coacts with a corresponding gear 16 on the shaft 10, whereby the latter, with its disk, and the hub 14, with its disk, may be concurrently driven in opposite directions to each other.

Affixed to the shaft 10 at a point below its gear 16 is a drum 17, upon the hub 19 of which are loosely mounted two rocking levers 19 20, disposed above and below the drum, respectively. The inner arms of these levers are bifurcated to afford jaws 21, which embrace the opposing edges of the drum, and the openings 22 in said arms are slightly elongated in opposite directions to each other.

The outer arm of the lever 20 is extended and is pivoted at or near its free extremity to a post 23, depending from the bed-plate. The outer arm of the upper lever is formed with an up-projecting lug 24, provided with a laterally-disposed ball 25, which is fitted to the socketed end 26 of a link 27. The opposite end of the latter is equipped with a pivot-stud 28, which is slidingly fitted to a vertical slot 29 in an oscillatory arm 30, pivoted at its upper end to the standard 3, as at 31. This arm has a rectangular opening 32 therein for the reception of an eccentric 33 on the main

shaft, whereby during the rotation of the latter said arm is oscillated, corresponding motion being transmitted by the link connection to the lever 19. During the oscillations of this lever the jaws thereof in their forward eccentric movement, due to the slot connection with the hub of the drum, bite the opposing portions of the drum and correspondingly advance the latter, the jaws of the lower lever, owing to the opposite disposition of its slot, permitting the advance movement of the drum by the lever 19, yet preventing its rearward movement during the back strokes of the latter lever. The lower lever thus serves as a back-stop. By this construction it will be seen that the drum 17 and its shaft 10 are intermittently rotated and that in consequence the two feed-disks are simultaneously impelled.

As a simple and efficient means whereby the step-by-step movement of the feed-disks may be regulated so as to correspondingly determine the feed of the fabric therebetween and perforce the length of the stitches we provide a means whereby the pivot-stud 28 may be adjusted longitudinally of the slotted arm, the position of such stud in relation to the axis of the arm determining the throw of the clutch-lever. To this end we dispose adjacent to the link 27 an arm 34, which is carried by a vertically-movable rod 35, extending through the standard 3. This rod is provided with a lateral set-screw 36, which extends through a vertical slot 37 in the standard, so that if such screw be properly manipulated the rod may be loosened and vertically adjusted and then be secured in its position of adjustment. The free end of the arm 34 lies adjacent to the pivot-stud 28 and is provided with a horizontal slot or recess 38 to receive the extended end of said stud. Hence when the arm 34 is vertically adjusted the stud will be raised or lowered thereby longitudinally of the oscillatory arm, the slot or recess in the arm 34 permitting the free horizontal movement of the stud as it is actuated by the arm 30.

The needle 39 is horizontally reciprocated across the bite of the two feed-disks, so as to penetrate the interposed edges of the fabric to be united. This needle is carried by the free end of a bar 40, which is fitted to horizontal guides 41 on the standard 2. On the bar is a lug 42, which is connected, by means of a link 43, with the upper end of an oscillatory frame 44. This frame is fulcrumed on a transverse shaft 45, supported by brackets on the under side of the bed-plate, and is provided with a pair of vertical members 46, which embrace an eccentric 47 on the main shaft, whereby during the rotation of the latter the frame is continuously oscillated and the needle-bar longitudinally reciprocated.

In order that the needle may be readily applied to or removed from the needle-bar, as desired, and in order also that the needle may be nicely adjusted vertically in respect to

the feed-disks, we provide the following construction: On the forward end of the needle-bar is affixed a bifurcated head 48, provided with a transverse clamping-screw 49. Between the members of the head is fitted a vertical bushing 50, which extends above and below the head, the lower extension being transversely recessed, as at 51, and the upper extension being externally screw-threaded, as at 52, and provided with a nut 53, that bears upon the head. Extending through the bushing is a rod 54, the lower end of which is laterally extended below the bushing and is snugly fitted to the recess in the lower end of the latter, while the upper end of the rod is exteriorly screw-threaded, as at 55, for the reception of a nut 56, that bears upon the upper end of the bushing. In the lower portion of the rod is a transverse orifice 57, adapted to receive the butt-end of the needle, which end is slightly flattened, as at 58, and the orifice therefor is correspondingly formed, so as to prevent rotation of the needle.

When the needle is applied to the orifice, its butt-end lies directly below the bushing, and hence if the nut 56 be tightened the needle will be clamped between the opposing portions of the rod and bushing. By unscrewing said nut the needle will be unclamped.

If the clamp-screw 49 be turned to effect the release of the bushing and rod, these parts may be manually raised to effect quick course adjustment of the needle vertically, or instead the set-nut 53 may be manipulated to effect minute adjustment of the parts.

A lateral stud 59 on the bushing lies between the members of the clamp-head and prevents rotation of the bushing.

The thread 60 on its way to the needle passes through a spring-controlled tension device 61, supported on a bracket 62 at the rear of the machine, thence through eyes 63 in the vertical members of a guide-bracket 64 and eyes 65 in the free end of a take-up lever 66, interposed between such members, thence to the needle. The take-up lever is pivoted at its rearward end between lugs 67 on the standard 2 of the main frame and is connected at a point between its ends with the upper end of a rod 68, which is coupled at its lower end by means of a strap 69 with an eccentric 70 on the main shaft, whereby during the operation of the machine the said lever is continuously oscillated in a manner to take up the slack thread during the reciprocations of the needle.

The looper 71 is arranged above the feed-disks and is actuated in respect to the needle to accomplish the requisite enchainment of the looper and needle threads for the formation of the stitches upon the edges of the fabric. The looper has, as usual, a rising-and-falling motion, a forward-and-back motion, and also a slight lateral motion, the whole being properly timed relatively to the recip-

locations of the needle. The looper is secured to the forward end of a lever 72, pivotally mounted on a bracket 73, which is in turn horizontally pivoted, as at 74, to a part of the main frame. The horizontal pivot of the bracket permits oscillation of the latter in a vertical arc. The connection of the lever to the bracket is effected by means of a pair of parallel links 75, one of which lies below and the other above the bracket, the bracket having a segmental slot 76 therein for the passage of the pin which connects the links and the lever, whereby said lever is movable in a horizontal arc on the bracket.

On the rearward end of the lever is a U-shaped extension 77, which has a universal-joint connection, such as a ball and socket 78, with the lower end of an arm 79, pivoted to an extension on the bracket 62. The lower end of this arm is also connected, by means of a link 80, with the upper end of an oscillatory frame 81. This frame is identical in construction with the frame 44, above described, and is similarly mounted on the shaft 45 below the bed-plate. It is likewise actuated by an eccentric 82 on the main shaft. By this construction it will be seen that during the operation of the machine the frame 81 will be continuously oscillated; that the lever 72 will be rocked in a vertical plane about the axis of the bracket 73, so as to impart the rising-and-falling motion to the looper; that said lever will be horizontally reciprocated to impart a corresponding movement to the looper, and that during such horizontal reciprocations the said lever will be laterally moved by the link connection with the pivoted bracket to impart a corresponding movement to the looper.

The thread 83 on its way to the looper passes through a spring-controlled tension device 84, arranged adjacent to the tension device 61, above referred to, thence through eyes 85 in laterally-extending lugs 86 87 on the take-up and looper levers, respectively, and thence to the looper. Hence during the actuation of the looper the slack of the looper-thread is taken up by the oscillating take-up lever.

The tension devices for the needle and looper threads are identical with each other both in construction and operation. Each of these devices comprises a pair of superposed disks 88, through which extends a vertical rod 89, slidably fitted to a perforated boss 90 in the bracket 62. The lower disk rests upon the boss, while a shoulder 91 on the rod bears upon the upper disk, the rod being maintained yieldingly depressed by a spiral spring 92, which, encircling the rod, bears against the under side of the bracket and against a shoulder 93 on the lower extremity of the rod. The disks being thus maintained yieldingly in contact with each other exert sufficient tension upon the thread passing between the same. It will be seen that if the

rod be raised against the pressure of the spring the thread will be released.

As above stated, the shaft 11, which supports the outer feed-disk 9, is carried by an oscillatory frame 13, mounted below the bed-plate. This frame comprises a transverse bar 94, provided at its respective ends with rearwardly and upwardly projecting lugs 95, which are pivoted to depending lugs 96 on the bed-plate. The bar is also provided at one end thereof with a depending extension 97, which is connected, by means of a link 98, with the shorter arm of a bell-crank lever 99, pivoted to a depending lug 100 near the rearward end of the bed-plate. The lever is maintained in a normal position by a suitably-disposed spring 101. On the pivot-stud 102 of the lever is a rearwardly-extending toe 103, upon which rests the lower end of a vertically-movable rod 104, that extends through a guide-lug 105 on the standard 2 of the main frame and through an orifice in the bed-plate. On the upper end of this rod is a cross-piece 106, that lies directly below the rods 89 of the two tension devices. By this construction it will be seen that if the longer arm of the lever 99 be depressed against the action of the spring the frame 13 will be tilted so as to incline the shaft 11 and throw the overlying feed-disk away from the inner feed-disk in a manner to free the interposed fabric and that at the same time the toe 103 being raised will elevate the rod 104, with its cross-piece, and thereby lift the rods 89 and free the threads in the tension devices, whereupon the fabric, with the connected threads, may be readily drawn from the machine.

The lever 99 may be depressed by means of a suitable treadle (not shown) connected therewith by a rod 107.

It will be observed that the axis of oscillation of the frame 13 is rearward of the vertical axis of the shaft 11, so that when the frame is tilted to incline the latter the feed-disk thereon will be swung in a downward arc to lie below the path of the needle. Hence if the needle should happen to be reciprocated when the disks are separated there will be liability of injurious contact of the needle with the outer disk.

The device for uncurling the edges of the fabric as they are delivered to the bite of the feed-disks differs but slightly from prior constructions, the novel feature residing in projections or abutments by means of which the proper delivery of the curled edges of the fabric to the uncurling members is insured even though the fabric be improperly guided by the attendant.

The uncurling device comprises a division-arm 108, depending from the free end of a horizontal rod or shaft 109, extending from a bracket 110 on the main frame. The lower end of this arm lies just in advance of the bite of the feed-disks and is made quite thin and extended forwardly in respect to the bite,

as indicated at 111. The device also comprises two depending arms 112, arranged on the respective sides of the arms 108 and hinged at their upper ends to the latter. The lower ends of these lateral arms also lie just in advance of the bite of the feed-cup, and they are made quite thin and extended forwardly, the extensions being deflected laterally, as at 113, and being provided with lateral uncurling members 114. Between the two lateral arms is a spring 115, which tends normally to separate them from the central member, each of the arms being provided with a set-screw 116, whereby it may be adjusted toward and from such member for the purpose of regulating the intervening space. As usual, the edges of the fabric on their passage to the feed-disks are guided between the lower flattened end of the central arm and the deflected ends of the lateral arms, respectively, so that the uncurling members on the latter will progressively receive and straighten the opposing curled edges of the fabric. To insure the proper guidance of the edges to these uncurling members, we provide the central arm with a transverse pin 117, which affords abutments directly forwardly of the members 114. As the fabric is fed inward it bears against the opposing abutments and is positively directed in a straight line to the uncurling members, and this though the delivery of the fabric by the attendant be somewhat irregular.

We claim—

1. In an overedge sewing-machine, the combination with the needle, its supporting and operating parts, the feed-disks and operating mechanism therefor, of the looper, the lever therefor, a pivoted bracket, a laterally-movable connection between the same and the lever, an oscillatory arm, a universal-joint connection between the same and the lever, an oscillatory frame, a connection between the same and said arm, and means for actuating said frame, substantially as described.
2. In an overedge sewing-machine, the combination with the needle, its supporting and operating parts, and feed mechanism, of the looper, the lever therefor, a pivoted bracket oscillatory in a vertical arc, a connection between the same and the lever permitting longitudinal movement of the latter in a horizontal arc on the bracket, an oscillatory arm,

a universal-joint connection between the same and said arm, a shaft, and means thereon co-acting with said frame to oscillate the latter, substantially as described.

3. In an overedge sewing-machine, the combination with the needle, its supporting and operating parts, and feed mechanism, of the looper, the lever therefor, a pivoted bracket oscillatory in a vertical arc, connection between the same and the lever permitting longitudinal movement of the latter in a horizontal arc on the bracket, an oscillatory arm, a universal-joint connection between the same and the lever, a shaft an eccentric thereon, a vertically-disposed frame fulcrumed below said shaft and provided at its lower end with a yoke portion embracing the eccentric, and a link connection between the upper end of said frame and the oscillatory arm, substantially as described.

4. In an overedge sewing-machine, the combination with the needle, its supporting and operating parts, the feed-disks and operating mechanism therefor, of the looper, the lever therefor, a pivoted bracket, a laterally-movable connection between the same and the lever, an oscillatory arm, a universal-joint connection between the same and the lever, an oscillatory frame, a link connection between the same and said arm, and means for actuating said frame, substantially as described.

5. In an overedge sewing-machine, the combination with the needle, its supporting and operating parts, the feed-disks, and operating mechanism therefor, of the looper, the lever therefor, a pivoted bracket, a link connection between the same and the lever permitting independent lateral movement of the lever on the bracket, an oscillatory arm, a universal-joint connection between the same and the lever, an oscillatory frame, a link connection between the same and said arm, a shaft, and an eccentric thereon coacting with said frame, substantially as described.

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

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Witnesses:

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