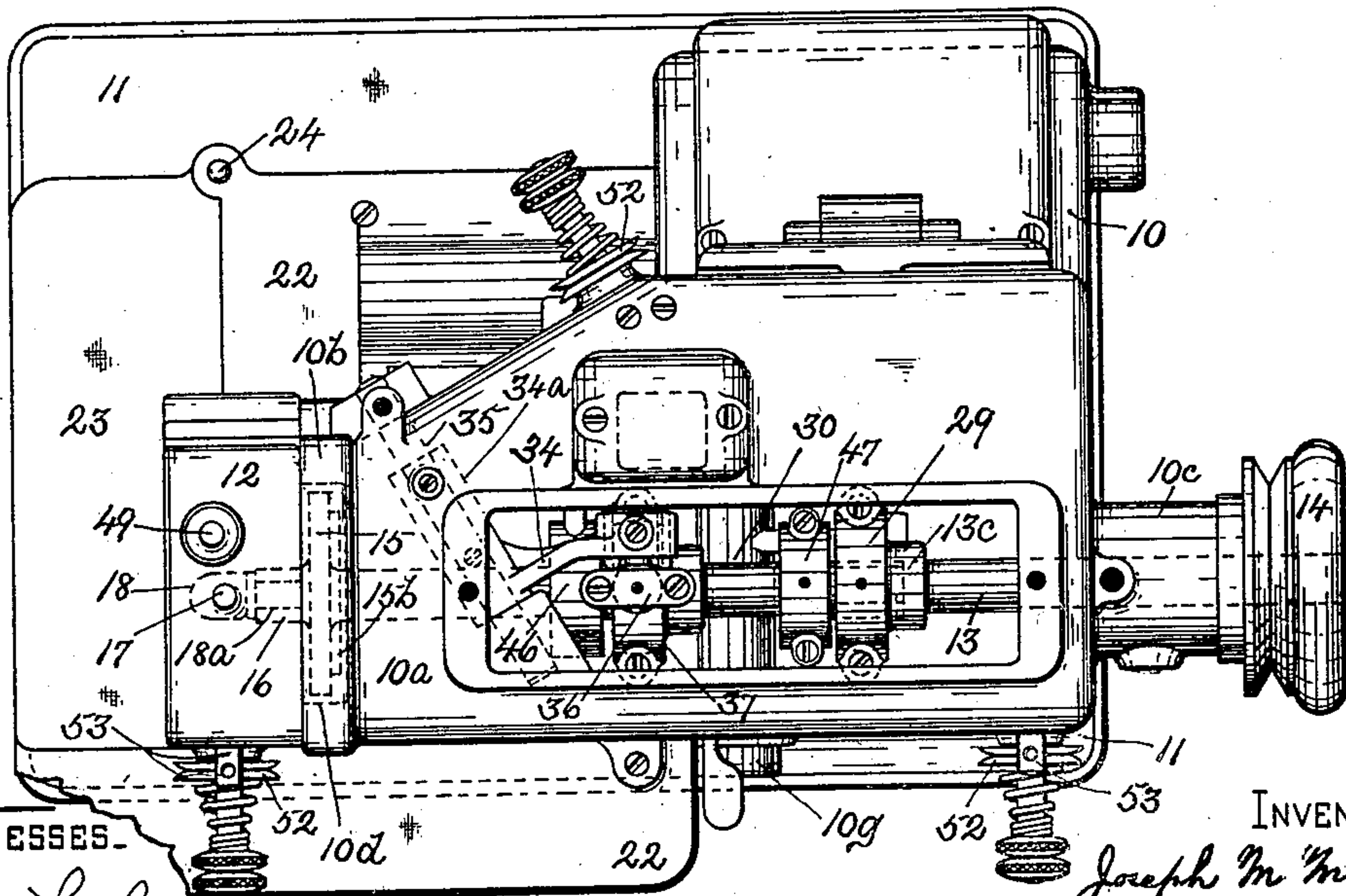
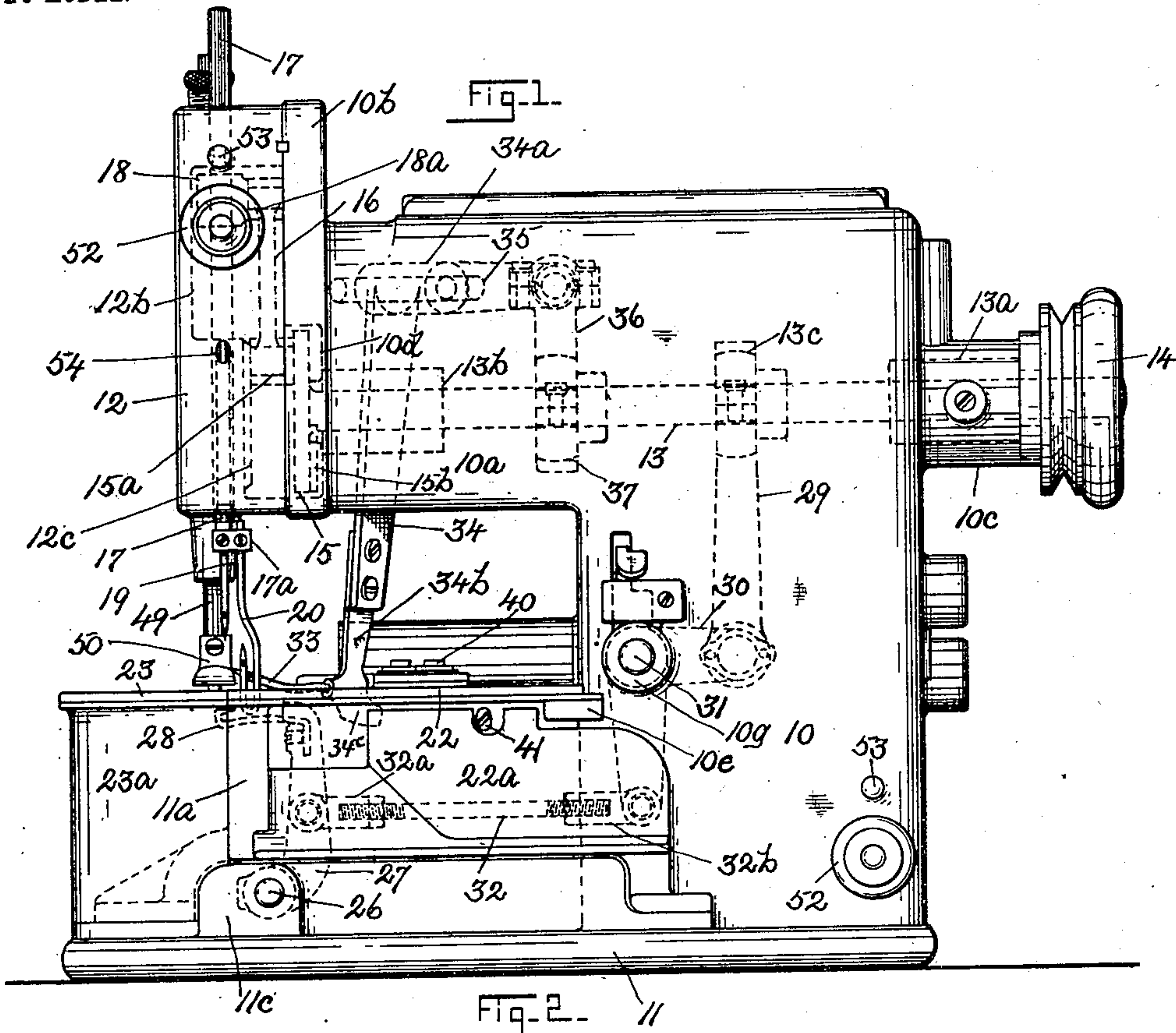


J. M. MERROW.
OVERSEAMING MACHINE.
APPLICATION FILED NOV. 30, 1901.

NO MODEL.

3 SHEETS—SHEET 1



WITNESSES.

Alfred M. Luther.
Thomas Durant

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By *Clayton & Church*
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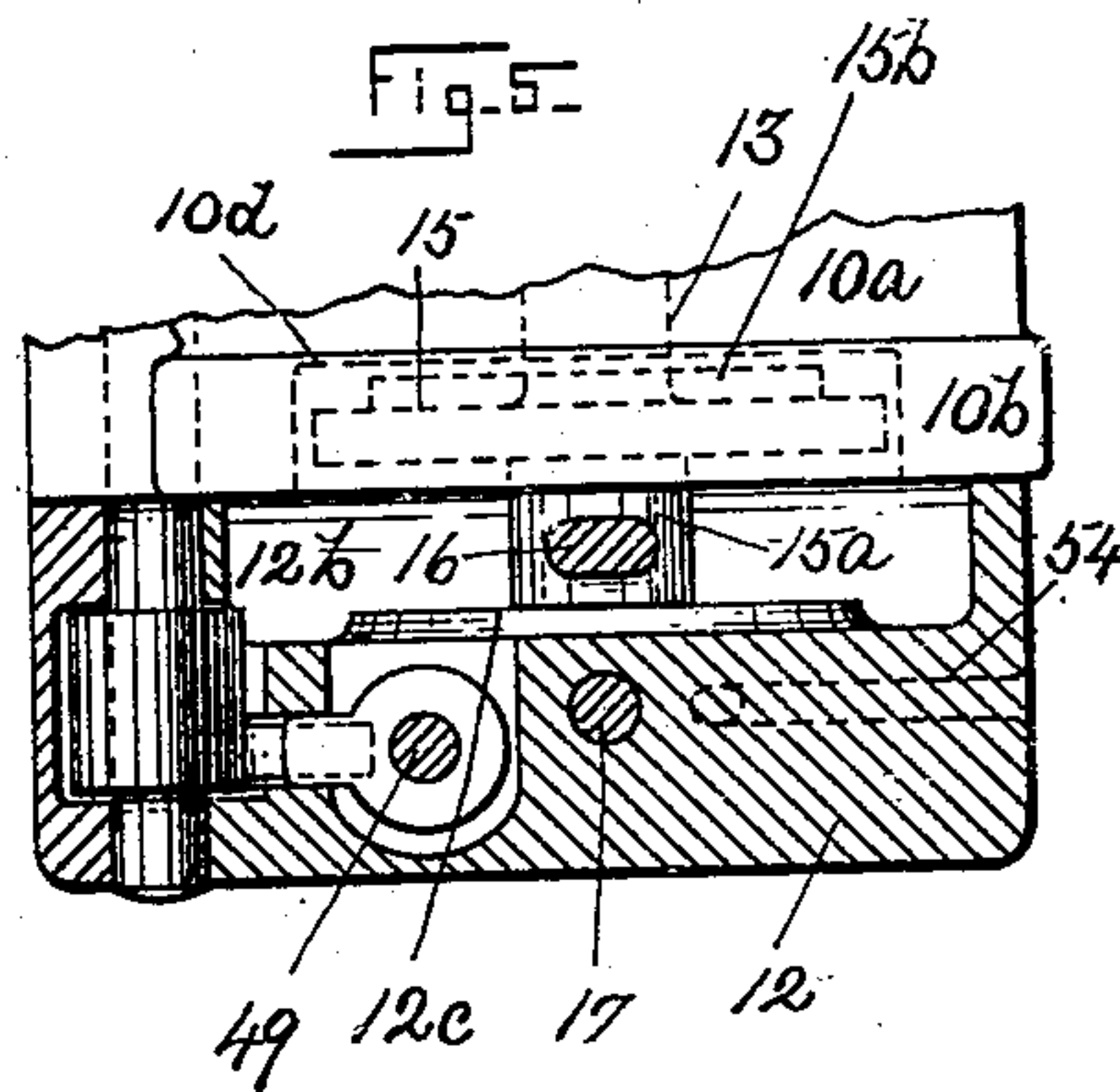
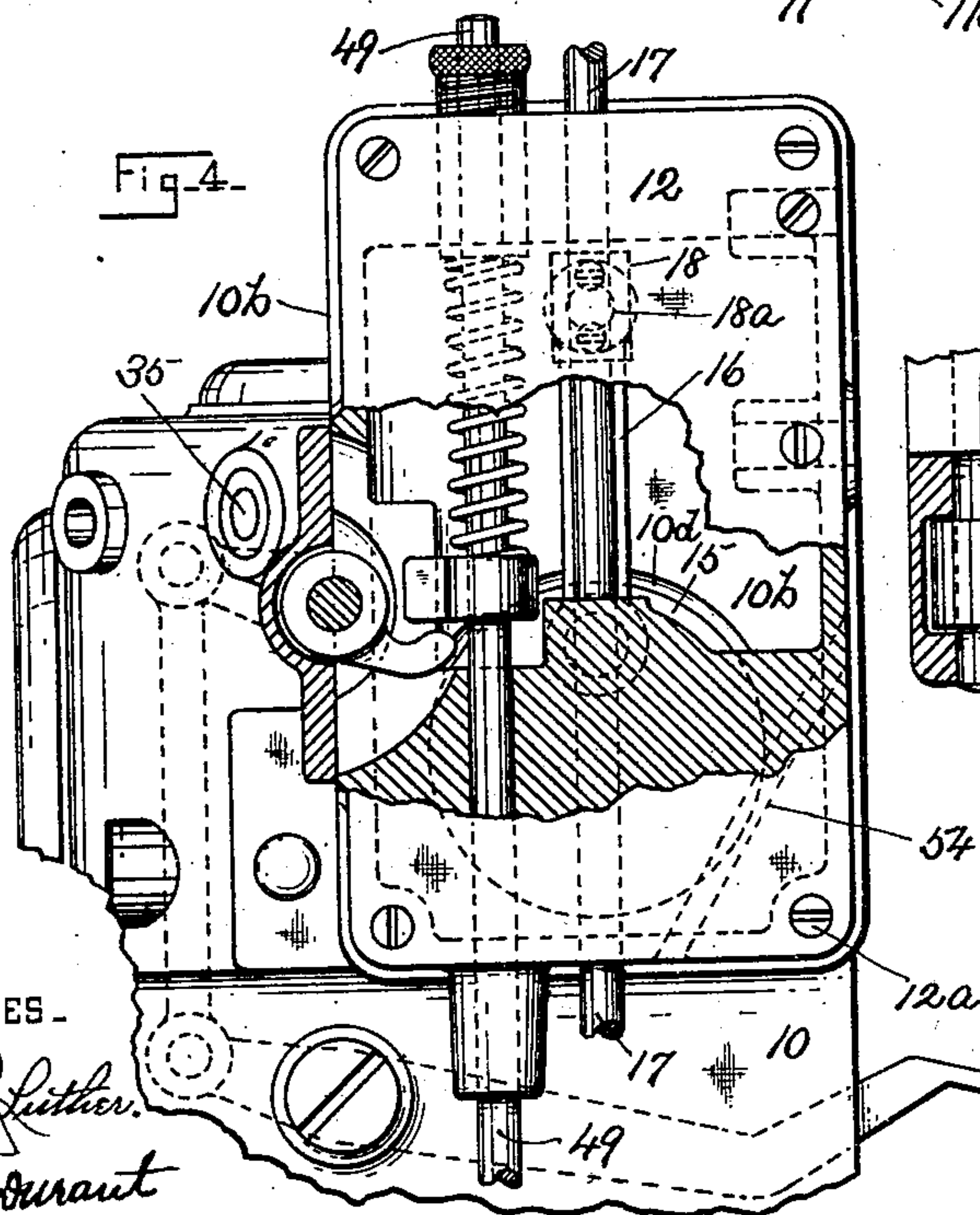
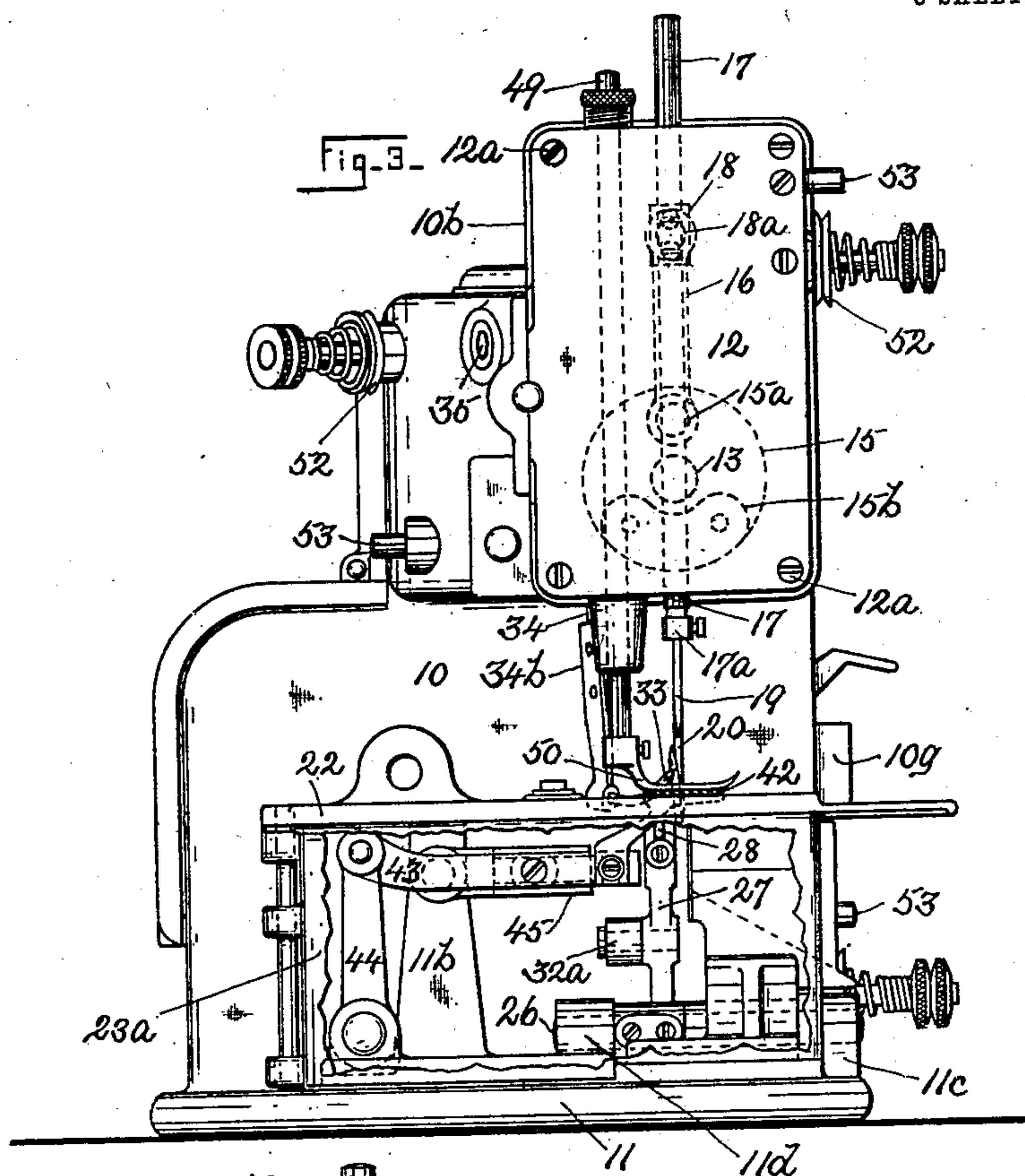
No. 730,944.

PATENTED JUNE 16, 1903.

J. M. MERROW.
OVERSEAMING MACHINE.
APPLICATION FILED NOV. 30, 1901.

NO MODEL.

3 SHEETS—SHEET 2:



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OVERSEAMING MACHINE.
APPLICATION FILED NOV. 30, 1901.

NO MODEL.

3 SHEETS—SHEET 3.

FIG-6-

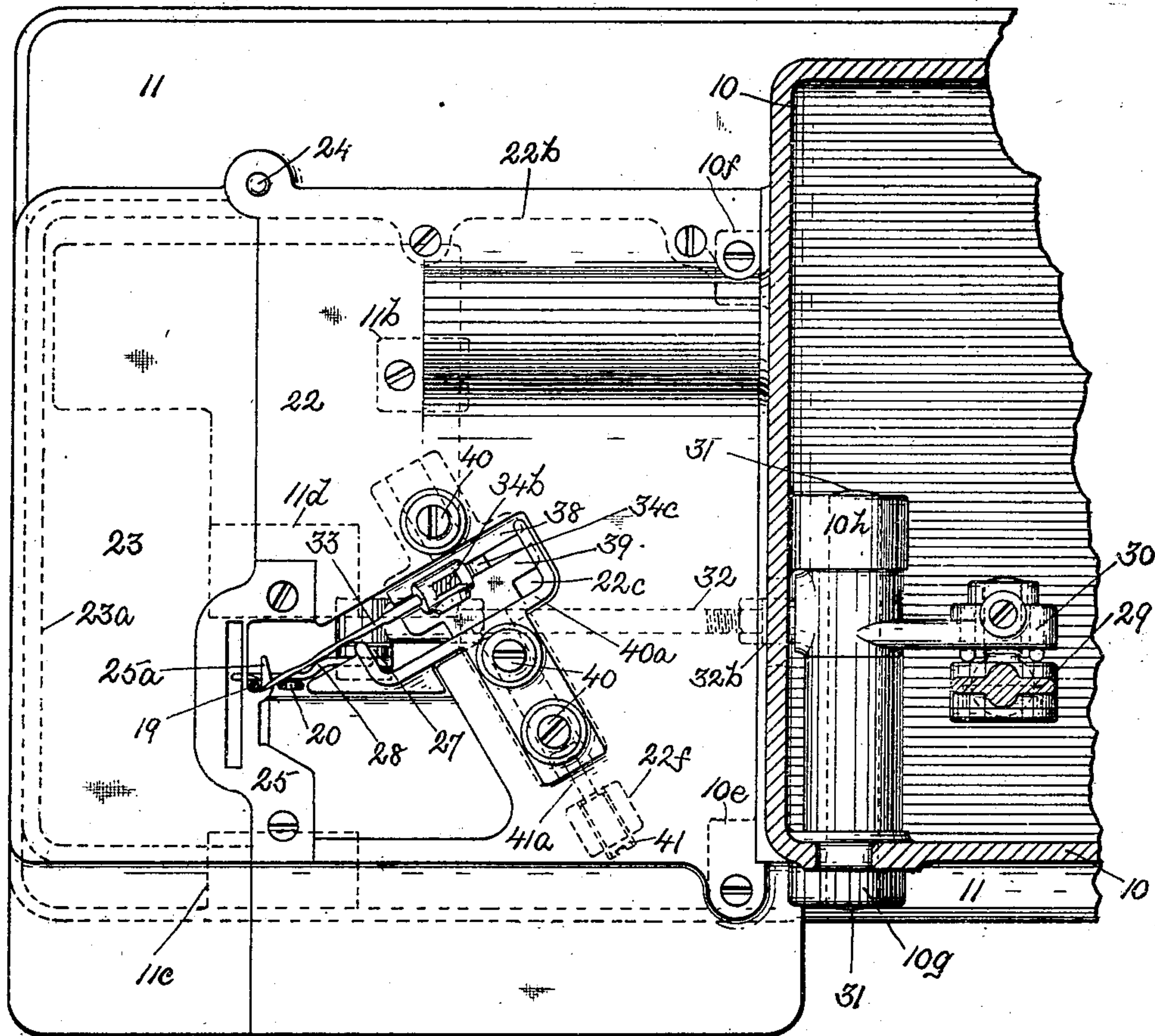


FIG-7-

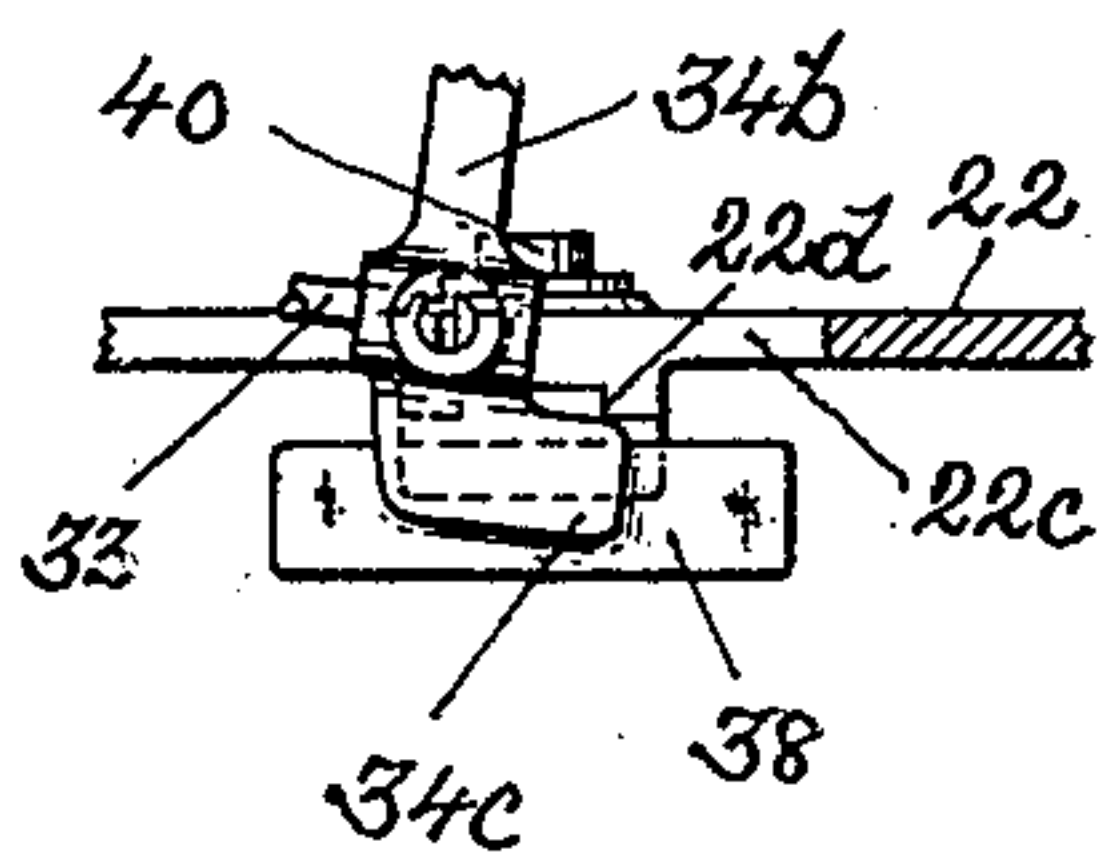


FIG-8-

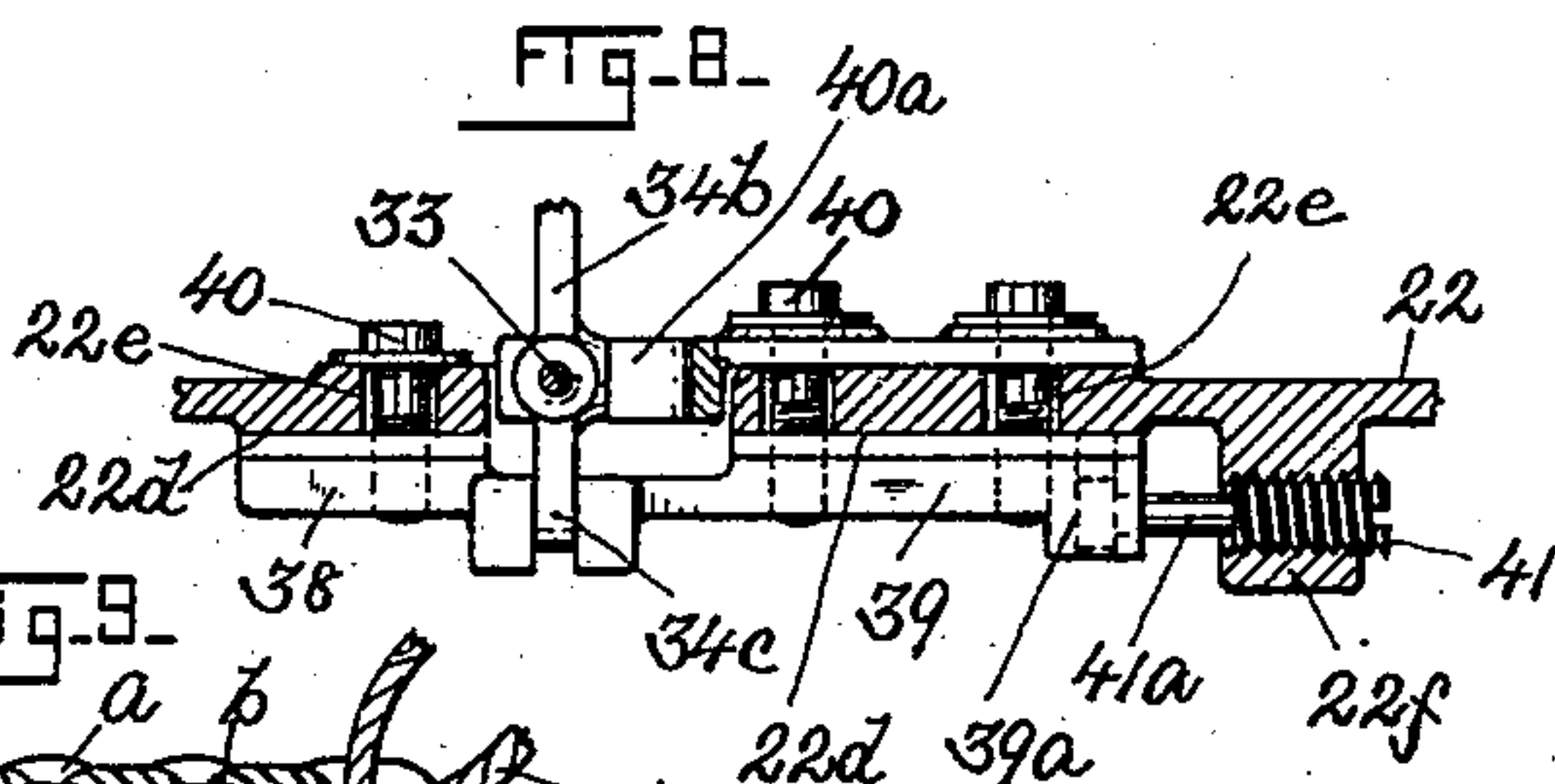
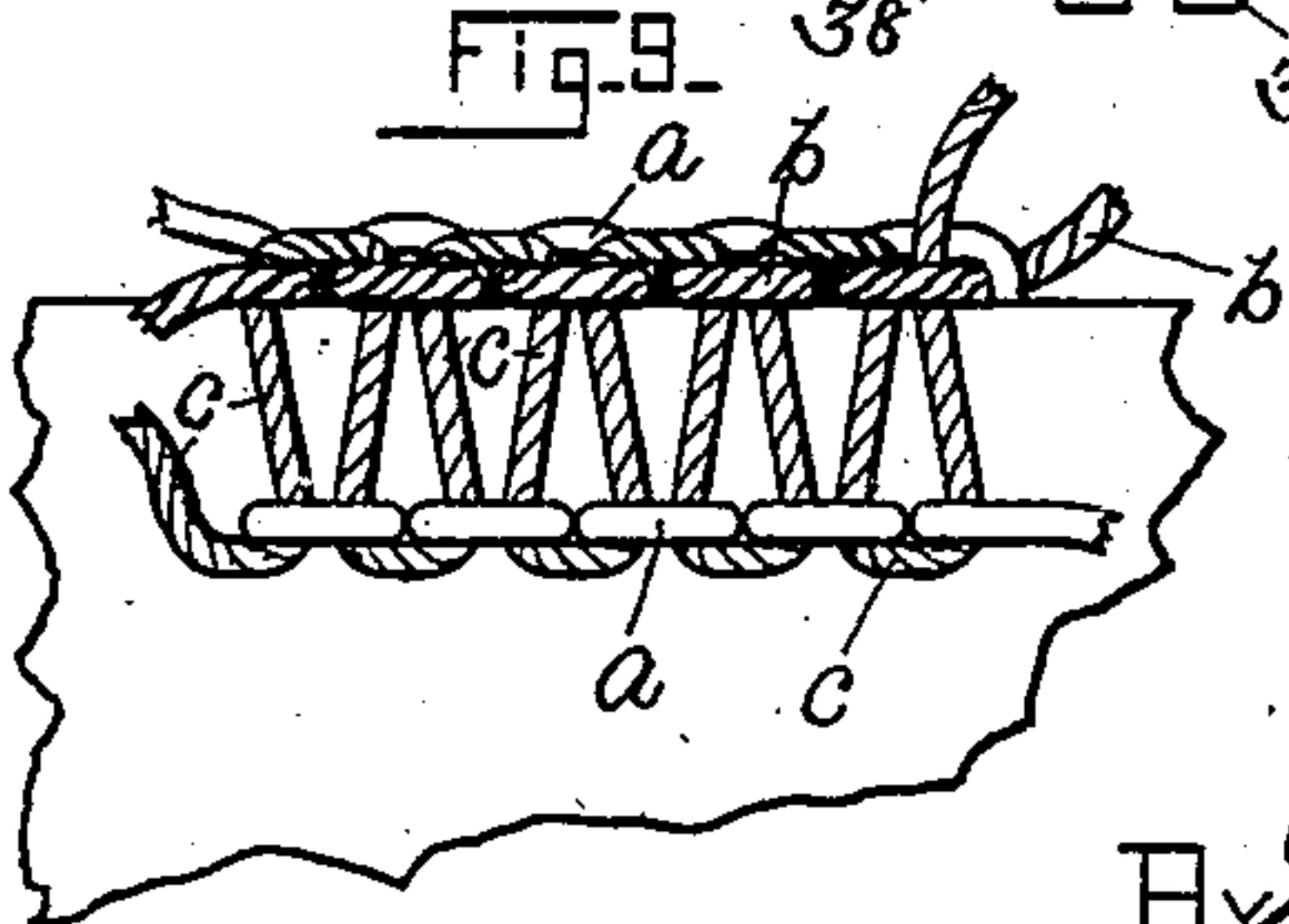


FIG-9-



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UNITED STATES PATENT OFFICE.

JOSEPH M. MERROW, OF MERROW, CONNECTICUT, ASSIGNOR TO THE
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CORPORATION OF CONNECTICUT.

OVERSEAMING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 730,944, dated June 16, 1903.

Application filed November 30, 1901. Serial No. 84,222. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH M. MERROW, a citizen of the United States, residing at Merrow, Tolland county, State of Connecticut, have invented certain new and useful Improvements in Overseaming-Machines; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, and to the characters of reference marked thereon.

The particular class of sewing-machines to which this invention relates is that for performing the operation of overseaming or of producing what is commonly known as a "buttonhole-stitch," such machines being known in the art as "overseaming" or "over-edge" machines.

The primary object of this invention is to produce a stitch of the character just mentioned by means of a novel arrangement and operation of new forms of stitch-forming implements, and a further object of the invention is to so arrange the said implements and their driving mechanisms and other elements of the machine immediately related thereto as to permit of very high speed and insure great durability, convenience of operation, and ready accessibility for adjustment or other purposes.

This invention therefore consists in certain novel arrangements and forms and combinations of stitch-forming implements as well as of the driving and supporting mechanism therefor, all as will be now described, and pointed out in the appended claims.

In the machine shown in the drawings the particular elements comprising the invention claimed herein are illustrated as mounted in a frame especially designed for their reception and also for the reception of various other stitch-forming implements and mechanisms and combinations thereof adaptable to the production of a variety of overedge and other stitches and finishes upon material of widely-varied character, thus facilitating the fitting up of the machine for a wide range of work. In the said machine shown in the drawings four implements are provided for the production of the stitch—viz., a thread-

carrying eye-pointed needle and three loopers, two of which are thread-carrying, thus producing a "three-thread" stitch; but it will be apparent to those conversant with the present state of the art in this class of machinery that loopers may be provided any or all of which may or may not be thread-carrying and an overseaming-stitch of one, two, three, or four threads, as desired, produced without altering the driving mechanism of the machine.

In a machine fitted up with the aforesaid stitch-forming implements a brief description of the said implements and the manner in which they operate to produce a stitch is substantially as follows: The needle carrying the first or initial thread passes its thread doubled through the fabric near the edge thereof, and a loop of said thread is taken by a looper beneath the work-plate and carried toward and beyond the edge of the fabric and into the path of a looper secured to and moving with the needle-bar. As the last-named looper rises its point enters the loop of the needle-thread which has been carried beyond the edge of the fabric and carries a loop of its own (the second) thread upwardly through the loop of the said needle-thread. A third looper carrying a third thread passes a loop of its thread through the loop of the second thread and carries the said loop of its own (third) thread over the upper face of the fabric and into the path of the needle, that the said loop may be entered by the needle in its downward travel and secured to the fabric. The looper carrying the third thread in its return travel withdraws from the loop of the second thread and permits the looper carrying the second thread to shed its (the last-named) loop upon the loop of the third thread, and as the said looper carrying the second thread moves downward with the needle the loop of the first or needle thread held by the said looper is shed off onto the loop of the second thread, thus forming one complete cycle of the stitch-forming operations, which will be more fully understood after a more complete description of the loopers and the manner in which they operate.

To assist in understanding this invention, 100

the accompanying drawings have been provided, which serve to illustrate the same, as follows:

Figure 1 is a front elevation of the machine. Fig. 2 is a plan view thereof with the top cover of the frame removed to expose certain interior mechanism. Fig. 3 is an end elevation of the machine looking from the left hand of Fig. 1. Fig. 4 is an elevation, on an increased scale, of the upper portion of Fig. 3 with the cap on the machine-head broken away to better disclose the interior. Fig. 5 is a cross-sectional view of the said cap. Fig. 6 is a plan view of the work-plate and parts immediately related thereto and shows in cross-section the adjacent portion of the machine-frame. Fig. 7 is an elevation illustrating means for preventing side play of one of the looper-carriers. Fig. 8 is a sectional view of a portion of the work-plate and also illustrates more fully the means for preventing side play of the looper-carrier. Fig. 9 shows in plan, on an enlarged scale, an over-seaming-stitch which the machine is designed to produce.

Like reference characters refer to the same parts in all the figures.

Referring to the drawings, the number 10 denotes a portion of the frame of the machine, consisting of a casing located near one end of a rectangular base-plate 11 and preferably integral therewith. The frame 10 extends upwardly and is formed with an arm 10^a, overhanging the base 11 and provided at its end with a plate or head portion 10^b. The head of the machine is provided with a cap formed as a separate box or casing, (indicated by the number 12,) secured to the head 10^b by screws 12^a or otherwise and adapted to contain much of the needle-bar and presser-bar mechanism. The main shaft of the machine (denoted by the reference-number 13) is located in the upper portion of the casing 10 and extends through the arm 10^a, being supported near its ends in suitable bearings 13^a 13^b, preferably bushings, the former of which bearings is located in a boss 10^c on the frame 10 and the latter, 13^b, in and near the end of the overhanging arm 10^a. A driving-wheel 14 is mounted on one end of shaft 13 adjacent the boss 10^c, and a disk 15, located within a chamber 10^d of the head 10^b, is mounted on the opposite end of said shaft. The disk 15 is provided with a wrist-pin 15^a, and a link 16 connects the wrist-pin with the needle-bar 17, as will be described. The box or cap 12 is recessed or chambered at 12^b on the side adjacent the head, and the needle-bar 17 extends vertically through the cap 12, crossing said chamber 12^b, and is capable of reciprocating in suitable bearings in the said cap or box. Within the chamber 12^b the needle-bar 17 is provided with a collar or clamp 18, having a pin 18^a for one end of the link 16.

It will now be understood that upon the rotation of the main shaft 13 the needle-bar 17, through the intermediate mechanism of the

disk 15 and the link 16, will be reciprocated vertically, and the disk 15 is preferably provided with a suitable counterbalance 15^b, as indicated in dotted lines in the drawings. To prevent play of the link 16 endwise of its supporting-pins 15^a 18^a, the boss or hub of the link receiving the pin 15^a is confined between the disk 15 and a finished surface 12^c on the confronting wall of the chamber 12^b, while the boss or hub of the link receiving the pin 18^a is confined between the clamp 18 and the finished confronting wall of the head 10^b. This manner of constructing and assembling the needle-driving mechanism, while effectually preventing any side play of the link 16, interferes in no wise with its travel in performing the office of driving the needle-bar 17.

The needle-bar 17 carries a needle 19 at its lower end adjustably secured to the said bar, and in addition thereto carries a peculiar form of looper 20, also adjustably secured to the needle-bar 17 and constituting an important feature of this invention. The needle 19 and looper 20 are shown as secured in a block 17^a on the lower end of the needle-bar 17 and preferably an integral part thereof; but the exact manner of securing such implements to the needle-bar is not essential to the successful working of the implements. Said looper 20 is located at that side of the needle 19 adjacent the frame 10 of the machine and in a line practically parallel with the main shaft 13. Near its point of support the looper 20 extends downwardly parallel with the needle, then outwardly, (toward the frame 10,) and then again downwardly, and its lower portion is doubled upon itself, such doubled portion being sufficiently open, however, to permit the free passage of thread therethrough, the upwardly-extending point being adjacent to but slightly below and to the right of the needle 19 as viewed in Fig. 1. The looper 20 is preferably eye-pointed to carry a thread. Said looper 20 reciprocates with the needle, and the point thereof is carried alternately above and below the plane of the work-plate 22 in a path near the edge of the work-plate and near the edge of any work it may be serving to support. Work-plate 22 is located beneath the overhanging arm 10^a and is supported on and secured to lugs 10^e 10^f, formed on the said frame, additional supports 11^a 11^b, located on the base 11, preferably being provided in addition to the lugs 10^e 10^f. An extension 23 of the work-plate 22, hinged to the latter by the pin 24, is provided, and such extension has formed on its under side a wall 23^a, which with a front wall 22^a and a rear wall 22^b, located beneath the plate 22 form a chamber beneath the work-plate 22 and its extension 23 for the reception of the feed and other mechanisms, which chamber may be readily opened by swinging the hinged portion 23 of the work-plate. A needle-plate 25, provided with the usual finger 25^a, is located on the work-plate, and the presser-foot of the machine may also be provided with a similar

finger, if desired, around either or both of which stitches are formed and pass off as the stitching progresses, said finger serving to produce even stitching at the edge of the work and also to assist in the production of stitches or "chaining" in the absence of the fabric.

Located near the base 11 in bearings 11^c 11^d, Fig. 3, formed on or secured to the said base, is a rock-shaft 26, extending at right angles to the main shaft 13 and bearing an upwardly-extending arm 27, having adjustably secured thereto a hook-looper 28, the office of said looper being to transfer a loop of the needle-thread beneath the work-plate into the path of the looper 20. For driving the arm 27 and its looper 28 the shaft 13 has secured thereto within the frame 10 a spherical eccentric 13^c, provided with a suitable strap and rod 29, the lower end of the latter being connected by a universal joint with the horizontally-extending arm of an angle-lever 30, the latter being mounted upon a shaft 31, extending at right angles to the main shaft 13 and supported in bearings 10^e 10^f, formed on the side walls of the frame 10. The angle-lever 30 has a downwardly-extending arm, the end of which is connected by a link 32 with the arm 27. Upon rotation of the eccentric 13^c, Fig. 1, its strap and rod effect the rocking of the angle-lever 30, from which, through the link 32, rocking motion is imparted to the arm 27, carrying the looper 28.

Referring to the description of the stitch-forming operation already recited, the adaptability of the needle 19 to carry its thread *a*, Fig. 9, doubled through the fabric and of the looper 28 to transfer a loop of the needle-thread below the fabric into the path of the looper 20 to permit a loop of the second thread *b*, Fig. 9, carried by the looper 20, to be passed through the said needle-thread loop will be apparent, and it now remains to describe the manner and means for passing a loop of the third thread *c*, Fig. 9, through the loop of the second thread *b* and into the path of the needle.

The looper carrying the third thread *c* is denoted by the reference-number 33, Figs. 1, 3, and 6, and in the performance of its work it is desirable that its line of travel shall be between the paths of the needle 19 and the looper 20, and that this may be accomplished the looper 33 is so located that it travels in a path at an angle to the line in which the needle 19 and the looper 20 are supported and operated, as best shown in Fig. 6 of the drawings, in which figure the said needle 19 and looper 20 are shown in cross-section to better illustrate their location with reference to the looper 33. For carrying the looper 33 an angle-lever 34 is provided. It is supported within the frame-arm 10^a upon a rod or shaft 35, which passes through the hub 34^a of the angle-lever 34 and is in turn supported in suitable bearings provided therefor in the frame-arm. Shaft 35 is arranged at an an-

gle to the main shaft 13, the downwardly-extending arm of the angle-lever 34 passing through an opening in the under side of the frame-arm 10^a. Said lever 34 preferably carries an extension 34^b, to which in turn the looper 33 is adjustably secured, the extension 34^b being separable from the arm proper to facilitate the operation of assembling the mechanism and for convenience in construction as well as to permit of making the arm extension 34^b of material especially adapted for its purposes. The shorter horizontally-extending arm of the angle-lever 34 is connected by a universal joint with the upper end of an eccentric-rod 36, the lower end of which rod is provided with a strap inclosing a spherical eccentric 37 on the shaft 13. Thus the rotation of the shaft 13 and eccentric 37 through the strap and rod 36 effect the oscillation of the lever 34 and the travel of the looper 33. It will be seen that the looper 33 traveling in the manner described is well adapted to carry a loop of its (the third) thread *c* through a loop of the second thread *b* (when the looper 20 is in a suitable position) and into the path of the needle to be entered thereby to complete the stitch-forming operation hereinbefore recited.

The needle 19 and the looper 20 are adjustably secured to the needle-bar 17, and the loopers 28 and 33 are also adjustably secured to their respective carriers, as before stated, to enable the stitch-forming implements to be properly set relatively to each other. In addition to the adjustability of the looper 28 in its carrier 27 the carrier itself is also capable of adjustment, said adjustment being preferably secured by threading the end portions of the connecting-rod 32 in opposite directions, as shown in dotted lines, Figs. 1 and 6, and thus by the rotation of the said rod its threaded ends will be caused to travel in the sockets 32^a 32^b, secured, respectively, to the arms 27 and 30 to increase or diminish the distance between the said arms.

The stitch-forming implements must be properly adjusted and timed relatively to each other and where necessary are preferably bent and "slabbed" that they may better engage the threads or loops to properly perform their respective functions—as, for example, it is found desirable to curve the point of the looper 20 slightly toward the rear, as shown in Fig. 3, that it may properly coact with the looper 28, and the point of the latter is shown in Fig. 6 so formed as to travel closely to the needle 19, while the opposite sides of the looper 33 are shown in the last-named figure as slabbed to insure the proper coaction between the looper 33 and the looper 20 and the needle 19. It is obvious that in lieu of "slabbing" the looper 33 for the passage of the point of the looper 28 the said looper 33 may be suitably bent or curved. The exact shape and construction of the stitch-forming implements or their sizes are not essential to their

successful operation, as these elements are adapted to be constructed as conditions may demand.

To prevent side play of the looper 33, the lower end 34^c of the extension 34^b of the longer arm of the angle-lever 34 works in an opening 22^c in the work-plate 22 and between a pair of adjustable guides 38 39. The guides 38 39 consist of body portions which are adjustably secured in ways 22^d, Fig. 8, formed on the under side of the work-plate 22 and extending at right angles to the line of travel of the looper 33. The guides 38 39 are secured by screws 40, the holes 22^e in the work-plate 22 through which they pass being sufficiently large to permit of a slight adjustment, as best shown in Fig. 8. The confronting portions of the guides 38 39 are T-shaped, as shown, Figs. 7 and 8, and form guides for the opposite sides of the lower end 34^c of the angle-arm 34. Said guides are so set relatively to each other as to permit of the free travel of the arm end 34^c between them, but prevent any side play, and to enable a fine adjustment of the guides to be effected one of them is provided with a screw adjustment, preferably consisting of a screw 41 of fine pitch threaded in a lug 22^f on the under face of the work-plate 22 and having a headed extension 41^a engaging in a slot 39^a in the guide 39. The wall 22^a at the front side of the machine is cut away, as shown in Fig. 1, to enable the screw 41 to be conveniently reached and manipulated.

The screws 40, which serve to secure the guide 39 to the under side of the work-plate 22, also serve to secure a guard 40^a, Figs. 6 and 8, to the upper side of the said work-plate in front of the looper 33 and the oscillating arm carrying the same to protect these parts.

In the machine shown in the drawings portions of the mechanism of a "four-motion" feed are illustrated, the feed-dog (denoted by the reference-number 42) being supported upon the end of the feed-bar 43, which receives its horizontal motions from a rocking arm 44. It is supported near its outer end and receives its rising and falling movements through an arm 45, the horizontal and vertical movements of the feed being imparted, respectively, by eccentrics 46 47, located on the main shaft 13, as shown in Fig. 2; but as the exact feeding mechanism forms no part of this invention it is thought unnecessary to illustrate and describe the intermediate mechanisms between the eccentrics 46 47 and the feed proper, it being understood that the stitch-forming implements could be made to operate with any suitable known feed properly coacting therewith.

The reference-number 49 denotes the presser-bar, which slides vertically in the head 12, and the number 50 indicates the presser-foot, carried at the lower end of the said bar to coact with the feed. Suitable pressure and lifting mechanisms are provided

for the presser-bar, which are in the main illustrated in connection with the head 12; but as the construction of these features is not essential to the successful working of the stitch-forming mechanism no detailed description of the same is necessary.

The machine is provided with suitable tension devices 52 and thread-guides 53, properly located to permit the operation of threading up the stitch-forming implements to be readily accomplished, and a passage 54 leads from a point at the front side of the cap 12 to a point in the lower side thereof near the needle-bar for the purpose of conducting the needle-thread to a point near the needle.

While in the drawings a particular form of overseaming-stitch is shown, it should be noted that by varying the tension of the threads, the length of the feed, and the relative sizes of the threads stitches of entirely different appearance may be produced.

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

1. In an overseaming-machine, the combination of the following instrumentalities, to wit; a work-support, a reciprocating needle-bar, an eye-pointed needle and an eye-pointed looper having oppositely-directed points both carried by the needle-bar and capable of penetrating the fabric from opposite sides, a second looper beneath the work-support oscillating in a plane approximately intersecting the axial line of the needle-bar, a third looper located above the work-support and oscillating in a plane different from that of the second looper but also approximately intersecting the axial line of the needle-bar, said oscillating loopers coacting with the needle and looper moving therewith to form a stitch and driving mechanism for said parts; substantially as described.

2. In an overseaming-machine, the combination of the following instrumentalities, to wit; a work-support, a vertically-reciprocating needle-bar, an eye-pointed needle and a looper carried by the needle-bar, a second looper beneath the work-support moving in a single plane and coacting with the reciprocating needle and looper carried by the needle-bar and a third looper above the work-support oscillating in a single vertical plane diagonal to the vertical plane of movement of the needle and the looper carried by the needle-bar, whereby said third looper coacts with the needle at the front side thereof and with the looper carried by the needle-bar at its rear side and mechanism for actuating the said needle and loopers; substantially as described.

3. In an overseaming-machine and in combination the following instrumentalities, a work-support, a vertically-reciprocating needle and looper, a looper coacting with the needle and its looper below the work-support, a driving-shaft located above the plane of the work-support, a looper-carrier supported

to move in a plane diagonally to the axis of the driving-shaft, a looper carried by said looper-carrier and adapted to coact with the needle-looper at the rear side thereof and the needle at the front side thereof above the work-support, an eccentric on the main shaft and a universal-joint connection between the looper-carrier and the main shaft eccentric, substantially as described.

4. In an overseaming-machine the combination with a drive-shaft and a work-support, of stitch-forming implements including a looper and its carrier supported above the work-plate and moving in a single plane diagonally to the main shaft and guides between which its lower end is supported laterally and mechanism for actuating the stitch-forming implements, all being adapted to operate substantially as described.

5. In an overseaming-machine the combination with a drive-shaft, a work-support, of stitch-forming mechanism including a looper-carrier oscillating in a plane diagonally to the main shaft and having the separable lower end 34^b with an extension 34^c, guides 38, 39 between which said extension travels adjustably secured to the work-support and adjusting mechanism for the said guides; substantially as described.

6. In an overseaming-machine, a frame including a machine-head, a separable cap secured to the machine-head and a needle-bar supported therein, a main shaft journaled in the head, a disk or crank on said shaft located in a recess in the head and a connecting-link between the said crank and needle-bar confined at one end between the disk or crank and the cap and at the other end between the needle-bar and the face of the said machine-head, all being combined and operating substantially as described.

7. In an overseaming-machine, stitch-forming implements including a needle and a looper so arranged that their points are confronting, the looper being provided with a doubled portion below its point forming a thread-passage therethrough, a reciprocatory

needle-bar on which both the needle and looper are mounted and mechanism for actuating the stitch-forming implements, combined and operating substantially as described.

8. In an overseaming-machine, a reciprocating needle-bar, an eye-pointed work-penetrating needle and a looper having a doubled lower portion and an upwardly-extending point somewhat out of alinement with and below the needle-point both carried by said needle-bar, stitch-forming implements cooperating with the reciprocating needle and looper and mechanism for actuating the same and the needle-bar substantially as described.

9. In an overseaming-machine, stitch-forming implements including an eye-pointed needle arranged with its point downward and an eye-pointed looper moving in unison therewith, the lower portion of the looper being doubled upon itself with its functional portion pointing reversely of the needle, the said doubled portion being adapted for the passage of thread therethrough and mechanism for actuating the stitch-forming implements all being combined and operating substantially as described and for the purpose set forth.

10. In an overseaming-machine, the combination of the following instrumentalities, to wit; an eye-pointed needle and a looper having their ends pointed in opposite directions and out of alinement with each other, a single reciprocating carrier on which both said needle and looper are rigidly mounted, a work-support, a looper below and a looper above the work-support for respectively carrying a loop from the needle to the first-mentioned looper below the work-support and from said looper to the needle above the work-support and actuating mechanism for said carrier and loopers; substantially as described.

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