

No. 684,287.

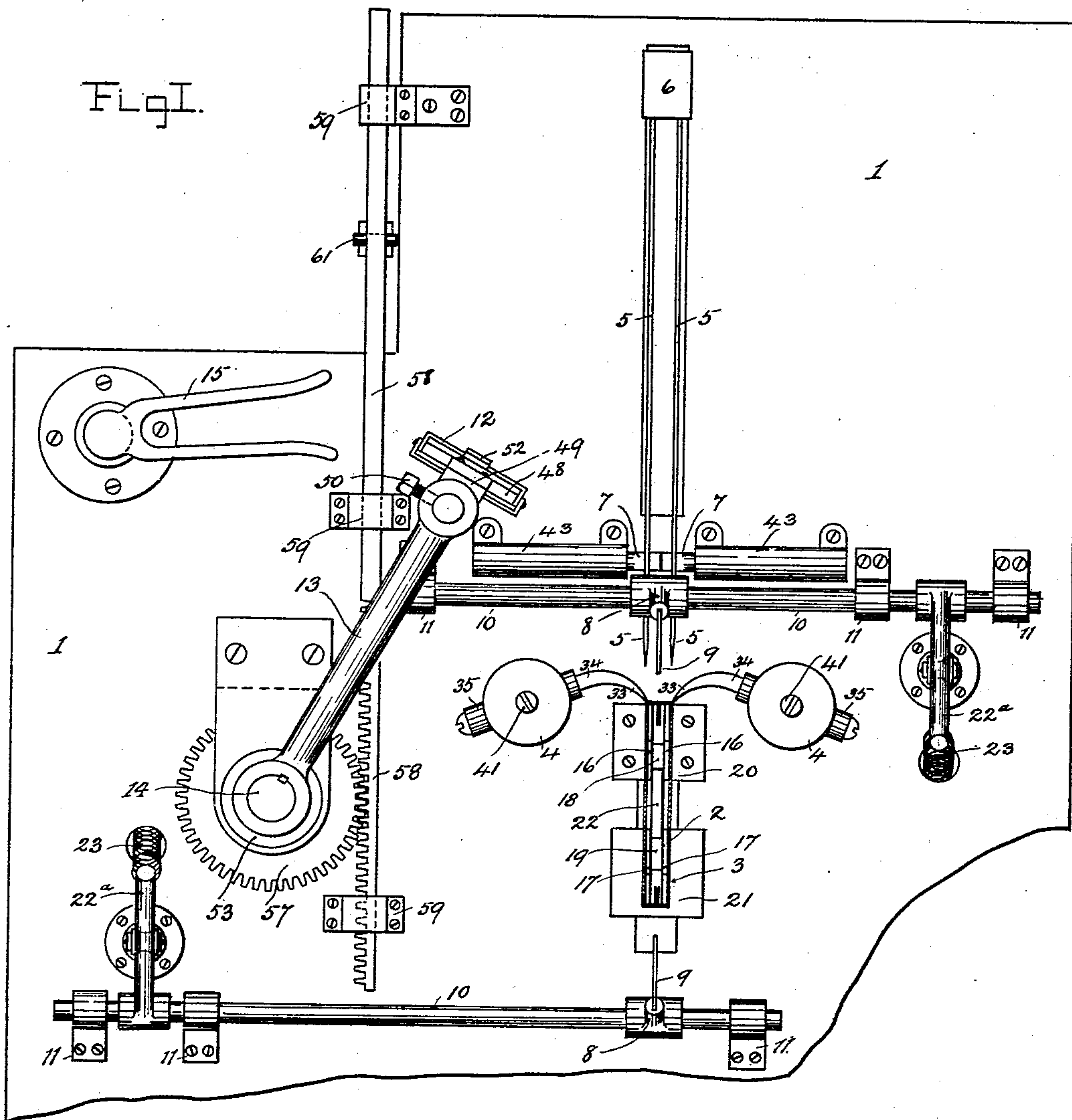
Patented Oct. 8, 1901.

C. MILLHISER & C. L. A. DOEPPE.
BAG STRINGING MACHINE.

(Application filed Mar. 15, 1900.)

(No Model.)

4 Sheets—Sheet 1.



WITNESSES:

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BY

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their ATTORNEYS.

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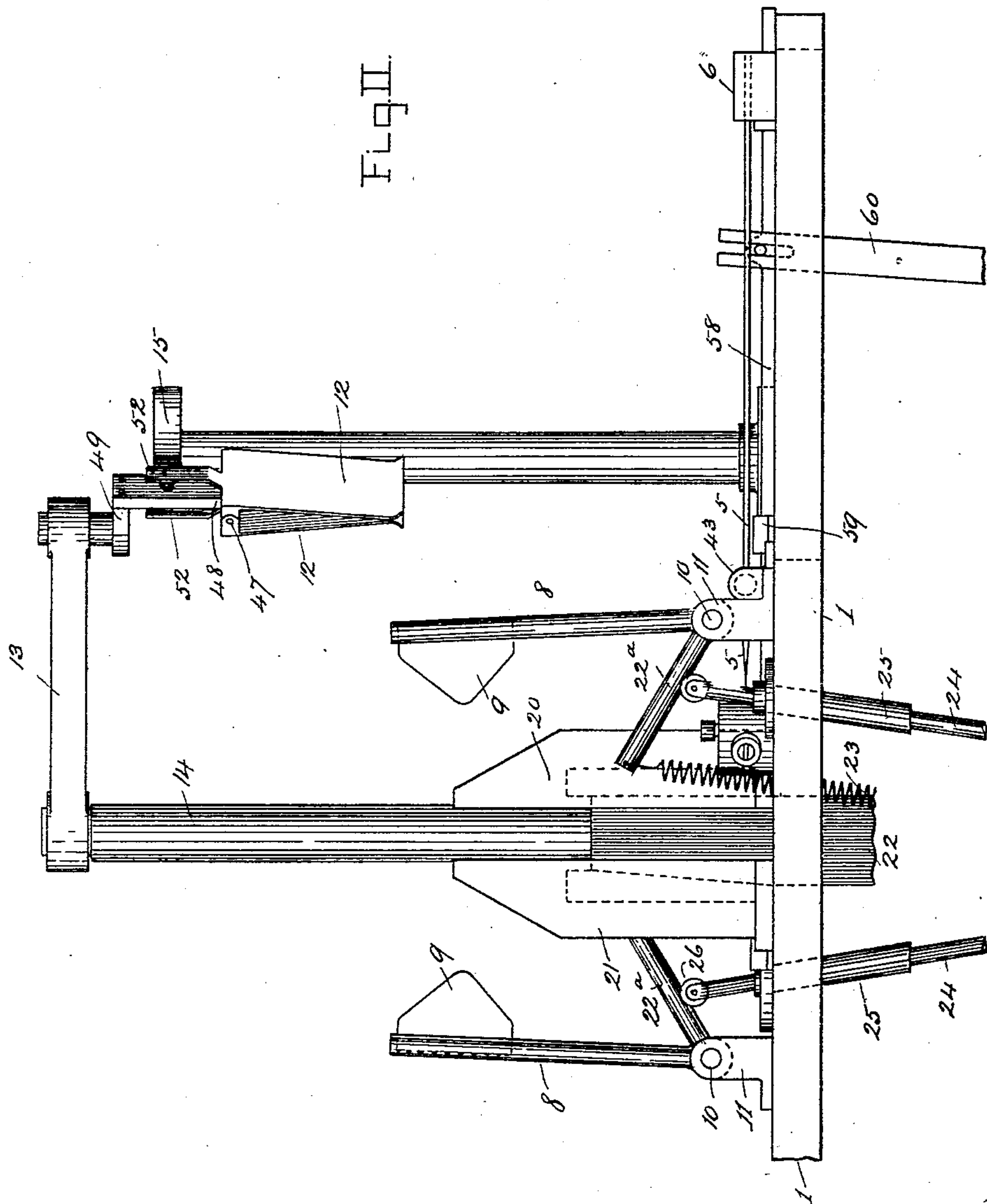
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4 Sheets—Sheet 2.



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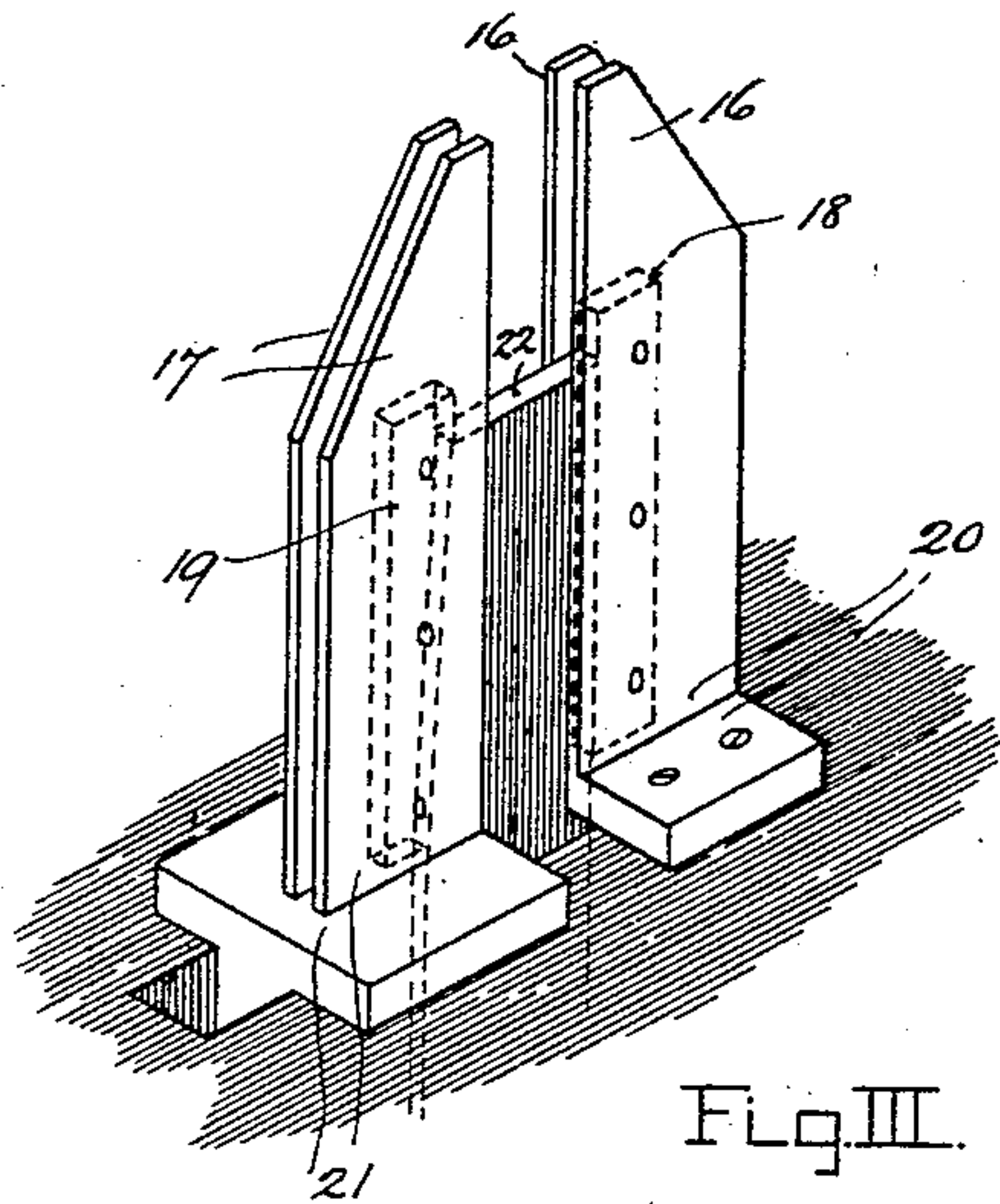


Fig. III.

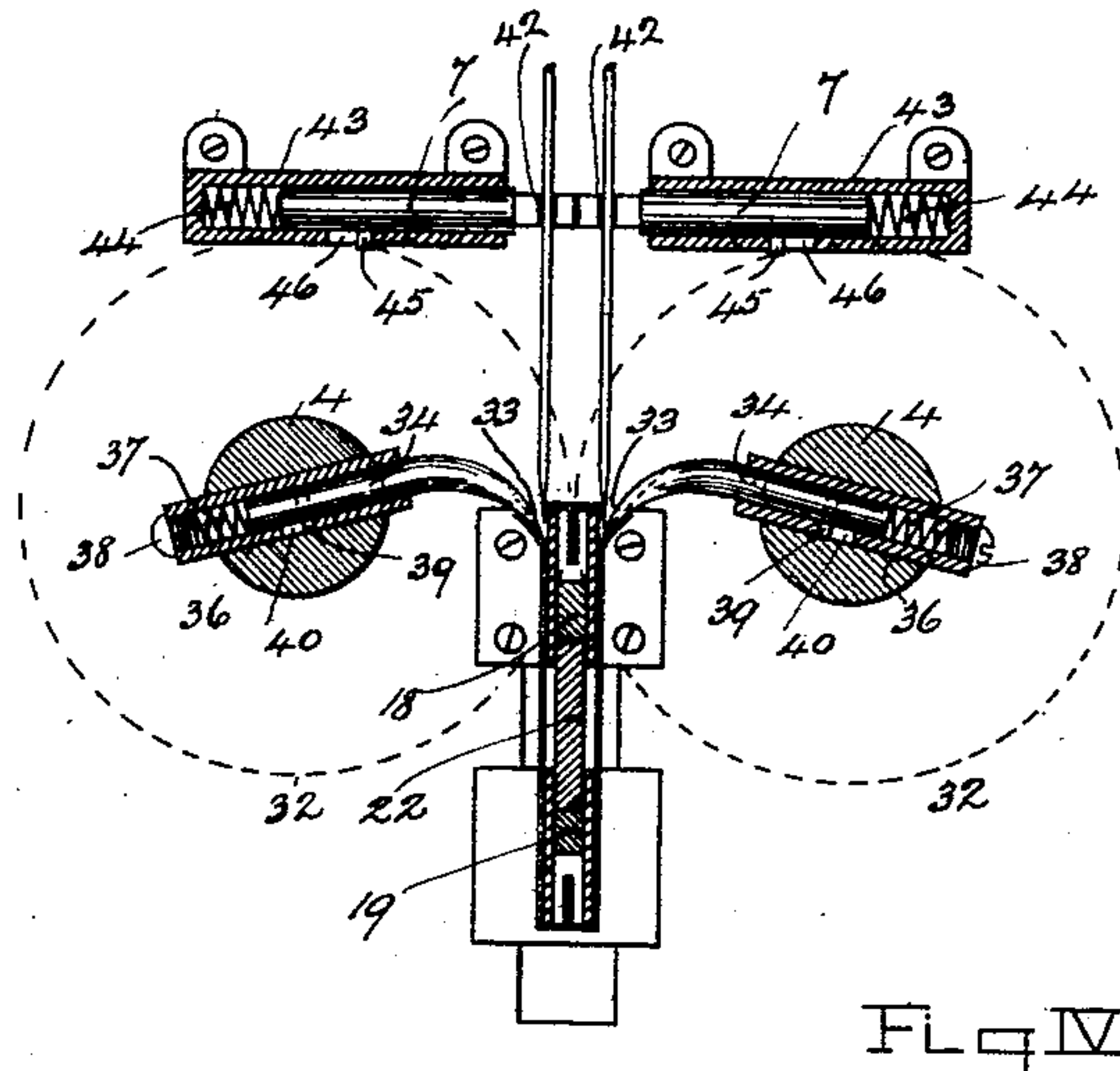


Fig. IV.

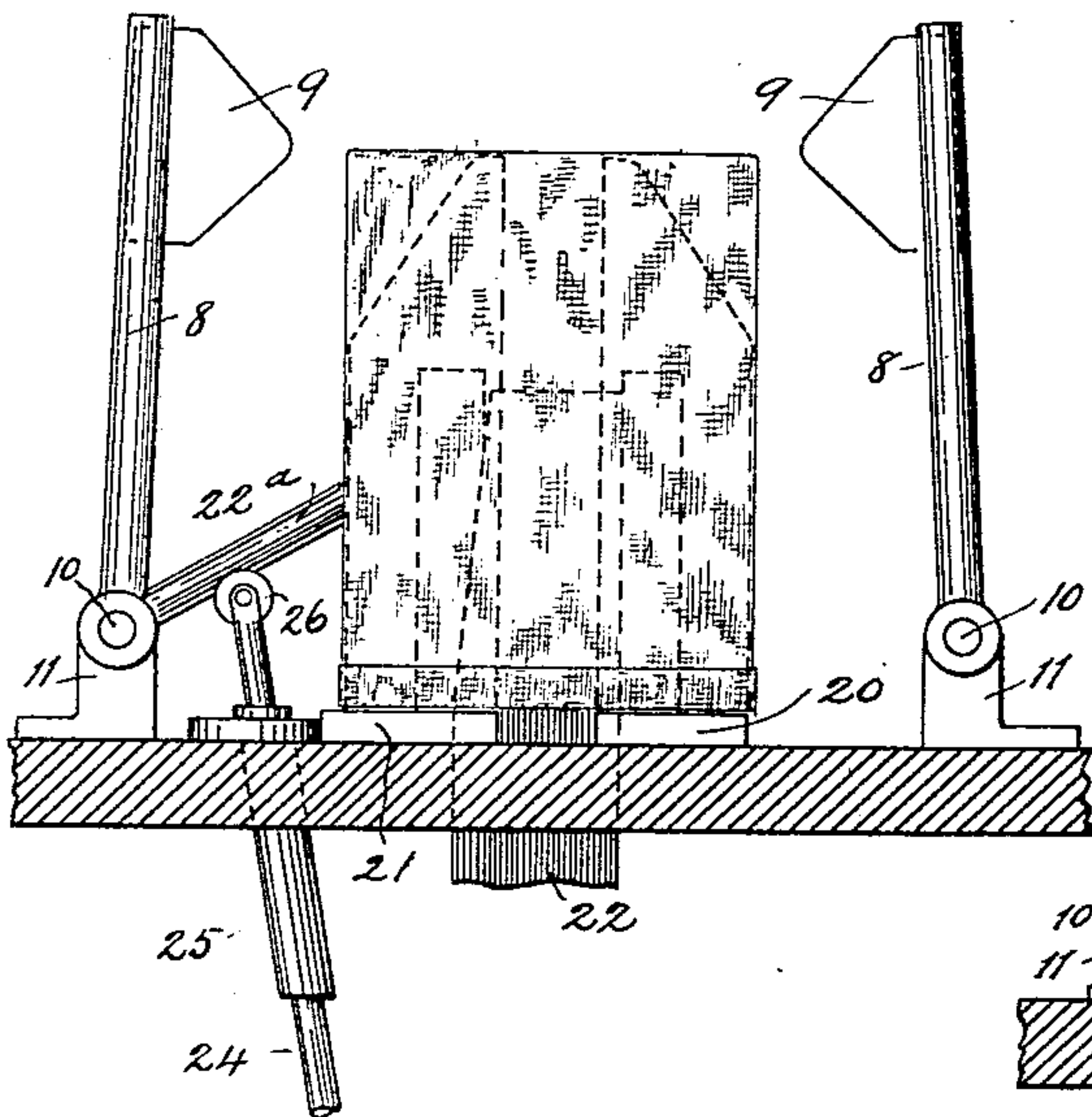


Fig. V.

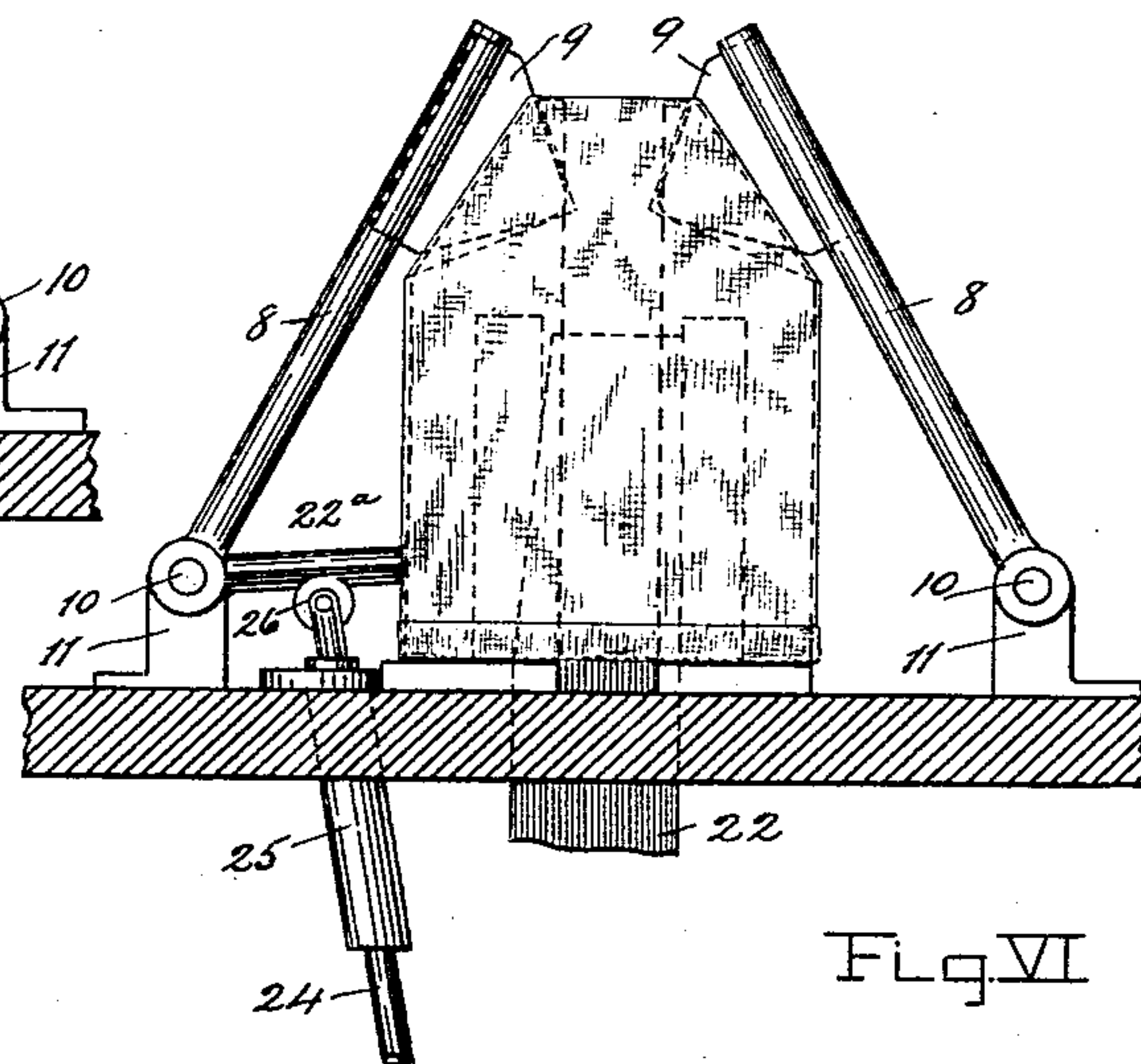


Fig. VI.

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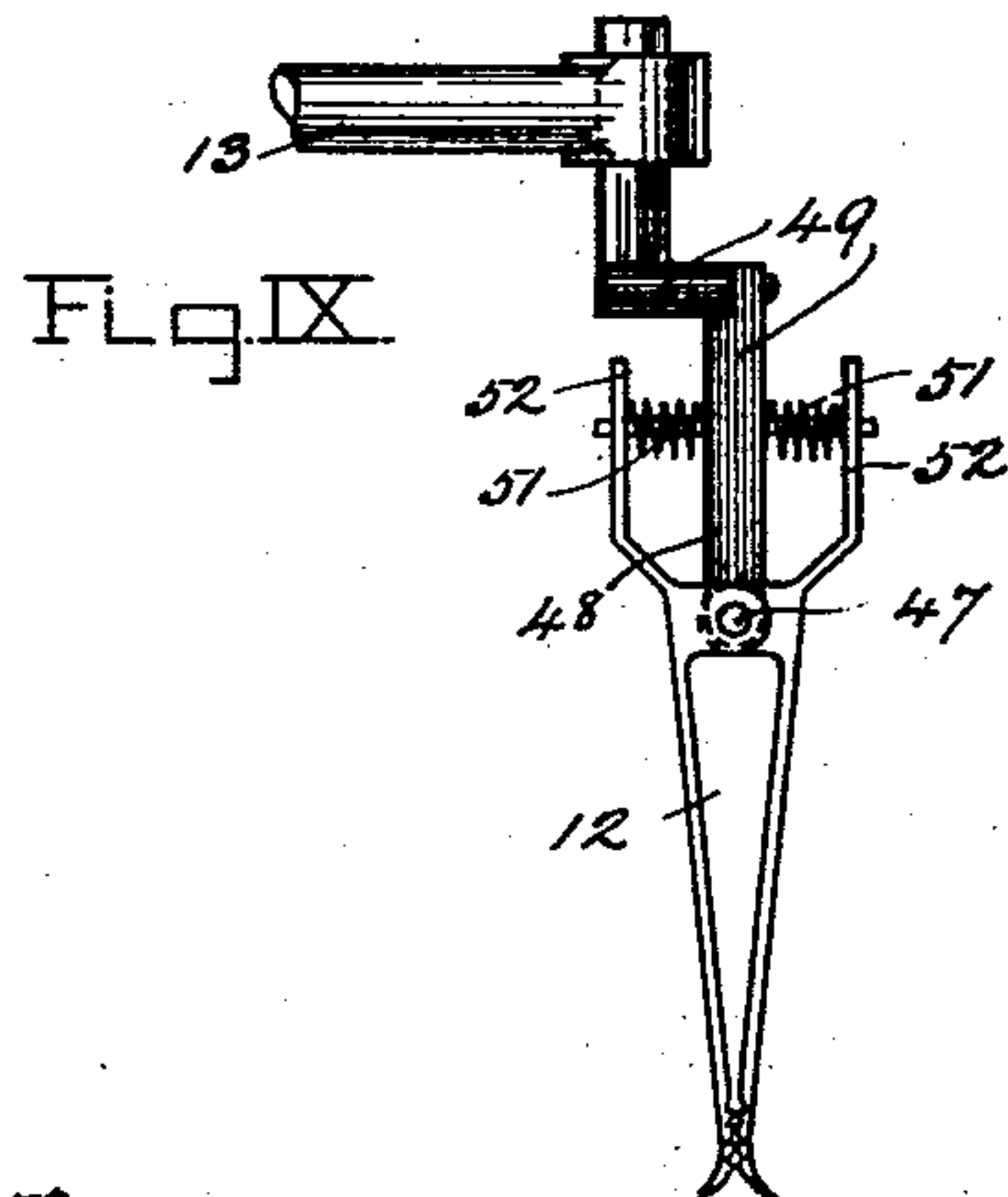
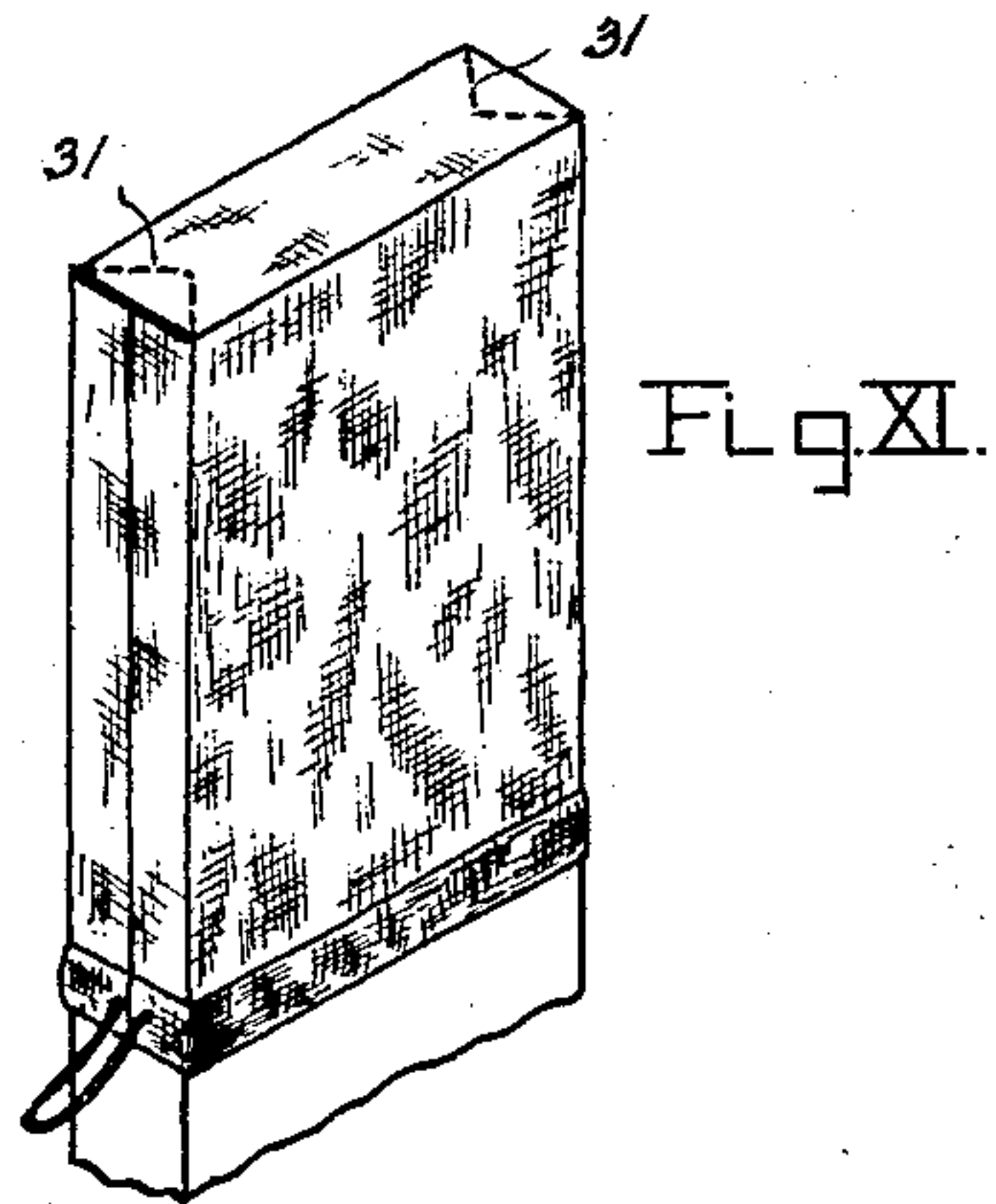
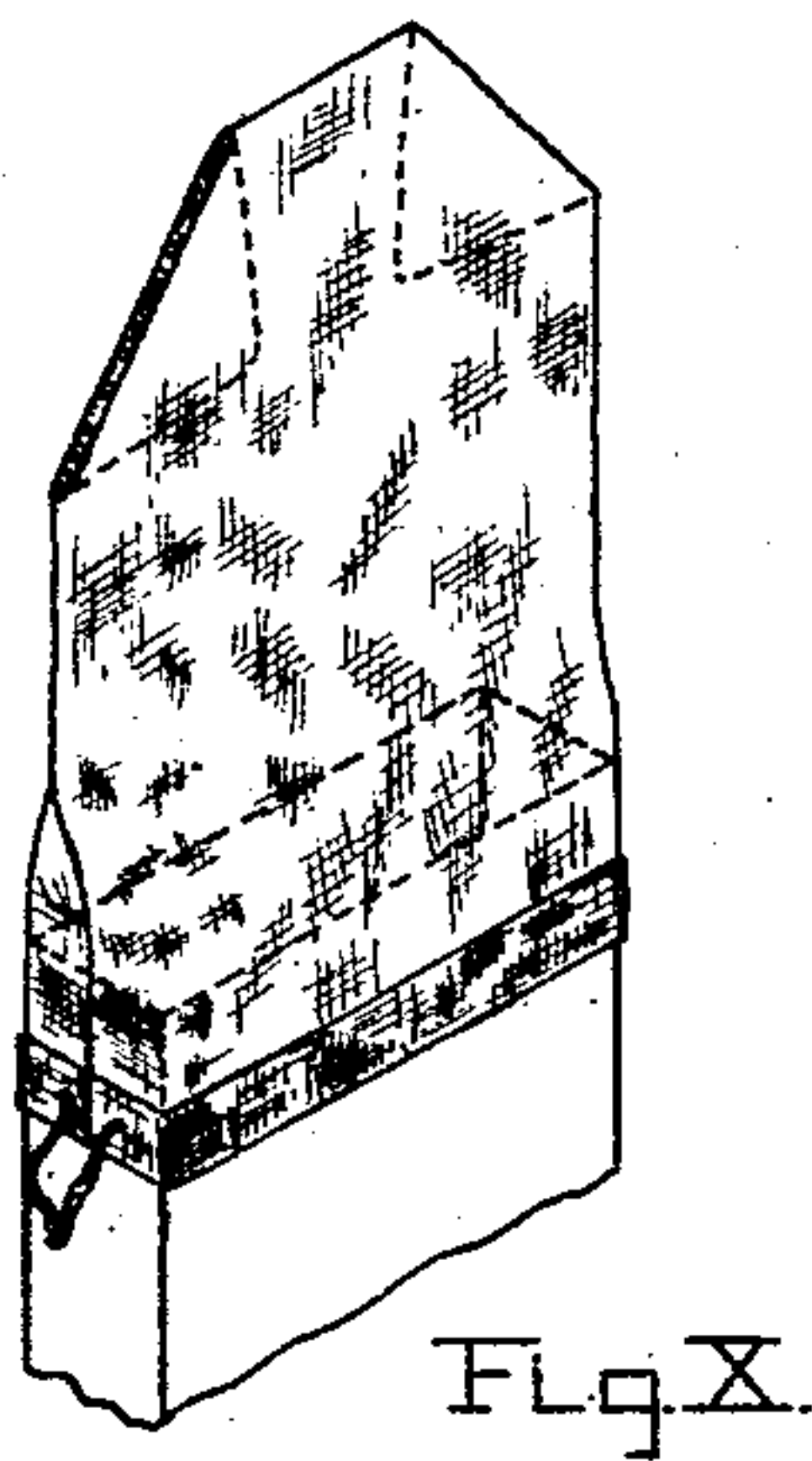
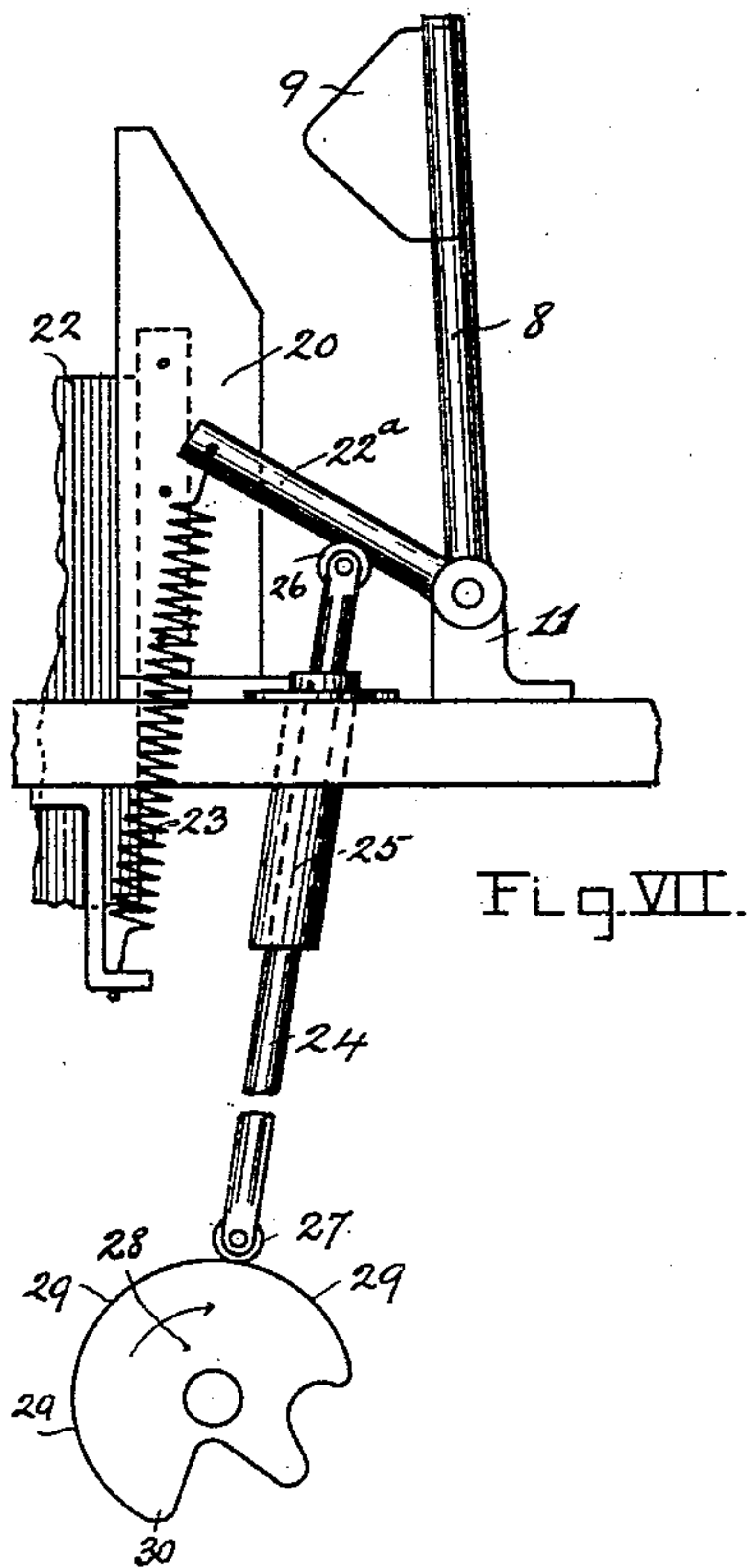
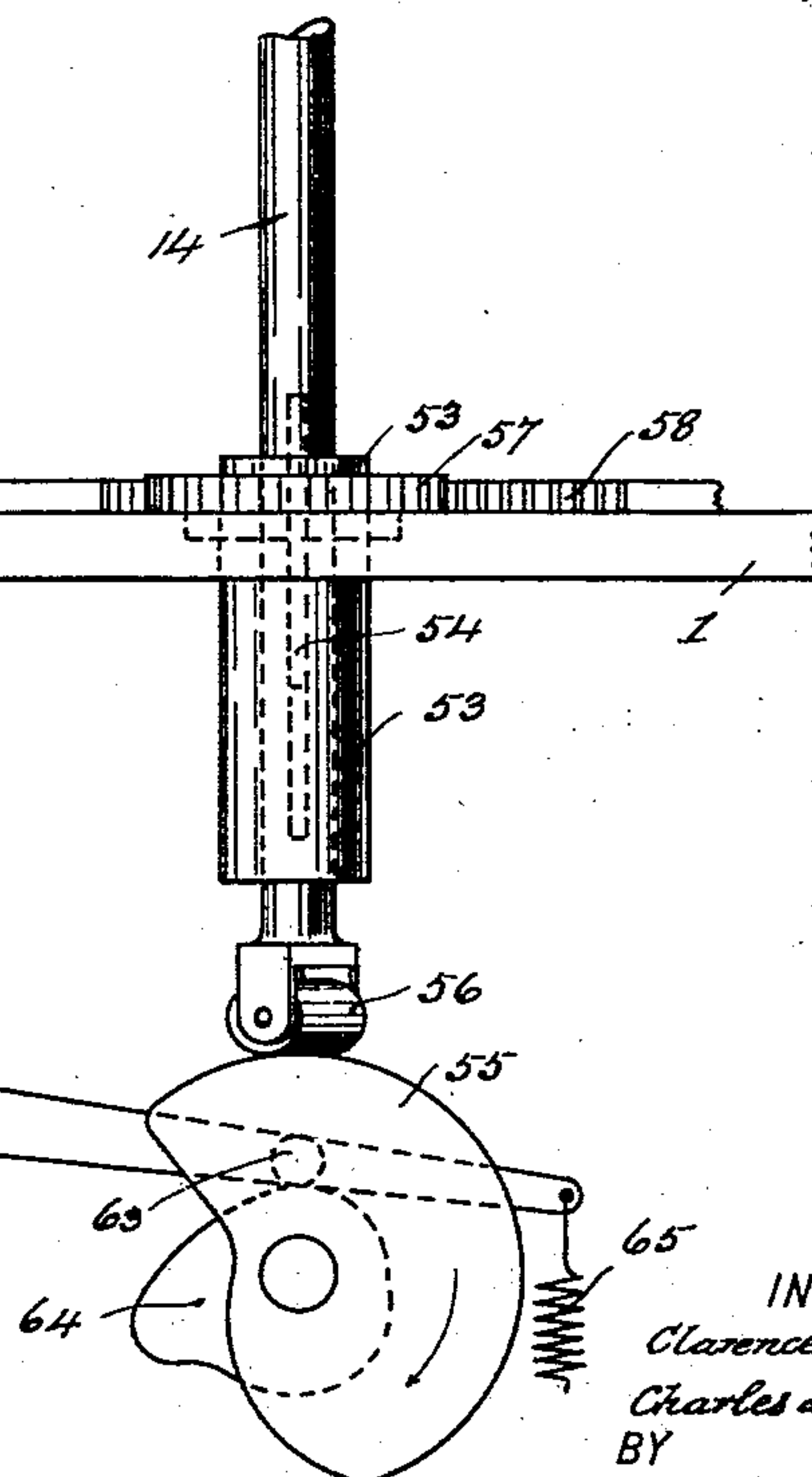


Fig. VII.



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UNITED STATES PATENT OFFICE.

CLARENCE MILLHISER AND CHARLES L. A. DOEPPE, OF RICHMOND, VIRGINIA, ASSIGNORS TO THE MILLHISER MANUFACTURING COMPANY, OF SAME PLACE.

BAG-STRINGING MACHINE.

SPECIFICATION forming part of Letters Patent No. 684,287, dated October 8, 1901.

Application filed March 15, 1900. Serial No. 8,750. (No model.)

To all whom it may concern:

Be it known that we, CLARENCE MILLHISER and CHARLES L. A. DOEPPE, citizens of the United States of America, and residents of Richmond city, State of Virginia, have invented certain new and useful Improvements in Bag-Stringing Machines, of which the following is a specification.

Our invention relates to improvements in machines for applying shirring-strings to the mouths of bags composed of textile or other suitable fabrics, the shirring-strings serving when drawn to close the mouths of the bags, and so prevent the escape of their contents.

The objects of our improvements are to provide a satisfactory holder for the bag, to afford facilities for the proper adjustment of the perforators and of the needles, means for tucking the bottom corners of the bags, and other details conducive to the proper and economical working of the machine.

In the drawings which form a part of this specification, and in which like numerals refer to like parts in the different views, Figure I is a broken plan showing part of the top of the machine and embodying our improvements. Fig. II is a broken side elevation of the upper part of the machine, showing the improved bag-holder, tucking device, lifter, and perforator. Fig. III is a view in perspective of the improved bag-holder. Fig. IV is a detail view showing a horizontal section of the improved bag-holder, needle-guides, and perforators. Figs. V and VI are detail views in elevation, showing the operation of the tucking device. Fig. VII is a detail view showing suitable mechanism for operating the tucking device. Fig. VIII is a detail view showing suitable mechanism for operating the lifter. Fig. IX is a detail view of the lifter. Figs. X and XI illustrate the manner in which the operation of tucking bags is usually completed just before the bag is filled.

In Fig. I, 1 is the table of the machine; 2, the bag-holder, carrying a bag, (shown in section at 3.) 4 4 are the perforators, whose function it is to pierce the hem of the bag, and so form an opening for the entrance of the stringing-needles 5 5, which are carried in the sliding block 6. 7 7 are the spring-guides, which control the

direction of the movement of the needles. 8 8 are the fingers of the tucking device, carrying the tucking-blades 9 and supported on the rods 10, which are carried in bearings 11, attached to the table of the machine. 12 is the lifter, carried by the arm 13, which is in its turn carried by the upright rod 14. 15 is a fixed fork, between the arms of which the "lifter" 12 is caused to swing and which then, opening the jaws of the lifter, cause the said lifter to release the bag which it has taken from the bag-holder and allow it to drop into a chute or other suitable receptacle.

In pointing out the novelty and use of our improved bag-holder it will be necessary to draw attention to the structure of the bags which the said bag-holder is intended to support while they are being strung.

All bags made in any other way than by cutting portions from a woven tube of fabric and by sewing up one end of the severed portions of the woven tube to form the bottoms of the bags must of necessity have a seam running down at least one of its sides, for in whatever manner you fold a piece of fabric which when folded and sewed will form a bag there must be three open edges to the folded portion of fabric. To form a bag, two of the open edges must be sewed up, the third edge being left open to form the mouth of the bag. If the open edges which are opposite to one another be sewed up, the edge which is opposite to the fold of the fabric will be left open to form the mouth of the bag, and consequently there will be a seam on both sides of the bag. Again, if that edge of the folded portion of fabric which is opposite to the fold and one of the adjacent edges be sewed up the other adjacent edge being left open to form the mouth, then the bag will have a seam on one side, the other side being formed by the fold of the portion of fabric. Now a portion of the fabric of which the bag is made projects beyond the line of stitches which form the seam or seams, and when a bag is placed on the bag-holder in order that it may be strung the fabric projecting beyond the side seam or seams must be accommodated in some way.

In bag-holders for stringing-machines as heretofore constructed the outer upright

edges of the holder have been made solid—that is, either flat or convex. When a bag is placed on such a holder, the fabric projecting beyond the line of stitches intervenes between the holder and the bag and prevents the latter from making a close neat fit on the holder, and it being desirable that the shirring-strings shall enter and leave the hem of the bag at or near the seams it follows that at the very point where accuracy in the fit of the bag on the holder is most necessary the fit is least perfect. The consequence is that the perforators and stringing-needles frequently pierce both thicknesses of the hem, with the result that the strings instead of being passed through the inside of the hem are passed inside the bag itself, where of course they are useless for closing the mouth of the bag. We overcome this difficulty by providing a space in the edge or edges of the bag-holder for the reception of the material projecting beyond the side seam or seams. This we do by cutting deep grooves in the vertical edges of the holder or by constructing the holder of pieces of plate 16 and 17, secured to intermediate distance-pieces 18 19, beyond whose outer edges the outer edges of the plate project, and so form grooves. The latter form of holder is clearly shown in Fig. III, and it is also shown in section in Fig. IV. The operator when placing a bag on the holder guides the fabric projecting beyond the seam or seams into the recess or recesses formed by the projecting edges of the side plates 16 and 17. The bag then fits the holder as perfectly as it would if it were seamless. We have referred to the fabric which projects beyond the seam or seams in order to include the bags which have either one or two side seams, according to the manner in which the folded portion of fabric was sewed up in the manufacture of the bag, as hereinbefore described. When bags having two side seams are to be strung, we use a bag-holder having two recesses or grooves, one to receive the fabric projecting beyond each seam. When a bag having one side seam only is to be strung, it is only necessary that the bag-holder should have one recess or groove to receive the fabric projecting beyond that seam; but it is manifest that we can use a bag-holder having two recesses or grooves in this case also. Consequently we generally use on our machines a bag-holder having two recesses or grooves, whether we are going to string bags having two side seams or only one side seam.

In order that the operator may easily place the bag on the bag-holder, the said holder is made in two principal sections. One of these sections 20, that of which the plates 16 and the distance-piece 18 form a part, is made stationary, while the section 21, or that of which the plates 17 and the distance-piece 19 form a part, is movable in a horizontal plane and in a direction toward or from the section 20.

Between these sections is fitted a wedge-piece 22, which when it is moved in one direction (downward) allows a spring or other contrivance to bring the two parts of the bag-holder nearer to one another, thus making the distance between the two upright edges of the holder sufficiently small to permit of the bag which is to be strung being easily slipped on. The wedge 22 then being caused to move in the opposite (upward) direction forces the two sections of the bag-holder apart until they stretch the bag tight. The width between the side seams of the machine-made bags is usually uniform, but in hand-made bags it sometimes varies a little, and since shirring-strings may be inserted in bags of either class the bag-holder should be so constructed that it may meet the requirements of both. In the case of machine-made bags the wedge may be given a movement of definite length, the said movement being so adjusted that the two sections of the bag-holder shall be forced apart a distance just sufficient to stretch the bag tight; but if bags which varied as to the width between their seams were to be placed on such a holder some might not only be stretched, but strained. Therefore we find it better in order to meet the requirements of both machine and hand made bags to connect the wedge to the mechanism by which it is operated by means of a spring of a strength sufficient to cause the wedge to force apart the sections of the bag-holder just far enough to stretch the bag tight without straining it. Then if a bag whose width between seams is less than the average be placed upon the holder the spring will “give” as soon as the bag is sufficiently stretched, and so take up the surplus motion of the wedge-actuating mechanism.

A square-bottomed bag, such as that shown in position on the bag-holder in Fig. V, is uniform in width from the hem down to the bottom. When such a bag is filled with any substance—such as flour, seed, tobacco, grain, &c.—the actual width of the bag will decrease for the greater part of its length. Not so the bottom, however. The length of the actual line of the bottom of the bag will be practically the same after the bag is filled as it was before, and owing to the decrease in the width of the bag above the bottom the bottom corners will be caused to stand out like ears. This projecting of the bottom corners of a bag is unsightly and would in many cases render a bag unmarketable. To correct it, the bottom corners of square-bottomed bags are “tucked”—that is, the corners of the bag are tucked in before the bag is filled—the tucked corners being held in place either by the pressure of the material within the bag or by means of a few stitches. The operation of tucking is conducted in the following manner:

The upper corners of the bag-holder, it will be seen on reference to Figs. II, III, V, and

VI, are cut away to an angle. There is also a clear space between the plates 16 and 17 at their upper ends. Into these spaces the tucking-blades 9 push the corners of the bag. 5 These tucking-blades 9 are carried by arms 8, attached to shafts 10, which are carried in brackets 11. Also attached to these shafts are other rods 22^a. To these rods are attached springs 23, Figs. I and II, which tend 10 to keep the rods 22 in their lowest position, and consequently the tucking-blades in the spaces between the plates 16 and 17. The rods 22^a and through them the arms 8 and blades 9 are raised (to the position shown in 15 Fig. V) by means of rods 24, which are carried in sleeves 25, attached to the table of the machine. These rods carry at their upper extremities grooved rollers 26 or other means for reducing friction which bear on 20 the under side of rods 22^a. At the lower extremities of the rods 24 are rollers 27, which bear on cams 28. So long as the parts 29 of the cams 28 bear against the rollers 27 the tucking-blades 9 will be kept in the position 25 shown in Fig. V; but when the parts 30 of the said cams pass the rollers 27, the rollers being free to drop, the springs 23 suddenly pull down the rods 22^a, and therefore the tucking-blades 9, until they are in the posi- 30 tion shown in Fig. VI.

In Fig. V a bag is shown in position on the holder ready to be tucked. As the cams 28, Fig. VII, revolve and their parts 30 pass the rollers 27 the tucking-blades 9 fall and tuck 35 the corners of the bag in between the plates 16 16 and 17 17, as shown in Fig. VI. It will be seen that the cams 28 have two indentations. (See Fig. VIII.) The second indentation causes the cams to give the blades 9 a 40 second and slower stroke. This we find to be advisable in certain cases, as it insures the equalization of the tucking of the two corners of the bag. The cams 28 continuing to revolve then raise the tucking-blades 9 to 45 their original position. The bag is now tucked as far as a bag can be before filling—that is, if the tucked corners are not to be secured by sewing. The rest of the operation of tucking is done by slipping the bag 50 over the “former-funnel,” through which the bag is to be filled. This is shown in Figs. X and XI. In Fig. X the bag as it comes from the stringing-machine is being drawn over the former, and in Fig. XI the bag is shown 55 on the former and ready for filling, the dotted lines at 31 indicating the final position of the tucked corners.

In order that the stringing-needles 5 may with certainty enter the hem of the bag at 60 the proper point, perforators are employed. These perforators are carried on vertical rods journaled in the table of the machine and geared together beneath the said table, as indicated by dotted circles 32 in Fig. IV, in 65 such a manner that they will revolve on their axes simultaneously and in opposite direc-

tions—that is, both toward the bag, which is in position on the bag-holder. The perforators carry points 33, which as the perforators revolve (the revolution continuing only 70 through a small arc of a circle) pierce the outer thickness of the hem of the bag, thus making the openings through which the points of the stringing-needles 5 may enter. Perforators as heretofore constructed and op- 75 erated are caused to continue their revolution through a small arc after piercing the hem of the bag, so that they may hold open the punctures made in the hem for the entrance of the stringing-needles and also so 80 that the points of the perforators may be carried out of the way of the advancing needles. It has been found that when operated in this manner the perforators are apt to tear the fabric of the hem at the puncture. We 85 overcome this difficulty by stopping the revolution of the perforators as soon as they have pierced the hem and by mounting the points 33 in the turrets 4 in such a manner that the advancing stringing-needles may push them 90 to one side. The points 33 are formed on the ends of small rods 34, which slide in sleeves 35, which in their turn are adjustable in sockets 36, drilled in the perforator-turrets 4. In the rear of the rods are small springs 37, 95 which held in the sleeves 35 by means of plugs 38 hold the points 33 in their most forward position, the forward movement being limited by the pins 39, which projecting from the rods 34 slide in slots 40 in the sleeves 35. 100 In Fig. IV the perforator-points 33 are represented as having just perforated the hem of the bag, and the needles 5 are represented as just about to enter the perforations. Now as the needles enter the perforations in the 105 hem of the bag they will strike against the points 33 and forcing them back against the springs 37 will clear a passage for themselves. This lateral movement of the points 33, it is found, does not tear the hem of the bag. As 110 soon as the needles have entered the hem of the bag the turrets 4 revolve in a direction opposite to that in which they first revolved, and so withdraw the points 33 from the hem. It is necessary that the position of the points 115 33 should be most carefully adjusted. We provide for this adjustment by mounting the sleeves 35, which carry the points 33, in sockets 36, drilled in the turrets 4. The sleeves 35 may be held at any point in the sockets 36 120 by means of set-screws 41, which pass through the heads of the turrets and bear upon the sleeves. (See Figs. I and II.)

In order that the stringing-needles 5 may adjust themselves to the position of the per- 125 forators in the hems of the bag, they are guided by spring-guides 7, Figs. I and IV. These guides, which have at their forward ends grooves 42 to carry the needles, are mounted in stationary sleeves 43 and are 130 kept in their forward positions by means of light springs 44, their forward movement be-

ing limited by the pins 45, which projecting from the body of the guides slide in slots 46, cut in the sides of the stationary sleeves 43. The needles are set so that when they advance their points will just strike the center of the hem; but since the bodies of the needles are, for the sake of strength, of appreciable diameter they would in advancing be turned slightly to one side. Now if the guides 7 were fixed, instead of self-adjusting, the points of the needles would be deflected more and more from their proper path as the needles advanced; but this deflection is corrected by the spring-guides 7, which adjust themselves to the position of the advancing needles and so allow the path of the needles to be practically straight and in line with the hem of the bag.

After a bag has been strung and tucked it is lifted from the bag-holder by the lifter 12. This lifter consists of two jaws 12, pivoted at 47 to the bar 48, which forms a part of the bracket 49. This bracket is adjustably secured in the arm 13 by means of the set-screw 50. The jaws 12 are kept in contact by means of springs 51, which act between the bracket 49 and the extensions 52 of the jaws 12. The arm 13, to which the lifter is attached, is mounted on the shaft 14, which has two movements—one rotary and the other vertical. These movements are obtained in the following manner: The shaft 14 is carried in a vertical sleeve 53, (see Fig. VIII,) in which it can be caused to slide; but the shaft 14 is prevented from turning in the said sleeve by means of a feather 54, which projects from the shaft into a slot cut into the inner wall of the sleeve. Vertical motion is given to the shaft 14 (and therefore to the lifter 12) by means of a cam 55, which bears against a roller 56, attached to the said shaft. On the sleeve 53 is placed a pinion 57, which gears with the rack 58, Fig. I, which runs in guides 59. This rack is given a reciprocating motion by means of a bell-crank 60, whose forked upper end engages a pin 61 in the rack 58. The bell-crank 60 is pivoted at 62 and carries on its horizontal arm a roller 63, which bears upon a cam 64. To the end of the horizontal arm of the bell-crank 60 is attached a spring 65, the lower end of which is secured to any convenient part of the frame of the machine. The cam 64 is so shaped that it, together with the spring 65, gives to the roller 63 the following movements and periods of rest—viz., downward, at rest, upward, downward, at rest. These movements of the roller 63 cause the lifter 12, (through the bell-crank 60, the rack 58, the pinion 57, the sleeve 53, the shaft 14, and the arm 13,) starting from the position shown in Fig. I, to swing into position over the bag-holder, then to pause, then to swing back until the extensions 52 of the lifter are pressed together between the jaws of the fork 15, then to

return to its first position and come to rest. The cam 55 imparts a vertical movement to the shaft 14, and consequently to the lifter 12 when the latter is in position over the bag-holder. The combined actions of the two cams 55 and 64 cause the lifter 12 to go through the following movements, starting from the position shown in Fig. I: to swing into position over the bag-holder 2, to drop and seize the bag, to rise again, lifting the bag from the bag-holder, to swing toward the fork 15 until the said fork pressing together the extension-pieces 52 of the lifter causes the lifter to release the bag, and finally to swing to its first position. In order to give the jaws of the lifter 12 a grip on the bag while drawing it from the holder, reversed teeth are cut along the inner face of the jaws, as shown in Fig. IX. It will be seen that these teeth will not prevent the jaws from slipping smoothly over the bag to engage it, but that as soon as the lifter begins to rise the teeth will catch the fabric of the bag and lift the bag from the holder.

Having now described our invention, what we claim, and desire to protect by Letters Patent of the United States, is—

1. A tucking device consisting of triangular blades adapted to tuck the bottom corners of a bag by tucking them into recesses in a bag-holding device, and means for operating the triangular blades, in combination with a bag-holding device having in its upper corners, the said corners being truncated, recesses to receive the bottom corners of the bag when they are tucked in by the tucking device.

2. A tucking device consisting of triangular blades adapted to tuck the bottom corners of a bag by tucking them into recesses in a bag-holding device, and means for operating the triangular blades, in combination with a bag-holding device having in its upper corners, the said corners being truncated, recesses to receive the bottom corners of a bag when they are tucked in by the tucking device; the said bag-holding device also having in one of its vertical edges a groove to receive the edges of the fabric projecting beyond the seam of the bag.

3. A tucking device consisting of triangular blades adapted to tuck the bottom corners of a bag by tucking them into recesses in a bag-holding device, and means for operating the triangular blades, in combination with an expansible and contractible bag-holding device consisting of two or more sections, one of the said sections, preferably the forward section, being stationary, and another section, preferably the rearward section, being movable in a horizontal plane toward and from the forward section, the said forward and rearward sections having recesses to receive the bottom corners of the bag when they are tucked in by the tucking device, and one

of the said sections also having a space to receive the edges of the fabric projecting beyond the seam of the bag.

4. A bag-holding device, in combination with a lifting device for lifting the bag from the bag-holding device, the said lifting device consisting of a pair of tongs and being adapted to descend to grip the bag, to rise to lift the bag from the holder, and to release the lifted bag, means for operating the tongs to grip the bag and to lift it from the holder, and means for releasing the bag from the tongs.

5. The combination of a bag-holding device, stringing-needles for introducing shirring-strings into or through a part of the mouth of the bag supported by the bag-holding device, and perforators for piercing the bag to make an entrance for the stringing-needles and so arranged that after they have pierced the bag and while the point of the perforator is still within the puncture made in the bag, the advancing needles may push them to one side and so cause them to hold open the puncture for the entrance of the said stringing-needles.

6. A bag-holding device, in combination with perforators having spring-adjusted points for piercing a part of the mouth of the bag supported by the bag-holding device so as to provide a passage for stringing-needles, the said spring-points being so arranged that they may be pushed to one side by the advancing stringing-needles so as to hold open the puncture for the entrance of the said stringing-needles, and stringing mechanism for introducing shirring-strings into or through a part of the mouth of the bag.

7. A bag-holding device having a space or spaces for the reception of the fabric projecting beyond the seam or seams of the bag, in combination with perforators having spring-adjusted points for piercing a part of the mouth of the bag supported by the bag-holding device so as to provide a passage for stringing-needles, the said spring-points being so arranged that they may be pushed to one side by the advancing stringing-needles so as to hold open the puncture in the bag for the entrance of the said stringing-needles, and stringing mechanism for introducing shirring-strings into or through a part of the mouth of the bag.

8. A bag-holding device, in combination with perforators having spring-adjusted points for piercing a part of the mouth of the bag supported by the bag-holding device so as to provide a passage for stringing-needles, the said spring-points being so arranged that they may be pushed to one side by the advancing stringing-needles so as to hold open the puncture for the entrance of the said stringing-needles, and so that they may be returned by means of springs to their original setting after they have performed their function, and stringing mechanism for introduc-

ing shirring-strings into or through a part of the mouth of the bag.

9. A bag-holding device having a space or spaces for the reception of the fabric projecting beyond the seam or seams of the bag, in combination with perforators having spring-adjusted points for piercing a part of the mouth of the bag supported by the bag-holding device to provide a passage for stringing-needles, the said spring-points being so arranged that they may be pushed to one side by the advancing stringing-needles so as to hold open the puncture in the bag for the entrance of the said stringing-needles, and so that they may be returned by means of springs to their original setting after they have performed their function, and stringing mechanism for introducing shirring-strings into or through a part of the mouth of the bag.

10. A bag-holding device having a space or spaces for the reception of the fabric projecting beyond the seam or seams of the bag, in combination with perforators having spring-adjusted points for piercing a part of the mouth of the bag supported by the bag-holding device so as to provide a passage for stringing-needles, stringing-needles for introducing shirring-strings into or through a part of the mouth of the bag, and spring-guides for guiding the stringing-needles, the said guides being so arranged that as the needles enter the punctures in the bag they may adjust themselves to the path of the needles, and so that when the needles have been withdrawn from the punctures in the bag they may be returned by means of springs to their original positions.

11. A tucking device consisting of triangular blades adapted to tuck the bottom corners of a bag by tucking them into recesses in a bag-holding device, and means for operating the triangular blades, in combination with an expansible and contractible bag-holding device consisting of two or more sections, one of the said sections, preferably the forward section, being stationary, and another section, preferably the rearward section, being movable toward and from the forward section to stretch the bag, the said forward and rearward sections having recesses to receive the corners of the bag when they are tucked in by the tucking-blades, and one of the sections also having a space to receive the edges of the fabric projecting beyond the seam of the bag, and means for operating the bag-holding device.

12. In a bag-stringing machine, the combination of stringing-needles for introducing shirring-strings into or through a part of the mouth of a bag, and spring-guides for guiding the stringing-needles, the said guides being so arranged that as the needles enter the fabric of the bag they may adjust themselves to the path of the needles, and so that when the needles have been withdrawn from the bag they may be returned by means of springs to their original positions.

13. The combination of a bag-holder having
slotted edges to receive the projecting portion
of the fabric of the bag beyond the seam,
with a pair of perforating-hooks located one
5 on each side of the bag-holder, the bag-holder
presenting the side of the hem of the bag to
the perforators, the seam and its projecting
portion of fabric being held out of the path
of the perforators in the slot of the bag-holder,
10 and needles for introducing shirring-strings

into the perforations and through the hem of
the bag.

Signed by us at Richmond this 16th day of
February, 1900.

CLARENCE MILLHISER.
CHARLES L. A. DOEPPE.

Witnesses:

C. W. THROCKMORTON,
ARTHUR SCRIVENOR.