

No. 680,475.

Patented Aug. 13, 1901.

T. A. CURTIS.

MACHINE FOR THREADING TAPE INTO EDGINGS.

(Application filed May 11, 1901.)

2 Sheets—Sheet 1.

(No Model.)

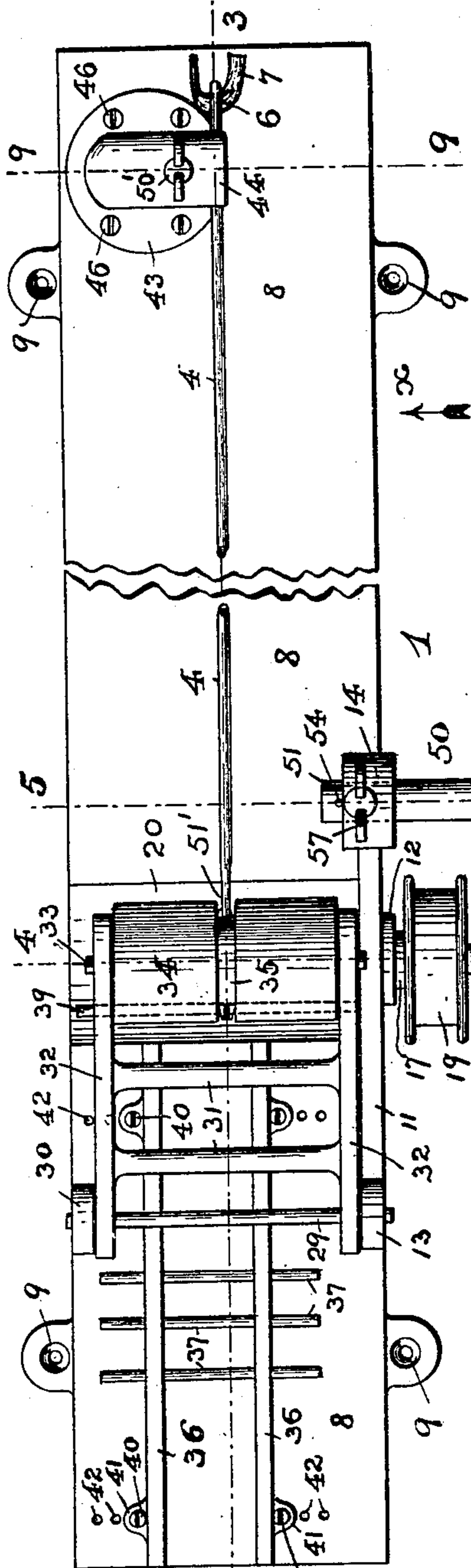


FIG. 1

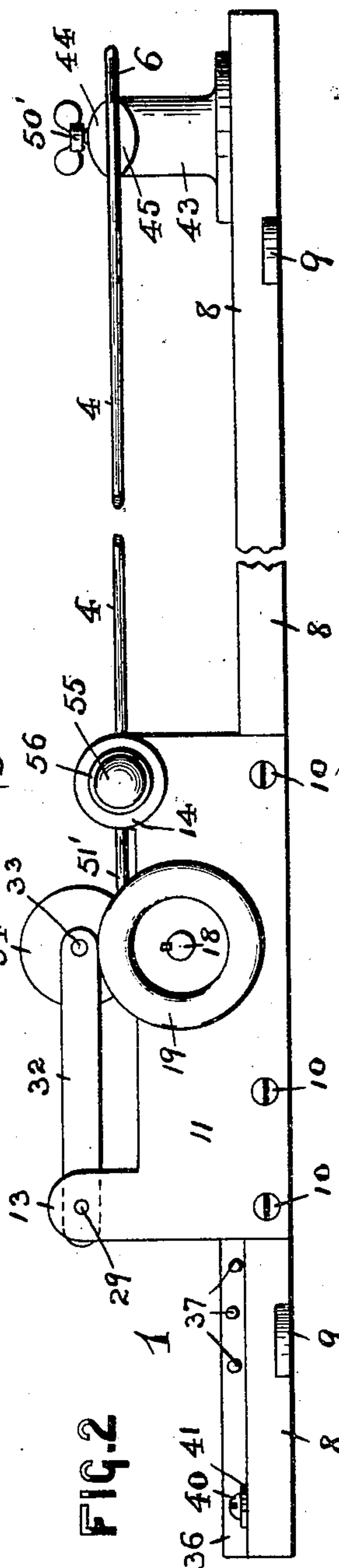


FIG. 2

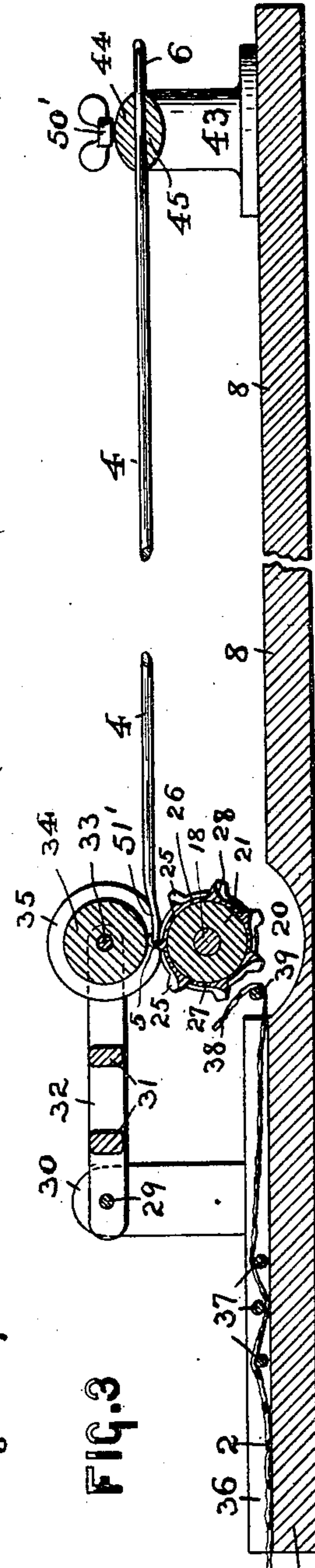


FIG. 3

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2 Sheets—Sheet 2.

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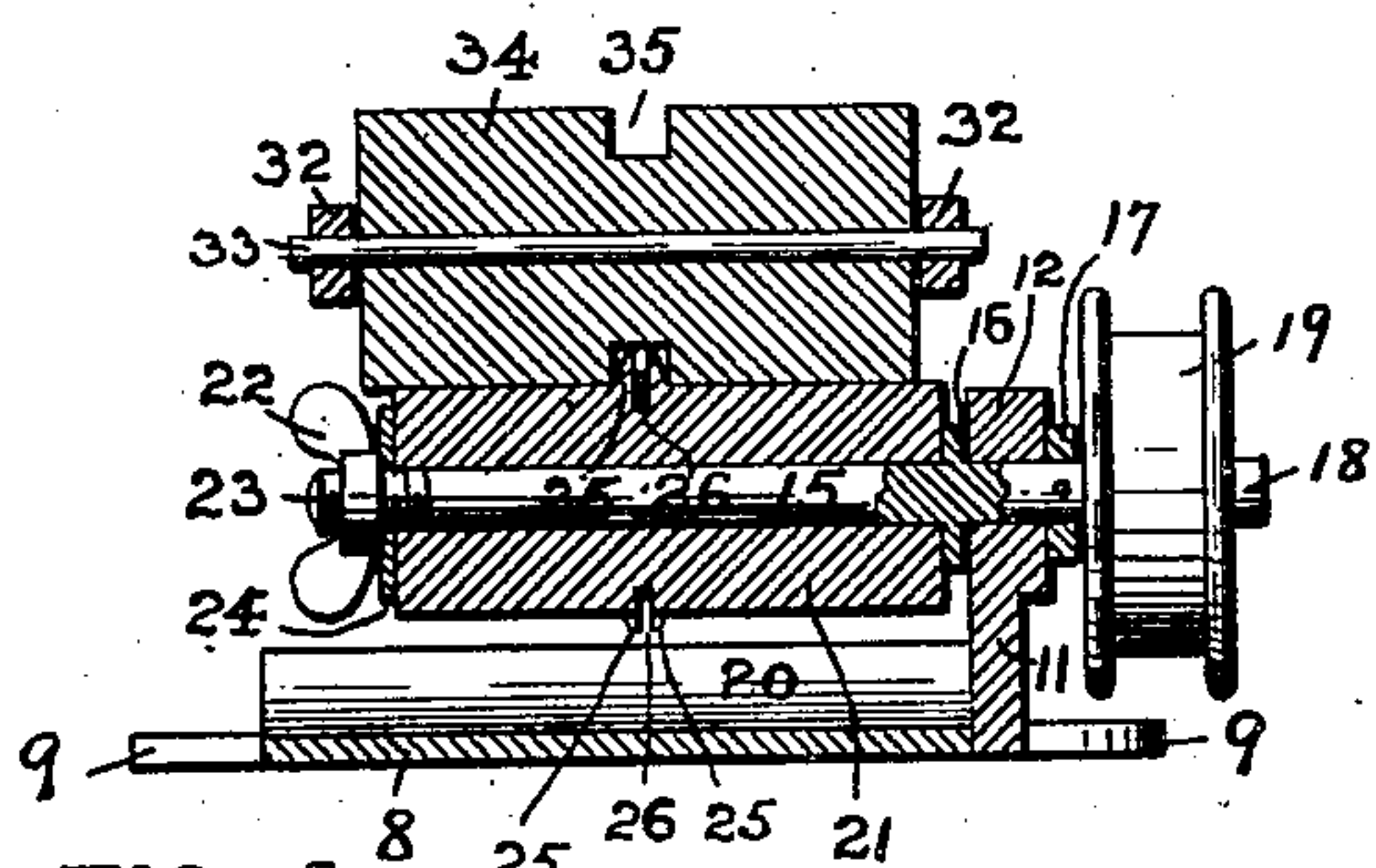


FIG. 4

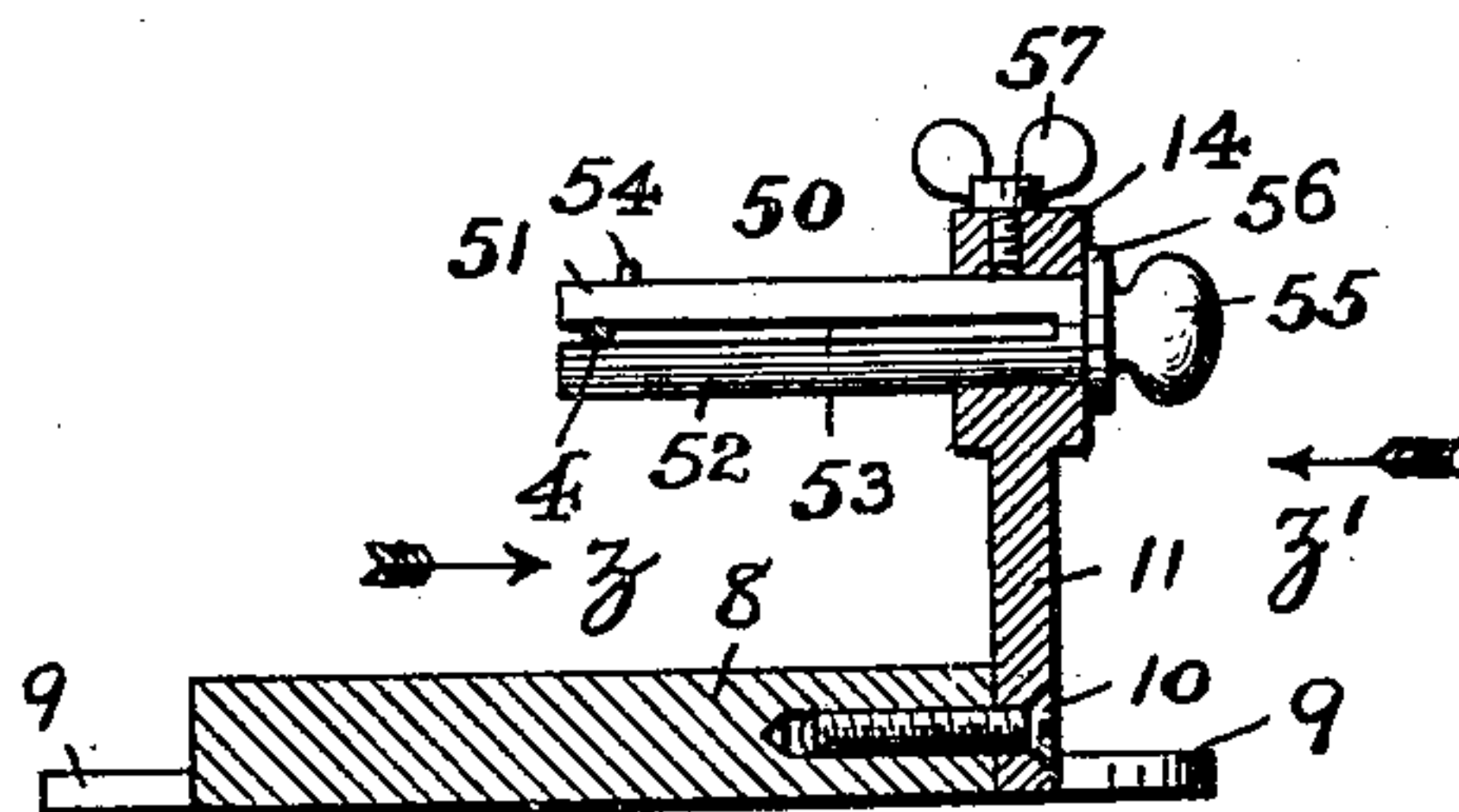


FIG. 5

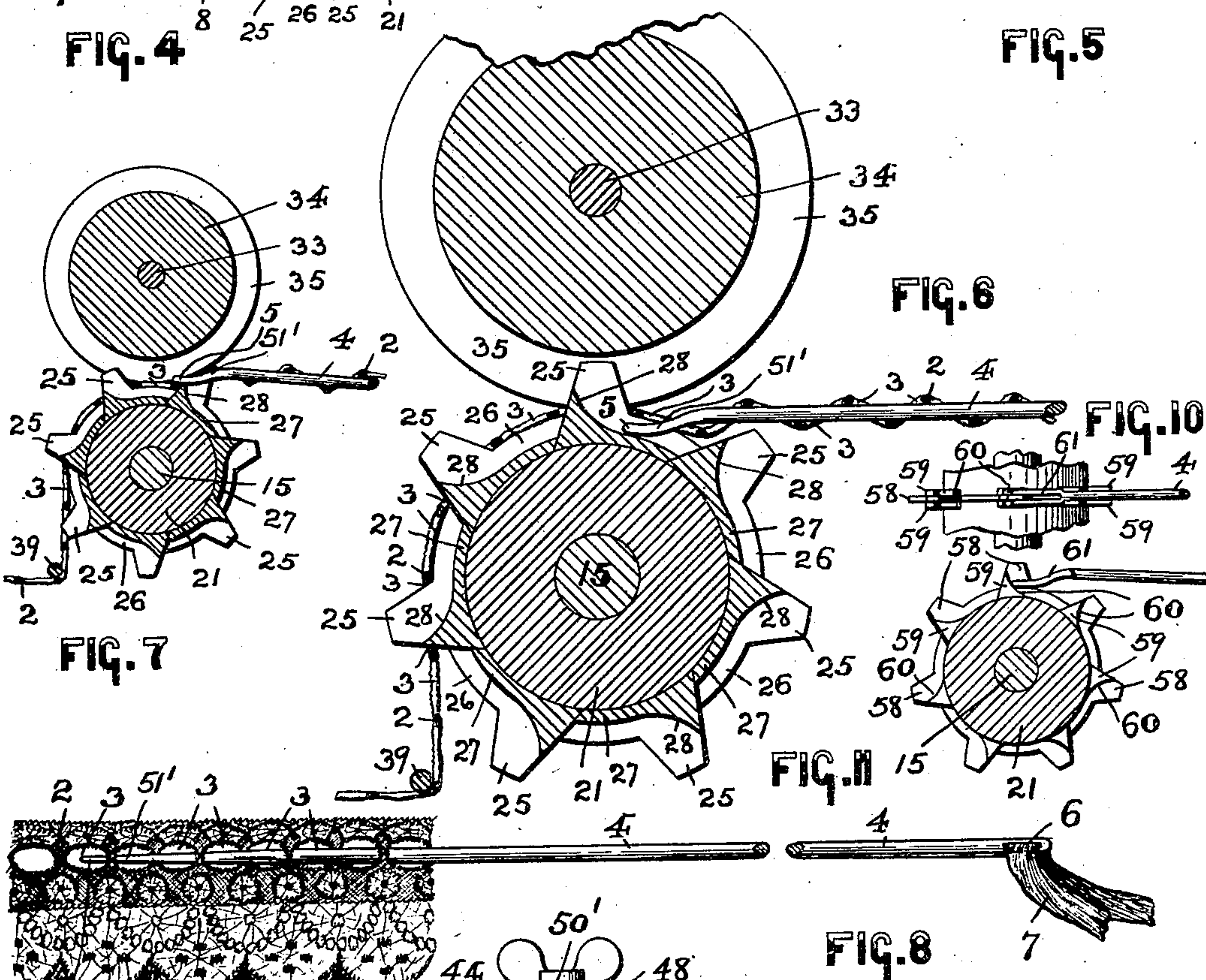


FIG. 7

FIG. 11

FIG. 8

FIG. 12

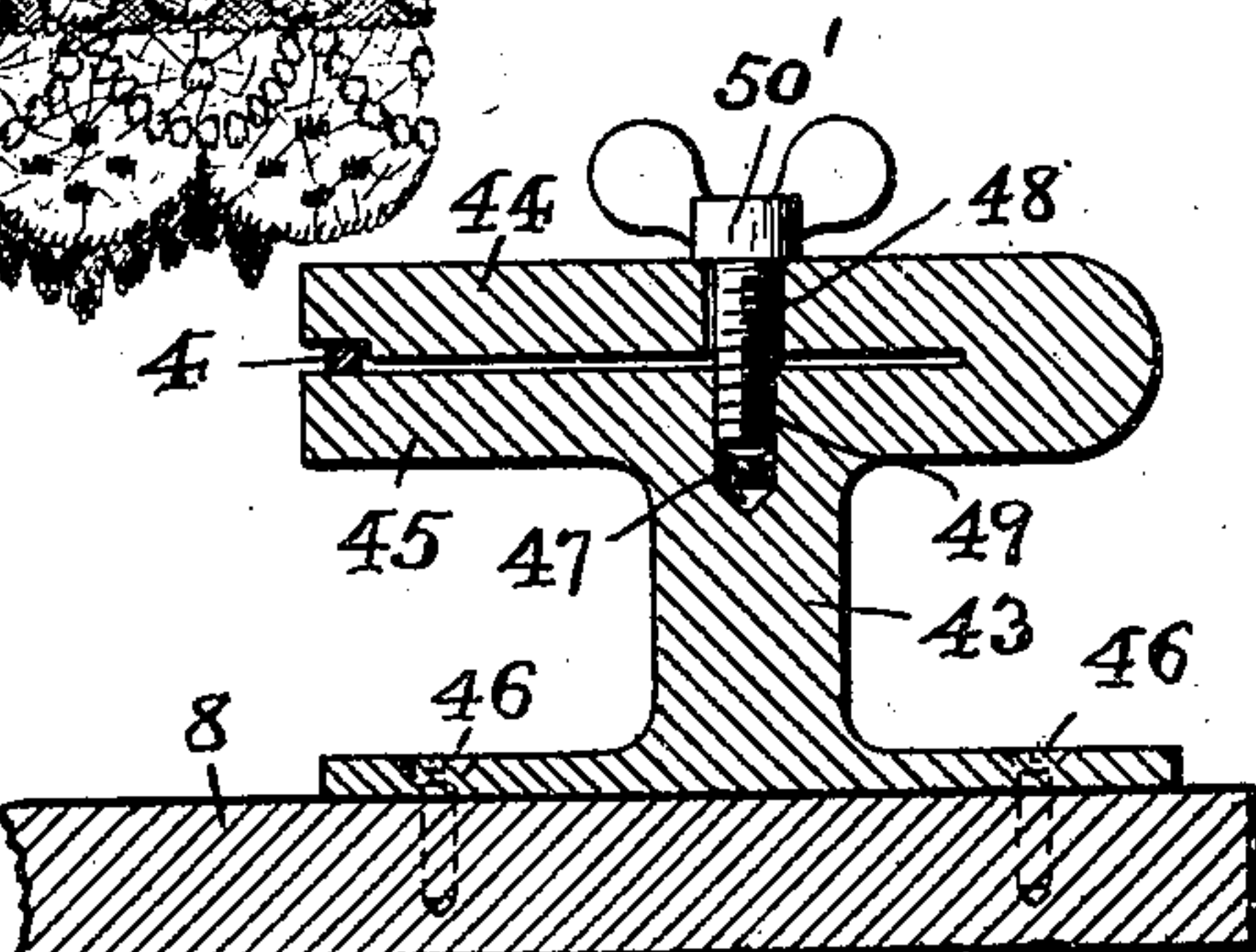


FIG. 9

WITNESSES:

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UNITED STATES PATENT OFFICE.

TIMOTHY A. CURTIS, OF NEWARK, NEW JERSEY.

MACHINE FOR THREADING TAPE INTO EDGINGS.

SPECIFICATION forming part of Letters Patent No. 680,475, dated August 13, 1901.

Application filed May 11, 1901. Serial No. 59,790. (No model.)

To all whom it may concern:

Be it known that I, TIMOTHY A. CURTIS, a citizen of the United States, residing at Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Machines for Inserting Ribbon in Laces; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to numerals of reference marked thereon, which form a part of this specification.

This invention relates to a novel machine or apparatus for the purpose of inserting in the loops or meshes of lace, such as is used with corsets and ladies' garments in general, ribbon of the desired width, the end of the ribbon being passed through an eye in the one end of a needle or "pick-up," and the arrangements and constructions of the various parts of the apparatus being such that the lace is fed between a pair of rollers and is arranged in the manner to be hereinafter more fully set forth upon the said needle or pick-up for the purpose of inserting the ribbon in the loops or meshes of the lace.

The primary object of this invention, therefore, is to provide a simply-constructed device of this character provided with a pair of feed-rolls between which the lace is readily and quickly fed and its row of loops or meshes are forced upon the needle or pick-up, so as to have the connecting strands or meshes of the loops alternately arranged on the opposite sides of the pin and to receive the ribbon attached to the other end of the needle, when the lace is finally forced from said end of the needle to which the said ribbon has been attached.

Other objects of this invention not at this time specifically mentioned will be fully understood from the following description of the apparatus employed for forcing the lace upon the needle or pick-up and then inserting the ribbon in the loops or meshes of the lace.

My invention consists, primarily, in the novel apparatus of the character hereinafter fully described and for the purposes above enumerated; and, furthermore, this inven-

tion consists in the several novel arrangements and combinations of the various devices and the parts thereof, all of which will be fully set forth in the following specification and then finally embodied in the clauses of the claim, which form a part of the same.

The invention is clearly illustrated in the accompanying drawings, in which—

Figure 1 is a plan view of an apparatus embodying the various principles of my present invention. Fig. 2 is a side elevation of the same; and Fig. 3 is a longitudinal vertical section of the apparatus, said section being taken on line 3 3 in said Fig. 1 and looking in the direction of arrow *x*. Fig. 4 is a vertical cross-section of the lace-feeding rolls, said section being taken on line 4 4 in said Fig. 1 and looking in the direction of the arrow *y* in said figure. Fig. 5 is a vertical cross-section, taken on line 5 5 in Fig. 1, representing a bracket and needle-holding clamp slidably arranged in the bearing portion of said bracket. Fig. 6 is a longitudinal vertical representation, on an enlarged scale, of the feed-rolls and a portion of the needle or pick-up, said view illustrating the position of the pointed or pick-up end of the needle in its relative position with a cam-shaped surface of the lower feed-roll for raising the said end of the needle and forcing it through one of the loops or meshes in the lace, and thus forcing or gathering the lace upon the shank of the needle or pick-up; and Fig. 7 is a similar sectional representation of the said parts represented in said Fig. 6, showing the position of the pointed end of the needle or pick-up after the loop of the lace has been gathered and said end of the needle is about to enter the next loop in the lace. Fig. 8 is a side view of the needle or pick-up with its one end provided with an eye for receiving the end of a piece of ribbon, as shown, and the pick-up end of the said needle being represented inserted through the loops or meshes of a piece of lace. Fig. 9 is a vertical cross-section taken on line 9 9 in Fig. 1 of the drawings of a bracket and clamping bearing for the back or eye end of the needle or pick-up. Figs. 10 and 11 are a top view and vertical section, respectively, of a lower feed-roll of a slightly-modified form of construction and modified form of needle or pick-up employed with the same; and Fig.

12 is a top view of the pick-up end of the said needle.

Similar numerals of reference are employed in all of the said above-described views to indicate corresponding parts.

In the said drawings, 1 indicates one form of complete device or apparatus for the purpose of gathering lace upon a needle or pick-up and then inserting ribbon in the loops of the said lace, and 2 indicates any suitable piece of lace which is provided with the usual loops or meshes 3, as indicated in Fig. 8 of the drawings. The principal object of this invention, as above stated, is to force these loops or meshes 3 of the lace upon the gathering or pick-up end 5 of a long needle 4, said needle being provided at its opposite end with an eye or perforation 6, in which is arranged the end of a piece of ribbon 7, substantially as illustrated in said Fig. 8. The said ribbon 7 may be of any suitable width, as desired, and the length of the said eye or perforation 6 is made accordingly. It will also be understood that the length of the needle or pick-up may be varied according to the lengths of lace to be gathered upon the body of the needle and the length of the ribbon to be inserted in the loops or meshes of the lace.

The device or apparatus 1 consists, essentially, of a suitable bed or base 8, which is preferably provided at its sides with perforated ears or lugs 9 for the reception of screws for securing the apparatus in its operative position upon a bench or table or a suitable frame made for the purpose. Of course it will be clearly understood that any suitable fastening means other than that just set forth may be employed, if desired. Suitably secured at one side of the said base, preferably by means of screws or bolts 10, as shown in Figs. 2, 4, and 5, is a bracket 11, which is provided with suitably-disposed bearings 12, 13, and 14, substantially as illustrated in the several figures of the drawings. Rotatively arranged in the said bearing 12 is a spindle or shaft 15, which is provided with a shoulder 16, adapted to be arranged upon the one side of the bearing 12 and with a suitable collar or nut 17, which is secured upon the said spindle 15, so as to be arranged against the opposite side of said bearing 12. In this manner the said spindle or shaft 15 is rotatively arranged in said bearing 12 against any lateral displacement from the bracket or support 11, as will be clearly evident. Suitably secured upon the free end 18 of said spindle 15 is a pulley 19 or any other suitable means for producing the rotation of said spindle 15 in its bearing 12. Secured upon the main body of the said shaft or spindle 15, directly above the laterally-extending channeled or grooved part 20 in the base 8, as shown, is the lower feed-roll 21, which is securely retained in its operative position upon the said shaft or spindle 15 and turns with the same, by a suitable nut or thumb-screw 22, which is screwed upon the screw

portion 23 of said spindle or shaft 15, against a washer 24, substantially as represented in Fig. 4 of the drawings. The said lower feed-roll 21 is provided in its cylindrical peripheral surface at any desired point or points with radially and outwardly extending projections or extensions 25, preferably formed like sprockets, the said sprockets being arranged in pairs, as represented in said Fig. 4, and having an annular groove or depression 26 between them, which also extends partly into the main body of the roll, as shown. Within this depression or groove I have suitably arranged in any desired manner certain shoes or sections 27, preferably made of tempered steel or any other material suitable for the purposes of my invention, each shoe or section 27 being formed with an upwardly-curved surface 28, substantially as shown. The said shoes or sections 28 correspond in number to the number of projections or sprockets 25, and the number of sprockets on the feed-roll 21 is dependent upon the size and shape of the holes or loops 3 of the piece of lace 2, through which the needle or pick-up 4 is to be passed. By unscrewing the nut 22 from the screw end of the shaft or spindle 15 any lower feed-roll 21 can be replaced by another feed-roll bearing the requisite number of projections or sprockets 25, according to the design of the lace which is to be fed above the said projections or sprockets of the roll 21 in the manner to be presently fully described. Suitably arranged in the bearing 13, connected with the support 11, and in a bearing 30, placed at the opposite side of the base of the apparatus, is a spindle 29, on which is pivoted a frame 31, comprising a pair of side pieces or bars 32, at or near the free ends of which is a pin or spindle 33, on which is rotatively arranged an upper feed or presser roll 34. Owing to the pivotal arrangement of the said frame 31 this roll 34 can be lifted from the surface of the lower feed-roll 21 or can be placed thereon when necessary for properly spreading the lace and causing it to maintain its flat position while passing between the two rolls. The said roll 34 is also formed with an annular groove or depression 35 in alinement with the projections or sprockets 25 on the lower feed-roll 21, the uppermost pair of sprockets entering the said groove 35 during the rotary movements of the parts while the machine is being operated. Suitably secured upon the face of the bed or base 8 of the apparatus in front of the said feed-rolls hereinabove described are a pair of guides 36, between which the piece of lace 2 is placed and passed over and under an arrangement of straightening-out rods or bars 37, as shown in Fig. 3, the end portion 38 of the lace being passed around another rod 39, which extends from the inner face of the bracket or support 11, and the first loop or mesh of said end of the piece of lace then being arranged over one of the projections or sprockets of the lower feed-roll 21, as will be

clearly evident, and to be fed between the two rolls 21 and 34 by this arrangement of the sprockets which enter the loops in the lace, and thereby pull or feed the lace between the two rolls, to be placed or gathered upon the needle or pick-up in the manner clearly represented in Figs. 6 and 7 of the drawings. The said guides 36 may be adjustably arranged upon the said base or bed 8 by having their tightening-screws 40, which pass through perforated ears or lugs 41 on the sides of the said guides 36, screwed into differently-placed screw-holes 42 in the said base 8, as will be clearly understood from an inspection of Fig. 1 of the drawings. The said guide rods or bars 37 are of sufficient length, as shown, to permit of the said lateral adjustment of the guides 36, whereby the said guides can be arranged in different positions upon the base 8 to increase or decrease the space between the said guides, according to the width of lace which it is desired to pass between the feed-rolls of the apparatus.

The needle or pick-up 4 when used in the apparatus has its back end, which is provided with the loop or eye 6, arranged in a fixed position between a pair of grasping or holding jaws 44 and 45 of a standard or support 43, which is suitably secured upon the said base or bed 8 of the apparatus by means of screws or bolts 46, substantially as illustrated. As shown more particularly in Fig. 9, the said standard or support 43 is provided with a screw-threaded socket 47, into which is screwed the shank of a screw 49, the upper end of the said screw being provided with a suitable head 50' and the upper portion of said shank being rotatively arranged in a hole 48 in the jaw 44. Thus when the said screw 49 is turned down the said head 50' will bring the jaw 44 securely and firmly down upon the needle or pick-up 4 and hold the same in its proper position, with the pointed end of said needle extending directly into the annular groove 26 between the lace-feeding sprockets 25 on said lower feed-roll 21, as will be seen from an inspection of Figs. 1, 3, 6, and 7. In order that the said pick-up end of the needle 4 may readily gather up the loops or meshes 3 of the piece of lace 2 and arrange the lace upon the body of the needle when the parts of the machine have been set in operation, the said pick-up end 5 of the needle 4 is curved, as at 51', the lower surface of said curved part resting directly upon the exposed surfaces of the shoes or sections 27 and riding directly upon the curved surface 28 during the rotation of the lower roll 21. This action will cause the slightly upwardly extending point of the needle 4 when in the position indicated in said Fig. 6 to be passed into and through the hole formed by the loop of the lace, the said point entering from the lower surface of the lace, and when the parts are in the positions indicated in Fig. 7, which is the next step in the gather-

ing operation, then the downward tendency of the needle caused by the spring action of the latter will cause the said point of the needle to enter the next hole in the lace from the top, and so on alternately from the top to the bottom and from the bottom to the top of the piece of lace, whereby the same will be rapidly gathered upon the body of the needle, as shown. When the desired length of lace has been gathered upon the needle, then the lace is cut at a point in front of the pick-up end of the needle, and a clamping-dog 50 (see Figs. 1 and 5) is next placed over and around the needle and secured thereon in the manner to be presently described. This clamping-dog is slidably arranged in the bearing 14 of the support 11, and consists, essentially, of a pair of clamping or holding jaws 51 and 52, separated from each other by a longitudinally-extending slot 53. A pin or other suitable stop 54 limits the movement of said clamping-dog in its bearing 14 when pulled in the direction of arrow *z* in said Fig. 5 by means of a finger-piece 55, and a shoulder 56 on said dog limits its movement in the opposite direction, (indicated by the arrow *z'*.) As has been stated, when the lace has been gathered upon the needle 4 and the piece of lace has been cut off then the said clamping-dog 50 is forced from the position indicated in Fig. 1 to the position represented in said Fig. 5, with the two clamping or holding jaws 51 and 52 arranged on opposite sides of the said needle. A set-screw 57 is then screwed down tightly and the said jaws 51 and 52 are held in their fixed position upon opposite sides of the needle. The screw 49, connected with the standard 43, is then unscrewed, whereby the holding-jaws 44 and 45 are loosened from the opposite end of the needle 4, and said end can be pushed to one side from between the said jaws and the lace stripped from the needle, whereby the ribbon is inserted in the loops or meshes, as will be clearly evident. After the sufficient length of ribbon has thus been inserted in the lace the ribbon is cut off and the new end of ribbon is inserted in the eye 6 of the needle, as heretofore. This end of the needle is then again placed between the jaws 44 and 45 and fixed in position by the tightening-screw 49. At the same time the set-screw 57 is unscrewed and the jaws 51 and 52 are slid from the opposite end of the needle, the said dog being pulled to its former position (indicated in Fig. 1 of the drawings) by means of its finger-piece 55, in which position it can be secured by screwing down the set-screw 57. The operation of again gathering a new piece of the lace upon the needle is then proceeded with in the manner hereinabove fully described.

In lieu of arranging the projections or sprockets 25 in pairs, as in the construction illustrated in the hereinabove-described figures, a single row of such projections or sprockets, as 58, may be employed, the said

sprockets being provided on their opposite sides with shoes or sections 59, provided with the curved surfaces 60, as clearly indicated in Figs. 10 and 11. When this form of feed-roll is employed, the pick-up end of the needle is made as shown in Fig. 12, being provided with a pair of tines 61, having a space between them into which the sprockets or projections 58 enter, so as to cause the said curved tines 61 to rest directly upon the curved surfaces 60 of the shoes or sections 59 on opposite sides of the projection or sprocket. In all other respects the construction and operations of the parts are the same as that hereinabove described in connection with Figs. 1 to 9, inclusive.

From the above description of my invention it will be seen that I have devised a simply-constructed and operative device or apparatus for quickly gathering a piece of lace of any desirable length upon a needle or pick-up for readily inserting pieces of ribbon in the loops or meshes of the lace.

I am fully aware that many changes may be made in the various arrangements of the devices and in the different arrangements and combinations of the parts of the apparatus, as well as in the details of the construction of the same, without departing from the scope of my present invention. Hence I do not limit my invention to the exact arrangements and combinations of the devices and the parts thereof as herein described and as illustrated in the accompanying drawings, nor do I confine myself to the exact details of the construction of any of the said parts.

Having thus described my invention, what I claim is—

1. In a machine for inserting ribbon in lace, the combination, with a needle, of a lace-feeding roll, shoes on said roll with which the point of said needle is in sliding engagement, said shoes being constructed to alternately raise and lower the point of the needle, and means on said roll for feeding the meshes of the lace upon said needle and causing the lace to be gathered on the needle, substantially as and for the purposes set forth.

2. In a machine for inserting ribbon in lace, the combination, with a needle, of a lace-feeding roll, shoes on said roll with which the point of said needle is in sliding engagement, said shoes being constructed to alternately raise and lower the point of the needle, and sprockets on said roll adapted to enter the meshes of said lace and feed the said lace upon the needle and to be gathered on said needle, substantially as and for the purposes set forth.

3. In a machine for inserting ribbon in lace, the combination, with a needle, of a lace-feeding roll, and sprockets on said roll adapted to enter the meshes of said lace, said sprockets being provided with shoes having curved surfaces with which the "pick-up" end of the needle is brought in sliding engagement to cause said end of the needle to enter the

meshes of the lace and gather the same upon the needle, substantially as and for the purposes set forth.

4. In a machine for inserting ribbon in lace, the combination, with a needle, of a lower feed-roll, shoes on said roll with which the point of said needle is in sliding engagement, said shoes being constructed to alternately raise and lower the point of the needle, and an upper feed-roll bearing upon the said lower roll, said upper roll being provided with an annular groove, and means on said lower roll extending into the groove in said upper roll for feeding the meshes of the lace upon said needle and causing the lace to be gathered upon the needle, substantially as and for the purposes set forth.

5. In a machine for inserting ribbon in lace, the combination, with a needle, of a lower feed-roll, shoes on said roll with which the point of said needle is in sliding engagement, said shoes being constructed to alternately raise and lower the point of the needle, and an upper feed-roll bearing upon the said lower roll, said upper roll being provided with an annular groove, and sprockets on said lower roll extending into the groove in said upper roll and adapted to enter the meshes of the lace and feed the lace upon the needle and to be gathered on said needle, substantially as and for the purposes set forth.

6. In a machine for inserting ribbon in lace, the combination, with a needle, of a lower feed-roll, and an upper feed-roll bearing upon the said lower roll, said upper roll being provided with an annular groove, and sprockets on said lower roll extending into the groove in said upper roll, said sprockets being provided with shoes having curved surfaces with which the "pick-up" end of the needle is brought in sliding engagement to cause said end of the needle to enter the meshes of the lace and gather the same upon the needle, substantially as and for the purposes set forth.

7. In a machine for inserting ribbon in lace, the combination, with a base provided with a support, and a needle in said support, of a second support having bearings, a lower feed-roll rotatively arranged in one of said bearings, and a frame pivotally connected with a spindle in another of said bearings, an upper feed-roll in said frame, provided with an annular groove, and means on said lower roll extending into the groove in said upper roll for feeding the meshes of the lace upon said needle and causing the lace to be gathered upon the needle, substantially as and for the purposes set forth.

8. In a machine for inserting ribbon in lace, the combination, with a base provided with a support, and a needle in said support, of a second support having bearings, a lower feed-roll rotatively arranged in one of said bearings, and a frame pivotally connected with a spindle in another of said bearings, an upper feed-roll in said frame, provided with an annular groove, and sprockets on said lower roll

extending into the groove in said upper roll and adapted to enter the meshes of said lace and feed the lace upon the needle and to be gathered on said needle, substantially as and for the purposes set forth.

9. In a machine for inserting ribbon in lace, the combination, with a base provided with a support, and a needle in said support, of a second support having bearings, a lower feed-roll rotatively arranged in one of said bearings, and a frame pivotally connected with a spindle in another of said bearings, an upper feed-roll in said frame, provided with an annular groove, and sprockets on said lower roll extending into the groove in said upper roll, said sprockets being provided with shoes having curved surfaces with which the "pick-up" end of the needle is brought in sliding engagement to cause said end of the needle to enter the meshes of the lace and gather the same upon the needle, substantially as and for the purposes set forth.

10. In a machine for inserting ribbon in lace, the combination, with a base provided with a support, and a needle in said support, of a lace-guide and a lace-feeding roll on said base, shoes on said roll with which the point of said needle is in sliding engagement, said shoes being constructed to alternately raise and lower the point of the needle, and means on said roll for feeding the meshes of the lace upon said needle and causing the lace to be gathered upon the needle, substantially as and for the purposes set forth.

11. In a machine for inserting ribbon in lace, the combination, with a base provided with a support, and a needle in said support, of a lace-guide and a lace-feeding roll on said base, shoes on said roll with which the point of said needle is in sliding engagement, said shoes being constructed to alternately raise and lower the point of the needle, and sprockets on said roll adapted to enter the meshes of said lace and feed the lace upon the needle and causing the lace to be gathered upon the needle, substantially as and for the purposes set forth.

12. In a machine for inserting ribbon in lace, the combination, with a base provided with a support, and a needle in said support, of a lace-guide and a lace-feeding roll on said base, and sprockets on said roll adapted to enter the meshes of said lace, said sprockets being provided with shoes having curved surfaces with which the "pick-up" end of the needle is brought in sliding engagement to cause said end of the needle to enter the meshes of the lace and causing the lace to be gathered upon the needle, substantially as and for the purposes set forth.

13. In a machine for inserting ribbon in lace, the combination, with a base provided with a support, and a needle in said support, of a lace-guide on said base, a second support having bearings, a lower feed-roll rotatively arranged in one of said bearings, and a frame pivotally connected with a spindle in

another of said bearings, an upper feed-roll in said frame, provided with an annular groove, and means on said lower roll extending into the groove in said upper roll for feeding the meshes of the lace upon said needle and causing the lace to be gathered upon the needle, substantially as and for the purposes set forth.

14. In a machine for inserting ribbon in lace, the combination, with a base provided with a support, and a needle in said support, of a lace-guide on said base, a second support having bearings, a lower feed-roll rotatively arranged in one of said bearings, and a frame pivotally connected with a spindle in another of said bearings, an upper feed-roll in said frame, provided with an annular groove, and sprockets on said lower roll extending into the groove in said upper roll and adapted to enter the meshes of said lace and feed the lace upon the needle and causing the lace to be gathered upon the needle, substantially as and for the purposes set forth.

15. In a machine for inserting ribbon in lace, the combination, with a base provided with a support, and a needle in said support, of a lace-guide on said base, a second support having bearings, a lower feed-roll rotatively arranged in one of said bearings, and a frame pivotally connected with a spindle in another of said bearings, an upper feed-roll in said frame, provided with an annular groove, and sprockets on said lower roll extending into the groove in said upper roll, said sprockets being provided with shoes having curved surfaces with which the "pick-up" end of the needle is brought in sliding engagement to cause said end of the needle to enter the meshes of the lace and gather the same upon the needle, substantially as and for the purposes set forth.

16. In a machine for inserting ribbon in lace, the combination, with a lace-feeding roll, and shoes on said roll, of a needle having its pointed end in sliding engagement with said shoes, said shoes being constructed to alternately raise and lower the point of said needle to thereby gather the lace upon said needle, substantially as and for the purposes set forth.

17. In a machine for inserting ribbon in lace, the combination, with a base, of a support provided with a pair of holding-jaws, a needle detachably secured near the back end between said jaws, means on said base for feeding and gathering lace upon said needle, a second support on said base, having a bearing, and a holding-dog slidably arranged in said bearing provided with holding-jaws adapted to grasp the gathering end of the needle, substantially as and for the purposes set forth.

18. In a machine for inserting ribbon in lace, the combination, with a needle, and means for feeding and gathering lace upon said needle, of a support having a bearing, a holding-dog slidably arranged in said bear-

ing, provided with holding-jaws, and means for fixing said jaws about the needle, substantially as and for the purposes set forth.

19. In a machine for inserting ribbon in
5 lace, the combination, with a needle, and means for feeding and gathering lace upon said needle, of a support having a bearing, a holding-dog slidably arranged in said bearing, provided with holding-jaws, means for
10 fixing said jaws about the needle, and a set-screw in said support for securing said dog in its adjustable positions, substantially as and for the purposes set forth.

20. In a machine for inserting ribbon in
15 lace, the combination, with a feeding-roll, having feeding-sprockets arranged in pairs with a space between them, and shoes 27 be-

tween said sprockets provided with curved surfaces 28, of a gathering-needle having a curved "pick-up" end in sliding engagement 20 with said curved surfaces of said shoes, substantially as and for the purposes set forth.

21. In a machine for inserting ribbon in lace, a lace-feeding roll, shoes on said roll, and means coöperating with said shoes for 25 picking up and gathering the lace, substantially as and for the purposes set forth.

In testimony that I claim the invention set forth above I have hereunto set my hand this 8th day of May, 1901.

TIMOTHY A. CURTIS.

Witnesses:

FREDK. C. FRAENTZEL,
F. H. W. FRAENTZEL.