

(No Model.)

5 Sheets—Sheet 1.

E. NUGENT.
BOOK SEWING MACHINE.

No. 507,034.

Patented Oct. 17, 1893.

Fig. 17.

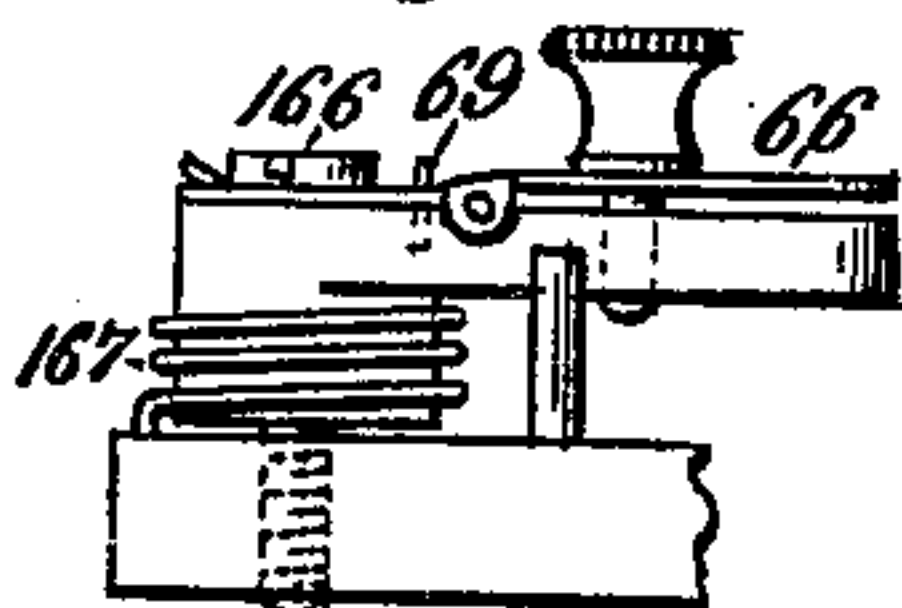


Fig. 18.

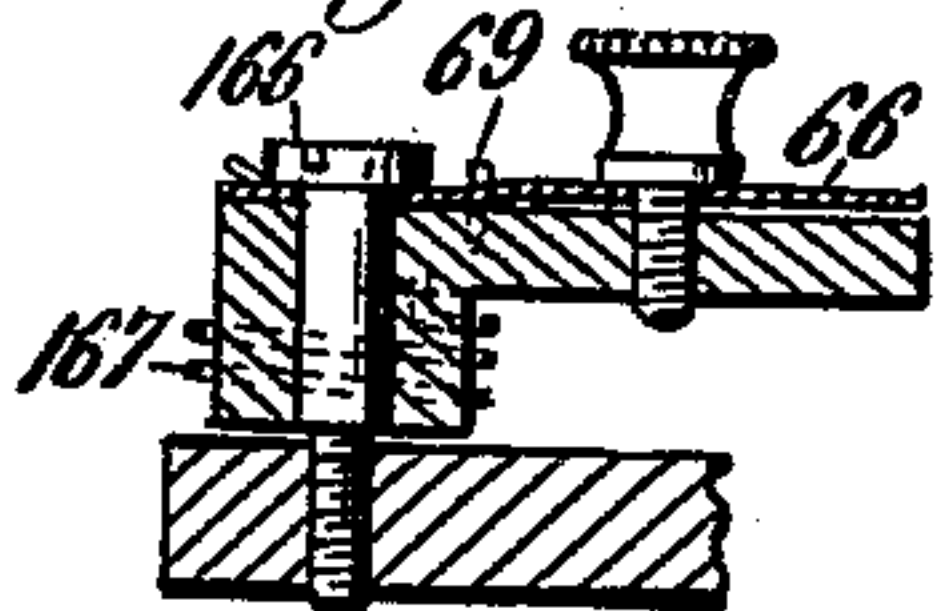
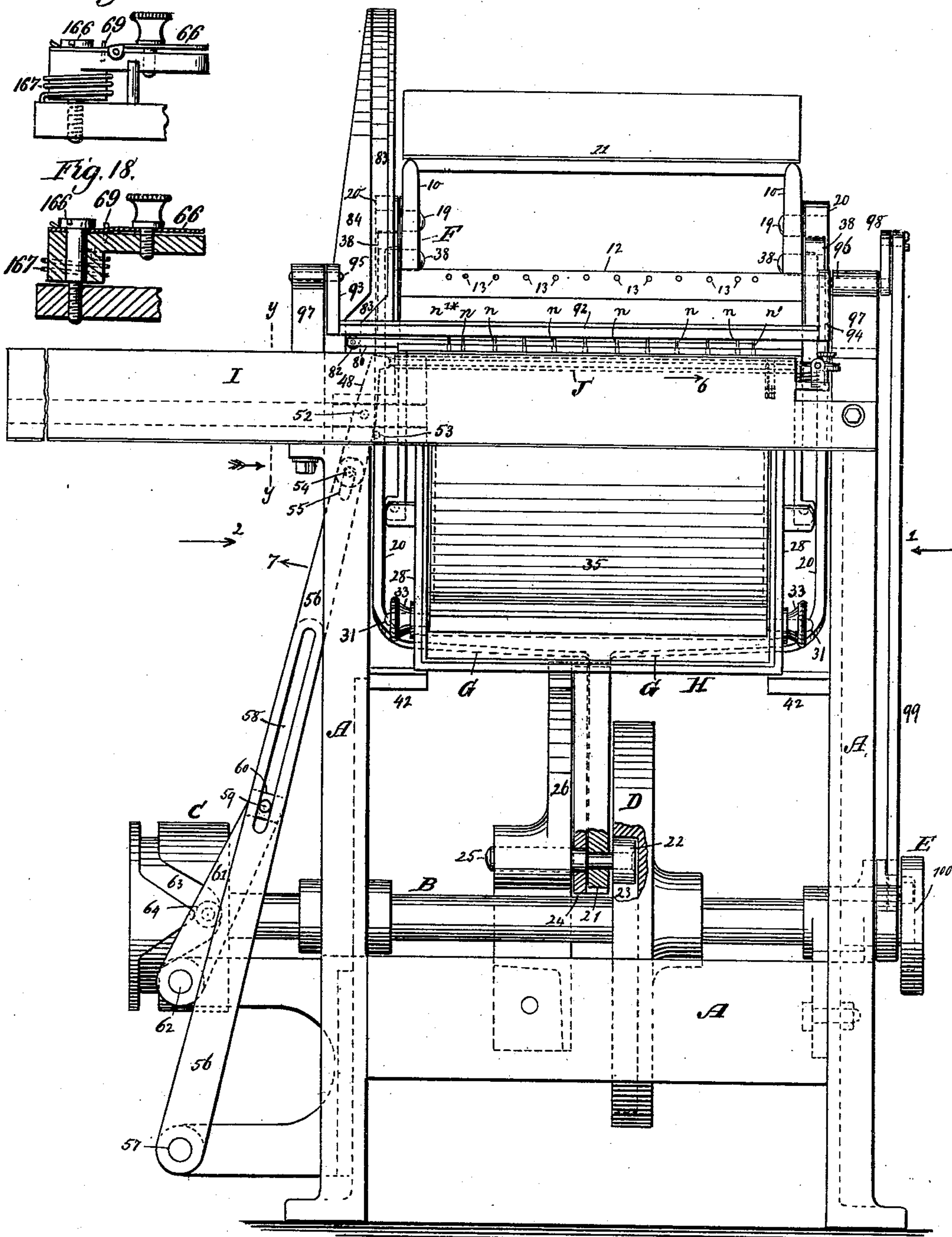


Fig. 1.



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INVENTOR:
Edward Nugent.
BY
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ATTORNEYS.

(No Model.)

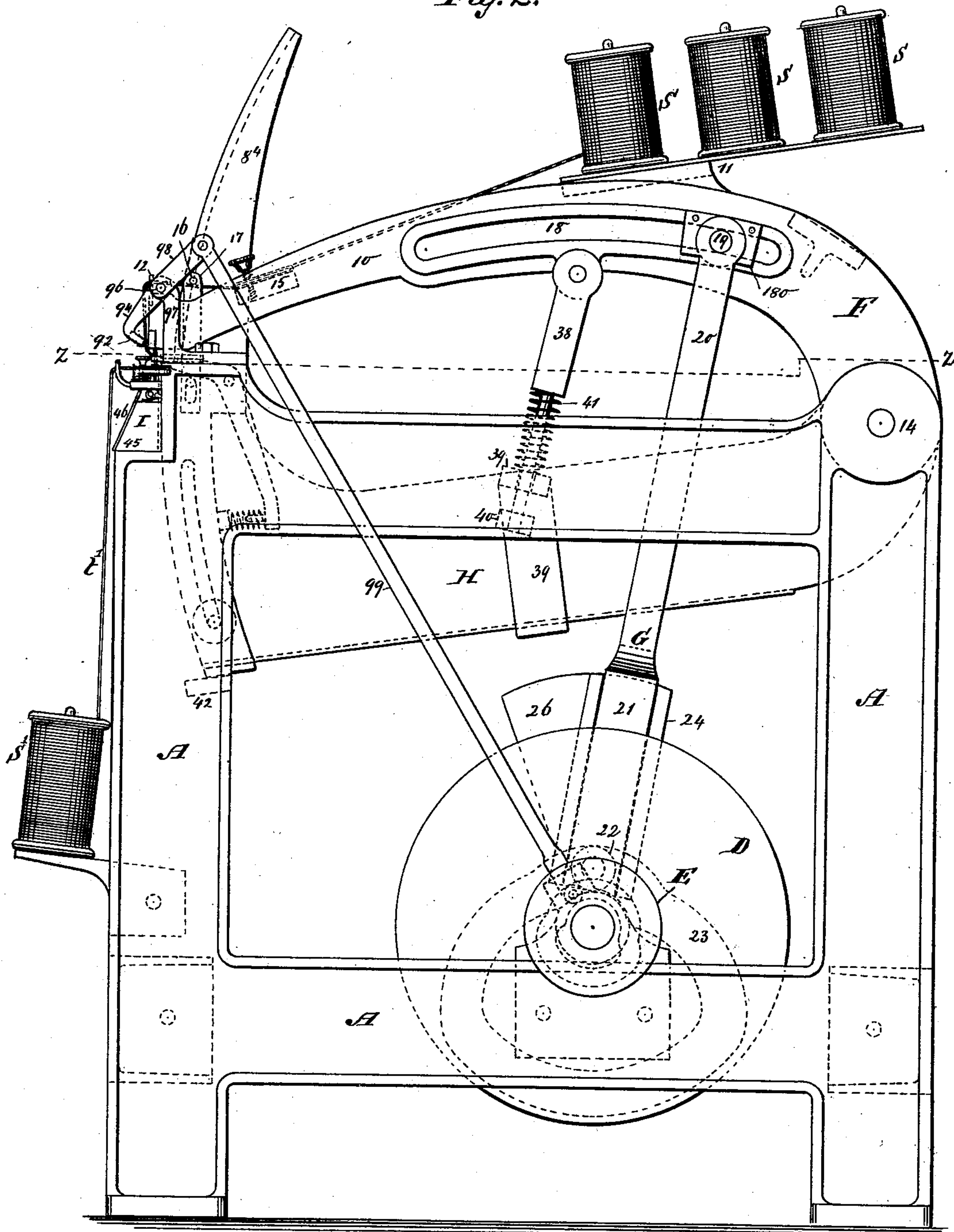
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Fig. 2.



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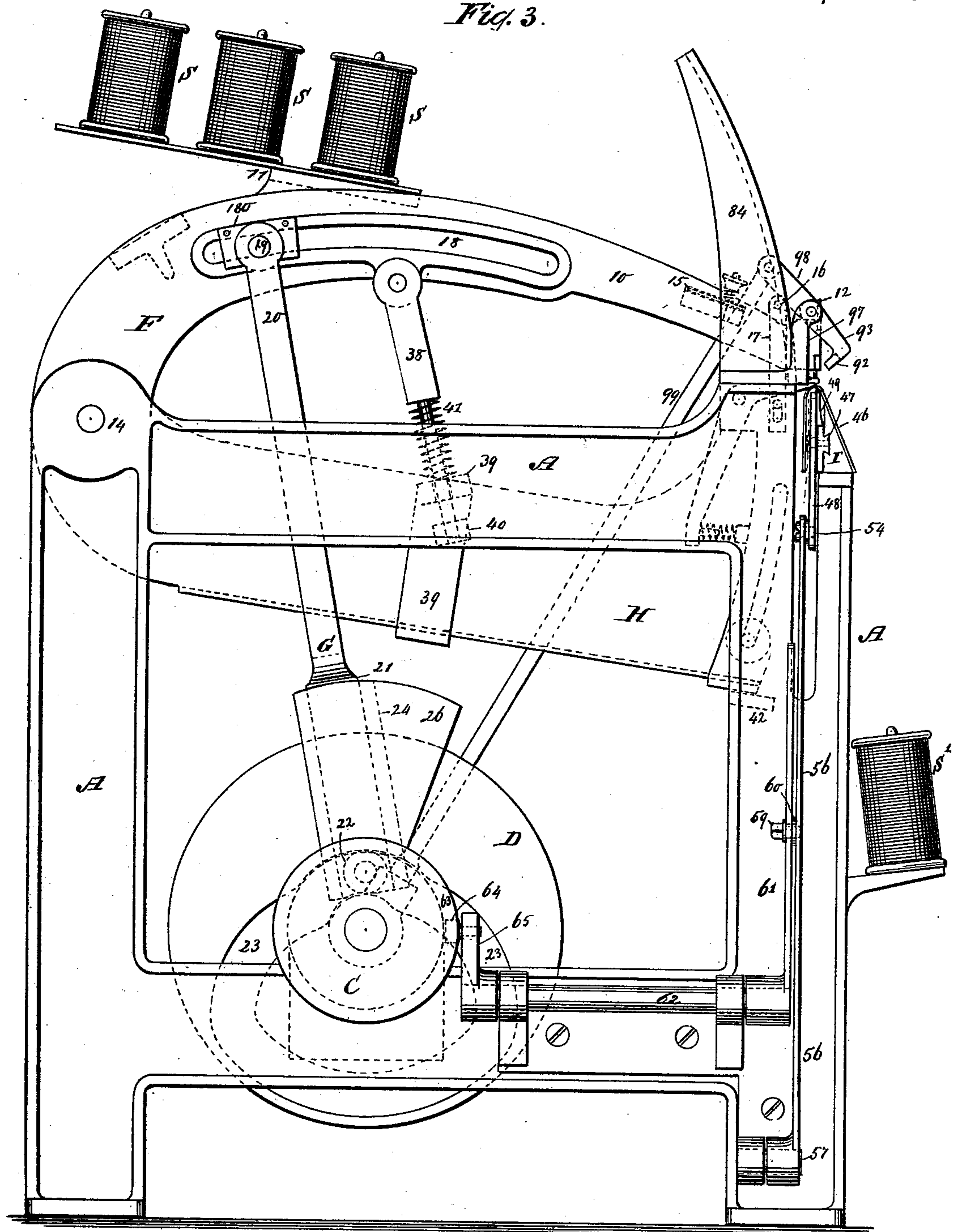
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Fig. 3.



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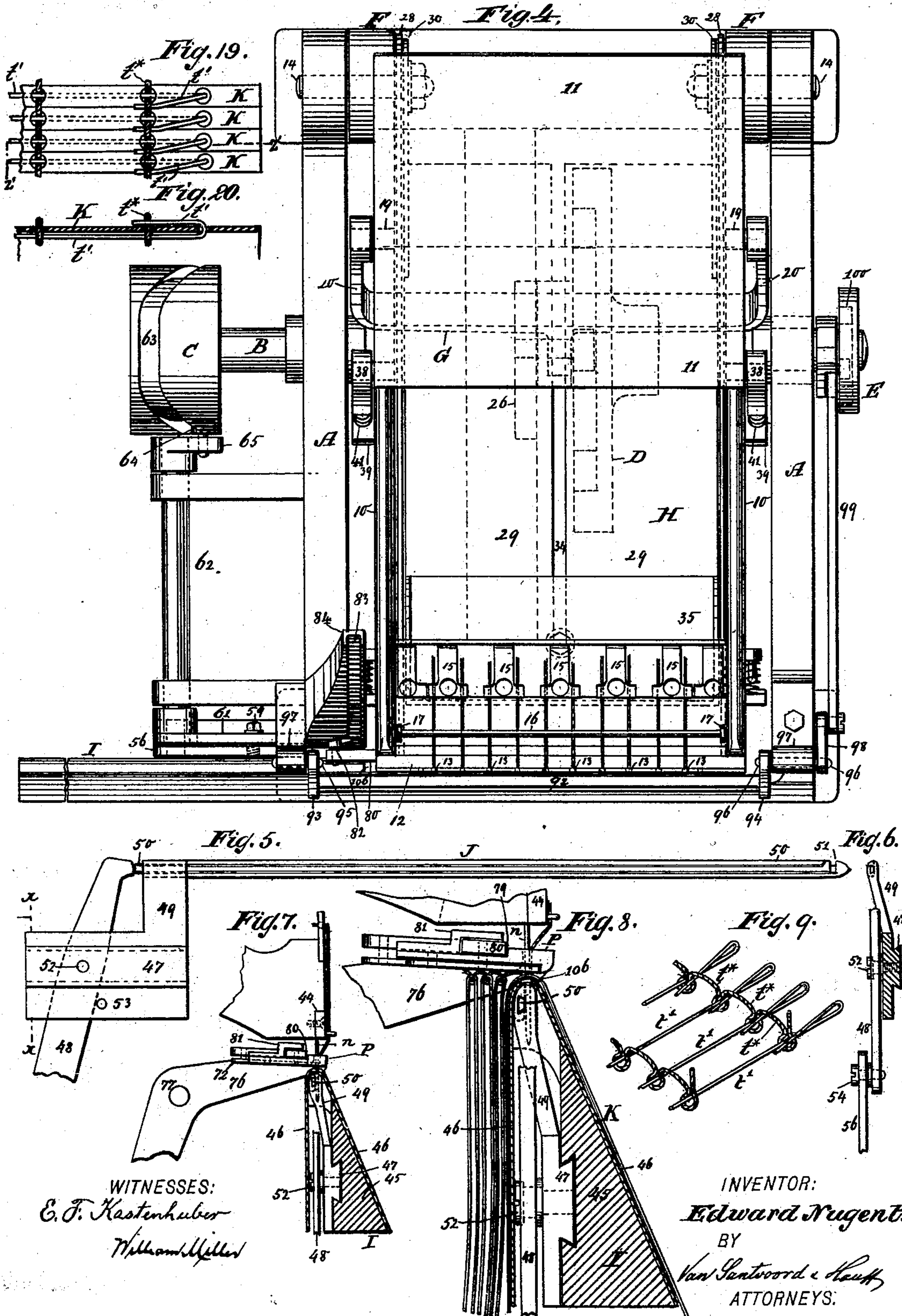
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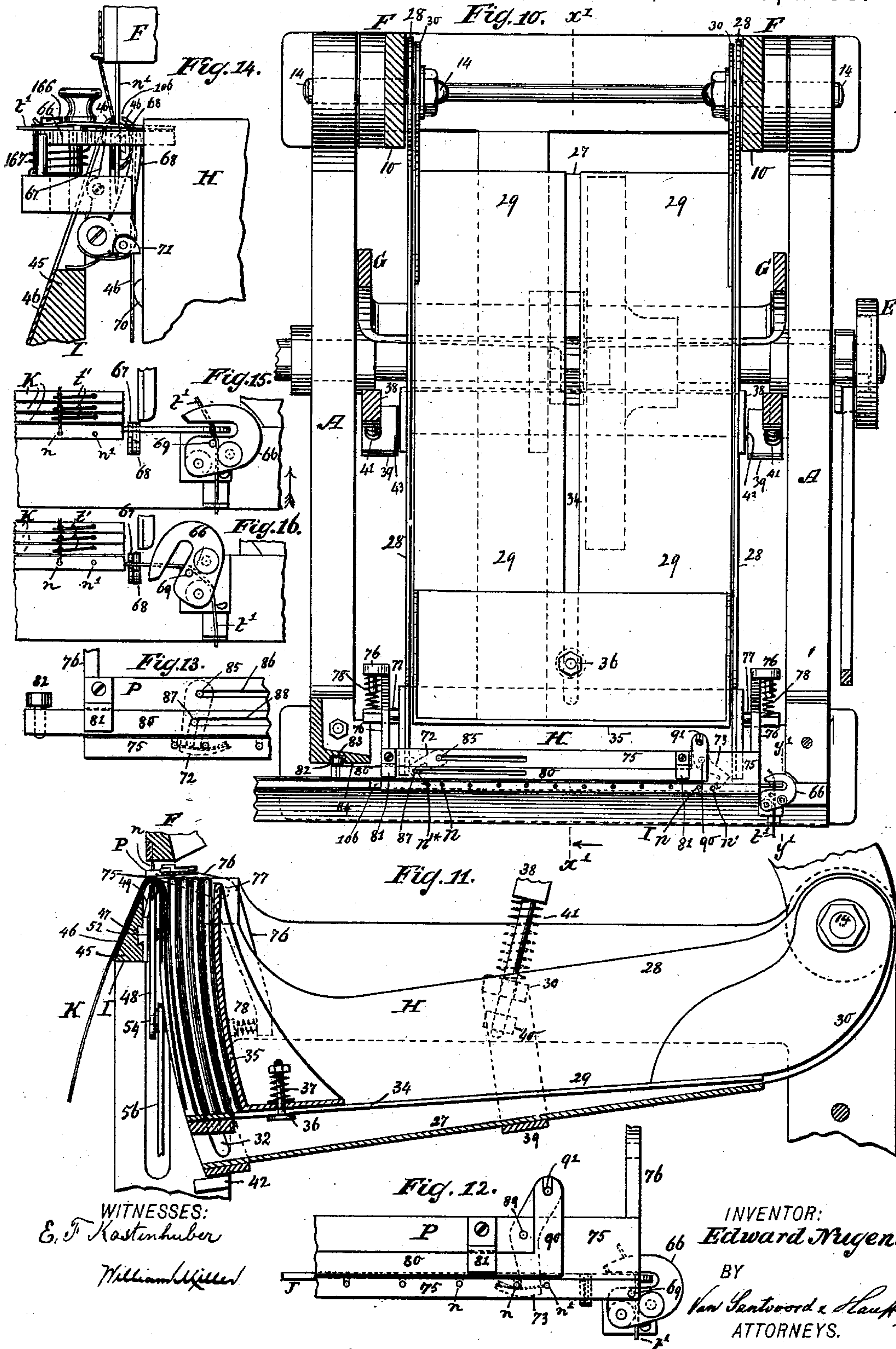
(No Model.)

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Patented Oct. 17, 1893.



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UNITED STATES PATENT OFFICE.

EDWARD NUGENT, OF BROOKLYN, ASSIGNOR TO THEODORE W. SHERIDAN
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BOOK-SEWING MACHINE.

SPECIFICATION forming part of Letters Patent No. 507,034, dated October 17, 1893.

Application filed January 6, 1893. Serial No. 457,473. (No model.)

To all whom it may concern:

Be it known that I, EDWARD NUGENT, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented new and useful Improvements in Book-Sewing Machines, of which the following is a specification.

This invention relates to certain improvements in book sewing machines as pointed out in the following specification and claims and illustrated in the accompanying drawings, in which—

Figure 1, represents a front view. Fig. 2, is a side elevation looking in the direction of arrow 1, Fig. 1. Fig. 3, is a side elevation looking in the direction of arrow 2, Fig. 1. Fig. 4, is a plan or top view. Fig. 5, is a detached elevation of the locking thread carrier on a larger scale than the previous figures. Fig. 6, is a transverse vertical section in the plane $x\ x$, Fig. 5. Fig. 7, is a transverse vertical section in the plane $y\ y$, Fig. 1, on the same scale as Figs. 5 and 6. Fig. 8, is a similar section as Fig. 7 on a still larger scale showing also the position of the signatures. Fig. 9, is a perspective view of the stitch formed by my machine. Fig. 10, is a horizontal section in the plane $z\ z$, Fig. 2. Fig. 11, is a partial longitudinal vertical section in the plane $x'\ x'$, Fig. 10. Fig. 12, is a detached plan or top view of one part of the mechanism which acts upon one end of the locking thread on a larger scale than Figs. 10 and 11. Fig. 13, is a similar view of that part of this mechanism which acts upon the opposite end of the locking thread. Fig. 14, is a transverse vertical section in the plane $y'\ y'$, Fig. 10, on the same scale as Figs. 12 and 13 and illustrating the mechanism for cutting the locking thread. Fig. 15, is a plan or top view of the same parts illustrating the means for introducing the locking thread into the thread carrier. Fig. 16, is a plan or top view of the same parts after the locking thread has been drawn through the loops of the needle threads. Fig. 17 is a side view of the spring clamp looking in the direction of the arrow marked near it in Fig. 15. Fig. 18 is a longitudinal vertical section of the same. Fig. 19 is a back view of a series of signatures connected according to my invention. Fig.

20 is a longitudinal section in the plane $z'\ z'$, Fig. 19.

In the drawings the letter A designates the frame which supports the working parts of my machine and B is the driving shaft on which are firmly mounted the hubs C, D, E.

F is the needle frame which consists of two curved arms 10 which support a platform 11 for the spools S of the sewing thread, one for each needle and also a plate 12 (Figs. 1 and 4) which is provided with a number of holes 13 (Fig. 4) to form the guides for the needle threads. The arms 10 oscillate on studs 14 which are secured in the rear portion of the frame A and between said arms near their front ends is secured a series of clamps 15 which form the tensions and from which the needle threads pass beneath a bar 16 to the thread guides 13. The bar 16 is secured in brackets 17 which can be adjusted up and down (best seen in Figs. 2, 3 and 4). Each of the arms 10 of the needle frame F is provided with a segmental slot 18 (Figs. 2 and 3) into which are fitted slides 180 which can be adjusted toward and from the studs 14 so that the throw of the needle frame can be adjusted. Said slides engage studs 19 which project from the arms 20 of a bifurcated lever G (best seen in Fig. 1). The shank 21 of this lever carries a roller stud 22 which engages a cam groove 23 in the hub D (Figs. 1, 2 and 3) and in order to retain this roller stud in engagement with said cam groove, the shank 21 is fitted into a slide 24 which swings on a pin 25 secured in a bracket 26 which is firmly secured to the frame A.

H is the book way which receives the successive signatures after the same have been provided with the required stitches. A longitudinal vertical section of this book way is shown in Fig. 11 and a plan view in Fig. 10. It consists of a main plate 27 from the sides of which rise two flanges 28 which engage the studs 14 on which the needle frame F oscillates. In the interior of the flanged plate 27 is situated a secondary plate 29 provided with arms 30 which engage the studs 14 so that this secondary plate or false bottom can be swung up and down and from its front end extend screw studs 31 (see Figs. 1 and 11) which engage curved slots 32 in the front ends

of the side flanges 28 of the book way H and the screw studs 31 are provided with nuts 33 so that the false bottom 29 can be adjusted up or down to correspond to the depth of the signatures to be sewed. On the false bottom 29 is placed a presser slide 35 and a screw bolt 36 (Fig. 11) passes up through a slot 34 in the false bottom 29 and through the bottom flange of the presser slide 35. This screw bolt is provided with a nut which acts upon a spring 37 so that the friction between the presser slide and the false bottom can be adjusted and that said presser slide will recede automatically whenever a fresh signature is discharged into the book way H and at the same time said presser slide exerts sufficient pressure upon the signatures to retain the same in an upright position. The book way H is connected to the needle frame F by links 38 (Figs. 2 and 3) the shanks of which pass through brackets 39 secured to the opposite sides of the book way and are provided with nuts 40 which are adjusted at some distance beneath the brackets so that the needle frame can move up a short distance before the upward movement of the book way commences and on the shanks of the links 38 are placed springs 41 which act as cushions and prevent the book way from slamming in its downward movement against the lugs 42 which are secured to the frame A. The brackets 39 swing on pivots 43 (Fig. 10) so that they can follow the oscillating movement of the links 38.

To the front bar 44 of the needle frame F are secured the sewing needles n and the end needles $n' n''$ by any suitable means and in the example shown in the drawings (Fig. 1) I have represented ten sewing needles n but this number may be changed as may seem desirable. The signatures to be sewed are placed upon the support I, a front view of which is shown in Fig. 1, while Figs. 7 and 8 show cross-sections and Fig. 10 a plan view of the same. It consists of a metallic bar 45 and of a sheet metal hood 46. The cross-section of the bar 45 has the form of a rectangular triangle and it is firmly secured to the frame A. The hood 46 is firmly secured to the hypotenuse of the bar 45, but it extends up beyond said bar and the inner branch of said hood extends down parallel with the inner vertical face of the bar 45 (best seen in Figs. 7 and 8) leaving an open space in which is situated a carriage 47 and a lever 48 which serves to impart motion to said carriage. This carriage is fitted into a guide groove in the inner vertical face of the bar 45 and it is provided with an arm 49 from which extends the locking thread carrier J (best seen in Fig. 5). This thread carrier is provided with a guide groove for the clamping bar 50 which co-operates with a shoulder 51 formed at the free end of the thread carrier so that, when the end of the locking thread is placed between this shoulder and the outer end of the clamping bar and this clamping bar is pushed toward said shoulder, the end of the locking thread

is firmly retained, until the clamping bar is released and permitted to recede. The clamping bar 50 extends through the arm 49 of the carriage 47 and it is exposed to the action of the lever 48 which swings on a pivot 52 secured in the carriage 47 and the movement of which is partially controlled by a stop 53. The lower end of the lever 48 is connected by a pivot 54 to a lever 56 and said pivot plays in a slot 55 (best seen in Fig. 1). The lever 56 oscillates on a pivot 57 secured in a bracket which is fixed to the frame A and it is provided with a slot 58 which engages a slide 60 fitting into the slot 58 and carrying a pivot 59 which engages a slot in a lever 61 which is firmly mounted on the outer end of a rock shaft 62 (Figs. 1 and 3) to which an oscillating motion is imparted by a cam groove 63 in the hub C which engages a roller stud 64 secured in an arm 65 which is firmly mounted on the inner end of the rock shaft (Fig. 3).

By referring to Fig. 1 it will be seen that, when the locking thread carrier J has approached its extreme position in the direction of arrow 6, the lower portion of the lever 48 strikes the stop 53 (Fig. 5) and the lever 48 is caused to swing on its pivot 52 so as to allow the clamping bar 50 to move away from the shoulder 51, so that the end of the locking thread which is drawn off from the spool S' can be placed in the proper position inside of the shoulder 51, and when the lever 56 is caused to move in the direction of arrow 7, the lever 48 forces the clamping bar 50 toward the shoulder 51, so as to clamp the locking thread and then the thread carrier J is moved backward in the direction opposite arrow 6 and the locking thread is drawn through the loops of the needle threads and then it is cut off and its ends are turned inward and locked by the needle threads as will be presently explained.

When the needle frame F is moved downward toward the position shown in Figs. 1, 2, 3, 7, and 8, the needles $n n' n''$ which have been threaded in the manner usually practiced in lock-stitch sewing machines, pass down through the signature K—previously adjusted in the proper position on the support I by the operative and held down by the presser foot P—(Fig. 8) (the hood 46 being provided with throats 106 for the passage of the needles) and receive the usual "dip" for the formation of the loops, the locking thread carrier J is caused to move inward through the loops of the needle threads, the locking thread is introduced into the thread carrier and clamped therein and then the thread carrier is moved back so as to carry the locking thread through the loops of the needles and the locking thread is cut off, while the needles rise, by the following means: The locking thread t' is drawn from the spool S' and its end is placed into the locking thread carrier J as shown in Figs. 14, 15, and 16 and in its passage to the thread carrier said thread passes through a spring clamp 66 and

when the thread carrier is moved back in the direction opposite to arrow 6 (Fig. 1) it draws the end of the locking thread t' through the loops of the needle threads (see Figs. 9, 19 and 20) to a distance beyond the end needle n'^* (Fig. 1) somewhat longer than the distance between this needle and the nearest needle n and at the same time the spring clamp 66 is tipped over to the position shown in Fig. 16 due to the strain of the locking thread upon a pin 69 situated in the interior of said spring jaw, thereby throwing the locking thread between the jaws 67 and 68 of a pair of shears. As soon as the locking thread carrier J has been moved back so as to draw the locking thread through the loops of the needle threads, the needle frame F and the book way H begin to move upward and on the book way is formed a projection 70 (Fig. 14) which strikes a dog 71 pivoted to the movable jaw 68 of the shears and this jaw is moved so as to cut the locking thread at a distance from the end needle n' (Fig. 16) somewhat larger than the distance between this end needle and the needle n nearest to it. As the needle frame rises still farther, the loops of the needles n are locked by the locking thread (Fig. 9) but the ends of the locking thread are drawn up through the signature by the loops of the end needles $n' n'^*$ and then they are bent inward so as to be caught under and retained by the threads carried by the needles n nearest to them on the formation of the next stitch. The operation of bending the ends of the locking thread inward is performed by two fingers 72, 73 which are pivoted to the presser foot P and actuated by a slide 80. The presser foot consists of a bar 75 (Figs. 10 and 12) provided with arms 76 which engage studs 77 secured in the side flanges 28 of the book way H and the downwardly extending portions of the arms 76 (see Fig. 11) are exposed to the action of springs 78 (Figs. 10 and 11) so that the bar 75 holds the signature down upon the support I during the time the needles pass through the same. The bar 75 of the presser foot is provided with a recess 79 (Fig. 8) into which is fitted a slide 80 which is held in said recess by brackets 81 and which carries a roller stud 82 engaging a cam groove 83 in the upwardly rising projection 84 of the frame A (Fig. 1).

The finger 72 (see Fig. 13) is attached to the presser bar 75 by a pivot 85 which is made adjustable in a slot 86 and it is connected to the slide 80 by a pivot 87 which is also adjustable in a slot 88, so that this finger can be adjusted to the width of the signatures to be sewed. The finger 73 (Fig. 12) is attached to the presser bar 75 by a pivot 89 and from the end of the slide 80 projects an arm 90 provided with a recess which engages a stud 91 secured in the tail end of the finger 73. If the slide 80 is pushed inward by the action of the cam slot 83 to the position which it occupies in Figs. 12 and 13, the fingers 72 and 73 are moved toward each other and the ends of the locking thread are bent inward across the

path of the needles n next to the extreme or end needles $n' n'^*$, so that the same are locked by the next stitch as indicated in Figs. 9, 15, 16, 19 and 20, the locking of said ends being effected by the branches t^* of the needle threads on the backs or outsides of the signatures while the loops of the needle threads are situated in the interior of the folded signatures. As the needle frame F moves upward, the stitches in the interior of the folded signatures are drawn tight and the signature is bodily lifted up above the support I and pushed into the book way H by the action of a bar 92 which is secured to levers 93, 94, which are connected to axles 95, 96, mounted in standards 97 which are secured to the frame A. On the outer end of the axle 96 is firmly secured a lever 98 which connects by a rod 99 with a cam groove 100 (Figs. 1 and 4) formed in the hub E which is mounted on the main shaft B so that the bar 92 is moved at the proper intervals. As the signatures are successively crowded into the book way H, the presser slide 35 recedes as already stated.

The spring clamp 66 is mounted upon a pivot 166 and it is subjected to the action of a spring 167 (Figs. 14, 17 and 18) so that as soon as the locking thread t' has been cut by the shears 67, 68, the spring clamp 66 returns from the position shown in Fig. 16 to that shown in Fig. 15 and the locking thread is held in position to engage the shoulder 51 of the locking thread carrier J when the latter is moved inward to the position shown in Figs. 1 and 16. As soon as the locking thread carrier has engaged the locking thread, the latter is locked therein by the clamping bar 50 and carried through the loops of the needle threads.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a book sewing machine, the combination of a stationary signature support, a hood fitted to this support and provided with needle throats, a presser foot, a needle frame carrying a series of eye pointed needles, means for imparting to the needle frame a reciprocating motion with a dip to form loops of the needle threads in the interior of the hood, a book way connected to and moving with the needle frame, a locking thread carrier, means for imparting motion to this thread carrier through the loops of the needle threads, and the oscillating bar 92 for leading each signature, after the same has been sewed, into the book way, substantially as described.

2. In a book sewing machine, the combination of a stationary signature support, a hood fitted to this support and provided with needle throats, a presser foot, a needle frame carrying a series of eye pointed needles, means for imparting to the needle frame a reciprocating motion with a dip to form loops of the needle threads in the interior of the hood, a book way connected to and moving with the needle frame, a locking thread carrier, means for imparting motion to the thread carrier

through the loops of the needle threads, a presser slide 35 in the book way, and the oscillating bar 92, substantially as described.

3. In a book sewing machine, the combination of a stationary signature support, a hood fitted to this support and provided with needle throats, a presser foot, a needle frame carrying a series of eye pointed needles, means for imparting to the needle frame a reciprocating motion with a dip to form loops of the needle threads in the interior of the hood, a locking thread carrier, means for imparting motion to this thread carrier through the loops of the needle threads, and the spring clamp 66 for throwing the locking thread in engagement with the thread carrier, substantially as described.

4. In a book sewing machine, the combination of a stationary signature support, a hood fitted to this support and provided with needle throats, a presser foot, a needle frame carrying a series of eye pointed needles, means for imparting to the needle frame a reciprocating motion with a dip to form loops of the needle threads in the interior of the hood, a locking thread carrier, means for imparting motion to this thread carrier through the loops of the needle threads, the shears 67, 68, means for actuating these shears, and the spring clamp 66 for throwing the locking thread in engagement with the thread carrier and with the shears, substantially as described.

5. In a book sewing machine, the combination of a stationary signature support, a hood fitted to this support and provided with needle throats, a presser foot, a needle frame

carrying a series of eye pointed needles, means for imparting to the needle frame a reciprocating motion with a dip to form loops of the needle threads in the interior of the hood, a book way connected to and moving with the needle frame, a locking thread carrier, means for imparting motion to this thread carrier through the loops of the needle threads, shears 67 and 68, means for throwing the locking thread in engagement with the thread carrier and with the shears, and the projection 70 on the book way for actuating the shears, substantially as described.

6. In a book sewing machine, the combination of a stationary signature support, a hood fitted to this support and provided with needle throats, a presser foot, a needle frame carrying a series of eye pointed needles, means for imparting to the needle frame a reciprocating motion with a dip to form loops of the needle threads in the interior of the hood, a locking thread carrier, means for imparting motion to this thread carrier through the loops of the needle threads, shears 67, 68, means for throwing the locking thread in engagement with the thread carrier and with the shears, the fingers 72, 73 for engaging the ends of the locking thread, and means for actuating these fingers, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

EDWARD NUGENT.

Witnesses:

J. VAN SANTVOORD,
E. F. KASTENHUBER.