

(No Model.)

2 Sheets—Sheet 1.

J. TRIPP.
SEWING MACHINE.

No. 585,724.

Patented July 6, 1897.

Fig. 1.

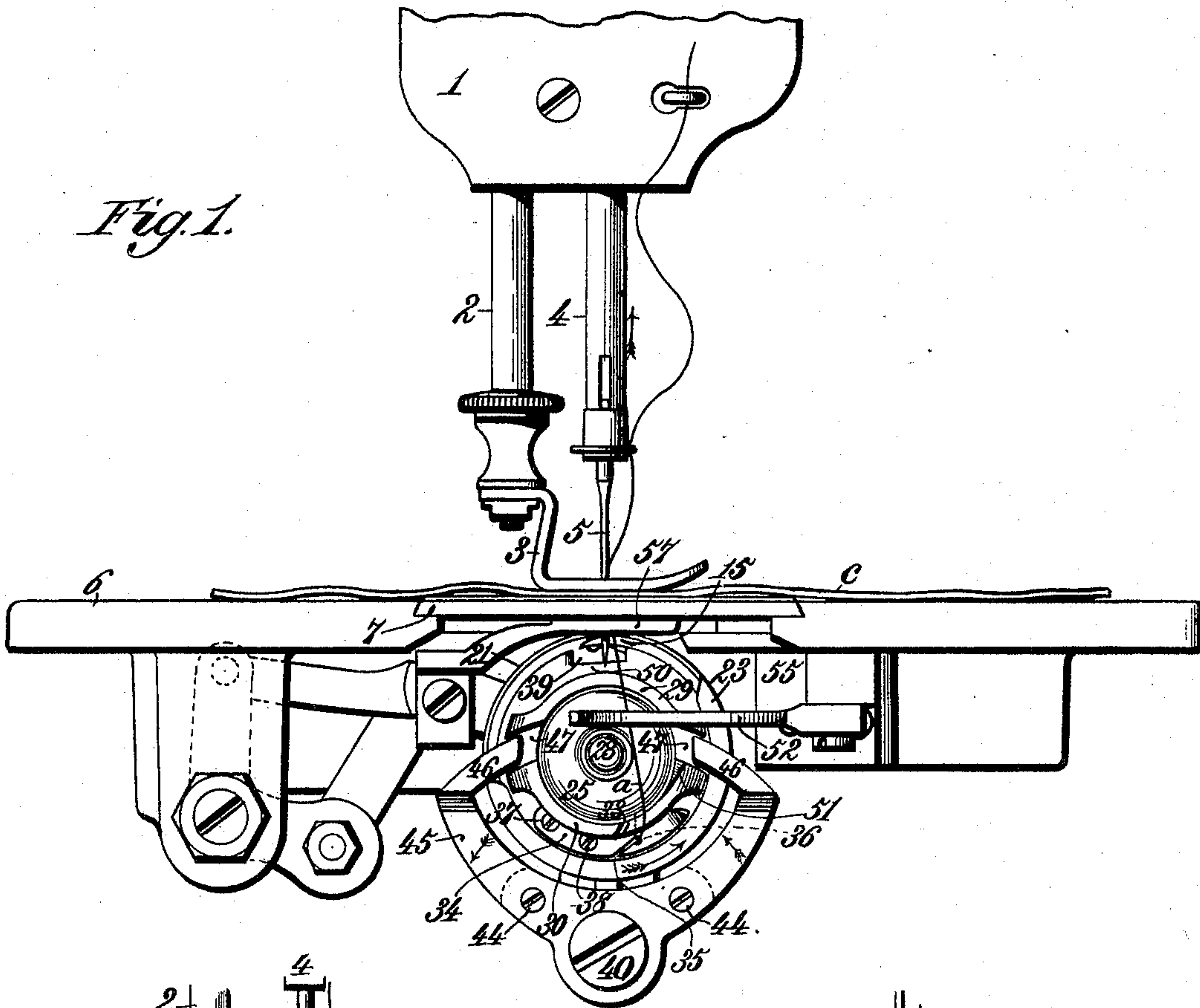


Fig. 2.

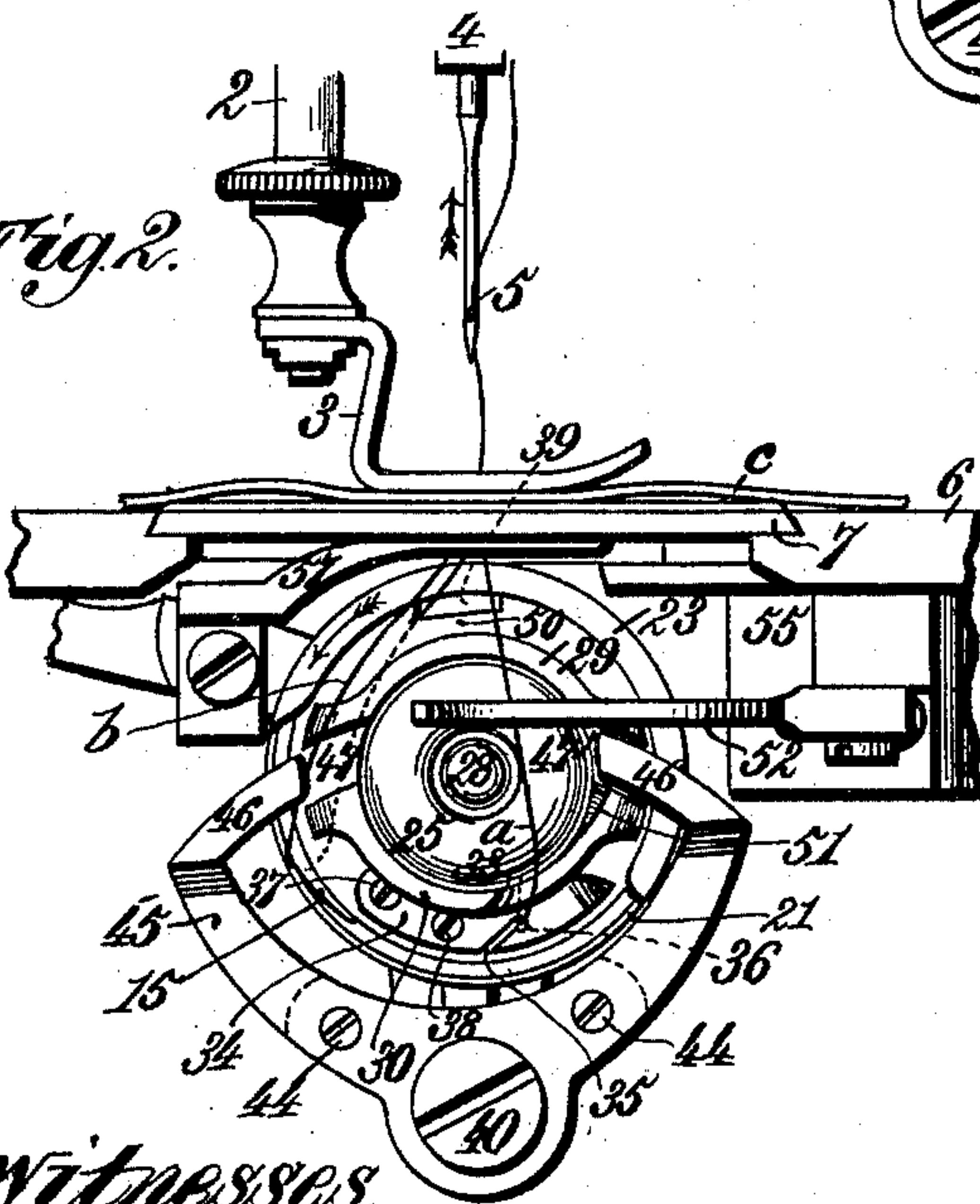
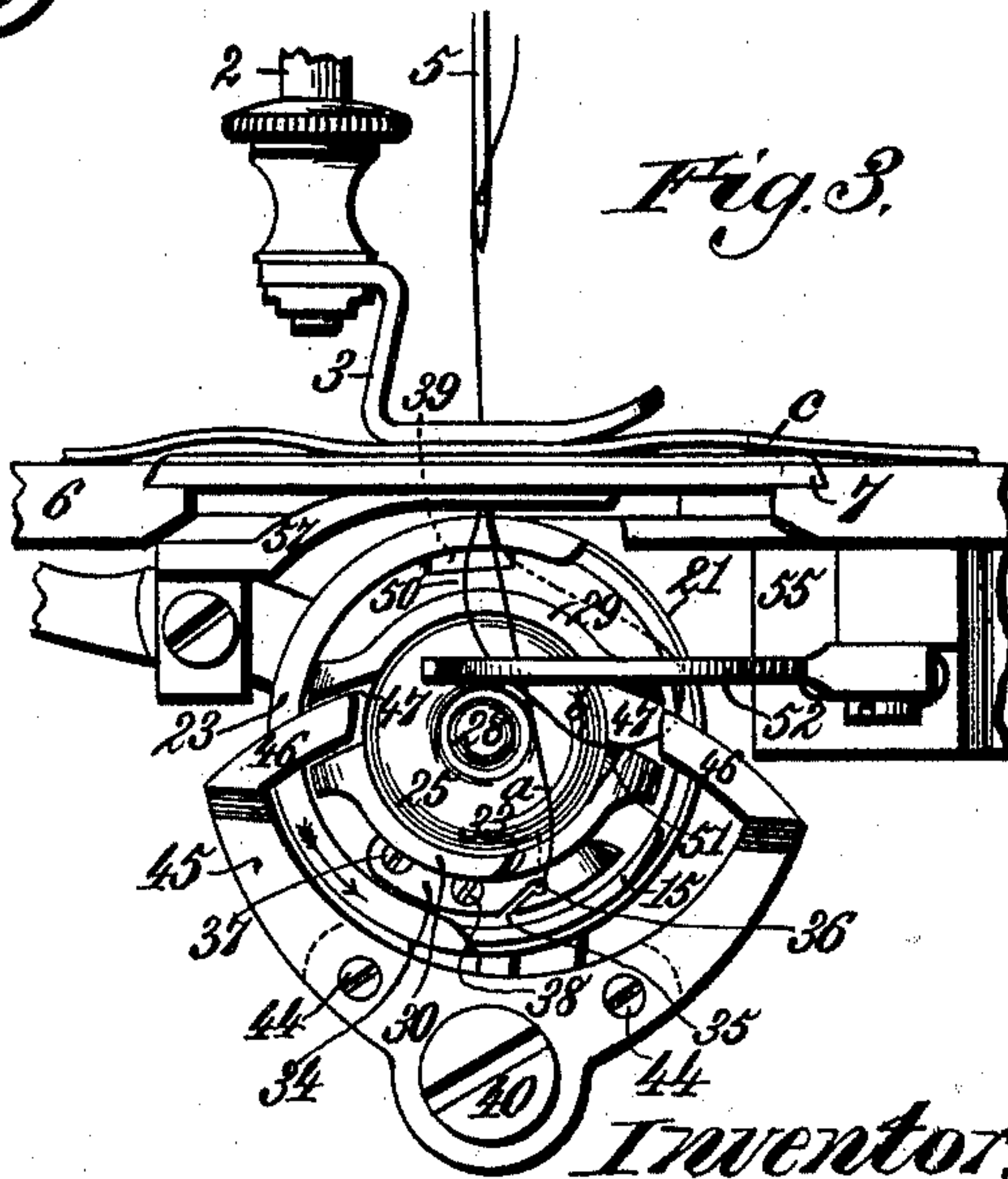


Fig. 3.



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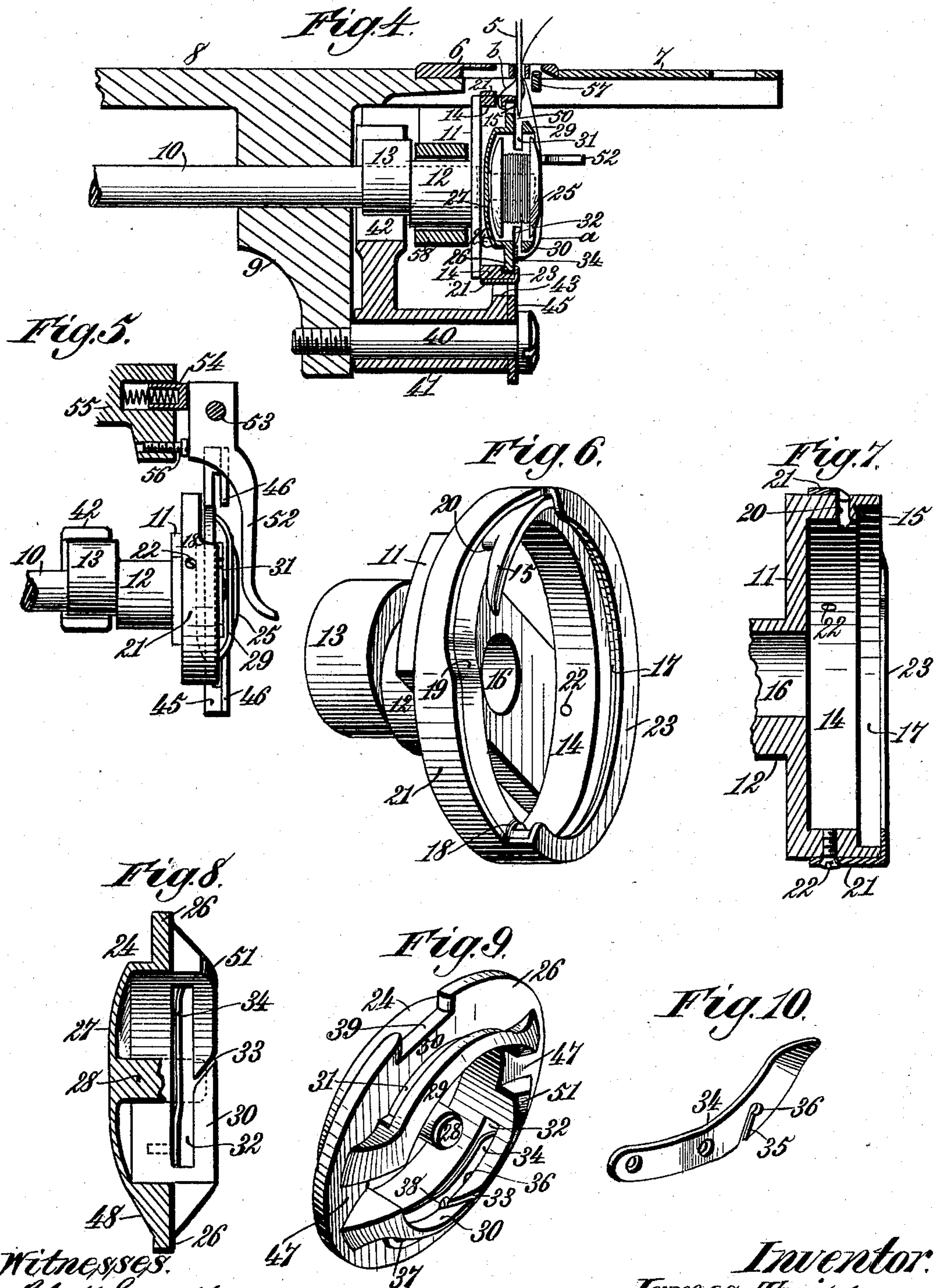
(No Model.)

2 Sheets—Sheet 2

J. TRIPP.
SEWING MACHINE.

No. 585,724.

Patented July 6, 1897.



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UNITED STATES PATENT OFFICE.

JAMES TRIPP, OF NEW YORK, N. Y.

SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 585,724, dated July 6, 1897.

Application filed October 15, 1895. Renewed November 19, 1896. Serial No. 612,782. (No model.)

To all whom it may concern:

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

My invention relates to that class of lock-stitch or double-thread sewing-machines in which a rotary hook is employed for taking the loop from the needle and carrying it around the bobbin-casing or spool-holder in such manner as to spread or bow the loop and cause it to encompass the under thread in forming the lock-stitch.

It is among the objects of my invention to improve the rotary hook and its supporting-head, to provide an improved form of bobbin-casing or holder and improved means for locking said holder against rotation, and to relatively arrange the several parts and effect their required operation in such manner as to not only insure the spreading of the loop, but to provide as well a free and unobstructed passage for the thread in the formation of the stitch, whereby the machine may be run at high speed without liability of breaking even the finest thread that may be required for the work.

Other purposes of the invention in its several parts will hereinafter appear.

The invention consists in features of construction and novel combinations of devices described and claimed.

In the annexed drawings, Figure 1 is a front or end elevation of part of a sewing-machine embodying my invention and showing the rotary hook taking the loop from the needle. Fig. 2 is a similar view showing the needle on its upward movement and the rotary hook as carrying the bowed loop around the bobbin casing or holder. Fig. 3 is a similar view showing the loop as cast off from the rotary hook and as being acted upon by the take-up. Fig. 4 is a vertical longitudinal section through a part of the machine-frame, cloth-plate, rotary-hook-supporting head, and bobbin-casing with accompanying parts. Fig. 5 is a partly-sectional plan illustrating the holding of the bobbin in its casing and the pas-

sages afforded for release of the needle-thread loop after it has been carried around the lower thread. Fig. 6 is an enlarged perspective of the rotary-hook-carrying head and connected parts. Fig. 7 is a transverse section of the same with a rear portion broken off. Fig. 8 is a horizontal section of the bobbin-casing with part of the bobbin-spindle broken away. Fig. 9 is a perspective of the bobbin-casing or spool-holder viewed from the front. Fig. 10 is a perspective of a slotted spring to be attached to the bobbin casing or holder to control the tension of the lower thread.

Referring, first, to Fig. 1, the numeral 1 designates a portion of the machine-head with presser-foot bar 2, presser-foot 3, needle-bar 4, and needle 5 arranged as usual.

In the cloth-plate 6 there may be arranged a slide 7, Figs. 1, 2, 3, and 4, to give convenient access to the parts supplying the lower thread and the loop-controlling portions of the double-thread sewing mechanism.

The numeral 8 in Fig. 4 designates a portion of the table or main bed of the machine, and 9 a pendant forming one of the bearings of the rotary-hook shaft 10, which is driven from the main shaft (not shown) by means of any suitable connections.

On the forward end of the rotary-hook shaft 10 is carried a hook-supporting head 11, which is preferably constructed integral with two eccentrics 12 and 13, Figs. 4, 5, and 6, as well as with a ring 14, on which the hook 15 is immediately formed. The purpose of the eccentrics 12 and 13 will hereinafter appear. Through the head 11 and connected eccentrics is formed an opening or bore 16, Figs. 6 and 7, to receive and tightly engage the rotary hook-shaft.

As shown in Figs. 6 and 7, the front of the ring 14 is provided in its inner periphery with a countersunk or reamed-out portion 17, on which the hook 15 is formed. The reamed-out ring portion or channel 17 is extended somewhat more than half the ring-circumference, and for the remainder of its periphery the width of the ring 14 is reduced from front to rear to afford a free passage for the taking up of the needle-thread in advance of the

movement of the hook 15, when said thread is cast off from the hook, as shown in Fig. 3. The channel 17 is terminated at one end by the hook 15, as shown in Fig. 6. At the other
 5 end of the channel 17 and at its rear side is a shoulder 18, formed on the front of the reduced portion of the ring. The ring 14 is reduced in width from the shoulder 18 to another shoulder 19, Fig. 6, and from this point
 10 it is still further reduced in width to a crotch 20 at the junction of the hook 15 with the main body of the ring. The channel 17 terminates on the hook 15, a portion of which is continuous with the main body of the ring 14
 15 or rear wall of said channel, as shown in Figs. 4 and 7; but the said rear wall is dressed off or disappears before the point of the hook is reached.

On the outside of the hook-carrying ring
 20 14 and attached thereto is a cap or sheath 21, Figs. 4, 5, 6, and 7, which is preferably formed separate from the said ring and secured thereon by screws 22 or otherwise. The front portion of the periphery of this cap or sheath
 25 21 has a contour that corresponds with the front outer edge of the ring 14, except that a portion of the front edge of said sheath is dressed off to expose the hook 15 and part of its supporting-ring, as shown in Fig. 6. On
 30 the front of the forward extended portion of the sheath or cap 21 is an inwardly-turned lip or flange 23, which, as shown in Figs. 6 and 7, nearly corresponds with the channel 17 in length and constitutes its front wall.

35 The channel 17 and flange or lip 23 serve to hold in the ring 14 a bobbin-casing 24, Figs. 1 to 5 and 8 and 9, in which the spool or bobbin 25 is removably supported.

There is on the periphery of the bobbin-
 40 casing 24 a circumferential flange or collar 26 to engage in the channel 17 and hold the bobbin-casing from endwise movement in the hook-carrying ring. The bobbin-casing has a convexed back 27, Figs. 4 and 8, and from
 45 the inner or front face of this back there projects a spindle 28, Fig. 9, on which the spool or bobbin 25 is to be loosely mounted. The front of the bobbin-casing 24 comprises two segmental ribs 29 and 30, one above and one
 50 below the circular opening through which the bobbin 25 is inserted and removed. For permitting suitable descent of the needle 5 to its lower limit of movement there is provided in the bobbin-casing 24 a transversely-arranged
 55 slot 31 in rear of and parallel with the upper rib 29, which preferably constitutes the front wall of said slot. There is formed through the lower portion of the bobbin-casing 24 in rear of its lower rib 30 a similar slot 32 for
 60 passage of the lower thread *a*, supplied by the spool or bobbin. In the lower rib 30 is a threading-slot 33, extended diagonally from front to rear of said rib, for passage of the lower thread *a* into the slot 32 when thread-
 65 ing or attaching said lower thread to the bobbin-casing.

On the front of the bobbin-casing 24, immediately below and partly within the slot 32, is attached a spring 34, provided with a diagonally-arranged slot 35, Fig. 10, extending
 70 from the lower edge of said spring and terminating in an eye or guide-opening 36 for the lower thread. The spring 34 is preferably somewhat curved, as shown in Fig. 10. Its free portion is set slightly outward from
 75 the flanged body of the bobbin-casing, as shown in Fig. 8, to permit passage of the lower thread behind the spring, and the free end of the spring is turned slightly forward to facilitate threading. It is preferable to
 80 attach the spring 34 by means of two screws 37 and 38, and whenever required the screw 38 may be slightly loosened or tightened to regulate the tension.

When the spool or bobbin 25 is in place, 85 the loose end portion of the thread thereon is passed through the threading-slot 33 into the slot 32 and is then drawn along the front of the spring 34 to the forward turned end thereof and thence behind said spring and
 90 forward and upward through the slot 35 into the guide-eye 36 and thence outward beneath the lower rib 30 of the bobbin-casing.

It has been noted that the back 27 of the bobbin-casing 24 is convexed, and by refer- 95 ence to Figs. 1, 2, 3, 4, 5, 8, and 9 it will be seen that the anterior faces of the ribs 29 and 30 are somewhat beveled, rounded, or tapered, especially at their ends; also, the front face of the upper rib 29 is beveled off in an up- 100 ward direction, and the front face of the lower rib 30 is beveled off in a downward direction, as more clearly indicated in Figs. 4 and 9. This construction of the bobbin-casing back 27 and front ribs 29 and 30 greatly aids in the
 105 required spreading or bowing of the loop in the needle-thread *b* as said loop is carried around by the rotary hook 15 and presents no obstruction to the free passage of the loop in forming a lock-stitch. 110

In the top of the flange 26 on the bobbin-casing 24 is a substantially rectangular notch 39, Fig. 9, to receive the loop of the needle-thread on its engagement with the rotary hook 15, as shown in Figs. 1 and 4. This 115 notch 39 also affords a free passage, as shown in Fig. 2, for one side of the needle-thread loop in the bowing or spreading of the loop around the bobbin-casing 24, and, as shown in Fig. 3, it acts with the lip or flange 23 to
 120 prevent twisting or kinking of the thread as it is drawn off by the take-up in the closing of the loop around and onto the lower thread.

It is necessary to hold the bobbin-casing 24 stationary independent of the rotary move- 125 ments of the hook 15 and bobbin 25 and by means that will not obstruct free passage of the needle-thread loop around the bobbin-casing or holder. For this purpose there may be provided a vibratory locking device ar- 130 ranged to lock the bobbin-casing 24 alternately at its opposite sides. To this end I

have shown a stud or screw-bolt 40, Fig. 4, projecting forward from the lower portion of the pendant 9 or other support. On the stud 40 is a loose sleeve 41, provided at its rear end with an upward-projecting fork 42, engaging the eccentric 13 on the rotary hook-shaft.

The forward end of the sleeve 41 is preferably formed with a laterally-extended arc-shaped plate 43, (indicated by dotted lines in Figs. 1, 2, and 3,) to which, by means of screws 44, is secured a two-armed balance-lever 45, preferably segmental in form and arranged with its arms curved upward, as shown. On the ends of the lever 45 are carried lugs or pallets 46 to engage alternately with locking-recesses 47 between the ends of the ribs 29 and 30 on the front of the bobbin-casing. The pallets 46 and their supporting and actuating mechanism constitute an effective and positively-actuated vibratory locking device for engaging alternately the recesses 47 of the bobbin-casing 24 in such manner as to hold said casing from rotation without obstructing passage of the bowed loop around it. By reference to Fig. 1 it will be seen that both pallets or locking-lugs 46 are partly engaged with the bobbin-casing for a short season while the loop is not yet fully spread; but as the loop is carried around by the hook 15 the pallet that is first in the path of the outermost portion of the loop-thread will move outward and permit the loop to pass, as shown in Fig. 2, the bobbin-casing being meanwhile held from rotation by the full locking engagement of the opposite pallet. When by action of the take-up the loop is drawn off from the hook 15, as shown in Fig. 3, the pallet on this side will have moved outward to permit free passage of the loop, while the bobbin-casing 24 will now be held by the locking engagement of the pallet on the other side. Thus by the vibratory movements and intermittently-locking action of the pallets 46, alternately engaging and disengaging the bobbin-casing 24, the said casing will be held at all times stationary by one pallet or the other or by both together and will not partake of the rotary movement of the surrounding hook-support or the inclosed bobbin, as might otherwise occur from frictional contact. At the same time a positively free passage is provided for the bowed or spread-apart loop-thread.

The spreading or bowing of the loop and its free passage around the bobbin case or holder 24 will be assisted by the convexity of the back 27 and the ribs 29 and 30; and, by reference to Fig. 8, it will be seen that the convexity of the back 27 is extended on one side at 48 nearly to the periphery of the flange 26, so that there is at this point no shoulder on which the thread might be caught. Before the loop is in position to be drawn off from the hook 15 by action of the take-up the hook support or ring 14 will have re-

involved a sufficient distance, as shown in Fig. 3, to afford free passage for disengagement of the loop in the space between the shoulder 18 and hook-crotch 20, and before this the needle-thread loop will have encompassed the under thread a , which may have been previously carried up through the needle-orifice in the cloth-plate. With the full action of the take-up and further rotation of the hook-supporting ring the loop of the needle-thread will be wholly released and become combined with the under thread in forming the stitch.

By reference to Figs. 1 and 4 it will be seen that the needle 5 is arranged to descend immediately in front of the hook 15, notch 39, and that portion of the flange or collar 26 which is below said notch. This portion of the collar or flange below the notch 39 will serve as a guard or guide 50 for the needle-point, so that should the needle be slightly deflected rearward it will be prevented from getting in the path of the hook 15 that is close to the rear side of the needle when the loop is taken therefrom.

There may be provided on the lower rib 30 of the bobbin-casing 24 a beveled surface 51, adjacent to the spool or bobbin 25, to facilitate insertion of the thumb-nail to remove an empty spool or bobbin.

When a filled spool or bobbin has been mounted on the spindle 28, it may be held from longitudinal displacement by means of a laterally-swinging arm 52, arranged on a pivot 53, Fig. 5, supported beneath the cloth-plate. The pivotal end of the arm 52 is squared, as shown in Fig. 5, to have a firm support in either of its positions against a spring-bearing 54, Fig. 5, provided on a portion 55 of the machine-frame. When swung outward or forward, the arm 52 will offer no obstruction to insertion or removal of the bobbin 25, but when said arm is turned laterally across the front of the bobbin-casing the bobbin 25 therein will be prevented from flying out of its holder. The arm 52 does not, however, come in contact with the bobbin nor so close to it as to obstruct free passage of the bowed loop around and off from the bobbin-casing. In order that the arm 52 may not be swung too far inward, there is provided in the frame part 55 an adjustable forward-projecting stud or bolt 56, Fig. 5, that can be moved outward to afford a suitable stop for the arm 52 when swung inward.

The machine may be provided with the usual feed 57, reciprocated by the ordinary and well-known lever mechanism and receiving its vertical movements through a fork 58, actuated by the eccentric 12 on the rotary hook-shaft.

The operation of the several parts concerned in sewing the fabric c will be readily understood from the foregoing description and need not be further explained. Owing to the smooth running of the hook-carrying head or support, the prompt, easy, and efficient action of the

alternately-engaging locking devices for the bobbin-casing, and the absence of frictional action between the hook-support, bobbin-casing, and bobbin the operation of the several parts is practically noiseless and the machine may be run at very high speed without impairing the accuracy and neatness of the work.

What I claim as my invention is—

1. In a sewing-machine, the combination with a needle, and a rotary-hook-carrying ring, of a circumferentially-flanged bobbin-casing having a convexed back, an open front for insertion and removal of a bobbin, anteriorly-convexed segmental ribs above and below the opening in said front, an upper transverse slot and a lower transverse slot in rear of said ribs, a tension-regulating spring arranged in said lower slot and provided with a threading-slot terminating in an eye, the said lower rib being provided with a slot for passage of the under thread to said spring, and means for holding said bobbin-casing against rotation and longitudinal displacement, within the rotary-hook-carrying ring, substantially as described.

2. In a sewing-machine, the combination with a needle, and a rotary-hook shaft, of an eccentric and a hook-carrying ring or head formed integrally and mounted in one body on the forward end of said hook-shaft, a bobbin-casing held from longitudinal displacement within the hook-carrying ring, a bobbin, and a positively-actuated locking device adapted to engage the bobbin-casing at two points alternately for locking said casing at all times against rotation and to provide free passage for the loop at each locking-point as required, said eccentric being arranged for actuating the said locking device, substantially as described.

3. In a sewing-machine, the combination with a needle, a rotary-hook-carrying ring having a portion of its periphery provided with a passage for the loop, and a bobbin-casing held from longitudinal displacement within said ring and provided with locking-recesses at two points in the path of the needle-thread loop that is to be bowed or spread around said casing to encompass the under thread, of a positively-actuated vibratory locking device provided with lugs or pallets adapted and arranged to engage both locking-recesses of the bobbin-casing for a time while the loop is not yet fully spread and to alternately disengage from and become fully engaged with the respective recesses of the bobbin-casing, whereby the said casing is at all times locked against rotation and a free passage afforded for the loop at each locking-point as required, substantially as described.

4. In a sewing-machine, the combination with a needle, a rotary-hook-carrying ring provided with a passage for the needle-thread loop and mounted on a shaft provided with an eccentric, and a bobbin-casing held from longitudinal displacement in the said hook-

carrying ring, around which casing the loop of the needle-thread is to be bowed or spread, of a vibratory two-armed locking device provided with lugs or pallets adapted and arranged to simultaneously have a partial engagement with the bobbin-casing for a time while the loop is not yet fully spread and to alternately become disengaged from and fully engaged with the bobbin-casing as the loop is carried fully around the same, whereby the said casing is at all times locked against rotation and a free passage afforded for the loop at each locking-point as required, and means for vibrating said two-armed locking device from the eccentric on the hook-shaft, substantially as described.

5. In a sewing-machine, the combination with a needle, and a rotary-hook-carrying ring adapted to afford passage for the loop of the needle-thread around and in advance of the hook, of a bobbin-casing held against longitudinal movement in said hook-carrying ring and provided with a convexed back and an open front having anteriorly-convexed ribs one above and one below the bobbin-receiving opening and with recesses between the end of said ribs and upper and lower transverse slots in rear of the ribs, and a positively-actuated vibratory locking device provided with lugs or pallets to engage in both of said recesses for a time and to alternately disengage from and fully engage with the respective recesses, whereby the bobbin-casing is at all times locked against rotation and a free passage afforded for the needle-thread loop at each locking-point, substantially as described.

6. In a sewing-machine, the combination with a needle, and a rotary-hook-carrying ring having a portion of its periphery reduced in width to afford passage for the loop of the needle-thread, of a bobbin-casing closed at the back and open in front for insertion and removal of a bobbin, the said bobbin-casing being provided with convexed surfaces for free passage of the bowed or spread loop around it and having transverse slots above and below the front of the bobbin-receiving opening and locking-recesses at the sides, a tension-regulating spring arranged in one of the slots of the bobbin-casing and provided with a threading slot and eye in said spring, and vibratory locking devices to alternately engage with and disengage from the said recesses in the sides of the bobbin-casing for holding it against rotary displacement within the hook-carrying ring and to permit free passage of the loop at each locking-point, substantially as described.

7. In a sewing-machine, the combination with a needle, a rotary-hook-carrying ring, and a bobbin-casing having an open front and provided with locking-recesses on opposite sides, of positively-actuated vibratory locking devices adapted to simultaneously engage for a time in both said recesses of the bobbin-

casing and to alternately disengage from and
fully engage with said recesses as the loop is
carried around the casing, to lock the latter
and permit free passage for the loop at both
5 locking-points in succession, and an arm to
retain the bobbin in its casing, substantially
as described.

In testimony whereof I have hereunto set
my hand in presence of two subscribing wit-
nesses.

JAMES TRIPP.

Witnesses:

ANNE M. ASHER,
M. J. GARCIA.