No. 860,123. PATENTED JULY 16, 1907.

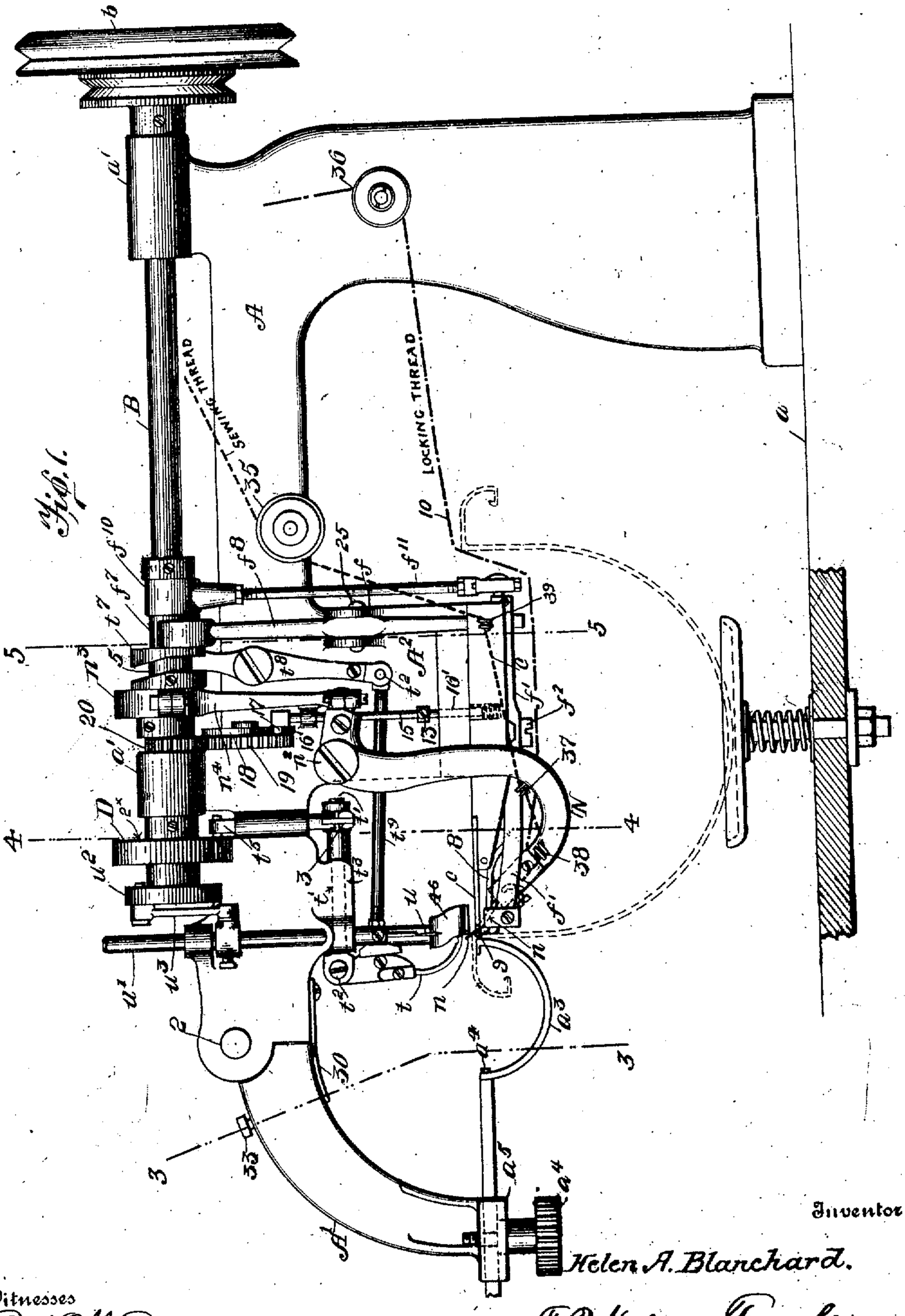
H. A. BLANCHARD.

HAT SEWING MACHINE.

APPLICATION FILED NOV. 15, 1905. RENEWED DEC. 5, 1906.

4 SHEETS—SHEET 1.

Fig. 1.



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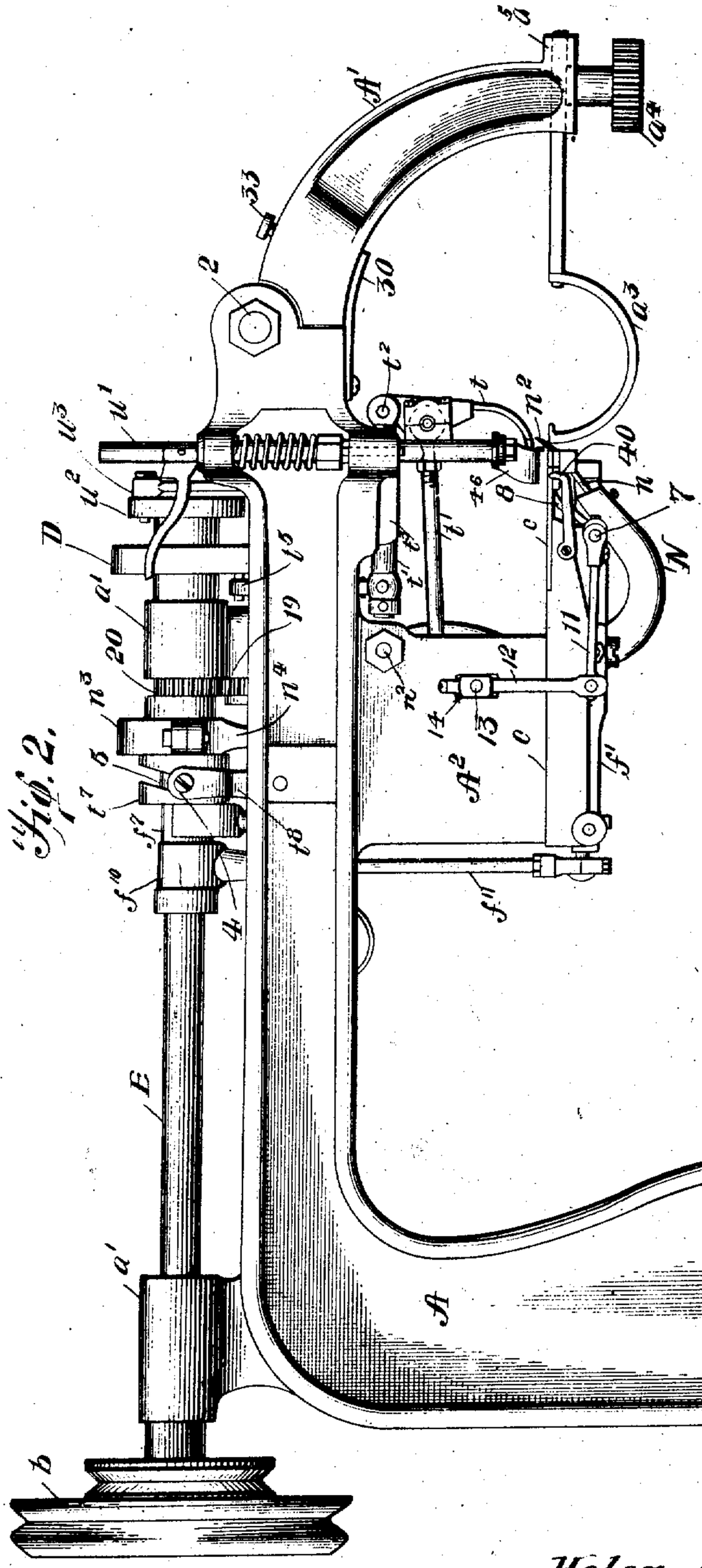

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4 SHEETS—SHEET 3.

Fig. 5.

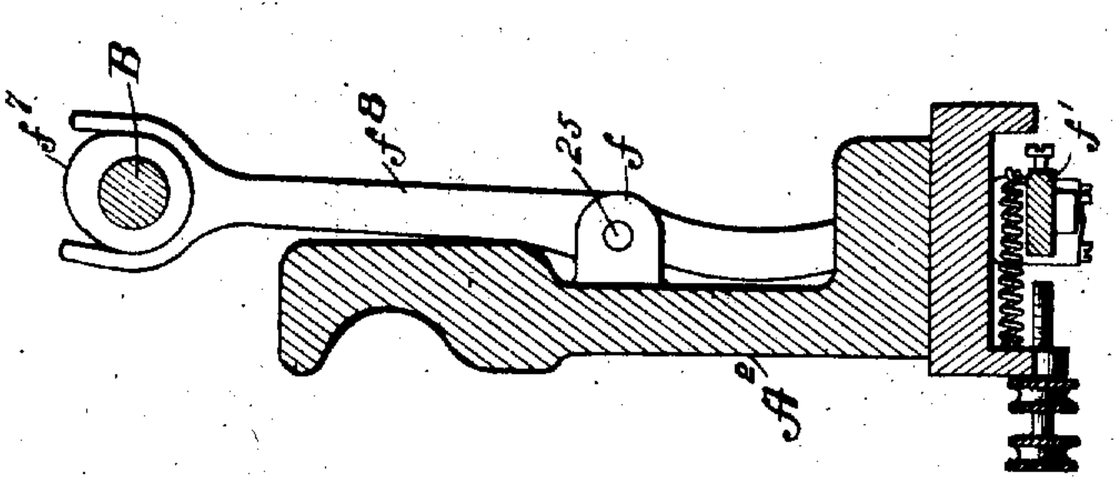


Fig. 4.

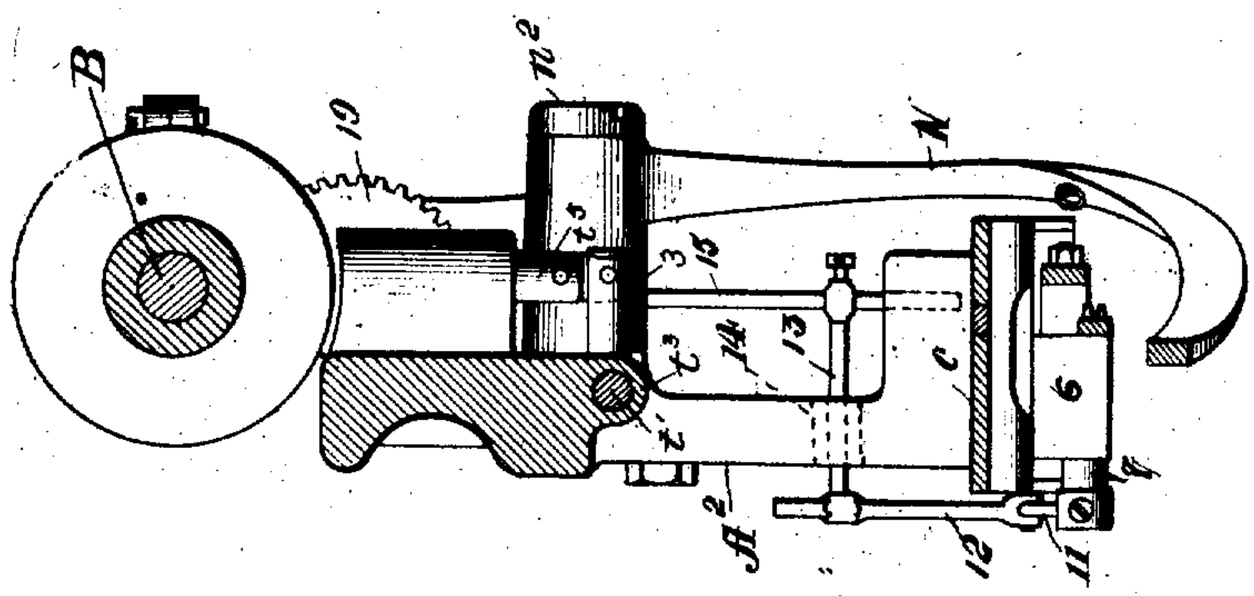


Fig. 3.

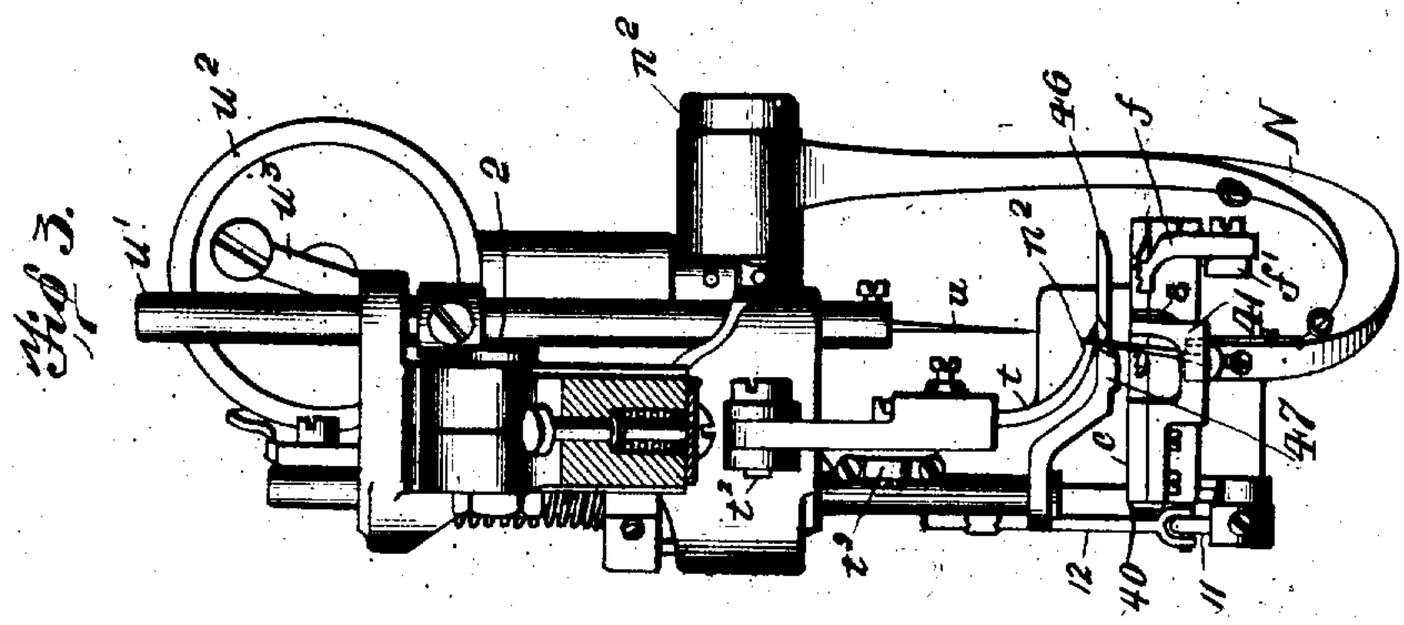
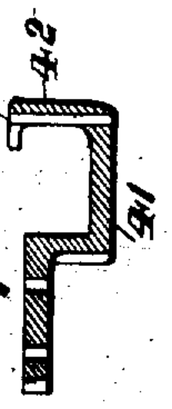


Fig. 12.



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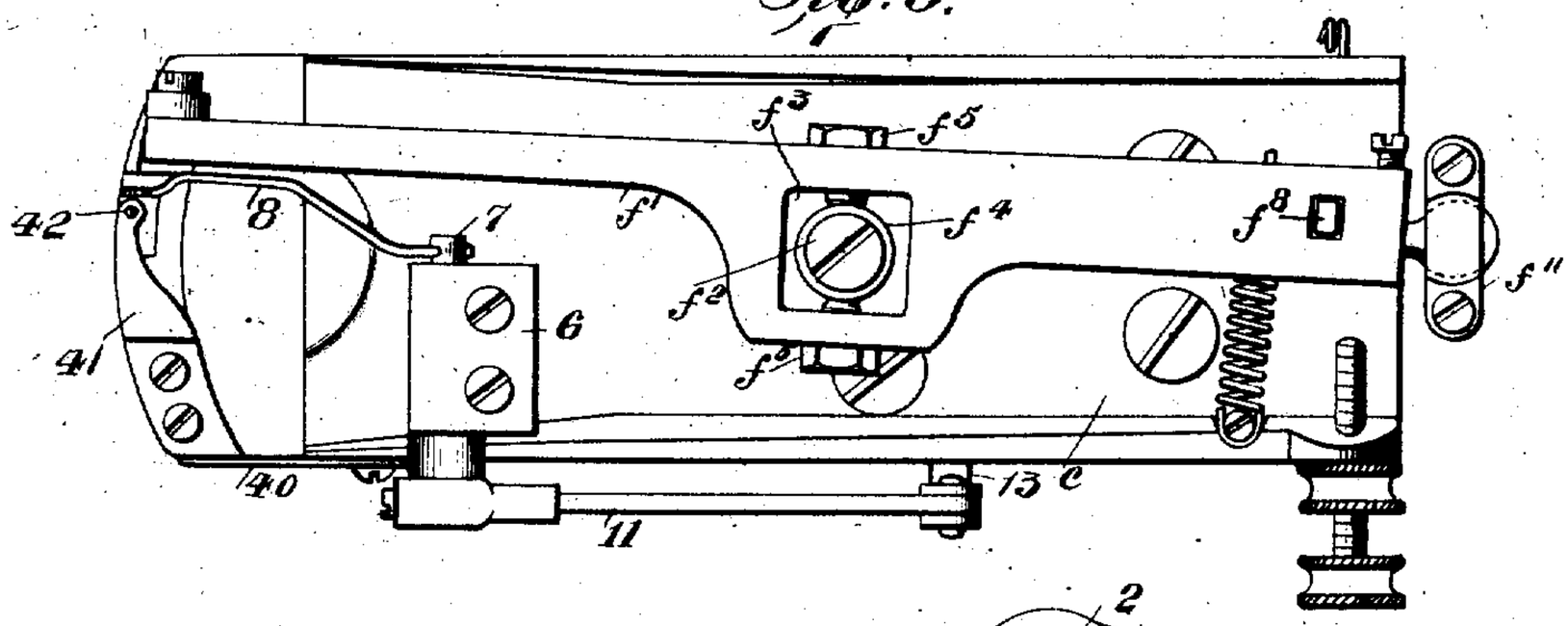
4 SHEETS—SHEET 4.

Fig. 6.



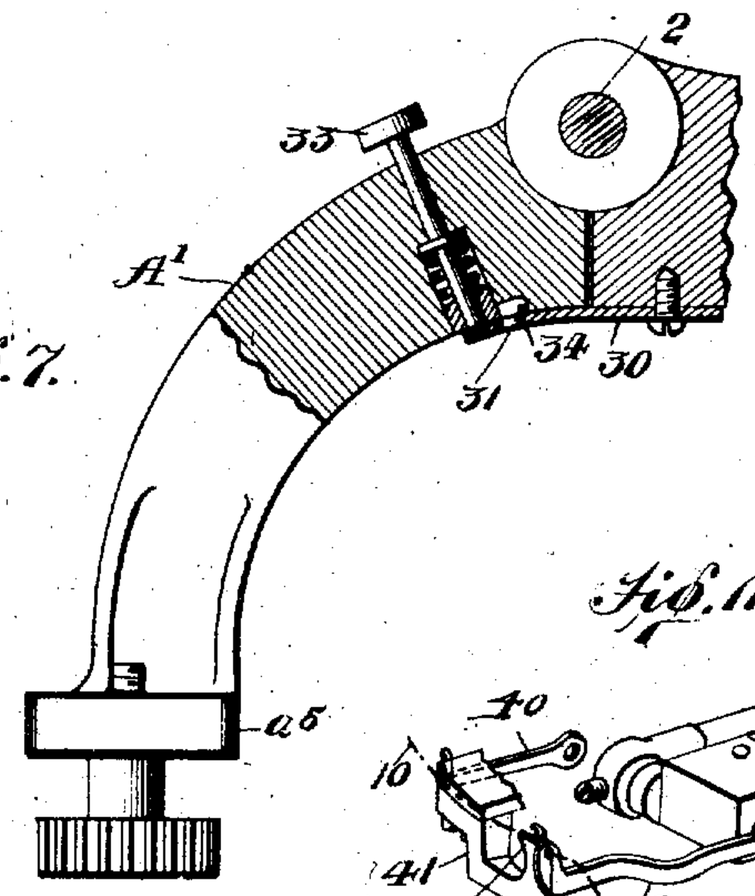


Fig. 7.

Fig. 11.

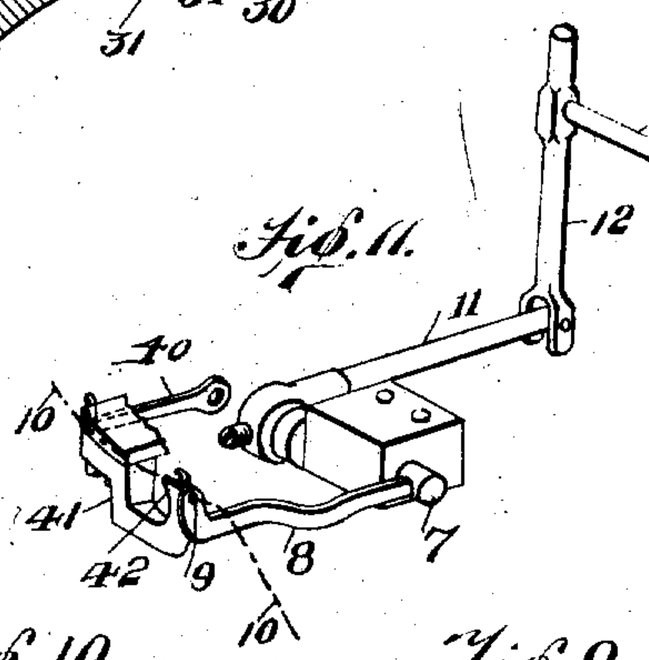


Fig. 8.

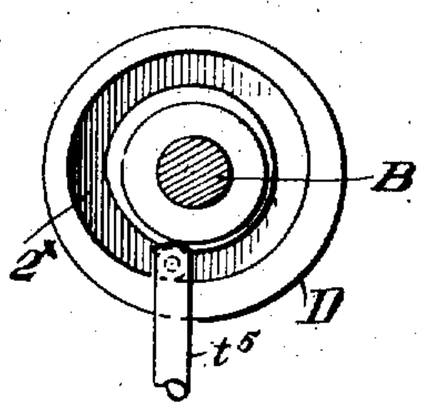


Fig. 10.

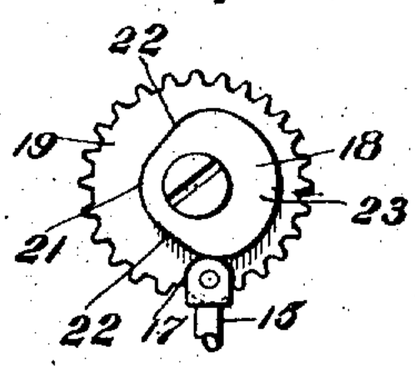
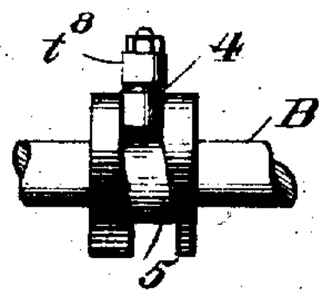


Fig. 9.



Witnesses
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UNITED STATES PATENT OFFICE.

HELEN A. BLANCHARD, OF PHILADELPHIA, PENNSYLVANIA.

HAT-SEWING MACHINE.

No. 860,123. Specification of Letters Patent. Patented July 16, 1907.

Application filed November 15, 1905, Serial No. 287,422. Renewed December 5, 1906. Serial No. 346,486.

To all whom it may concern:

Be it known that I, HELEN A. BLANCHARD, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented new and useful Improvements in Hat-Sewing Machines, of which the following is a specification.

My invention relates to certain new and useful improvements in sewing machines making a common overedge chain stitch with one thread and a plurality of thread carriers; and it is designed primarily to sew sweat-bands into hats and onto a strap of linen or other material, hereinafter termed a reed, which has been previously basted on the inner edge of the hat.

Heretofore the sweat-bands in hats have been sewed onto the basted strip by hand, and by machinery, as for instance by the mechanism shown, described and claimed in my former patent No. 684,176, dated October 8, 1901, the machine sewing reducing the cost of the finished hat and resulting in a better fastening of the sweat-band to the basted strip of the hat.

The present invention is an improvement on my aforesaid prior patent and it comprehends means for supporting the hat with its attached or basted reed relative to the band and then attaching the sweat band or leather to the reed by a sewing thread and a locking filament or thread, which is automatically fed with the band, and which is moved alternately substantially across the path described by the lower sewing needle, and concatenating the sewing thread to form a series of interlocking loops certain of which are looped around the locking filament or thread and others locked out of sight in the separate thread and thereby removed from the edge of the reed.

My invention further comprehends certain improvements in the means by which a locking thread or filament is moved substantially into and out of the range of action of one of the sewing needles; in the means for actuating an oscillating thread carrier or looper; in the arm of the machine having a jointed or hinged section and locking means therefor, and in certain other features which I will hereinafter describe and claim.

In the accompanying drawing, I illustrate a machine of the type shown in my said former patent, having the present improvements applied thereto.

Figure 1 is a side elevation of the sewing machine, showing the stitching mechanism with its lower sewing needle carrying the thread, a thread carrier or looper, a notched sewing needle, a hat support and means for operating the various mechanisms. Fig. 2 is a view of the opposite side of the machine. Fig. 3 is a cross section on the line 3—3 of Fig. 1. Fig. 4 is a similar section on the line 4—4 of Fig. 1. Fig. 5 is a cross-section on the line 5—5 of Fig. 1. Fig. 6 is a plan view of the underside of the cloth plate and the devices supported thereon. Fig. 7 is a sectional view of the jointed end of the machine arm. Figs. 8—9—10 11 and 12 are details to be referred to.

Referring now to said drawing for a more complete explanation of my invention, A represents the machine arm, which is designed to be appropriately supported on or secured to a table *a*. This arm is provided with two bearings *a'* in which is mounted the main shaft B having fixed to it a pulley *b* which is driven by a belt in the usual manner.

On a bracket A^2 depending from the main arm A is fixed the cloth plate *c* of the machine and in line therewith, towards the left end, is a movable support a^3 for the hat-rim and which support is suitably held in place by a set screw a^4 or equivalent means, to the channeled guide or block a^5 on the curved end A' of the arm A, said curved end forming a horn and being jointed or pivotally connected to the arm A at the point 2 whereby it may be raised and lowered about its point 2 to facilitate the insertion and removal of the hat relative to the cloth plate, as I will hereinafter more fully describe.

The stitch-forming mechanism includes a lower thread carrying sewing needle *n* which is appropriately secured to an oscillating and curved needle arm N pivoted on a stud n^2 projecting from the machine arm and which arm N receives oscillatory motion about said stud from an eccentric n^3 on the main shaft and an eccentric strap n^4 connected to the arm N at a point at one side of its pivotal connection.

The lower needle *n* has a thread-engaging eye and operates in conjunction with an upper needle *u* having a thread engaging notch or barb adapted to engage and carry a thread through the goods. This upper needle which I will hereinafter refer to as the barb needle, is suitably secured to a vertically reciprocal needle bar *u'*, which receives its movement from the main shaft B through the medium of an eccentric-pin disk u^2 and connecting rod u^3.

In addition to the foregoing the stitch-forming devices include a thread looper *t* which, as shown, is hinged to a rock shaft *t'*, which extends to the right, said looper being designed to have a combined oscillatory and a backward and forward movement. This looper is hinged at t^2 to the rock shaft *t'*, journaled in a bracket t^3 of the machine arm, said rock shaft being given a vibratory motion by means of a cam groove 2× made in the face of a disk D fixed to the main shaft B. A vertical rod or shaft t^5 is journaled in a bracket or bearing on the machine arm and carries at its upper end a roller which operates in the cam groove of the disk D, the lower end of said rod being connected to a stud or arm 3 projecting from the rock shaft *t'*, whereby the shaft is rocked in its bearing and a rocking movement is imparted to the looper. The oscillatory motion is given the looper through the medium of a cam

disk t^7 on the main shaft B, and a lever t^8 said lever being pivotally secured between its ends to the machine arm and having one end connected to a rod t^9 which extends to and is connected with the looper, said lever t^8 having its opposite end supplied with a stud carrying an anti-friction roller 4 which operates in the cam groove 5 of the disk t^7 fixed to the main shaft, whereby said lever is rocked about its pivot and the looper is oscillated into and out of the range of action of the needles in a plane substantially at right angles to the rocking movement of the shaft t'.

Beneath the cloth plate c is arranged the feed mechanism which is designed to move the hat and sweat band around a common support—*i. e.* the band with the inner edge of the hat is fed in a substantially circular path. To this end the feed f is attached to a bar f' beneath the cloth plate and is adapted to oscillate horizontally and also move up and down. This bar f' is secured to the cloth plate by a universal joint f^3 comprising the collar f^4 encircling a stud f^2 and the pointed set screws f^5 securing the bar to the collar. Oscillating motion is imparted to the feed by means of an eccentric f^7 on the main shaft B and a lever f^8 pivoted at 25 to the depending bracket of the machine arm, the lower extremity of the lever passing through the cloth plate and entering a recess in the oscillating feed bar f'. The up and down motion of the feed is obtained from the main shaft through an eccentric f^{10} the strap f^{11} of which extends to and connects with the free end of the feed bar.

On the underside of the cloth plate is a bracket or bearing 6 in which is journaled a rock shaft 7. To one end of this shaft is fixed an arm 8 which extends upwardly and its free end is arranged substantially vertical and enters the front of the usual needle recess in the feed f, said vertical portion of the arm being disposed slightly to one side of the vertical plane of the sewing needles and being provided with an eye 9 for the locking thread 10. To the other end of the rock shaft 7 is fixedly connected a horizontal rod 11 which is pivotally connected to the lower end of a vertically disposed rod 12, and connected to the rod 12 is a transverse rod 13 which extends through a slot 14 in the machine arm; and on the opposite sides of the machine arm is a vertical spring-pressed rod 15 which is connected to the said transverse rod 13 and is itself vertically movable in guides or bearings 16′ as shown in Fig. 1. The upper end of this vertically slidable rod 15 carries an anti-friction roller 17 which bears under a cam 18 fixed to the larger gear 19 of the two-to-one geared connection shown and which connection includes the aforesaid gear 19 and a smaller gear 20, the former being preferably twice the diameter of the latter, which is fixed to the main shaft. The cam 18 by which the rock shaft 7 and arm 8 which carries the locking thread or filament are operated, is of the general form shown in Fig. 10, that is, it has a portion 23 which is struck from the center of the gear wheel and is accordingly concentric therewith, and it has a smaller portion 21 also struck from the center of the wheel said portions 23 and 21 being joined by the cam portions 22. When the portion 23 of said cam begins to engage the roller of the vertically slidable rod 15, the arm 8 which carries the locking thread is held elevated and stationary and the lower needle begins to rise with the sewing thread, and it is during the time the part 23 of the cam is operating that the lower needle carries the sewing thread upwardly and below the locking thread, when the looper t operates to pick up the loop of the sewing thread and carry it into the path of the upper needle. As the lower needle withdraws beneath the cloth plate, the cam 18 has been turned sufficiently to about remove the concentric portion 23 from contact with the roller 17 and the latter now travels down the declining portion 22 of the cam which results in the vertical rod 15 moving upwardly thereby rocking the shaft 7 and lowering the thread-carrying end of the arm 8 and lowering the locking thread. The upper needle is now descending and it takes the loop from the looper t and carries it through the goods, and into the path of the now ascending lower needle which latter, with the sewing thread, now passes through the loop held by the upper or barb needle. The locking thread carrying arm remains lowered while the smaller concentric portion 21 of the cam is engaging the roller, and it is during this time that the lower needle passes through the loop held below the cloth plate by the upper needle, said lower needle this time carrying the sewing thread above the still lowered locking thread and into the range of action of the looper t. As the lower needle again descends, over the top of the locking thread, the inclining portion 22 of the cam operates on the roller and connections to rock the shaft 7 and again elevates the locking thread so that on the next upward movement of the lower needle, the sewing thread will be carried upward under said locking thread.

Thus the locking thread is alternately raised and lowered in harmony with the operations of the needles, and the sewing thread is laid over the locking thread and is concatenated thereto to form a series of interlocking loops which are looped around the locking thread separate from the hat and in such position that the loops are invisible and removed from the edge of the reed, giving the full appearance of hand sewing on the reed and relieving the edge of the reed of the objectionable rough appearance which is so common in hats whose sweat-bands are attached by mechanical means.

It is also apparent that it is in fact immaterial whether the lower sewing needle passes through or under the locking thread; in one revolution of the machine the lower needle, carrying the sewing thread, passes over the locking thread, and on the next revolution of the machine said lower sewing needle passes under, or through, the locking thread, thus tying the lock of the thread out of sight. Previous to my invention the locking of the sewing thread was governed by the basting thread of the reed and sometimes the locking would be on top of the reed, and at other times it would be between the reed and sweat-band, thereby giving a rough and irregular appearance.

As before stated, the machine arm is pivoted or hinged at 2, to provide a curved head which is capable of being lifted to admit and remove the hat body. Secured to the underside of the main part of the machine arm is a flat spring plate 30, having an opening 31 in its free end, which extends beneath the hinged part of the arm. In the hinged part of the arm is mounted a push pin 33 which slides through said part, and the free end of the spring plate 30 is provided with a catch 34 which

is designed to snap into engagement with a notch or undercut recess in the hinged part of the arm and thereby hold the hinged portion of the arm in a locked position.

To release the hinge part of the arm, the pin 33 is pushed down until its lower end comes in contact with the free end of the spring plate 30 and thereby forces the catch of said plate out of the recess and allows the hinged end of the arm to be lifted to remove the hat.

The locking thread is shown as passing over a suitable tension device 36, through the eye 9 of the arm 8 and across the front of the cloth plate and back of a tension plate 40, Fig. 2; and the sewing thread passes over a tension device 35 and through guides 37—38—39 and the eye of the lower sewing needle. To the front underside of the cloth plate is fixed a plate 41 having a vertical portion 42 with an opening in which a portion of the feed operates.

The inner portion of the plate 41 is provided with a vertical groove or channel 44 which stands in line with the upper needle and guides and receives the point of this needle and thereby keeps the needle firm so that the lower threaded needle may pass through the loop in forming the second stitch. The lower end of the groove or channel 44 is closed at opposite sides to form a sheath and brace for the point of the needle, as shown in Fig. 12. The presser foot 46 is also provided with some suitable form of guide, as 47, for the leather band.

The machine will be mounted in any usual or well known manner and will be supplied with such complementary accessories as may be necessary for the work to be performed.

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

1. In a sewing machine the combination of a thread-carrying needle, a reciprocal needle operating substantially opposite to the first needle said second needle provided with a thread-engaging notch, a thread carrier adapted to take a loop from the thread-carrying needle and present it to the notch of the other needle, complementary mechanism for actuating the needles and the looper, an oscillating member supporting a locking thread proximate to the needles, and means whereby the locking thread is alternately moved to allow the thread-carrying needle to pass above and below the locking thread during successive operations of the machine.

2. The combination with stitch forming mechanism including oppositely operating needles one having an eye and the other a thread engaging recess, and a thread carrier adapted to take a loop from the thread-carrying needle and present it to the recess of the other needle, of a locking-thread-carrier and means operating substantially coördinately with the stitch-forming mechanism for positioning the locking thread or filament of said carrier first at one side and then at the opposite side of the range of action of the thread-carrying eye-needle whereby the sewing thread is locked to and around the locking thread.

3. A sewing machine having in combination oppositely operating needles one of which is provided with an eye for a sewing thread, and the other has a thread-engaging notch, means for taking a loop of the sewing thread from the eye-needle and presenting said loop to the notch of the other needle and means for presenting a locking thread first on one side and then on the opposite side of the path of movement of the eye-needle whereby the sewing thread is concatenated to form a series of interlocking loops certain of which are looped around the locking thread and others locked out of sight in the separate thread.

4. In a sewing machine the combination of stitch-forming mechanism including oppositely operating needles one of which is provided with an eye and the other with a recess, and a thread carrier adapted to take a loop from the thread carrying needle and present it to the recess of the other needle, means for supporting a hat body with attached reed relative thereto; and means for attaching a sweat band to the reed said last named means comprising a separate locking thread and a carrier therefor, said carrier operating to position the locking thread relative to the stitch-forming devices so that the sewing thread of the latter will be concatenated to the reed and to the locking thread by a series of interlocking loops certain of which are looped around the locking thread and others are locked out of sight therein.

5. In a hat sewing machine having means for supporting a hat body with attached reed, and wherein a sweat band is positioned relative to the said reed, a means for positioning a separate locking thread relative to and beneath the reed, and means for simultaneously attaching the band to the reed and also securing the band to the locking thread by means of a single sewing thread whereby the locking thread serves as a carrier for the interlocked portions of the sewing thread, certain of said interlocked portions being looped around the separate thread and others being out of sight and locked in the separate thread, and the portion of the sewing thread between interlocked portions overseaming the reed, substantially as described.

6. In a hat sewing machine having means for supporting a hat body with attached reed and wherein a sweat band is positioned relative to the reed, a means for feeding a separate locking thread coördinately with the hat body and sweat band, said thread being disposed beneath the reed, and stitch-forming mechanism for securing the band to the locking thread, by means of interlocking loops certain of which overseam the reed and locking thread and others are removed from the reed and are substantially out of sight in the separate locking thread.

7. In a hat sewing machine, the combination of a lower thread-carrying needle oscillating about a center above the cloth plate of the machine, a reciprocating vertical needle having a thread-engaging notch, a looper adapted to take a loop from the lower thread-carrying needle and present it to the notch of the vertical needle, means for operating the needles, means for operating the looper, and means for delivering a separate locking thread to the action of the thread-carrying needle and looper whereby a single sewing thread may be looped over or around the reed and locking thread to attach the sweat band to said reed and separate thread by a succession of interlocking loops certain of which are looped around the reed and separate thread and others lock themselves in the separate thread.

8. In a sewing machine of the character described, the combination of a lower thread-carrying needle oscillating about a center above the cloth plate of the machine, a reciprocating vertical needle having a notch and moving in front of the lower needle, a looper adapted to take a loop from the lower needle on one side and present the said loop above the cloth plate to the said vertical needle so that the notch thereof may engage the same and carry it through the material to be sewed, a separate locking thread advanced in unison with the material to be sewed, over or around which the successive interlocking loops of the sewing thread are carried and alternate of said loops finally locked thereto, and means for operating the needles, the looper, and the locking thread carrier.

9. The combination in a single thread sewing machine having means for supporting a hat with attached reed relative to the stitch-forming devices, and to an unattached sweat band and separate locking thread, of oppositely operating thread-carrying needles one of which is provided with an eye and the other with a thread-engaging notch, said eye needle adapted during one movement, to carry the sewing thread beneath the separate locking thread, a looper adapted to take a loop of said sewing thread from the eye needle and present said loop to the notch of the other needle, whereby the sewing thread is carried over and around the reed and separate thread, and its loop is presented to the eye-needle in its succeeding movement, means for shifting the position of the locking thread to allow the eye-needle to next carry the sewing thread above the locking thread whereby the sweat band is secured to the reed and to the separate thread by a succession of interlocking loops certain of which are looped around the reed and separate thread and others lock themselves out of

sight in said separate thread, and means for actuating the needles, the looper, and the separate thread carrier.

10. The combination in a hat sewing machine having means for supporting a hat with an attached reed relative to stitch-forming mechanism and an unattached sweat band, and separate locking thread, of a thread-carrying needle normally located under the cloth-plate and adapted to pass up beneath the locking thread, a coacting thread carrier located above the cloth-plate and the goods to be operated upon, a thread-taking fabric-penetrating needle adapted to receive a loop from the thread carrier above the cloth plate and push the said loop through the goods and carry the intermediate portion of the loop over the separate locking thread, said loop being carried into the path of the said thread-carrying needle, means for shifting the position of the separate locking thread to enable the thread-carrying needle to pass above the same and through the loops held by the upper thread taking needle, and means for restoring the position of the separate locking thread, said sewing-thread being interlocked with the locking thread and means for operating the needles, the looper and the locking thread carrier.

11. The combination in a machine of the character described having means for supporting a hat with its attached reed, of means for attaching a sweat band to said reed, said means comprising stitch-forming mechanism adapted to operate upon a single sewing thread, and means for supplying a separate locking thread beneath the reed and to which the single sewing thread is concatenated and in which locking thread the alternate interlocking loops of said sewing thread are substantially hidden from view.

12. The combination in a machine having means for supporting a material to be sewed, of oppositely acting needles, a thread carrier, said needles and carrier acting upon a single thread and said carrier taking a loop of said thread from one of said needles and delivering it above the goods and in the path of the other needle, intermittently-oscillating means for holding a separate locking thread first above and then below the path of one of the needles whereby the said needle alternately passes above and below said locking thread, and means whereby the needles are given both an advanced and a retracted movement during each intermission in the movement of the locking thread carrier, whereby portions of the sewing thread are looped over the reed and locking thread and carried through the goods and other portions are locked in the locking thread.

13. The combination in a machine having means for supporting a hat with an attached reed, of means for attaching a sweat band to said reed said means including oppositely acting needles, a thread carrier, said needles and carrier acting upon a single sewing thread and said carrier taking a loop of said thread from one of said needles and delivering it above the goods in the path of the other needle, a thread-carrier for a separate locking thread said locking-thread being positioned below and parallel with the reed, and means for operating the locking thread carrier, said means including a pair of gears one of which is approximately twice the diameter of the other, a cam carried by the larger gear, a rock shaft on which the carrier is mounted, and connections between the rock shaft and cam, and means for operating the needles to cause them to advance and retract during the intermission of the movement of the locking-thread-carrier whereby the sewing thread is carried under and then over the reed and locking thread and through the sweat-band, and its loops interlocked with the locking thread.

14. The combination in a machine having means for supporting a hat with an attached reed, of means for securing a sweat band to said reed, said means including a main shaft, oppositely operating needles and means whereby they are operated from said shaft, a looper adapted to take a loop of a sewing thread from one of said needles and deliver the same above the reed and band and into the range of action of the other needle so that the loop may be carried through the goods, means for operating the looper, a carrier adapted to position a separate locking thread relative to the needles, and means for operating the carrier said means comprising a rock shaft for the carrier, a pinion on the main shaft, a gear of substantially twice the diameter of the pinion and engaged thereby, a cam on the larger gear, and connections between the cam and the rock shaft, for oscillating the carrier to position the locking thread first at one side and then at the other side of the path of movement of one of the needles.

15. The combination in a machine having means for supporting a hat with an attached reed, of means for securing a sweat band to said reed said last named means including a pair of needles and a looper one of said needles having an eye and the other needle having a thread-engaging notch, said looper adapted to take a loop from the eye-needle and present it to the notch of the other needle, an intermittently-operating locking-thread carrier adapted to position a separate locking thread first substantially at one side and then substantially at the opposite side of the range of action of said eye-needle, means whereby the eye-needle is caused to advance and retract during each intermission in the movement of the locking-thread carrier, and operative connections for the needles, the looper and the locking thread carrier.

16. A stationary and rigid sewing machine arm having a curved head movable towards and from the work, a bolt extending transversely across the end of the stationary part of the arm and forming a pivot upon which the head turns, and means for locking said head against movement said means including a latch and engaging part between the arm and pivoted head, and a push member operatable to disengage the latch from its engaging part to allow the head to be moved away from the work.

17. In a sewing machine, the combination with a reciprocal needle, of a cloth plate having an opening for the passage of the needle, and having, also, a channel or groove in line with the axis of said needle and adapted to receive and guide the point of the needle, the lower end of the groove or channel being closed at opposite sides to form a sheath and brace for the point of the needle.

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

HELEN A. BLANCHARD.

Witnesses:
EMERY G. WILSON,
AUGUSTUS F. MOULTON.