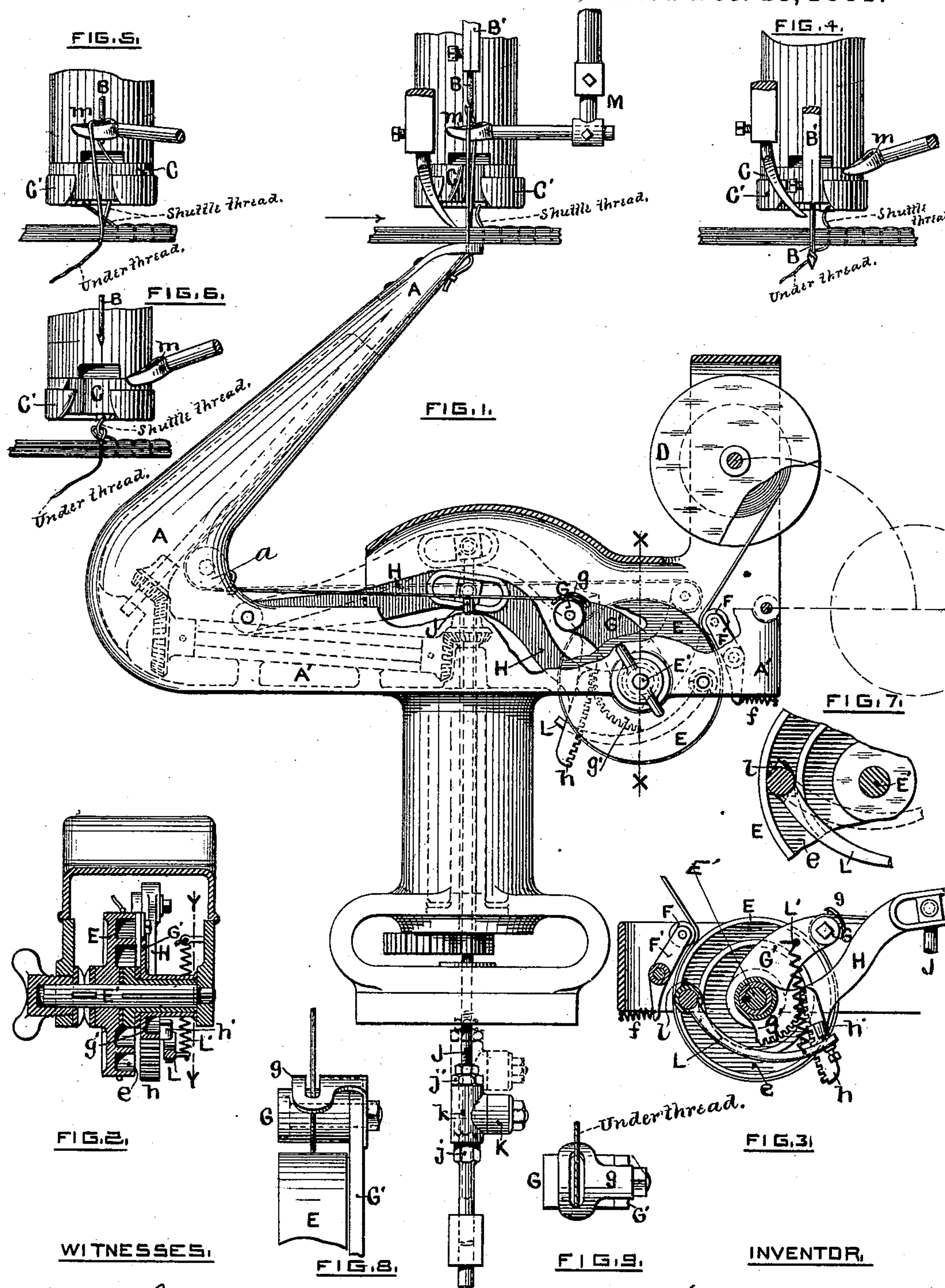


2 Sheets—Sheet 1.

No. 250,689.

Patented Dec. 13, 1881.



WITNESSES.

INVENTOR,

W. H. Thurston.
J. Knight.

James A True

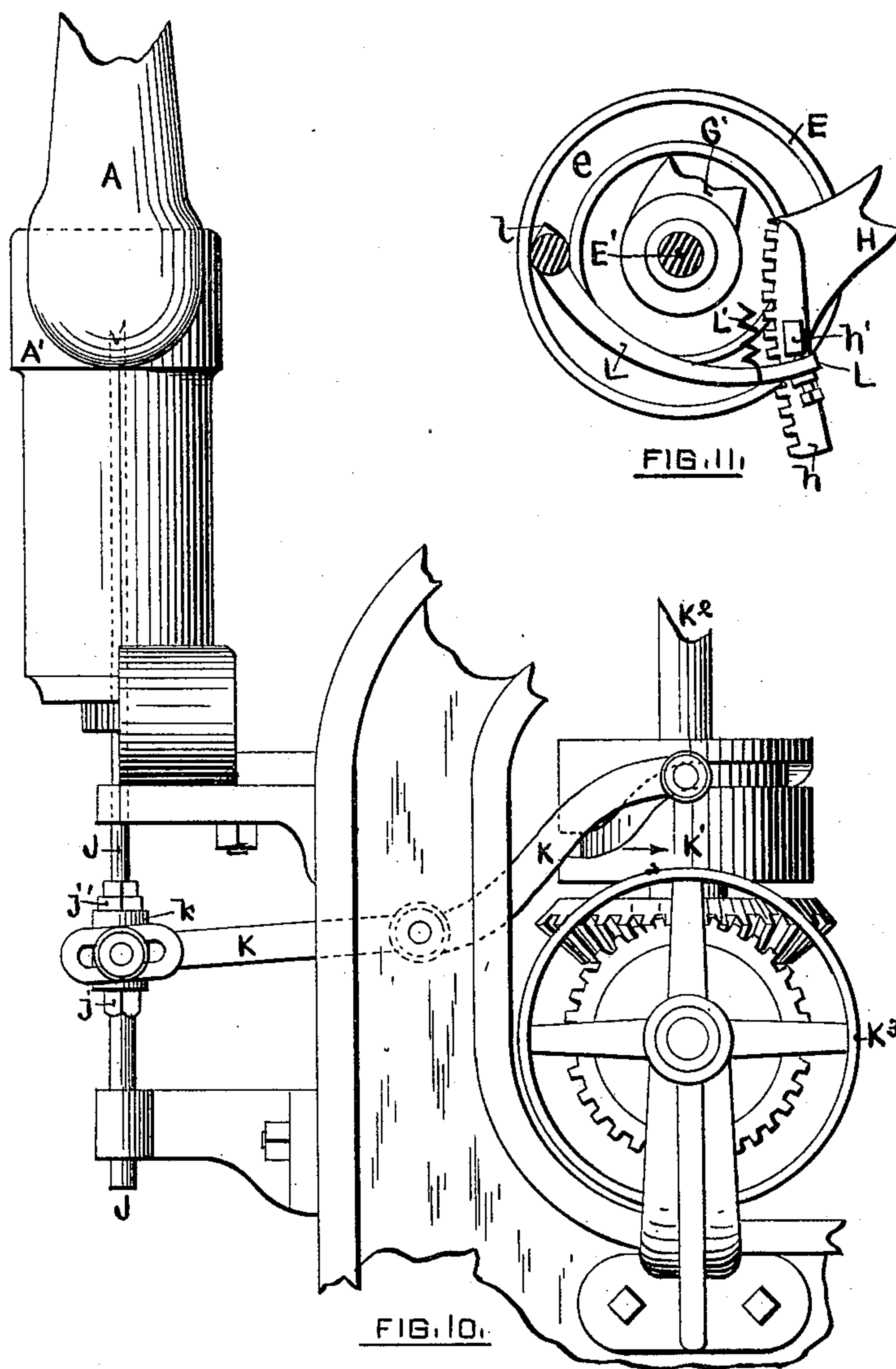
(No Model.)

2 Sheets—Sheet 2.

J. A. TRUE.
SEWING MACHINE.

No. 250,689.

Patented Dec. 13, 1881.



WITNESSES,

Edson Salisbury Jones.
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UNITED STATES PATENT OFFICE.

JAMES A. TRUE, OF PROVIDENCE, RHODE ISLAND, ASSIGNOR TO JOHN B. ANTHONY, OF SAME PLACE.

SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 250,689, dated December 13, 1881.

Application filed August 18, 1881. (No model.)

To all whom it may concern :

Be it known that I, JAMES A. TRUE, of the city and county of Providence and State of Rhode Island, have invented a new and useful
5 Improvement in Sewing-Machines; and I do hereby declare that the following specification, taken in connection with the accompanying drawings, forming a part of the same, is a full, clear, and exact description thereof.

10 My invention relates to that variety of sewing-machines particularly adapted for sewing soles upon boots and shoes, stitching leather, &c., which forms a "lock-stitch" and employs a shuttle located upon that side of the work
15 from which the needle approaches.

My improvement consists in the mechanism employed for controlling the main or spool threads during the formation of a stitch, and in means for locating the position of the lock
20 of the threads in the goods.

In lock-stitch sewing-machines so constructed that the main thread has been drawn in to finish the stitch by the rising needle, and in that class of machines particularly adapted
25 to sew leather, &c., in which the shuttle is located upon that side of the work from which the needle approaches and the thread has been drawn in to finish a stitch during and by the operation of forming the initial portion or loop
30 of the subsequent stitch, an undue strain upon the thread has been produced as it passes through the needle-eye and is sharply bent around the same, causing the thread to be badly chafed and oftentimes to be broken.

35 The main object of my invention is to remedy this defect, and this I accomplish by finishing the stitch independently of the needle and before a subsequent stitch is commenced, as will hereinafter appear.

40 Referring to the drawings, Figure 1 represents, in front elevation, a portion of a machine embodying my improvement. Fig. 2 shows a section of Fig. 1 on line *x x*. Fig. 3 represents a section of Fig. 2 on line *y y*. Figs. 4,
45 5, and 6 show a stitch in various stages of formation, and Figs. 7, 8, 9, and 11 represent certain parts of the machine in detail. Fig. 10 shows in side elevation a portion of a machine embodying my improvement.

50 In the drawings only such portions of the

machine are shown as are necessary to an understanding of the improvement.

A is the horn or bed adapted to support the work, and commonly used in bottoming boots and shoes.

55 B is the needle, secured in the needle-bar B', to which vertical reciprocating motions are given by the usual mechanism in such well-known machines.

C is the hook-shuttle, mounted in a holder, 60 C', and arranged to revolve in a horizontal plane at the proper time and pass the thread which it carries through the loop formed in the under or spool thread.

D is the spool which supplies the main or 65 under thread. It is mounted on a standard secured to the base-member A' of the horn. The thread passes from the spool D to a drum-wheel, E, which is loosely mounted to revolve upon a spindle, E', Figs. 1, 2, 3, 7, and 11, ex-
70 cept when it is locked against rotation, as hereinafter described.

Between the spool D and the drum-wheel E is a roller, F, which is mounted on an arm, F', and presses the thread against the wheel 75 by the action of a spring, *f*, as shown in Figs. 1 and 3, and constitutes a spring-clamp to press the thread against the surface of the drum in order to create a considerable extent of frictional contact between the thread and the
80 drum. This spring-clamp F also serves to give a slight tension to the thread, to prevent slipping, and dispenses with the necessity of wrapping the thread one or more times around the drum for that purpose. From the roller F the
85 thread passes nearly around the drum-wheel E, then around a roller, G, which is located considerably above the horizontal diameter of the drum E, and on a vibrating arm, G', which is mounted upon the spindle E', so that when
90 said arm is vibrated, as hereinafter described, the said thread-roller guide G will move in a path concentric with the periphery of the drum E. From said roller G the thread passes through a slotted guide-eye, *g*, overlying the
95 roller G, and concentric therewith, as shown in Figs. 8 and 9, onward around a pulley, *a*, then upward and out through the end of the horn A, as shown in Fig. 1.

To the hub of the arm G' is attached a seg- 100

mental gear, g' , Figs. 1, 2, and 3, which meshes with a segmental rack, h , upon a lever, H , pivoted to the base-member A' of the horn, as shown in Fig. 1. The arm G' , with its roller G , is partially rotated in opposite directions upon the spindle E' by the upward and downward movements of the rack end of the lever H . These movements are imparted to the lever through a vertically-sliding rod, J , pivoted thereto, as shown in Fig. 1, by a lever, K , which is pivoted to a sleeve, k , mounted on the rod J , between a shoulder or nut, j , and a nut, j' . The lever K is actuated by a cam, K' , upon a vertical shaft, K^2 , which shaft is driven by bevel gears from a pulley, K^3 , mounted on the driving-shaft of the machine, as shown in Fig. 10.

Suppose the machine to be in operation and a stitch about to be commenced, the needle will be at its lowest point, as shown in Fig. 4, and the roller G will be in its rearward position—that is, near the roller F , as shown by dotted lines in Fig. 1. By mechanism well-known in this variety of machines the under thread is now partially wound around the needle, so that when the latter rises its hooked end will engage the thread and carry it upward to form the loop through which the shuttle is to pass. When the needle commences to rise, and during the greater portion of its upward movement, the arm G' , with its roller G , is moved toward the horn A by the downward motion of the lever H , and delivers to the needle, as required, the exact amount of thread which is entering into the loop. No thread passes from the spool at this time, as sufficient thread to form the greater portion of the loop is given off by the swinging arm G' and its roller G . To guard against any rotation of the spool by the pull of the needle when it is rising to form this portion of the loop, the wheel E is firmly clamped, to prevent its rotation by a tooth, l , on an arm, L , which arm is pivoted to the base A' . This tooth occupies a groove, e , in the side of the wheel E , Figs. 3, 7, and 11, and is brought into engagement with the outer wall of the groove to clamp the wheel by a spring, L' , Figs. 2, 3, and 11, which constantly acts to raise the outer end of the arm L . The friction of the thread upon the clamped wheel added to the pressure of the roller F upon the thread prevents the rising needle from drawing thread from the spool. At some time during the rise of the needle, however, sufficient thread to form a stitch must be drawn from the spool. As the machine is arranged this is done as the needle approaches its highest point. For this purpose the drum-wheel E is unclamped by the action upon the free end of the arm L of a pin or boss, h' , on the lever H , Figs. 2, 3, and 11. As the lever H descends the boss h' comes in contact with the arm L , depresses its free end, and moves the tooth l out of engagement with the wall of the groove e , leaving the drum-wheel E free to turn; and the needle, during its continued rise, draws from the spool—without embarrass-

ment—an amount of thread equivalent to that which is to enter into the stitch, the said amount of thread entering into and completing the loop. At or about the time the needle reaches its highest point a finger, m , on a vibrating arm, M , which is actuated by a cam or equivalent mechanism, (not shown in the drawings,) is made to separate the legs of the loop, as shown in Fig. 1, as is common in machines of this class. The hooked end of the needle now descends into a perforation in the finger m to clear itself of the thread, as shown in Fig. 5, and the shuttle, now in revolution, enters the loop. The finger m is next withdrawn by a downward and rearward movement, and the shuttle and its thread pass through the loop, leaving the same standing up from the goods. The stitch is now ready to be finished or drawn in. This is accomplished independently of the action of the needle in forming the next stitch by the arm G' , which, as the shuttle clears the loop, is moved rearward by the rising lever H of the second order, and draws the loop down toward the goods, as shown in Fig. 6. At the same time the drum-wheel E is locked fast against rotation, because the rising of the lever H allows the spring L' to cause the tooth l on the arm L to engage the drum-wheel E and clamp it, so that no thread can pass from the spool during the finishing of the stitch. When the arm G' and its roller G reach their rearward position the stitch will be completed—that is, the under and shuttle threads will both be drawn down into the goods by the action of the arm G' on the under or spool thread, making a lock-stitch.

Preferably the lock of the stitch is located at or about a point midway between the upper and under surfaces of the work; but as the work differs in thickness and character it is necessary that means be employed whereby the position of the lock of the threads can be determined at pleasure.

From the foregoing description it will be understood that the position of the lock of the threads is determined by the movement of the arm G' and that this arm derives its motions from the lever K through the rod J and lever H . According, therefore, to the length of time which the sleeve k , pivoted to the lever K , engages the nut j' on the rod J while said lever is in motion, the amount of the rearward movement of the arm G' will be more or less in extent. The lower the nut j' is adjusted on the rod the greater will be the rearward movement of the arm G' and the deeper will the lock of the threads be drawn into the goods, and the higher the adjustment of the nut j' the less will the arm G' move rearward and the nearer the upper surface of the work will the lock of the threads be located. During the drawing in or finishing of the stitch the needle will descend, and when the arm G' reaches its rearward position the work will be fed forward and the operations above described will be repeated to form subsequent stitches.

The slotted guide-eye *g* is, as before stated, concentric with the thread-guide roller *G*. This construction is important for the reason that it enables the thread to be guided without being chafed in all the positions which the roller *G* is obliged to take as the result of the vibration of the arm *G'* when acting in combination with the then stationary drum-wheel *E* to complete the stitch.

To regulate the friction upon the drum *E* at the times when it is intended to revolve in allowing thread to be given off for sewing, a simple friction device, such as is represented in section at Fig. 2, is applied to the hub of the drum.

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

1. The combination, substantially as set forth, of the drum-wheel *E*, around which the main thread passes, and which in the formation of a stitch by the machine is first free to revolve to allow the thread to be given off and afterward locked to prevent its rotation, a vibrating arm, *G'*, mounted on the axle of the drum, carrying a roller or guide for the thread, and a lever, *H*, for causing the said arm to be vibrated rearward over the periphery of the drum-wheel *E* while the latter is locked to prevent its rotation, whereby the under or main thread is pulled backward to fully complete the stitch in the work.

2. The combination, substantially as set forth, of the drum *E*, around which the main

thread passes, a spring locking device, *L*, and the lever *H*, the upward and downward movements of which control said locking device, so that at determined times the drum will be free to revolve to give off the thread and afterward be locked while the thread is being drawn backward to complete the stitch.

3. The combination, substantially as set forth, of the drum *E*, the pressure-roller clamp *F*, and the vibrating arm *G'*, carrying a guide-roller for the thread, whereby the thread, when the drum *E* is locked against rotation, will, by frictional contact with the surface of the drum, be prevented from slipping thereon.

4. The combination, with the drum *E*, of the vibrating arm *G'*, the thread-guide roller *G*, and the slotted guide-eye *g*, concentric with said roller, substantially as and for the purposes specified.

5. The combination, substantially as set forth, of the lever *H*, the vibrating arm *G'*, carrying a thread-guide roller, and suitable adjusting means, as described, for regulating the extent of movement of the lever *H*, and consequently the extent of vibration of the arm *G'*, whereby the position of the lock of the main and shuttle threads in the goods may be determined.

JAMES A. TRUE.

Witnesses:

W. H. THURSTON,
I. KNIGHT.