

No. 687,719.

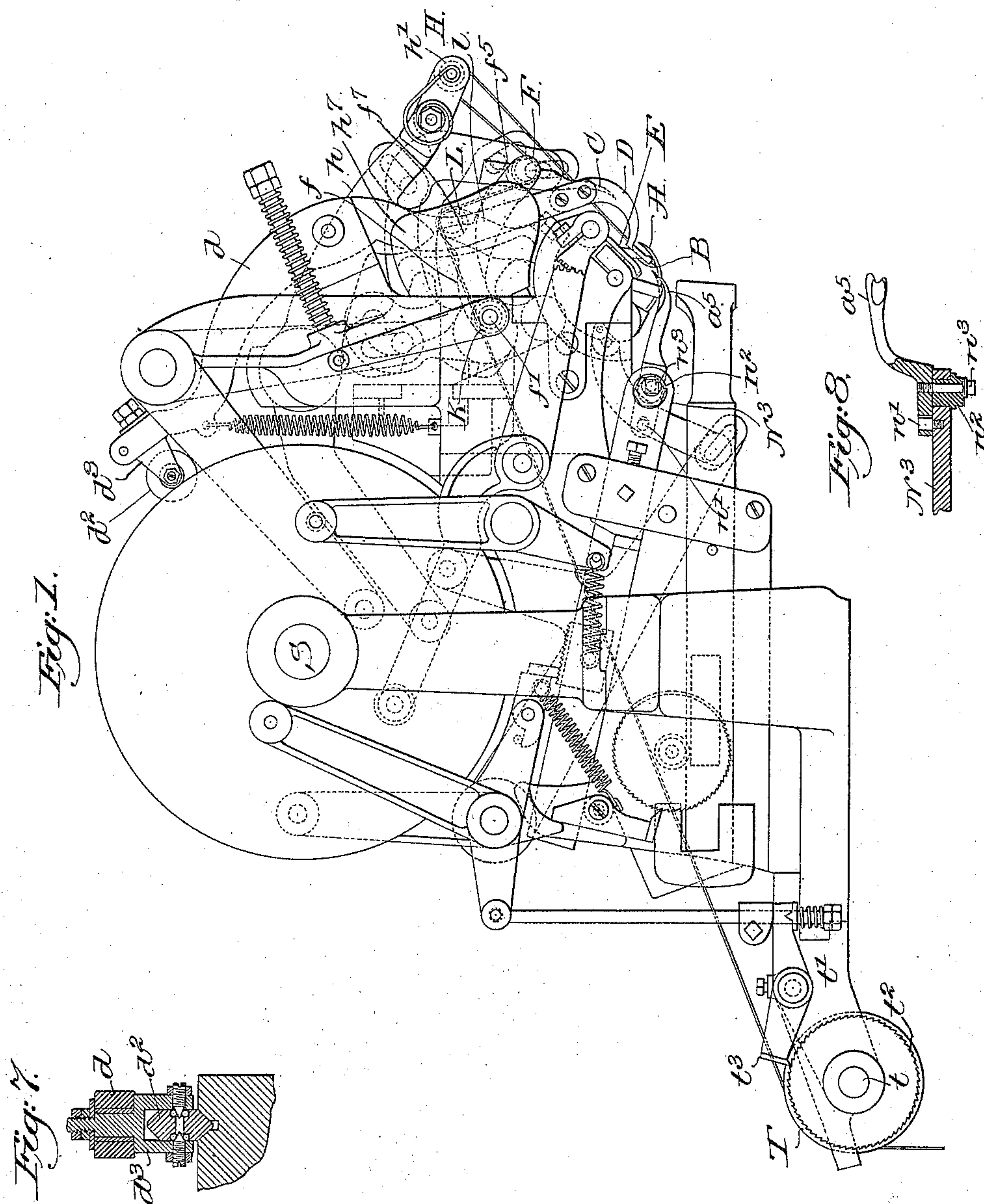
Patented Dec. 3, 1901.

H. BRIGGS.  
SHOE SEWING MACHINE.

(Application filed Aug. 3, 1901.)

(No Model.)

6 Sheets—Sheet 1.



Witnesses:  
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Horace Van Euren

Inventor:  
Harry Briggs  
by his Attorney  
Benjamin Phillips



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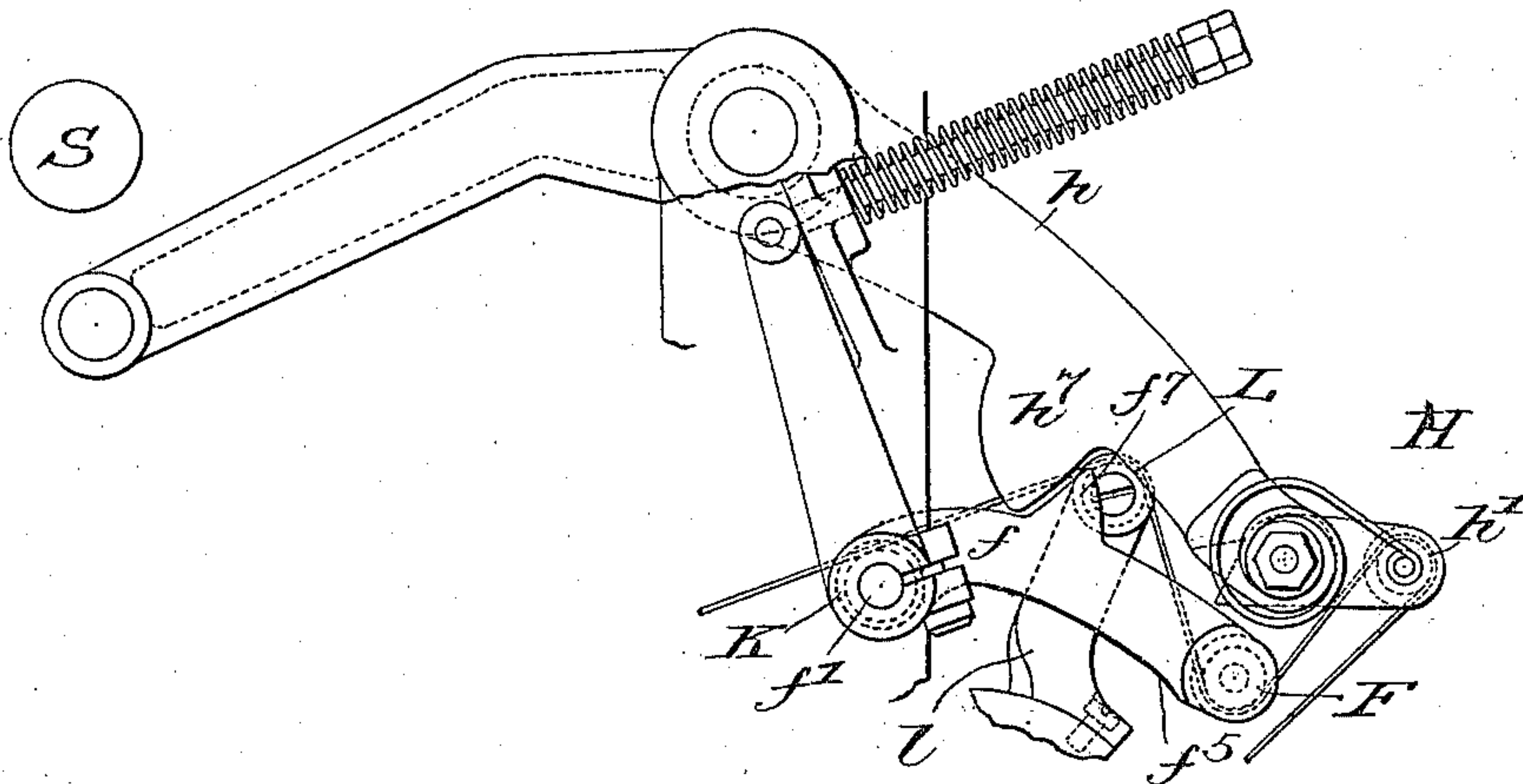
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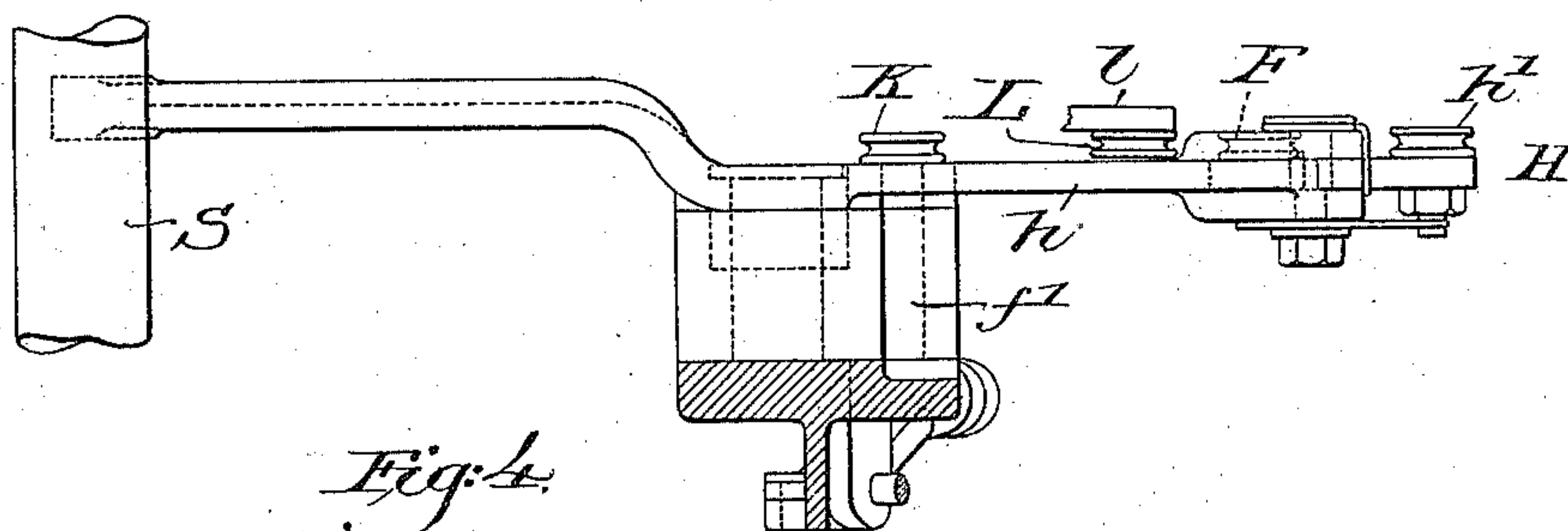
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*Fig. 3.*



*Fig. 4.*



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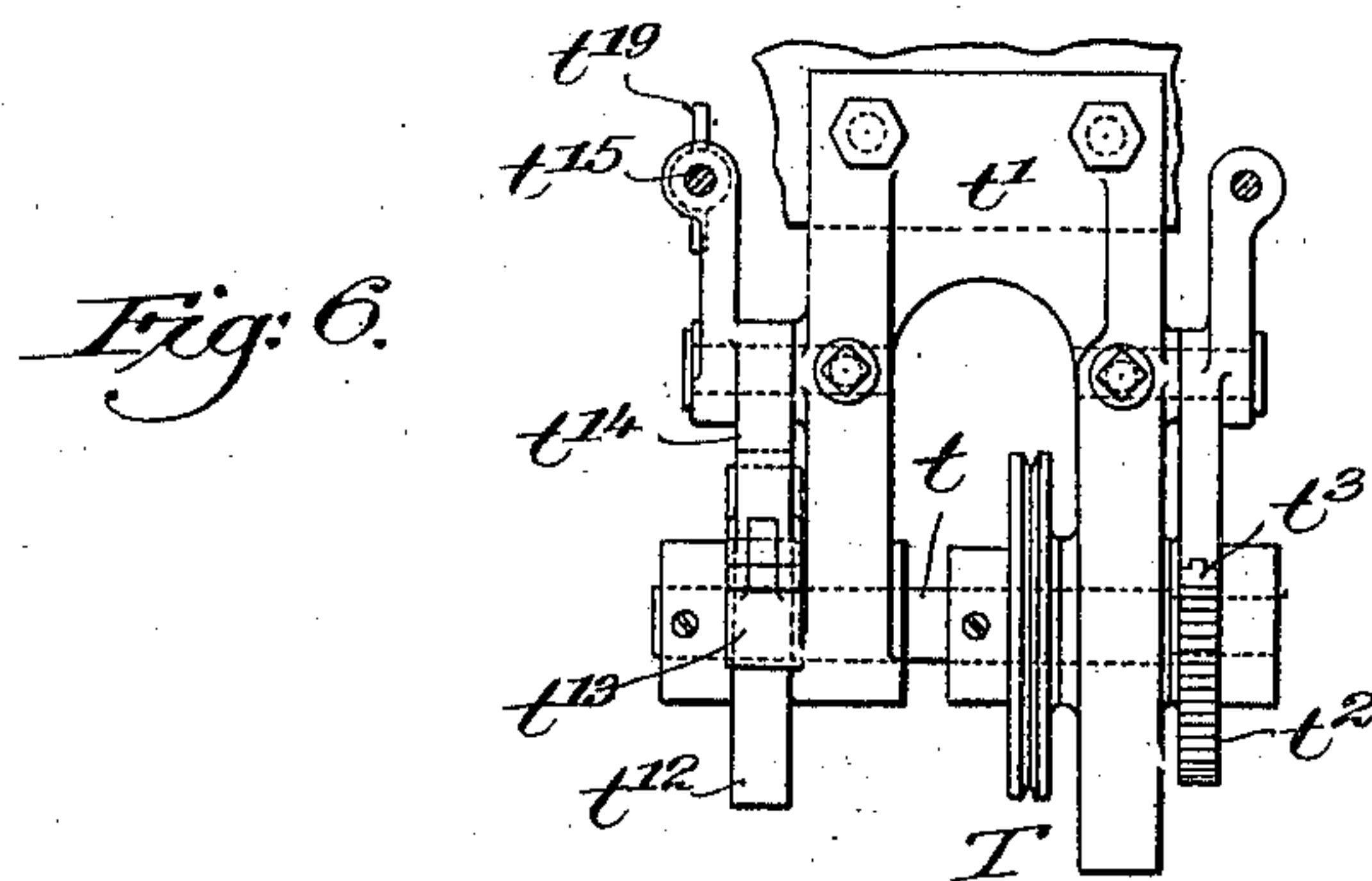
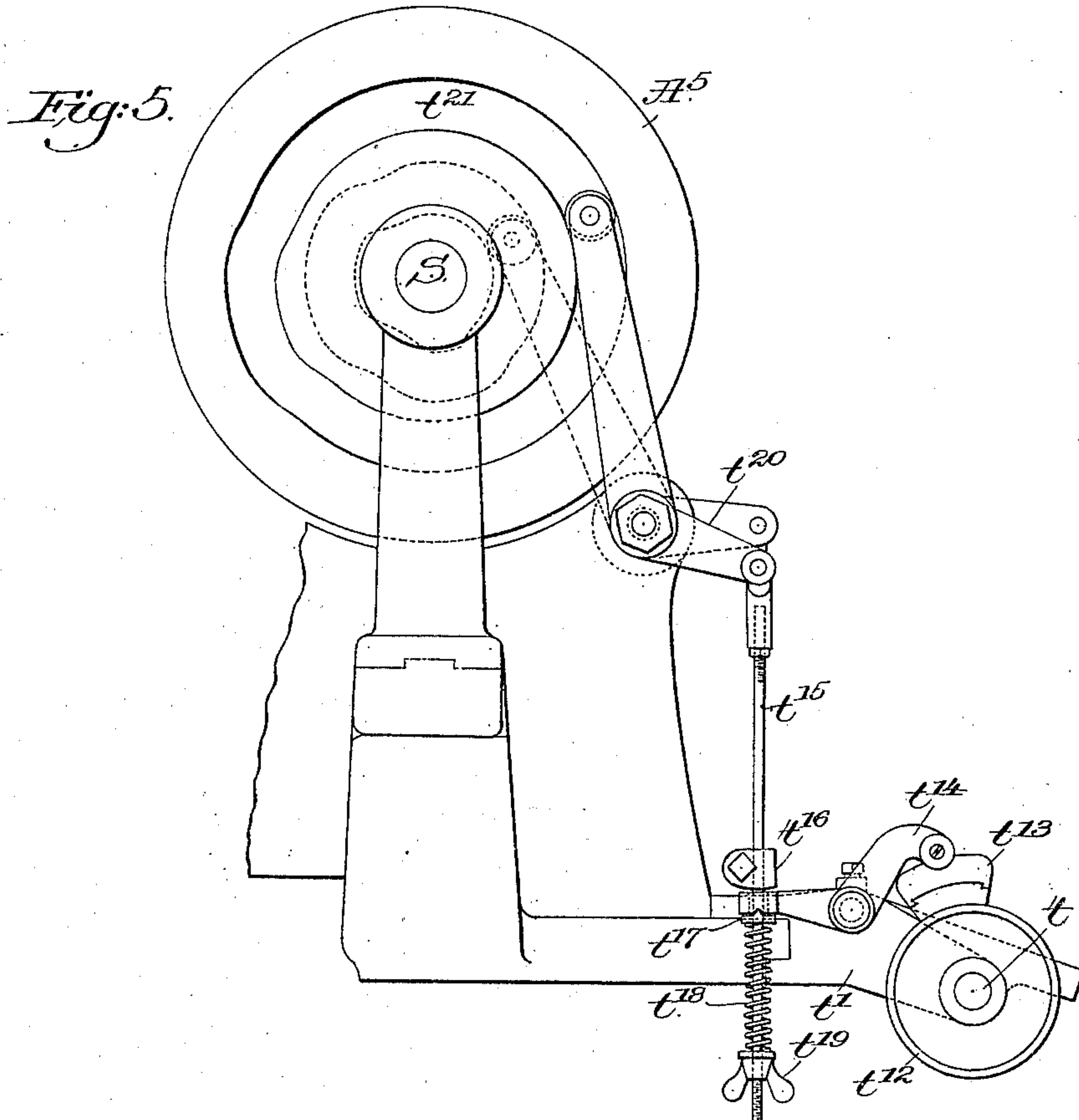
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(No Model.)

6 Sheets—Sheet 4.



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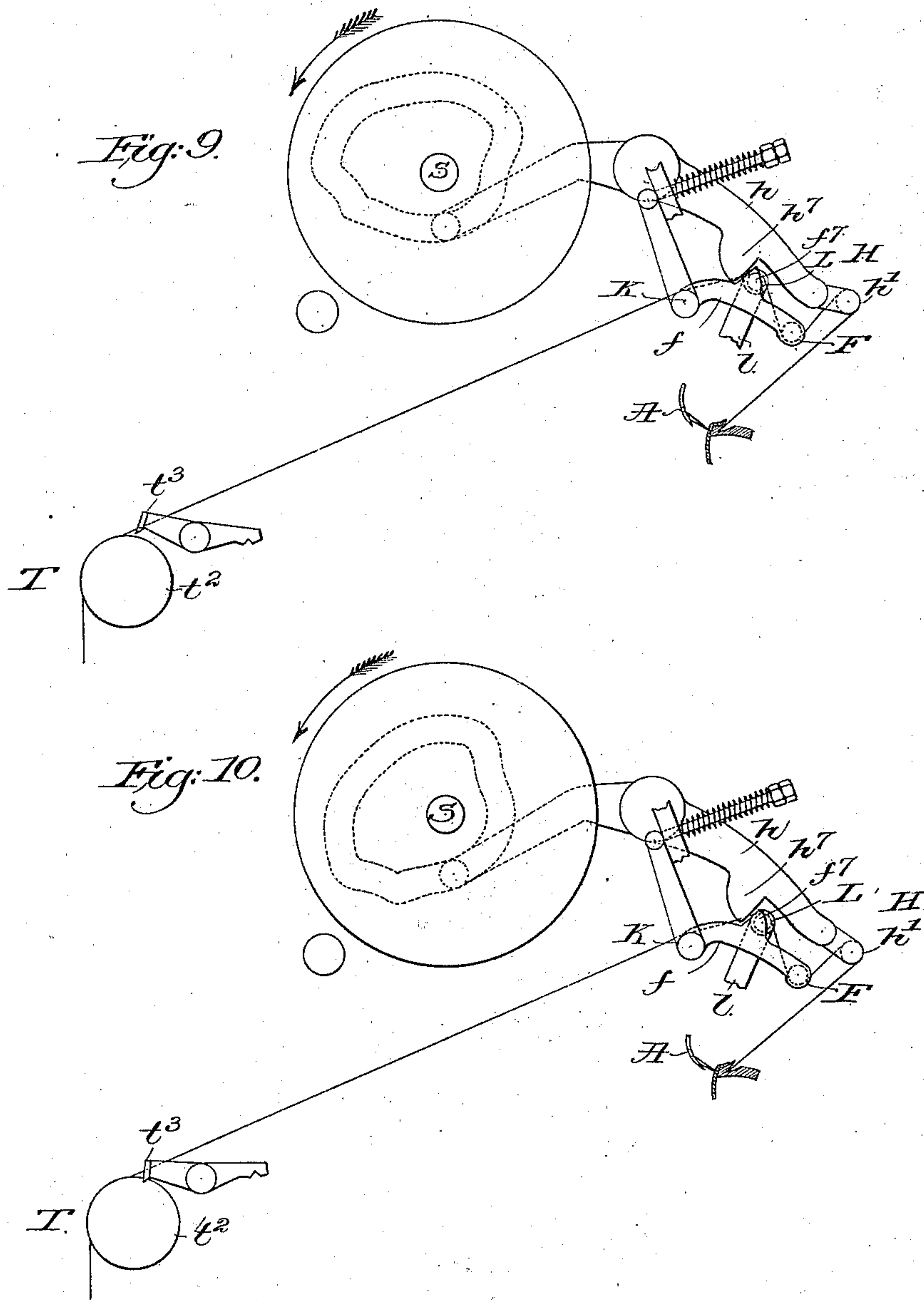
Patented Dec. 3, 1901.

H. BRIGGS.  
SHOE SEWING MACHINE.

(Application filed Aug. 3, 1901.)

(No Model.)

6 Sheets—Sheet 5.



Witnesses:  
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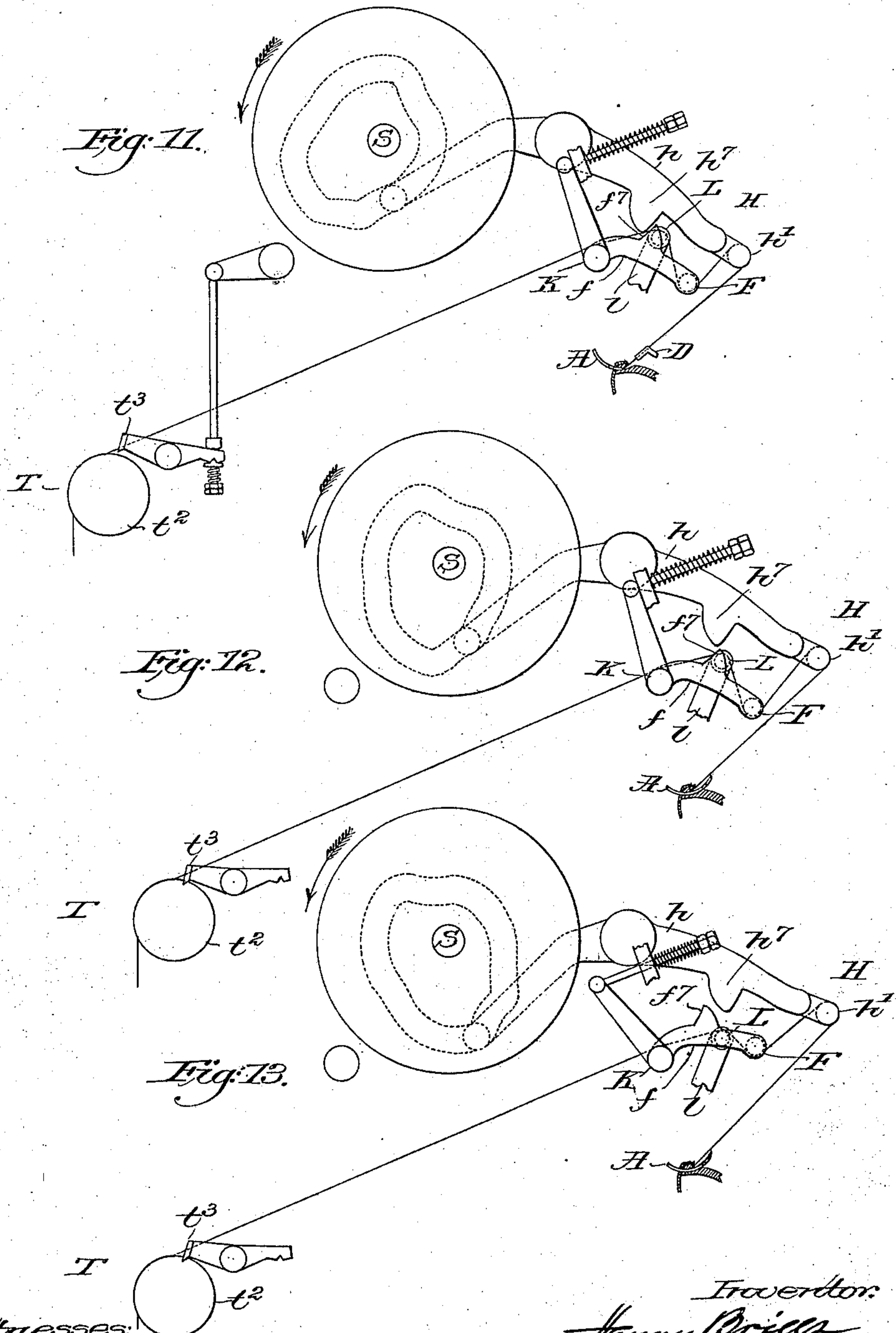
Patented Dec. 3, 1901.

H. BRIGGS.  
SHOE SEWING MACHINE.

(Application filed Aug. 3, 1901.)

(No Model.)

6 Sheets—Sheet 6.



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# UNITED STATES PATENT OFFICE.

HENRY BRIGGS, OF HASBROUCK HEIGHTS, NEW JERSEY, ASSIGNOR TO  
UNITED SHOE MACHINERY COMPANY, OF PATERSON, NEW JERSEY,  
A CORPORATION OF NEW JERSEY.

## SHOE-SEWING MACHINE.

SPECIFICATION forming part of Letters Patent No. 687,719, dated December 3, 1901.

Application filed August 3, 1901. Serial No. 70,798. (No model.)

*To all whom it may concern:*

Be it known that I, HENRY BRIGGS, a citizen of the United States, residing at Hasbrouck Heights, in the county of Bergen and State of New Jersey, have invented certain new and useful Improvements in Shoe-Sewing Machines; 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.

The present invention relates generally to shoe-sewing machines, and more particularly to shoe-sewing machines of the wax-thread chain-stitch type, of which the commercial turn and welt sewing machines are examples.

The present invention consists generally of an improvement upon the thread-handling devices of sewing-machines of this class, and more particularly of improvements upon the sewing-machine described and claimed in my application for Letters Patent filed May 21, 1900, Serial No. 17,368, now Patent No. 684,538. I have found in the operation of the machine of my said application that sometimes during the time the take-up lever was rising to take slack thread from the preceding loop or to pull off thread for the next stitch the strain upon the thread was sufficient to lift the spring-controlled thread-engaging device against the tension of its spring, so that after the tension was locked the further throw of the take-up lever to exert a stitch-setting strain on the thread would cause too great a compression of the spring of the thread-engaging device, with the result that the amount of thread between the tension and the work was insufficient to avoid the bringing of an undue strain upon the thread, rendering it liable to be weakened or broken thereby.

The object of my invention is to obviate the difficulty above suggested; and to that end my present invention consists in providing a chain-stitch shoe-sewing machine having suitable mechanism for forming and setting a stitch, combined with a thread-lock for locking the thread while the stitch is being set and a spring-controlled thread-engaging device against which the stitch is set, with means to prevent the thread-engaging device

from giving up thread during a portion of the operation of the stitch forming and setting mechanism to insure the pulling off of the required amount of thread. Thus, for example, in the preferred embodiment of my invention illustrated in the drawings I always provide sufficient thread between the locked tension and the work so that the take-up motion of the take-up is entirely completed before or at the limit of the yielding movement of the thread-engaging device, whereby I am enabled absolutely to prevent the take-up lever from exerting an undue strain upon the thread by reason of a deficiency in the length thereof between the tension and the work. I have also improved the machine in various other details hereinafter described.

I have illustrated the present invention in connection with the machine described and illustrated in my said application, and the parts of the machine illustrated in the accompanying drawings not specifically described herein are preferably the same as the corresponding parts of the machine illustrated in said application.

The following description of the machine illustrated in the accompanying drawings is therefore limited to a description of the present improvements upon the machine of my said application and of the coöperative relation therewith of such other parts of the machine as may be necessary for a clear understanding of the machine by those skilled in the art.

In the accompanying drawings, Figure 1 is a side elevation, and Fig. 2 is a front elevation, of a turn or welt sewing machine embodying my invention. Fig. 3 is a side elevation, and Fig. 4 is a plan, of the take-up lever and spring-controlled thread-engaging device, enlarged. Fig. 5 is a side elevation of the tension-brake and its actuating mechanism, taken from the right-hand side of the machine as viewed in Fig. 2. Fig. 6 is a plan view of a portion of the same. Figs. 7 and 8 are detail views hereinafter referred to. Figs. 9, 10, 11, 12, and 13 are diagrammatic views in side elevation, showing the thread-lock, take-up, spring-controlled thread-engaging device, and needle in different positions as



sumed during the operation of forming a stitch.

The needle A, the channel-guide B, the awl C, the looper D, and thread-finger E are all constructed, arranged, and operated in the same manner and by substantially the same mechanism, being actuated from the main shaft S by suitable cams and levers, as described in said application.

The tension-wheel T is mounted upon and secured to a shaft  $t$ , supported in bearings in a bracket  $t'$ , attached to the rear of the machine. The shaft  $t$  carries upon one end a ratchet  $t^2$ , which is arranged to be engaged by a pawl  $t^3$ , which is operated by the same mechanism and in the same manner as described in my said application. Upon the other end of the shaft  $t$  is mounted a brake-wheel  $t^{12}$ , against which bears a brake-block  $t^{13}$ , pivotally mounted upon a pivoted lever  $t^{14}$ . The lever  $t^{14}$  is adapted to be actuated by a rod  $t^{15}$ , which passes through a hole in one end of the lever  $t^{14}$  and is provided with a split collar  $t^{16}$ , which engages the upper side of the end of the lever  $t^{14}$ , and with a collar  $t^{17}$  and a spring  $t^{18}$ , which press against the under side of said lever  $t^{14}$ . A thumb-screw  $t^{19}$  is provided on the lower end of the rod  $t^{15}$ , by means of which the pressure of the spring on the lever  $t^{14}$  may be regulated. The upper end of the rod  $t^{15}$  is pivoted to a lever  $t^{20}$ , fulcrumed upon a stationary part of the machine and actuated by a cam-path in one of the cams, as by cam-path  $t^{21}$  in the cam A<sup>5</sup> upon the main shaft S. The above-described arrangement is such that brake-block  $t^{13}$  is positively lifted off of the brake-wheel  $t^{12}$  at the time the needle is back, after the awl has made its positioning movement and has engaged the material preparatory to its feeding movement, and while the back-rest and back-gage are unlocked, so that the work may be freely removed from the machine at this time without exerting a strain on the thread greater than that necessary to draw it through the dry-thread tension and the strippers of the wax-pot. In this connection it is to be noted that the brake-block  $t^{13}$  is positively lifted off of the brake-wheel  $t^{12}$  by the engagement of the collar  $t^{16}$  with the lever  $t^{14}$  and that said brake-block is yieldingly pressed against said brake-wheel by the spring  $t^{18}$  with a pressure dependent upon the adjustment of the thumb-screw  $t^{19}$ . It is also to be noted in this connection that this tension-brake should preferably exert enough resistance to the rotation of the tension-wheel to prevent it from overrunning after the completion of the pull-off motion of the take-up. This feature is not essential to my present invention, although it is a useful adjunct of the machine, and is described herein merely as being a part of the machine in which my invention is preferably embodied.

The looper D and its actuating mechanism are substantially the same as in the machine of my said application, except that the truck  $d^2$ , mounted in the fork  $d^3$  upon the end of

the looper-lever  $d$ , is supported upon ball-bearings which prevent the truck  $d^2$  from cramping in the fork  $d^3$  during the lateral or oscillatory movements of the looper-lever. (See Fig. 7.) This feature is not essential to my present invention and is described herein merely as being a part of the machine in which my invention is preferably embodied.

The back-gage  $a^5$  (or in case of a welt-sewing machine the welt-guide) is adjustably mounted upon the forward end of the back-gage slide N<sup>3</sup>. To this end the shank of the back-gage  $a^5$  is provided with a hole which fits over the stud  $n'$ , screwed into the slide N<sup>3</sup>, said hole being of a width equal to the diameter of the stud  $n'$ , but slightly elongated to allow for a slight come and go of the guide during adjustment, as hereinafter described. In the end of the slide N<sup>3</sup> is rotatably mounted the shouldered bushing  $n^2$ , provided with an eccentric hole to receive the cap-bolt  $n^3$ , which screws into a hole in the shank of the back-gage  $a^5$ . The above-described arrangement is such that by loosening the bolt  $n^3$  the bushing  $n^2$  can be turned, so as to raise or lower the work-engaging end of the back-gage, whereby the position of the inseam may be varied in the work. (See Fig. 8.) This feature is not essential to my present invention and is described herein merely as being a part of the machine in which my invention is preferably embodied.

The thread-engaging device of the machine of the drawings is the same as the thread-engaging device of the machine described in said application, except that the arm  $f^5$  of the lever  $f$ , which carries the thread-truck F, is provided with a lug or projection  $f^7$ , which coöperates with means hereinafter described to hold the thread-truck F stationary during the slack-taking and pulling-off operations of the take-up.

The take-up, (indicated in a general way by the reference-letter H,) the take-up lever  $h$ , the cam which operates said take-up lever, and the auxiliary take-up are all constructed and arranged as described in my said application, except that the take-up lever is provided with a lug or projection  $h^7$ , which is arranged to coöperate with the lug or projection  $f^7$  on the arm  $f^5$  of the lever  $f$  of the thread-engaging device. The contacting surfaces of the lugs  $f^7$  and  $h^7$  are such that the take-up lever  $h$  may rise through the first portion of its upward stroke, holding the lever  $f$ , and consequently the truck F, stationary. The contacting surface of the lug  $h^7$  I prefer to make on the arc of a circle the center of which is the center of the fulcrum of the take-up lever  $h$ . The contacting surface of the lug  $f^7$  I prefer to make on the arc of a circle of which the radius is the same as the radius of the contacting surface of the lug  $h^7$ , so that when the parts are in the positions shown in Fig. 3 the contacting surfaces will fit each other, and thus during the first portion of the upward stroke of the take-



up lever its contacting surface will slide freely upon the contacting surface of the lug  $f^7$ , holding said lever stationary until the lug  $h^7$  has risen far enough to cease to engage the lug  $f^7$ .

The lead of the thread in the machine of the drawings is around the disk T, over the truck K, (which is mounted on the end of the stud  $f^1$  which forms the fulcrum of the lever  $f$ ), thence over the truck L, (which is mounted on the bracket  $l$ , secured conveniently on the needle-carrier guide,) thence down around the thread-truck F of the thread-engaging device, up over the thread-truck  $h'$  of the take-up H, and through the looper to the work. It is to be noted that the stationary thread-truck L enables the thread-truck F to form a bight of thread between it and the truck  $h'$  of the take-up. This construction is not essential to my invention, but is preferred because it conduces to certainty in the operation of the machine by making the strains exerted on the thread by the thread-engaging device independent of the positions of the truck F.

The operation of the machine of the drawings is as follows: Referring particularly to Figs. 9, 10, 11, 12, and 13 of the drawings and to the description of the operation of the machine of my said application contained in the specification thereof, the said description describes the operation of the machine of the present application, except as the operation is modified by the locking of the thread-engaging device to prevent said device from giving up thread to the stitch forming and setting mechanism during its slack-taking or pulling-off operations. In the following description I have therefore briefly described the operation of the machine of the present application, referring with particularity only to the modifications of the operations of the parts as set forth in said application, to which reference may be had for fuller information. Assuming the several parts to be in the position shown in Fig. 9, with the needle A in its retracted position, the pawl  $t^3$  raised, the tension T unlocked, and the take-up H in its lowest position, the operation is as follows: First, the tension T is locked by dropping the pawl  $t^3$  into engagement with the ratchet  $t^2$ , (see Fig. 10,) the needle A starts forward, and then the take-up H begins its upward movement, taking slack from the loop as it rises. The tension T and the thread-engaging device F both being locked the take-up H is absolutely compelled to take all of the thread which its movement demands from the loop. Second, the tension is now unlocked, (see Fig. 11,) and the needle having advanced so that it has entered the material the further upward movement of the take-up pulls off thread from the tension. During this pull-off movement of the take-up the projections  $h^7$  and  $f^7$  remain locked, and therefore the take-up is prevented from stealing thread from the thread-engaging device and

the take-up is compelled to get all of the thread which its motion demands either from the loop or from the tension, and in the usual operation of the machine such thread will be pulled off from the tension, because all the slack thread will have previously been taken from the loop. During this time the needle moves forward through the material into position to be looped by the thread. Third, the tension is now locked (see Fig. 12) and the projections  $h^7$  and  $f^7$  are disengaged, leaving the thread-engaging device free to exert a yielding and gradually-increasing resistance to the pull of the thread, and the further upward movement of the take-up takes place, during which movement the parts move from the positions indicated in Fig. 12 to the positions indicated in Fig. 13, the tension remaining locked, the thread being pulled upon by the take-up against the thread-engaging device to bring it into the position which it finally occupies in the finished seam. Fourth, the take-up drops, the thread-engaging device falls, the tension is unlocked, and the needle is looped by the thread and retracted, the parts moving from the positions indicated in Fig. 13 to the positions indicated in Fig. 9.

The cams for actuating the several working parts of the machine of the drawings are not herein specifically described, because from the foregoing description of the construction, organization, and mode of operation of the machine any person of average skill in the art could readily develop the same without the exercise of invention or of greater skill than is possessed by an average skilled mechanic.

While I have described the preferred form of my invention as embodied in a machine like that of my said application, I do not consider my invention as limited to such embodiment, since, as appears from the foregoing description, my invention can be readily embodied by those skilled in the art in other forms and in connection with different forms of sewing mechanism.

Having thus described my invention, I claim as new and desire to secure by Letters Patent of the United States—

1. A chain-stitch shoe-sewing machine, having, in combination, mechanism for forming and setting a stitch, an intermittent thread-lock for locking the thread while the stitch is being set, a spring-controlled thread-engaging device against which the stitch is set, and means to prevent the thread-engaging device from giving up thread during a portion of the operation of the stitch forming and setting mechanism to insure the pulling off of the required amount of thread, substantially as described.

2. A chain-stitch shoe-sewing machine, having, in combination, a needle, a looper, a stitch-setting take-up, a thread-lock for locking the thread while the stitch is being set, a spring-controlled thread-engaging device against which the stitch is set, and means for



locking the thread-engaging device during a portion of the thread-drawing stroke of the take-up, substantially as described.

3. A chain-stitch shoe-sewing machine, having, in combination, a needle, a looper, a stitch-setting take-up, a thread-lock for locking the thread while the stitch is being set, and a spring-controlled thread-engaging device against which the stitch is set, said thread-engaging device and take-up having coöperating lugs or projections constructed

to hold said thread-engaging device stationary during the first portion of the upward stroke of the take-up, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

HENRY BRIGGS.

Witnesses:

HORACE VAN EVEREN,  
ALFRED H. HILDRETH.