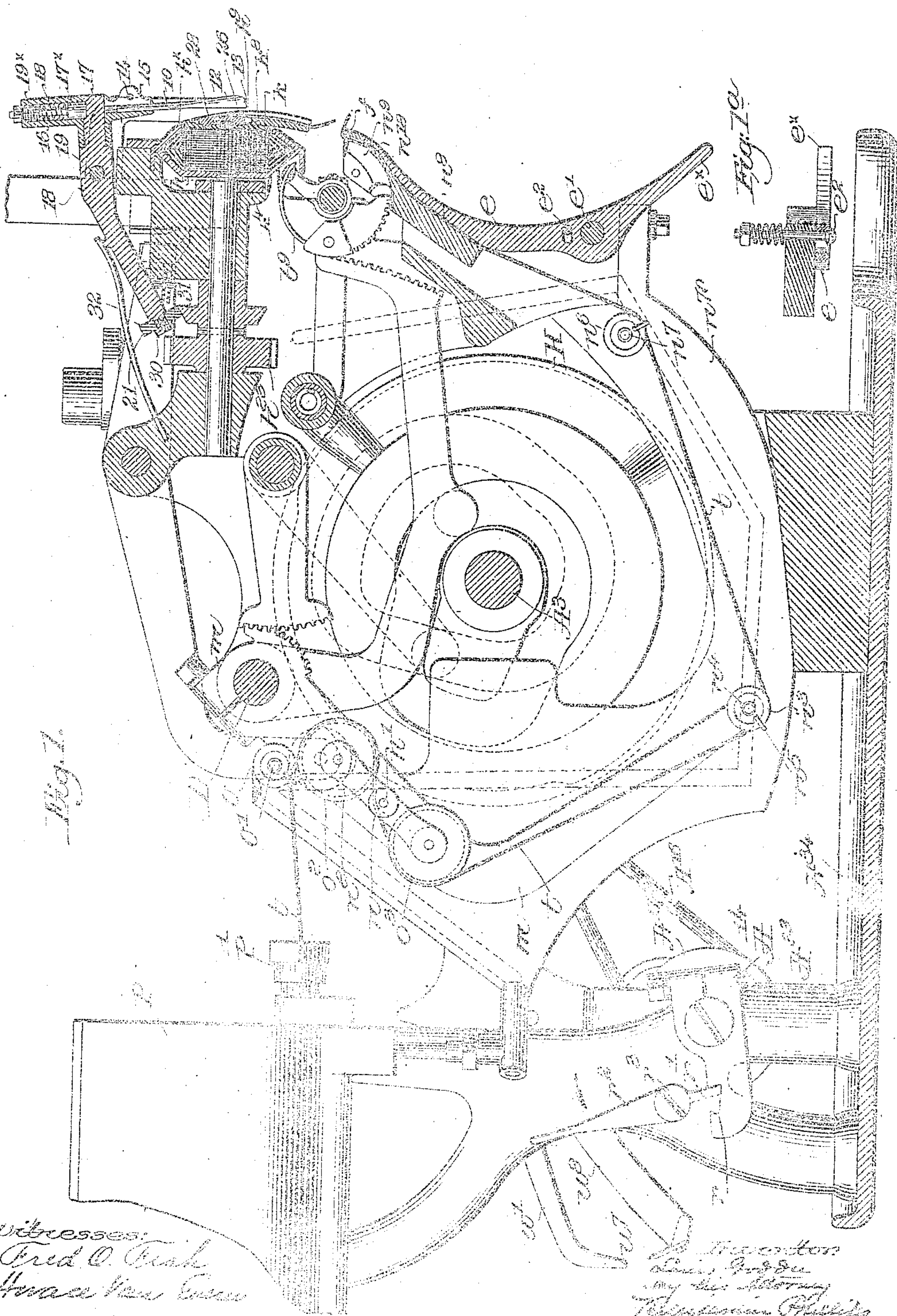


940,637.

L. GODDU.
SOLE SEWING MACHINE.
APPLICATION FILED AUG. 31, 1900.

Patented Nov. 16, 1909.
4 SHEETS—SHEET 1.



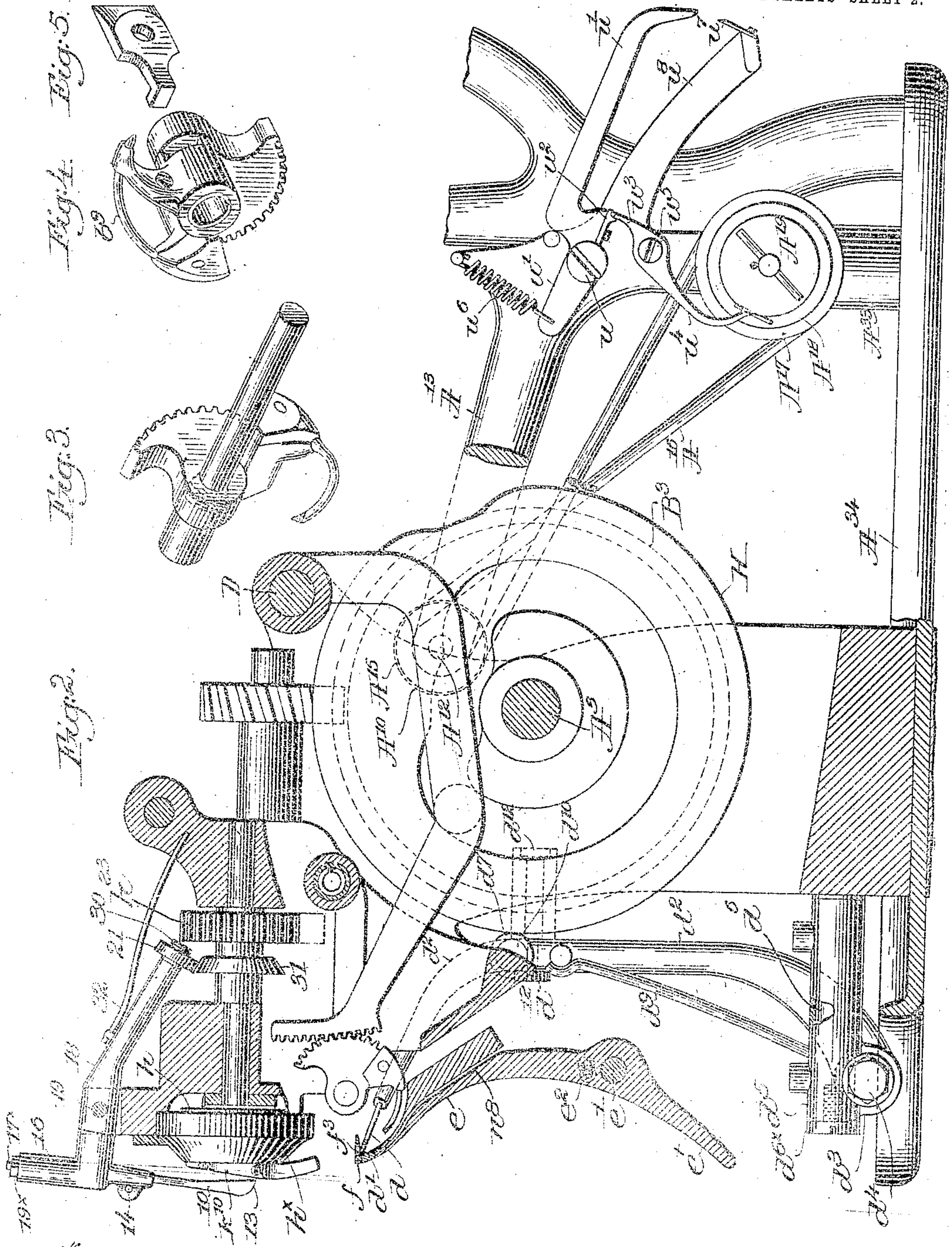
Witnesses:
Fred C. Fish
Amos Van Eusen

Inventor:
L. Goddu
By his Attorney
Theodore P. Phillips

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4 SHEETS—SHEET 2.



Witnesses:
Fred C. Fish
Hiram Van Eusen

Inventor
L. Goddu
by his Attorney
Benjamin Phillips

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4 SHEETS—SHEET 3.

Fig. 6.

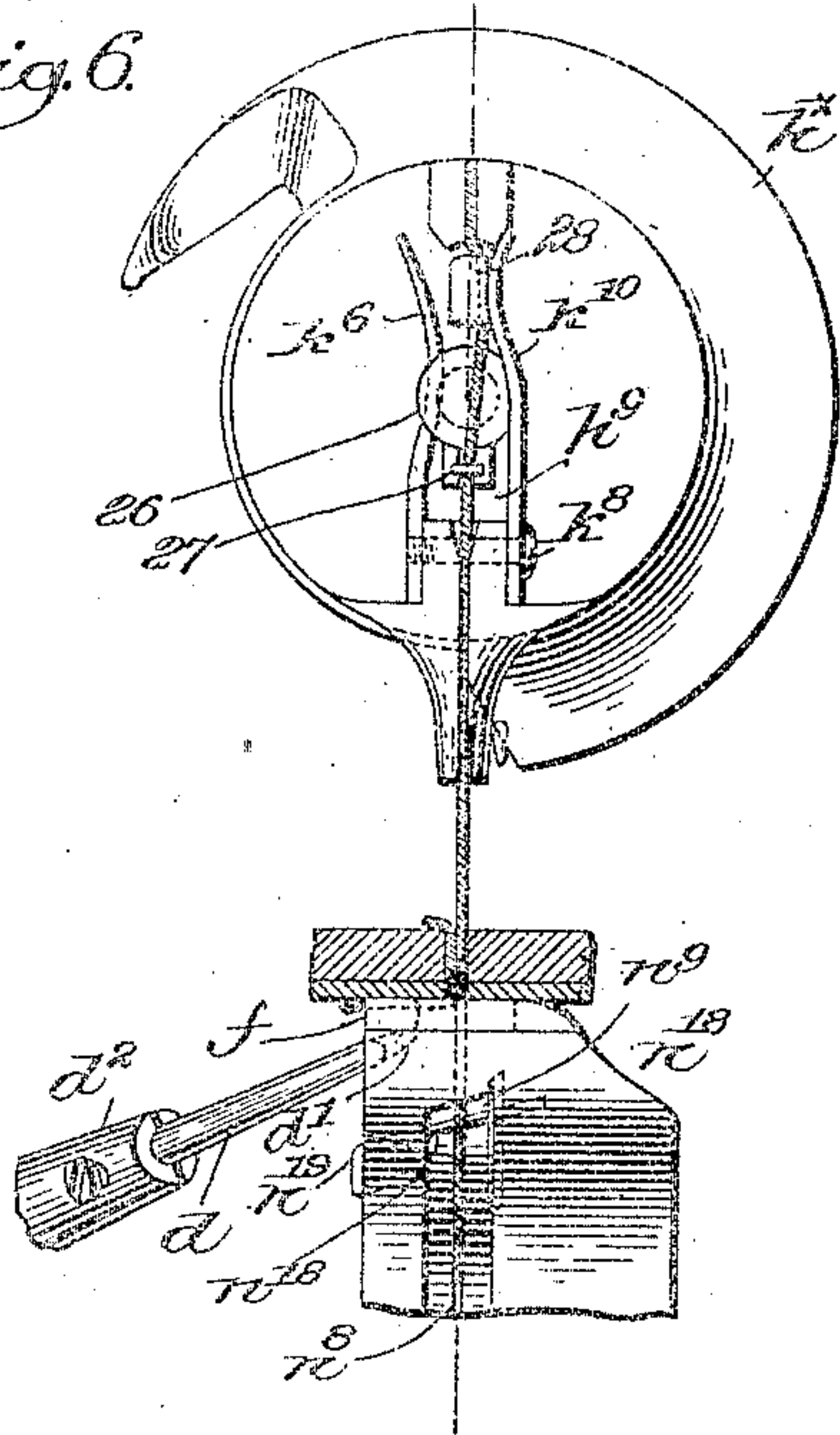


Fig. 7.

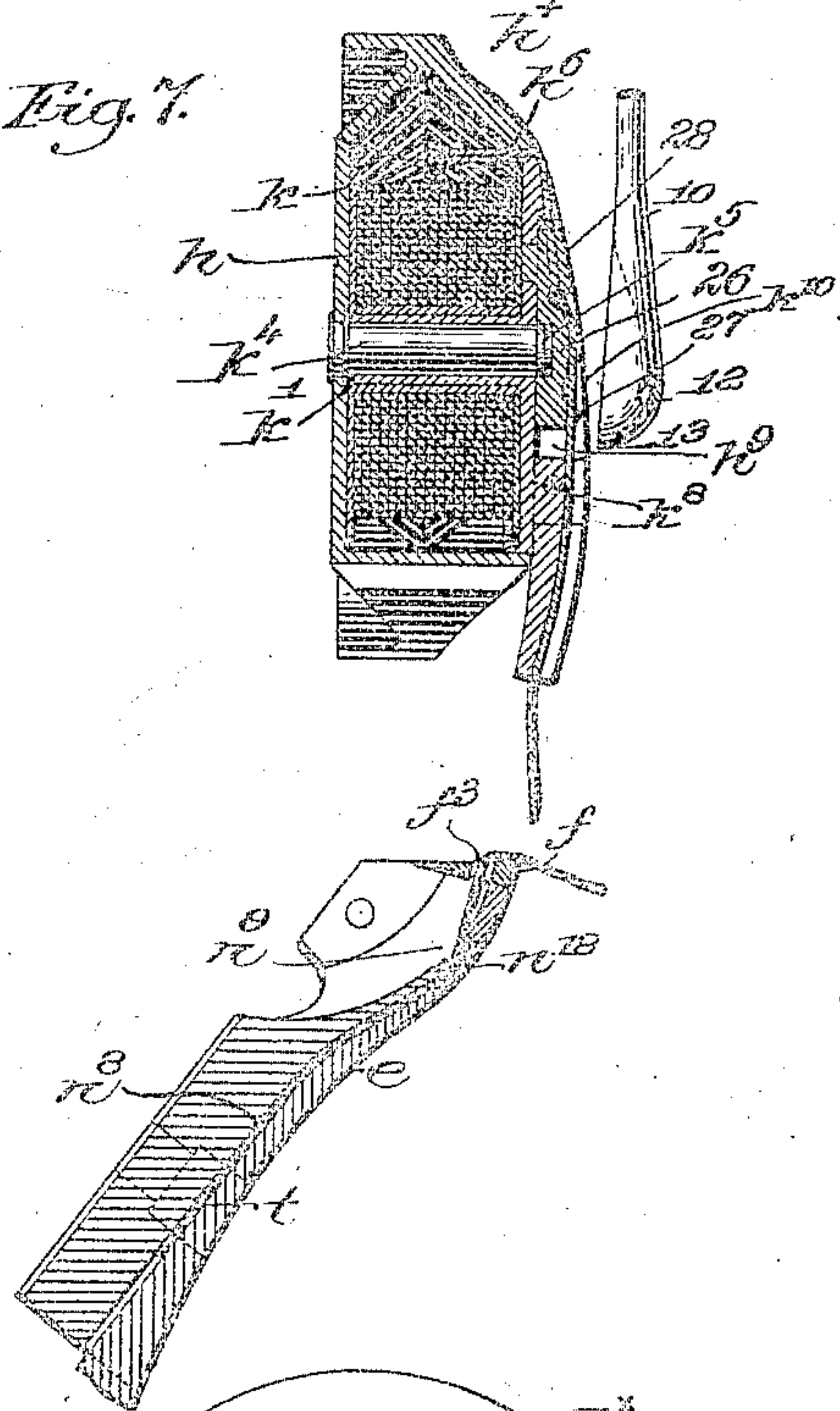


Fig. 8.

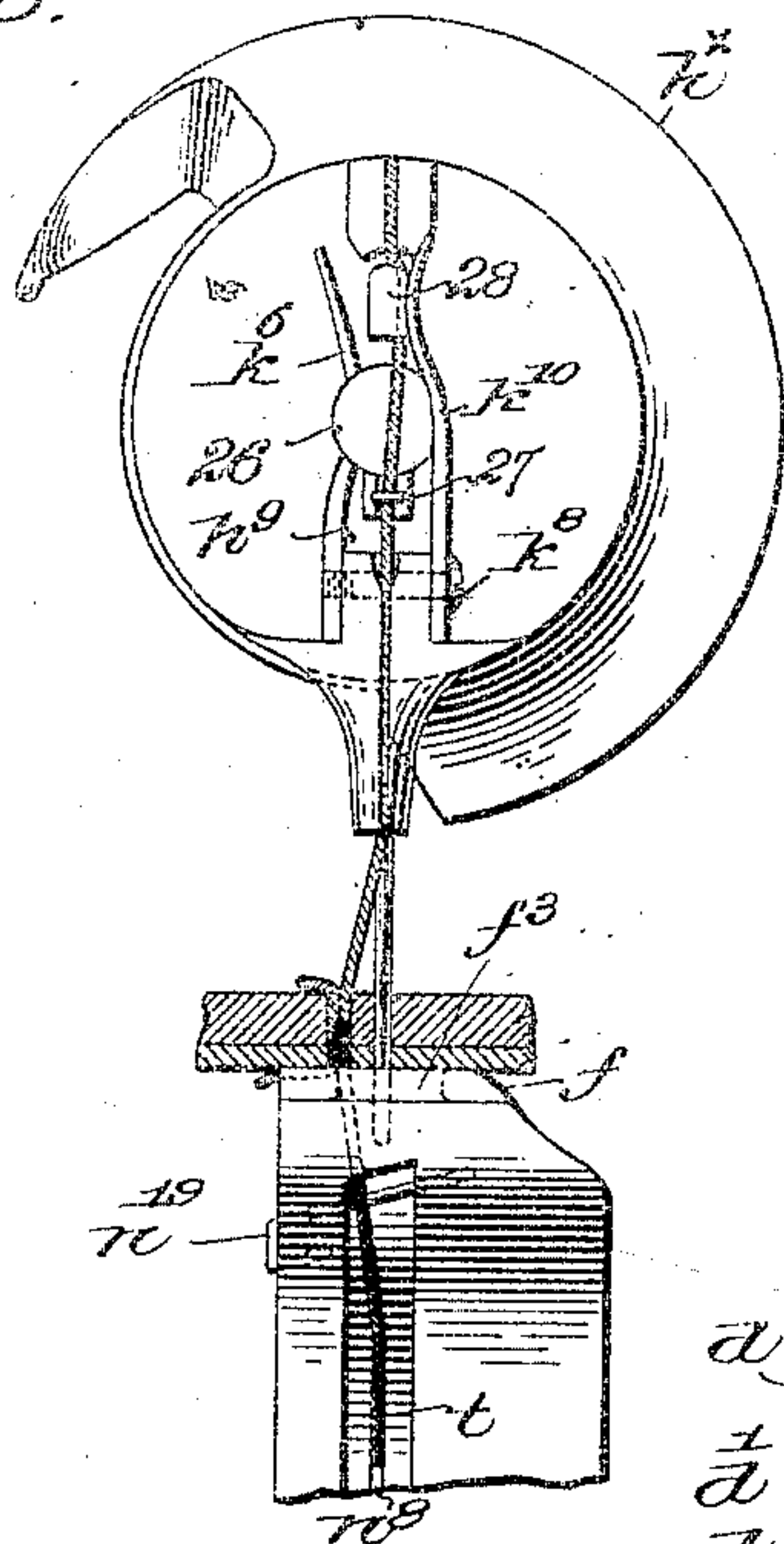


Fig. 9.

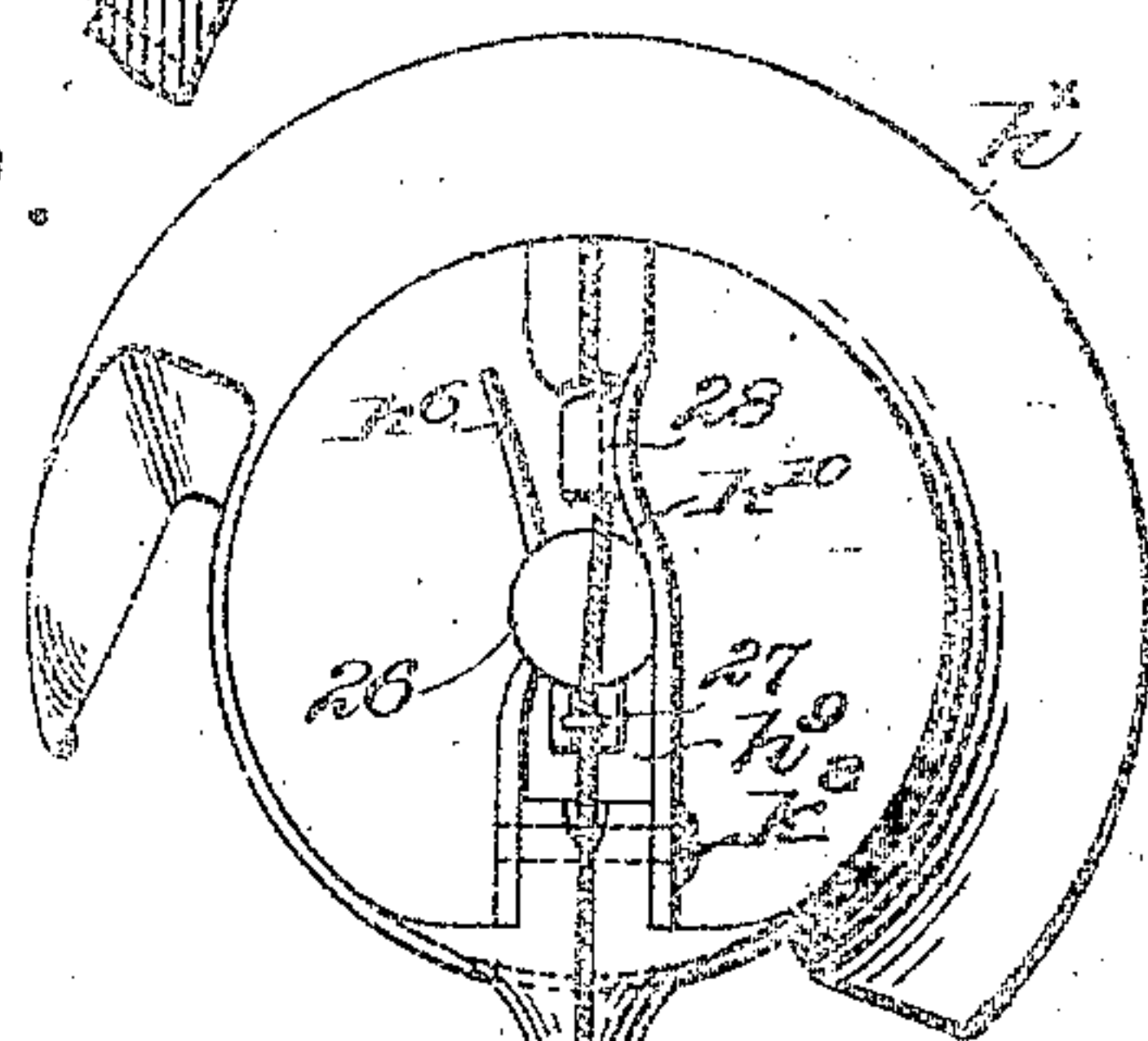
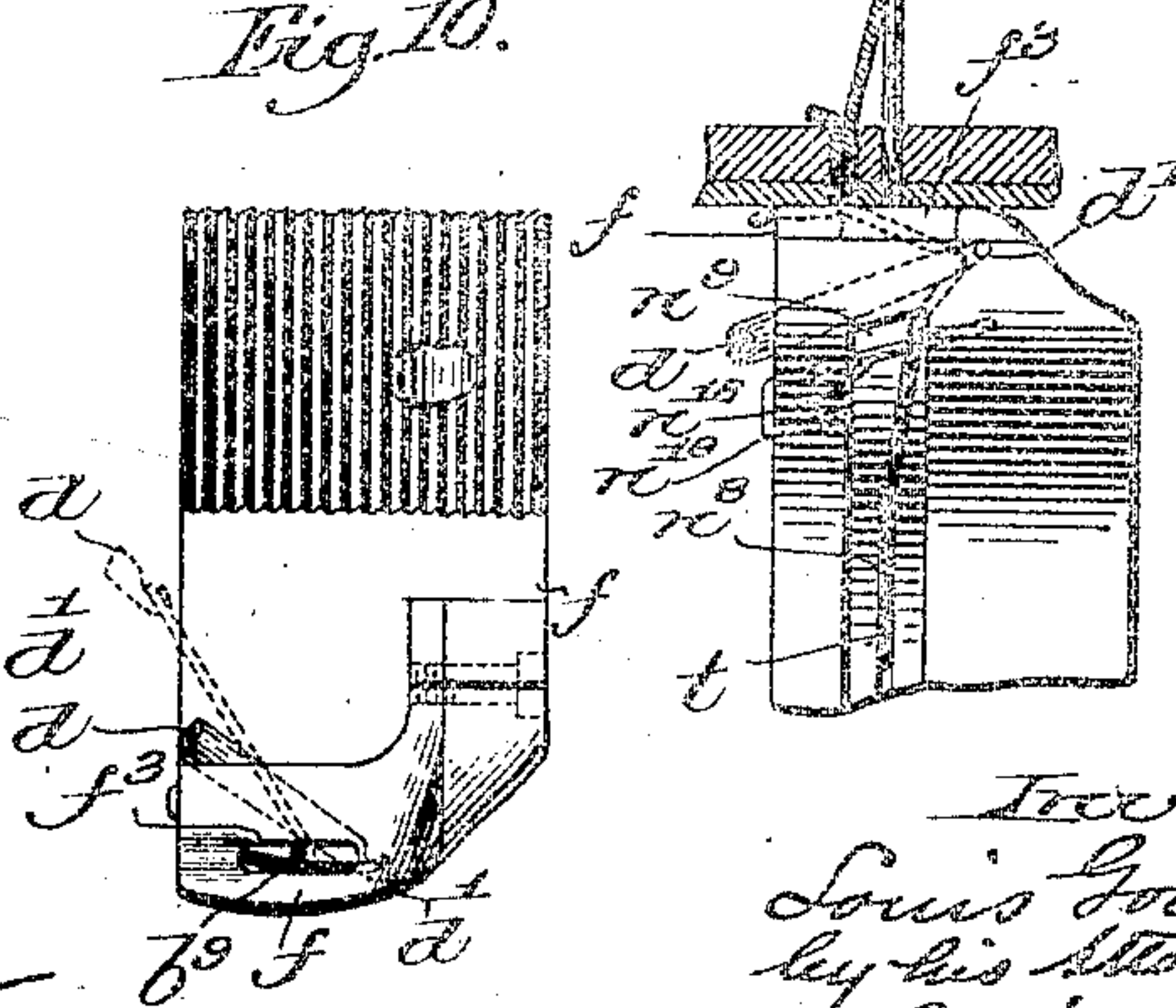


Fig. 10.



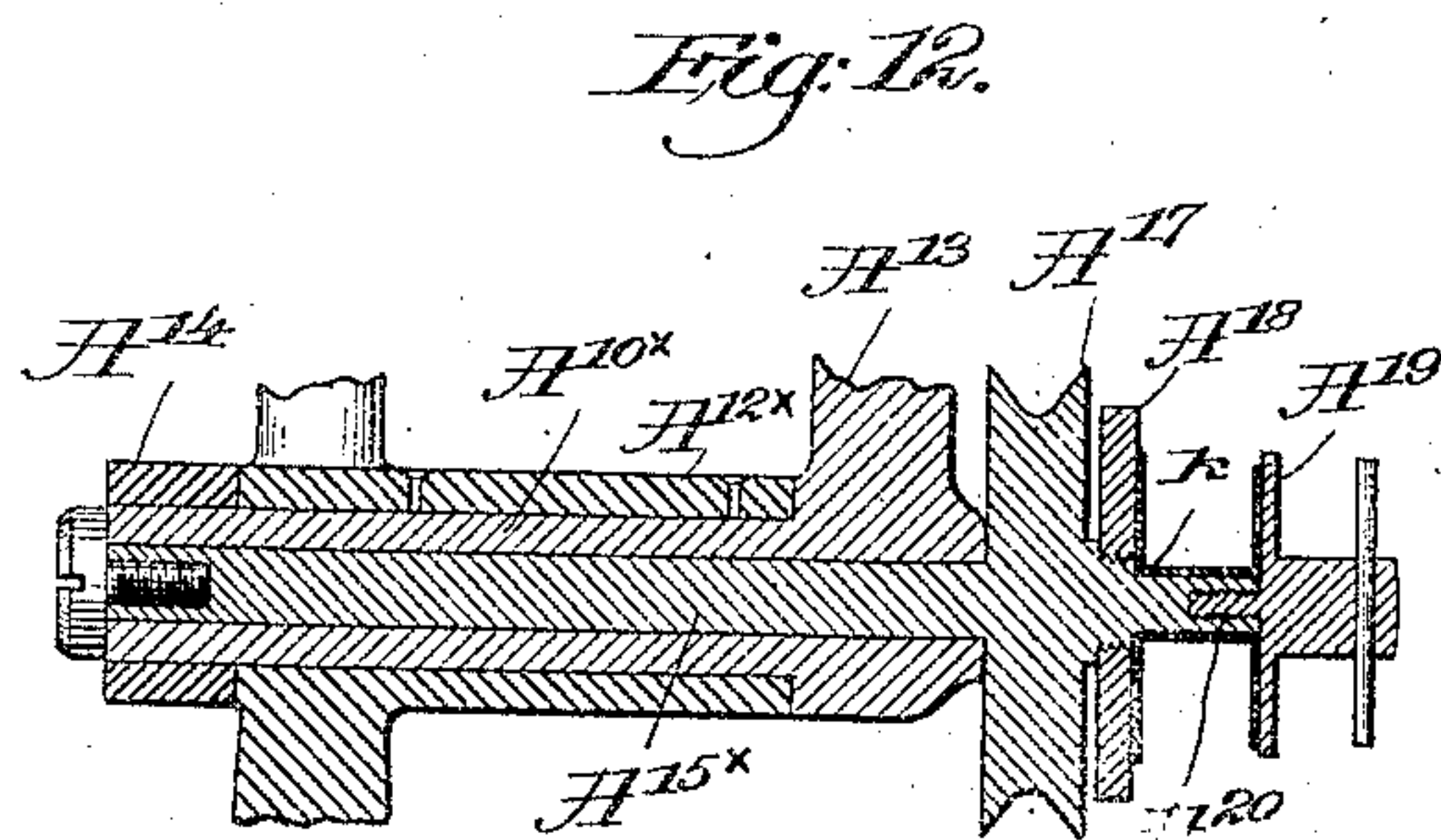
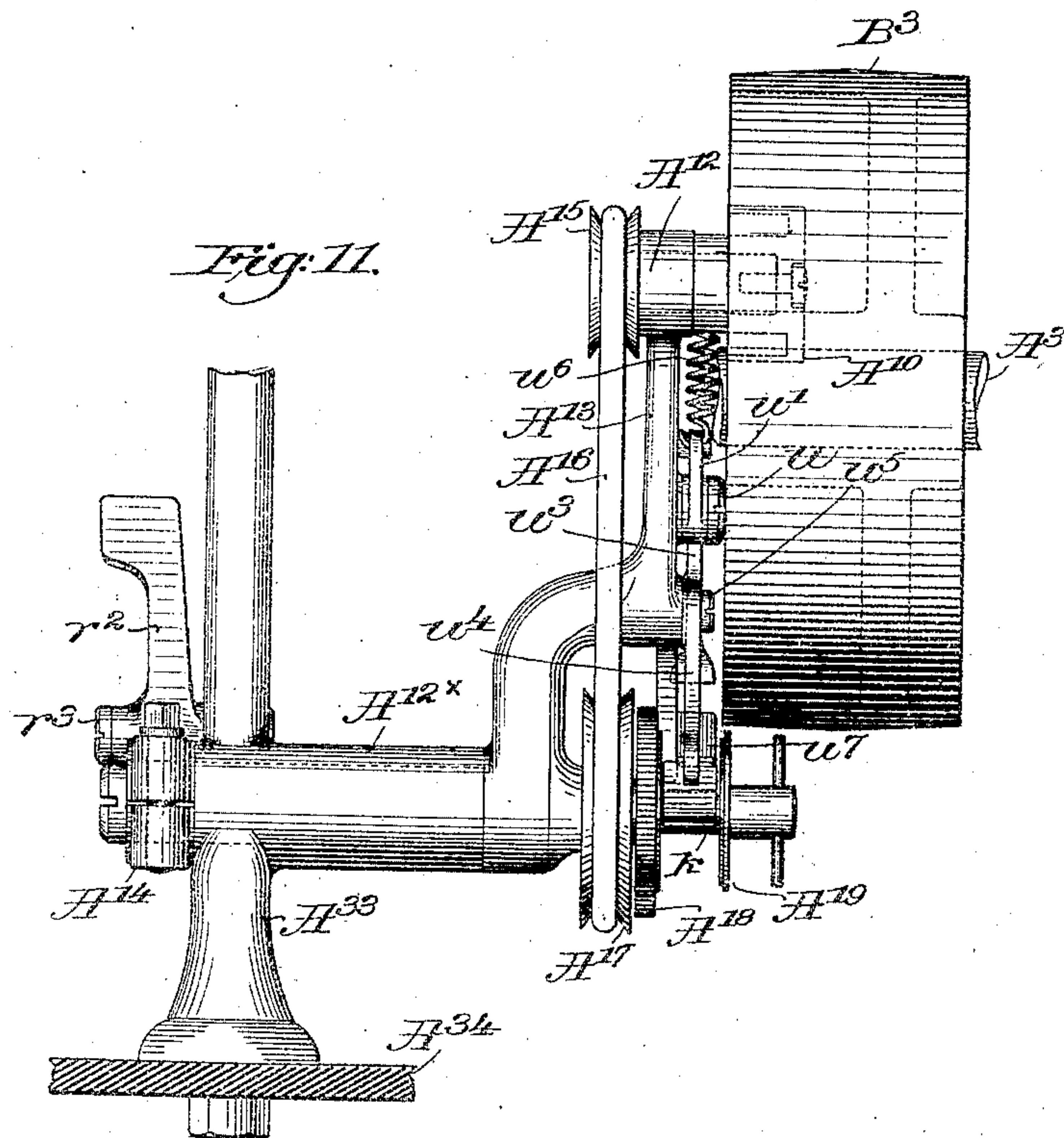
Witnesses:
Fred O. Fish
Hvacu Van Euren

Inventor:
Louis Goddu
by his attorney
Benjamin Phillips

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L. GODDU.
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APPLICATION FILED AUG. 31, 1900.

Patented Nov. 16, 1909.
4 SHEETS—SHEET 4.



Witnesses:
John F. Le. Prinslock
Horace Van Euren

Inventor:
Louis Goddu
by his Attorney,
Benjamin Phillips

UNITED STATES PATENT OFFICE.

LOUIS GODDU, OF WINCHESTER, MASSACHUSETTS, ASSIGNOR TO GODDU SEWING MACHINE CO., OF PORTLAND, MAINE, A CORPORATION OF MAINE.

SOLE-SEWING MACHINE.

940,637.

Specification of Letters Patent.

Patented Nov. 16, 1909.

Application filed August 31, 1900. Serial No. 28,624.

To all whom it may concern:

Be it known that I, LOUIS GODDU, a citizen of the United States, residing at Winchester, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Sole-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 to sole sewing machines of the lock stitch type and has for its object to improve the construction and arrangement of certain parts of such a machine whereby the parts are better adapted to cooperate with each other to perform their inter-related functions, and the machine as a whole is improved as to construction and mode of operation.

More particularly my invention has for its object to improve the construction and arrangement of those parts of a shoe sewing machine which constitute the stitch forming mechanism, and those devices which cooperate with the stitch forming mechanism in producing the seam.

With this object in view my invention consists in the devices and combinations of devices hereinafter described and claimed.

In the accompanying drawings, I have shown my invention as applied to the machine disclosed in my United States Patent, No. 581,817, dated May 4, 1897, but it is to be understood that my invention is not limited to such application but may be applied to other shoe sewing machines without departing from the spirit thereof.

Referring to the drawings, Figure 1 is a sectional view of the machine described in the patent above referred to, modified according to my present invention, the view corresponding to Fig. 3 of the said patent, Fig. 1^a is a detail view of a locking device to be referred to, Fig. 2 is a sectional view on the same plane as Fig. 1, but looking in the opposite direction, Fig. 3 shows the awl segment, the awl, and the rock-shaft to which it is fixed, detached; Fig. 4 shows the needle segment, the needle, and needle-guide, detached, Fig. 5 shows the stop for the needle guide; Figs. 6, 7, 8 and 9 show details of the shuttle, the work-support, and some other parts together with stock lying on the work-support, said figures illustrating the forma-

tion of the stitch; Fig. 10 is a top view of the work support, with part of the looper to represent its path when feeding the needle with thread; Fig. 11 is a view in front elevation of the thread winding mechanism, and, Fig. 12 is a sectional view showing details of such mechanism.

The frame of the machine, the driving shaft journaled therein, the arrangement of cams on the driving shaft, the mechanism for rotating the shuttle, the awl and needle devices with their actuating mechanisms and the mechanism for actuating the take-up arm are the same as in the machine disclosed in Patent #581,817 above referred to, and a detail description thereof is therefore deemed unnecessary in this application.

The shuttle case h^x is substantially the same as in the patent referred to, and is supported and actuated in substantially the same manner. In my present invention, however, the shuttle case is arranged to receive a bobbin spool, and the thread is led from the bobbin, and guided and controlled in its passage to the work by certain novel devices which will now be described. The face plate or cap of the shuttle is provided with the hollow stud h^1 adapted to be slipped over a stud h^4 extending from the end h of the shuttle and to form a bearing for the bobbin spool h . The face plate has a block 26 rigidly secured thereto so as to form a part thereof, provided with a boss having formed therein a recess, see Fig. 7, to receive the free end of the stud h^4 . A spring h^6 secured to the face plate by the screw h^5 passes through an opening in the side of the block 26 and engages a groove h^5 in the end of the stud h^4 to hold the face plate in place. At the top of the face plate and projecting backwardly into the shuttle case is an arm h^6 provided with a thread case is an arm h^6 provided with a thread opening and a groove leading from the thread opening to a groove in the front face of the face plate. Directly below this groove and at the upper end of the block 26 is a projection 28 having a thread groove in its side, and arranged to press against the thread in said groove is a tension spring h^{10} secured to the face plate by the screw h^8 . The free end of the spring h^{10} bears against a shoulder formed by a projection from the face plate above the thread rest 28 and the spring can be adjusted to bear with more or less

pressure on the thread by means of the screw k^8 . At the lower end of the block 26 a thread opening 27 is formed and at a short distance below the opening 27 the face plate is provided with a forwardly extending projection, the projection being extended downwardly to form a nose similar to that shown in Patent No. 581,817, and having a thread guiding groove.

As will be clear from Figs. 6 and 7, the shuttle-thread passes from the bobbin through the opening in the arm h^9 along the grooves in the arm h^9 and upper portion of the face plate under the tension spring k^{10} through the opening 27 across the space h^9 between the block 26 and the projection on the face plate, along the groove in the nose to the work.

Herein provision is made as in the patent referred to for measuring off from the bobbin in the shuttle a sufficient portion of thread for the next stitch, but herein the devices instrumental in measuring off the thread differ materially from those described in said patent. Herein the measuring device is shown as a finger 10 scooped out at its inner side at 12, to form an edge or lip as represented in section, Fig. 7, the extremity 13 of the measuring device being located in such position that when the finger 10 is moved, it will enter the notch h^9 and act on the shuttle-thread, while the latter is stretched between the nose and stock, and will measure off from the bobbin the thread required for the next stitch, leaving said thread with slack to be taken up as the shuttle next passes through the loop of needle thread. The upper end of this finger 10 is clamped by a clamp screw 14 in the split end 15 of a rocker 16 fitted to surround and turn on the end 17 of a lever 18 pivoted at 19 on the head of the machine.

The upper arm of the rocker 16 receives in it a headed bolt 17^a, the shank of which is surrounded by a spring 18, a threaded hollow nut 19^a being screwed into the rocker to compress said spring and force said bolt against a flattened post of the end 17 of the lever, see Fig. 1, said spring-pressed bolt constituting a retaining device to maintain the rocker and its measuring finger in correct working position, yet whenever the operator desires to turn the measuring finger away from the cap of the shuttle, to replace the shuttle-thread, or for any other purpose, he may by striking the rocker, turn it on the projection 17, the head of the bolt at such time slipping off from the said flattened face. The rear end of this lever 18 is provided with an anti-friction roll 21 held thereon loosely by a screw 30, see Fig. 1, the edge of said roll running against the edge of a cam 31, herein shown as connected with or forming part of the toothed gear h^{23} . The lever 18 is acted upon by a spring 32,

which keeps the roller 21 against the cam 31, this cam actuating the measuring device once during each stitch.

The needle thread t is taken from a wax-pot P , through a stripper P' , and is then led once about a sheave o , mounted on a stud o' , and from thence the needle thread is carried about the inner side of a tension sheave o^2 , and thence over the outer side of a second tension sheave o^3 , the studs carrying said sheaves being all mounted on the take-up lever m . The tension disks o^2 and o^3 constituting tension devices, are located close to the center of motion D of the take-up lever, so that their weight does not affect the momentum of the take-up. The tension exerted on the thread extended over said sheaves o^2 and o^3 , may be varied at will by means of a nut n , on a stud n' extended from said take-up lever, and arranged to press against a spring n^2 which bears upon the central parts of the said tension devices, so that by turning said nut the tension may be regulated as desired.

The needle-thread is taken from the tension wheel or disk o^3 over a loose sheave n^3 of very light weight, mounted on a stud n^4 at the end of the take-up lever, the said sheave being retained on the said stud by a wire lip n^5 , and thence the thread t is extended over a sheave n^6 on a stud n^7 fixed to the frame-work, or to a steam heated chamber n^{70} forming part of the frame-work, and thence the thread is shown as led through a groove n^8 at the underside of the work-support f , said thread passing from said groove through an opening n^9 and meeting the stock through the hole f^3 in the top of the work support.

The take-up arm herein described, being made of thin metal, is very light in weight, and by mounting the tension devices close to the center of motion of the actuating shaft D , the strains due to momentum, which said take-up has to overcome in rapid movement, are reduced to a minimum, and further said arm is made to reciprocate against a heated box n^{70} , so that said arm, the sheave n^3 , and tension devices are kept properly heated so that the wax will not stick. In the vibration of this arm, the sheave or roller o' acts at each movement of the sheave n^3 toward the work support, to draw from the wax pot a sufficient length of thread to be used in making a stitch in stock of maximum thickness.

In operation the take-up is actuated in the same time, and order with relation to the rotating shuttle to take-up the loop of needle thread, as provided for in said patent, but herein the tension devices o^2 and o^3 take the place of two rolls carried by the take-up in said patent, and the extremity of the arm has but a very light sheave.

The location of the heavier tension de-

vice near the center of motion D of the take-up arm, and the addition to the take-up arm of the sheave o' to pull off the thread, adds very materially to the effectiveness of the machine, for the reason that the momentum generated in the take-up arm which has to be overcome at each stroke, is very materially lessened, and the speed of the machine may be increased without fear of breaking the take-up lever.

The mechanism of Patent No. 581,817 for locking and releasing the presser-foot has been slightly modified as shown in Fig. 1 by omitting the ratchet plate and pawl for positively raising the presser foot during the feeding movement of the awl. Otherwise the construction and operation are substantially the same as in the machine of the patent.

The shank of the work support f has a groove n^8 for the thread t , and at the upper end of said groove a passage n^9 , the lower side of which is inclined as best represented in Figs. 6 and 9, the said inclined side presenting a hard finish smooth edge by inserting in it a steel wearing face n^{18} composed as shown of a round piece of steel wire n^{19} hardened, such face withstanding the wear of the thread and obviating the otherwise frequent renewal of work supports. The wearing face is inclined and receives upon it the thread t , and the latter under the strain put upon it in the process of making stitches has a tendency to ride down the incline, and especially so when the work is fed over the work-support by the awl as represented in the detail Fig. 9.

The groove n^8 in the shank of the work-support is entered by a closure e , shown as a lever pivoted at e' , the upper end of said lever being extended above said passage, and shielding the waxed thread, so that the wax cannot possibly get on the face of the work-support and contact with the upper of the shoe being stitched. The lower end e^x of this closure e may be struck by the operator whenever it is desired to get access to the thread in the passage n^8 or to seize the thread and draw it through the passage n^9 in threading up the machine. The closure e has coöperating with it a suitable locking device e^2 , it being shown as a screw having the underside of its head rounded to enter a slot in the closure, the edges of said slot being beveled, see detail Fig. 1^a. The screw is surrounded by a spiral spring, and the nut on the end of the screw acting on the end of the spring regulates the force of the spring in pulling the underside of the head of the screw into the slot, so that the said closure is held frictionally either closed or opened.

The looper d is substantially straight, and it has near its end a hook d' , and the looper is carried by a lever d^2 so mounted as to have a substantially universal motion. The lower

end of the lever d^2 has a hollow hub d^3 which is slipped over a stud d^4 extended from a hollow sleeve d^5 , mounted on a stud d^6 fixed to the head. The sleeve d^5 is retained on said stud by a set screw d^{6x} , while the sleeve d^3 is retained on the stud d^4 by a similar screw. The lever d^2 has a backwardly extended stud d^{12} , which engages a cam surface formed on the side of the disk H, the said cam surface being of a shape to turn the lever d^2 about the stud d^6 as a fulcrum. The lever d^2 has a roller or other stud d^7 , which is borne against the cam shaped periphery of the disk H, by a spring d^9 acting on a stud d^{10} extended from the said lever, the periphery of said disk H imparting to the lever a movement about the stud d^4 . The spring d^9 also acts to hold the stud d^{12} against the cam surface on the face of the disk H.

In operation the looper d starts forward, so that its hook passes the needle thread at its outer side, said needle thread being extended from the passage n^8 to the opening f^3 in the throat of the work-support, and between said thread and the work support, and the hook of the looper engages the said thread and carries it up the inclined part of the passage n^8 into substantially the position shown in Fig. 9, and thereafter the needle descends at the inner side of the thread held by the hook, and as the needle is moving in its lowest position, the looper is moved toward the main shaft of the machine and also retracted, taking with it the needle-thread and forming it in a loop, so that both bights of the loop are stretched across the shank of the needle, as in Fig. 10, and the needle in rising engages the loop held against it, and the thread having been caught by the hook of the needle, the looper is immediately moved forward to release the loop of needle-thread drawn out by it, giving up the loop so held by it to the needle as the latter rises through the stock. The looper by its movements and action furnishes sufficient length of needle thread to the needle to enable the latter to rise and draw the loop through the stock without the rendering of the thread through the hook of the needle, thus fraying it.

Heretofore it has been customary to wind the thread to be used in the shuttle on separate thread-winding machines, but herein I have provided means connected with the sewing machine and wax pot for winding the waxed thread onto the spool so that it may be readily applied to the bobbin when exhausted, the thread being wound during the regular operations of the machine.

The right-hand end of the main shaft A^3 of the machine will have secured to it a fast pulley or hand-wheel and a loose pulley B^3 , all as in said Patent No. 581,817. Herein the loose pulley is chambered at its inner

side to receive a pulley A^{10} secured to a short shaft A^{12} mounted in a bearing at one end of a lever A^{13} , said lever having a sleeve-like hub A^{10x} which is extended through a bearing A^{12x} projected from an upright A^{33} mounted on the plate A^{34} forming part of the head of the machine. The sleeve A^{10x} receives upon its opposite end a lever A^{14} having a cam surface r against which operates the end r' of a lever r^2 pivoted at r^3 . The shaft A^{12} has fast upon it a belt wheel A^{15} which receives a belt A^{16} , which is extended over a belt-wheel A^{17} , fast on a shaft A^{15x} within the sleeve A^{10x} . The end of the shaft A^{15x} outside of the belt wheel is provided with a screw threaded portion on which is screwed the disk A^{18} and a slightly reduced portion forming a bearing for the spool k . The spool is held on the shaft by means of the flanged block A^{19} , the screw threaded stud A^{20} of which engages a threaded hole in the end of the shaft. By turning the disk A^{18} the spool is clamped with any desired friction between the disk and the flanged block A^{19} . The disk A^{18} also serves as a convenient means for forcing the spool endwise off the shaft when the flanged block A^{19} has been removed.

The lever A^{13} has pivoted upon it at u , a lever u' forming part of a thread cutting mechanism, said lever having attached to it a notched block u^2 , which receives in it the short arm u^3 of a let-off lever u^4 pivoted at u^5 , and the lever u' is acted upon by a suitable spring u^6 to actuate the lever u' and throw it toward the cutter or blade u^7 fast on a projection u^8 of the said lever A^{13} .

Whenever the thread mass wound upon the projecting end of the rod A^{15x} is of the proper size to substantially fill the bobbin, then the outer coils of the thread will meet the flattened end of the lever u^4 and will turn it so that its end u^3 retires from the notch u^2 , letting the spring u^6 immediately actuate the lever u' , causing the latter to descend upon the thread passing between it and the blade u^7 , and cut the same off.

The waxed thread to be wound on the spool to be applied to the shuttle, is taken from one end of the wax-pot P , and is led over suitable tension wheels, and through the space between the open cutting mechanism described, to the winding spindle or rod A^{15x} .

The belt A^{16} and the winding spindle may be left at rest until when it is desired to wind a spool for the bobbin, and at such time the operator will turn the lever r^2 in the direction of the arrow near it in Fig. 1, causing the short arm r' to act upon the incline r and turn the sleeve A^{10x} and its lever A^{13} in a direction to force the pulley A^{10} against the interior of the loose pulley B^3 .

Providing the sewing machine itself with the winding mechanism enables the operator

to save much of his time heretofore employed in winding thread for the shuttles.

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

1. A lock-stitch shoe-sewing machine having, in combination, a needle, a shuttle, means for actuating the needle and the shuttle to interlock the needle and shuttle threads, a depending nose on the face of the shuttle provided with a forwardly-open thread guiding groove, and a tension device in the face of the shuttle located above and substantially in line with said groove, the tension device comprising members engaging the thread laterally but not in front, so that by drawing the thread downwardly it may be at once drawn into position in the tension device and the shuttle nose, substantially as described.

2. A lock stitch shoe sewing machine, having, in combination, a needle, a shuttle, means for actuating the needle and shuttle to interlock the needle and shuttle threads, a cap to close the open face of the shuttle to inclose the shuttle thread, said cap having an extended grooved nose and being provided with a thread rest above said nose projecting at one side of the shuttle thread, said thread rest being independent of the nose and at a distance therefrom and a tension spring to act on the shuttle thread lying on the side of the said rest, substantially as described.

3. A lock stitch shoe sewing machine, having, in combination, a needle, a shuttle, means for actuating the needle and shuttle to interlock the needle and shuttle threads, a cap to close the open face of the shuttle to inclose the said thread, said cap being provided with a projecting thread rest, a tension spring to act on the shuttle thread lying on said rest, and a projection from said cap for supporting the free end of said spring, substantially as described.

4. A lock stitch shoe sewing machine, having, in combination, a needle, a shuttle, means for actuating the needle and shuttle to interlock the needle and shuttle threads, a cap to close the open face of the shuttle to inclose the said thread, said cap having an extended split nose, an open thread guide above and independent of said nose in which the thread may be drawn, and a thread rest independent of said thread guide and nose to sustain the shuttle thread, and a spring to act on the thread lying on said rest, to determine its tension, substantially as described.

5. A lock stitch shoe sewing machine, having, in combination, a needle, a shuttle, means for actuating the needle and shuttle to interlock the needle and shuttle threads, said shuttle being provided with a notch at its face, a measuring device composed of a finger to act on the shuttle thread opposite

said notch, a lever, a laterally movable support for said finger carried by said lever, and means for actuating the lever, substantially as described.

5 6. A lock stitch shoe sewing machine, having, in combination, a needle, a shuttle, means for actuating the needle and shuttle to interlock the needle and shuttle threads, a measuring device comprising a finger to
10 act on the shuttle thread and extending in front of the shuttle, mechanism for actuating the finger, and connections between the finger and its actuating mechanism whereby the finger may be moved from in front of the
15 shuttle, substantially as described.

7. A lock stitch shoe sewing machine, having, in combination, a needle, a shuttle, means for actuating the needle and shuttle to interlock the needle and shuttle threads,
20 said shuttle having at its front side a notch, a measuring device composed of a finger having an edge or lip to act on the shuttle thread opposite said notch, a rocker carrying said finger, a lever on which said rocker
25 is mounted, means to hold said rocker and measuring device in operative position, and means to move said lever to cause the said measuring device to depress the thread into said notch, substantially as described.

30 8. A lock-stitch shoe-sewing machine having, in combination, a needle, a shuttle, means for actuating the needle and shuttle to interlock the needle and shuttle threads including a shuttle driver and an actuating
35 shuttle shaft, a cap to inclose thread in said shuttle, said cap having a depression which is crossed by the shuttle thread, a measuring device having an edge or lip to act on the shuttle thread, a lever carrying said meas-
40 uring device fulcrumed outside the periphery of the shuttle and a cam moved in unison with said shaft to operate said measuring device once for each stitch, substantially as described.

45 9. A shoe sewing machine, having, in combination, a needle, a looper, means for actuating the needle and looper, a work support having a groove to receive the thread on its way to the needle and a closure for said
50 groove to prevent the wax on the thread getting on the outside of the work support, and then on the upper of the shoe being stitched, substantially as described.

10. A shoe sewing machine, having, in
55 combination, a needle, a looper, means for actuating the needle and looper, a work support having a groove to receive the needle thread on its way to the needle, a closure for said groove to prevent the wax on the thread

getting on the outside of the work support 60 and then on the upper of the shoe being stitched, and means to hold said closure shut or open, substantially as described.

11. A lock stitch shoe sewing machine, having, in combination, a needle, a shuttle, 65 means for actuating the needle and shuttle to interlock the needle and shuttle threads, a cap to close the open side of said shuttle, a hollow stud projecting from said cap to form a bearing for the bobbin, a stud on the
70 shuttle arranged to enter said hollow stud, said cap having a recess at its inner side extending part way only through the cap to receive the outer end of the shuttle stud, and a locking device mounted on the cap ar-
75 ranged to engage the shuttle stud, substantially as described.

12. A lock stitch shoe sewing machine, having, in combination, a needle, a shuttle, means for actuating the needle and shuttle 80 to interlock the needle and shuttle threads, said shuttle having a stud notched near its outer end, a cap to close the open side of said shuttle said cap having at its face a boss recessed at its rear side to fit over said
85 stud, said boss being slotted at its side next the face of the cap, and a locking device carried by said cap and extended through the slot in the boss to engage said stud, substantially as described. 90

13. A lock stitch shoe sewing machine, having, in combination, a needle, a shuttle, means for actuating the needle and shuttle to interlock the needle and shuttle threads, said shuttle having a stud notched near its
95 outer end, a cap to close the open side of said shuttle and a locking spring mounted on said cap and arranged to engage the notched end of said stud, substantially as described. 100

14. A lock stitch shoe sewing machine, having, in combination, a needle, a shuttle, means for actuating the needle and shuttle to interlock the needle and shuttle threads, a stud projecting from the shuttle and pro- 105 vided with a notch near its outer end, a cap to close the open side of said shuttle provided with a slot, and a locking device carried by said cap and extending through the slot to engage the notch in said stud, sub-
110 stantially as described.

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

LOUIS GODDU.

Witnesses:

HORACE VAN EVEREN,
ALFRED H. HILDRETH.

It is hereby certified that in Letters Patent No. 940,637, granted November 16, 1909, upon the application of Louis Goddu, of Winchester, Massachusetts, for an improvement in "Sole-Sewing Machines," errors appear in the printed specification requiring correction as follows: Page 1, line 77, the word "chuttle" should read *shuttle*, and same page, the line 97 should be canceled; and that said Letters Patent should be read with these corrections therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 21st day of December, A. D., 1909.

[SEAL.]

C. C. BILLINGS,
Acting Commissioner of Patents