

No. 689,214.

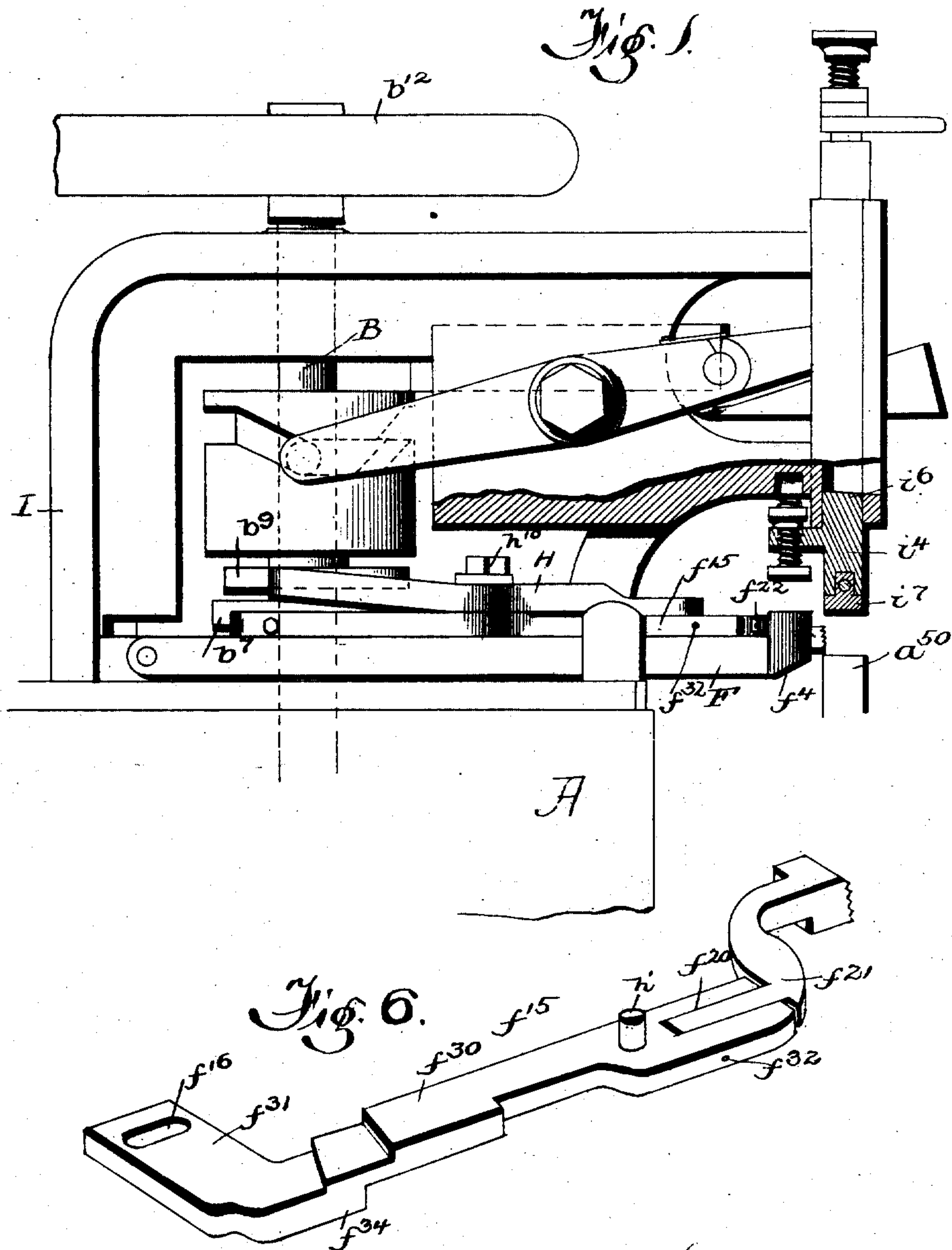
Patented Dec. 17, 1901.

E. NORMANCUT.
FEED MECHANISM FOR SEWING MACHINES.

(Application filed Aug. 10, 1901.)

(No Model.)

3 Sheets—Sheet 1.



Witnesses:
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Fig. 2.

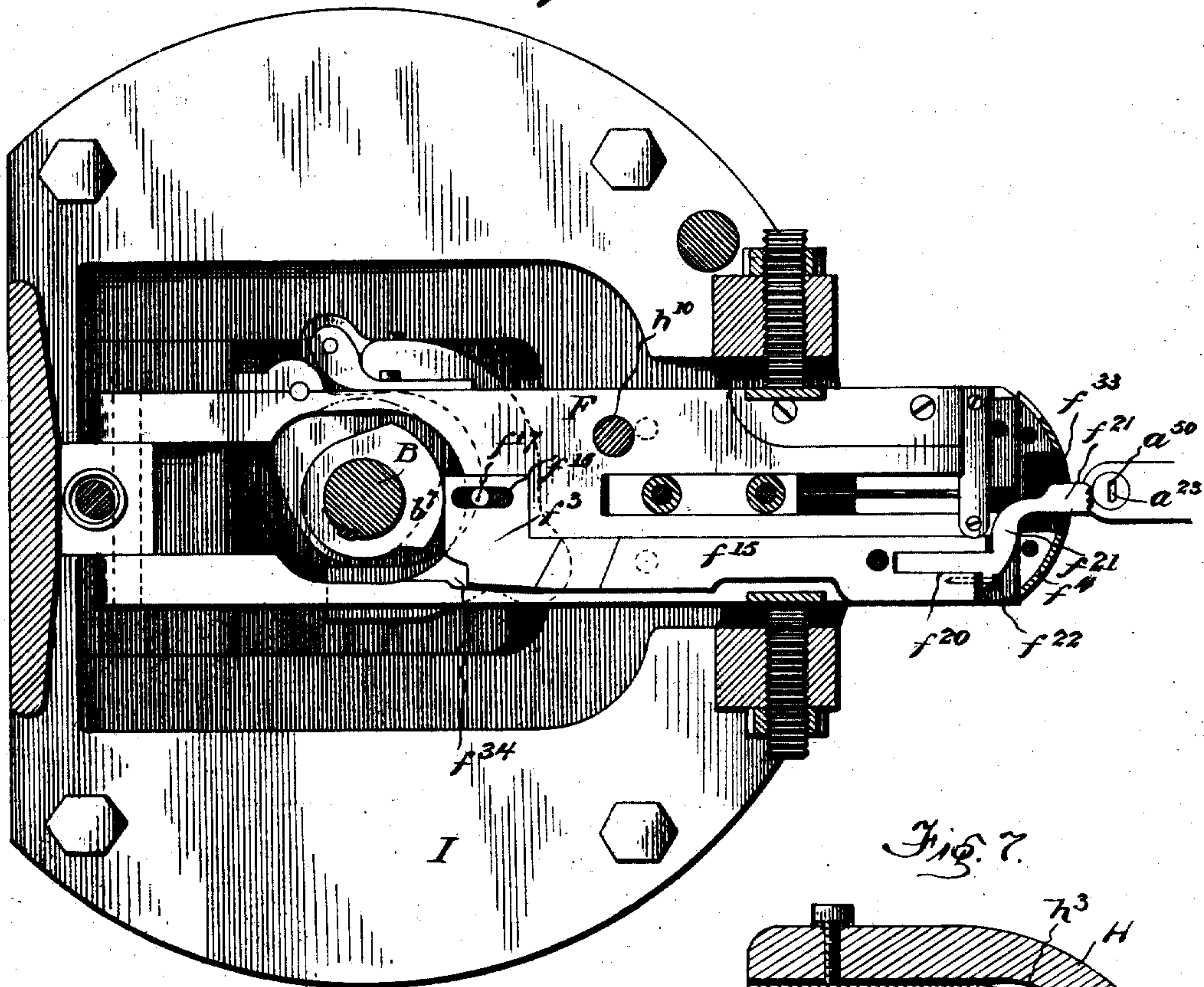


Fig. 7.

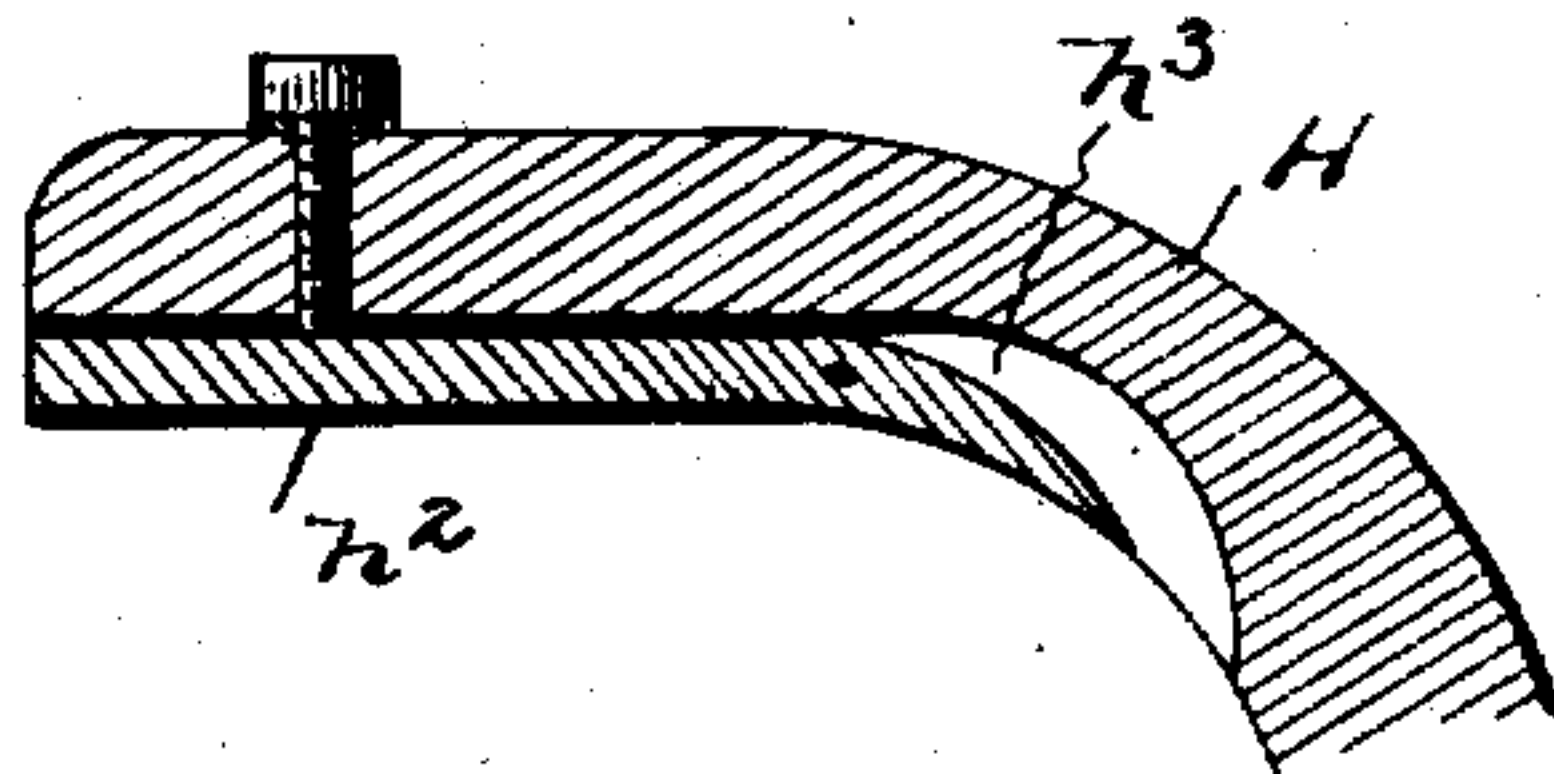
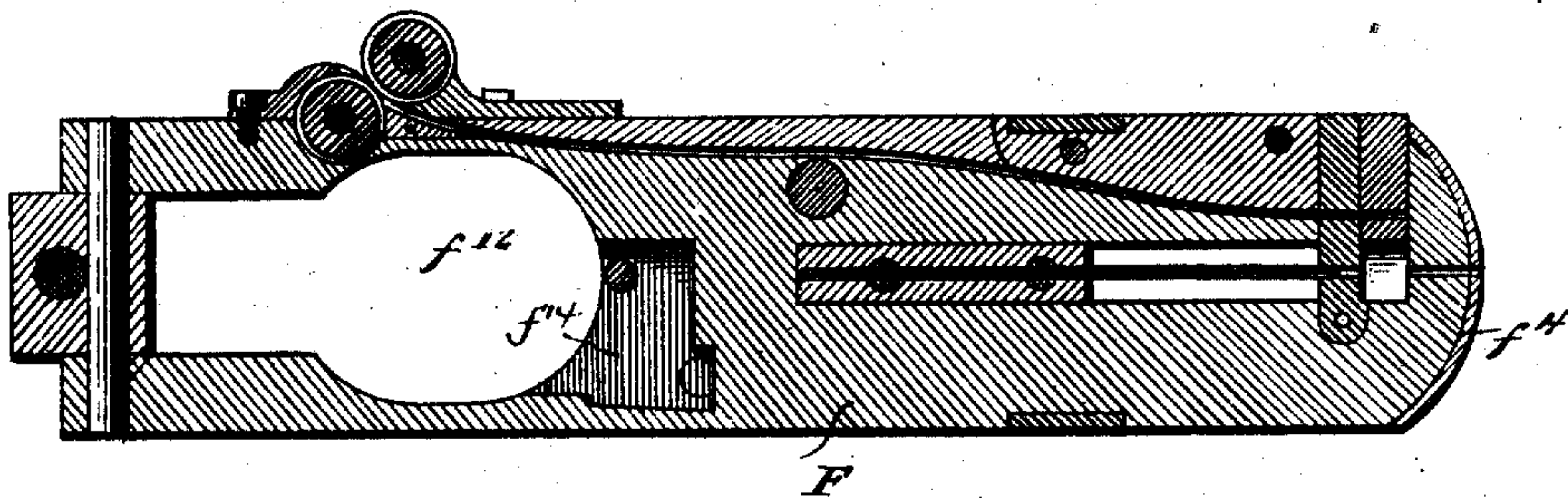


Fig. 5.



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3 Sheets—Sheet 3.

Fig. 3.

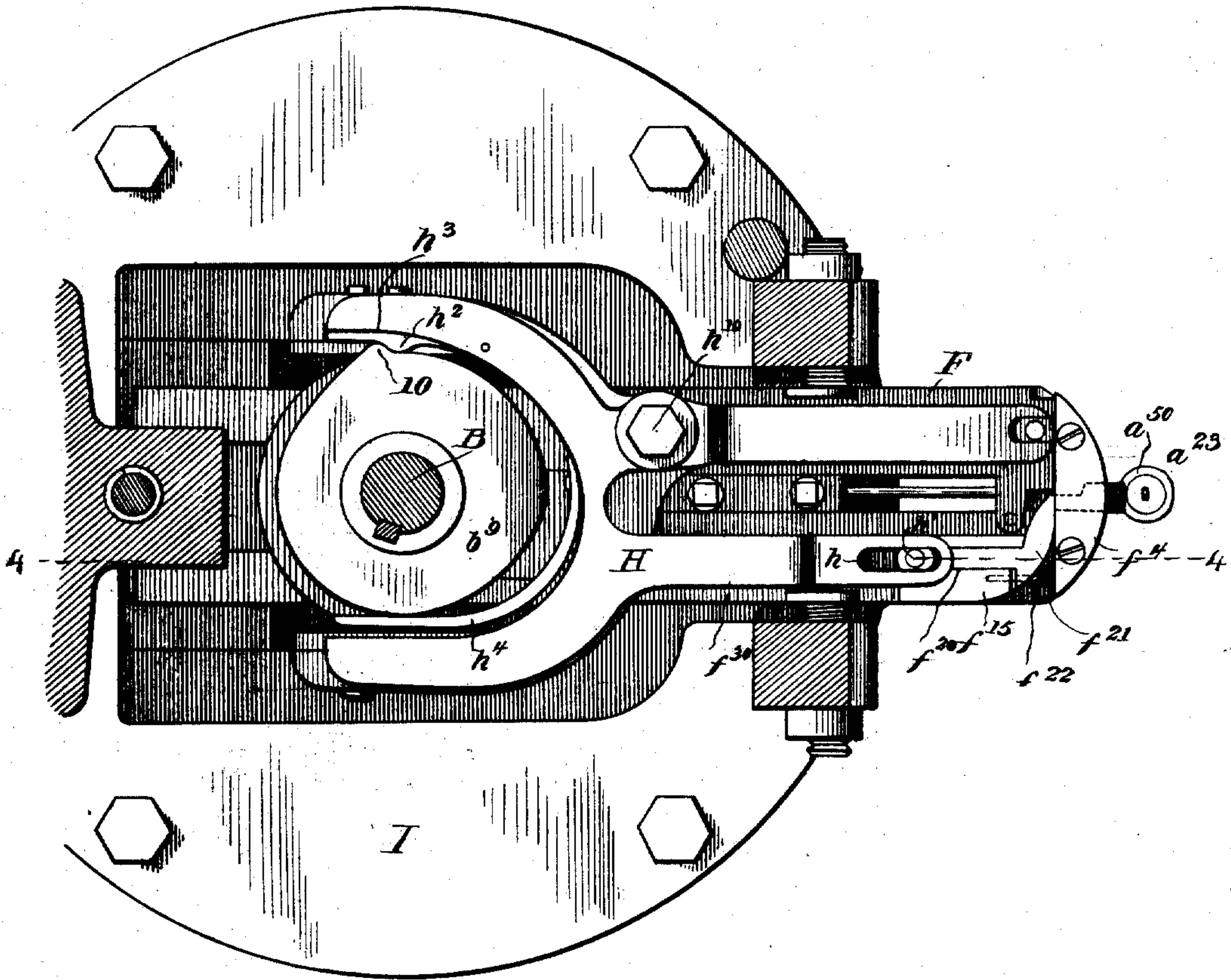
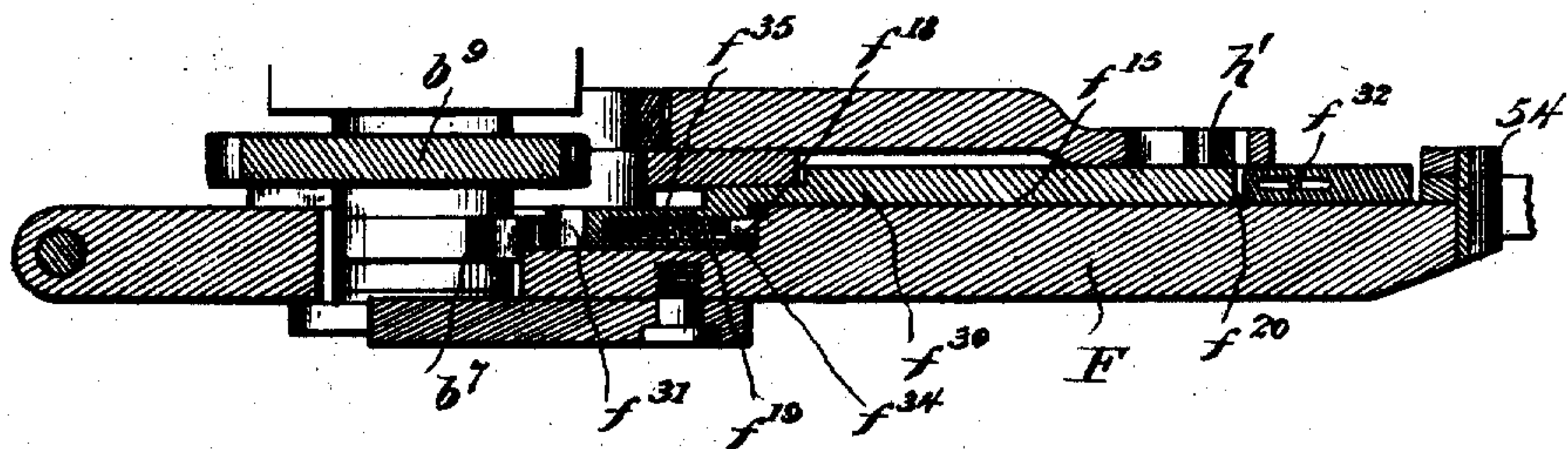


Fig. 4.



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UNITED STATES PATENT OFFICE.

ENOCH NORMANCUT, OF MONTREAL, CANADA, ASSIGNOR TO COLUMBIA WIRE SEWING LOCK STITCH MACHINE COY., LTD., OF PORTLAND, MAINE.

FEED MECHANISM FOR SEWING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 689,214, dated December 17, 1901.

Original application filed April 14, 1898, Serial No. 677,634. Divided and this application filed August 10, 1901. Serial No. 71,669. (No model.)

To all whom it may concern:

Be it known that I, ENOCH NORMANCUT, a subject of His Majesty the King of Great Britain, residing at Montreal, in the Province of Quebec, Canada, have invented certain new and useful Improvements in Feed Mechanisms for Sewing-Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, in which similar reference characters indicate similar parts in all of the figures.

My invention relates to improvements in feeding mechanisms for sewing-machines, and relates particularly to machines adapted for sewing shoes.

The invention herein disclosed constitutes a part of the mechanism for sewing shoe-soles and is a divisional application of an application filed by me on April 14, 1898, Serial No. 677,634, wherein a full and complete disclosure is made of the complete machine.

In order that a clearer understanding may be had of the purposes and objects of the mechanism herein described, it may be stated that said machine has for its object the attaching of a shoe-sole by sewing with wire, a continuous strip being used to form a portion of the stitch, this portion being formed by the vertical movement of a needle the length of movement of which is regulated, said needle being carried by the shoe-horn and being herein designated as the "upright" needle. The movement of this needle into the sole (from the inside of the shoe) carries with it a portion of the wire strip, which upon the withdrawal of the upright needle leaves the inserted portion within the sole in the form of a loop having its inner portion uncaught. This loop is adapted to receive a wire bur, which is located transversely therethrough, (in the line of the axis of the loop,) said bur passing through the edge of the sole and thereby forming a lock-stitch located within the sole, the bur lying at the outer end of the loop, and hence preventing its withdrawal. The bur is inserted by a "side" needle, carried by the lever-bar plate, the needle having two forward movements, the first making the opening for the bur, (passing within the loop

as the upright needle is withdrawn,) while the second movement carries the bur ahead of it into the opening made during the previous movement. During these movements the shoe is held in position on the shoe-horn by the presser-bar, which in turn regulates the length of the loop and the position of the lever-bar plate to insure the entering of the side needle at the proper point. As the locked position of the presser-bar varies with the thickness of the sole the lock-stitch will be formed on a uniform plane parallel with the outer surface of the sole and located a regulated distance from such surface. As the upright needle moves vertically, carrying the wire strip with it, it will be obvious that the tension of the strip is such that the surface of the needle would necessarily move relatively to the strip, thus forming a friction, with a consequent tendency of injuring the wire strip and damaging the needle, and hence provision must be made to insure a relaxation of the tension at a period anterior to the movement of the upright needle. To accomplish this end, advantage is taken of the feeding movement of the shoe, and to produce this movement, together with the production of mechanism for accomplishing the same, are the primary objects of the invention herein described.

It will be understood, of course, that while the mechanism herein disclosed is especially adapted for use in connection with the machine described in said application, yet it may, with modification, be used in other connections, and I reserve the right to use it in such other mechanisms.

The object of my invention, therefore, is to provide a feed mechanism which will move the work forward a greater distance than the length of the stitch, and thereby draw the sewing material from the spool, and then return the work to the proper position to form the stitch, thus forming a "slack" in the tension of the sewing material and permitting a free movement of the upright needle.

A further object is to provide a feed-bar having means for adjustably regulating the length of the feed.

Other and further objects will be apparent as the disclosure is hereinafter made.

To these and other ends my invention consists in the improved construction and combination of parts hereinafter fully described, and particularly pointed out in the appended claims.

In the drawings, Figure 1 is a side elevation, partly in section, showing the head of a shoe-sole-sewing machine, the invention being applied in position. Fig. 2 is a horizontal sectional view taken through the head of the machine, showing the feed-bar and feed-nose and also showing the cam for imparting the forward or longitudinal movement thereto. Fig. 3 is a similar view taken of a different plane and showing the mechanism for imparting the lateral movements to the feed-bar and feed-nose. Fig. 4 is a sectional view taken on the line 4 4 of Fig. 3. Fig. 5 is a horizontal sectional view of the lever-bar plate, showing the recess which receives the mechanism for imparting the return longitudinal movement to the feed-bar. Fig. 6 is a detail view of the feed-bar and feed-nose. Fig. 7 is a detail of one end of the bifurcated lever.

It will be understood that while the drawings show portions of the general structure of the head of the sewing-machine, yet such parts are not lettered nor described, inasmuch as they do not pertain particularly to the subject-matter of the present invention.

I designates the head of a sewing-machine, mounted on the top of a column A, the latter having extended vertically therethrough a shaft B, driven through suitable connections from the power-supply, said shaft leading vertically through the head and having a hand-wheel b^{12} , by which it may be turned independently of the power.

a^{50} designates the upper or toe portion of the shoe-horn, the aperture for the upright needle being designated as a^{23} .

i^6 designates a slide-plate mounted in the front of the head and having a vertical movement therein, which serves to cause the presser-foot i^4 and its removable presser-plate i^7 to contact with the sole of the shoe during the formation of the stitch and be removed out of contact while the feed movement takes place.

F designates a lever-bar plate extending longitudinally of the head and having a space or opening f^{12} for the passage of the shaft B. The forward end of the lever-bar plate is provided with a cap portion f^4 , which serves to retain the feed-bar in position and at the same time forms a support for the edge of the sole when the feed-nose is withdrawn.

The feed-bar f^{15} (best shown in Fig. 6) comprises an elongated portion f^{30} , at the rear end of which is provided an offset f^{31} , having an elongated slot f^{16} , adapted to receive a stud f^{17} , fixedly carried by the lever-bar plate, (see Fig. 2,) the stud and slot positioning the rear end of the feed-bar. The rear face of the

feed-bar is adapted to contact with and be operated to move in a forward longitudinal direction by a cam b^7 , carried by the shaft B, said cam being of a proper shape to impart the proper movement, as shown in said Fig. 2. The front end of the feed-bar is bifurcated, as at f^{20} , within which is adjustably mounted the feed-nose f^{21} , formed substantially as shown. The connection between the feed-bar and feed-nose is through a pin-and-slot connection f^{32} , (see Fig. 4,) while the adjustability is obtained by means of the set-screw f^{22} , Fig. 2. The feed-nose extends through an opening f^{33} , in the cap portion when in projected position, being drawn thereinto by the retracting movement. The adjustability of the connection between the feed-bar and feed-nose, due to the set-screw f^{22} , permits of a regulating of the distance traversed by the extreme front end of the feed-nose during the lateral movement (hereinafter described) of the feed-bar, it being obvious that the greater the distance of said front end of the feed-nose from the pivot-point (the stud f^{17}) during such lateral movement the greater the arc traversed, and hence an increased length of feed, the movement of the lateral-movement-imparting means remaining unchanged.

The feed-bar is provided with a downwardly-extending offset portion f^{34} , having an opening or recess f^{19} , Fig. 4, to receive the stud f^{18} , which has one end abutting against the wall of a recess f^{14} , formed in the lever-bar plate, Fig. 5, a spring f^{35} , carried by said stud f^{18} , serving to normally retain the feed-bar in contact with the cam b^7 .

It will be readily understood that with the parts in the position shown in Fig. 2 the feed-bar is in its projected position, which is retained until the cam passes to a point where the cam-face permits of a sudden operation of the spring f^{35} , when the feed-bar is retracted, which position is continued until the cam again passes to a point where the outward movement is again inaugurated. This movement is longitudinally of the feed-bar. The feed-bar also has a lateral movement with the stud f^{17} as the pivot-point, and this movement is imparted by the cam b^9 acting on the feed-bar-actuating lever H, Fig. 3. As shown, said lever is pivoted at h^{10} and is formed with a bifurcated rear end, one arm of which is provided with a cam-acting face h^2 , pivotally and adjustably mounted within a slotted recess h^3 , formed in said arm, as shown in Fig. 7, while the opposite arm is provided with the spring-bearing h^4 . The front end of the lever H is provided with a slot h , to receive the pin and collar h' , carried by the feed-bar, the collar fitting within and having a movement longitudinally of the recess. The cam b^9 , as shown, is provided with an extension 10.

As will be understood, the bearing-spring h^4 being in contact with the cam-face at all times holds the cam-acting face h^2 in contact

with the cam-face, and hence as the rear side of the extension 10 is reached by the face h^2 the lever H will receive a sudden movement, while the remaining movements of said lever will be gradual. It will also be understood that the high and low portions of the cam will operate on both the face h^2 and the spring h^4 , so that a movement of the lever will be given in both directions, the cam being formed to permit such movement. The cams b^7 and b^9 are so timed with relation to each other and to the remaining operating parts of the machine as to produce the following movements: With the parts in the position as shown in the drawings, which is just after the feed has moved the work forward, the lever H will ride on the high portion of the cam b^9 , while the feed-bar will ride on the high portion of the cam b^7 , thus leaving the feed-bar projected. As the feed-bar is about to be retracted the presser-bar is first depressed into contact with the sole and locked into position, followed by the upward movement of the upright needle. As the latter passes into the sole the feed-bar is released by the termination of the high portion of the cam b^7 , and the spring f^{35} brings the feed-bar to its retracted position. As the movement of the upright needle is continued the lever-bar plate is moved vertically by suitable mechanism, and during such movement the side needle begins its first movement. This is followed by a forward movement of the lever-bar plate to bring the cap portion f^4 into contact with the edge of the sole. During these movements the bur-cutting mechanism has formed the bur, and as the side needle is brought to the end of its return movement the bur is brought in position to be driven. At this time the cam b^9 has passed to a point where the cam-acting face h^2 leaves the high portion of the cam, thereby permitting the spring h^4 to act to move the lever H on its pivot, and thereby move the feed-bar (in its retracted position) laterally to the point where when projected it will contact with the sole in readiness to again feed the work. From the foregoing it will be readily seen that the movements of the feed-nose are distinctly rectilinear and separate, each of the movements being independent of the other movements. This is of positive advantage and improvement in machines of this character wherein the parts are necessarily closely confined and have their movements quite restricted. During this movement the side needle has driven the bur, after which the lever-bar plate is dropped to its normal position and at the same time retracted from contact with the sole. At this point the cam b^7 operates to move the feed-bar outward into contact with the work, after which the presser-bar is released. The cam b^9 now begins its action on the face h^2 , causing the feed-bar to begin its feed movement, which movement is terminated at the time when the face h^2 reaches the apex of the extension 10. This feed movement serves to draw the wire strip from its spool. As the face h^2 passes over

the extension 10 the spring h^4 forces the lever H back a slight distance to a position corresponding with the exact length of the stitch. From this it will be seen that the feed movement of the work is of a greater length than the actual length of the stitch, and as it is immediately returned to its proper point the drawing of an excess quantity of the wire from its spool will provide a slack portion, which will permit of the ready operation of the upright needle and at the same time prevent the excessive tightening of the stitch, although without permitting the stitch to be loosely made, it being understood that the slack is not quite sufficient to prevent the upright needle drawing to some degree on the wire from the spool.

I do not limit myself to the precise details herein specified, reserving to myself the right to use any modifications thereof as will fall within the spirit and scope of the claims.

Having thus described my invention, what I claim as new is—

1. A feed mechanism for sewing-machines, comprising a feed-bar; a feed-nose removably and adjustably secured to and extending in the same direction as said feed-bar; means for imparting a longitudinal movement to said feed-bar; and means for imparting a lateral movement to said feed-bar after it has reached its extreme movement longitudinally.
2. A feed mechanism for sewing-machines, comprising a feed-bar; a feed-nose adjustably secured at one end of said bar, said adjustment being longitudinally of the bar; means for imparting a longitudinal movement to said feed-bar; and means for imparting a lateral movement to said bar after it has reached its extreme movement longitudinally.
3. A feed mechanism for sewing-machines, comprising a feed-bar; a feed-nose adjustably connected to said feed-bar; means for imparting a longitudinal movement to said feed-bar; and means for imparting a lateral movement to said bar when at its extreme of longitudinal movement, the adjustment of said nose on said bar serving to adjustably regulate the length of the stitch being formed.
4. A feed mechanism for sewing-machines, comprising a feed-bar having its front end bifurcated; a feed-nose mounted in said bifurcated end, said nose having a longitudinal adjustment therein; means for adjustably regulating the position of said nose relative to said bar; means for imparting a longitudinal movement to said feed-bar; and means for imparting a lateral movement to said bar after it has reached its extreme movement longitudinally, the adjustment of said nose on said bar serving to adjustably regulate the length of the stitch being formed.
5. A feed mechanism for sewing-machines, comprising a feed-bar having its front end bifurcated; a feed-nose slidably mounted in said bifurcated end; a set-screw mounted in said feed-nose and said bifurcated end, to adjust the position of said nose relative to said

bar longitudinally; means for imparting a longitudinal movement to said feed-bar; and means for imparting a lateral movement to said bar after it has reached its extreme movement longitudinally, the adjustment of said nose and bar serving to adjustably regulate the length of the stitch being formed.

6. A feed mechanism for sewing-machines, comprising a feed-bar having its front end bifurcated; a feed-nose mounted in said bifurcated end, said nose having an elongated slot adapted to receive a pin mounted in said bifurcated end; a set-screw connected with said nose and said bifurcated end, to adjust the longitudinal position of said feed-nose in said bar; means for imparting a longitudinal movement to said feed-bar; and means for imparting a lateral movement to said bar after it has reached its extreme movement longitudinally, the adjustment of said nose on said bar serving to adjustably regulate the length of the stitch being formed.

7. A feed mechanism for sewing-machines comprising a feed-bar having a feed-nose; means for imparting a feed movement to said nose, said movement feeding the work forward a distance greater than the length of the stitch to be formed; and means for returning the feed-nose and work to their proper positions to form the stitch, whereby the sewing material will be automatically drawn for use.

8. A feed mechanism for sewing-machines comprising a feed-bar; a feed-nose adjustably connected to said feed-bar; means for imparting a feed movement to said feed-nose, said movement serving to carry the work forward a distance greater than the length of the stitch to be formed; and means for returning the feed-nose and work to their proper position to form the stitch, whereby the sewing material will be automatically drawn for use.

9. A feed-bar-movement-imparting means comprising a lever having a bifurcated rear end; a recess formed in one of the arms of said bifurcated end; a cam-acting face pivotally mounted in said recess; an adjusting-screw adapted to bear against the rear face of said cam-acting face; a positively-driven operating-cam located between the arms of the bifurcated end; a bearing-spring carried by the arm of said end opposing the cam-acting face, whereby said face will be held in contact with the cam; said face and spring cooperating to move the lever in opposite directions; and feed mechanism operatively connected to the free end of said lever.

In witness whereof I have hereunto set my hand in the presence of two witnesses.

ENOCH NORMANCUT.

Witnesses:

H. T. BERNHERD,
T. MYNARD.