

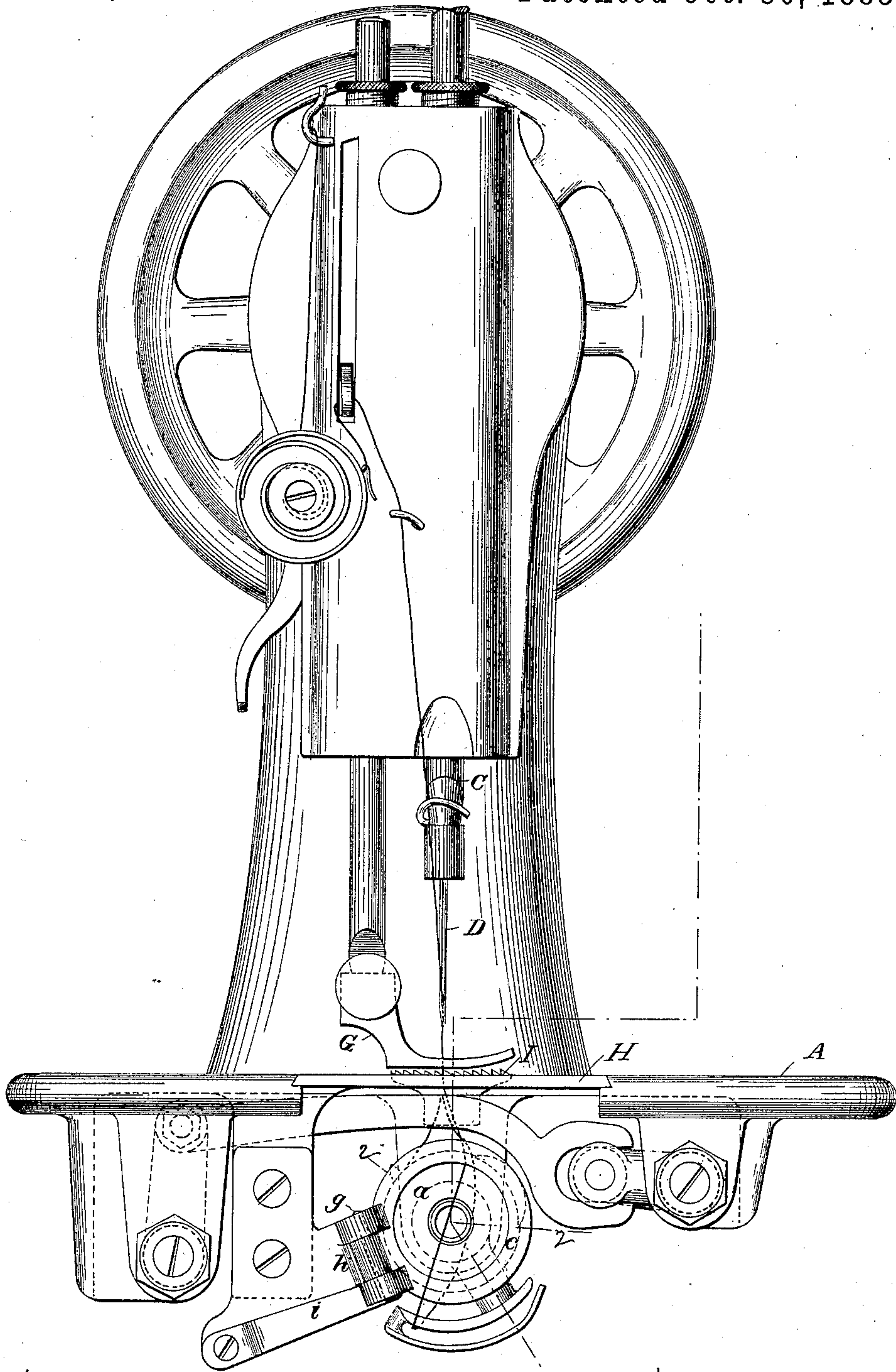
(No Model.)

4 Sheets—Sheet 1.

C. F. LITTLEJOHN.
SEWING MACHINE.

No. 391,806.

Patented Oct. 30, 1888.



WITNESSES.
C. S. Gooding.
William Ramsay.

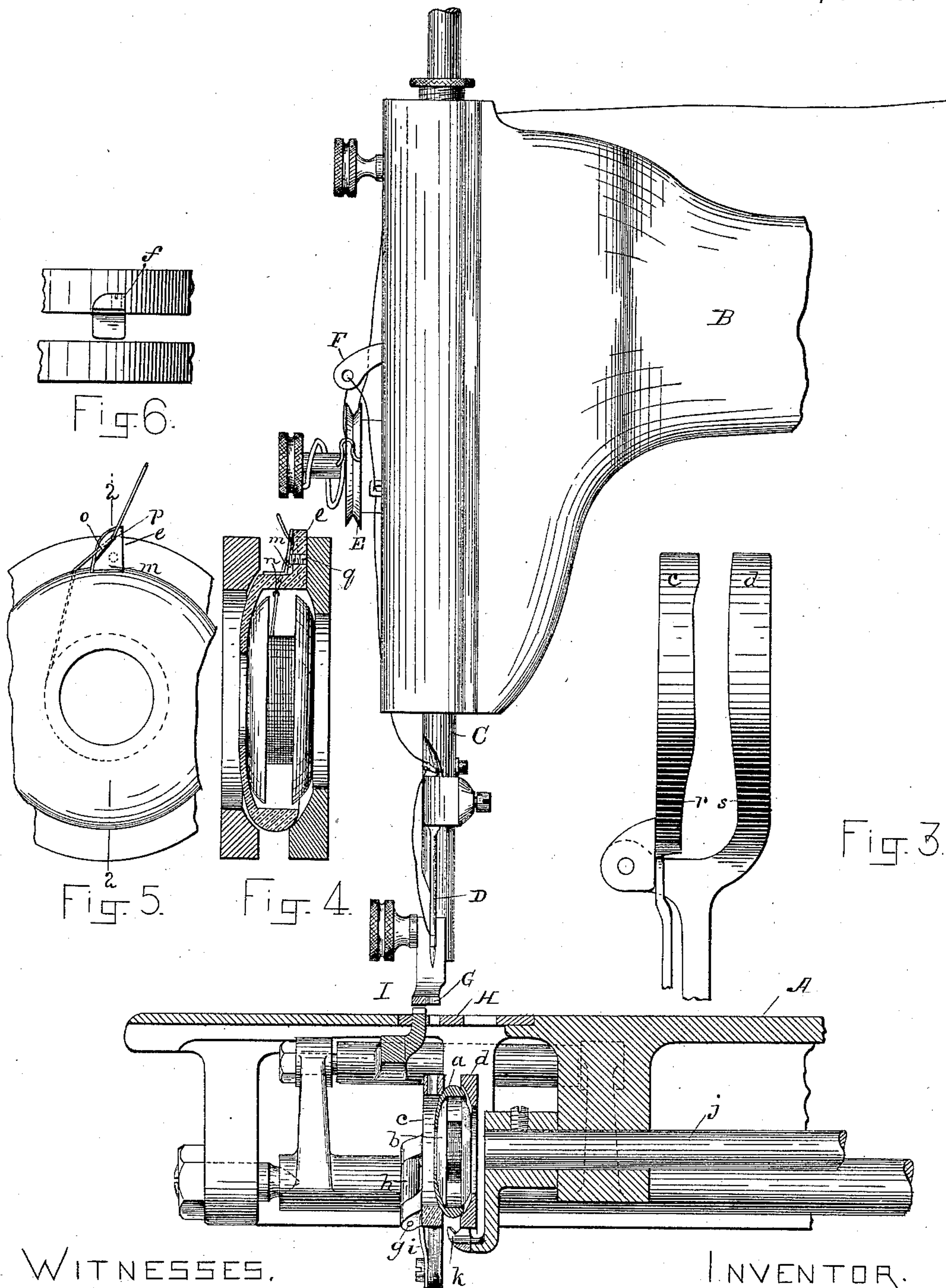
Fig 1

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Fig 2.

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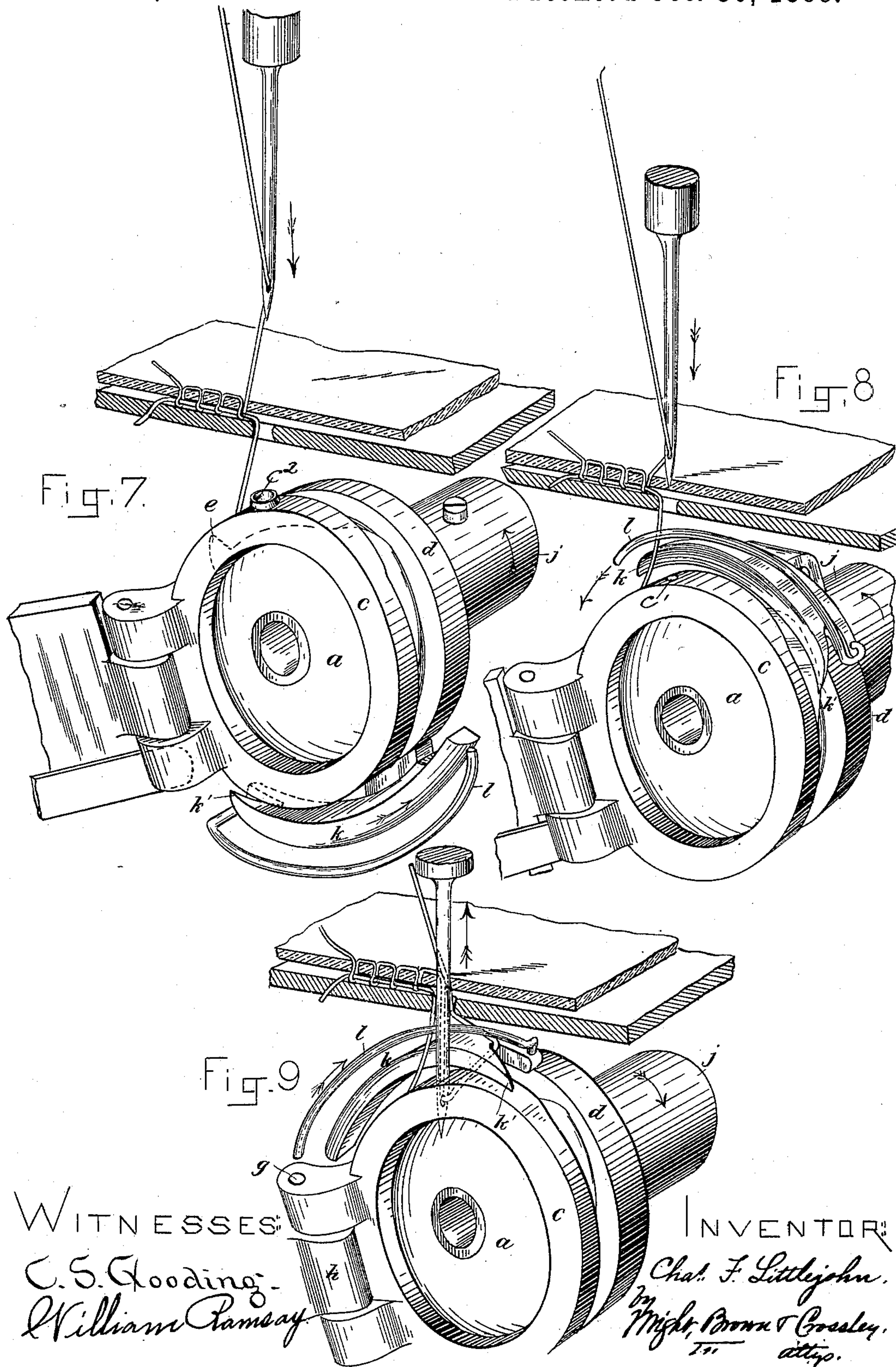
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(No Model.)

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Fig. 10.

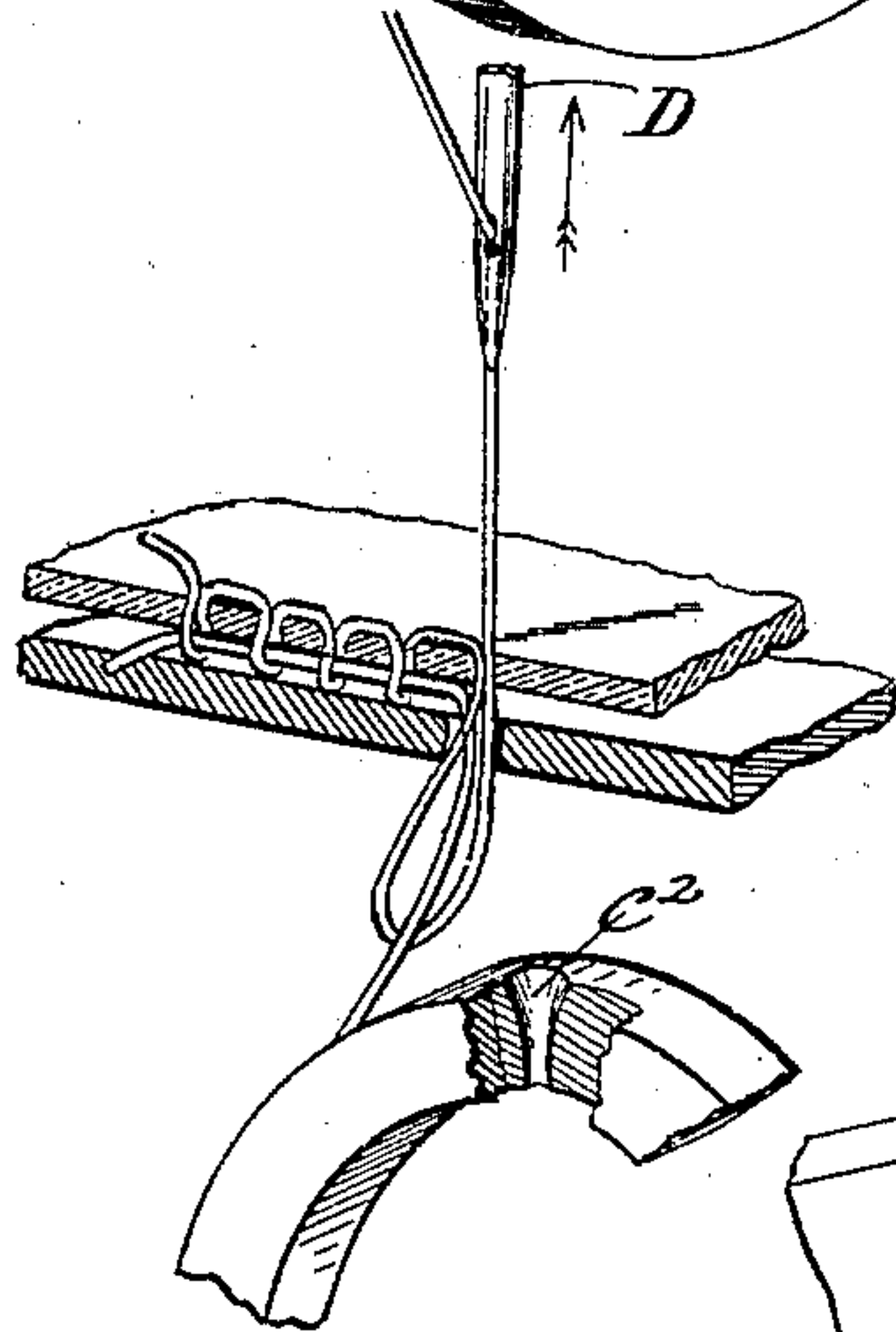
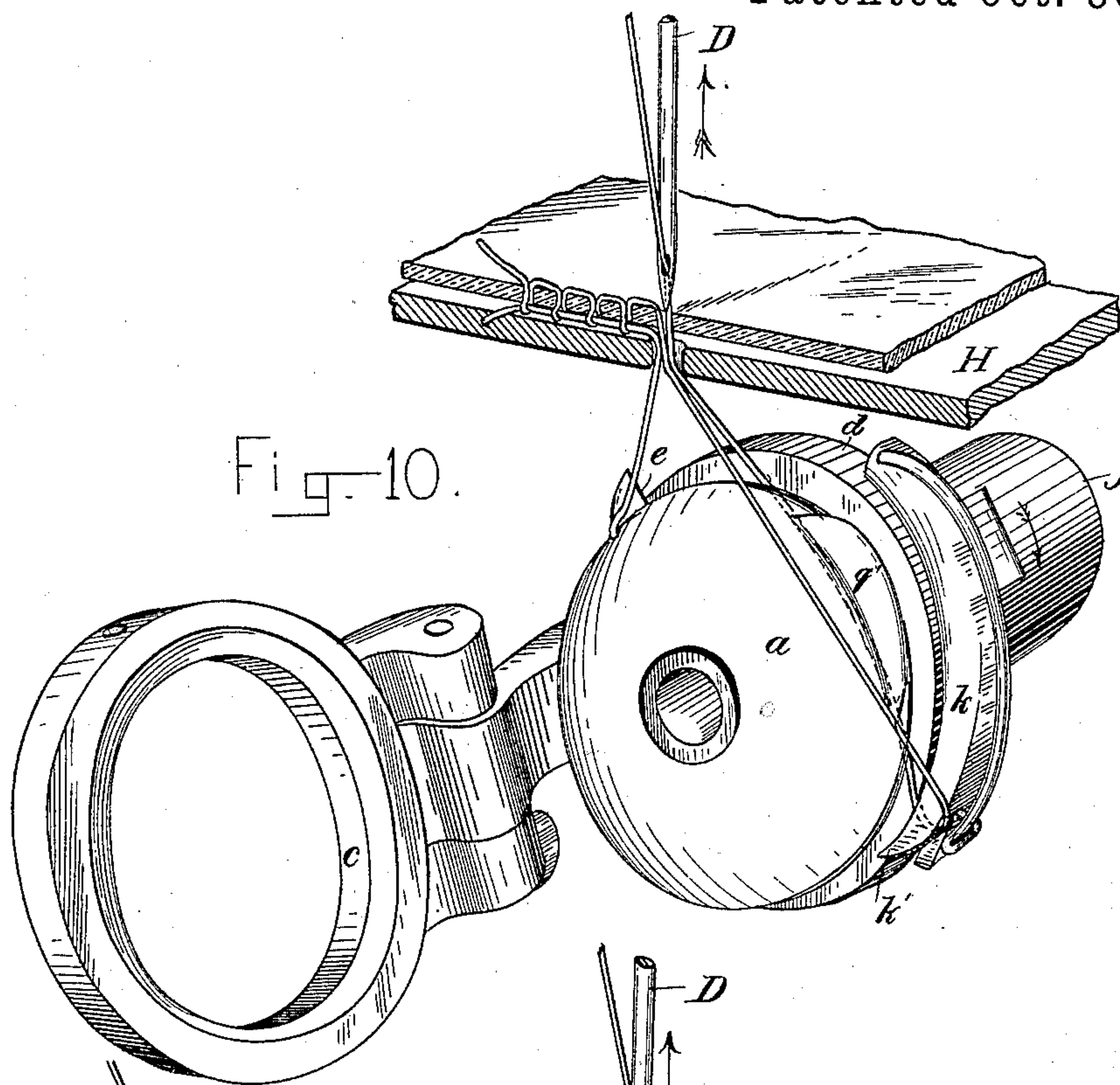


Fig. 12.

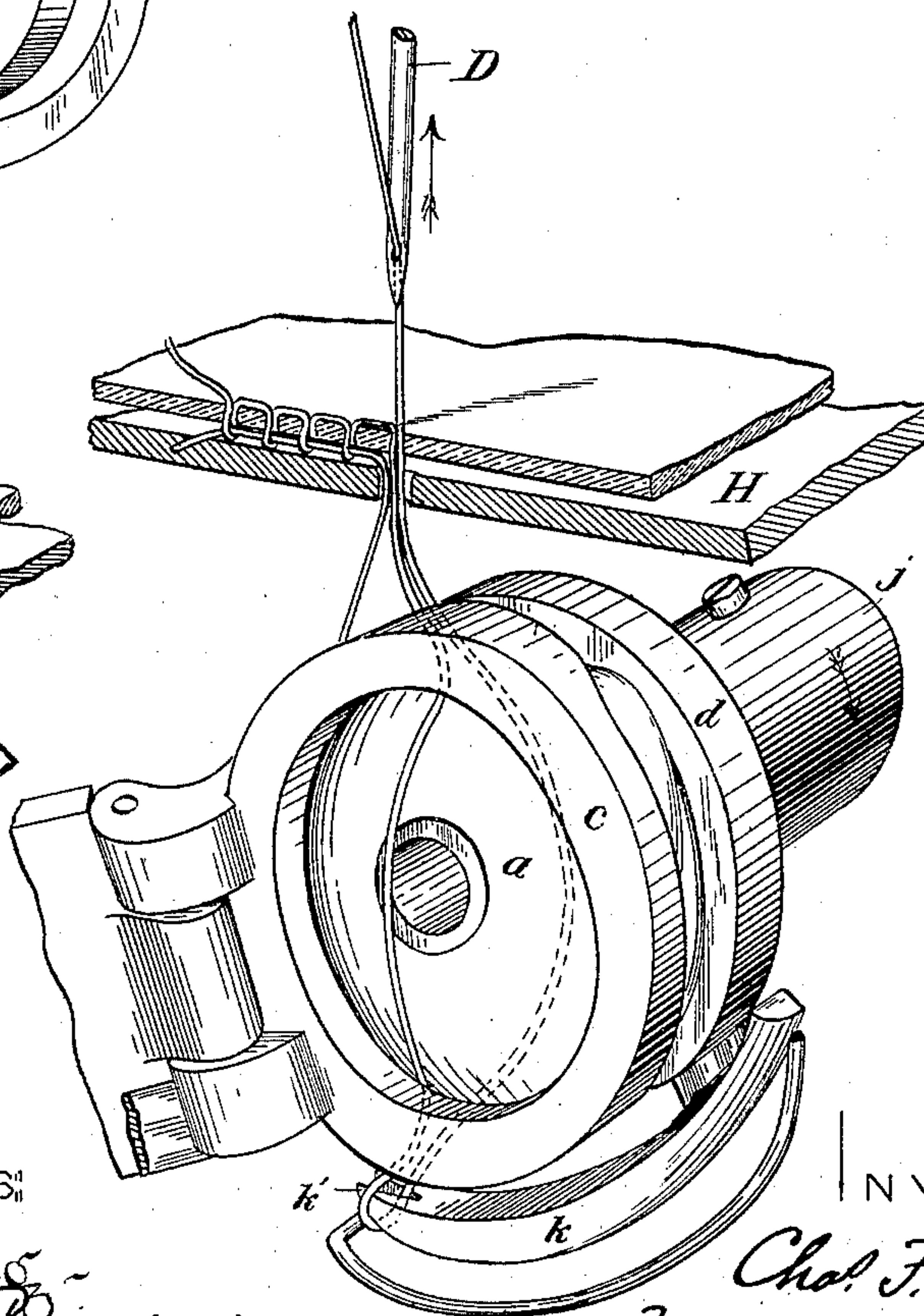


Fig. 11.

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INVENTOR:

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UNITED STATES PATENT OFFICE.

CHARLES F. LITTLEJOHN, OF BRIDGEPORT, CONNECTICUT, ASSIGNOR OF
ONE-HALF TO E. B. WELCH, OF CAMBRIDGE, MASSACHUSETTS.

SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 391,806, dated October 30, 1888.

Application filed December 22, 1886. Serial No. 222,235. (No model.)

To all whom it may concern:

Be it known that I, CHARLES F. LITTLEJOHN, of Bridgeport, in the county of Fairfield and State of Connecticut, have invented
5 certain new and useful Improvements in Sewing-Machines, of which the following is a specification.

My invention relates to sewing-machines of the class known as lock-stitch machines, in
10 which the loop of the upper thread is carried around a stationary bobbin, on which the under thread is wound.

It is the object of my invention to effect improvements which will insure entire freedom
15 of the thread from contact with oil or any of the lubricated parts.

It is also the object of my invention to effect improvements touching the points of simplicity of construction and certainty and rapidity
20 of operation.

To these ends my invention consists in the improvements hereinafter described, and pointed out in the claims.

Reference is to be had to the accompanying
25 drawings, and to the letters of reference marked thereon, forming a part of this specification, similar letters indicating similar parts wherever they occur.

Of the drawings, Figure 1 represents a front
30 end view of a sewing-machine embodying my invention. Fig. 2 represents a side view, partially in section, of the front end of a sewing-machine equipped with my improvements. Fig. 3 is a diagram of the bottom of the bobbin-case holder. Fig. 4 is a section on the
35 line 2 2 of Fig. 5. Fig. 5 is a diagram of the front of the bobbin-case and rear portion of the bobbin-case holder, parts being represented as broken away. Fig. 6 is a top plan
40 view of a portion of the bobbin and bobbin-case. Figs. 7 to 12, inclusive, are diagrams in perspective, showing the construction of the parts immediately concerned in the formation of the stitch and the successive steps pursued in the accomplishment of that function.

The arrows marked on the several figures of the drawings indicate the directions of movement of the various parts.

In the drawings, A represents the bed of
50 the machine; B, the overhanging arm; C, the

needle-bar; D, the needle; E, the tension for the upper thread; F, the take-up; G, the presser-foot, and I the feed-dog. These parts serve the purpose and perform the functions common thereto in all sewing-machines in
55 which they are found, and may be actuated by any suitable mechanism calculated to effect their requisite movements, the character of which is so well understood as not to need particular explanation.

In carrying out my invention I provide a bobbin-case, *a*, which, as common in devices of this character, covers one side and the mouth or opening between the sides of the bobbin *b*. The bobbin-case *a* is held in position
60 between the two walls *c d* of the bobbin-case holder in such position that a thread may be freely carried therearound, and to maintain the bobbin-case in stationary position—that is, so as to keep it from turning in the bobbin-case holder—said bobbin-case *a* is provided
65 on its rear edge and a little back of and below its highest point with a horn, *e*, adapted to rest in a recess, *f*, formed in the rear wall, *d*, of the bobbin-case holder. The front wall, *c*,
70 of the bobbin-case holder is hinged or pivoted at *g* to a suitable bracket, *h*, formed on or attached to the bed A, and the free end of a spring, *i*, bears on the heel of the hinge portion of the wall *c*, so that when the case-holder
80 is opened by moving said wall on its pivot or hinge it will be yieldingly held at an angle of about forty-five degrees to its normal position, to facilitate the manipulations necessary in removing and replacing the bobbin and
85 bobbin-case.

j indicates a rock-shaft provided on its forward end with a hook, *k*, constructed and arranged to move around in a line concentric with and near to the upper forward and lower
90 portions of the periphery of the bobbin-case holder. A wire guard, *l*, is attached to the forward end of the hook *k* on the side farthest from the needle, and extends upward or outward toward the front end of the machine and
95 rearwardly, for a purpose to be presently explained.

To provide a tension for the bobbin-thread, I construct a spring, *m*, adapted to extend up
100 along and bear against the forward side of horn

e, as shown most clearly in Figs. 4 and 5. Said spring *m* at its lower end is bent at right angles to the part which rests against the side of horn *e*, and said angular part is by preference set into and secured in a recess formed in the periphery of the bobbin-case, and a hole, *n*, is formed through the latter and the angular portion of the spring for the passage of the thread from the bobbin *b*, which thread is pressed between spring *m* and horn *e* and drawn up in slot *o* to the eye *p*, whence it passes between the end of the spring and horn to the work. A screw, *q*, is fitted in a screw-threaded hole formed in the horn *e*, the forward or inner end of which screw rests against the inner side or face of spring *m*, and serves as a means of regulating the force with which said spring bears against horn *e* and governs the tension on the bobbin-thread.

The bobbin-case *a* is provided on its edge or periphery with a rib, *q'*, as best seen in Fig. 10, and the opposing edges of the walls *c d* of the bobbin-case holder are cut away somewhat at the lower outer portion, as shown at *r s*, Fig. 3.

As is shown, a hole, *c'*, is formed in the wall *c* of the bobbin-case holder at a point directly under the needle. This feature serves the double purpose of first furnishing provision whereby the needle is permitted to descend to the lowest point of its downward movement, as clearly represented in Fig. 9, and, secondly, it serves as a guide to prevent the needle from springing over against and beyond the line of travel of the point of the hook, thereby insuring that the hook shall not in its forward movement catch the needle and break it. To make the hole *c'* fully answer the purpose of a guide to the needle in the movements of the latter, the walls of said hole are funnel-shaped—that is, said hole is made larger at the top than at the bottom, and its sides are gradually inclined, as best shown in Fig. 12; or an inclined projection, *c''*, may be formed on the wall around the hole *c'*, as shown in Figs. 7 and 12, though a hole with parallel sides formed in the wall *c* large enough to permit the passage of the needle and thread would answer ordinary circumstances.

The operation of my invention is as follows: A stitch having been formed and the parts being in the position represented in Fig. 7, the needle descends and simultaneously therewith the hook moves upward around the periphery of the walls *c d* of the bobbin-case holder, the end of wire guard *l* passing to the forward side of the bobbin-thread, as shown in Fig. 8, in order to move and hold said thread out of the way of the point *k'* of the hook *k* as said hook moves forward to catch the loop thrown out from the side of the needle, as pictured in Fig. 9. As now hook *k* moves around in the direction of the arrows in said last-mentioned figure, the portion of the loop drawn directly from the eye of the needle will fall to the right of rib *q* on the bob-

bin-case, and as said hook moves still farther in the direction of the arrows the other portion of the loop will fall the other side of said rib *q*, (see Fig. 10,) and the two strands of the loop thus separated and guided with certainty to opposite sides of the bobbin-case. The hook continues in its movement, carrying the loop around the bobbin-case to the position represented in Fig. 11, at which point the take-up begins to act, drawing the loop off the hook and up around the bobbin-case, as shown in Fig. 12, forming, in connection with the bobbin-thread, a lock-stitch, when the hook returns and the operation described is repeated. The walls of the bobbin-case holder being cut away, as represented at *r s*, Fig. 3, prevents the strands of the loop from rubbing against said walls, as they otherwise would when the hook moves around to the position in which it is represented in Fig. 7.

By the means shown and described I am enabled to dispense entirely with a lubricant for the parts carrying the lower thread, as also the parts immediately associated therewith and concerned in the formation of the stitch, and so insure the use of thread absolutely free from oil—a thing quite impossible when the shuttle rotates, or oscillates, or reciprocates.

Other points of advantage resulting from my improvements are simplicity of construction and certainty and rapidity of operation.

It is obvious that my invention is not dependent upon the precise form and arrangement of the parts shown and described, as these may be varied without departing from the nature or spirit of the invention.

Having thus described my invention, what I claim is—

1. The combination, with a reciprocating needle and an oscillating hook, of a bobbin-case holder provided with a recess or notch, *f*, a bobbin-case held loosely in the bobbin-case holder, and provided with a horn, *e*, projecting from its periphery, which horn is arranged to rest in said recess or notch to maintain the bobbin-case at all times in proper operative position, substantially as set forth.

2. A bobbin-case provided with a horn forming an integral part of the bobbin-case and projecting from the periphery thereof, combined with a bobbin-case holder provided with a recess, *f*, in which said horn is adapted to rest, and a tension-spring, *m*, secured to the periphery of the bobbin-case, substantially as set forth.

3. The combination, with a reciprocating needle and an oscillating hook, of a bobbin-case holder consisting of the circular walls *c d* and a non-rotating bobbin-case, *a*, in said holder, provided on its edge or periphery with the rib *q*, whereby the two strands of the loop will be properly separated and guided around the bobbin-case, substantially as set forth.

4. The combination, with a reciprocating needle and an oscillating hook, of a bobbin-case holder consisting of the circular walls *c*

d, provided with the notch *f*, and a bobbin-case holder *a*, having a horn, *e*, arranged to rest in said notch to hold the bobbin-case from rotating, and provided with a rib, *g*, on its periphery, substantially as hereinbefore set forth.

5. The combination, with a reciprocating needle and an oscillating hook, of a bobbin-case holder consisting of the circular walls *c* *d* and a non-rotating bobbin-case, *a*, held therein, said circular walls *c* *d* cut away at the lower side, as at *r s*, whereby the hook will be permitted to freely cast its loop when it arrives at a point below the bobbin-case holder, substantially as set forth.

6. The combination, with a reciprocating needle and an oscillating hook, of a bobbin-case holder consisting of the circular walls *c* *d*, cut away on the under side at *r s* and having the notch *f*, and a bobbin-holder, *a*, provided with a horn, *e*, arranged to rest in said notch, and having a rib, *g*, on its periphery, substantially as set forth.

7. The combination, with a reciprocating needle, a stationary bobbin-case holder, a non-rotating bobbin-case therein, and a bobbin loose in said case, of an oscillating hook pro-

vided with a wire guard, *l*, attached by one end to the forward end of the hook, and extending upwardly, outwardly, and rearwardly therefrom, the free end of said guard standing out or away from said hook, whereby the free end of said guard may engage the bobbin-thread as the hook moves upward and backward, to hold said thread out of the way of the point of the hook as the latter moves to catch the loop thrown out by the needle, and release said thread as the hook moves forward and downward, substantially as set forth.

8. The combination, with the reciprocating needle and an oscillating hook, of a bobbin, bobbin-case, and bobbin-case holder, consisting of two circular walls, *c* *d*, the latter wall being provided with a hole or recess, *c'*, and an inclined or funnel-shaped projection, *c''*, substantially as hereinbefore set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 14th day of December, A. D. 1886.

CHARLES F. LITTLEJOHN.

Witnesses:

WALTER NICHOLS,
C. R. MORRIS.