

No. 677,886.

Patented July 9, 1901.

H. P. RICHARDS.
LOOPER FOR SEWING MACHINES.

(Application filed Apr. 15, 1898.)

(No Model.)

4 Sheets—Sheet 1.

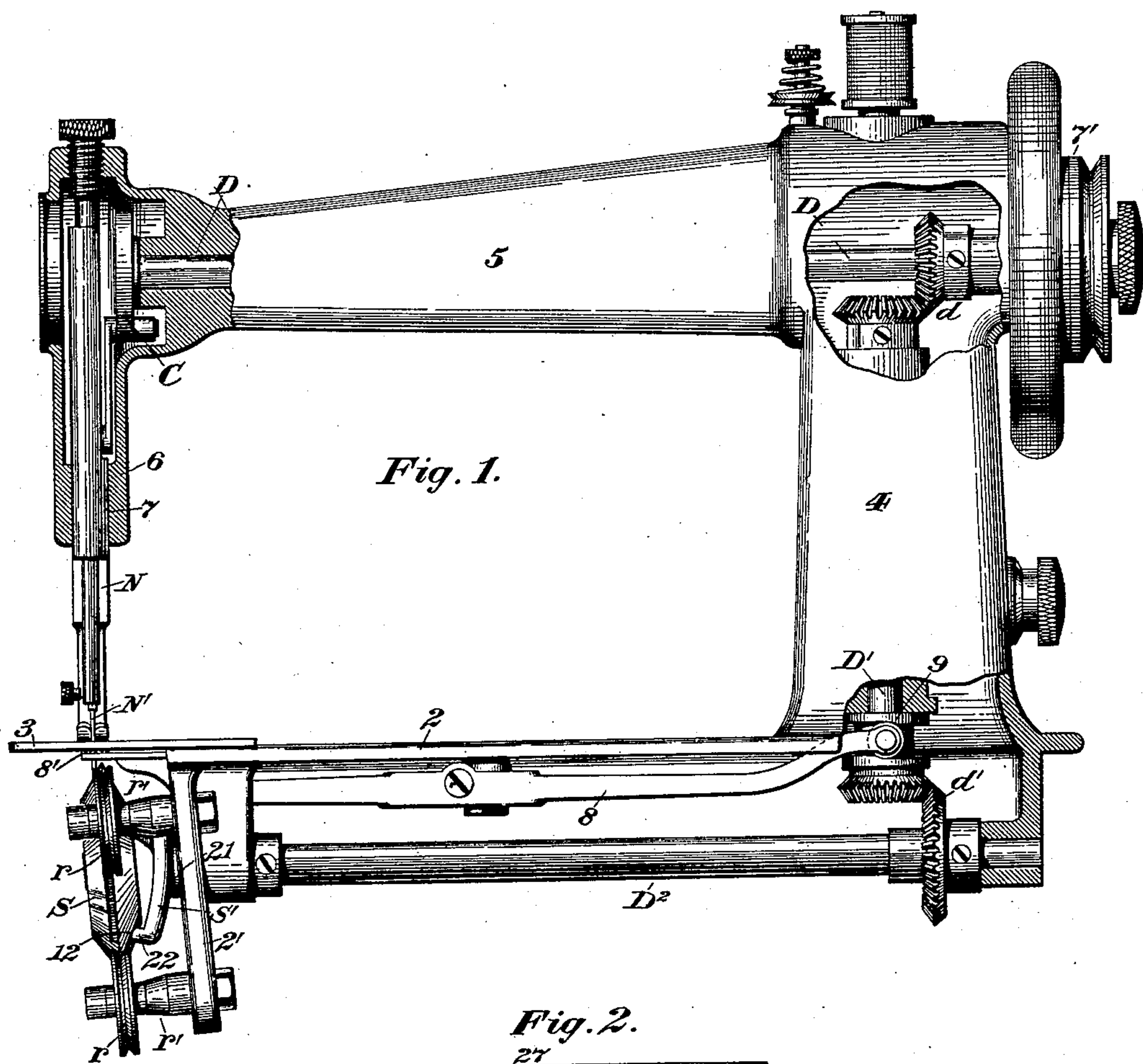


Fig. 2.

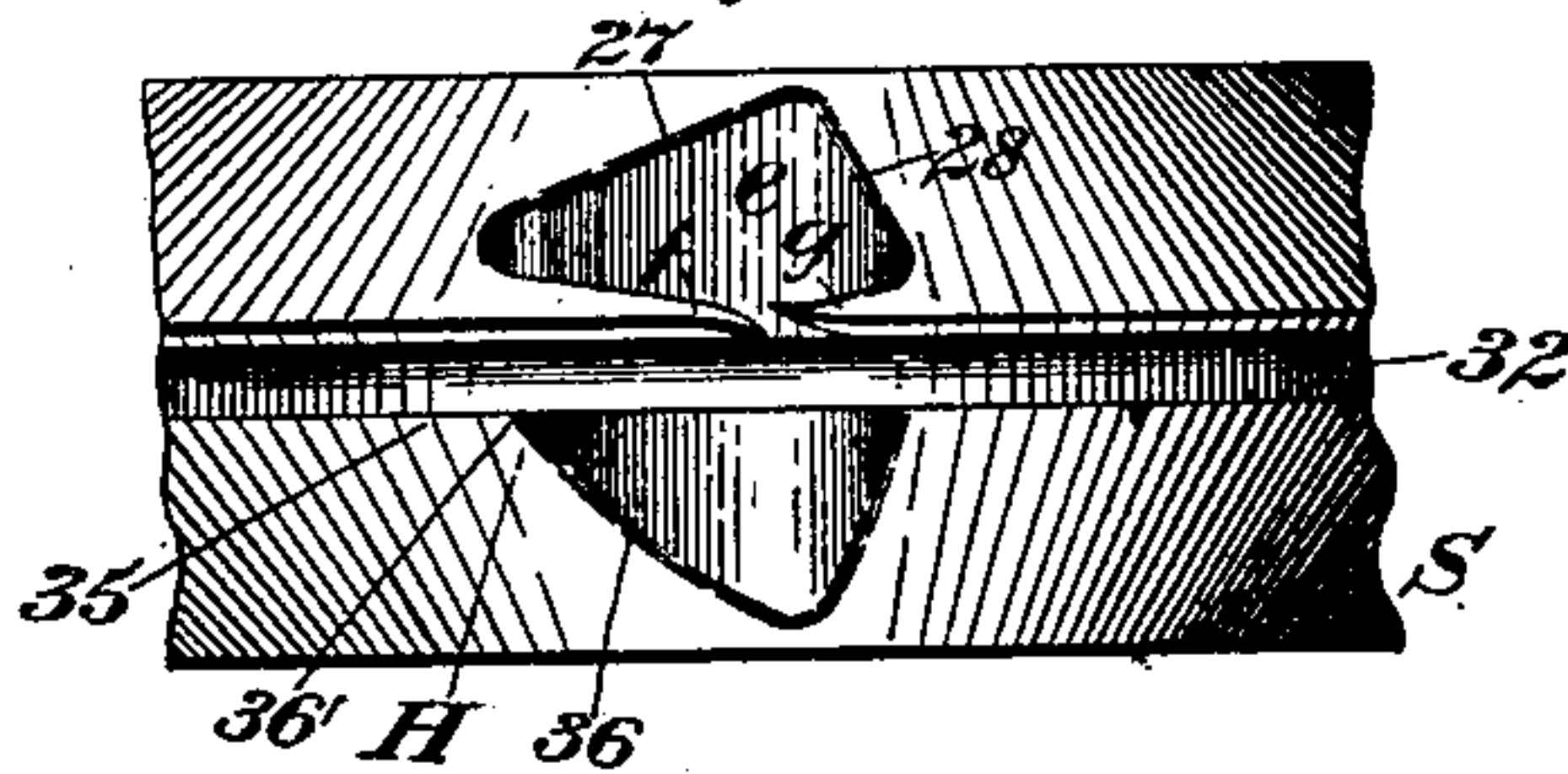
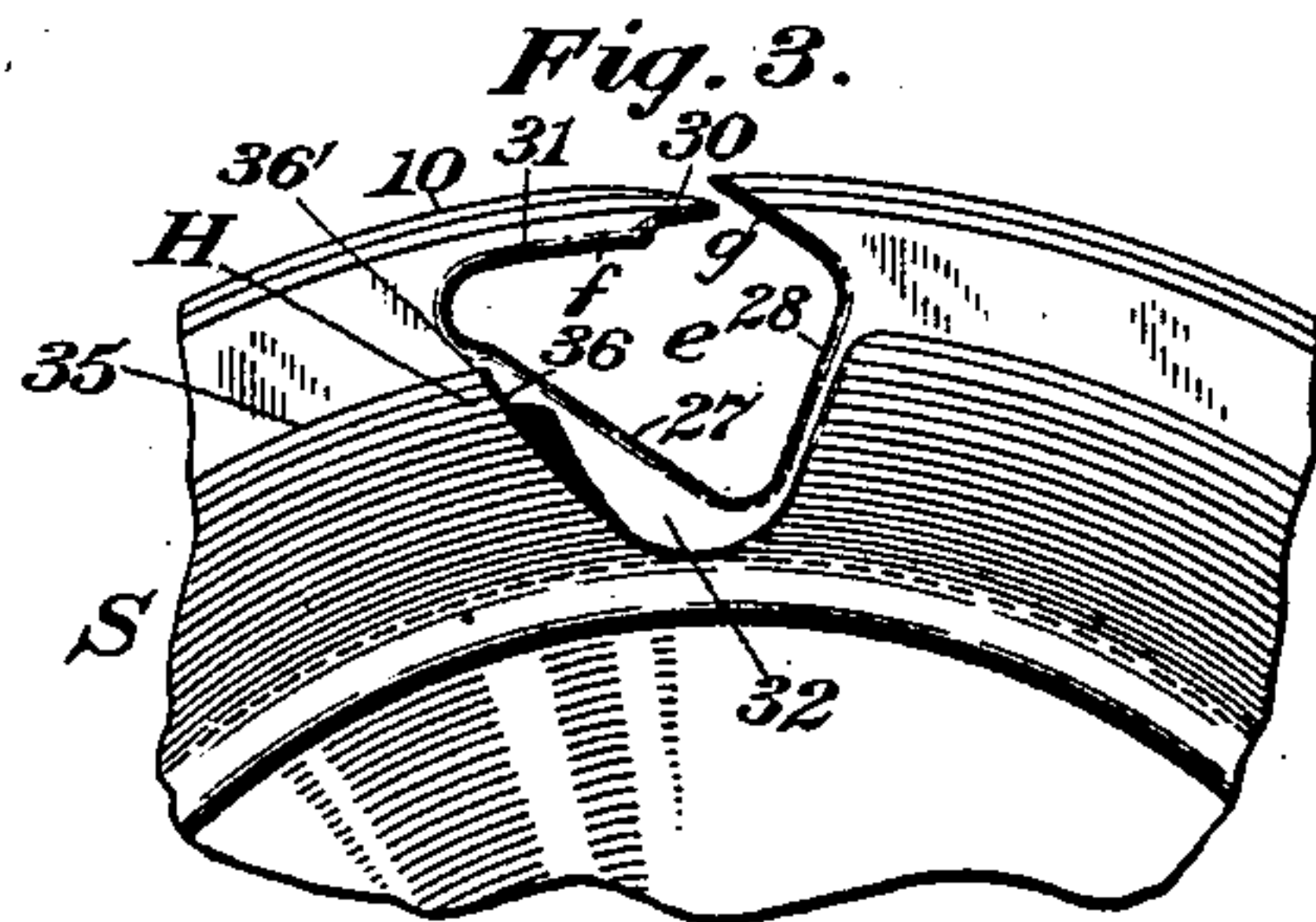


Fig. 3.



Witnesses.

Chas. F. Schuch
J. L. Edwards Jr.

Inventor:

H. P. Richards.

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Fig. 4.

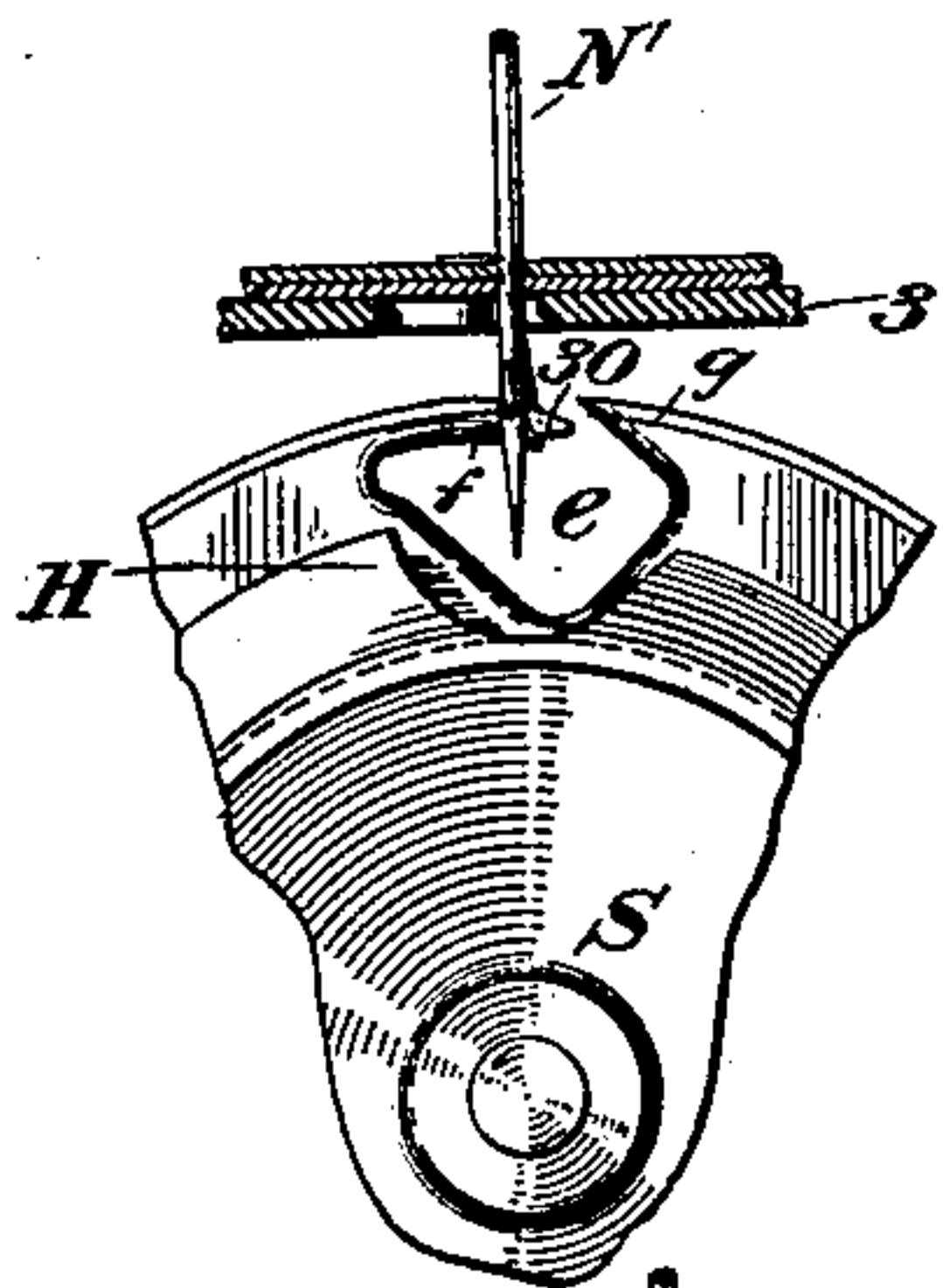


Fig.5.

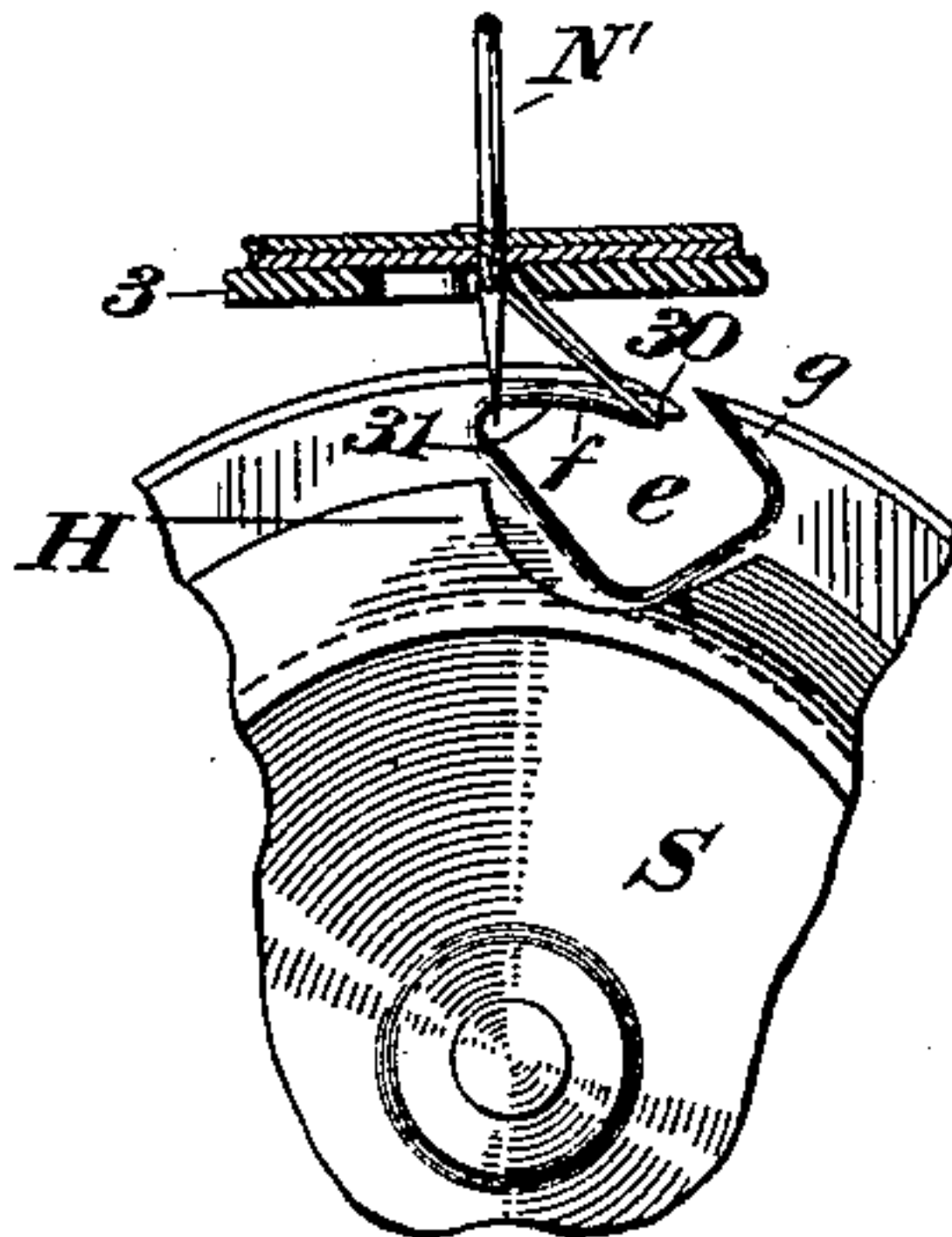


Fig. 6.

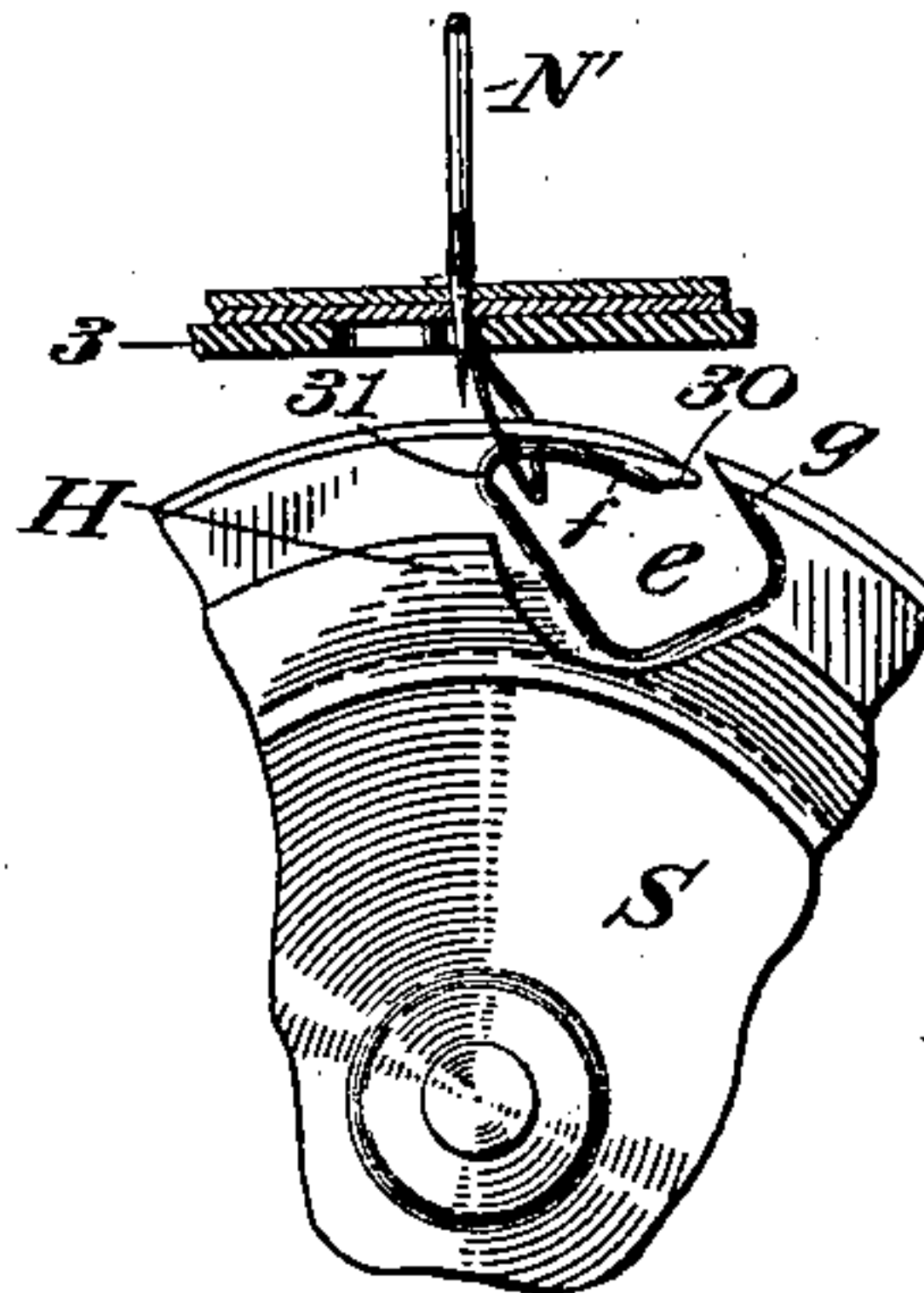


Fig. 7.

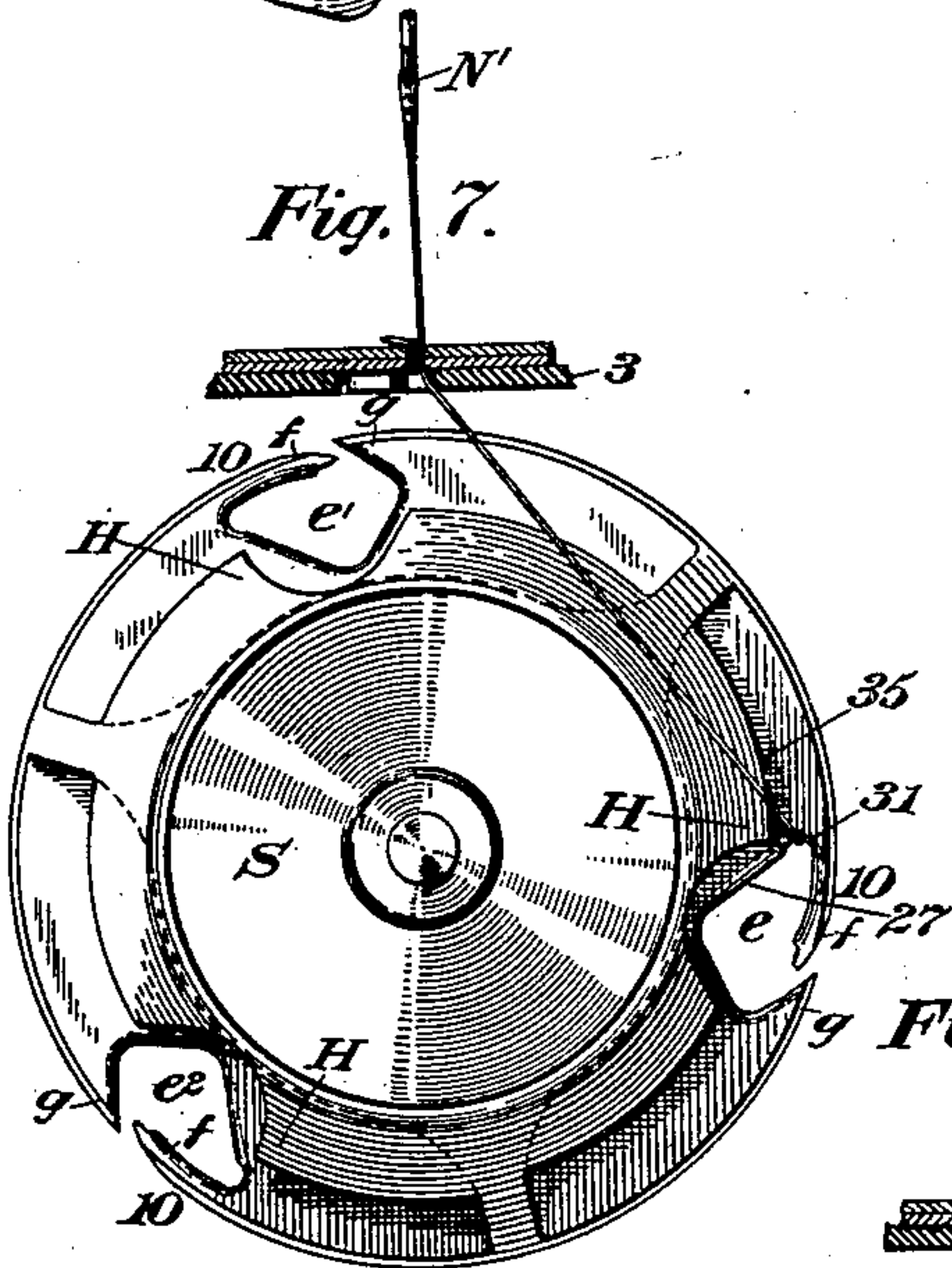


Fig. 8.

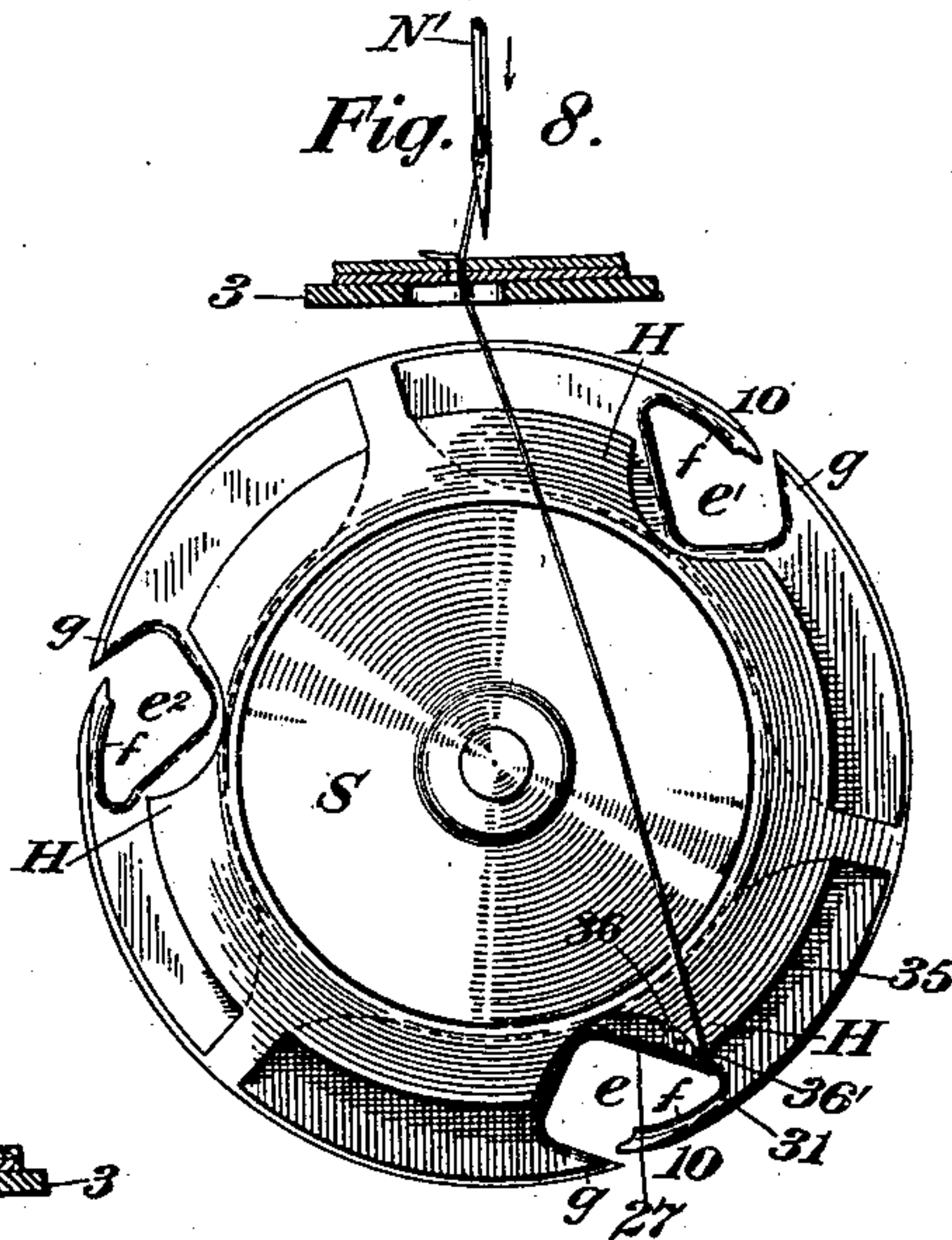
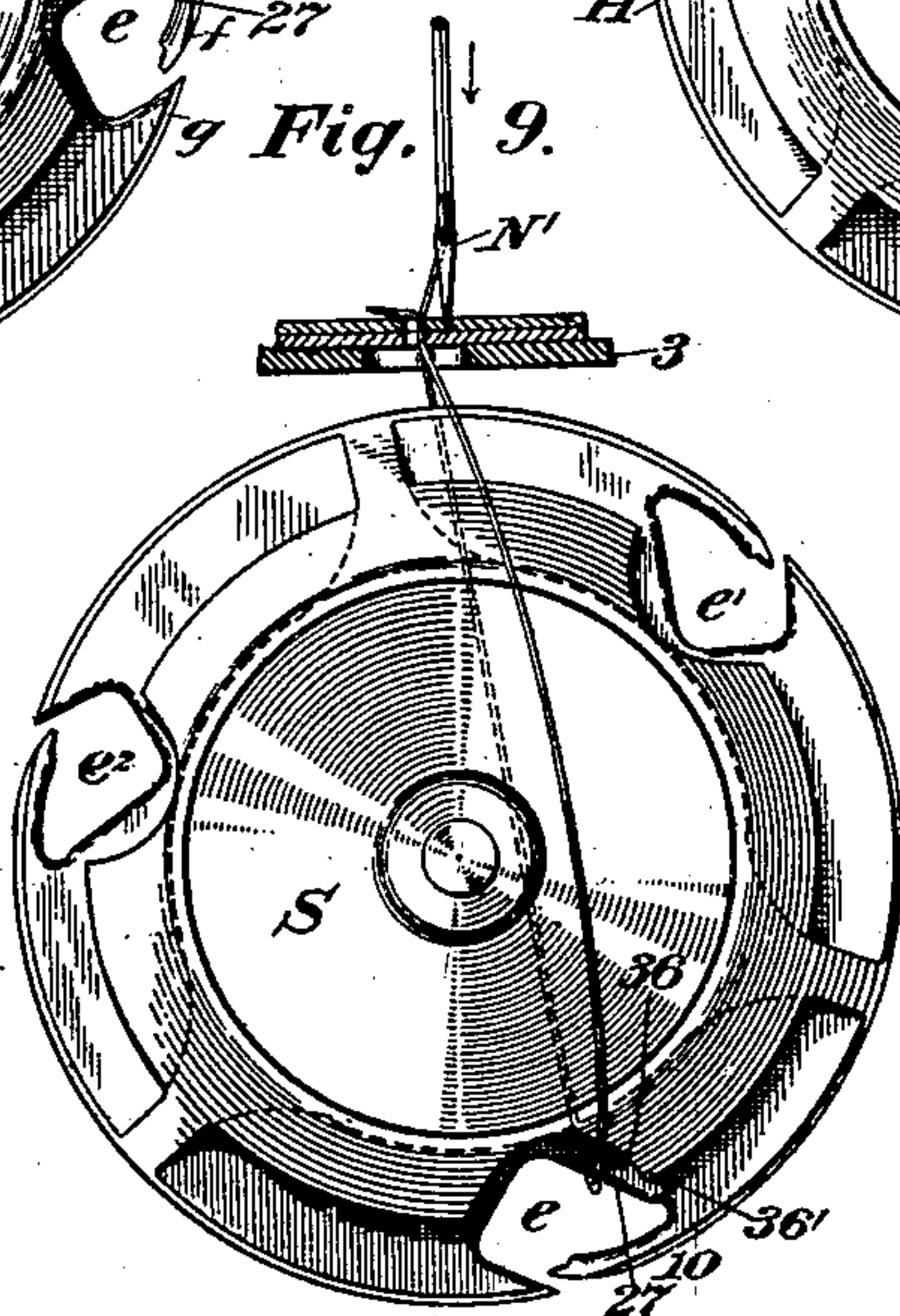


Fig. 9.



Witnesses
Chas. F. Schurely
J. L. Edwards Jr.

Inventor
H. P. Richards.

No. 677,886.

Patented July 9, 1901.

H. P. RICHARDS.
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Fig. 10.

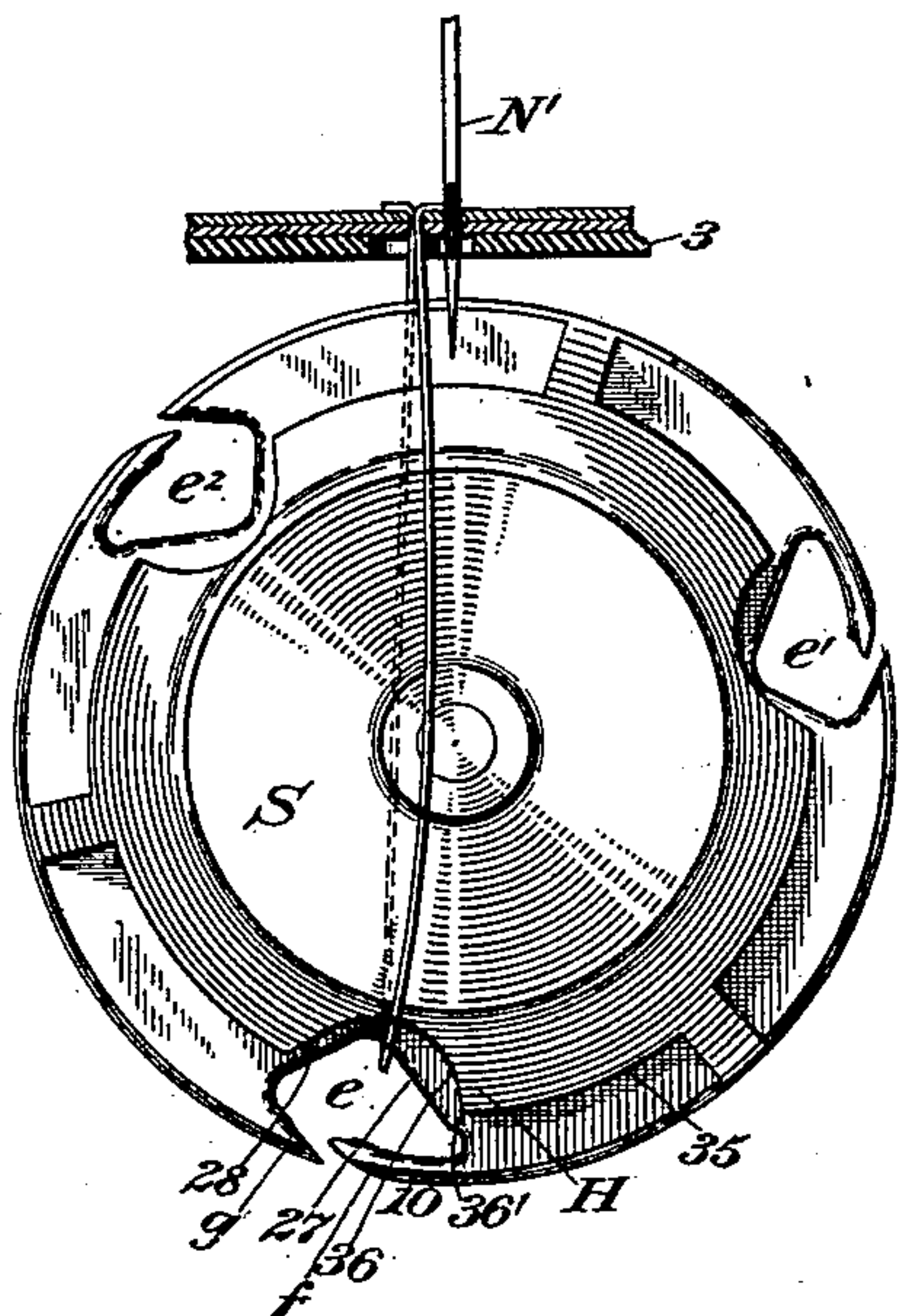


Fig. 11.

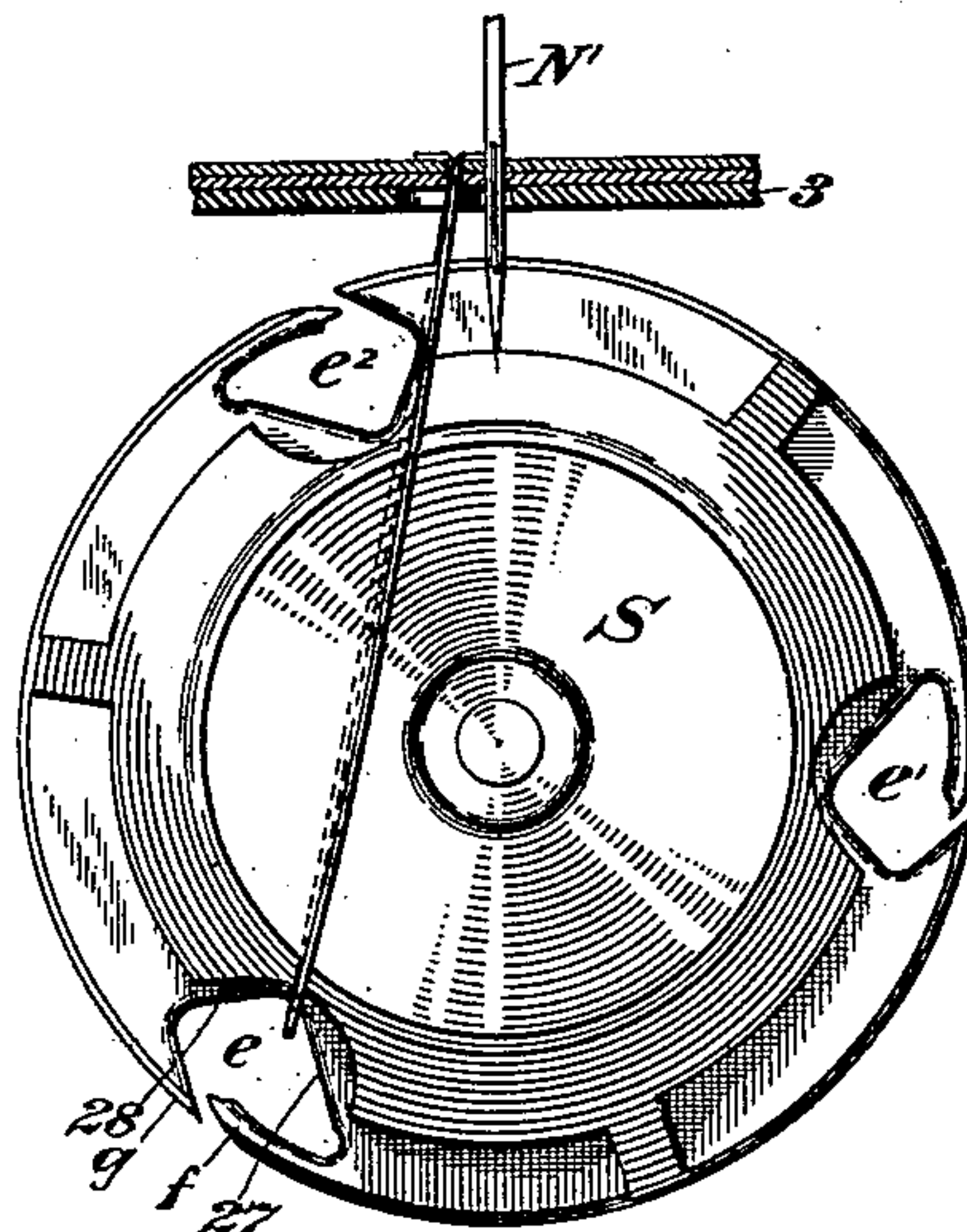


Fig. 12.

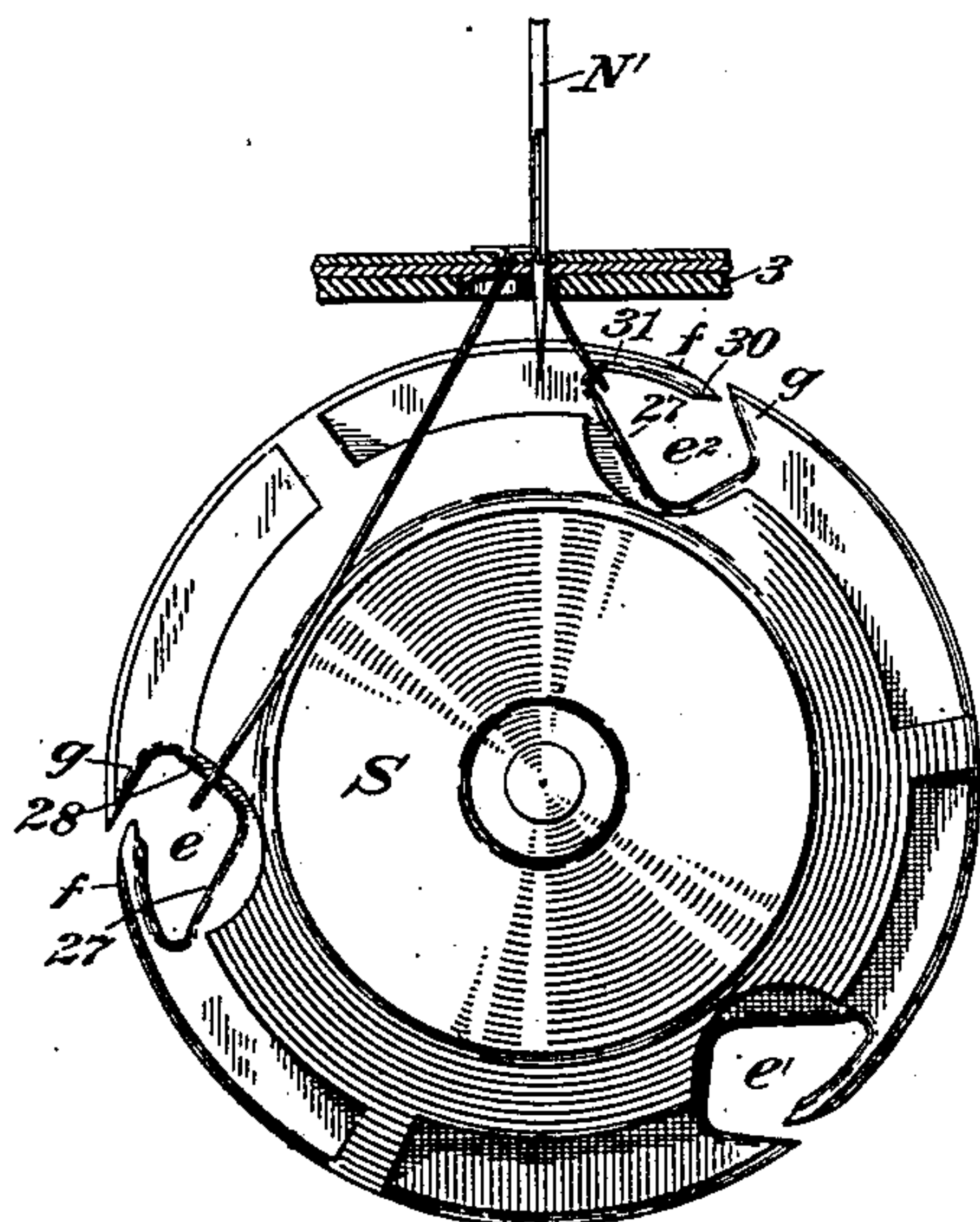
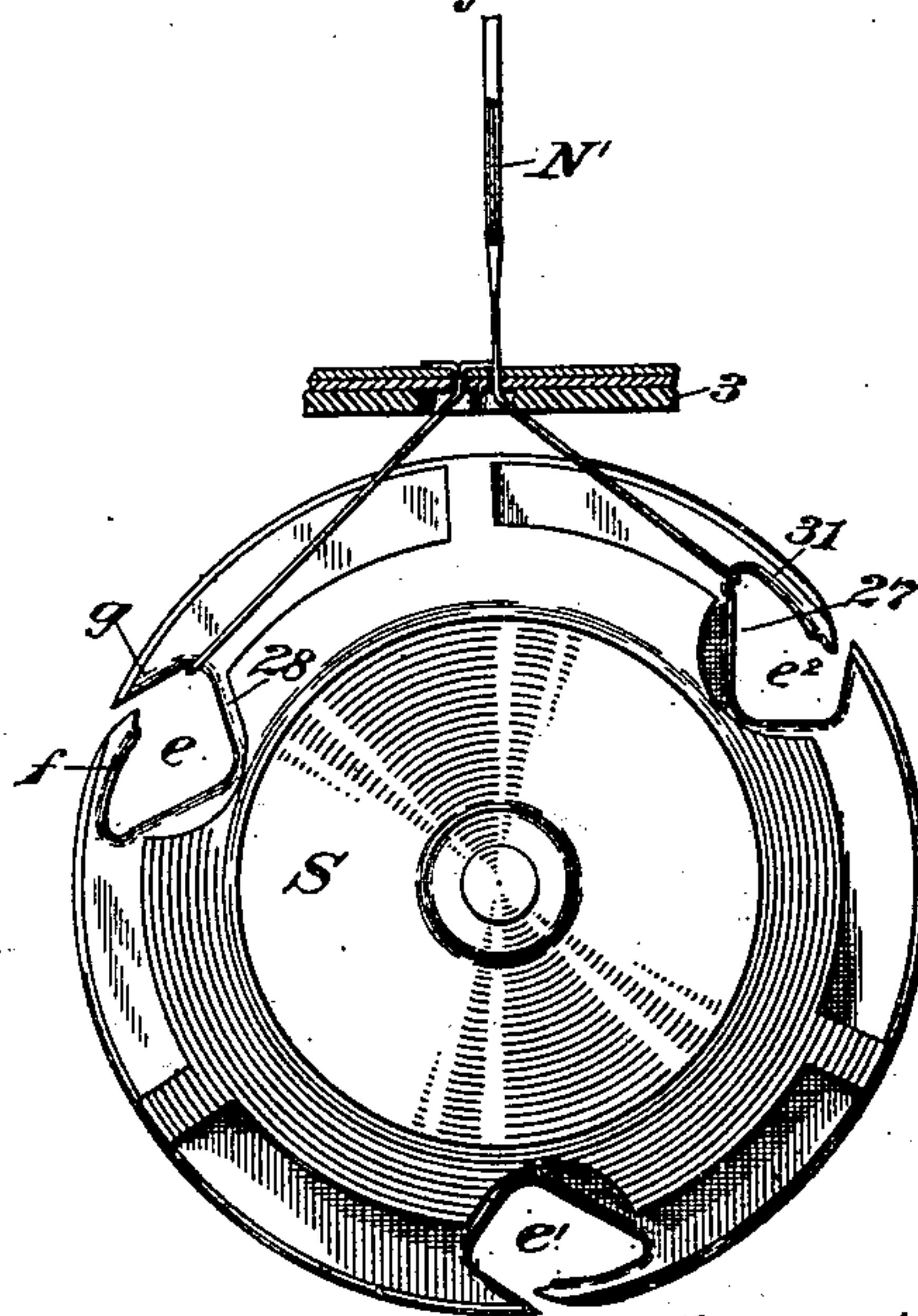


Fig. 13.



Witnesses:
Chas. F. Shultz
J. L. Edwards, Jr.

Inventor
H. P. Richards.

No. 677,886.

Patented July 9, 1901.

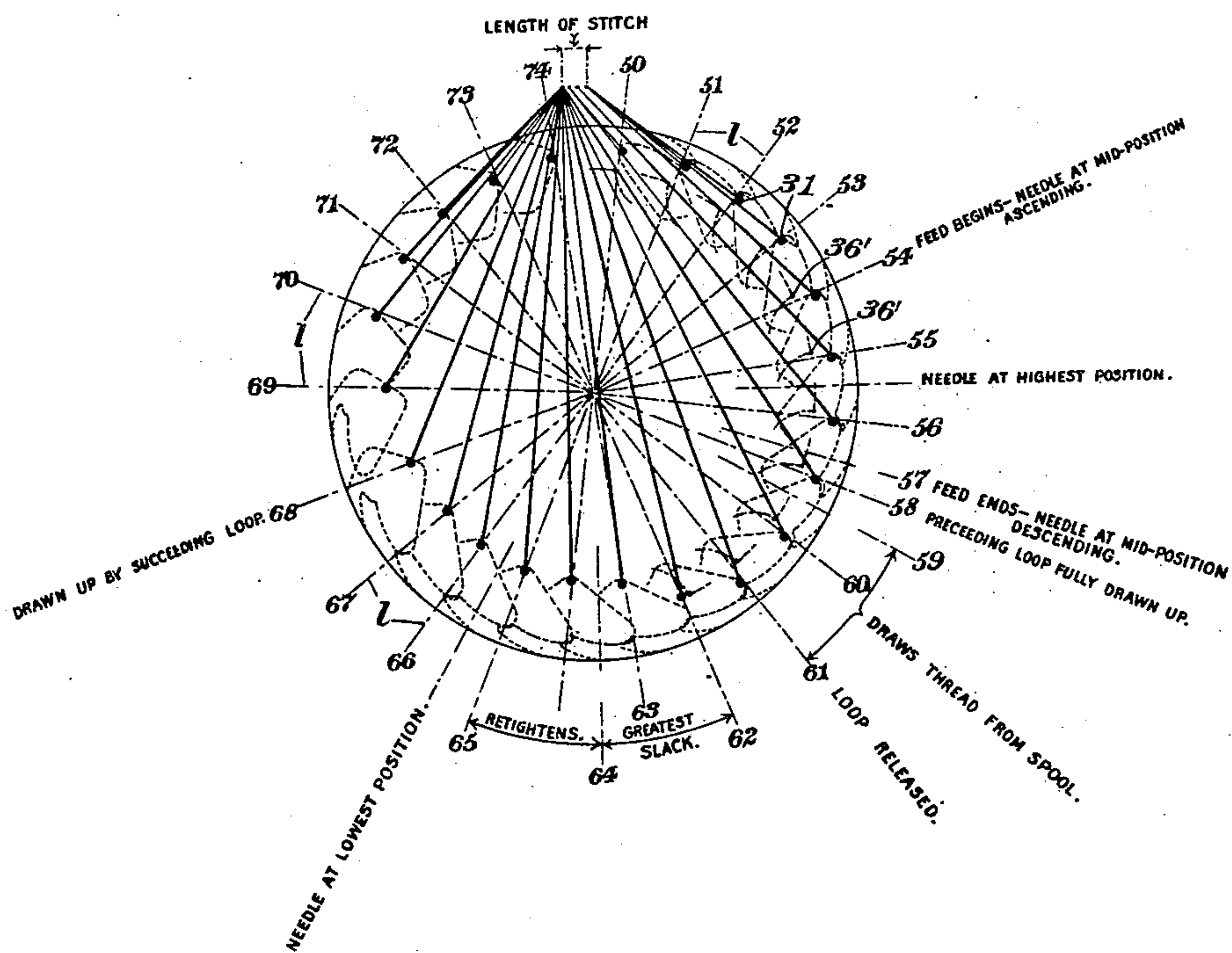
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4 Sheets—Sheet 4.

(No Model.)

Fig. 14.



Witnesses

Chas. F. Schuch
J. L. Edwards Jr.

Inventor

H. P. Richards

UNITED STATES PATENT OFFICE.

HUBERT P. RICHARDS, OF NEW BRITAIN, CONNECTICUT, ASSIGNOR TO J. EVARTS TRACY, OF PLAINFIELD, NEW JERSEY.

LOOPER FOR SEWING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 677,886, dated July 9, 1901.

Application filed April 15, 1898. Serial No. 677,729. (No model.)

To all whom it may concern:

Be it known that I, HUBERT P. RICHARDS, a citizen of the United States, residing in New Britain, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Loopers for Sewing-Machines, of which the following is a specification.

This invention relates to a sewing-machine of a class such as described, for instance, in Letters Patent of the United States No. 574,573, granted to Francis H. Richards January 5, 1897, to which reference may be had, in which machine the stitch-making mechanism includes a rotary looper having a series of loop-takers or hooks and in which the succeeding loops of the needle-thread are engaged by said loop-takers or hooks to be carried around the looper to inclose a second or lower thread to form a "lock-stitch" or carried through preceding loops to form a "chain-stitch" or a "chain lock-stitch;" and the essence of my present invention more particularly resides in the looper for a sewing-machine of this general class.

In rotary looper mechanisms generally, and more particularly in stitch-making mechanisms such as described in the patent referred to, the only means employed for determining, and this in a very indefinite and unsatisfactory manner, the positions at which successive loops are released or slackened during the rotation of the looper has been the loop-takers or hooks themselves or their loop-holding portions, and no loop-takers or hooks of the looper have heretofore been provided which would positively insure the release or the termination in the drawing out of the successive loops at a predetermined definite point in the rotation of the looper and in the proper time with relation to a predetermined position of the needle, so as to determine with accuracy the exact length of each succeeding loop and limit the amount of thread drawn from the spool immediately following the complete drawing up of the preceding loop or the completion of the preceding stitch. Consequently in stitch-making mechanism of this class as heretofore constructed and organized the difficulty or disadvantages experienced by the indefiniteness as regards

the point of location in the orbit of the loop-takers or hooks at which succeeding loops have been released or slackened has been such as to greatly impair the successful operation and commercial value of the machine. Practical experiments have demonstrated the fact that no dependence could be placed upon the hooks or loop-carrying portions thereof alone for carrying the successive loops during the rotative movement of the looper up to a predetermined point and in a drawing-out position on the hook and then suddenly releasing or slackening said loops; but, on the contrary, the successive loops would be released or slackened at different points in the orbit of the hooks, consequently resulting in the drawing out of said loops to different lengths, this frequently resulting in a deferred completion of the preceding stitch, a premature drawing down of thread from the spool, and a breaking of the thread through the undue strain imposed upon it by thread for the succeeding loop being drawn from the preceding loop and from the spool at the same time. A further disadvantage heretofore experienced in this class of mechanism and resulting from the uncertainty both as to time and position at which successive loops are released during the rotative movement of the looper is the formation of too much slack in some loops and too little in other loops to insure the complete drawing up of the preceding stitches by the succeeding loops concurrently with the arrival of the needle and the loop-carrying hook of the looper at predetermined relative positions and the drawing down of a uniform quantity of thread from the spool by a succeeding loop immediately following the complete closing up of the preceding stitch, as is a necessary requirement to perfect the operation of the stitch-making mechanism.

The principal object of my present invention is to furnish an improved stitch-making mechanism including means for overcoming the above-noted disadvantages and difficulties experienced in sewing with this class of stitch-making mechanisms of ordinary construction and organization.

A further object of my present invention is to provide in a sewing-machine improved

stitch-making mechanism comprising needle mechanism embodying a reciprocatory needle, complementary looper mechanism operable in proper timing with the needle mechanism and embodying a rotary looper having a loop-taker or hook disposed to engage the successive loops of the needle-thread and for carrying the same around said looper, and means independent of but cooperative with the loop-taker or hook for holding the loop at the loop-carrying portion of said hook and in a drawing-out position during the movement of the looper through a predetermined arc and until said looper and needle arrive at predetermined relative positions and for suddenly releasing and thereby terminating the farther drawing out of said loop immediately upon the arrival of said hook and needle at such position.

In the drawings accompanying and forming part of this specification, Figure 1 represents, in front elevation, partially in section, a sewing-machine embodying my improved stitch-making mechanism. Fig. 2 is an edge view, on an exaggerated scale, of a portion of a looper of the stitch-making mechanism embodying my invention. Fig. 3 is a side view of that portion of the looper shown in Fig. 2. Figs. 4 to 13, inclusive, are detail views illustrating successive positions of the looper, needle, and loop during one complete cycle of movements thereof or during the operation of forming one stitch, and Fig. 14 is a graphical diagram illustrating a series of successive positions of one loop during one complete rotation of the looper and indicating the relation of the bight of said loop to the holding portion of the hook or loop-taker carrying said loop.

Similar characters designate like parts in all the figures of the drawings.

Preparatory to a detailed description of the construction, organization, and operation of the several elements comprised in my improvements it is desired to state that the term "rotary looper" as employed in this specification and in the annexed claims signifies any suitable device for engaging and so manipulating the successive loops of the needle-thread as to form in connection with the needle mechanism successive stitches, and which device may be in the nature of a shuttle and embody means for carrying a second or lower thread, as required for making a lock-stitch, or may be constructed without means for carrying the second or lower thread and be operable for making a chain-stitch.

The looper mechanism in which the essence of my present invention resides is applicable to various kinds of sewing-machines; but for convenience this mechanism is shown in connection with a sewing-machine which in general construction, organization, and operation is substantially the same as that described in the Patent No. 574,573, hereinbefore referred to, only so much of the machine being shown in the accompanying drawings as is deemed necessary clearly to illustrate the application

and mode of operation of the looper mechanism with relation to the cooperative elements of said machine, reference being had to the patent referred to for a more complete understanding of the operation of those features of the machine which are only briefly described herein.

The framework of the machine, which may be of any suitable construction, is shown comprising a horizontal bed-plate 2 at one end thereof, having a bracket 2', a throat-plate 3 at one end thereof, the hollow upright 4 at the opposite end of the bed-plate, the hollow horizontal arm 5 above the bed-plate, and the vertical needle-bar-receiving head 6 at the outer end of the arm 5 and above the throat-plate 3.

As in the majority of sewing-machines of the class specified, the stitch-making mechanism as a whole comprises three cooperative mechanisms—to wit, the needle mechanism, the looper mechanism, and the feeding mechanism—all of which are connected for cooperative and properly-timed movements.

The needle mechanism shown in the accompanying drawings comprises a needle-bar N, supported for reciprocatory movements preferably in a tubular presser-bar 7, in turn supported for vertical movements in the head 6 of the frame, said needle-bar having a needle N' at the lower end thereof, a needle-bar-actuating shaft D, journaled in the arm 5 of the machine, and a connecting-actuator C (shown as a crank and arm) between said shaft and needle-bar, the needle-bar-actuating shaft being shown furnished with the band-wheel 7', whereby the same may be driven.

The feed mechanism is shown comprising a universal feed-lever 8, having a feed-bar 8' at the forward end thereof and actuated by a cam 9, fixed to a vertical shaft D', connected by a one-to-one train of gears d to the needle-bar-actuating shaft D.

The looper mechanism is shown comprising a looper S, a combined looper-support and driver S', disposed with its axis oblique to the axis of rotation of the looper, and a driver-actuating shaft D², shown connected by a two-to-three train of gears d' to the intermediate or feed-lever-actuating shaft D'.

In the drawings, the looper S is shown set to rotate in a path the plane of which is oblique to the path of movement of the needle N', and the looper-driver is shown disposed with its axis in a horizontal plane; but it will be obvious that the looper may be disposed in a vertical plane corresponding to the vertical path of the needle and the driver being disposed at an angle thereto, if desired.

For convenience the looper S is shown in the accompanying drawings located between a series of circumferentially-disposed rolls, each of which is designated by r , which rolls are supported on studs r' , fixed to the bracket 2'.

The looper S is shown having a series of

three peripherally-disposed loop-takers or hooks, each of which is designated by 10, and also has in the inner side face thereof a series of recesses or driver-sockets, preferably three in number, each of which is designated by 12, adapted for receiving drivers or driving-pins on the driver S'.

The looper-driver comprises in the form thereof shown in the accompanying drawings a hub 21, which is fixed to the driving-shaft D², and has a series of radially-disposed arms extending from said hub, and each arm of which has at the outer end thereof a looper-driver or driver-pin 22 corresponding to and adapted to fit a driver-socket in the looper.

The rotary looper or shuttle S, which constitutes an essential element of my present invention, is shown in the accompanying drawings somewhat similar in general conformation to the discoidal loop-taker described in the patent referred to, it being in the nature of a disk having a somewhat V-shaped periphery, and said looper being transversely recessed or cut away, preferably at three substantially equidistant points in the periphery thereof, to form loop-receiving openings or recesses, (designated by *e*, *e'*, and *e''*, respectively.) One wall of each loop-receiving recess is shown formed with an inclined portion 27, which terminates at its outer end in a forwardly-extending loop-taker or hook *f*, and the opposite wall of said recess is formed with an inclined portion 28, which terminates at its outer end in a loop-deliverer *g*, which is oppositely disposed with respect to the adjacent loop-taker or hook *f* of the same recess. In the form thereof illustrated in the accompanying drawings each loop-taker or hook *f* of the looper is made of greater length than has been customary in this class of loopers and has two successive loop-engaging portions 30 and 31, one of which, as 30, is shown as a projection or projecting part or wall located near the extreme forward end of the hook and constitutes a temporary loop-retainer, and the other of which, as 31, is located at the base of said hook or at its junction with the inclined wall 27 and constitutes the loop-carrier proper. The loop-engaging portions 30 and 31 are so disposed relatively to each other and the looper is so timed in its movements with respect to the needle that the forward or loop-engaging portion 30 will engage each succeeding loop of the needle-thread about the time the eye of the needle arrives, during the first stage of its ascending movement, about contiguous to the lower portion of the forward end of the hook, and when the preceding loop has arrived at its greatest slack position and will carry the lower end of said succeeding loop out of the path of the needle and take up a portion of the slack thread contained in the preceding loop during the first stage of said ascending movement of the needle and will release the bight of this loop at about the time the eye of the needle arrives at the un-

der side of the fabric being operated upon, after which the bight of said loop will on the farther advancing movement of the hook be released from this portion 30 of said hook and next be engaged by the rear loop-engaging portion 31 and carried around the looper, as will be understood by reference to Figs. 4, 5, 6, and 14 of the drawings.

To facilitate the movement of the needle in close proximity to one side face of the loop-taker or hook, the looper has a series of needle-receiving grooves 32 formed in the periphery at one side of the loop-takers, as shown in Figs. 1, 2, and 3 and as indicated by dotted lines in Figs. 4 to 13 of the drawings, each needle-receiving groove being disposed in a plane coincident with the path of movement of the needle, as indicated in said figures.

In stitch-making mechanisms of this class embodying a rotary looper it is, as before stated, extremely important that the succeeding loops of the needle-thread be drawn out to corresponding lengths during the rotation of the looper through a predetermined arc and released or slackened at a predetermined definite point in the orbit of the hook carrying such loops, and it is further desirable that each succeeding loop shall have drawn up the preceding loop and completed the preceding stitch before thread is drawn from the spool to complete this loop to provide the slack necessary for the making of the next succeeding stitch, and it is furthermore extremely important that all the succeeding loops shall draw from the spool the same amount of thread—an amount equal to that utilized in each stitch—so that no more thread will be contained in one loop than can be drawn up by the next succeeding loop during the orbital movement of the hook carrying said loop through its loop-drawing-up arc. As a means for insuring the retention of the bight of each succeeding loop in the loop-carrying portion 31 of each hook up to a predetermined point in the orbit of said hook and until said hook and needle have arrived at predetermined relative positions and for suddenly releasing and permitting the slackening of said loop on the arrival of said hook and needle at such predetermined position, I have provided in operative relation with each hook of the looper what may be consistently termed a "combined loop retaining and releasing device," each of which is coöperative during the rotation of the looper with a loop-taker or hook for retaining the loop of the needle-thread in the loop-carrying portion 31 of and in a drawing-out position on the hook until said hook arrives at a predetermined point in its orbit and for suddenly releasing and effecting a slackening of said loop at this point.

In the preferred form thereof (illustrated most clearly in Figs. 2, 3, and 7 of the accompanying drawings) the combined loop retaining and releasing device comprises, pref-

erably, a fixed parti-circular flange H, located at one side and in the rear of the hook *f*, said flange having its outer edge preferably concentric to the axis of the looper and having its side face inclined or convexed and merging into the side face of said looper. This flange comprises a loop-retaining portion 35, terminating at its forward end in a reëntrant quick-let-off portion 36, which is shown extending inward toward the axis of the looper in a curved path at one side of the loop-receiving recess of the hook *f*, the junction of the part 36 with the part 35, forming the let-off point 36', being disposed in such relation with the loop-carrying portion 31 of the hook that during a certain portion of and up to a certain point in the orbital movement of the hook the let-off point of the loop-holding portion 36 will be, owing to such disposition of the looper and the angular position of the loop, slightly in advance of the loop-carrying portion 31 of said hook and slightly in advance of the loop carried by said hook, and on the arrival of the hook at a predetermined point in its orbital movement the point 36' will, on account of the change in angular position of the loop, be in a position substantially coincident with or slightly in the rear of the loop and allow the sudden release of the bight of the loop from the loop-carrying portion 31 of the hook, as will be readily understood by reference to the diagram Fig. 14 of the drawings, which diagram indicates by the substantially radial lines *l* a series of successive positions of one loop during one cycle of movements of the loop-taker and indicates by the dots 31 and 36' the corresponding positions of the loop-holding portion 31 of the hook and the let-off point 36' of the holding and releasing device H, respectively, and the peculiar relation of the said let-off point 36' to the loop. This diagram further indicates certain positions of the needle when the loop-carrying portion 31 is at certain positions and also indicates at what point the preceding loop is drawn up by the succeeding loop, at what points in the orbit of the hook the succeeding loop is in its greatest slack position, where said succeeding loop is retightened, and where it begins to be drawn up by the next preceding loop.

By reference to the diagram Fig. 14 it will be understood that during the travel of the loop-carrying portion 31 of the hook from the position 50 to the position 58 the succeeding loop is drawing up the preceding loop, it having completed the drawing up of said preceding loop by the time said portion 31 arrives at the point 58, said complete drawing up of the preceding loop having taken place immediately after the completion of the feeding of the fabric, which takes place during the travel of said holding portion 31 from the position 54 to the position 57. During the travel of this carrying portion 31 from the position designated by 59 to the position designated by 61 the loop carried thereby draws thread

from the spool, since as the previous loop has been fully drawn up at this time it is necessary that the new loop have sufficient additional thread from the spool to form the next stitch. When the loop carried by the portion 31 arrives at the position indicated at 61, it passes over the let-off point 36' of the loop retaining and releasing device H, so that the bight of the loop is thereby suddenly released from the carrying portion 31 of the hook, whereupon it quickly slides down the inclined wall 27 of the loop-recess, thus causing said loop to quickly slacken, it remaining in a slack condition until the carrying portion 31 arrives substantially at the position indicated at 64, when it begins to retighten by the descent of the needle, since the needle again penetrates the work and carries the thread running from a previous loop with it, (see Fig. 10,) and consequently draws the slack thread of said loop with it, as it is not held under tension, as is the spool-thread, which needle arrives at its lowest point when the holding-point is about at the position indicated at 65.

From the above it will be seen that the device H acts during a certain period, owing to its location, to prevent the bight of the loop from passing down the inclined wall 27 of the loop-taker recess, but that when such device arrives at a point where, owing to the angle of the loop, the bight of such loop passes free of the point 36' it no longer prevents such loop from passing down said wall 27. Consequently it follows that when the looper has carried the thread into a certain angular position the point 36' is no longer effective to prevent the thread from passing down such wall 27, so that this device H, owing to its location relatively to and its movement with the looper, permits and thereby effects at this time the release of such thread from the carrying part 31 of the hook. The device thus acts in a positive manner to retain the loop in a certain position during a predetermined period and works during another period in what might be considered a passive manner to effect the release of the loop-bight, although the result which is accomplished is none the less positive in its action.

After the carrying portion 31 of the hook arrives at the position indicated at 68 the bight of the loop, which at this time is at the base or inner portion of the loop-recess, is carried up the inclined wall 28 of the loop-recess by the drawing out of the next succeeding loop, which draws up the aforesaid loop.

By providing the looper with a loop retaining and releasing flange disposed, as hereinbefore described, with relation to the loop-carrying portion of the hook I am, in the manner clearly and elaborately set forth in the preceding description, enabled to insure the retention of the bight of the loop in a loop-drawing position and in the base or loop-carrying portion 31 of the hook up to a predetermined point in the orbit of said hook and

prevent a premature release and slackening of said loop, which has been one of the greatest disadvantages in looper mechanisms of this class as heretofore constructed, and I am also enabled to positively insure the releasing and slackening of the loop at the proper time in the orbit of the hook and in proper relation with the movements of the needle.

Having described my invention, I claim—

1. A stitch-making mechanism embodying a rotary looper having one or more circumferentially-disposed loop-takers or hooks, and having for each of said hooks a combined loop retaining and releasing device located adjacent to the periphery of said looper and cooperating with such hooks to retain each successive loop in the same predetermined position on said hook during the rotary movement of the looper and during the drawing out of such loop, and to effect the release and thereby permit the slackening of the successive loops from such position on said hook at the same predetermined definite point in the orbit thereof.

2. In a sewing-machine, the combination, with needle mechanism including a needle, of complementary looper mechanism operable in proper timing with the needle mechanism and including a rotary looper having a loop-taker or hook disposed to engage the successive loops of the needle-thread and carry the same around said looper, and means independent of, but cooperative with, the loop-taker or hook for holding each successive loop in the same predetermined position on said hook and in a drawing-out position during the movement of the looper through a predetermined arc, and until said looper and needle arrive at predetermined relative positions, and for suddenly releasing, and thereby terminating the further drawing out of, said loop immediately upon the arrival of said hook and needle at said positions.

3. In a stitch-making mechanism, the combination of a needle; a rotary looper disposed in cooperative relation with the needle and having a peripheral loop-taker or hook, and also having a loop retaining and releasing flange disposed at one side of said hook and separated therefrom by a needle-receiving groove, said flange operating to retain each successive loop in the same predetermined position on said hook during the drawing out of each loop and having a quick-let-off point disposed in such position relatively to the loop-carrying portion of said hook as to permit and thereby effect a release of the loop from said portion at a predetermined definite point in the orbital movement of said hook; and means for actuating the needle and looper in proper timing.

4. In a sewing-machine having a reciprocating needle and a needle-actuator, the combination of complementary looper mechanism embodying a rotary looper having in the periphery thereof one or more loop-receiving openings or recesses one wall of each recess

of which terminates in a loop-taker or hook having at the base thereof a loop-carrying portion, said looper also having formed integral therewith one or more parti-circular flanges corresponding in number with said openings and disposed at one side, and in the rear, of said hook or hooks, respectively, and each flange terminating at the forward end thereof in a quick-let-off point disposed in such relation to the carrying portion of the hook that up to a certain point in the orbital movement of the hook said let-off point will be located slightly in the rear of one portion of the loop, and will at a predetermined point in said orbit come into alignment with said loop and permit and thereby effect a sudden release of said loop from the carrying portion of said hook; and means for rotating the looper in proper timing with the reciprocating movement of the needle.

5. A stitch-making mechanism including a rotary looper rotatable continuously in one direction and having one or more loop-takers or hooks each of which has at the forward end thereof a loop-engaging portion extending from the face of said hook to engage and temporarily hold the bight of the loop near the extreme point of the hook and prevent its passage toward the base of the hook during the rotary movement of the looper, and each of which also has a loop-carrying portion at the base of such hook for carrying the loop during another part of the rotary movement of the looper.

6. A stitch-making mechanism including a rotary looper having one or more loop-takers, each of which has a loop-engaging portion at the forward end and a loop-carrying portion at the base thereof, and which loop-engaging portion is adapted during the rotation of the looper to engage and temporarily hold the bight of the loop near the extreme point of the loop-taker, said looper also having one or more combined loop retaining and releasing devices one for each of said loop-takers and cooperative with said loop-taker or loop-takers for effecting the release and slackening of the successive loops at a predetermined definite point in the orbit of said loop-taker.

7. A stitch-making mechanism including a rotary looper having one or more loop-takers or hooks each of which has a loop-engaging portion at the forward end thereof and a loop-carrying portion at the base thereof and which loop-engaging portion is adapted during the rotation of the looper to engage and temporarily hold the bight of the loop near the extreme point of the hook, said looper also having one or more combined loop retaining and releasing flanges one for each of said loop-takers and disposed at one side of said hook or hooks and having a quick-let-off point disposed in such position relatively to the loop-carrying portion of the hook as to effect a release of the loop from said loop-carrying portion at a predetermined definite point in the orbital movement of said hook.

8. A looper having a plurality of successively-located loop-takers, and a plurality of successively-located combined loop retaining and releasing devices, one for each of said loop-takers, and each cooperating with its loop-taker to effect the release and slackening of successive loops on said loop-taker at the same predetermined definite point in the orbit thereof and on the termination of the drawing out of such loop.

9. A looper having one or more loop-takers, and one or more loop retaining and releasing devices, one for each of said loop-takers, and each cooperating with its loop-taker to effect the release and slackening of successive loops from said loop-taker at the same predetermined definite point in the orbit thereof and on the termination of the drawing out of such loop.

10. A looper having one or more loop-receiving recesses each terminating in a loop-taker, and one or more combined loop retaining and releasing flanges, one for each of said loop-takers, each integral with, and disposed at one side of, said looper and cooperative with its loop-taker to prevent during the drawing out of a loop the passage of said loop down the wall of said recess, and to permit and thereby effect the release and slackening of successive loops on said loop-taker at a predetermined point in the orbit thereof and on the termination of the drawing out of such loop.

11. A looper having one or more loop-takers or hooks, the beak of each of which has on its under side at its forward end an abruptly-presented wall facing toward the point of the loop-taker and forming a loop-engaging portion, said beak also having at its base a loop-carrying portion, said loop-engaging portion being adapted during the movement of the looper to engage and temporarily hold the bight of a loop near the starting-point of such beak and prevent its passage toward the base thereof.

12. A looper having one or more loop-takers each of which has a loop-engaging portion at its forward end and a loop-carrying portion at the base thereof, and which loop-engaging portion is adapted during the movement of the looper to engage and temporarily hold the bight of the loop near the extreme point of the loop-taker, said looper also having one or more combined loop retaining and releasing devices one for each of said loop-takers and

coöperative with said loop-taker or loop-takers for effecting the release and slackening of the successive loops at a predetermined definite point in the orbit of said loop-taker.

13. A looper having one or more loop-takers each of which has a loop-engaging portion at its forward end and a loop-carrying portion at the base thereof, and which loop-engaging portion is adapted during the movement of the looper to engage and temporarily hold the bight of the loop near the extreme point of the loop-taker, said looper also having one or more combined loop retaining and releasing flanges one for each of said loop-takers disposed at one side of, and coöperative with, said loop-taker and having a quick-let-off point disposed in such position relatively to the loop-carrying portion of said loop-taker as to effect a release of the loop from said loop-carrying portion at a predetermined definite point in the orbital movement of said loop-taker.

14. A looper having one or more peripheral loop-receiving recesses each provided with an inclined wall terminating in a loop-taker or hook and having intermediate such inclined wall and said hook a loop-carrying recess, said looper also having a loop retaining and releasing flange located at one side of said loop-taker and provided with a quick-let-off point disposed adjacent to the loop-carrying recess of said loop-taker and having a cut-away portion below said point, thereby to permit the loop when it has passed such let-off point, in the rotary movement of the looper, to be drawn down the inclined wall of said recess.

15. A looper having a peripheral loop-receiving recess terminating in a loop-taking hook, said hook having means at its free end for temporarily holding the bight of a loop near the extreme point thereof and having means at its base for carrying the loop during a predetermined period, and also having means disposed in position and effective to retain the bight of the loop at said base during a predetermined period and to quickly and effectively permit the release of said loop from said loop-carrying portion, thereby to permit the bight of the loop to be drawn into said loop-receiving recess.

HUBERT P. RICHARDS.

Witnesses:

F. N. CHASE,

JOHN O. SEIFERT.