(Model.) 6 Sheets—Sheet 1.

J. W. RAMSDEN.

SEWING MACHINE.

No. 262,116. Patented Aug. 1, 1882.

Fig. 2.

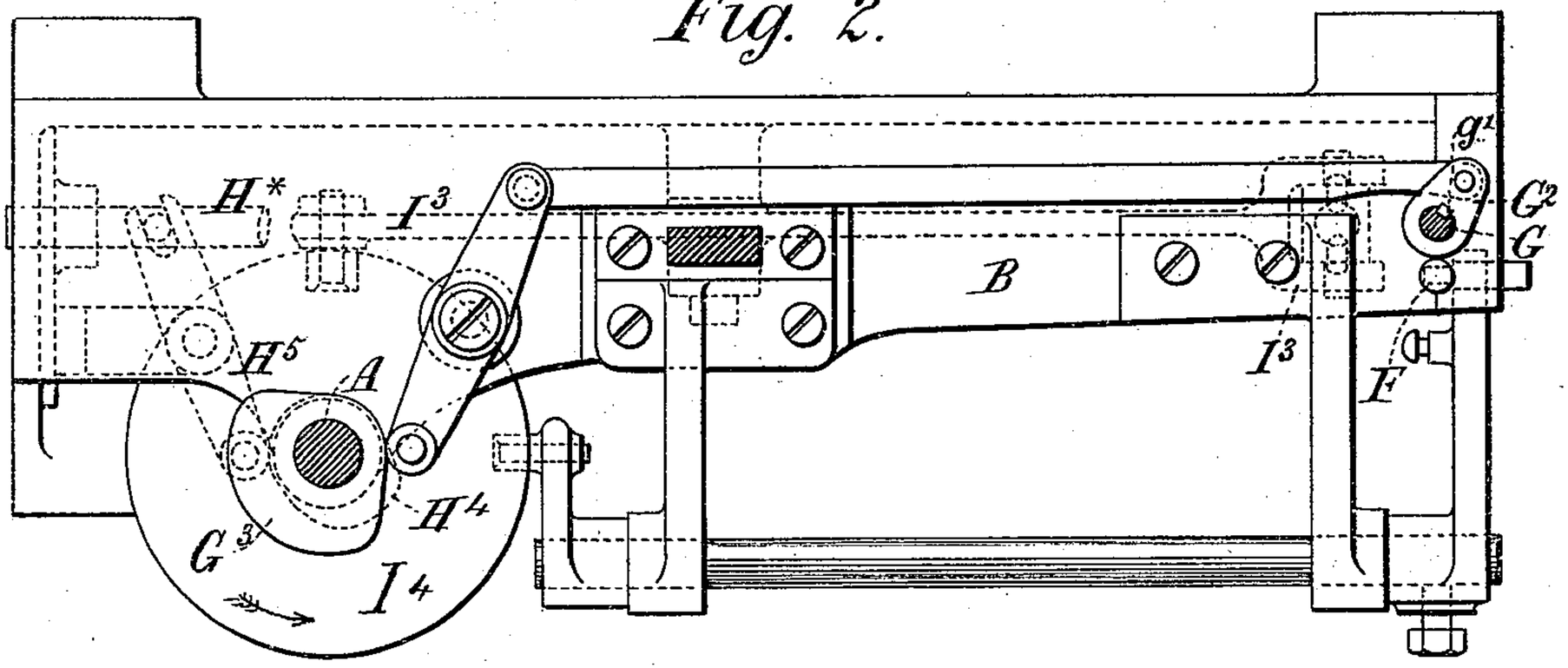
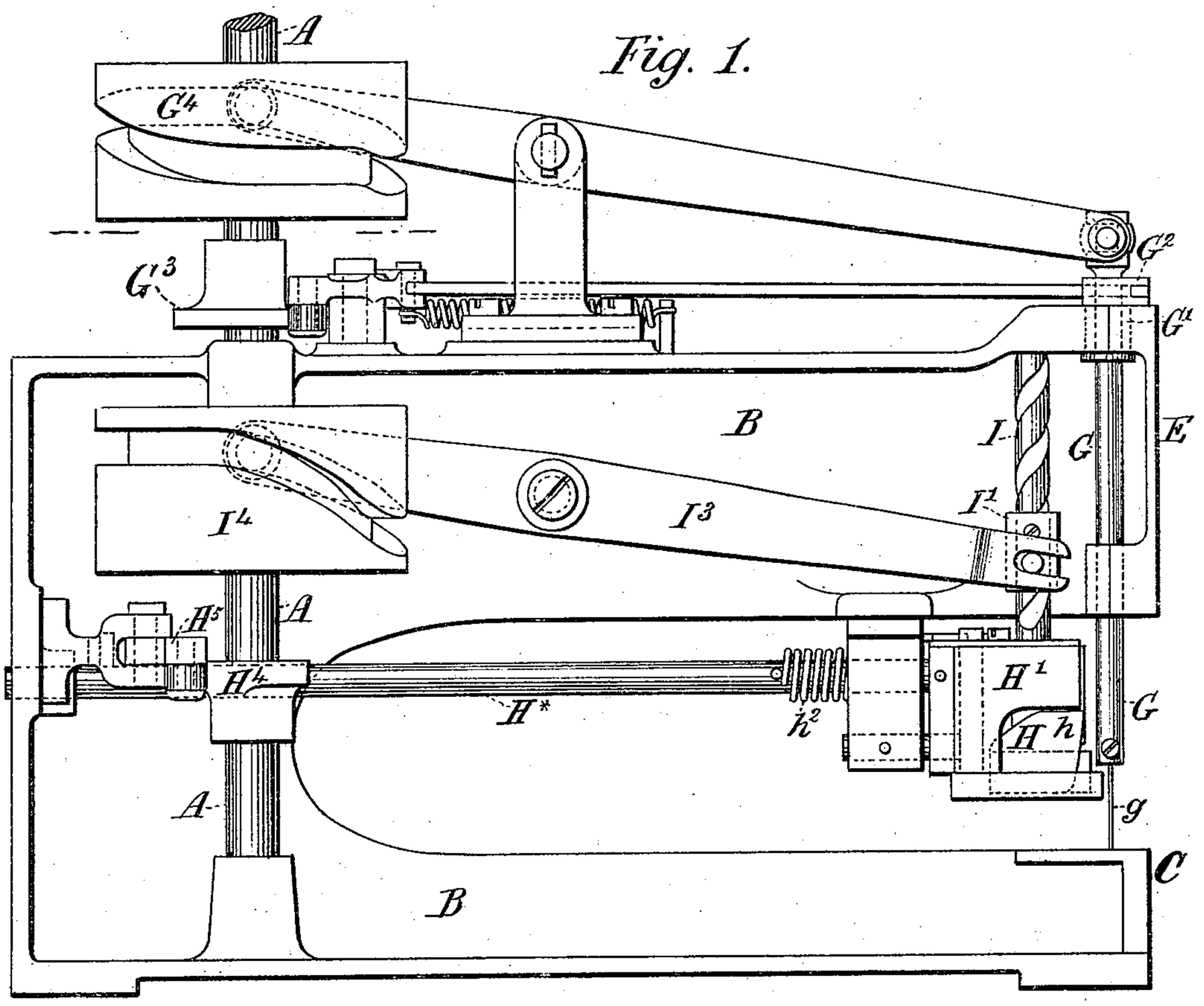


Fig. 1.



Witnesses-
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SEWING MACHINE.

No. 262,116. Patented Aug. 1, 1882.

Fig. 3.

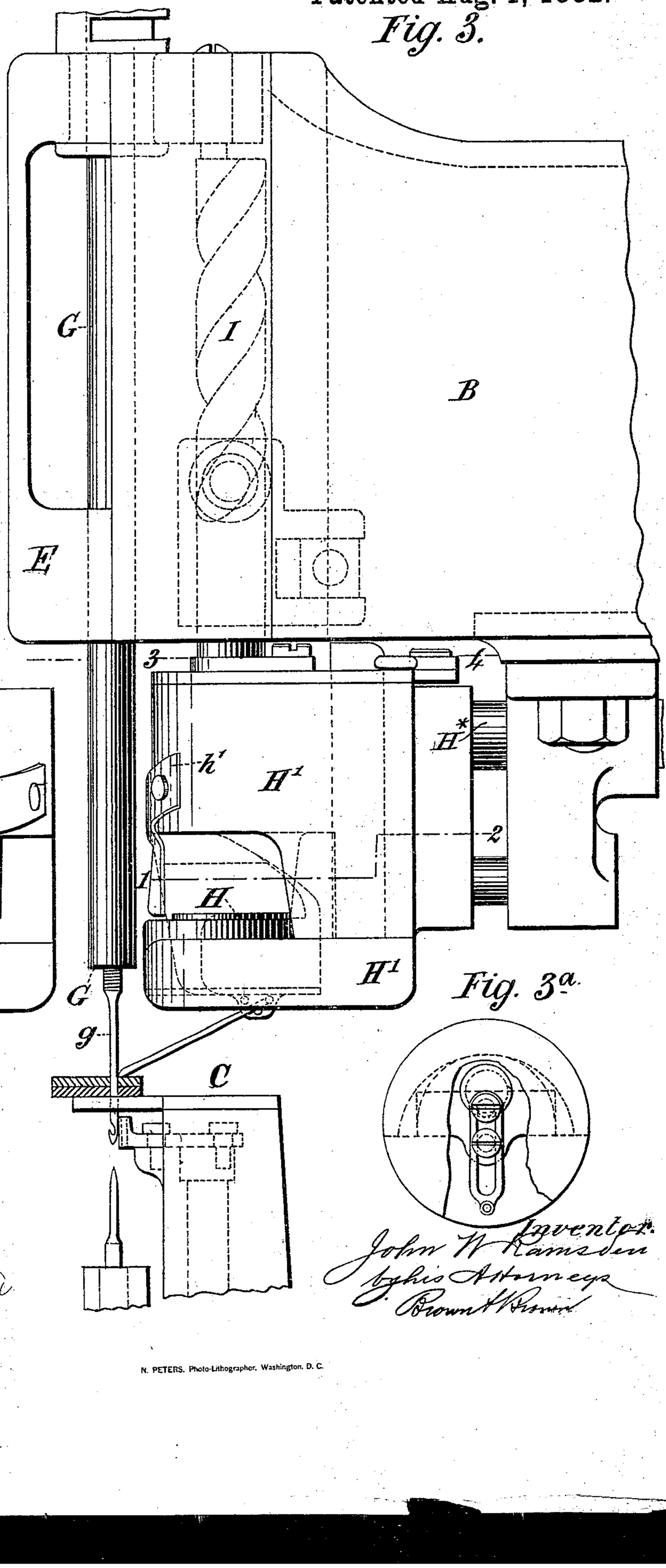

Fig. 6a.

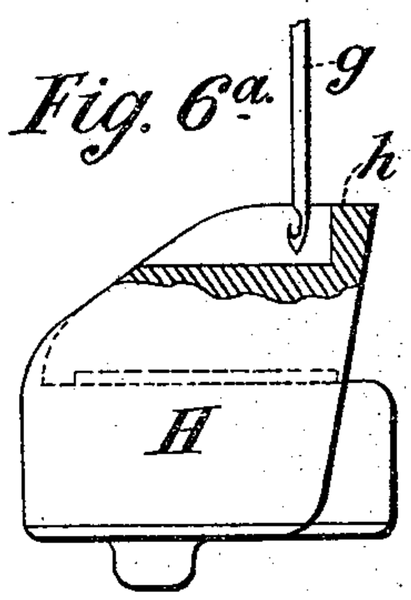

Fig. 4.

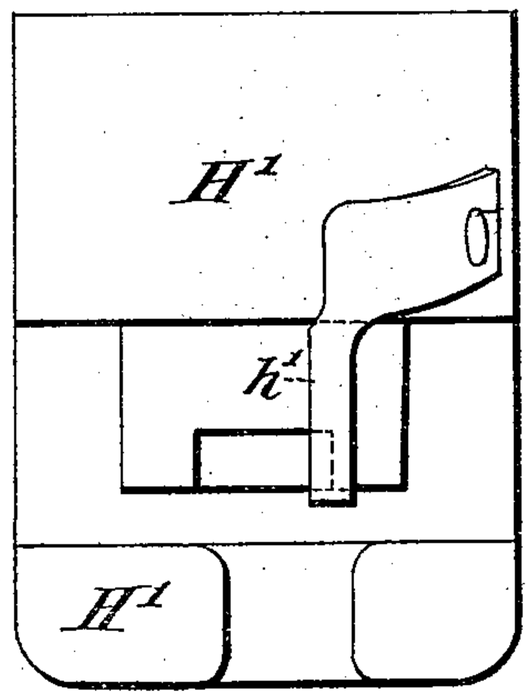

Fig. 3a.

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SEWING MACHINE.

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Fig. 9.

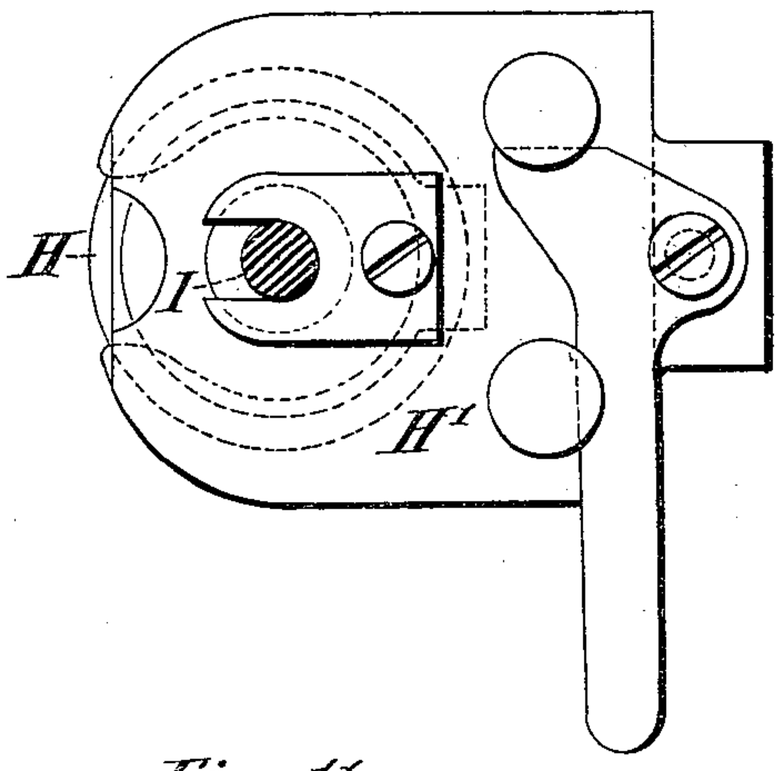


Fig. 7.

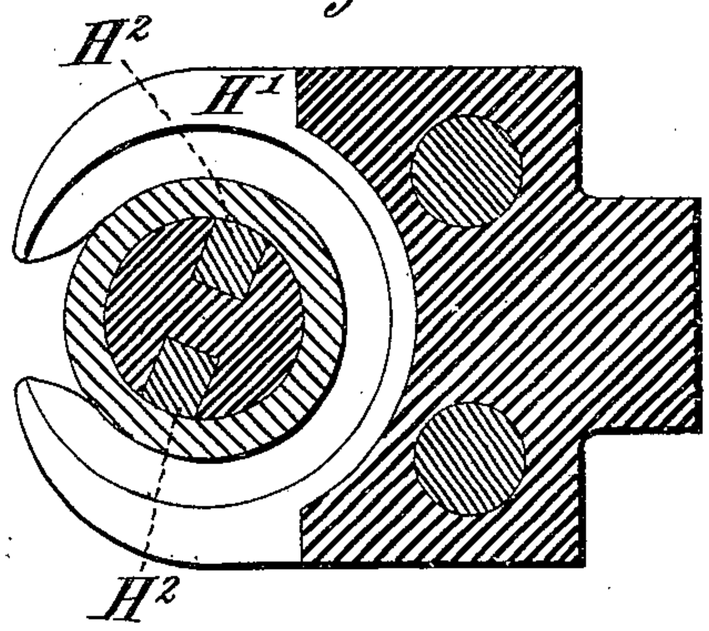


Fig. 11.

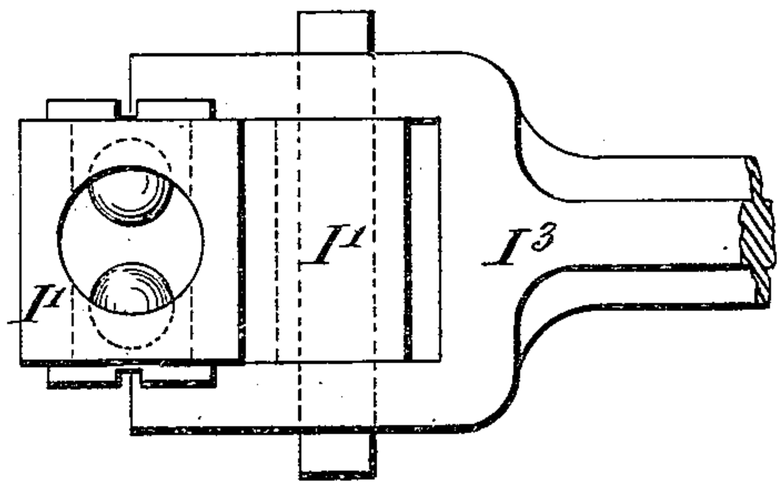


Fig. 8.

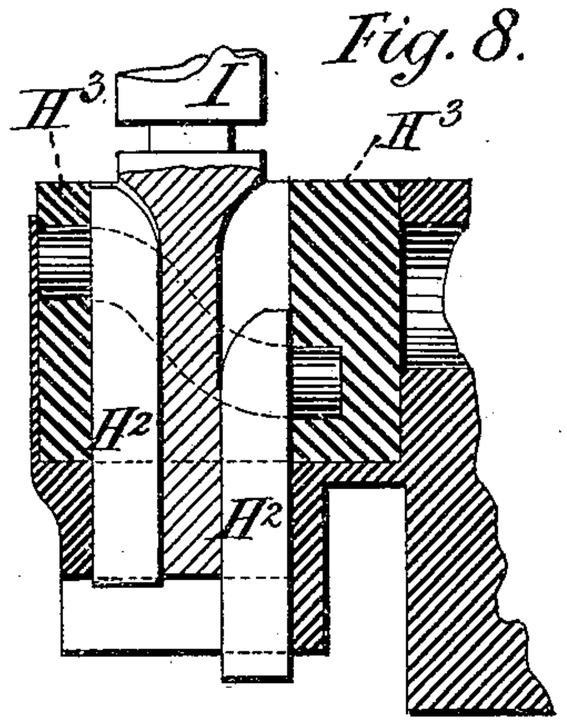


Fig. 10.

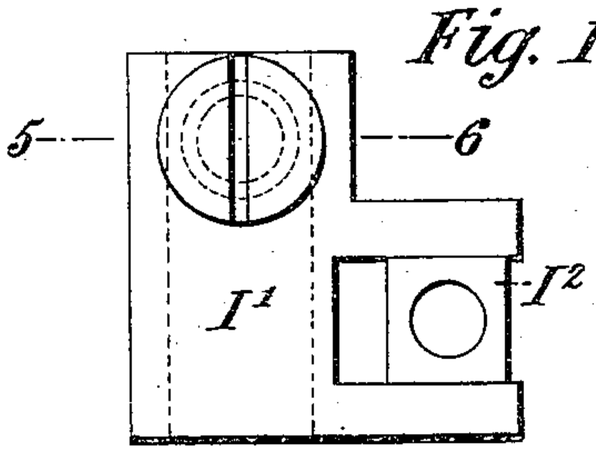


Fig. 12.

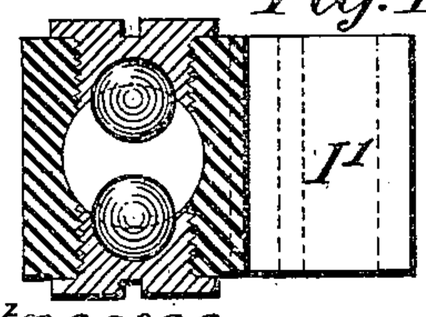
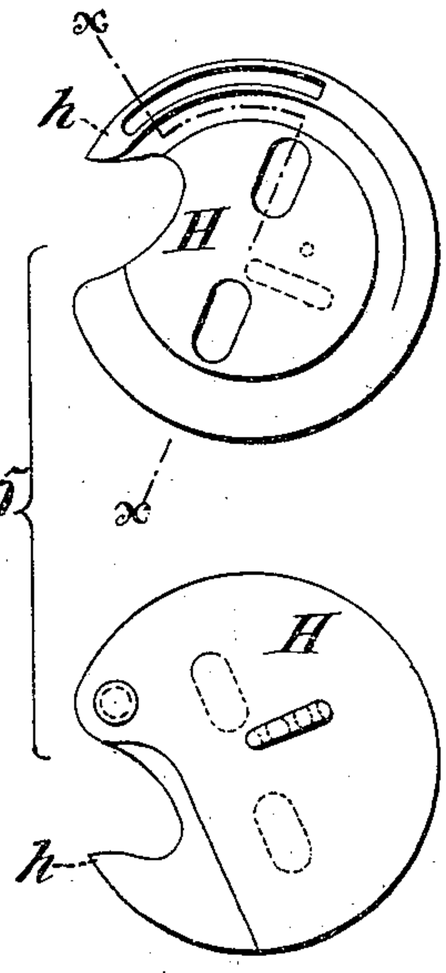
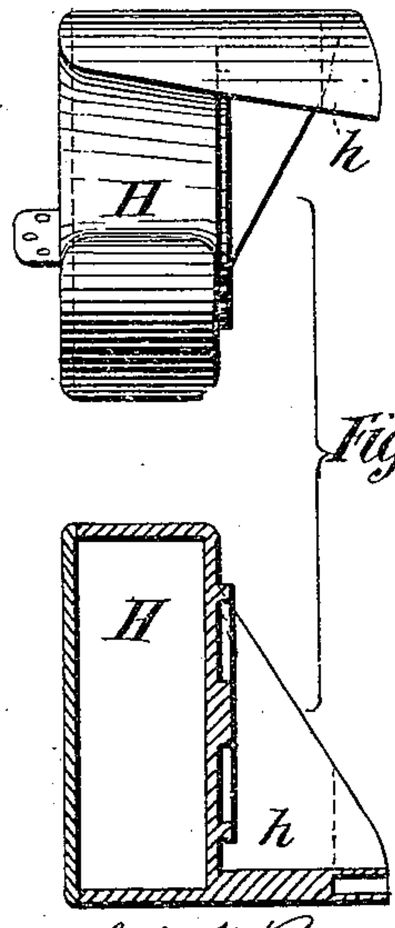


Fig. 5.



Figs. 6.



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SEWING MACHINE.

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Fig. 17.

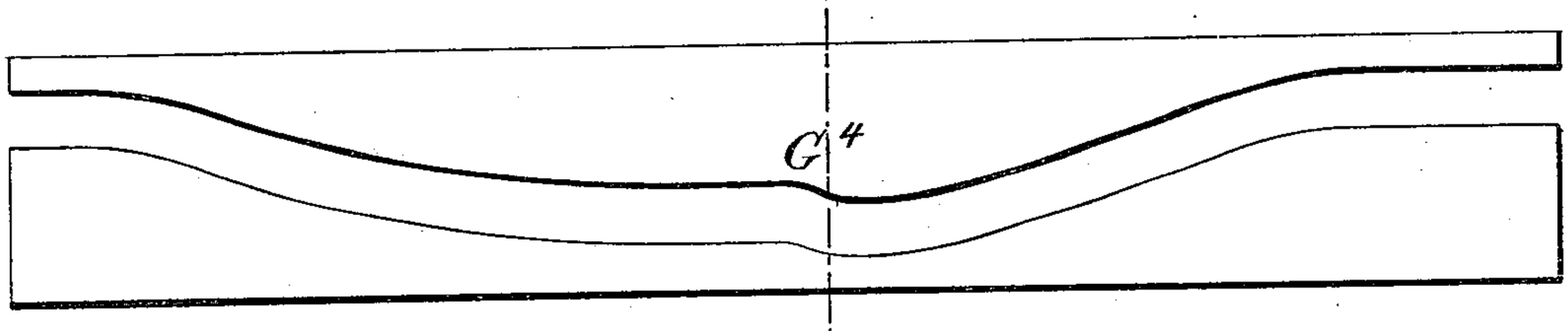

Fig. 16.

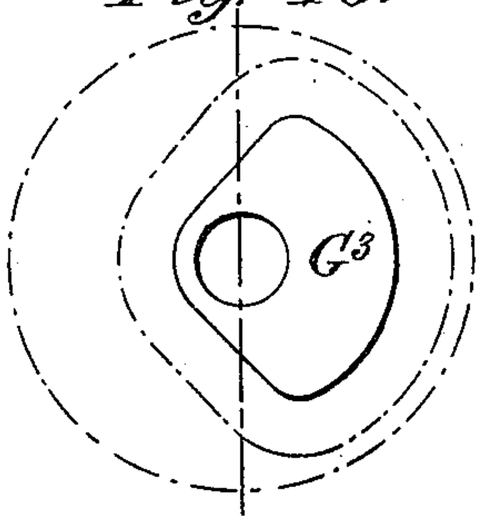

Fig. 15

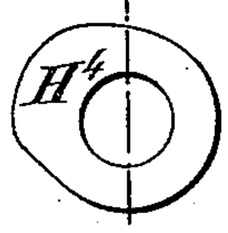

Fig. 14.

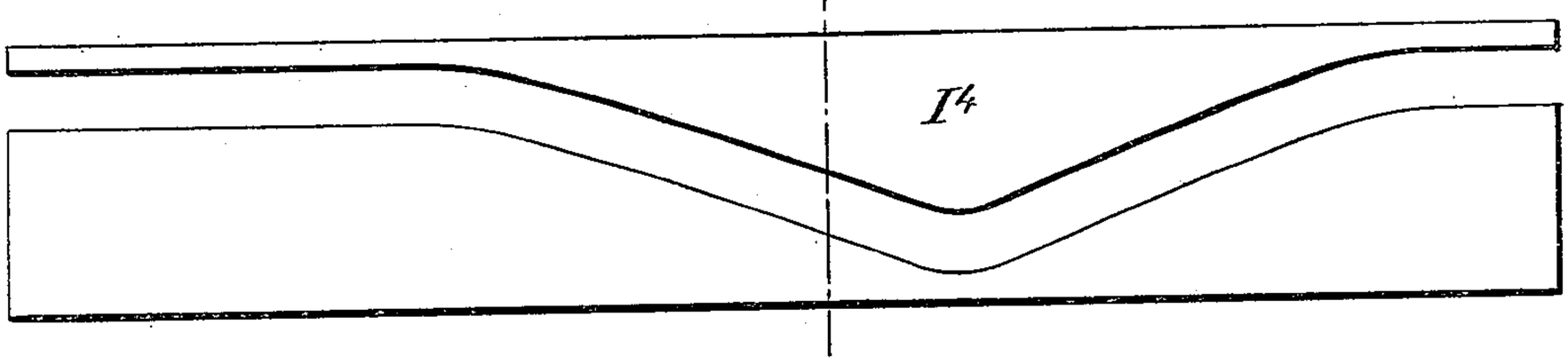

Fig. 13.

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(Model.)

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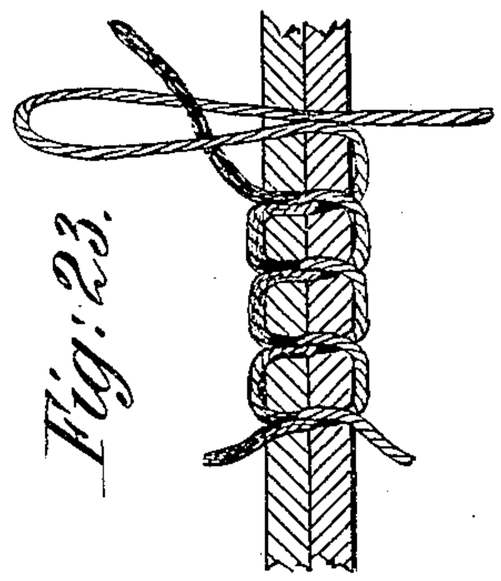
J. W. RAMSDEN.

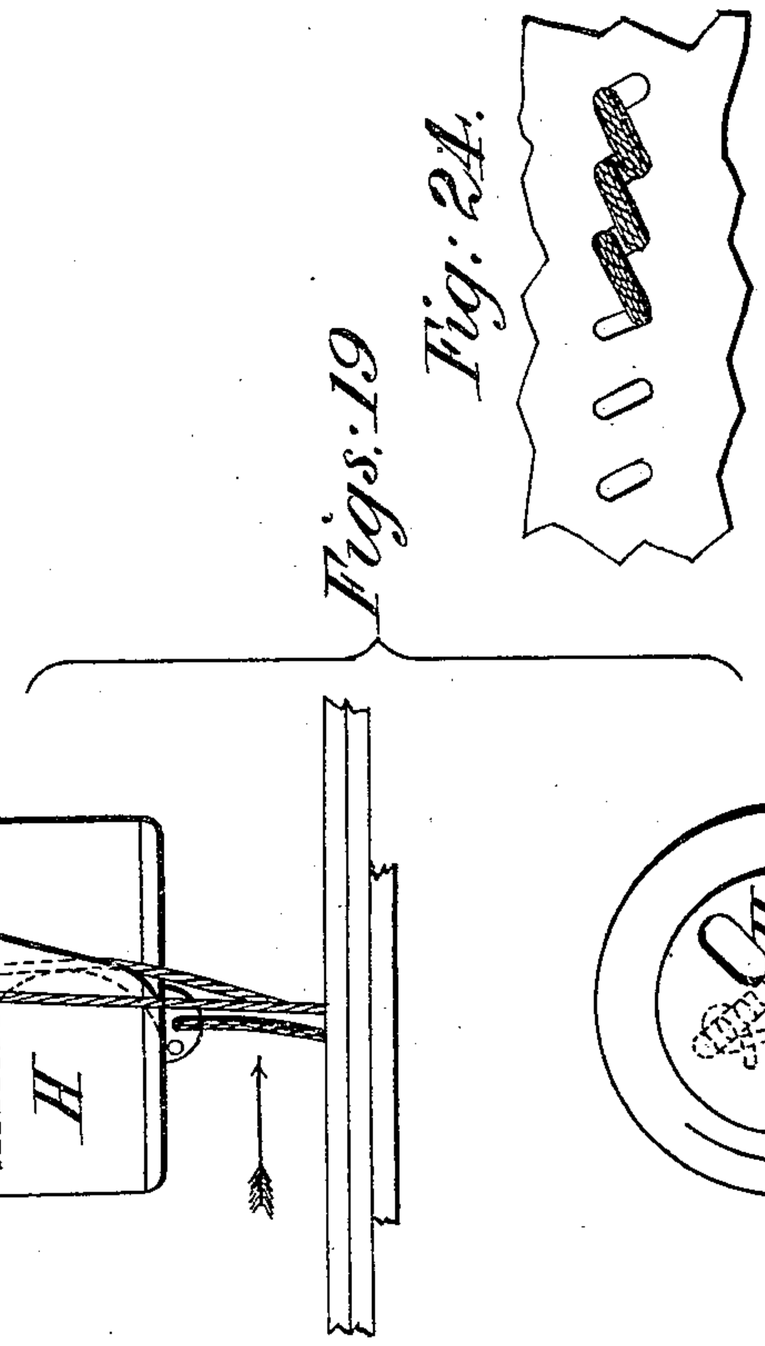
SEWING MACHINE.

No. 262,116. Patented Aug. 1, 1882.

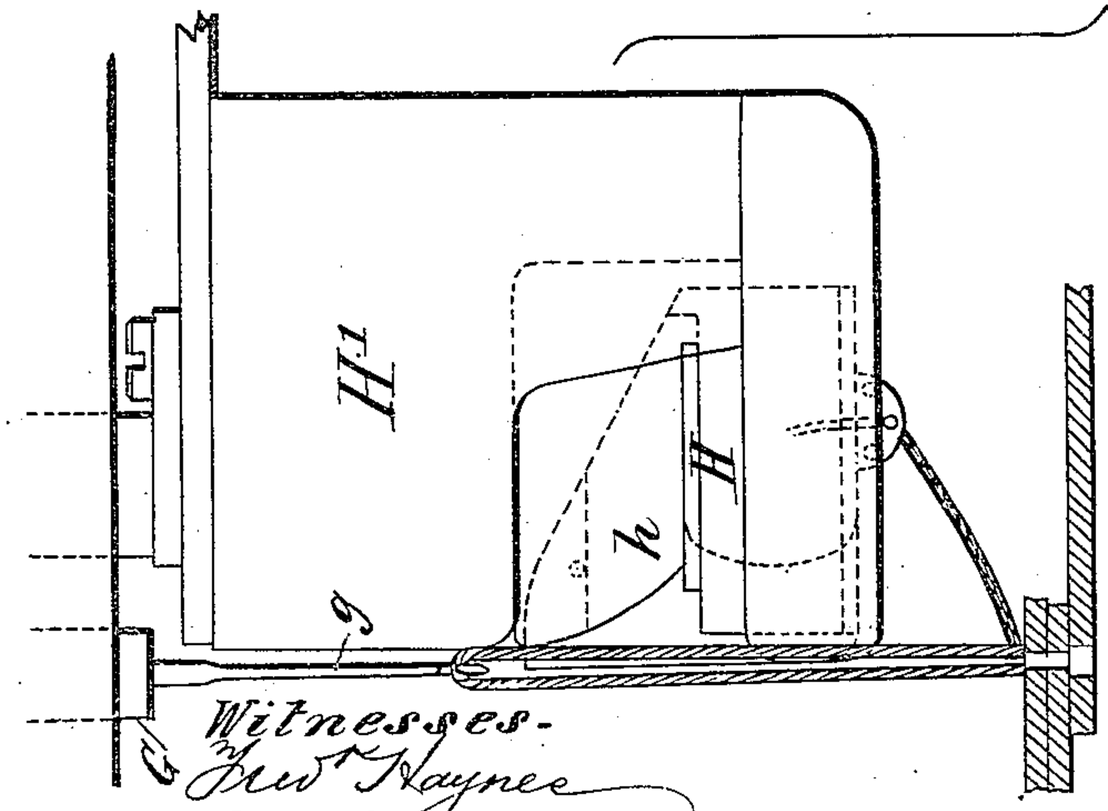
Fig. 23.

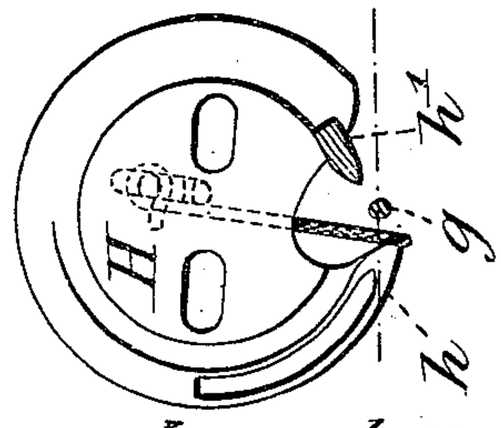


Figs. 19 Fig. 24.



Figs. 18.





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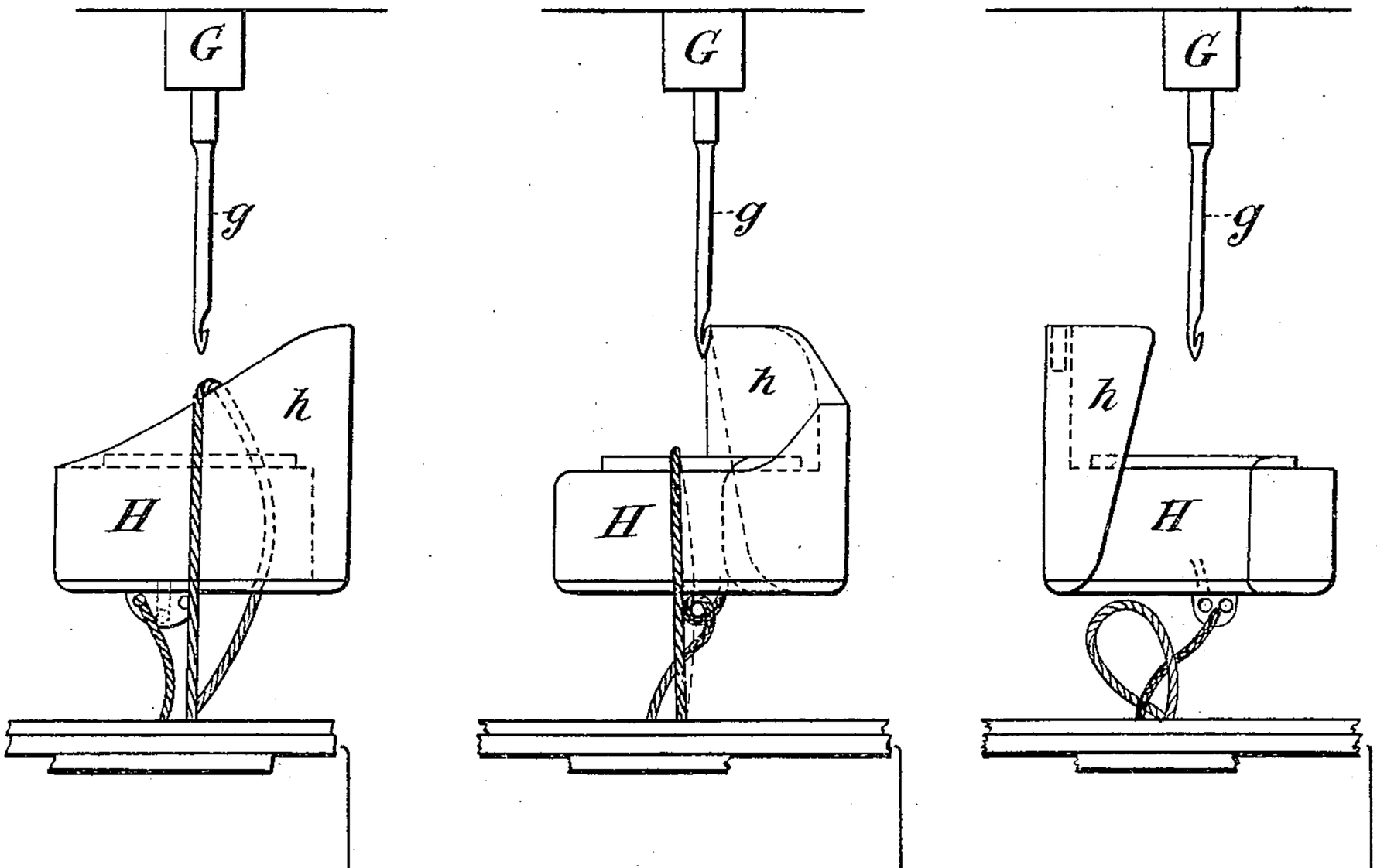
(Model.) 6 Sheets—Sheet 6.

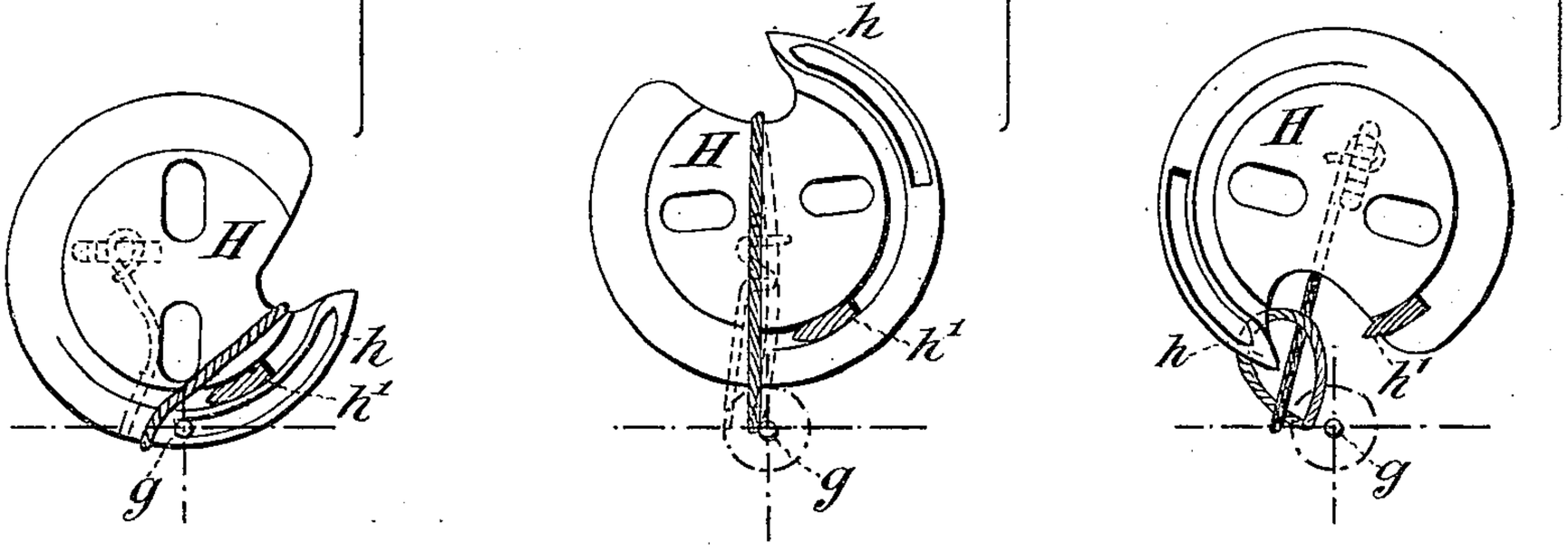
J. W. RAMSDEN.

SEWING MACHINE.

No. 262,116. Patented Aug. 1, 1882.



Figs. 20, 21, 22.



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UNITED STATES PATENT OFFICE.

JOHN W. RAMSDEN, OF LEEDS, COUNTY OF YORK, ENGLAND.

SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 262,116, dated August 1, 1882.

Application filed September 10, 1881. (Model.) Patented in England April 8, 1881, No. 1,548, and in France June 4, 1881, No. 143,224.

To all whom it may concern:

Be it known that I, JOHN WILLIAM RAMSDEN, of Leeds, in the county of York, England, mechanic, have invented certain Improvements in Sewing-Machines, of which the following is a specification.

This invention relates to an improvement in rotary shuttle sewing-machines of the class described by John Keats in the specification of his American patent, bearing date December 11, 1877, No. 198,120.

In this class of double wax-thread sewing-machines it has hitherto been necessary to use an instrument called a "divider." This divider enters the loop when drawn up by the hooked needle, lifts the thread out of the hook, and presents the divided or opened loop to the nose of the shuttle in such a manner that the shuttle can pass readily through the loop. I now propose to arrange the needle-bar carrying the hooked needle, and also the rotary shuttle, in such a manner that I can dispense altogether with the divider, moving the shuttle up to the needle in order that its nose may enter the loop of the needle-thread. The piercing chisel-edge of the needle may also, if desired, be caused to enter the material in such a direction as will enable me to give the desired cast to the stitch.

This invention is illustrated in the accompanying drawings as applied to a bracket-arm waxed-thread sewing-machine.

Figure 1, Sheet I, is a side elevation of the machine, and Fig. 2 a plan view of the same. In Sheet II Fig. 3 is a side elevation of the head of the machine drawn full size, the invention being shown as applied to a "post-machine" provided with a looper and a pricker-feed. Fig. 3ª shows the looper in plan view. Fig. 4 is a front view of the shuttle-carrier detached. Figs. 5, Sheet III, represent in plan views the upper and under side of the improved shuttle. Figs. 6 show the shuttle in side and sectional elevation on the line *x x* on the plan view of the upper side of the shuttle, (shown at Fig. 5;) and Fig. 6ª, Sheet II, is an elevation of the shuttle, the nose being brought to the front and cut away, so as to show the depth of the groove into which the needle dips when the loop is released from the barb. Figs. 7 and 8 are sectional views, showing the mounting of the shuttle and driving pins in the shuttle-carrier, Fig. 7 being a horizontal section on the line 1 2 of Fig. 3; and Fig. 8, a vertical section of a portion of the shuttle-carrier, showing the cam for operating the drivers. Fig. 9 is a sectional plan on the line 3 4 of Fig. 3, showing the manner in which the several parts of the shuttle-carrier are locked together. Fig. 10 shows in elevation the reciprocating shuttle-driver, from which the axial motion of the shuttle is derived. Fig. 11 is a plan view of the same, showing a portion of the lever which actuates the driver, and Fig. 12 is a horizontal section on the line 5 6 of Fig. 10. Figs. 13 to 17, Sheet IV, show the cams for actuating the hooked needle, also the cams for actuating the shuttle and shuttle-carrier. Figs. 18 to 22, Sheets V and VI, show in elevation and plan five positions of the needle and shuttle during the formation of a stitch. Fig. 23, Sheet V, shows the stitch on an enlarged scale, and Fig. 24 the cast stitch in plan view.

A is the main driving-shaft, mounted vertically in suitable bearings in the frame B of the machine. C is the support for the work, within which the ordinary whirl or other looper, and also the pricker or other suitable under feed, are mounted.

E is the ordinary guide-box at the front of the bracket-arm for the reception of the presser-bar F and needle-bar G. The needle-bar is mounted to slide and turn in bearings, and carries in a line with its axis the needle *g*.

H is the rotary shuttle, mounted in a reciprocating holder or carrier, H′, which has an extension, H*, toward the cam-shaft, and is supported in horizontal guides fixed to the bracket-arm. The shuttle H, which is worked by the usual drivers H², is constructed with an inclined segment-shaped projection or nose, *h*, which stands up vertically from the outer periphery of the shuttle and terminates in an overhanging chisel-edge. (See Figs. 5 and 6, Sheet III, and Fig. 6ª, Sheet II.) The inclined segment-shaped ridge thus formed is recessed vertically to receive the point of the hooked needle *g* when it dips, as seen best in the partial sectional view, Fig. 6ª, to permit of the removal of its loop. The overhanging edge which constitutes the point of the shuttle will, so soon as the needle-thread is presented to it,

(see Figs. 18, Sheet V,) enter the loop and open it out. At the same time the needle-bar descends or "dips" sufficiently to allow the shuttle on its onward course to take the thread out of the hook, as will be clearly seen in Figs. 19, Sheet V. To prevent the shuttle from carrying the thread forward, the shuttle-holder is provided with a guard, h'. This guard is bolted to the shuttle-holder above the shuttle, (see Figs. 3 and 4, Sheet II,) and its lower end dips into a rabbet formed in the upper side of the shuttle, (see Figs. 5 and 6, Sheet III, and the plan views on Sheets V and VI,) and prevents the needle-thread escaping past it. The segment-shaped projection h of the shuttle, as it rotates, passes outside the guard h', so that the guard forms a stop to the forward progress of the thread and retains the loop while the shuttle is worming itself through the loop. (See Figs. 19, Sheet V.) The raised part of the shuttle h decreases in depth rearward as the shuttle increases in breadth. Thus a broader part of the shuttle passes into the loop as the shuttle rotates and takes up a portion of the slack, leaving sufficient slack, however, to allow of the shuttle passing easily through the loop. (See Figs. 20 and 21, Sheet VI.)

Attached to the shuttle-carrier and concentric with the rotary shuttle is a vertical spindle, I, (see Fig. 3, Sheet II,) which is furnished with a pair of helical grooves for receiving a pair of anti-friction balls carried by a reciprocating driver, I′, shown detached in elevation and plan at Figs. 10 and 11, Sheet III. This driver is intended to impart axial motion through its anti-friction balls to the spindle I, the connection of which at its lower end with the shuttle-carrier is such as to permit of this axial motion. An enlargement at the foot of this spindle is grooved vertically on its opposite sides to receive the shuttle-driving pins H^2, (see Figs. 7 and 8, Sheet III,) which are surrounded by the fixed cam H^3, (see Fig. 8, Sheet III,) which cam is shown laid out at Fig. 13, Sheet IV, for giving the driving-pins the requisite motion for locking into and releasing themselves from the shuttle. The driver I′ is formed with a forked projection, into which takes a block, I^2, (see Fig. 10, Sheet III,) that is swiveled to a forked rock-lever, I^3, having its fulcrum on the bracket-arm. The tail of this rock-lever carries a bowl, which enters a groove formed in the periphery of a cam, I^4, on the cam-shaft A. By the rotation of this cam (shown detached at Fig. 14, Sheet IV) a vertical reciprocating motion is imparted to the rock-lever I^3, and from it to the driver I′, which, moving up and down the spindle I, imparts an axial motion thereto, and through the driving-pins H^2 to the shuttle H.

Keyed on the cam-shaft below the cam I^4 is a cam, H^4, against which bears a bowl carried by a rock-lever, H^5. The opposite end of this lever is forked and takes onto a pin standing up from the extension-piece H*. (See Fig. 2.) A spring, h^2, on this extension-piece holds the bowl against the periphery of the cam H^4. This cam is shown detached at Fig. 15, Sheet IV, and is so cut as to advance at the proper time the shuttle-carrier to the hooked needle g, and thus enable the nose h to enter the loop.

The motions of the shuttle-carrier with respect to the needle during the formation of a stitch will be best understood by reference to Fig. 3, Sheet II, and Figs. 18 to 22 of Sheets V and VI. In Fig. 3 the needle is shown as having descended to its lowest position to receive a loop of thread in its hook, and the shuttle and its carrier are drawn back to allow of the passage of the needle-bar down in front of them. Figs. 18, Sheet V, show the needle carrying a loop of thread raised to its highest position, and the shuttle and its carrier brought forward to their most advanced position, so that the nose h of the shuttle is in a position to enter the loop on axial motion being given to the shuttle. Figs. 19 show the nose of the shuttle in the loop, which is now free from the needle by reason of the "dip" of the needle into the groove in the nose h of the shuttle, and the respective plan view shows the guard h' as holding back the loop while the nose of the shuttle passes into the loop. In Figs. 20 the loop is shown as resting on the rear slope of the nose h of the shuttle. In Figs. 21 the nose of the shuttle has passed quite through the loop, and the shuttle and its carrier have moved back into their rear position. Figs. 22 shows the shuttle as having completed its axial motion while in its backward position, and the loop of the needle-thread with the shuttle-thread passed through it falling from the shuttle and ready to be drawn tight by the stitch-tightening lever of the machine. (Not shown in the drawings.)

When it is desired to produce a cast-stitch similar to that shown at Fig. 24, the needle-bar G may receive an axial, as well as a reciprocating, motion, and the rocking of this bar in its bearings serves to determine the angle to the feed at which the work shall be pierced.

Within the upper bearing of the needle-bar a sleeve, G′, is fitted. (See Figs. 1 and 2, Sheet I.) The upper end of the needle-bar is grooved vertically, and slides on a feather fixed in the sleeve G′, (see Fig. 1, Sheet I,) which is retained in place by a flange at its lower end and by an arm, G^2, attached to its upper end. A partial rotary motion being imparted to this sleeve will turn the needle-bar to any desired extent. The axial motion of the needle-bar, which it receives from the sleeve G′, is derived from the cam G^3, (shown detached at Fig. 16, Sheet IV,) which acts upon the bowl of a rock-lever jointed by a link to the arm G^2. (See the plan view, Fig. 2.) By this arrangement the needle, after presenting the loop to the nose of the shuttle, is turned axially in order that its chisel-shaped point may pierce the material at the desired angle to the feed to give a "cast" to the stitch. The up-and-down motion of the needle-bar is obtained from the cam-groove G^4. (Shown laid out at Fig. 17, Sheet IV.)

The connection of the lever I^3 with the driver I′ is by preference effected in the manner shown at Figs. 10, 11, and 12, Sheet III, where the swivel-piece I^2 enters the fork of the driver and allows, as will be readily understood, of the shifting of the shuttle-carrier and the parts in immediate connection therewith toward and from the rock-lever I^3 without disturbing the connection with that lever and the driver I; or it may be effected in the manner shown at Fig. 1, where the front end of the lever I^3 is forked to embrace pins standing out from opposite sides of the driver I′.

Having now set forth the nature of my invention of improvements in sewing-machines and explained the manner of carrying the same into effect, I wish it to be understood that I claim—

In combination with a hooked needle, a reciprocating circular shuttle provided with a segment-shaped grooved rib or projection for the reception of the needle-hook as the point of the shuttle enters the loop of the needle-thread, and a reciprocating shuttle-carrier in which such shuttle is mounted, such carrier being actuated by a cam on the cam-shaft, so timed as to advance the shuttle toward the needle when the loop is fully formed, in order that the shuttle may enter the loop without the aid of a divider and release it from the loop.

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