(No Model.) 2 Sheets—Sheet 1.

S. W. WARDWELL, Jr.

REVOLVING HOOK FOR SEWING MACHINES.

No. 391,666. Patented Oct. 23, 1888.

Fig. 1.

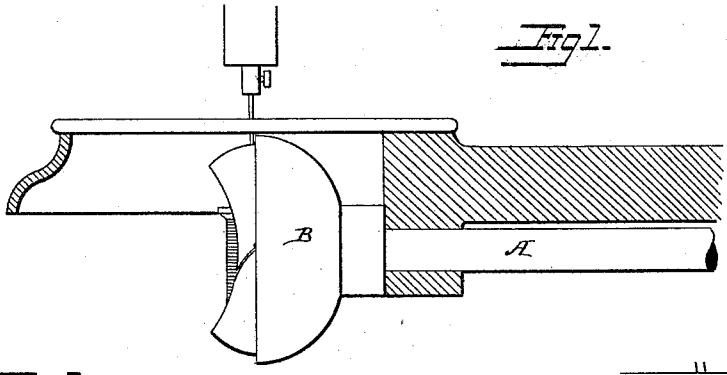


Fig. 2.

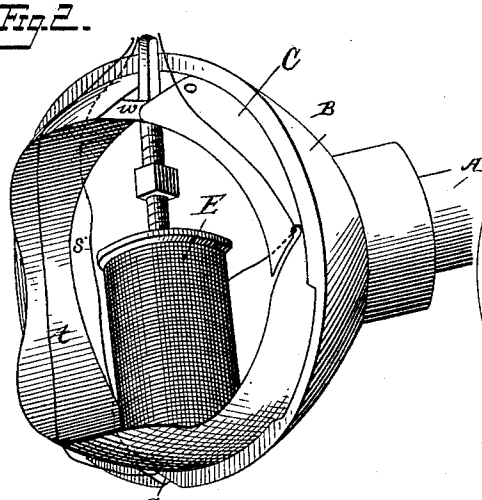


Fig. 3.

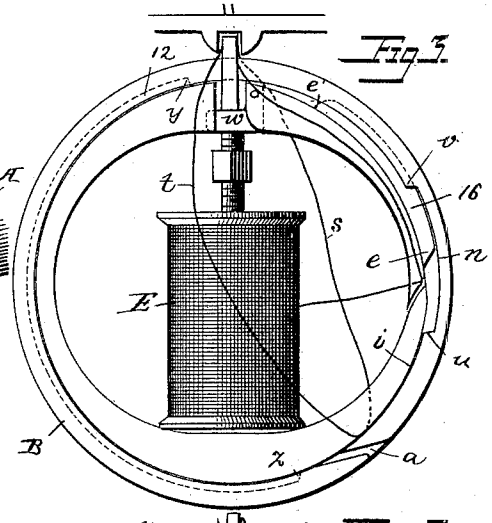


Fig. 4.

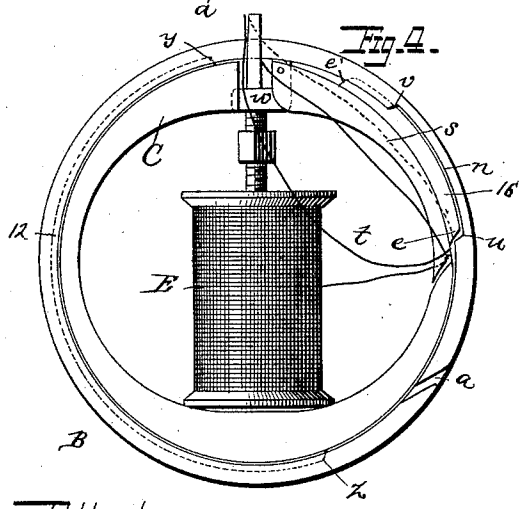
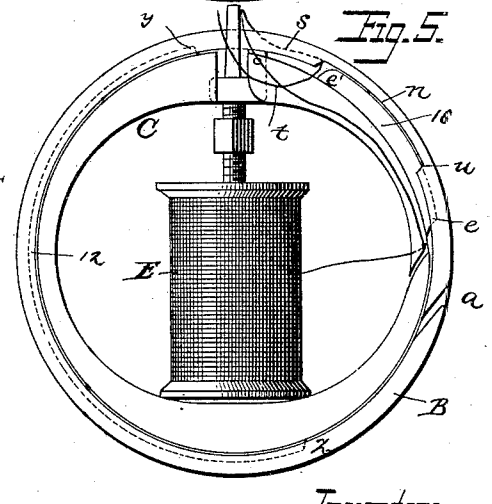


Fig. 5.



Attest:
Geo. G. Hundley Jr.
Sidney L. Johnson

Inventor:
S. W. Wardwell Jr.
by
Foster Freeman
attys.

(No Model.) 2 Sheets—Sheet 2.

S. W. WARDWELL, Jr.

REVOLVING HOOK FOR SEWING MACHINES.

No. 391,666. Patented Oct. 23, 1888.

Fig. 6.

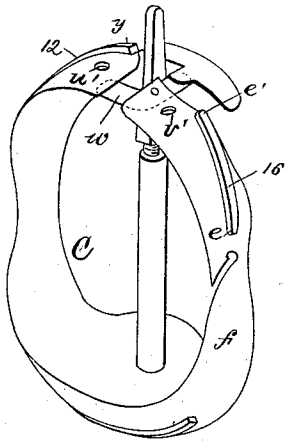


Fig. 7.

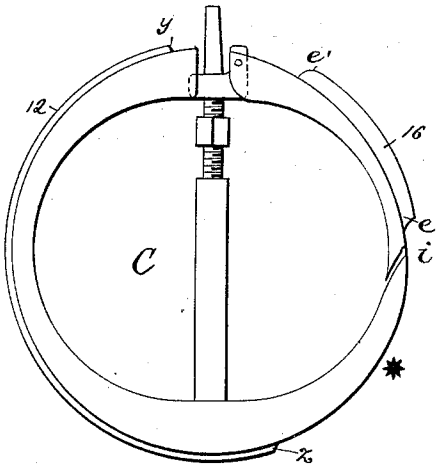


Fig. 8.

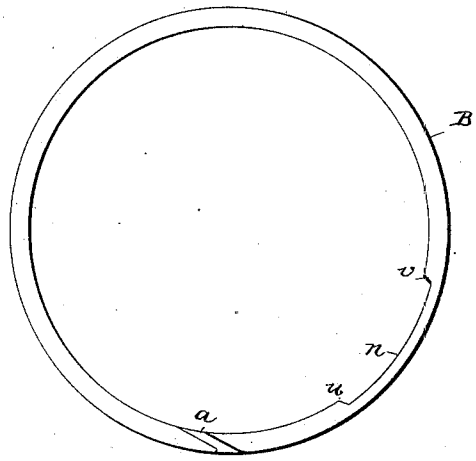


Fig. 9.

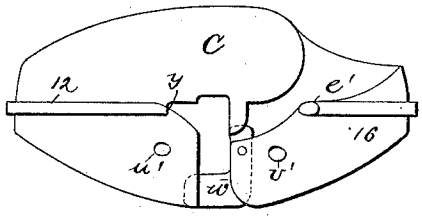
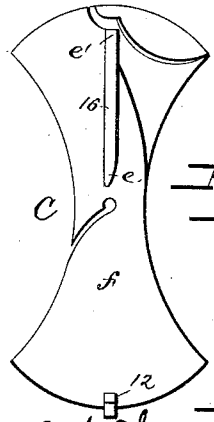


Fig. 10.



Attest:
Jno. G. Hinkel, Jr.
Sidney L. Johnson.

Inventor:
S. W. Wardwell, Jr.
by Thos. Freeman
Attys.

UNITED STATES PATENT OFFICE.

SIMON W. WARDWELL, JR., OF PROVIDENCE, RHODE ISLAND.

REVOLVING HOOK FOR SEWING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 391,656, dated October 23, 1888.

Application filed May 6, 1887. Serial No. 237,355. (No model.)

To all whom it may concern:

Be it known that I, SIMON W. WARDWELL, Jr., a citizen of the United States, and a resident of Providence, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Sewing-Machines, of which the following is a specification.

My invention relates to that class of sewing-machines in which a revolving bowl or concavo-convex hook carries a loop of needle-thread around a stationary case holding a bobbin or spool; and my invention consists in constructing and arranging the parts, as fully set forth hereinafter, and as illustrated by the accompanying drawings, to facilitate the operation of the machine.

In the drawings, Figure 1 is a side view, in part section, of sufficient of a sewing-machine to illustrate my invention. Fig. 2 is a perspective view showing the revolving concavo-convex hook or bowl and spool-case and illustrating the formation of the loop of needle-thread. Figs. 3, 4, 5 are face views, diagrammatic in character, illustrating the formation of the loop. Fig. 6 is a perspective view of the spool or bobbin case. Fig. 7 is a front view thereof. Fig. 8 is a front view of the revolving concavo-convex hook; Fig. 9, a top view of the spool or bobbin case, and Fig. 10 a side view of the latter.

In the class of machines to which my invention pertains there is a shaft, A, carrying a bowl or concavo-convex hook-support, B, having a hook, *a*, that catches the thread from the side of an eye-pointed needle and carries it in the form of a loop around a bobbin or spool, E, in a spool-case, C, which is held stationary in the concavo-convex hook. The loop in such case does not slip between the concavo-convex hook and the spool-case, but passes around the hook *a*, as best shown in Fig. 2, the outer portion, *t*, of the loop being carried outside of the case and lying on the outside of the hook, and the inner part, *s*, passing through the throat of the hook and across the inside of the case to and bearing on a shoulder, *y*, at the end of a rib, 12. This rib in machines as heretofore constructed encircles the case for about two-thirds the periphery, terminating in a shoulder, *z*, at one side of the case about in the position of the star in Fig. 7. In such machines the loop of thread, after the hook has passed the shoulder *z*, must slip up between the case and the concavo-convex hook until it is drawn up to the cloth around the thread carried by the spool E. It is necessary in such cases to extend the rib well up to the side of the case; otherwise the latter would bear upon and press the thread between it and the inside of the concavo-convex hook, wearing and breaking the thread. As a result of thus extending the rib 12 to the point, the loop must be held until the hook passes said point, and then must be drawn up, necessitating either an irregular action of the needle to hold it until after the loop escapes at the point and is drawn up and then descends quickly, or, as has been the practice, a double revolution of the concavo-convex hook to one reciprocation of the needle is effected, the second revolution taking place without catching the needle-thread while the loop is being drawn up. The necessity of a rapid drawing up of the loop, as in the first case, demands a rapidly-operating take-up, which results in a great increase of friction, reduction of speed of the machine, and frequent breaking of the thread. To obviate these difficulties, I extend the rib 12 only for about one-half the periphery of the case, so that the loop can escape as soon as the hook *a* has passed the bottom of the case, there being then ample time for the loop to be drawn up and for the needle to operate during the remaining half-revolution of the concavo-convex hook, and to prevent any pressure on the loop between the case and concavo-convex hook I provide a supplemental bearing for the case between the points *z* and *y*, that will hold the case away therefrom. As the loop must traverse between the concavo-convex hook and case along the whole distance from the point *z* to the top of the case, it is necessary to provide for its passage without contact with said bearing, and I therefore construct the same as follows: A rib, 16, constituting the supplemental bearing aforesaid, is arranged on the exterior of the case on the same plane as the rib 12, and the concavo-convex hook is cut away to form a space, *n*, between two shoulders, *u v*, and these parts occupy such relative position that the loop escaping from the hook can pass in the space *i*

between the shoulders *z* and *e*, Fig. 3, and slip up until it reaches the shoulder *e*, Fig. 4, and can then, as the space or recess *n* is brought and carried opposite the rib 16, slip into the recess *n* and move over the top of the rib 16, as the recess *n* is carried opposite the same until said recess passes beyond the shoulder *e'* of the rib 16, Fig. 5, when the loop can escape from between the case and the concavo-convex hook, and is then drawn around the bobbin-thread to the fabric. The bearing or rib 16 thus prevents any bearing on the traveling loop, while it does not interfere with the continuous free passage of the loop between the parts.

It is necessary to begin drawing upon the loop as soon as it has passed the center of the case at the bottom and escapes from the hook. Heretofore the case has been of a shape and thickness to maintain the distention of the loop and prevent its rapid contraction. I therefore have reduced the case in depth or thickness by cutting it away at front and back, leaving only a narrow connecting side portion, *f*, Fig. 6, which permits the loop to contract as it is drawn up.

To permit the ready insertion and removal of the spool-case, I make it in the form of a ring divided or split at *w*, as shown in Figs. 6, 7, 9, which ring may be contracted until it can be passed into the open mouth of the concavo-convex hook, after which it is released, and on expanding the ribs 12 16 take their place in the usual groove inside the concavo-convex hook and retain the ring in place.

To facilitate the contracting of the ring-case, I provide it with bearings for the jaws of a suitable contracting-tool, as a tongs or pliers, Thus there may be holes *u' v'* near the ends of the ring to receive the pointed jaws of pliers, by which the ends may be readily brought together.

Without limiting myself to the precise construction and arrangements of parts shown, I claim—

1. In a sewing-machine, the combination of the internally-grooved revolving hook having a recess, *n*, a case carrying the spool and having two bearings, 12 and 16, in the same circumferential plane with intervening spaces between them, means for rotating the hook, and means for holding the case stationary relatively to the hook, substantially as described.

2. The combination, with a grooved revolving hook of a sewing-machine, having a recess, *n*, of a stationary spool-case having a circumferential bearing-rib, 12, on one side extending from the upper to the lower edge thereof, and a short bearing-rib on the opposite side of the case, with spaces between the two bearing-ribs for the unobstructed passage of the thread, means for rotating the hook, and means for holding the case stationary relatively to the hook, substantially as described.

3. The combination of the revolving hook of a sewing-machine, means for revolving the same, a spool-case mounted therein, reduced in thickness at the front and back to leave a narrow connecting side portion, *f*, whereby rapid contraction of the loop is permitted, and means for holding the case stationary relatively to the hook, substantially as described.

4. In combination with the revolving hook of a sewing-machine, the compressible spool-case in the form of a split ring provided with bearings *u' v'*, near the ends of said ring to receive a compressing-tool, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

SIMON W. WARDWELL, JR.

Witnesses:
GEO. H. GRAHAM,
CHARLES W. HANDY.