

(No Model.)

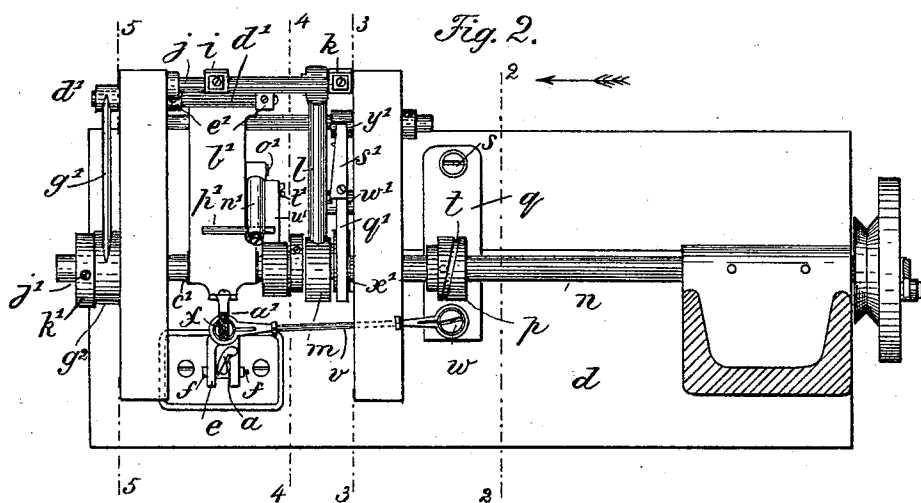
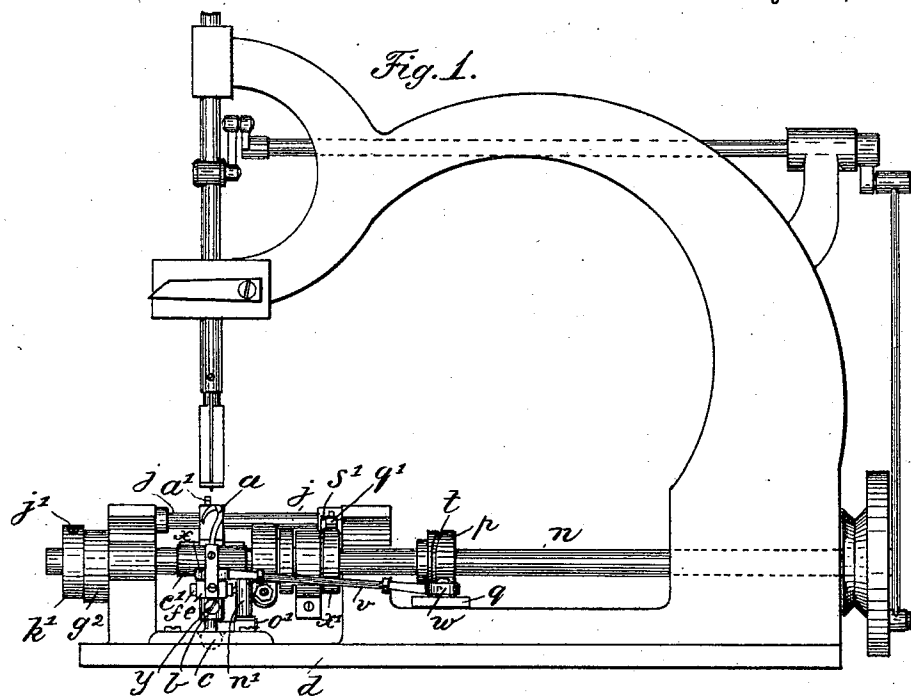
2 Sheets—Sheet 1.

A. A. BOUTON & S. H. VARNUM.

LOOPER OPERATING MECHANISM FOR SEWING MACHINES.

No. 582,716.

Patented May 18, 1897.



WITNESSES.

Ernst Lundgren
Chas. Morgan

INVENTORS

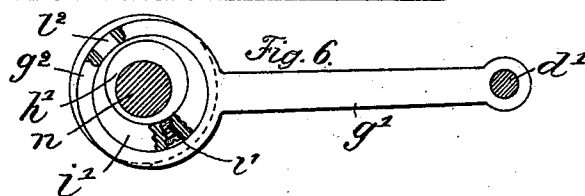
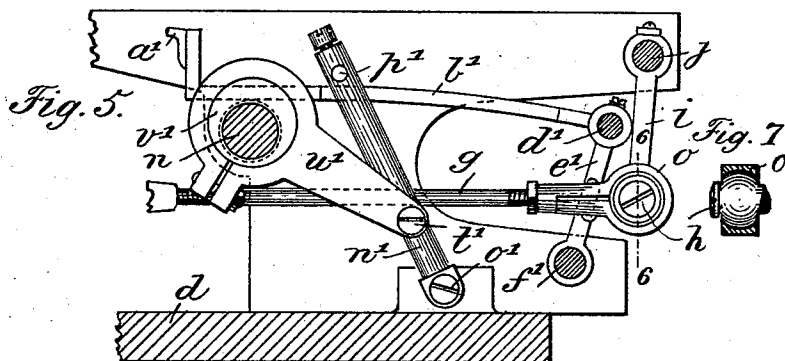
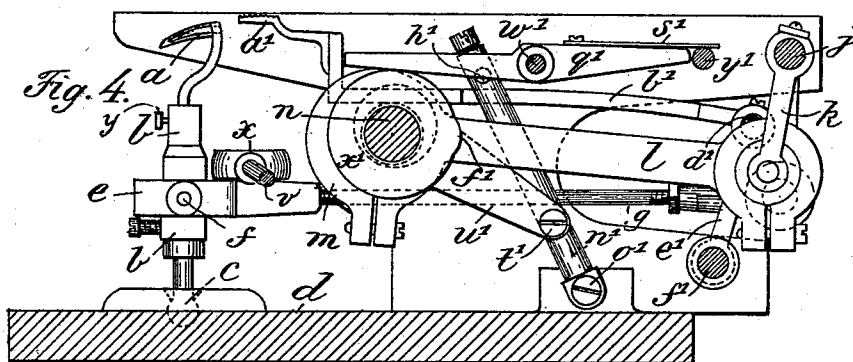
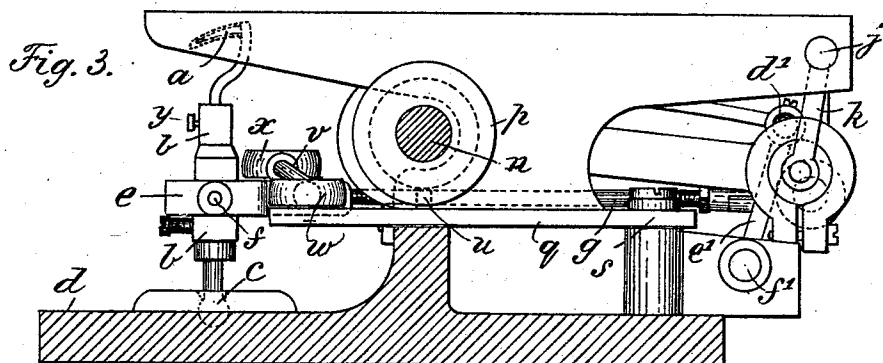
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UNITED STATES PATENT OFFICE.

ARTHUR A. BOUTON AND STEPHEN H. VARNUM, OF BROOKLYN, NEW YORK.

LOOPER-OPERATING MECHANISM FOR SEWING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 582,716, dated May 18, 1897.

Application filed October 18, 1895. Serial No. 566,034. (No model.)

To all whom it may concern:

Be it known that we, ARTHUR A. BOUTON and STEPHEN H. VARNUM, citizens of the United States, and residents of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Sewing-Machines, of which the following is a specification.

Our invention consists of improvements in the looping apparatus, as hereinafter described, reference being made to the accompanying drawings, in which—

Figure 1 is a side elevation of a sewing-machine constructed according to our invention with the work-supporting plate removed. Fig. 2 is a plan view also with the work-supporting plate removed and with the upper works and their supporting arm detached. Fig. 3 is a transverse section on line 2 2, Fig. 2, the view being in the direction indicated by the arrow. Fig. 4 is a transverse section on line 3 3, Fig. 2. Fig. 5 is a transverse section of part of the apparatus on line 4 4, Fig. 2. Fig. 6 is a transverse section on line 5 5, Fig. 2, with parts broken out to illustrate the eccentric device of the feed mechanism. Fig. 7 is a detail in section on line 6 6, Fig. 5.

To provide simpler and better working apparatus for imparting the necessary and usual horizontal and somewhat orbital movement to the hook *a* for the under thread, we mount said hook on the vertical standard *b*, set in a ball-and-socket step *c* in the base-plate *d*, whereby the standard is enabled to have free universal movement, and at a suitable distance above the step we connect the standard by the yoke *e* and pivots *f* with the rod *g*, coupled at its other end with the pivot *h* of the vibrating arm *i*, pendent from the rock-shaft *j*, which by another pendent arm *k* is coupled with the connecting-rod *l*, which is connected, by the eccentric-yoke *m*, with a suitable eccentric on the main shaft *n* for imparting the forward-and-backward vibrating motion to the hook. The yoke *o* of connecting-rod *g* has substantially a ball-and-socket-joint connection with the pivot *h*, as shown in the detail, Fig. 7, allowing the rod a limited rolling motion for accommodating the lateral movements of the hook-supporting standard. For imparting the said lateral movements to the said standard a cam *p* is fixed on the main

shaft *n*, which operates the vibrating lever *q*, pivoted at *s*, by its groove *t* and the stud *u* of the lever engaging said groove, to which lever the hook-support is coupled by the connecting-rod *v*, ranging at right angles to the rod *g*, which imparts the forward-and-backward movements, said rod *v* having ball-and-socket-joint connections *w x* with lever *q* and yoke *e*, of like character as represented in Fig. 7, for allowing unlimited freedom in the forward-and-backward movements of the hook-support.

It will be seen that by the use of the cam on the main shaft and the lever the vibrations of the looper can be timed independently of the movements of the needle, which cannot be done when the looper is connected with the needle-working arm.

The shank of the hook is vertically adjustable in the support *b*, and a set-screw *y* is provided for securing it in position, and the connecting-rods *g* and *v* are extensible to adjust the hook in proper relations with the needle.

It will be seen that the forward-and-backward movement is of the regular uniform character due to the operation of an eccentric mover, but for the lateral movement, which is required to be irregular, the cam affords by its irregular shape the precise gradation required, but the movements of the hook are substantially the same in other machines and need not be specifically defined, as it is only the apparatus for effecting the movements that is herein claimed.

The feeder *a'* is carried by the bar *b'*, resting on the cam *c'* of the main shaft for raising and lowering it at the proper times and connected to the bar *d'*, located at the rear side of the machine and carried by the rocking arms *e'*, supported on the rock-shaft *f'*. The bar *d'* has one extremity coupled to the connecting-rod *g'*, which is coupled by yoke *g²* to an eccentric on the main shaft for imparting the rock motion to bar *d'*, which actuates the feeder-bar. We construct this feed-operating eccentric in a compound device, comprising a small eccentric *h'*, fitted on the shaft *n*, and a larger eccentric *i'*, fitted on the small one, so that one or both can be shifted to lengthen and shorten the throw, as desired. They may be secured in any approved way.

The small one may be secured by a set-screw in its hub k' , taking effect on shaft n , and the larger eccentric i' may be secured to the small one by a set-screw l' , the yoke g^2 having a suitable perforation l^2 for applying a screw-driver to the set-screw. It will be seen that this contrivance affords a very simple apparatus for construction and keeping in order.

For the take-up device for the under thread we have a bar n' , pivoted at o' on the base of the machine and ranging upward nearly to the under side of the work-plate, where it carries the horizontal arm p' , having an eye through which the thread is strung between the hook a and the tension-grip $q's'$, said bar n' being coupled at t' a short distance above the pivot o' with the connecting-rod u' , yoked to an eccentric v' on the main shaft n for actuating the take-up.

The tension-grip consists of the lever q' , pivoted at w' , subject to an actuating-cam x' on the main shaft for actuating it to relieve the thread and carrying the spring s' , normally bearing against the side of the free arm of the lever, between which and the spring the thread is drawn from the spool or any other tension device that may be used, said arm being extended beyond the end of the lever and resting on the stud y' , so that when the other end of the lever is raised by the cam x' the grip of the spring on the thread is

relaxed, allowing the thread to be drawn in by the hook. At other times the thread is withheld by the grip.

The needle-bar, presser-bar, and other parts of the works above the work-plate are of common construction and need not, therefore, be described.

We claim as our invention—

The combination with the needle-bar and means connected with the main shaft for reciprocating the same, of a looping-hook having a ball-and-socket stepped support, and means for imparting the forward-and-backward movements, that consists of rocking arms located back of the main shaft, connecting-rods coupling said arms and hook-support, and the eccentric mechanism connecting said rocking arms and the main shaft; independently of the means for reciprocating the needle-bar; together with means for imparting lateral vibration to the hook-support substantially as described.

Signed at New York city, in the county and State of New York, this 16th day of October, A. D. 1895.

ARTHUR A. BOUTON.
STEPHEN H. VARNUM.

Witnesses:

W. J. MORGAN,
A. P. THAYER.