

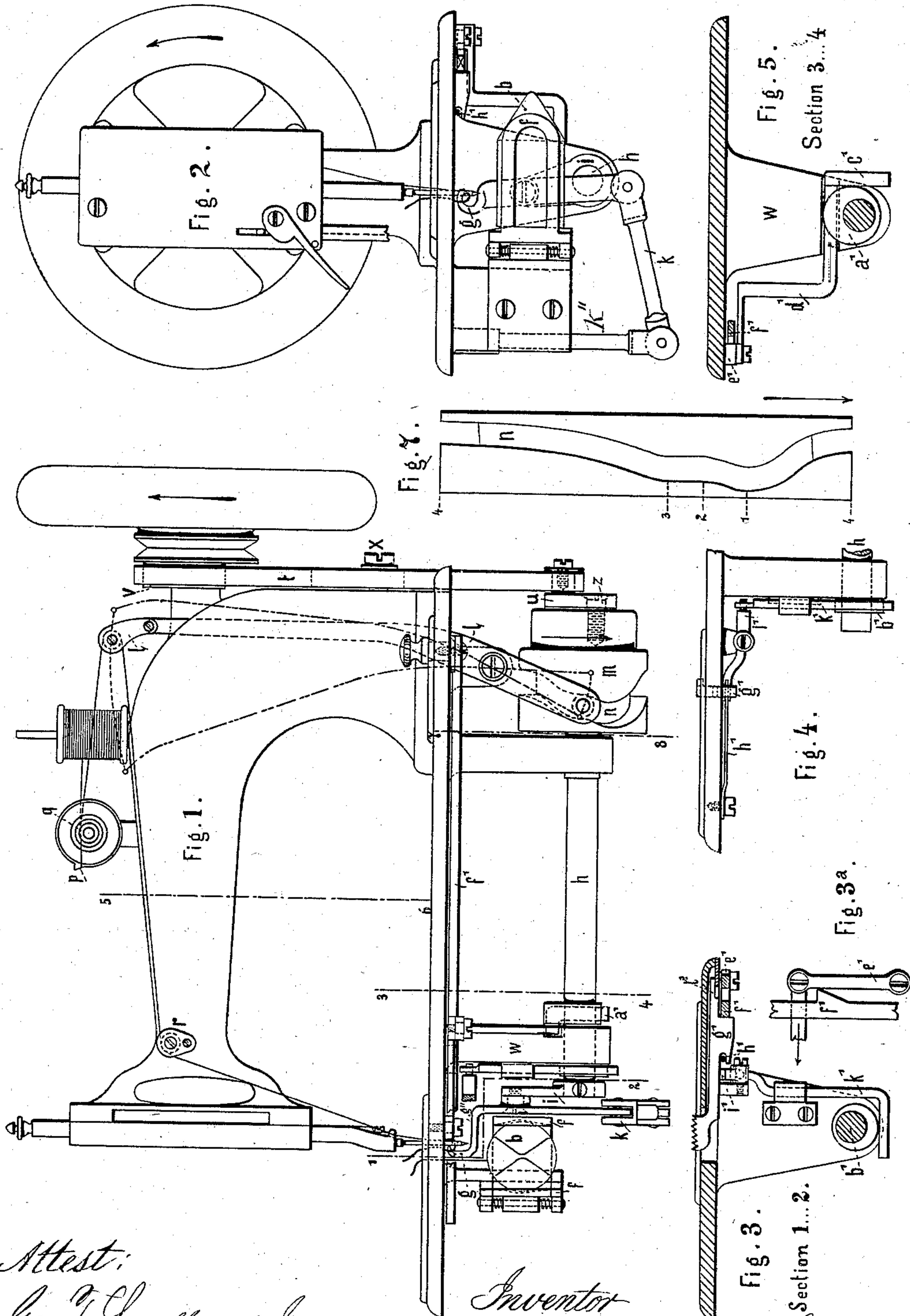
(No Model.)

2 Sheets—Sheet 1.

J. STERN.  
SEWING MACHINE.

No. 254,721.

Patented Mar. 7, 1882.



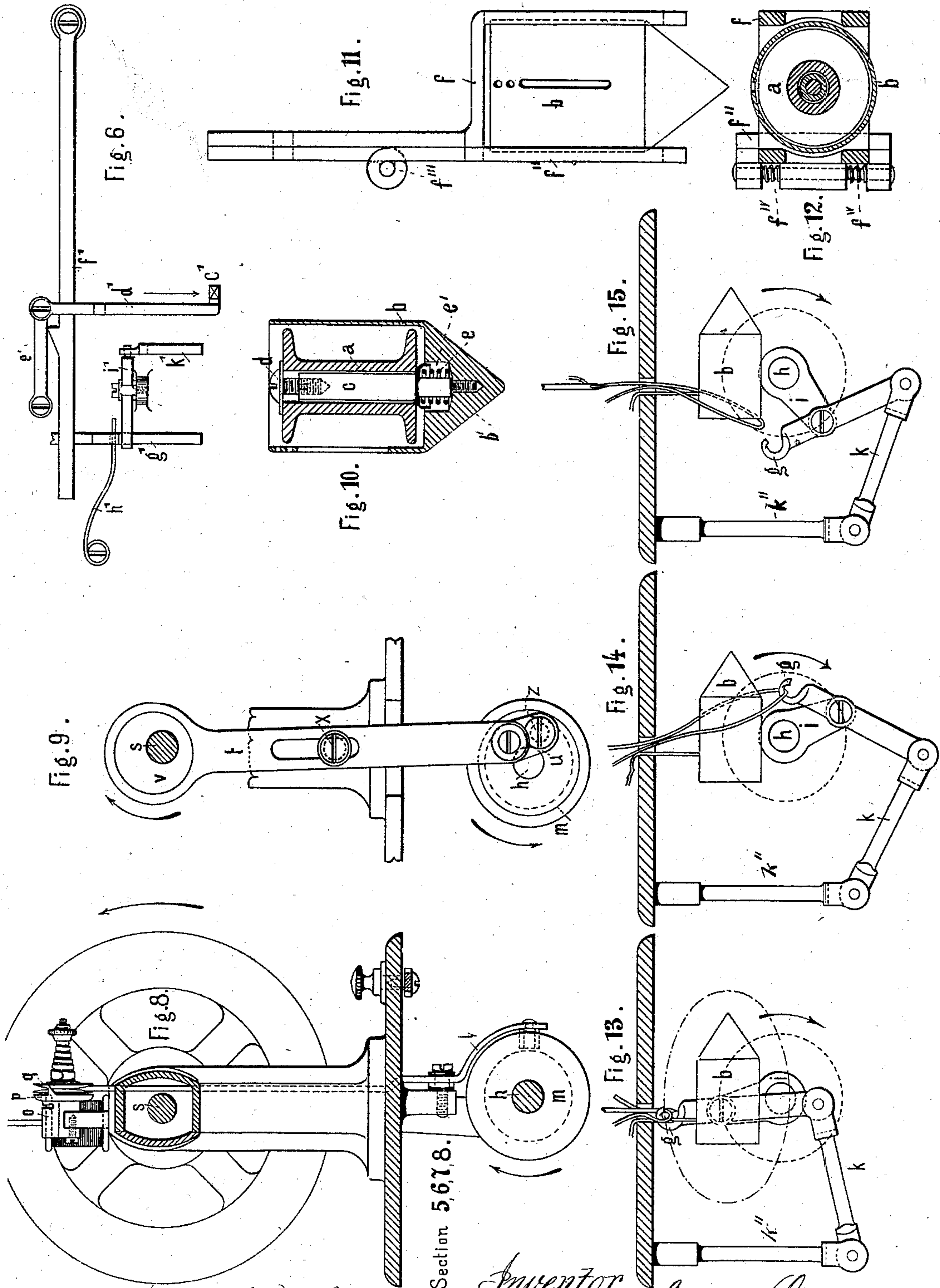
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# UNITED STATES PATENT OFFICE.

JULIUS STERN, OF ST. PETERSBURG, RUSSIA.

## SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 254,721, dated March 7, 1882.

Application filed June 20, 1881. (No model.) Patented in England May 19, 1881, in France May 20, 1881, and in Austria-Hungary July 8, 1881.

*To all whom it may concern:*

Be it known that I, JULIUS STERN, merchant, residing in St. Petersburg, Russia, have invented certain new and useful Improvements in Sewing-Machines, of which the following is a specification.

My invention relates to those sewing-machines in which the lower thread is worked directly off a common spool, such as form an article of trade.

The improved machine is represented on the annexed two sheets of drawings, in which Figure 1 is a front elevation of the machine. Fig. 2 is a front end view; Fig. 3, section on line 1 2, Fig. 1, looking toward the rear; Fig. 4, part of front elevation in which some parts have been omitted; Fig. 5, section on line 3 4, Fig. 1, looking forward; Fig. 6, view of the feeding device from below. (Part of this view is repeated in Fig. 3<sup>a</sup>.) Fig. 7, developed form of the cam-groove *n*, Fig. 1; Fig. 8, section on line 5 6 7 8, Fig. 1, looking toward the rear; Fig. 9, view of the mechanism for transmitting motion from the main shaft *s* to the shaft *h*; Fig. 10, vertical section of the case for the spool of the lower thread with spool inserted; Fig. 11, top view of the spool-case and its carrier; Fig. 12, transverse section of the spool-case and carrier. (The Figs. 10, 11, and 12 are drawn in full size.) Figs. 13, 14, and 15, three different positions of the parts serving for drawing the loop of the upper thread around the case.

The mechanism for imparting motion to the needle is similar to the well-known shuttle sewing-machines, and has therefore not been shown in the drawings.

The part of the machine containing the lower thread, and by which the entwining of the upper thread with the lower one is caused, differs in detail of construction from the arrangements heretofore employed.

The spool *a*, carrying the lower thread, (an ordinary wooden sewing-thread spool,) is contained, as may be seen from Fig. 10, in a cylindrical case, *b*, terminating at its front end in a cone, *b'*. The said spool turns, with a certain friction due to a spring, *e*, located in a recess, *e'*, on a pin, *c*, the amount of this friction allowing of regulation by means of the screw *d*, which keeps the spool in its place. From the spool the thread passes outward through

a longitudinal slit cut into the wall of the case, and for increasing its tension it may also be drawn through various holes drilled into the case for this purpose. The case *b* is so inclosed in a carrier, *f*, that it cannot leave its place, (see Figs. 2, 11, and 12;) but between it and the carrier there is so much play that the loop of the upper thread may freely pass around the case. For the purpose of allowing the case to be removed from the carrier the front or outer part, *f''*, of the latter is hinged at *f'''*, while a spring, *f<sup>iv</sup>*, serves to keep it in its place.

The case *b* being stationary, it necessarily follows that the upper thread, after having been carried by the needle below the cloth-plate, has to be drawn around the case. For this purpose serves the hook *g*, the arrangement and action of which may be seen from Figs. 1 and 2, but principally from Figs. 13, 14, and 15. The shank or body of this hook is on one hand pivoted to a crank, *i*, fixed on the shaft *h*, whereas on the other hand it is jointed to a radius-rod, *k*, hinged to a depending bar, *k''*, as will be understood from the different figures without further explanation. When the shaft *h* rotates the hook *g* is carried around in a curve somewhat resembling an ellipse. Moreover, it has to be stated that the hook, the needle, and the point of the case *b* are so arranged with respect to each other that the hook passes with its point close to the needle, and that, besides, it executes its motion in the vertical central plane of the case *b*. For allowing the latter condition to be fulfilled the shank of the hook must be bent, as at *g''*, Fig. 1, in such a manner that it may pass alongside of the case-carrier *f* without touching the same. The motions of the needle and the hook are in such relation to each other that the latter passes the needle after the same has begun to rise and the upper thread has formed a small loop. The hook seizes this loop (see Figs. 2 and 13) without, however, requiring a stoppage of the needle, as is necessary in shuttle sewing-machines. It thereupon expands the same and draws it along in the direction of its motion. As soon as the hook has passed the point of the case the loop lays itself upon this point, and is thereupon drawn lengthwise over the case. (See Fig. 14.) For facilitating the sliding of the thread the conical part of the



case *b* may be flattened at the sides, so that its end will then form a narrow edge instead of a point. When the loop has attained the position Fig. 15 it slips off the hook, and is thereupon drawn tight by the take-up shown by Figs. 1 and 8. The same consists of a lever, *l*, which is put in motion by the cam-groove *n*, cut into the rotating cylinder *m*, and through the top end of which the upper thread is drawn. The said top end of the lever passes outward through a slit in the frame of the machine. The upper thread runs from its spool through the thread-guide *o*, around a projection or point on the disk *p*, to the tension device *q*, thence through the head of the said lever *l* and over the guider, and, finally, through an eye on the needle-bar to the needle.

The shape of the cam-groove *n* (shown developed on a plane-surface in Fig. 7) is such that the lever *l* will first pay out so much thread as the needle requires when descending. To this period the part 1 2 of the groove corresponds. The part 2 3, then following, causes the lever to stand still, while the needle commences to rise and the hook enters into the loop. From 3 to 4 the groove causes a further and more extensive paying out of thread for the expansion of the loop. As soon as the loop has passed the case *b* the lever-head is drawn speedily back by the action of the part 4 1 of the groove for the purpose of taking up the loop and of drawing tight the stitch. Instead of this take-up, however, some other device having a similar action may be combined with the rest of the mechanism described.

To the shaft *h* motion is or may be imparted from the main shaft *s* by means of an eccentric, *v*, fixed on *s*, and of an eccentric-rod, *t*, guided at or near its center and pivoted at its lower end to an intermediate piece or driver, *u*, which oscillated on a pin, *z*, fixed to the cylinder *m*, and thereby to the shaft *h*. This arrangement is of advantage on account of its simplicity;

but it may be replaced by any other suitable and known gear.

The feeding mechanism, although not presenting any essentially novel features, nevertheless requires a short description, as the form of the various parts differs somewhat from those ordinarily employed.

On the shaft *h* the two eccentrics or cam-disks *a'* and *b'* are placed, as shown by Figs. 1, 3, 4, 5, and 6. The eccentric *a'* acts against the part *c'* of the variously-bent bar *d'*, which is guided in a groove cut into the bearing *w*, (see especially Fig. 5,) and which, by the medium of the lever *e'* and the bar *f'*, moves the feed-bar *g'*. (See Figs. 3<sup>a</sup> and 6.) *h'* is a spring which presses the feed-bar against *f'*, and at the same time downward. By shifting the bar *f'* the length of the stitch may be regulated, as usual. The upward motion of the feed-bar is caused by the eccentric *b'*, the bar *k'*, and the lever *i'*, Figs. 3, 4, and 6, the outer end of the latter pressing from below against the feed-bar, whose end *l'* is formed and guided in such a manner that the bar may oscillate on this end, and at the same time slide forward and backward. The presser-foot, in connection with which the feed-bar works, has been omitted in the drawings.

I claim as my invention—

1. The shuttle herein described, consisting of case *b*, formed with cone-point *b'* and recess *e'*, the pin *c*, set-screw *d*, and spring *e*, as set forth.
2. The combination of shuttle *b*, shuttle-carrier *f f'' f''' f''''*, shaft *h*, crank *i*, hook *g*, bent at *g''*, radius-rod *k*, and depending bar *k''*, as set forth.

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

JULIUS STERN.

Witnesses:

HENRY SPRINGMANN,  
BERTHOLD ROE.