No. 663,673. Patented Dec. 11, 1900.

P. DIEHL & A. GRIEB.

FEEDING MECHANISM FOR SEWING MACHINES.

(Application filed Aug. 2, 1900.)

(No Model.) 3 Sheets—Sheet 1.

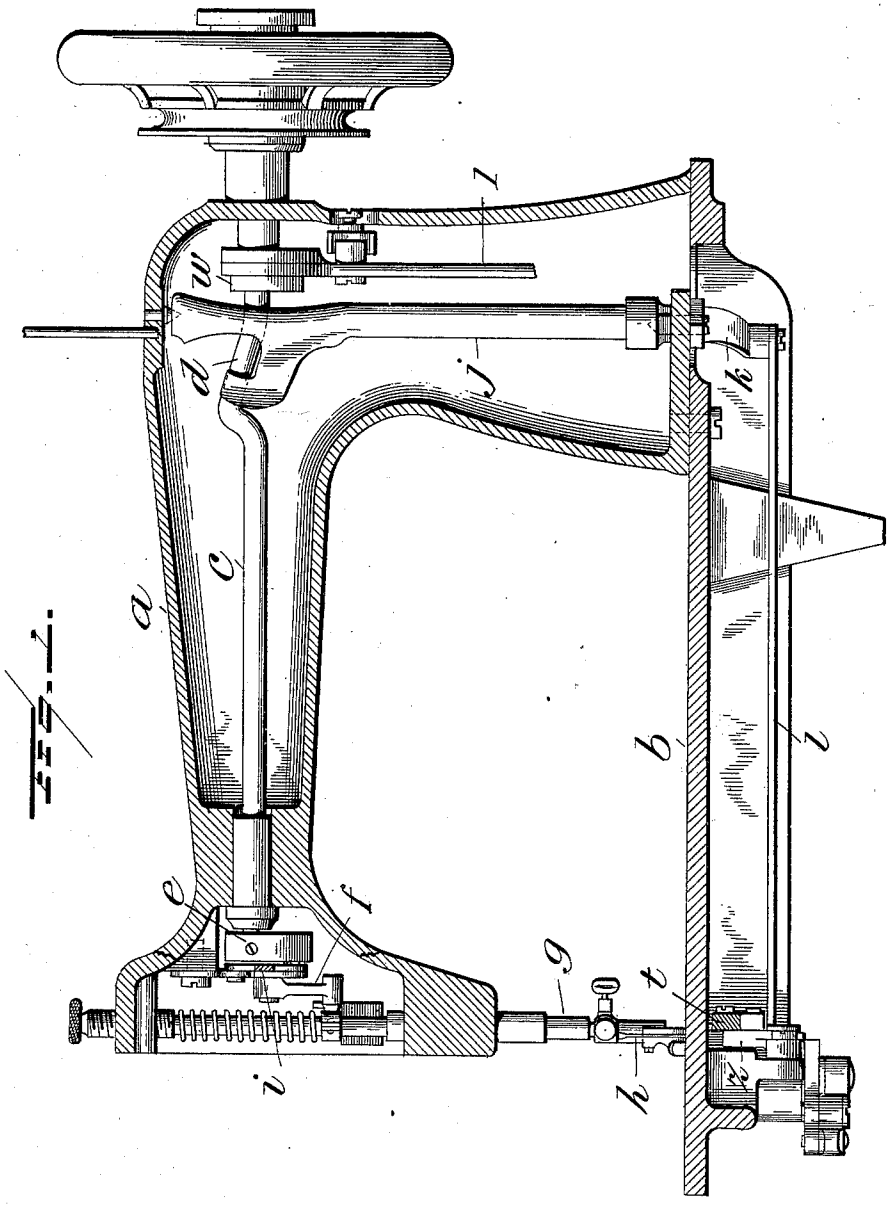

Fig. 1.

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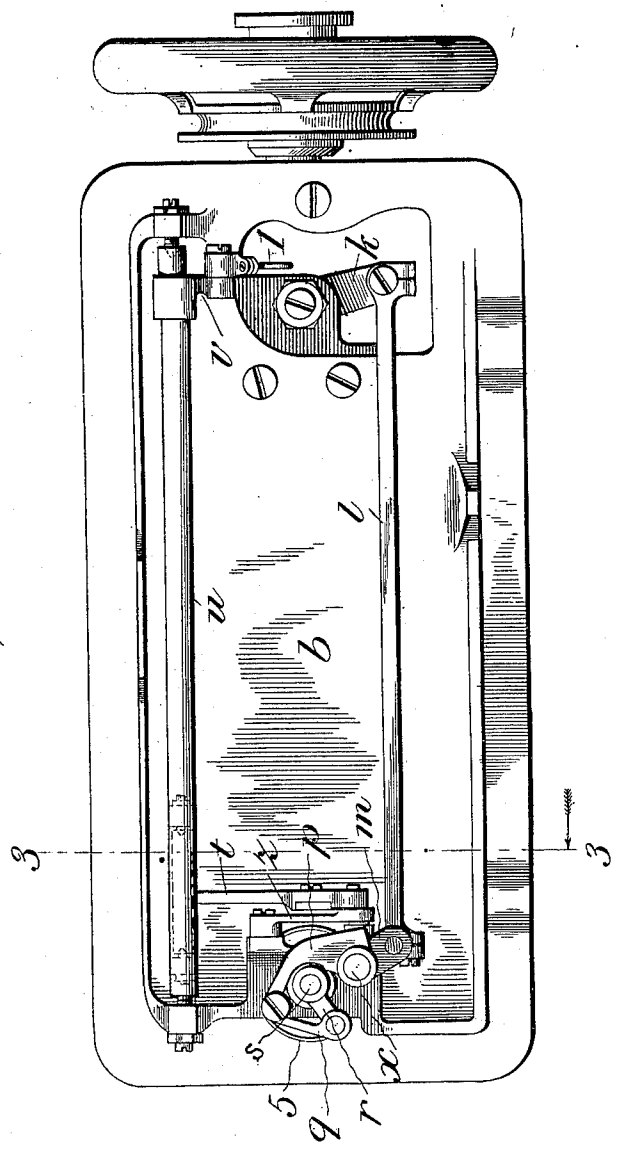
Fig. 2.



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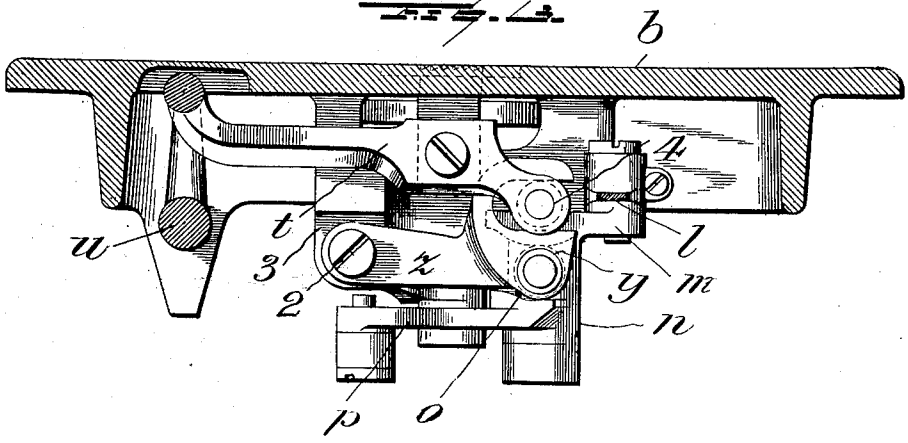

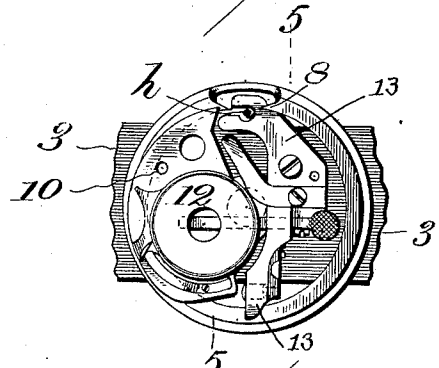

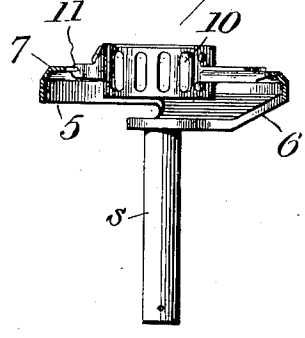

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UNITED STATES PATENT OFFICE.

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FEEDING MECHANISM FOR SEWING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 663,673, dated December 11, 1900.

Original application filed April 9, 1900, Serial No. 12,215. Divided and this application filed August 2, 1900. Serial No. 25,608. (No model.)

To all whom it may concern:

Be it known that we, PHILIP DIEHL and ALFRED GRIEB, citizens of the United States, residing at Elizabeth, in the county of Union and State of New Jersey, have invented certain new and useful Improvements in Feeding Mechanisms for Sewing-Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to a positive four-motion feeding mechanism more especially adapted for use in connection with an oscillating loop-taking hook which carries the loops of needle-thread around a thread-case supported by said hook, as fully described in our United States application, Serial No. 12,215, filed April 9, 1900, of which application this case is a division.

In the accompanying drawings, Figure 1 is a sectional side view of a sewing-machine embodying the invention. Fig. 2 is a bottom plan view thereof; and Fig. 3 is a section on line 3 3, Fig. 2, looking in the direction of the arrow adjacent to said line, showing the work-plate and the parts located below the same. Fig. 4 is a plan view of the oscillating hook and the thread-case supported thereby and adjacent parts. Fig. 5 is a cross-section of the oscillating hook on line 5 5, Fig. 4, showing the hook-shaft and thread-case in elevation.

Referring to the drawings, *a* denotes the arm of the machine, *b* the bed-plate, and *c* the horizontal driving-shaft journaled in the upper portion of said arm and provided near its rear end with a crank *d* and having at its forward end a crank *e*, connected by a pitman *f* with the needle-bar *g*, carrying the usual eye-pointed needle *h*, said crank *e* being also connected in a well-known manner with the "link" take-up *i*. The crank *d* is embraced by a fork at the upper end of a vertical rock-shaft *j*, having at its lower end an arm *k*, connected by a pitman *l* to an arm *m* of a rocking hub *n*, provided with a grooved cam *o*, and having a second arm *p*, joined by a link *q* to an arm *r* of the rocking hook-shaft *s*.

The feed-bar *t*, carrying the usual feed-dog, is reciprocated horizontally, as is common in a well-known style of "Singer" feeding mechanism, by a rocking feed-shaft *u*, having at its rear end an arm *v*, to which is jointed the lower end of a feed connection or link 1, operated from a cam or eccentric *w* on the driving-shaft *c*. The vertical movements of the feed-bar are imparted thereto from the grooved cam *o* in the rocking hub or sleeve *n*, journaled on the fixed pin or stud *x*, the groove of said cam being entered by a roller-stud *y* on a lever *z*, pivoted at 2 to the bracket 3, depending from the work-plate, and forked or slotted at its free end to embrace a roller-stud 4, with which the feed-bar *t* is provided.

The hook-shaft *s* carries at its upper end the horizontally-disposed circular-moving hook or hook-ring 5, connected with said shaft by one or more webs or spokes 6, said hook-ring having an inwardly-extending rib or flange 7, on the inner face of which is formed the loop-seizing beak or hook proper, 8, outside of which is a throat 9, in which the loops of needle-thread are carried around the thread-case 10, having a peripheral groove 11, entered by the said rib or flange 7, to enable the said thread-case to be entirely supported by the said hook-ring or hook, owing to the rib-and-groove connection of these parts. The thread-case is preferably furnished with a bobbin 12 to contain the lower or locking thread; but it is obvious that a cop of thread might be used instead of the bobbin, if desired. Attached to the bracket 3 and arranged within the hook-ring is a holder 13, which serves to maintain the thread-case stationary as the hook-ring travels about it.

From the foregoing it will be apparent that we secure a four-motioned feeding mechanism in which all the movements of the feed-bar are positive and that we operate the rock-shaft which carries the oscillating hook through the rocking hub or rocker which imparts the positive up and down movements to the said feed-bar.

We do not herein claim the horizontally-disposed oscillating hook which supports the thread-case arranged eccentrically to the axis of said hook or the other specific devices co-operating therewith and incidentally shown in Fig. 4, as these features are embraced by our application hereinbefore referred to; but

What we do herein claim is—

1. In a sewing-machine, the combination with a driving-shaft in the upper portion of the arm thereof, of a needle-bar operatively connected with the forward end of said shaft, a vertical rock-shaft in the vertical portion of said arm and operatively connected with said driving-shaft, a feed-bar and connections with said driving-shaft for imparting horizontal or feeding movements to said bar, a vertical rocker provided with a cam for imparting vertical movements to said feed-bar, a vertical rock-shaft operatively connected with said rocker, and a loop-taking device operated by said rock-shaft and coöperating with the needle carried by said needle-bar in forming stitches.

2. The combination with the driving-shaft *c*, of the needle-bar operatively connected with the forward end of said shaft, the rock-shaft *j* connected with the said driving-shaft, the feed-bar and connections with said driving-shaft for imparting horizontal feeding movements thereto, the rocking hub *n* provided with a grooved cam for imparting vertical movements to said feed-bar and having also the arms *m* and *p*, the pitman *l* connecting said rock-shaft *j* with the said arm *m* of said rocking hub, the rock-shaft *s* operatively connected with the said arm *p* of said rocking hub, and a loop-taker actuated by said rock-shaft and coöperating with the needle carried by said needle-bar in the formation of stitches.

In testimony whereof we affix our signatures in presence of two witnesses.

PHILIP DIEHL.
ALFRED GRIEB.

Witnesses:
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