

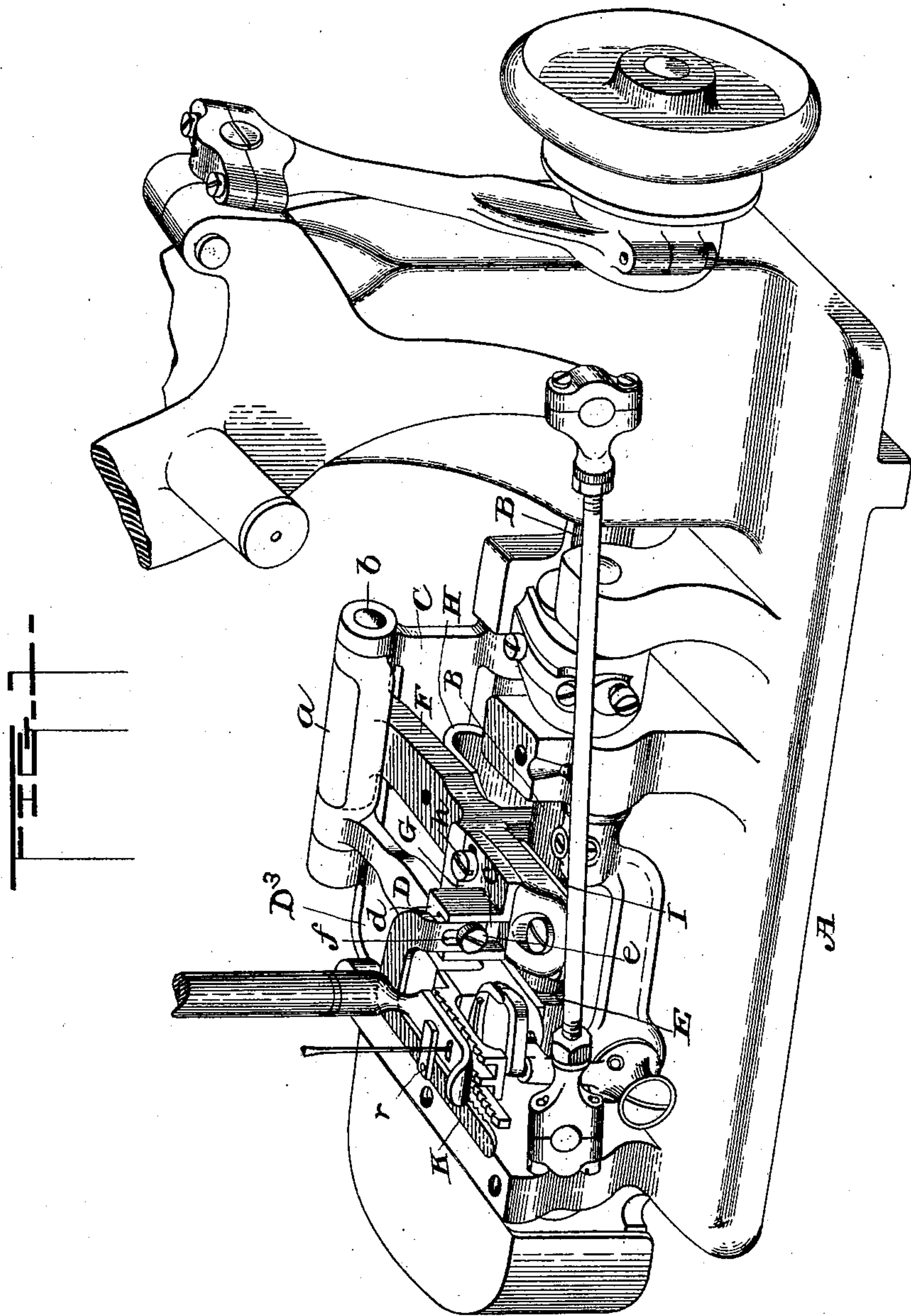
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3 Sheets—Sheet 1.

R. G. WOODWARD.
FEED MECHANISM FOR SEWING MACHINES.

No. 591,517.

Patented Oct. 12, 1897.



Witnesses,
G. W. Smith
J. A. Moore.

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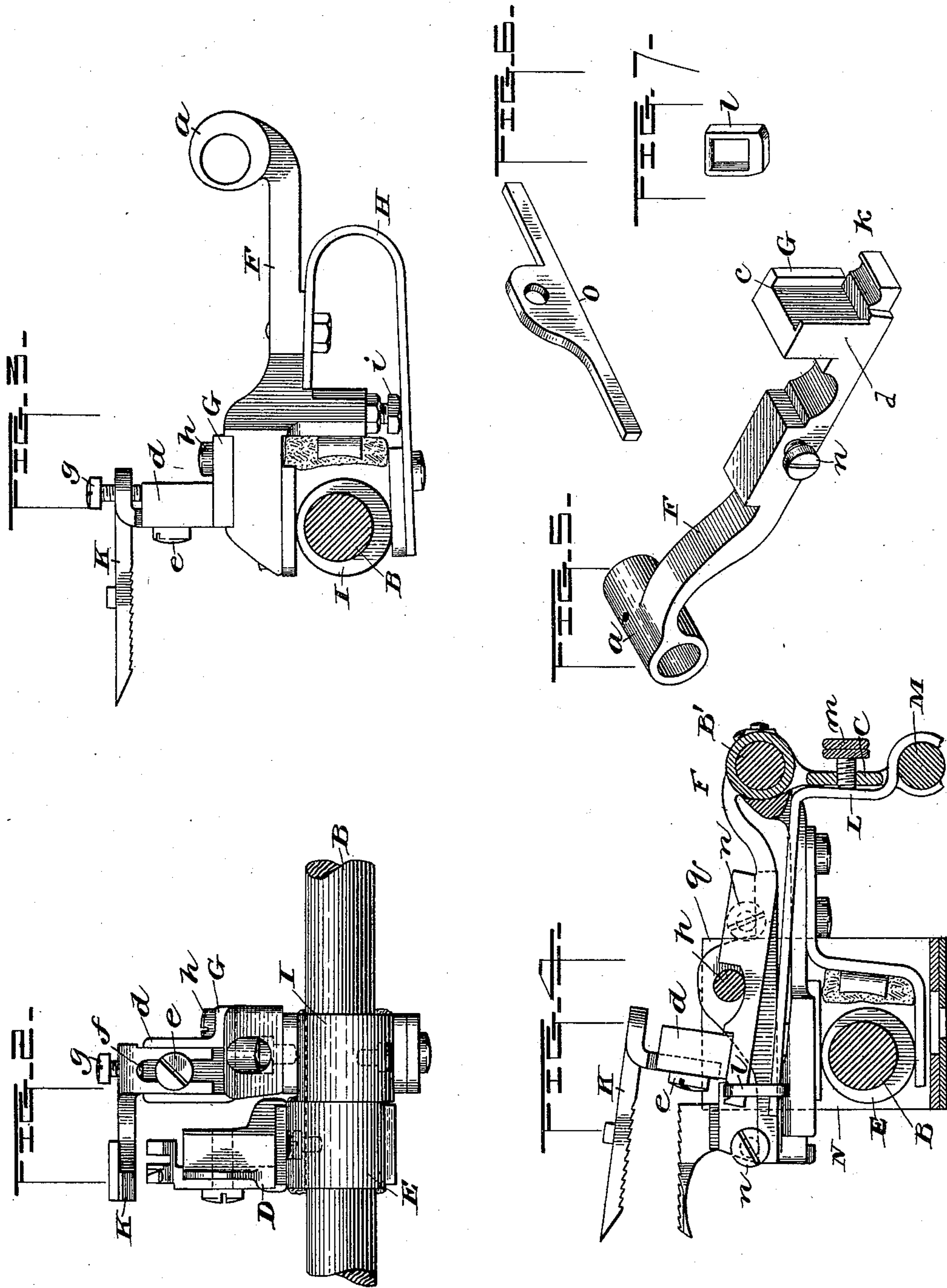
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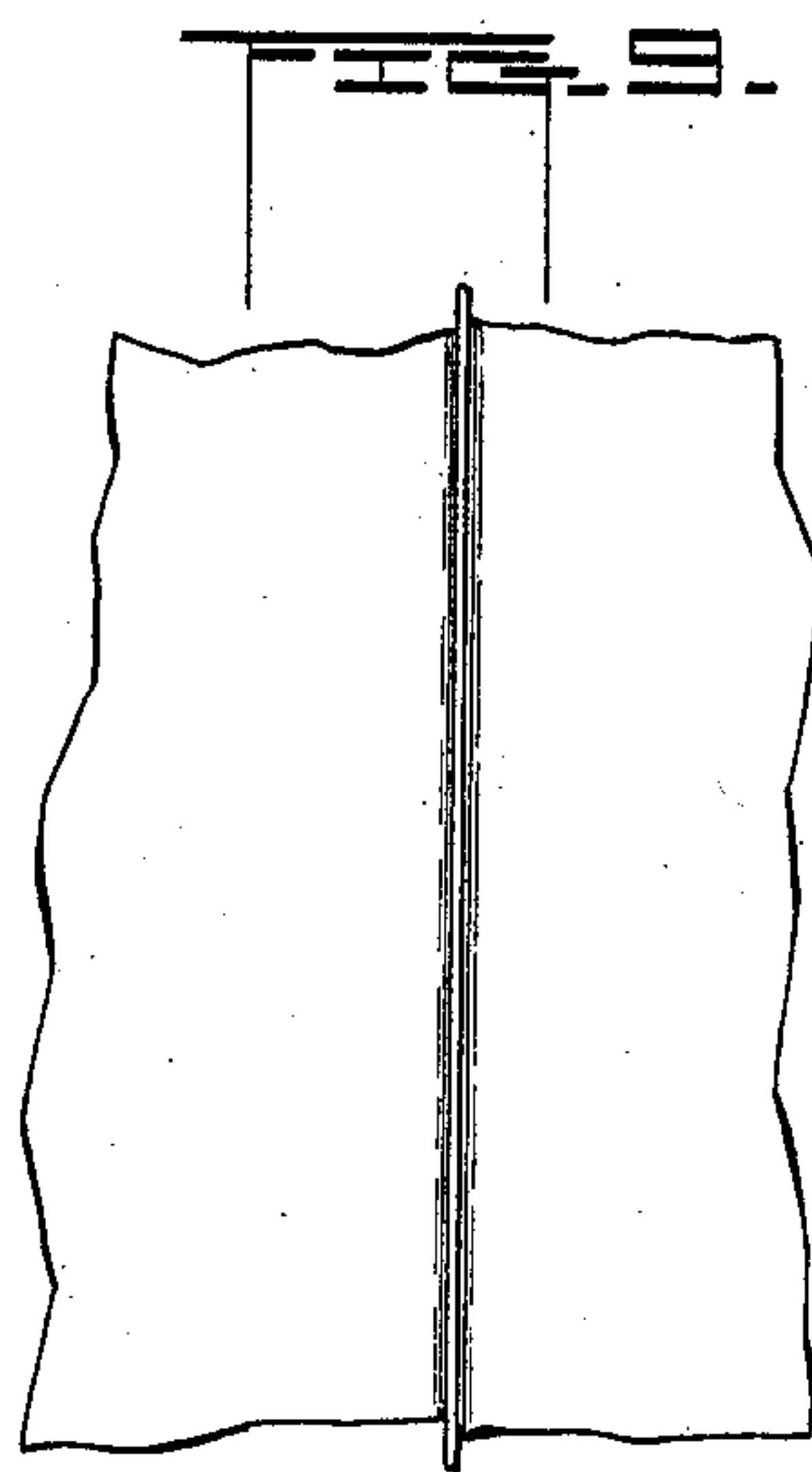
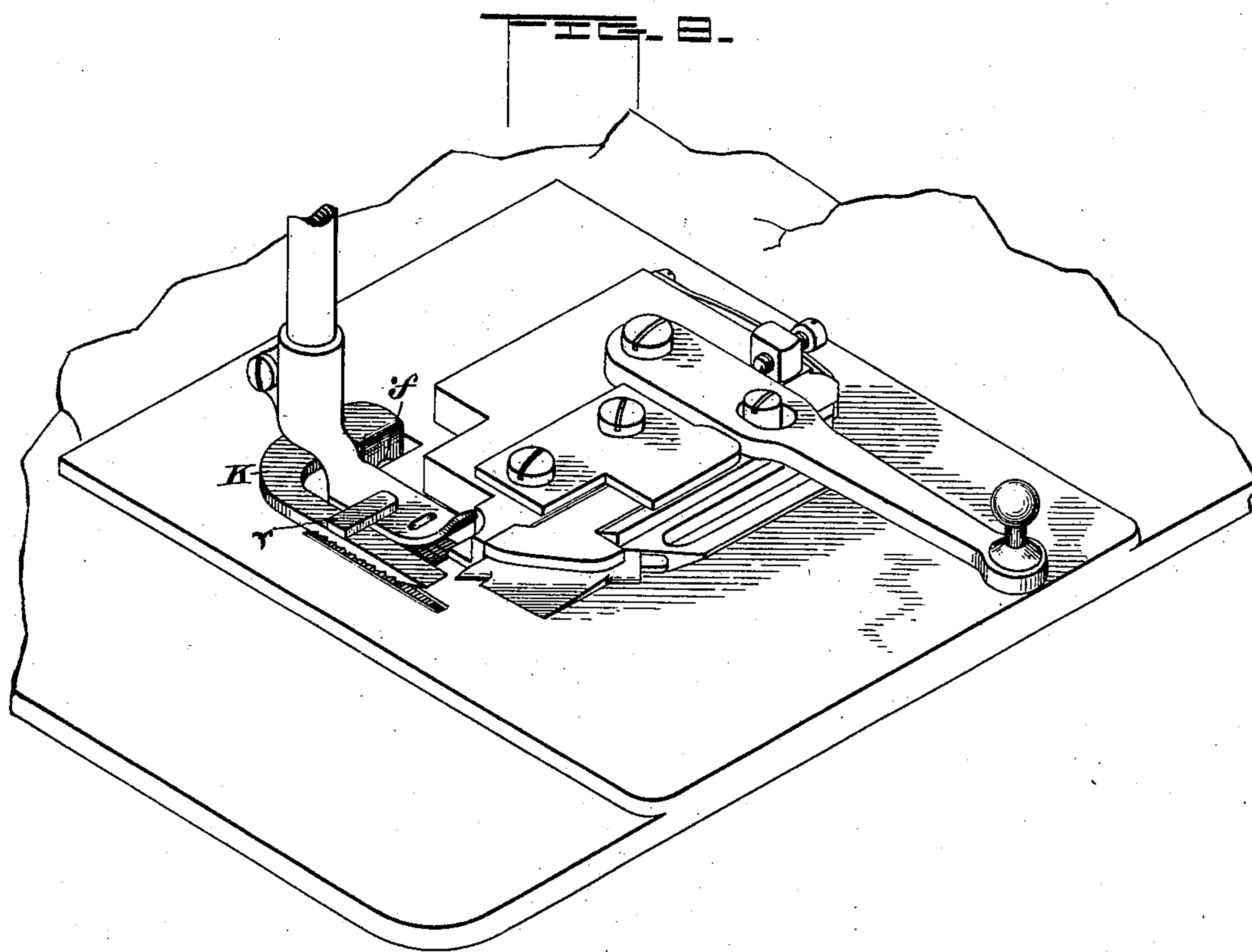
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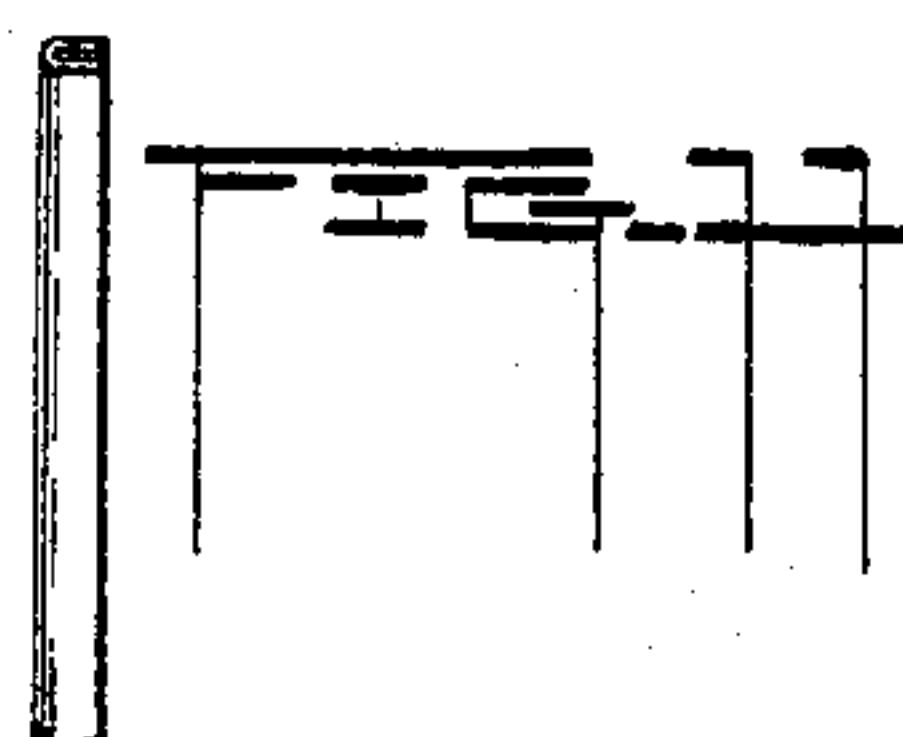
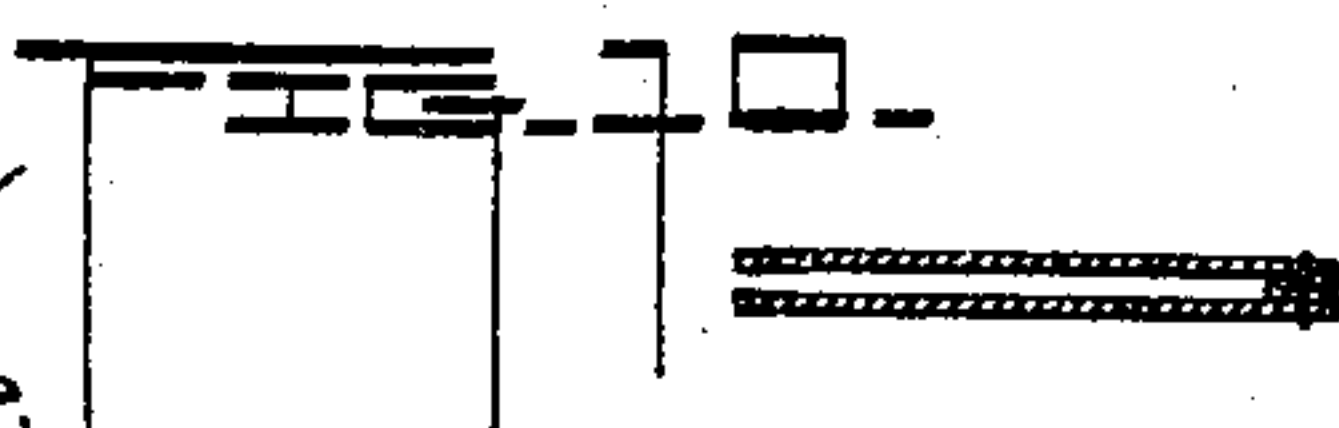
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UNITED STATES PATENT OFFICE.

RUSSEL G. WOODWARD, OF WAUKEGAN, ILLINOIS, ASSIGNOR TO THE UNION SPECIAL SEWING MACHINE COMPANY, OF CHICAGO, ILLINOIS.

FEED MECHANISM FOR SEWING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 591,517, dated October 12, 1897.

Application filed March 5, 1896. Serial No. 581,921. (No model.)

To all whom it may concern:

Be it known that I, RUSSEL G. WOODWARD, a citizen of the United States, residing at Waukegan, in the county of Lake, State of Illinois, have invented certain new and useful Improvements in Sewing-Machines, of which the following is a description, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

My invention relates to an improvement in sewing-machines, and more especially to the feeding mechanism thereof, designed especially for feeding two thicknesses of superposed material having smooth surfaces which render them liable to slip or creep one upon the other—as, for instance, in closing the seams of boots and shoes—and is, moreover, of great utility when a stay is to be inserted between the thicknesses.

The object of the invention is to provide a machine in which several thicknesses of material may be firmly clamped and positively and accurately fed in unison, avoiding the danger of one thickness feeding faster than the other. This object is attained by special mechanism, which will be clearly described, involving also a structure whereby at will the machine may be converted into a machine having a single feeding device, and this without leaving any of the mechanism of the upper feed in sight or in the way. Thus the machine is capable of being used with the single feeding device, and when thus used may employ any and all auxiliaries or attachments for doing various kinds of work.

The invention consists in the parts, improvements, and combinations hereinafter described and claimed.

In the accompanying drawings, which illustrate the invention, Figure 1 is a perspective view of a sewing-machine embodying my invention, part being broken away to illustrate the feed-operating connections. Fig. 2 is a longitudinal elevation of a portion of the main shaft, showing the feeding-dog-carrying bars and the cams on the main shaft for operating the same. Fig. 3 is a detail side view of the supplemental feed-dog-carrying bar or frame. Fig. 4 is a cross-sectional view illus-

trating another form of device for operating the supplemental feed-dog-carrying bar. Figs. 5, 6, and 7 are detail views of portions of the mechanism shown in Fig. 4. Fig. 8 is a perspective view showing a welt-guide applied for use in connection with this machine; and Figs. 9, 10, and 11 are detail views of the welted seam made on this machine.

In the drawings, A represents the bed-plate of an ordinary Union Special sewing-machine using a single needle, although it will be understood that other stitch-forming mechanism may be substituted for that herein shown.

B represents the main shaft of the machine, and it will be understood that it has on its outer end a disk, across the face of which a crank-pin is radially adjustable, this crank-pin being connected with the ordinary feed-rocking frame C by the arm D³, all as illustrated in Letters Patent No. 299,568, granted to Muther and Dearborn June 3, 1894.

The lower feed-dog is attached to a bar D, pivoted at one end to the rocking frame and having a rise and fall imparted to it by the cam E. Also pivoted to the rocking frame C, by means of a sleeve *a*, fitting over the rod B', is a second bar F, formed as shown in the drawings, and having secured on its outer end a holder G for the upper feed-dog, the shank of which fits in the groove *c* of the vertical part *d* of the holder G, and is held in proper position by a screw *e*, passing through the slot *f* into the holder, it being vertically adjustable on said screw, without taking off the bed-plate of the machine, by means of the screw-bolt *g*, passing vertically through said feed-dog and impinging upon the holder G. By this construction the upper feed-dog is also removable from its supporting-bar, which renders the machine capable of being used as a single or clamp feed machine. The machine is thereby convertible respecting its feeding mechanism, enabling it to be used in almost any capacity and having no limitation by reason of employing an upper feeding-jaw which adapts the machine to special work. Upon removing the upper feed-jaw all evidence of the upper feeding mechanism practically disappears and no obstructions remain above

the bed-plate to interfere with materials to be operated upon or attachments to be employed for special purposes.

The holder is laterally adjustable on the bar F by means of the slots and screws *h*.

Secured to the under side of the bar F is one end of a strong bent spring H, which is curved as shown, and between its outer end and the outer end of the bar F rides the cam I on the main shaft, oppositely cut to the cam E, which latter imparts the rise and fall to the bar D—that is to say, the cams or eccentrics I and E have their centers arranged on opposing sides of the axis of the shaft B. The tension of the spring H is adjustable by means of the screw *i*.

The upper feed-dog K is of the form shown and curved to allow room for the action of the presser-foot being extended in rear of same and toward the front of the machine, so as to lie normally substantially parallel with the presser-foot and having teeth on its under surface.

By the arrangement of devices described it will be noticed that the forward and backward movements of the upper and lower feed-dogs are in unison, both rocking bars carrying the same being pivoted to the rocking frame, while by reason of the opposite cuts of the cams E and I the lower feed-dog moves up while the upper dog moves down, thus clamping the thicknesses of material to be sewed firmly together and avoiding all liability of one slipping on the other. By the use of the spring H a sufficient amount of flexibility is given to the upper bar and feed-dog that when the goods are clamped together between the dogs variations in thickness of the goods will not strain or break the parts, as the upper feed-dog will yield automatically.

As previously stated, it has been found that a feed of this character is specially advantageous in connection with a welt-guide, the welt being fed in the usual manner through a guide of substantially the construction shown in patent to L. Muther, dated May 16, 1890, No. 427,352. Fig. 8 shows the guide in place in connection with my feeding mechanism.

In Fig. 4 and the three detail views immediately following it I have shown an arrangement whereby the cam I may be dispensed with and the proper rising-and-falling movement given to the upper feed-dog, only one eccentric or cam E being used. In this embodiment of the invention the supplemental feed-dog-carrying bar is of substantially the same construction as heretofore described, but it has at its outer end a projection *k*, having a groove upon which is hung a link *l*, supporting one end of a spring L, curved as shown, and embracing the feed rock-shaft M, its tension being adjustable by means of the thumb-screw *m*. The feed-dog-carrying bars D and F are provided with projecting screws or lugs *n*, beneath which bear the ends of a rocking lever *o*, pivoted on the rod *p*, supported be-

tween the parts *q q* of the standard N, secured to the bottom of the machine-casing. The spring L normally tends to keep the bar F down and, through the lever *o* and lugs *n*, the bar D up, thus grasping the cloth between them. In the rotation of the cam E the elevation of the bar D thereby allows the spring L to act to draw down the bar F, while in the further rotation of the cam the bar D is forced down and the bar F up against the tension of the spring to release the cloth. In this construction, as well as that shown in Figs. 1, 2, and 3, the presser-foot holds the goods during the time that the feed-dogs are moving toward the front of the machine preparatory to again seizing the goods.

The upper feed-dog has a lug *r* extending laterally over the top of the presser-foot, whereby when the latter is raised to permit of the insertion of the material the upper feed may be raised against its spring.

Various minor modifications and changes in the construction of this apparatus may be devised without departing from the spirit of my invention, which, in its broad sense, is not limited to any details of construction.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. A feeding mechanism for sewing-machines comprising a driving-shaft, a rocking frame, a main feed-bar, and means carried by said shaft for giving said bar its backward and forward motions; a supplemental feed-bar operatively connected to the rocking frame, whereby its forward and backward movements are in unison with the main feed-bar; and means also carried by said shaft for actuating both feed-bars vertically in opposition to clamp and release the work, said means acting directly upon both bars substantially as described.

2. A feeding mechanism for sewing-machines comprising a driving-shaft, a rocking frame, a main feed-bar, and means carried by the said shaft on the forward end thereof for giving said bar its backward and forward motions; a supplemental feed-bar operatively connected to the rocking frame, whereby its forward and backward movements are in unison with the main feed-bar, and means also carried by said shaft on the forward end thereof for actuating both feed-bars vertically in opposition to clamp and release the work, substantially as described.

3. A feeding mechanism for sewing-machines comprising a driving-shaft, a main feed-bar and a supplemental feed-bar; means common to both bars for imparting thereto longitudinal reciprocations in unison, and means for imparting to said bars vertical vibrations in opposition, said means including two adjacent eccentrics having their centers arranged on opposite sides of the driving-shaft's axis, and acting directly upon the respective bars substantially as described.

4. A feeding mechanism for sewing-machines comprising a driving-shaft, a main feed-bar and a supplemental feed-bar; and means carried by said shaft for actuating both feed-bars to impart thereto longitudinal reciprocations in unison and vertical vibrations in opposition, said means including two adjacent eccentrics having their centers arranged on opposite sides of the driving-shaft's axis, and acting directly upon the respective bars substantially as described.

5. A feeding mechanism for sewing-machines comprising a driving-shaft, a rocking frame, a main feed-bar, and a supplemental feed-bar, both said bars being pivotally connected to the rocking frame; and means carried by said shaft for actuating the rocking frame to thereby impart to both bars longitudinal reciprocations in unison, said means including a device for imparting to said bars vertical vibrations in opposition, substantially as described.

6. A feeding mechanism for sewing-machines comprising a driving-shaft, a main feed-bar and a supplemental feed-bar; means for imparting to both bars their longitudinal reciprocations in unison and their vertical vibrations in opposition, said means including an eccentric on the driving-shaft, a yoke on the supplemental bar one branch of which is elastic, and means for adjusting said branch, substantially as described.

7. A feeding mechanism for sewing-ma-

chines, comprising upper and lower four-motion gripping and feeding jaws, each having its supporting and actuating means located entirely below the bed-plate of the machine, and the upper jaw being removably connected with its supporting means, whereby upon the removal of said jaw the machine is converted into one of single feed and nothing of the upper feeding mechanism remains above the bed-plate to impede or interfere with the work, substantially as described.

8. A feeding mechanism for sewing-machines comprising a feed-dog-carrying bar provided with a laterally-adjustable holder, and a feed-dog vertically adjustable on said holder by means of a screw passing vertically through the dog and impinging upon the top of the holder, substantially as described.

9. A "top feed" for sewing-machines comprising a feed-bar located below the machine bed-plate and having a dog secured thereto which projects through said bed-plate and extends in rear of the presser-foot of the machine and has a portion which lies alongside of and normally, substantially, parallel with said foot on the surface of said plate, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

RUSSEL G. WOODWARD.

Witnesses:

CHAS. L. STURTEVANT,
CHESTER MCNEIL.