

2 Sheets—Sheet 1.

No. 432,956.

Patented July 22, 1890.

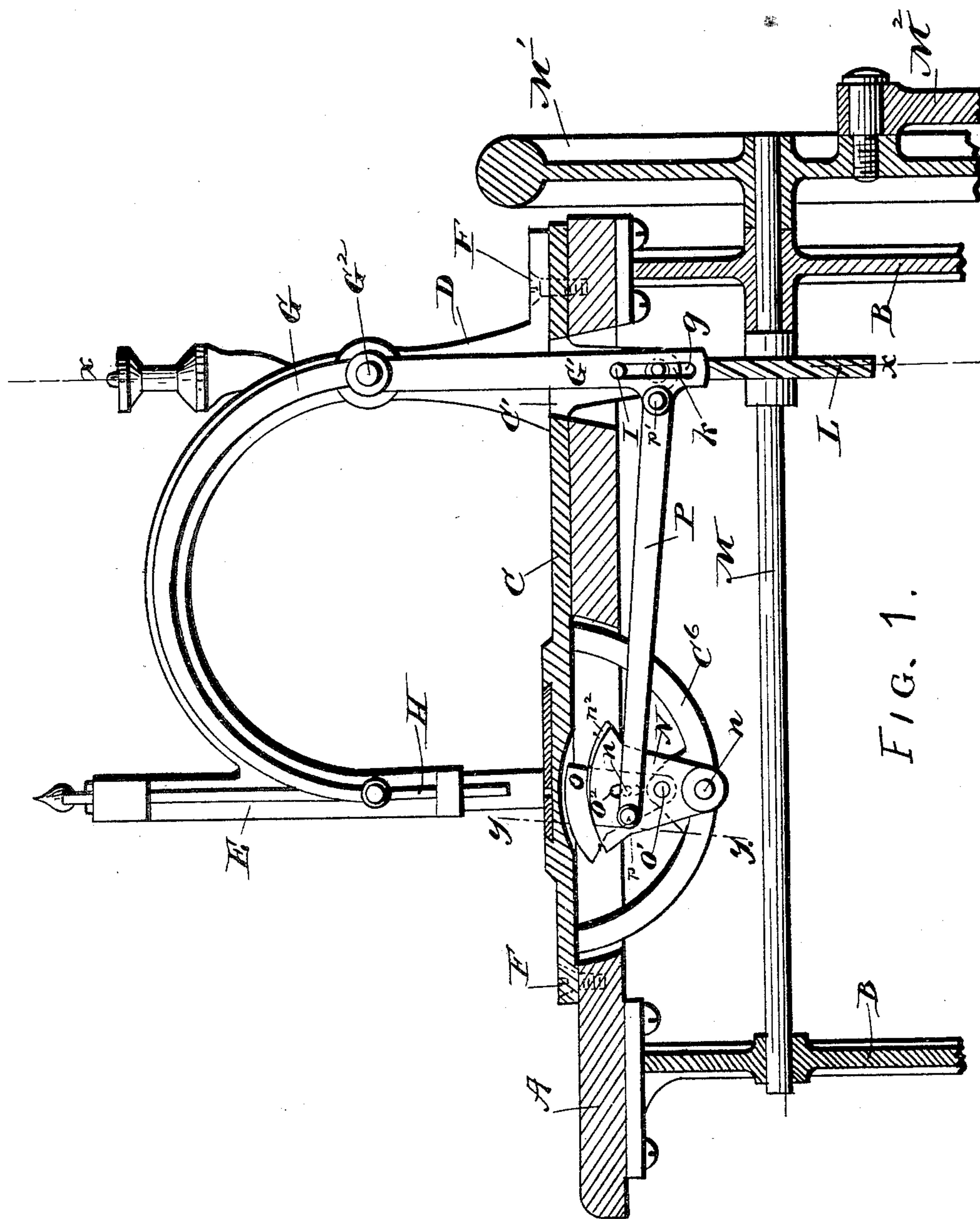


FIG. 1.

INVENTOR

Daniel W. Fink
Benjamin L. Dennis

Charles R. Squire
by his attorney,
Warren R. Perce

(No Model.)

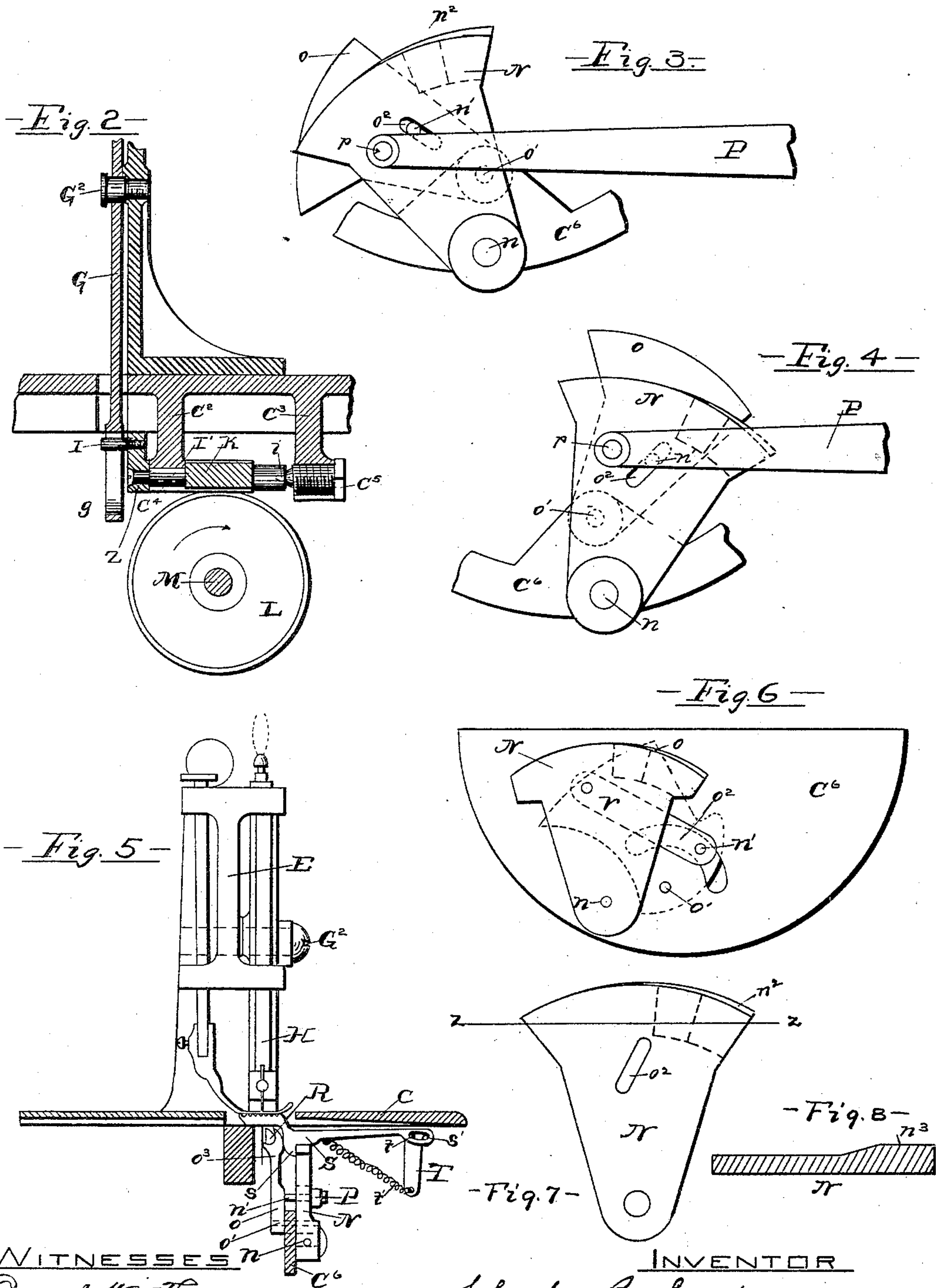
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C. R. SQUIRE.

FEEDING MECHANISM FOR SEWING MACHINES.

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WITNESSES

Daniel W. Fink
Benjamin L. Denny

INVENTOR

Charles R. Squire
by his attorney
Warren R. Pierce

UNITED STATES PATENT OFFICE.

CHARLES R. SQUIRE, OF BROOKLYN, NEW YORK, ASSIGNOR TO FREDERIC
CONDIT, OF PROVIDENCE, RHODE ISLAND.

FEEDING MECHANISM FOR SEWING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 432,956, dated July 22, 1890.

Application filed March 15, 1889. Serial No. 303,443. (No model.)

To all whom it may concern:

Be it known that I, CHARLES R. SQUIRE, of the city of Brooklyn, in the county of Kings, in the State of New York, have invented a certain new and useful Improvement in Sewing-Machines; and I declare the following to be a specification thereof, reference being had to the accompanying drawings.

Like letters indicate like parts.

Figure 1 is a front elevation, partly in vertical section, of such parts of a sewing-machine as embody my invention. Fig. 2 is a transverse vertical section on the line xx of Fig. 1. Figs. 3 and 4 show in front elevation the feed and shuttle carriers at the end of their forward and backward movements, respectively, and the link operating the same with a differential motion. Fig. 5 is an end elevation, with the bed-plate in vertical section on line yy of Fig. 1. Fig. 6 shows a modified form of the feed-carrier and shuttle-carrier and their intermediate connection. Fig. 7 is a side elevation of the feed-carrier. Fig. 8 is a cross-section on line zz of Fig. 7.

My invention is an improvement upon the device shown in my pending application for Letters Patent, Serial No. 248,383.

It relates to the feeding mechanism of sewing-machines, and consists in providing the feed-carrier with a cam on its periphery adapted to lift the feed-bar, and with a cam on the inner face of the carrier, at its rear end, adapted to advance the feed-bar at the same time that it is lifted as aforesaid.

The several parts of my improved sewing-machine are fully specified in my said pending application, and therefore need only to be described here in a brief manner.

A represents the table, and B the legs, of the sewing-machine.

C is the bed-plate, cut away at C' to allow the lower end of the needle-arm to extend through it. It is fastened to the table A by bolts F. The pitman M^2 of a treadle revolves the wheel M' in the well-known manner. The wheel M' is rigidly fastened upon the main shaft M, which is mounted upon the legs B of the machine. A worm-wheel L is secured upon the main shaft M and turns with it.

The bed-plate C has hangers C^2 C^3 , projecting downwardly. A shaft I' is mounted within a bearing C^4 , formed in the hanger C^2 , and at its rear end has a central conical recess i , into which enters a screw-bolt C^5 , which passes through the hanger C^3 and engages with said recess i to furnish a bearing for the shaft I' at that end and to take up the lost motion of said shaft longitudinally. The shaft I' has a crank and pin I and a worm K formed on it. A needle-arm G is pivotally mounted at G^2 on the fixed arm D, and has its lower extremity slotted longitudinally, as shown at g . The crank-pin I enters and engages with said slot g . At its opposite end the needle-arm G carries the vertically-reciprocating needle-bar H in the usual manner, said bar H being supported within guides of the standard E. A bracket C^6 extends downwardly from the bed-plate C. A feed-carrier N is pivoted thereto at n , and a shuttle-carrier O is pivoted to said bracket C^6 at o' . The feed-carrier N has a slot o^2 , and the shuttle-carrier O has a pin n' , which enters and engages with said slot o^2 . A link-bar P, pivoted to the end of the needle-arm at p' , is also pivoted to the feed-carrier at p .

As explained in the specification of my said pending application, the operation of said parts of my machine is as follows: The revolution of the wheel M' by the pitman M^2 of the treadle in the usual manner turns the main shaft M and the worm-wheel L, which is fastened on said main shaft. The worm-wheel L engages with and turns the worm K of the shaft I' , and the crank-pin I, engaging with the slot g of the needle-arm G, causes said needle-arm to vibrate, which vibratory motion gives a reciprocating motion to the link-bar P and at the same time gives a vertical reciprocating motion to the needle-bar H and causes the needle inserted therein to pass into and out of the cloth. The link-bar in turn oscillates the feed-carrier N, which oscillation is communicated to the shuttle-carrier O by means of said pin-and-slot connection $n' o^2$. The carriers N O have a differential movement, because the distance from the pivot n of the carrier N to the pivot p , by

which the link P is connected with said feed-carrier, is greater than the distance from the pivot o' of the shuttle-carrier O and the pin n' of said carrier, which enters the slot o^2 of the feed-carrier N. The consequence is that the shuttle-carrier O has a quicker travel and describes a greater arc than the feed-carrier N.

Having thus described the mechanism which is the subject of the specification of my pending application, I will now proceed to the description of those parts which constitute the subject of my present application. The feed-carrier N has two cams, one a side cam n^3 , projecting laterally from the rear face of said carrier, and the other a segmental cam n^2 , formed eccentrically upon the periphery of said feed-carrier, (see Fig. 7,) so that the radius of said segmental cam increases from its inner to its outer end. A feed-bar S, having a downwardly-projecting lip s , rests upon the periphery of the feed-carrier N and has at its end a longitudinal slot s' . A hanger T extends downwardly from the bed-plate C and has a fixed pin t . The pin t , entering the slot s' , supports the feed-bar S at that end. As the carrier N moves forward, the feed-bar S is lifted by the segmental cam n^2 and is also advanced by the lateral pressure of the side cam n^3 of said carrier. As the carrier N moves backward, the cam n^2 causes the feed-bar which rides upon it to descend, and the passage of the cam n^3 allows said feed-bar to return to its former position by the action of the spring t' . These movements of the feed-bar, in connection with the presser-foot, feed the cloth from stitch to stitch. The shuttle-carrier O has a rest o^3 , in which the shuttle R is supported and carried.

The operation of my improved device is as follows: When the feed and shuttle carriers are thrown back in the position shown in Fig. 4, the needle is down to its full extent, and will rise a short distance to loop the thread before the shuttle reaches the loop in its forward movement. The shuttle-carrier advances more rapidly than the feed-carrier and passes the shuttle through the loop and moves rapidly forward out of the way, while the feed-carrier follows with a slower movement to raise and push forward the feed-bar after the needle has been withdrawn from the fabric. In Fig. 3 the carriers are shown in position at

the end of their forward throw and the needle is then up to its full extent. As the needle descends the carriers rock back, the feed-bar is lowered and pulled back by the spring to normal position, as shown in Fig. 5, and the shuttle is carried back by its carrier to the full extent of its backward throw, so as to give ample space and time for the needle to descend and make the next loop.

Instead of connecting the carriers by a pin upon one passing through a slot in the other, as hereinbefore described, they may be connected by a link V and mounted as shown in Fig. 6, and produce the same movements. In Fig. 6, however, the bracket is shown as being solid and having a slot through which the pin n' extends. In such a construction of the parts the carriers are mounted on opposite sides of the bracket.

I claim as a novel and useful invention and desire to secure by Letters Patent—

1. In a sewing-machine, the combination of the bed-plate, the standard, the presser-foot, the feed-bar, the pivoted feed-carrier having the cams n^2 n^3 , the link pivoted to the feed-carrier, the vibrating needle-arm pivoted to said link and having a slotted end, the worm-shaft having a crank in engagement with said slot of the needle-arm and rotatable by its engagement with the worm-wheel of the driving-shaft, substantially as specified.

2. In a sewing-machine, the combination, with the needle-arm, the needle-bar, the needle, the standard, and the presser-foot, of the feed-carrier pivoted on a bracket and having the cams n^2 n^3 , the shuttle, the shuttle-carrier pivoted upon said bracket eccentrically to the center of oscillation of said feed-carrier, said carriers being connected at points unequally distant from their pivotal centers to secure their differential movement, and the movable feed-bar resting near its free end on the periphery of said feed-carrier and suitably supported at its opposite end, and the spring adapted automatically to return said feed-bar to its normal position when relieved from the pressure of said cam n^3 , substantially as specified.

CHARLES R. SQUIRE. [L. S.]

Witnesses:

GEORGE E. RIGHTER,
HENRY CLAY WOOD.