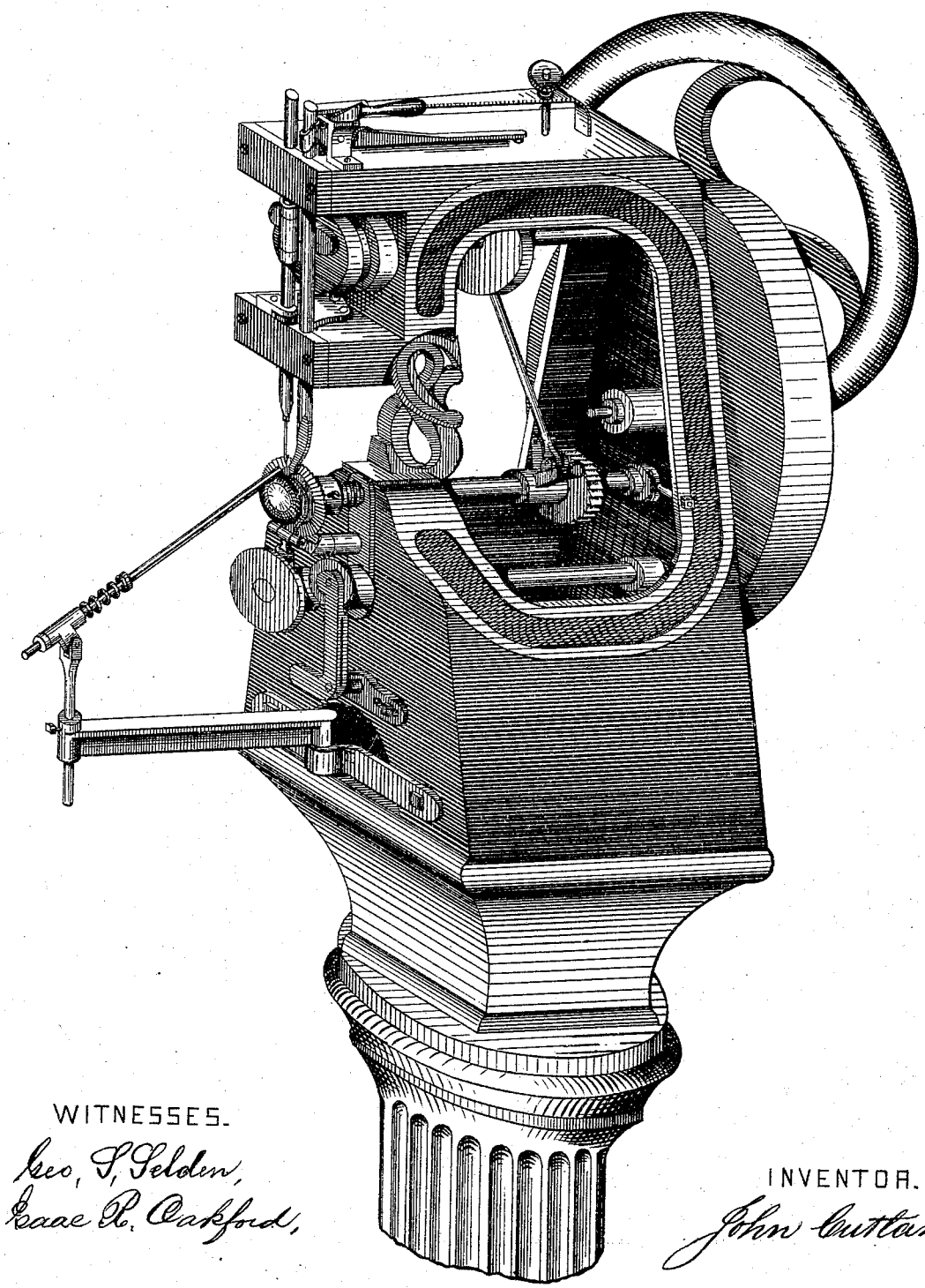
4 Sheets—Sheet 1.

J. CUTLAN.

MACHINE FOR SEWING BOOTS AND SHOES.

No. 182,420. Patented Sept. 19, 1876.

FIG. 1



WITNESSES.

Geo. S. Selden,

Isaac R. Oakford,

INVENTOR.

John Cutlan

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MACHINE FOR SEWING BOOTS AND SHOES.

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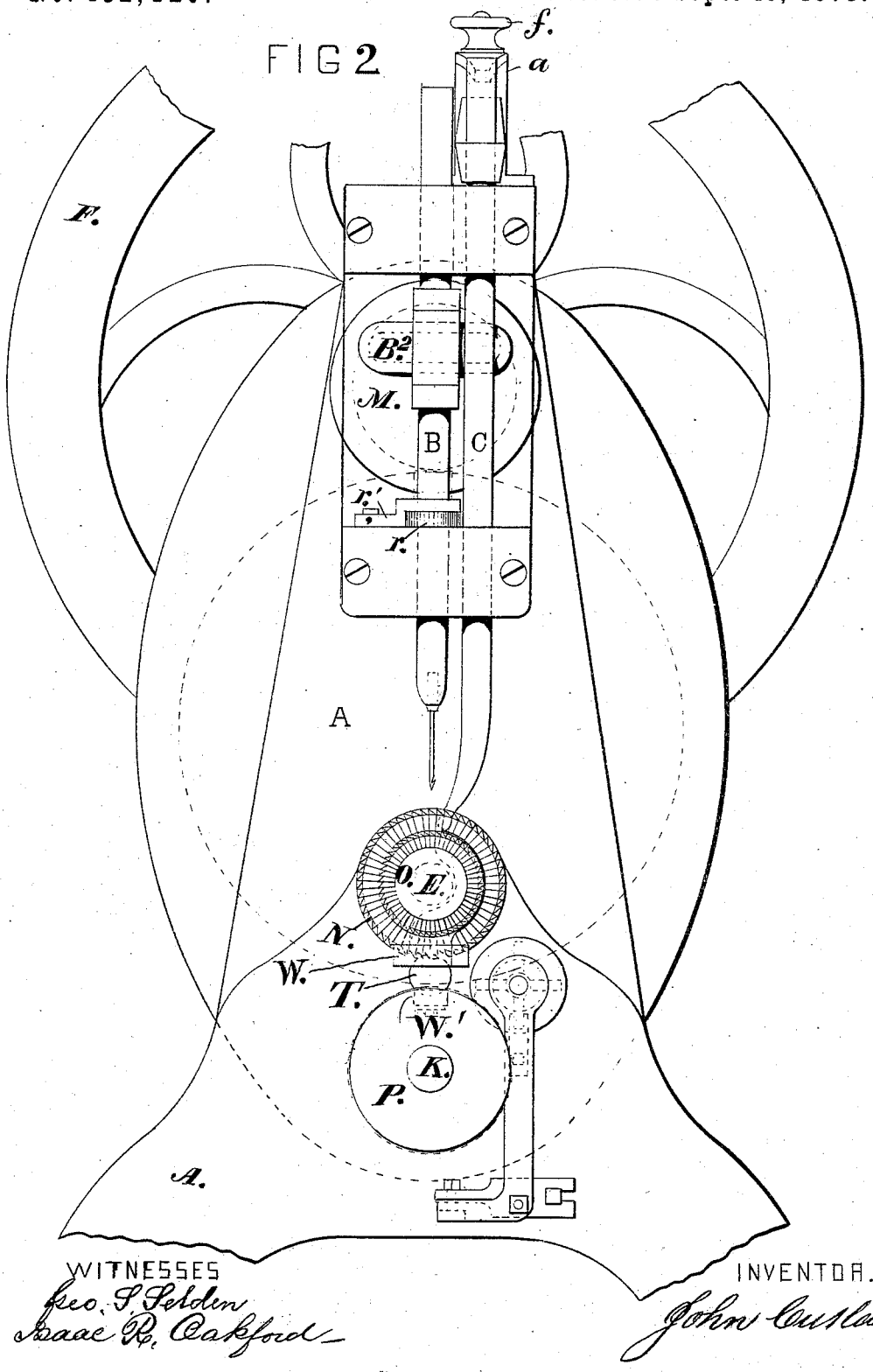
FIG 2



WITNESSES
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4 Sheets—Sheet 3.

J. CUTLAN.

MACHINE FOR SEWING BOOTS AND SHOES.

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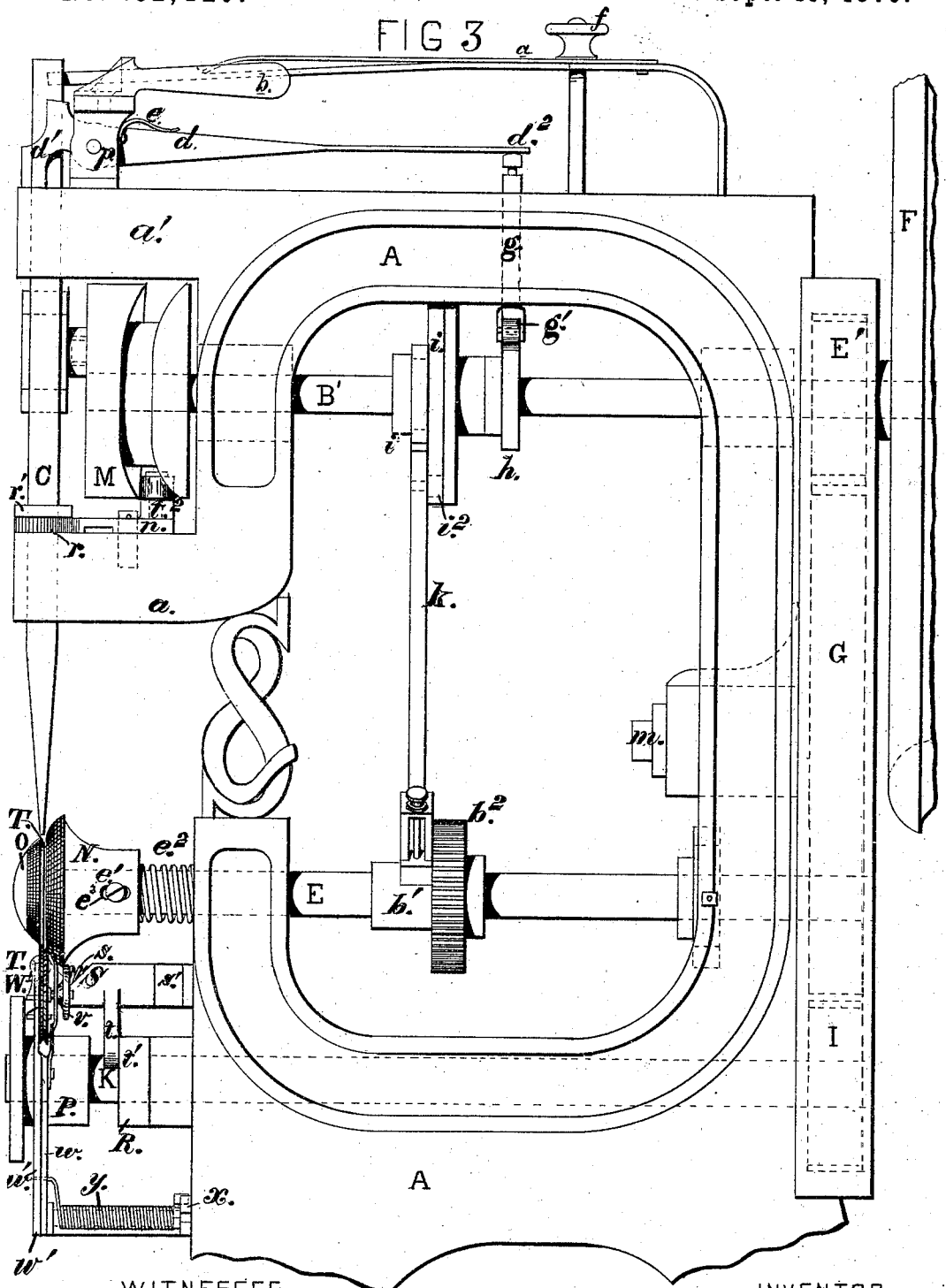
FIG 3



WITNESSES

Geo S Selden

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J. CUTLAN.

MACHINE FOR SEWING BOOTS AND SHOES.

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FIG 5

FIG 4

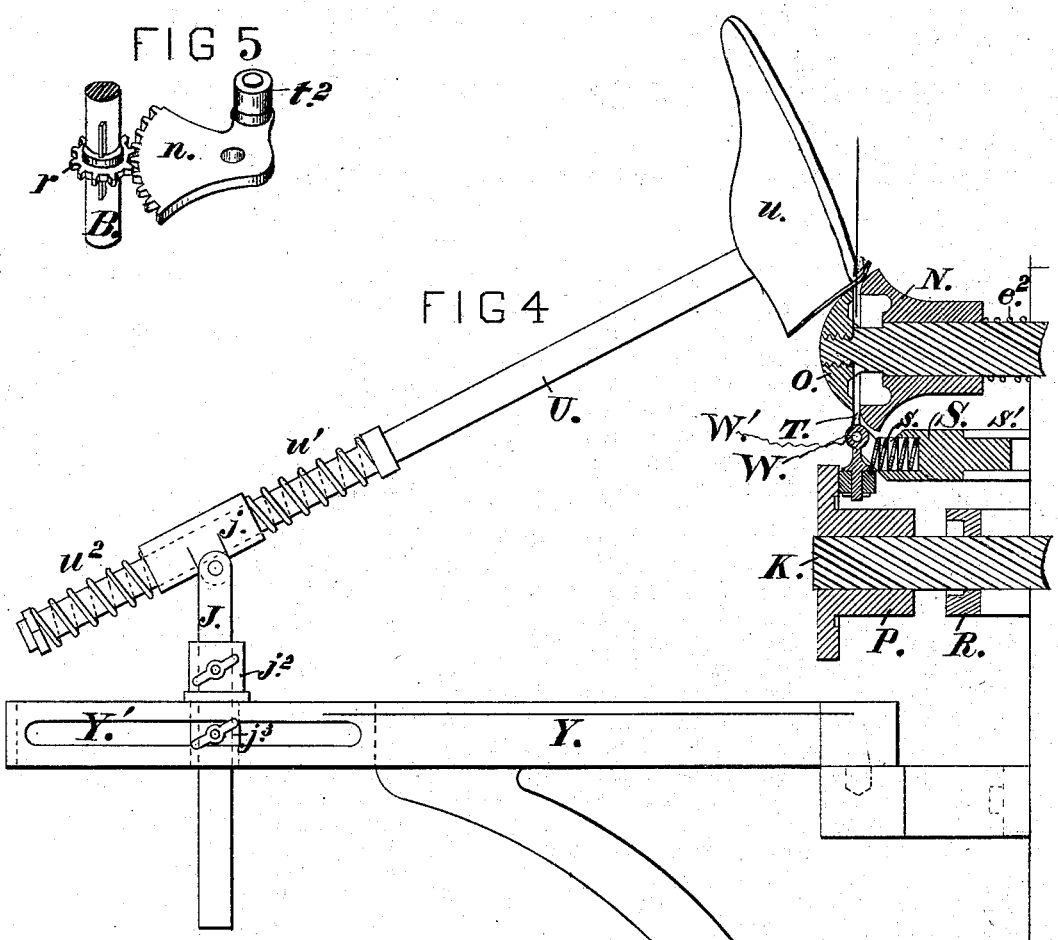


FIG 7

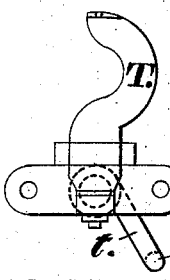


FIG 8

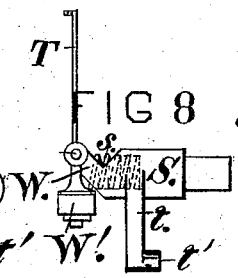
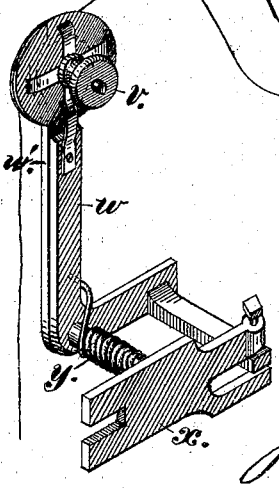


FIG 6



WITNESSES.

Geo S Seldin

Isaac R. Oakford

INVENTOR.

John Cutlan

UNITED STATES PATENT OFFICE.

JOHN CUTLAN, OF CAMDEN, NEW JERSEY.

IMPROVEMENT IN MACHINES FOR SEWING BOOTS AND SHOES.

Specification forming part of Letters Patent No. **182,420**, dated September 19, 1876; application filed May 27, 1875.

To all whom it may concern:

Be it known that I, JOHN CUTLAN, a subject of the Queen of Great Britain, and now a resident of Camden, in the county of Camden and State of New Jersey, have invented certain Improvements in Machines for Sewing Boots and Shoes, of which the following is a specification, reference being had to the accompanying drawings, in which like letters represent like parts.

My invention relates, first, to the construction and mounting of two vertical convex feed-wheels together to sustain the shoe to be sewed upon a horizontal shaft having its bearings in the frame of the machine, the outer one of said feed-wheels being rigidly fixed upon the outer end of the shaft, while the other is loose upon and has a limited amount of play along the length of the shaft, and yields from the direction of the outer wheel elastically against the force of a spiral spring seated on the shaft.

This inner feed-wheel is recessed upon its outer face, to afford working room for the thread, thread-carrier, and needle, as hereinafter more fully described.

Secondly, to constructing a thread-carrier with such form, and mounting it upon a bearing in such a manner, that its upper end will carry the thread in its upper end within the recess in the feed-wheel, as hereinbefore mentioned, and have two separate and distinct movements caused by the action of other devices upon its lower end, as hereinafter more fully described.

Thirdly, to the combination of two other shafts mounted in the frame, one above the other, and both below the feed-wheel shaft, before mentioned, and their cams and other auxiliary parts which co-operate to produce the two separate movements of the thread-carrier, hereinbefore mentioned.

Fourthly, to a combination of devices by means of which the needle, when it has made its downward thrust through the work, and has caught the thread below it upon its barb, is made to revolve upon its vertical axis halfway around, in order that the barb may not catch the loop in returning above the work again, and then to revolve back to its original position before making another downward thrust.

Fifthly, to a combination of devices, by which the vertical presser is operated in such a manner that its lower end or foot exerts a constant elastic pressure down upon the work, and at the instant of the upward or return movement of the needle-bar it is grasped and held firmly in position until the stitch is pulled in, when it is released again, as hereinafter more fully described.

Sixthly, to a combination of parts constituting a frame swinging horizontally for the convenient support of the work while being sewed, and holding it against the feed-wheel, as hereinafter more fully described.

In the accompanying drawings, Figure 1 represents a perspective view of a machine embodying my improvements; Fig. 2, a front elevation of the upper part of the same; Fig. 3, a side elevation thereof; Fig. 4, a side elevation of the swinging frame, and a central longitudional vertical section of the feed-wheels, shafts, and other accessory parts; and Figs. 5, 6, 7, and 8 are detail views of devices embraced in the same.

The letter A, wherever it occurs, indicates the frame of the machine. Motion is imparted to all the operative parts by means of a band over pulley F on the main shaft B′, which imparts motion in the same direction to the lower shaft K by means of the pinions E^1 and I and the intermediate gear G; and, by means of the cam-slot in the face of cam-wheel *i*, and the connecting-rod *k*, provided with wrist-pin i^2, as shown in Fig. 3, the shaft B′ by every revolution turns shaft E a few degrees, and with it the feed-wheels, and thus affords the feed-motion required, and the ratchet-wheel b^2 and its pawl on shaft E prevent retrograde motion of that shaft.

The spiral spring e^2, seated on the shaft E between the hub of feed-wheel N and the frame, presses that wheel in the direction of feed-wheel O. The pin e^1 in the shaft E prevents the feed-wheel from turning upon it, and the slot e^3 in the hub of the feed-wheel N allows the play upon the shaft before mentioned.

In Fig. 4 is shown an annular recess in the

interior of feed-wheel N, extending around the shaft E, and also the thread-carrier T standing within the recess, and so curved edgewise that its upper end or tip may stand directly over its lower end and over the shaft, and make its side and edge movements.

The thread-carrier is mounted upon its support W, and is hinged thereto by means of a pin, as shown, and the body of that support extends into a recess within the outer end of shaft S, which has its bearings in the frame, and a spiral spring, *s*, seated within the recess, presses the lower end of the carrier T, which is provided with a friction-roller, out against the cam-wheel P, and so when the cam revolves the lower end of the carrier is vibrated inwardly and outwardly by the joint action of the spring and cam, and the upper end is given one of the movements required.

The second or edgewise movement is given to the thread-carrier by means of the shaft S, which supports its bearing W, and which is rocked a few degrees upon its axis by every revolution of the shaft K by means of the bar *t*, which at its upper end is rigidly attached to shaft S, and at its lower end is provided with wrist-pin t^1, which works in a suitable cam-slot in the face of cam-wheel R, which is fixed on shaft K.

The top end of the carrier is bent over in the direction of the front of the machine, so as to form a right angle with its side, and that tip thus formed is pierced with a vertical hole for the thread, which is passed up from the spool below.

Now, when a stitch is to be made the needle is thrust down through the leather, and the carrier makes its outward movement, and draws the thread past the needle, above its notch and barb, and then makes its edgewise movement at right angles with the line of the first, and wraps the thread partly around the needle, which, then, upon its upward or return movement, catches the thread on its barb, and pulls it up through the leather and forms the stitch.

The needle-bar B, bearing the needle, receives its vertical reciprocating motion from the shaft B′ by means of a cam, as shown, in the usual way.

In order to oscillate the needle-bar upon its vertical axis, for the purpose hereinbefore stated, it is inclosed within a toothed wheel, *r*, so that it cannot turn in the wheel, but is free to reciprocate vertically therein; and a toothed sector, *n*, is pivoted on a projection, *a*, of the frame, as shown, to mesh with toothed wheel *r*, and the sector is provided with a wrist-pin, t^2, which is made to work in a suitably-formed slot in cam M on the shaft B′, and these parts are so arranged, with respect to each other, that the oscillation shall begin and end exactly when desired, with respect to the vertical action of the needle-bar.

The devices for operating the presser-foot C consist of the spring-lever *d*, which is pivoted at *p*, the back end of which, d^2, is held down by a plate-spring, *e*, upon the upper end of bar *g*, which is connected at *g′* with cam *h* on shaft B′, while the other end of the lever *d* is provided with a hollow vertical arm or elbow, d^1, which loosely incloses the upper portion of the presser-bar C, which is held in its vertical position by the arms *a* and *a′* of the frame, through which it passes, and the spring-lever *d* holds the foot of the bar down upon the work with an elastic pressure that will prevent the feed-movement; but just before the upward or return movement of the needle-bar B the action of the cam *h*, by rod *g*, forces up the rear end d^2 of spring-lever *d*, and causes the forward end of that lever, by its hollow arm d^1, to grasp and hold firmly the upper end of the presser-bar C, with its lower end upon the work, against the return movement of the needle until the stitch is pulled in, and then releases it again.

The cam is formed, of course, in such a manner that this action shall take place at the proper time. The grasping action of the hollow elbow d^1 upon the upper portion of the presser-bar C is due to the change in the direction of the elbow in respect to the presser-bar, which causes a pinching action between them. The tension of the thread is regulated by the milled screw and plate-spring shown in Fig. 3, and need not be further described, since no claim is made upon that mechanism.

A side view of the swinging frame hereinbefore mentioned is presented in Fig. 4. The bar U has one end inserted in the last in the shoe *u*, and upon the bar are seated two spiral springs, u^1 and u^2, and between them is a sleeve, J, which is connected by a hinge-joint with vertical bar J′, which, in its turn, is adjustably connected with the horizontal crane-bar Y, which is provided with a brace, and both bar and brace are pivoted to the main frame, and swing freely back and forth in front of the machine.

By means of the adjustable connections shown between the bar U and the horizontal bar, the inclination of the bar U may be changed, as may be required, to suit different kinds of work. The convex surfaces of the feed-wheels N and O are milled or otherwise roughened, to prevent the work slipping upon them.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination, with the feed-wheel N and the auxiliary feed-wheel O, of the feed-shaft E and spring e^2, the several parts being constructed and arranged substantially as and for the purpose described.

2. The thread-carrier T, mounted, as shown, in combination with cam P, spring *s*, and shaft S, whereby the proper vibratory movement, sidewise, is imparted to said carrier, substantially as and for the purpose described.

3. In combination with the thread-carrier T, mounted, as shown, arm *t*, wrist-pin t^1, and

cam R on shaft K, substantially as and for the purpose described.

4. The combination of the feed-wheel N, spring e^2, shaft E, adapted to afford an elastic pressure in the direction of the work upon the feed-wheels, substantially as and for the purpose described.

5. The combination with the needle-bar B and toothed wheel r feathered thereon, as shown, the toothed sector n, provided with wrist-pin b^2, and pivoted on projection a of the main frame, and the cam M on the shaft B′, adapted to vibrate the needle-bar upon its vertical axis, substantially as and for the purpose described.

6. The combination of the lever d, provided with its tubular elbow d^1 pivoted at p, plate-spring e, and cam h on shaft B′, and connecting-bar g, adapted to operate the presser-bar C, substantially in the manner and for the purpose set forth.

7. The combination of the parts composing the swinging frame to support the work and render the frame adjustable, to wit, the horizontal bar Y provided with its slot Y′, inclined bar U, having the spiral spring u^1 and u^2, and sleeve j seated thereon, and the vertical bar J, substantially as shown and described.

JOHN CUTLAN.

Witnesses:

ROBERT K. SMITH,

E. W. SELDEN.