

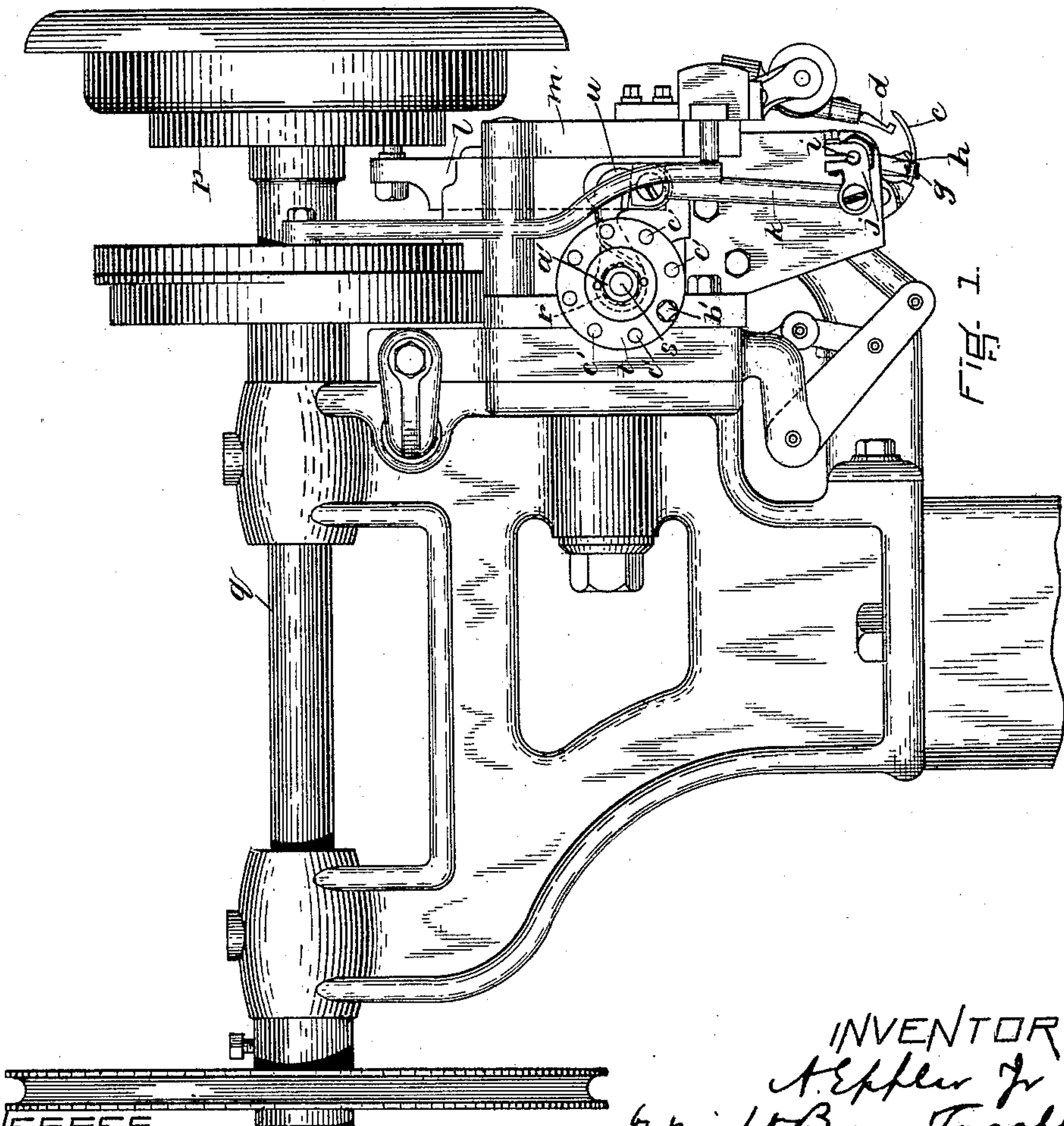
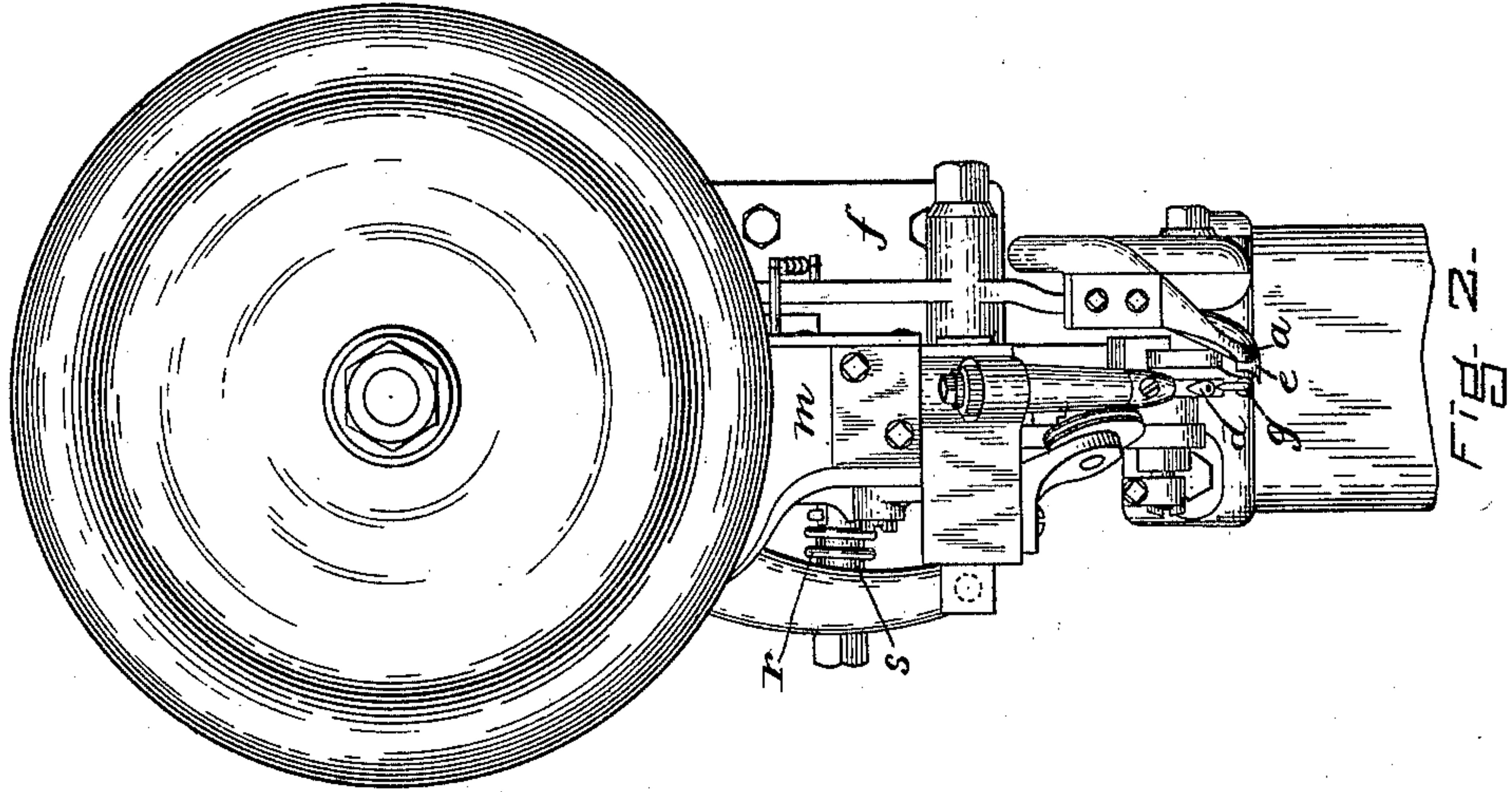
(No Model.)

3 Sheets—Sheet 1.

A. EPPLER, Jr.
SHOE SEWING MACHINE.

No. 409,281.

Patented Aug. 20, 1889.



WITNESSES.
A. D. Grover
F. W. Lynde

INVENTOR -
A. Eppler Jr
by night Brown Corralley
Atty.

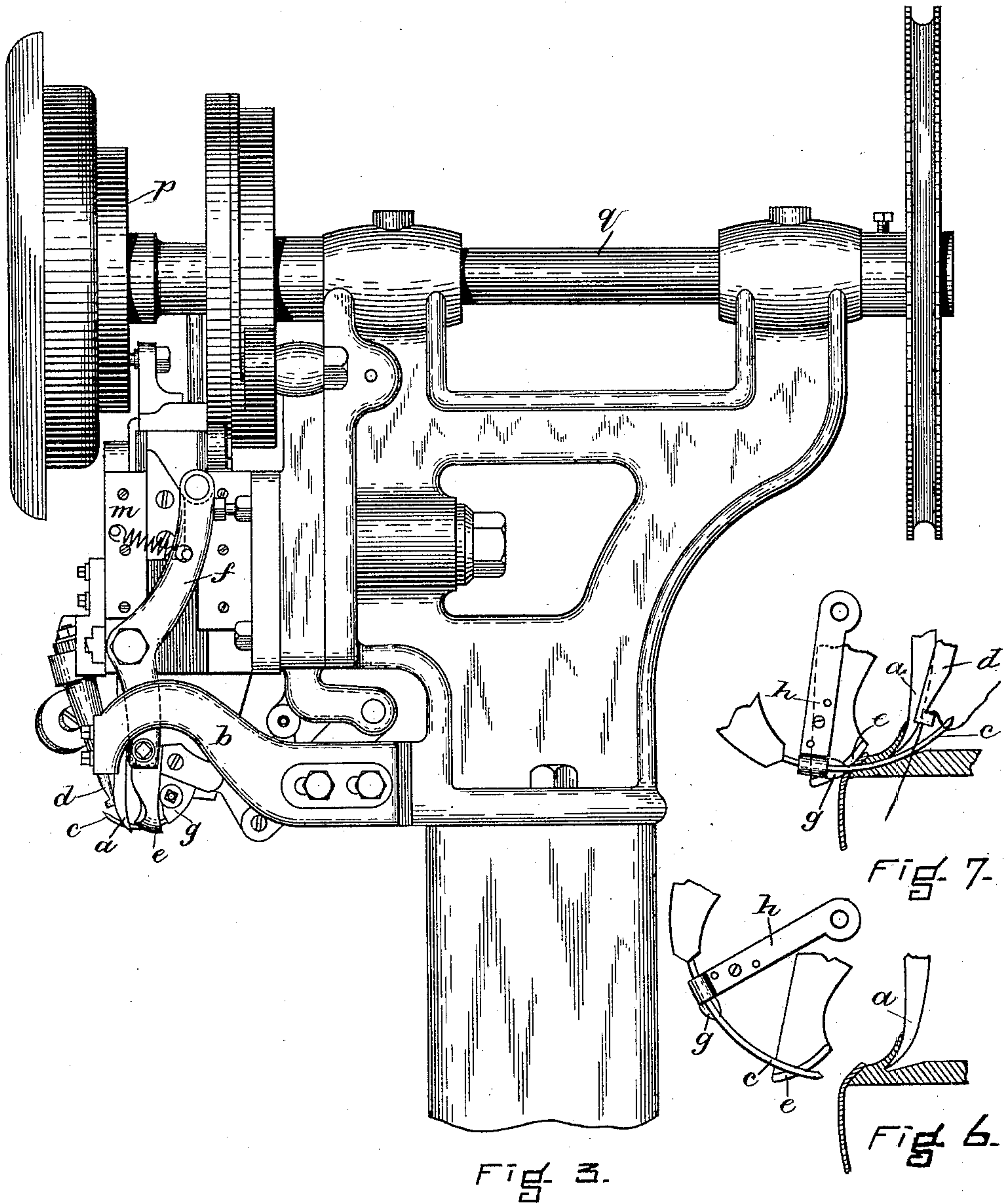
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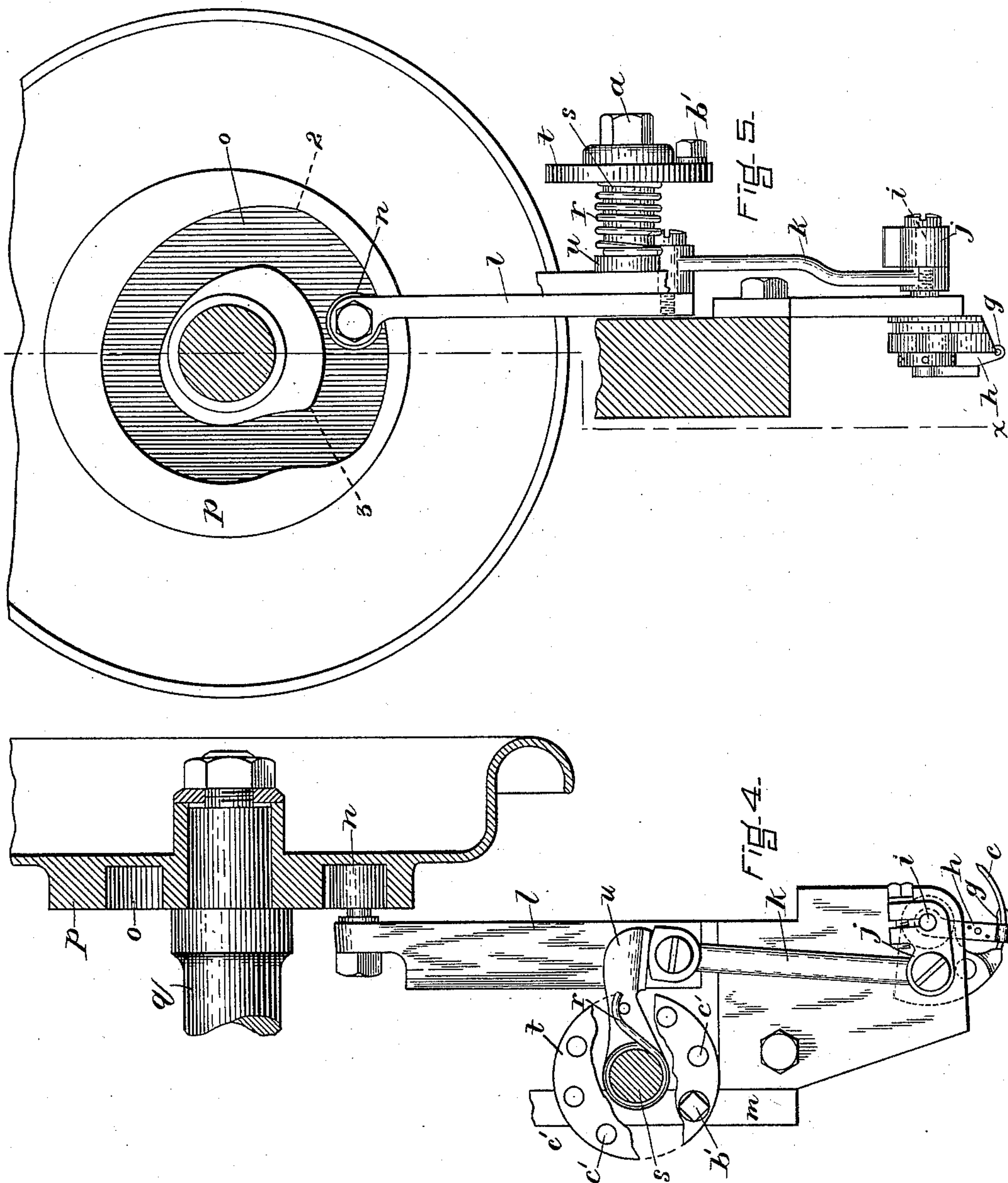
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UNITED STATES PATENT OFFICE.

ANDREW EPPLER, JR., OF BOSTON, MASSACHUSETTS.

SHOE-SEWING MACHINE.

SPECIFICATION forming part of Letters Patent No. 409,281, dated August 20, 1889.

Application filed April 25, 1888. Serial No. 271,833. (No model.)

To all whom it may concern:

Be it known that I, ANDREW EPPLER, Jr., of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Boot and Shoe Sewing Machines, of which the following is a specification.

This invention relates to sewing-machines having curved oscillating needles, and adapted chiefly for stitching together the soles and uppers of shoes which are turned inside out.

The invention has for its object to provide a machine of this class with a cast-off having a yielding movement, whereby it is enabled to conform to variations in the thickness of the upper of the shoe.

To this end the invention consists in the improvements which I will now proceed to describe and claim.

Of the accompanying drawings, forming a part of this specification, Figure 1 represents a side elevation of a machine having my improvements. Fig. 2 represents an end view of the same. Fig. 3 represents an elevation of the opposite side. Fig. 4 represents a section on line $x\ x$, Fig. 5. Fig. 5 represents a rear view of the cast-off and its operating mechanism. Fig. 6 represents a sectional view of an upper and sole, showing the channel-gage, back-gage, needle, and cast-off in the positions they occupy when the needle is advancing to enter the work. Fig. 7 represents a similar view after the needle has entered the work.

The same letters of reference indicate the same parts in all the figures.

a represents the fixed channel-gage, which is attached to a fixed arm b , the latter being suitably secured to the supporting-pedestal of the machine. The lower end of the channel-gage is pointed and formed to enter the channel in the sole, said gage standing close to and at one side of the path of the needle c .

d represents the looper, which is oscillated about the needle when the latter is advanced and engages the thread with the barb of the needle.

e represents the back-gage, which is attached to a lever f , and is formed to bear on the outer surface of the turned upper and to press the outer side of the channel against the channel-gage while the needle is penetrat-

ing the upper and the "between substance," as the portion of the sole between its outer edge and the bottom of the channel is termed. The back-gage is moved away from the channel-gage to release the work after the formation of each stitch, and is moved forward to co-operate with the channel-gage in holding the work while the needle is entering and withdrawing from the work.

g represents the cast-off, which is formed, as usual, as a sheath or guard through which the needle passes. The cast-off is moved forward while the needle is penetrating the work until it (the cast-off) bears against the outer surface of the upper. The cast-off then remains at rest until the needle has withdrawn from the work enough to bring its hook or barb within the cast-off, the latter then being moved back with the needle.

The mechanism which operates the needle, looper, and back-gage forms no part of my present invention, and as said mechanism is fully shown and described in Letters Patent No. 337,291, granted to Edwin Adams, March 2, 1886, I do not here describe nor show it in detail, my present invention being confined to the means hereinafter described for operating and giving a yielding pressure to the cast-off.

The operation of the parts as a whole is the same as described in the Letters Patent above referred to.

In carrying out my present invention I provide the cast-off with a yielding movement, whereby it may conform to variations in the thickness of the material between it and the channel-gage, such variations being chiefly caused by the heel-stiffener at the heel portion of the upper and the cap at the toe portion, said stiffener and cap increasing the thickness of the material at these points.

Heretofore the cast-off in this class of machines has been rigid and unyielding with relation to the channel-gage when in contact with the upper during the formation of the stitch, so that an increase in the thickness of the interposed material will cause such an increase of pressure of the cast-off against the material as to require greater power to give the needle its lateral work-feeding movement than would be required if the cast-off were yielding, the work being fed by a lateral movement of the

needle while it is in the work and while the cast-off is pressing the between substance toward the channel-gage. To give the cast-off the described yielding movement, I employ the devices which I will now describe.

h represents the arm on which the cast-off is formed. Said arm is attached to a rock-shaft i , which passes through the hub of the oscillating needle-arm, and is adapted to rock or oscillate independently in said hub. To one end of said shaft is attached a short arm j , the outer end of which is connected by a rod k with a slide l , which is fitted to slide vertically in a guide or way in the oscillating head m , which carries the needle, back-gage, looper, and cast-off, as in the patent above named. Said slide has a trundle-roll n , which enters a cam-groove o in a wheel or disk p on the driving-shaft q , said cam being formed to vertically reciprocate the slide l and thus oscillate the rock-shaft i and the cast-off-carrying arm h , the connecting-rod k and arm j converting the reciprocating movements of the slide l into oscillating movements of the rock-shaft and cast-off arm. The cam-groove o is timed to give the cast-off the movements above described—that is to say, when the needle is advancing the cast-off also advances at a slower rate than the needle until it bears against the outer side of the upper, and is then held at rest until the needle has partially withdrawn, and then moves back with the needle.

r represents a spiral spring, which is coiled upon a stud s affixed to the swing-head m , and has one end engaged with a plate t , while its other end bears with a downward pressure on an arm u , which is pivoted at one end on said stud and bears at its other end on the upper end of the connecting-rod k . The spring r therefore exerts a downward pressure through the arm u on the connecting-rod k and through the latter on the slide l , said pressure being also imparted to the cast-off through the rock-shaft i .

The described pressure holds the trundle-roll n of the slide l against the outer side of the cam-groove o . That part of said groove which co-operates with said roll while the cast-off is bearing against the upper is made considerably wider than the roll n , as shown in Figs. 4 and 5, where the wider portion is indicated by the numerals 2 3. The increased width of the cam at the point referred to enables the cast-off to yield or move back from the channel-gage a against the pressure of the spring r , the roll n and all the described intermediate devices yielding with the cast-off, the spring holding the cast-off with a yielding pressure against the upper through said devices.

The cam-groove o , excepting at the part 2 3, is preferably formed to fit the roll n accurately, so that the cast-off will be positively moved by said groove at all times excepting when it is bearing against the upper. It is obvious, however, that the yielding capacity

of the cast-off may be continuous without departing from the spirit of my invention, as it would be if the cam-groove were widened throughout its entire extent.

The plate t , to which one end of the spring r is attached, is provided with a squared or polygonal head a' , so that it may be turned with a wrench or other tool on the stud s to vary the tension of the spring r . Said plate is held at any point to which it may be turned by a bolt b' passed through one of a series of holes c' in the plate t , and inserted in a socket in the head m .

It will be observed that the channel-gage and the oscillating looper are arranged at one side of the between substance and the back-gage and yielding cast-off at the other side. This is a very advantageous arrangement, as will be readily seen.

I claim—

1. In a curved-needle sewing-machine, the combination, with the needle, looper, and work-holding devices, of the cast-off, the rock-shaft supporting the same, a spring and connecting devices between the same and the said rock-shaft, whereby a yielding pressure is imparted to said rock-shaft and cast-off in one direction, and means, substantially as described, whereby the rock-shaft and cast-off are positively impelled in the opposite direction, as set forth.

2. In a curved-needle sewing-machine, the combination, with the needle, looper, and work-holding devices, of the cast-off, the rock-shaft supporting the same, a cam, as o , the slide reciprocated by said cam, means for connecting said slide and rock-shaft, and a spring and devices connecting the same with the rock-shaft, whereby a yielding pressure is imparted to said slide, rock-shaft, and cast-off, as set forth.

3. In a curved-needle sewing-machine, the combination, with the needle, looper, and work-holding devices, of the cast-off, the rock-shaft i , supporting the same, the cam o , the slide l , engaged with said cam, the rod k , connecting the slide with an arm j on the rock-shaft, and a spring and devices connecting the same with the rock-shaft, whereby a yielding pressure is exerted on the slide, the cast-off, and the intermediate devices, as set forth.

4. In a curved-needle sewing-machine, the combination, with the needle, looper, and work-holding devices, of the cast-off, the rock-shaft i , supporting the same, the cam o , the slide l , engaged with said cam, the rod k , connecting the slide with an arm j on the rock-shaft, a pivoted arm u , bearing at its free end on the rod k , and a spring r , bearing upon the arm u , whereby said arm is pressed downwardly upon the rod, as set forth.

5. The combination, with the needle, looper, and work-holding devices, of the cast-off, a rock-shaft upon which it is mounted, a cam, and loose connections between the rock-shaft and cam, a spring interposed in such loose

connections to impart a yielding pressure to the rock-shaft and cast-off, a stud *s*, supporting the spring, and the plate *t*, engaged with one end of the spring and pivoted with means for
5 holding it in different positions, substantially as set forth.

6. The combination of the fixed channel-gage and the oscillating looper, arranged at one side of the material, and the curved
10 needle, the back-gage, and the oscillating cast-off arranged on the other side, loose connections for said cast-off and its source of

motion, and a spring interposed therein to impart to said cast-off a yielding pressure toward the point of the needle, substantially
15 as and for the purposes set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses, this 16th day of April, 1888.

ANDREW EPPLER, JR.

Witnesses:

C. F. BROWN,
G. W. STATHAM.