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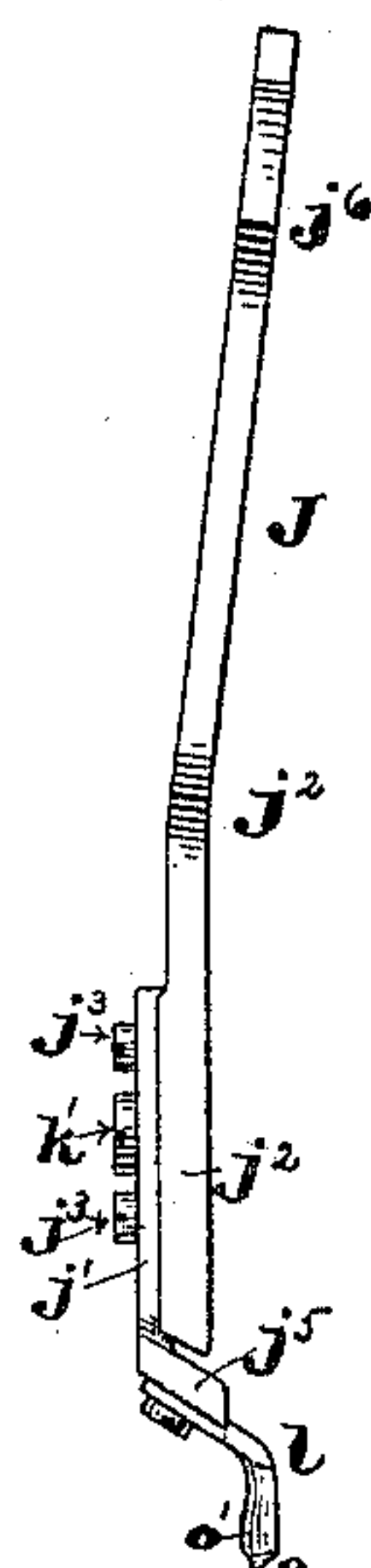
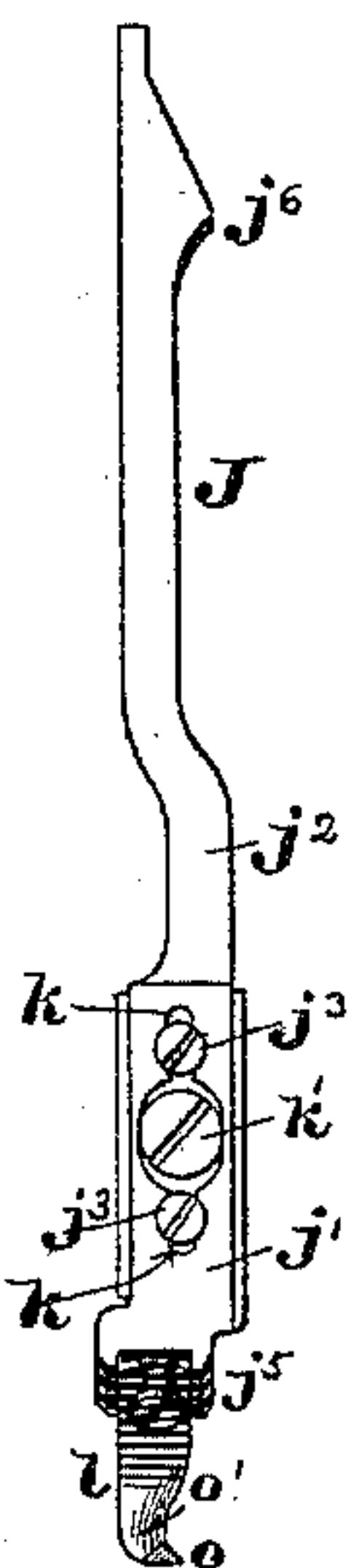
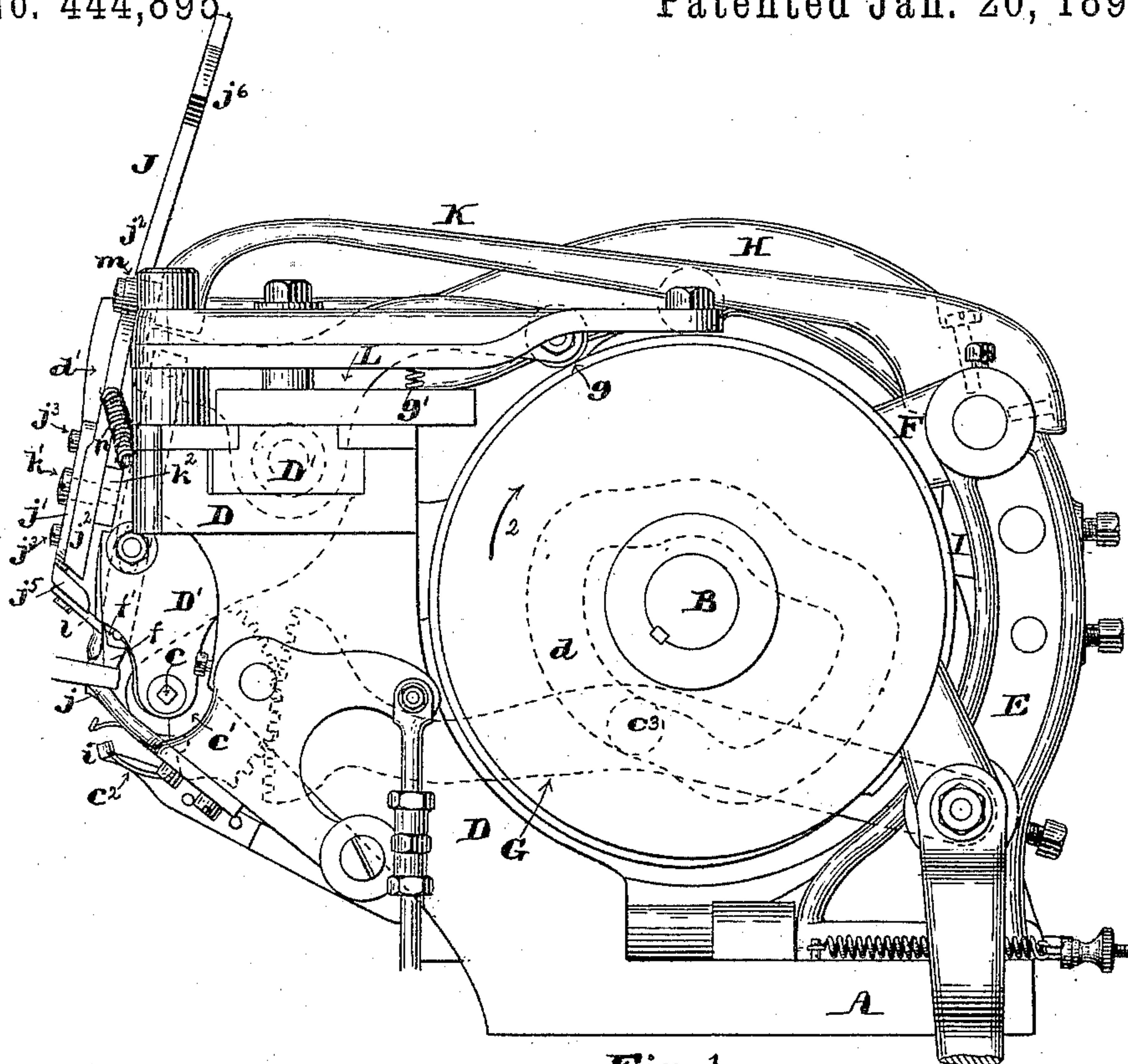
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A. E. JOHNSON & C. H. PORTER.

CHANNEL CUTTING AND FLAP TURNING ATTACHMENT FOR SEWING MACHINES.

No. 444,895.

Patented Jan. 20, 1891.



Witnesses:

Walter E. Lombard.
C. A. McClure.

Inventors:

Albert E. Johnson,
Cyrus H. Porter,

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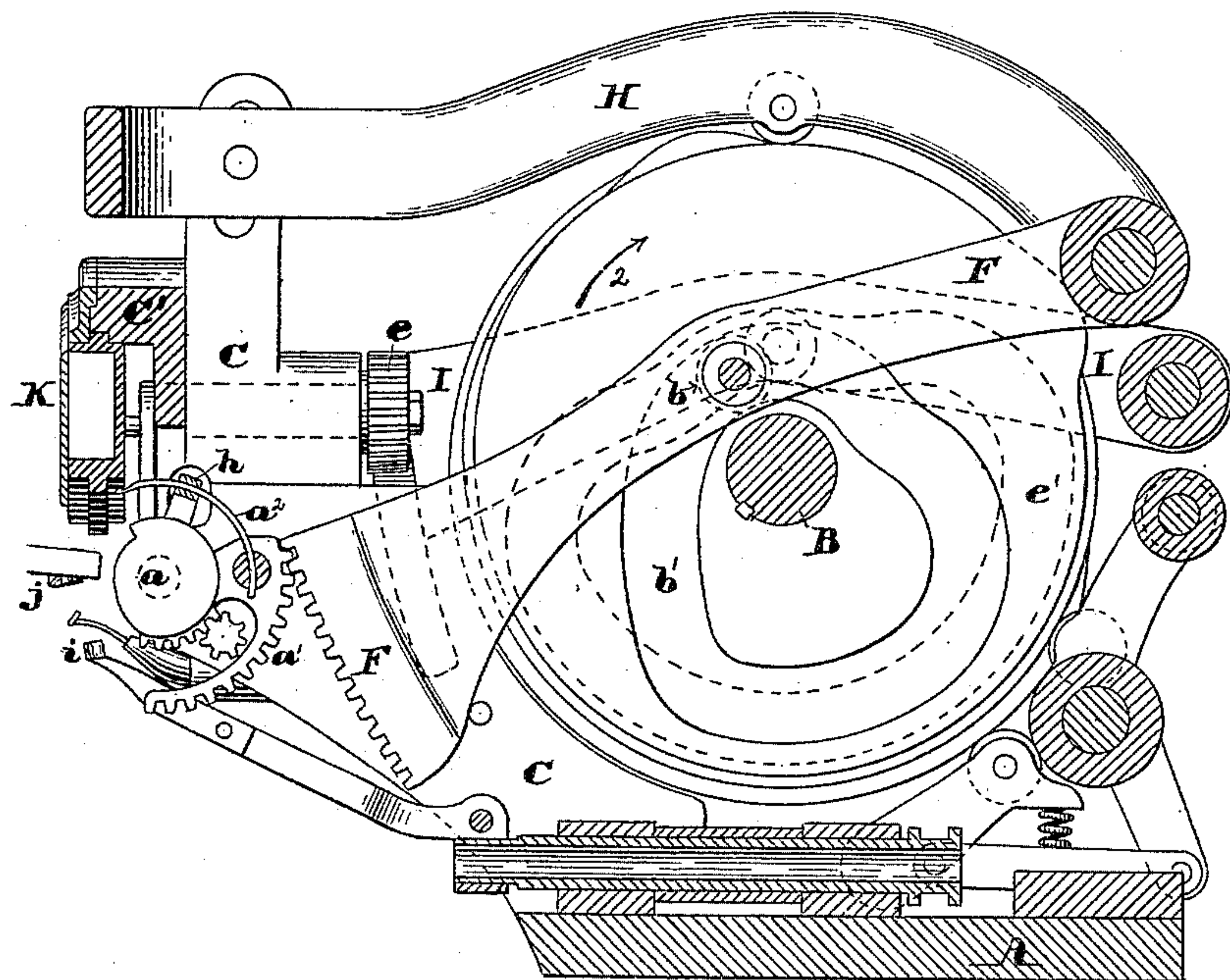
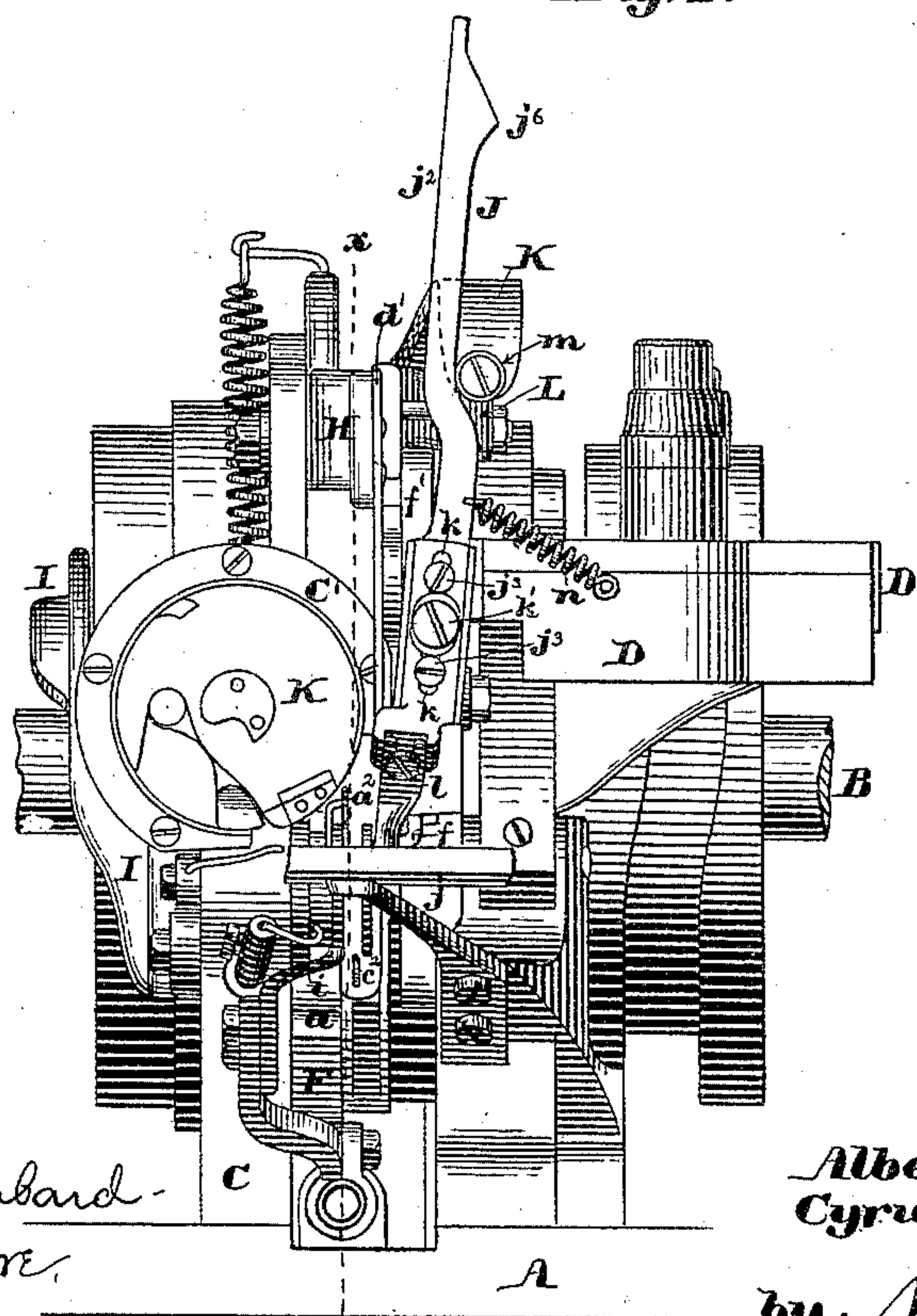


Fig. 2.



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Fig. 3.

UNITED STATES PATENT OFFICE.

ALBERT E. JOHNSON AND CYRUS H. PORTER, OF BROCKTON, MASSACHUSETTS.

CHANNEL-CUTTING AND FLAP-TURNING ATTACHMENT FOR SEWING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 444,895, dated January 20, 1891.

Application filed May 22, 1890. Serial No. 352,700. (No model.)

To all whom it may concern:

Be it known that we, ALBERT E. JOHNSON and CYRUS H. PORTER, both of Brockton, in the county of Plymouth and State of Massachusetts, have invented, jointly, a new and useful Channel-Cutting and Flap-Turning Attachment for Sewing-Machines, of which the following, taken in connection with the accompanying drawings, is a specification.

Our invention relates to machines for channeling boot or shoe soles or other leather stock for the reception of a line of stitching; and it consists in the combination, with the stitch-forming and work-feeding mechanisms of a sewing-machine, of a channel-cutter and flap-turner constructed and arranged to operate upon the sole or other article being sewed just in advance of the needle and awl and cut a section of an incision beneath a portion of the stock and raise and turn back the flap thus formed during the formation of each stitch of the line of sewing.

It further consists in certain novel features of construction, arrangement, and combination of parts, which will be readily understood by reference to the description of the drawings, and to the claims hereinafter given.

Figure 1 of the drawings is a side elevation of so much of a sewing-machine as is necessary to illustrate our invention. Fig. 2 is a sectional elevation of the same, the cutting-plane being on line xx on Fig. 3. Fig. 3 is a front elevation of the same. Fig. 4 is a front elevation of the channel-cutting and flap-turning tool and its carrying-lever. Fig. 5 is an elevation of the same viewed at right angles to Fig. 4. Fig. 6 is a transverse section of a sole, illustrating one form of channel; and Fig. 7 is a similar section illustrating another form of channel.

The drawings forming a part of this specification illustrate our invention as applied to a lock-stitch sole-sewing machine substantially like that shown and described in the Letters Patent No. 412,703, granted to French and Meyer, October 8, 1889; but our invention is equally applicable to any of the well-known wax-thread sewing-machines now in general use, it only being necessary to slightly modify the form of the tool-carrying lever and the arm for operating the same to adapt them to the different styles of machines without in

the least affecting the principles of operation.

In the drawings, A is the bed-plate of the head of the machine, which is in practice mounted upon a column of suitable height. (Not shown.)

B is the cam-shaft, which is mounted in bearings formed in the upper ends of two standards set in opposite ends of said plate A, as shown in the before-cited patent. The bed also has secured to the upper side thereof the stands C, D, and E, upon which are mounted, respectively, the shuttle-race C', the feed-slide D', and the levers F, G, H, I, and J. The stand C also carries the stud a , upon which is mounted the needle-segment a' , with the teeth of which the toothed segment formed on the front end of the lever F engages to impart to said segment and the needle a^2 a vibratory motion about the axis of said stud, said lever F having mounted upon a stud set therein a roll b , which fits into and is acted upon by the cam-path b' , as described in said prior patent.

The feed-slide D' has set therein a stud c , upon which is mounted the toothed segment c' , which carries the awl c^2 , to which a vibratory motion is imparted by the lever G, which has formed upon its front end a toothed segment, which engages with the awl-segment c' , and has mounted upon a stud set therein the roll c^3 , which is fitted to and acted upon by the cam-path d . (Shown in dotted lines in Fig. 1.)

The lever H carries at its front end the loop-spreader d' and is vibrated by the face-cam d^2 .

The lever I is provided at its front end with a toothed segment, (shown only in dotted lines in Fig. 2,) that engages with the pinion e , firmly secured upon the rear end of the shaft of the shuttle-carrier, said lever I being vibrated to impart a reciprocating rotary motion to the shuttle K by the cam-path e' , (shown in dotted lines in Fig. 2,) acting upon a roll mounted upon a stud set therein.

The presser-foot f is secured to the lower end of the bar f' , fitted to a bearing in the feed-slide D' and pivoted at its upper end to the front end of the lever L, fulcrumed on said slide and provided at its rear end with an anti-friction roll upon which the face-cam

g acts to depress the presser-foot, said roll being kept in contact with the cam by a spring *g'*.

The needle-guide *h*, the looper *i*, and the work-support *j*, together with all the parts heretofore described, are constructed, arranged, and operate as shown and described in the patent before cited.

Our channeling device consists of a lever *J*, made in two parts *j'* and *j''*, adjustably secured together by the screws *j³* *j³* passing through slots *k k* in the part *j'* and screwing into the part *j''*, said lever being pivoted at *k'* to a stand *k²*, secured to or formed in one piece with the presser-bar *f'*, and the lower end of the part *j'* is provided with an oblique slide *j⁵* to receive the channeling-tool *l*, which is also adjustable laterally of said lever. The upper portion of the part *j''* of the lever *J* has formed upon its edge the cam projection *j⁶*, to be acted upon by a roll *m* to move said lever in one direction around its fulcrum-pin *k'*, the spring *n* serving to move said lever in the opposite direction and keep the cam-edge of said lever generally in contact with the roll *m*. In the case illustrated in the drawings the roll *m* is mounted upon a stud set in the end of the lever or arm *K*, which may be secured to the hub of or formed in one piece with the needle-operating lever *F*, as shown. The channeling-tool *l* is provided with a cutting knife-edge *o*, arranged oblique to the surface of the work-support and made of a width equal to the desired width of channel to be cut and with a share *o'*, which serves to lift and turn back the flap of leather cut under by the knife.

The tool-carrying lever *J* is constructed substantially as shown and described in the Letters Patent No. 412,188, granted Albert E. Johnson October 1, 1889, only such changes being made therein as are made necessary in order to apply it to the particular machine shown in the drawings of this specification. In that patent the device was designed to cut a groove in a previously-channeled sole and the tool cut out a semicircular strip of leather to make room for laying a line of loop-stitches in doing what is called "fair-stitch work."

Our present invention is an improvement upon the invention described in said Patent No. 412,188, and is designed more especially for use on lock-stitch sewing-machines; but it can be very advantageously used on loop-stitch machines.

Our invention may be used successfully upon any of the well-known wax-thread machines now in use, only slight changes in the form of the tool-carrying lever and in the mounting of the truck *m* being necessary to adapt it to either of said machines, which changes would not affect the principles of operation, and hence we do not wish to be limited in our claims to its use on any particular sewing-machine.

The operation of our invention is as follows: The several parts being in the positions

shown in the drawings, and a shoe-sole being placed with its projecting edge upon the work-support *j* and with its tread-surface uppermost, with the presser-foot resting thereon, if the cam-shaft be revolved in the direction indicated by the arrow 2 on Figs. 1 and 2 the awl *c²* will be moved upward through the sole. The awl, its segment, and the feed-slide *D* are then moved toward the left of Fig. 3 to feed the work a distance equal to the length of the stitch desired, the presser-foot and the channeling-tool resting upon the work, and the work-support yielding to relieve the pressure on the sole while the feed is taking place. The awl then commences to recede and is withdrawn from the sole, and the needle is moved about the axis of its segment and descends through the hole formed by the awl to receive the needle-thread, which is laid into its barb by the looper *i* in a well-known manner. When the needle begins to move toward the sole, the roll *m* begins to move upward in contact with the cam-edge of the upper arm of the lever *J*, and when the needle has passed well through the work said roll *m*, acting upon the lower incline of the cam projection *j⁶*, causes a movement of the channeling-tool toward the right of Fig. 3 and the knife *o* to cut a short section of a channel in the upper or tread surface of the sole and the share *o'* to turn the flap of leather undercut by said knife upward and backward, so as to be out of the path of the awl at its next upward movement. As the roll *m* passes over the upper incline of the cam projection *j⁶* the spring *n* causes a movement of the lever *J* and the channeling-tool *l* in the opposite direction. The needle-thread having been laid into the barb of the needle by the looper *i*, the motion of the lever *F* and arm *K* is reversed, the needle begins to recede, and the roll *m*, moving downward over the upper incline of the cam projection *j⁶*, causes the lever *J* to be moved about its fulcrum, so as to move the channeling-tool *l* toward the right of Fig. 3 again, and as the roll passes down the lower incline of said projection the tool *l* recedes. When the needle is in its lowest position, the slide *D'*, the presser-foot, and the awl and awl-segment are returned toward the right of Fig. 3 to the positions shown in the drawings, and when the needle is fairly withdrawn from the work and the stitch is completed the awl is again moved upward through the sole, the work is fed toward the left of Fig. 3, the awl is withdrawn, the needle descends through the sole, and another section of the channel-flap is undercut and turned upward and backward, as before described.

By the use of our invention a great saving is made in the manufacture of sewed boots and shoes by virtue of the fact that the whole cost of channeling the sole and turning back the flap as now practiced is saved, as with our device the channeling and turning back of the flap are done while the sole is being sewed

without extra labor and at the same speed that the sewing alone can be done. The channeling-tool shown in the drawings shows its cutting-blade inclined, so as to cut an incision oblique to the surface of the sole, (see Fig. 6;) but for some kinds of work we make said blade so as to make an angular incision the main body of which is parallel to the tread-surface of the sole, as shown in Fig. 7.

The lever J is so arranged and operated that the cutting action of the channeling-tool takes place when the needle is in the work and just before it completes its downward stroke; but this is not absolutely essential, as it may take place earlier in the downward stroke of the needle or during the upward and rearward stroke of the needle, if desired; but we prefer to do the cutting during the last part of the downward movement of the needle or during the first part of the upward movement of the needle.

The roll *m* may be mounted on or connected to any other moving part of the machine that will give the desired movement at the right time.

It is very necessary that the channeling-tool should have a reciprocating or vibratory movement given thereto, in order that it may be lifted with the presser-foot when the awl and presser-foot are moved back or toward the right of Fig. 3 after feeding the work to the left without causing injury to the flap which has been cut under by the cutting-blade, which would necessarily be the case if it were lifted without being moved back after cutting a section of the channel.

We are aware that attachments have been applied to sewing-machines for cutting a groove in the surface of the sole or in the bottom of a previously-formed channel at the same time that the sewing is being done by cutting out a portion of the stock, which is entirely removed and discarded as waste material. We are also aware that attachments have been used on sewing-machines for cutting an incision in the sole at right angles to its outer or inner surface without removing any stock or turning up any flap, and also that machines have been made for cutting an incision under a portion of the material of the sole to form a flap and pricking said flap to determine where the awl or needle shall be inserted in sewing the welt to the inner sole by hand, and hence we make no claim to any of these devices; but we are not aware that prior to our invention an attachment had been used on a sewing-machine adapted to cut an incision under a portion of the stock of the

outer sole just in advance of the needle which forms the stitch, and at the same time to raise and turn back the portion of the sole so cut under, so that the needle and awl can perform their function of forming a stitch without injury to the flap, which is to be subsequently turned down over the seam to hide it from view.

What we claim as new, and desire to secure by Letters Patent of the United States, is—

1. In combination with the stitch-forming and work-feeding mechanisms of a sewing-machine, a channel-forming tool provided with a knife-edge adapted to cut an incision beneath a portion of the stock of the sole, and a share or inclined projection in the shank of said tool in suitable proximity to said cutting-edge to raise and turn back the flap of stock so cut under, said tool being constructed and arranged to operate upon the sole or other article being sewed just in advance of the needle and awl and cut and turn up a short section of the channel-flap during the formation of each stitch of a line of sewing.

2. The combination, with the stitch-forming and work-feeding mechanisms of a sewing-machine, of the tool *l*, provided with the cutting-knife *o* and the flap-turning share *o'*, formed upon the shank of said tool in suitable proximity to the cutting-edge of said knife to raise and hold up the flap of material cut under by said knife, the lever J, provided with a cam-surface, and the roll *m*, constructed and arranged to act upon said cam-surface to vibrate said lever during the formation of each stitch of a line of sewing.

3. The combination, with the stitch-forming and work-feeding mechanisms of a sewing-machine, of the lever J, provided with a cam-surface and pivoted to and movable with the presser-foot bar, the channeling-tool *l*, adjustably mounted upon said lever and provided with a cutting knife-edge to cut under the flap and a share to raise and turn back said flap, and a roll mounted upon a vibrating arm and arranged to act upon the cam-surface of said lever J to vibrate said lever and channeling-tool.

In testimony whereof we have signed our names to this specification, in the presence of two subscribing witnesses, on this 19th day of May, A. D. 1890.

ALBERT E. JOHNSON.
CYRUS H. PORTER.

Witnesses:

N. C. LOMBARD,
WALTER E. LOMBARD.