(No Model.) 4 Sheets—Sheet 1.

J. A. AMBLER.

SEWING MACHINE.

No. 263,648. Patented Aug. 29, 1882.

Fig. 1.

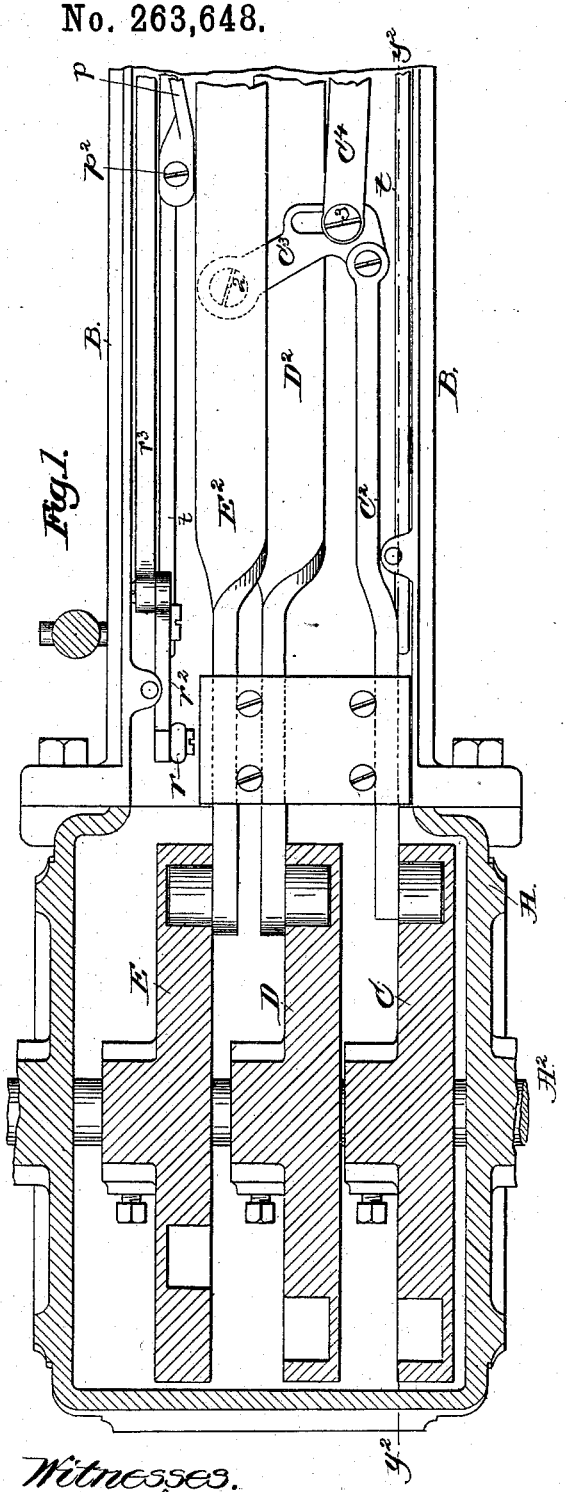
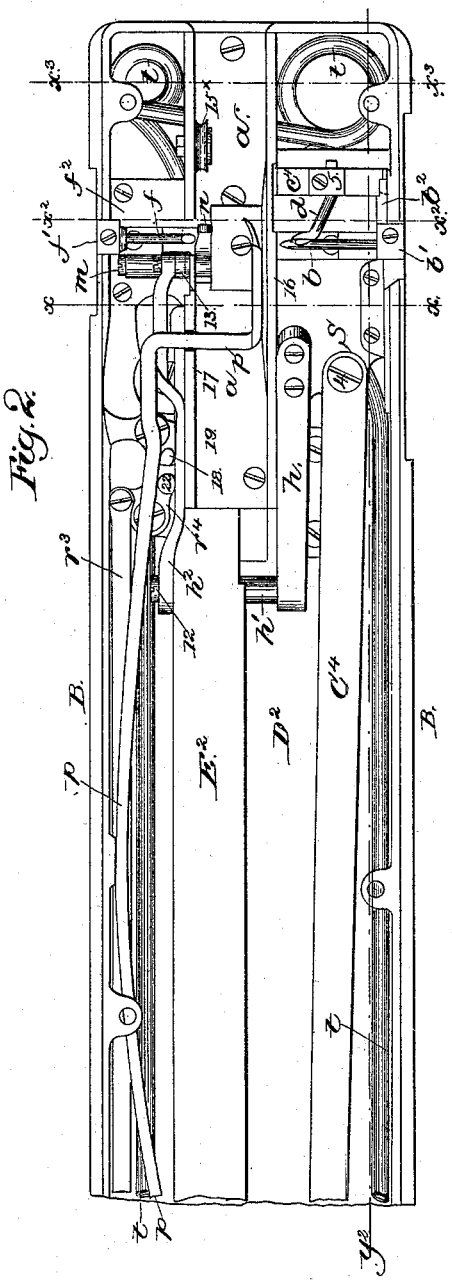


Fig. 2.



Witnesses.
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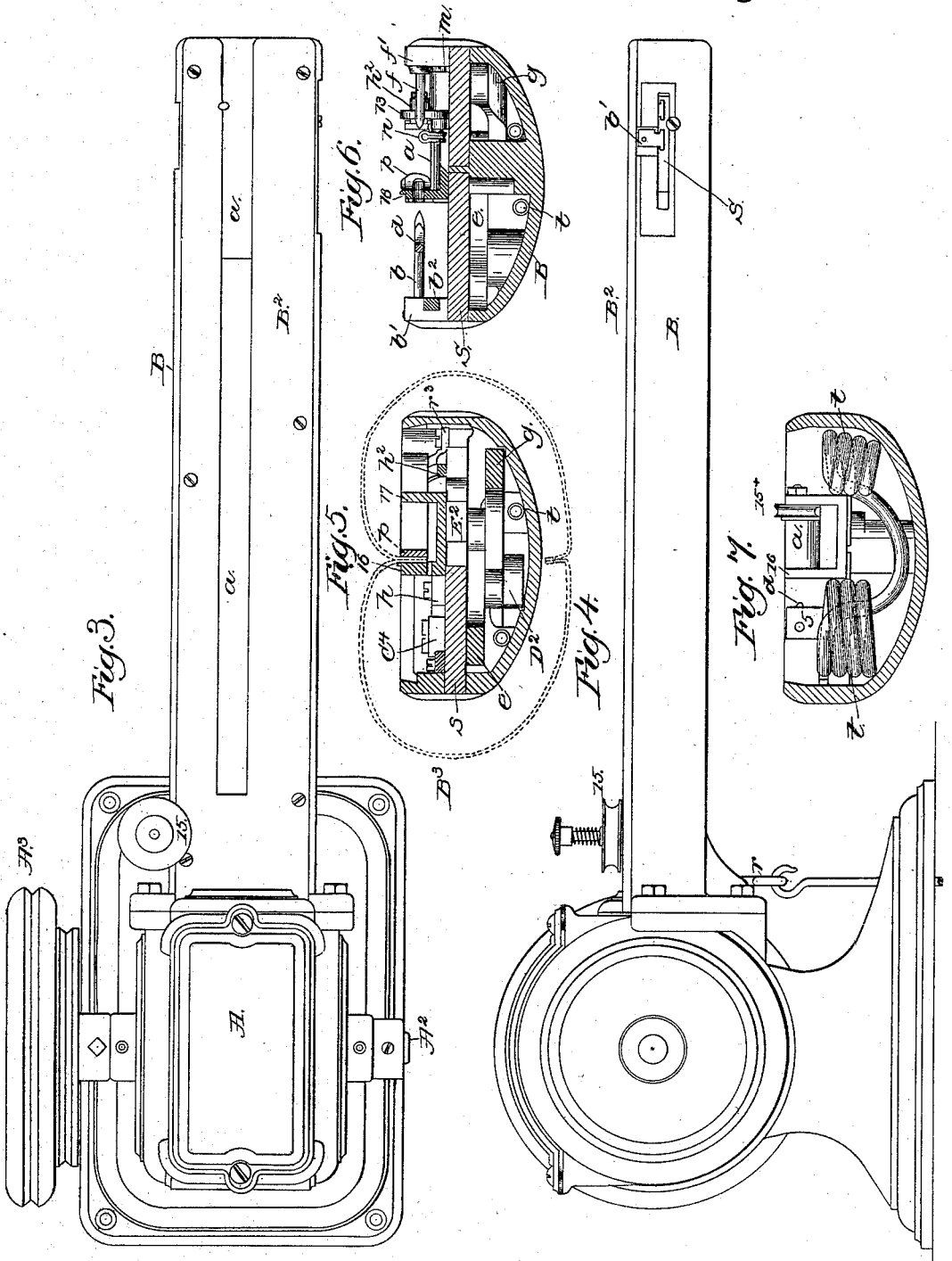
(No Model.) 4 Sheets—Sheet 2.

J. A. AMBLER.

SEWING MACHINE.

No. 263,648. Patented Aug. 29, 1882.



Witnesses.
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(No Model.)

4 Sheets—Sheet 3.

J. A. AMBLER.

SEWING MACHINE.

No. 263,648. Patented Aug. 29, 1882.

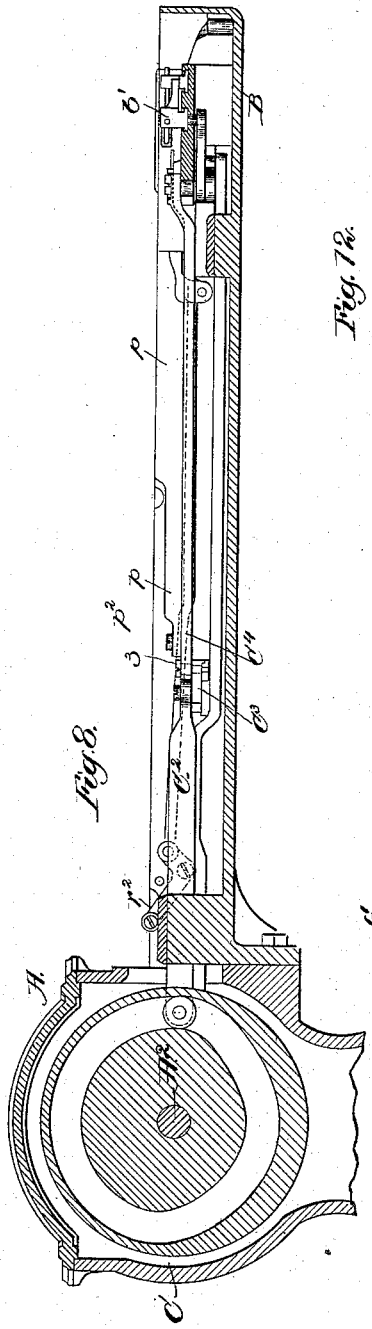

Fig. 8.

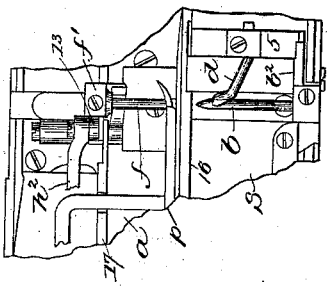

Fig. 12.

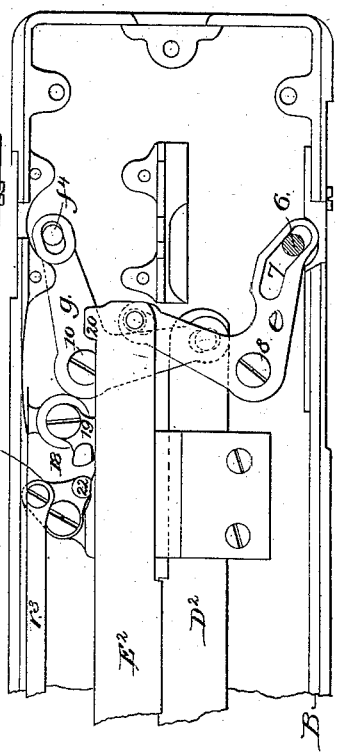

Fig. 9.

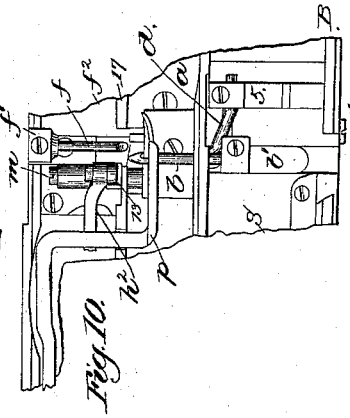

Fig. 10.

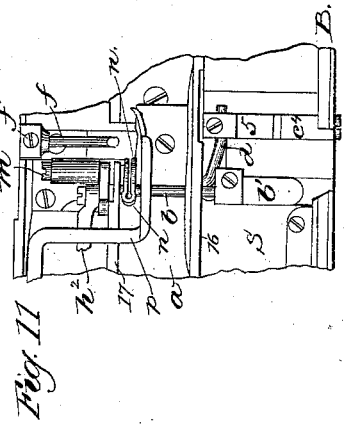

Fig. 11.

Witnesses.
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(No Model.) 4 Sheets—Sheet 4.

J. A. AMBLER.

SEWING MACHINE.

No. 263,648. Patented Aug. 29, 1882.

Fig. 13.

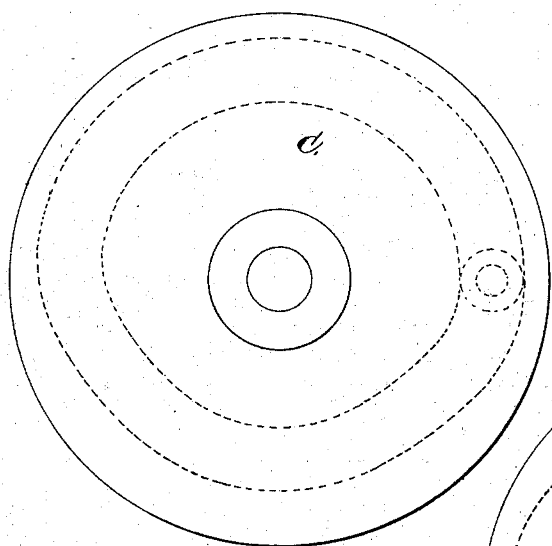


Fig. 14.

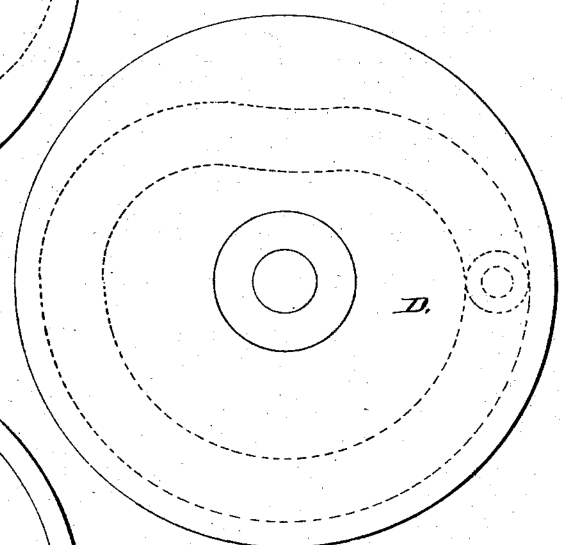
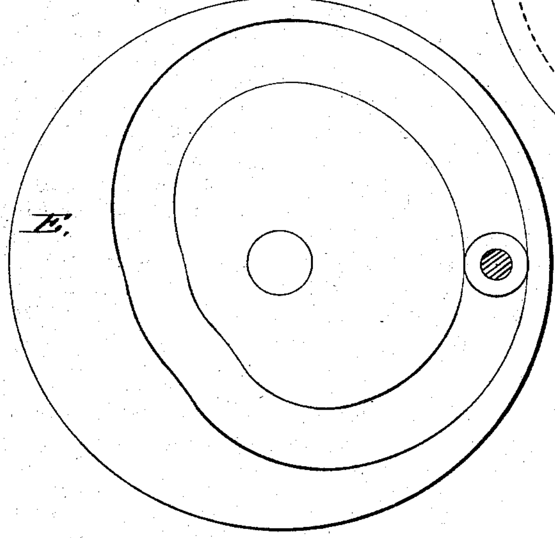


Fig. 15.



Witnesses.
John F. C. Prinkert
Fred A. Powell.

Inventor:
James A. Ambler
by Crosby & Gregory Attys.

UNITED STATES PATENT OFFICE.

JAMES A. AMBLER, OF NATICK, MASSACHUSETTS.

SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 263,648, dated August 29, 1882.

Application filed May 12, 1882. (No model.)

To all whom it may concern:

Be it known that I, JAMES A. AMBLER, of Natick, county of Middlesex, State of Massachusetts, have invented an Improvement in Sewing-Machines, of which the following description, in connection with the accompanying drawings, is a specification.

This invention in sewing-machines has for its object the production of a sewing-machine whereby the seams for closing boot-legs such as described in United States Patent No. 239,304, dated March 29, 1881, and other tubular articles, may be formed within the said articles while they are right side out, thus obviating turning the boot-legs or other articles right side out after their edges have been united to bring the edges of the material next the seams within the boot-leg or tubular article.

My invention is embodied in a machine containing a horn or sleeve-like arm provided with a longitudinal opening to permit the edges of the boot-leg, right side out and embracing the said horn or arm, to be placed in the said opening to be stitched by means of a hooked needle supplied with thread from a thread-guide. The thread guide has co-operating with it a cast-off of usual construction. The holes for the hooked needle are made with an awl, and the needle is moved to feed the boot-leg longitudinally over the horn or arm. The needle, cast-off, awl, and thread-guide are all arranged at the front end of this horn or arm, which is small enough to be embraced by a small boot-leg, the devices for operating the said parts deriving their movement from bars or rods, which, actuated by suitable cams, are reciprocated longitudinally in the said horn or arm.

In other sewing-machines having a long sleeve-like arm for supporting tubular articles to be sewed or united by a two-thread stitch, the shuttle (not the needle) has been contained in the arm, and the needle and its actuating mechanism being outside the horn or arm, it is obvious that a seam could not be made within a tubular article, which is the object to be accomplished by my invention.

Prior to my invention thereof I am not aware that a horn or arm containing all the stitch-making parts has ever been devised or employed to "side," as it is called, boot-legs or unite tubular articles.

Figure 1 is a plan view of the rear part of a sewing-machine embodying my invention, the upper part of the frame-work being removed to show the working parts. Fig. 2 is a like view of the front part of the machine, it and Fig. 1 put together representing the entire length of the machine. Fig. 3 is a plan view of the entire machine on a smaller scale; Fig. 4, a side elevation thereof; Fig. 5, a section on the dotted line $x\ x$, Fig. 2; Fig. 6, a section on the dotted line $x^2\ x^2$, Fig. 2; Fig. 7, a section on the dotted line x^3, Fig. 2. Fig. 8 is a detail in broken side elevation. Fig. 9 is a detail showing the lever for moving the awl and needle and their actuating devices. Figs. 10, 11, and 12 are details of the awl, needle, presser-foot, and thread-guide in different positions, and Figs. 13, 14, and 15 are details of the cams which impart movement to the operative parts.

The base A of the machine has extended from it the horn or tubular arm B, having upon it a cover-plate, B^2. One side of this horn (herein shown as its upper side) is provided with a recess or chamber, *a*, (see Figs. 2, 3, 5, 6, 7,) into which may be placed, as shown in dotted lines, Fig. 5, the edges of the material B^3 to be seamed or united by thread while the said material—as, for instance, a boot-leg such as described in my United States Patent No. 239,304, dated March 29, 1881—is right side out, to thus obviate the necessity of turning the said boot-leg, as now commonly done, when the material of the boot leg is stitched together wrong side out.

The main shaft A^2, provided with a drive-wheel, A^3, driven in any usual manner, has upon it three grooved cams, C D E. The cam C has at its side a groove of suitable shape to actuate the slide-rod C^2, connected with the short lever C^3, pivoted at 2. The lever C^3 has adjustably attached to it by screw 3 a link, C^4, pivoted at its front end, as at 4, to the slide S, fitted to slide horizontally in guides of the arm B. The extent of horizontal movement of this slide S may be adjusted by changing the point of connection of link C^4 with the lever C^3. The stroke of slide S will be more or less, according to the length of stitch to be

made, for in this my invention the material is fed by the hooked needle *b* when in it, and the needle-carriage *b'* is fitted to be moved transversely in the said slide.

The needle *b* (herein shown as of the hooked class, commonly employed in the production of a chain-stitch) has co-operating with it a cast-off, *d*.

The needle carriage *b'* has projecting from one side of it a finger, b^2, which at the proper times strikes first one and then the other of two lugs on the cast-off carriage 5, fixed to be reciprocated in a groove, c^4, made in the slide S. The needle-carriage *b'* has projecting from its under side (see Fig. 9) a pin or roller, 6, which enters a cam-groove, 7, at the end of an elbow-lever, *e*, pivoted at 8, the said lever being vibrated by means of the slide-rod E^2, with which it is connected by a suitable pin and slot, the said slide-rod receiving its reciprocations from the grooved cam E.

The awl *f*, which perforates the material to form a hole for the passage of the needle *b*, is secured to an awl-carriage, *f'*, fitted to be reciprocated in a guideway of a block, f^2, fixed within the tubular arm B. The awl-carriage *f'* at its under side has a suitable pin or projection, f^4, (see Fig. 9,) which is engaged by the elbow-lever *g*, pivoted at 10. The lever *g* has imparted to it suitable movements to operate the awl in the proper manner by means of a slide-rod, D^2, with which it is connected by a suitable pin and slot, said slide being operated by the grooved cam D.

The slide S has extended backward from it an arm, *h*, (see Fig. 2,) provided with a lateral projection, *h'*, upon which is pivoted at 12 a link, h^2, which is attached by a suitable pin to a short arm, 13, of a rock-shaft, *m*, having connected with it the thread-guide *n*, (shown as a small curved and grooved arm,) it taking its thread from a suitable bobbin, the thread passing to the said thread-guide being wound around the tension devices 15 $15^\times$. The hooked needle, which also feeds the material, passes into the recess or chamber *a* of the arm B through its wall 16, while the awl passes through a suitable recess of the opposite wall, 17. The material in which the stitch is made is suitably held upon the wall 16, which is slotted and constitutes the needle-throat of the machine, by presser-foot *p*. The presser-foot forms part of a long arm pivoted at p^2, and is lifted automatically while the hooked needle is being moved to feed the material by means of a pin, 18, on a pivoted block, 19, which is struck by a lug, 20, (see Fig. 9,) projecting from one side of the slide-bar E^2.

Whenever it is desired to lift the presser-foot *p* without operating the other parts of the machine, it may be done through the link *r*, attached to the elbow-lever r^2, connected by link r^3 with the small vibrating block r^4, provided with pin 22.

In the arm B and at its forward end I place a suitable coil or coils of pipe, *t*; or it may be a box, into which steam may be introduced to keep warm those portions of the arm B and sewing parts which come in contact with the material and the waxed thread, so as to keep the wax on the thread of suitable consistency.

The hooked needle, cast-off, and awl operate with relation to each other all as common in other hooked-needle chain-stitch wax-thread machines. The hooked needle and awl work from opposite sides into and across the recess or groove made in the arm B.

The first seam of the boot-leg will be closed while the right or dark faces of the front and back are in contact, the said edges being passed between the presser-foot *p* and the wall 16 of the horn or arm B. When the final seam is to be closed to bring the boot-leg into tubular form, with both seams inside, the boot-leg will be made to surround the arm B, as in Fig. 5, the right or dark faces of the front and back being outermost, and with the right or dark faces of the material in contact and entered between the presser-foot and wall 16 the final seam to close the boot-leg will be made through and through the said edges and entirely inside the boot-leg so held right side out, thus avoiding turning the boot-leg after it has been closed, which is very detrimental, for turning the boot-leg in a very great measure takes out the crimp therein, so that the effect of crimping is partially lost before the boot is lasted.

I claim—

1. The arm B, provided with the opening made therein to receive within it, as shown, the edges of the front and of the back boot-leg right side out, substantially as described.

2. The arm B, provided with the opening made therein to receive within it, as shown, the boot-leg or tubular article to be closed right side out, combined with the hooked needle and thread-guide located in the said arm, and with means, substantially as described, to operate them, whereby the final seam in the boot-leg or tubular article may be closed or sewed inside the boot-leg or tubular article, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JAMES A. AMBLER.

Witnesses:
G. W. GREGORY,
B. J. NOYES.