

(No Model.)

2 Sheets—Sheet 1.

H. J. DOUGHTY.
MAKING RUBBER BOOTS OR SHOES.

No. 547,373.

Patented Oct. 1, 1895.

Fig. 1.

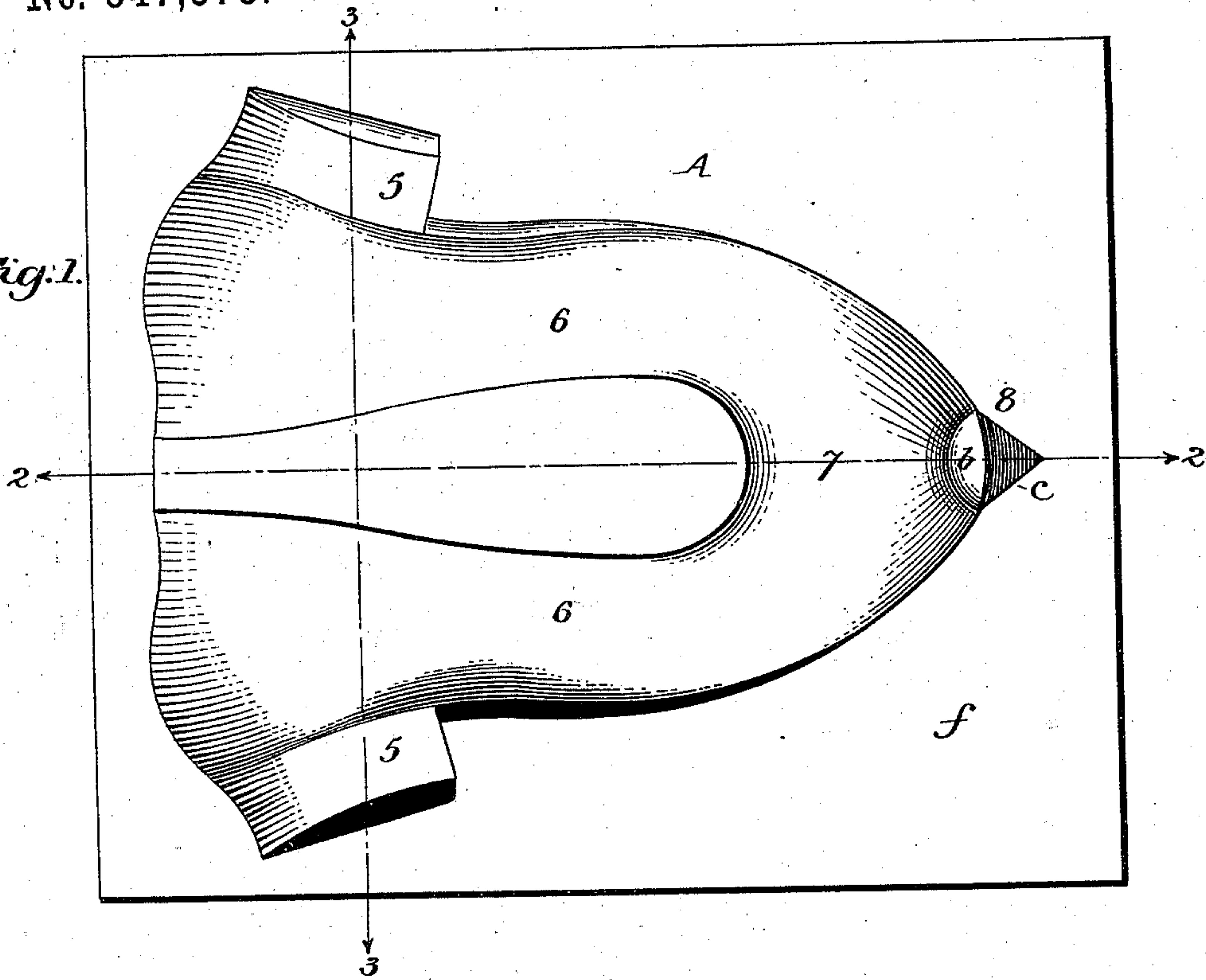


Fig. 2.

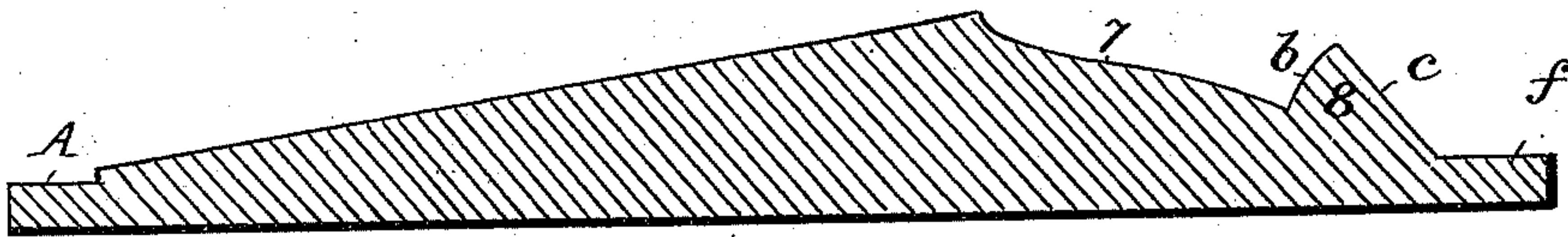
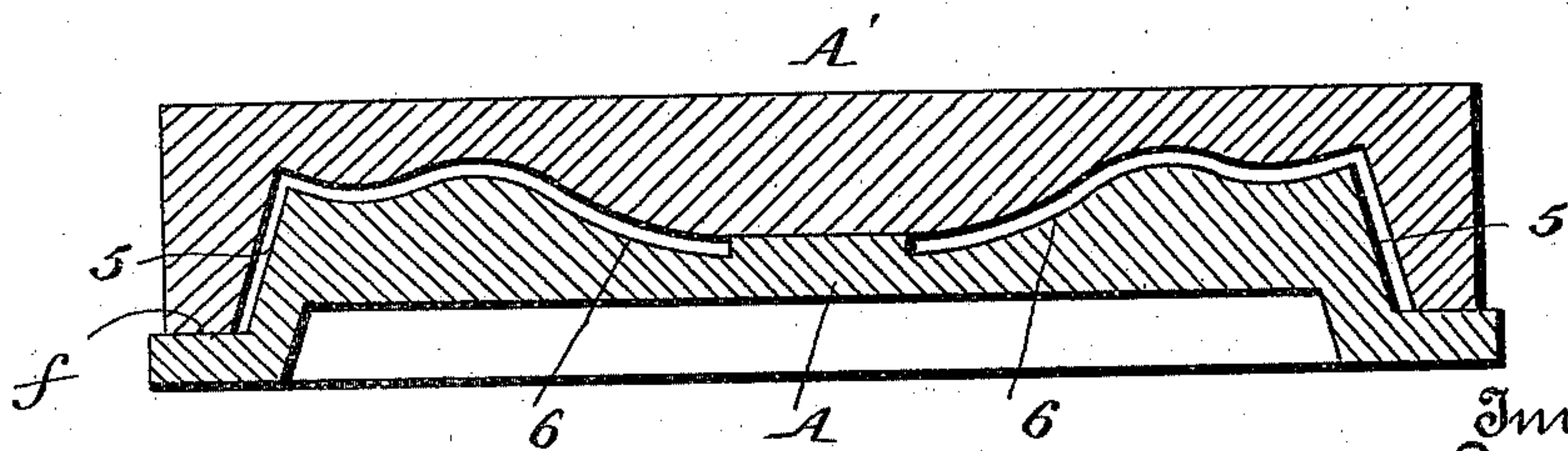


Fig. 3.



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Fig. 4.

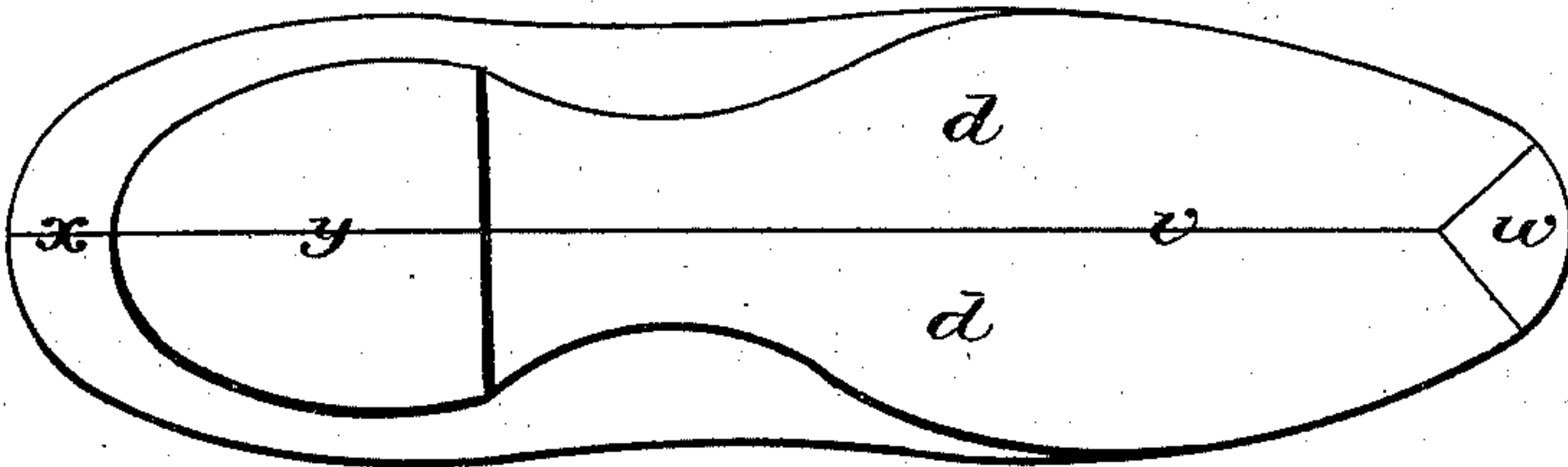


Fig. 5.

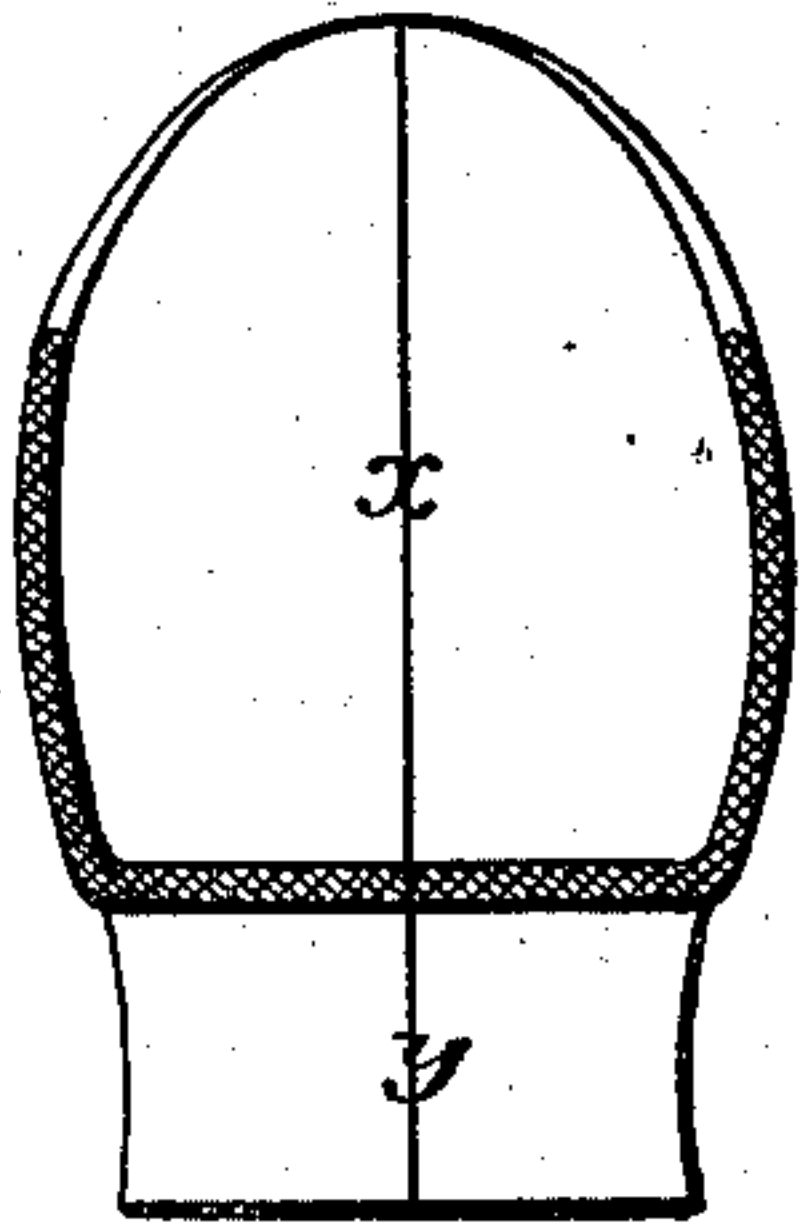


Fig. 6.

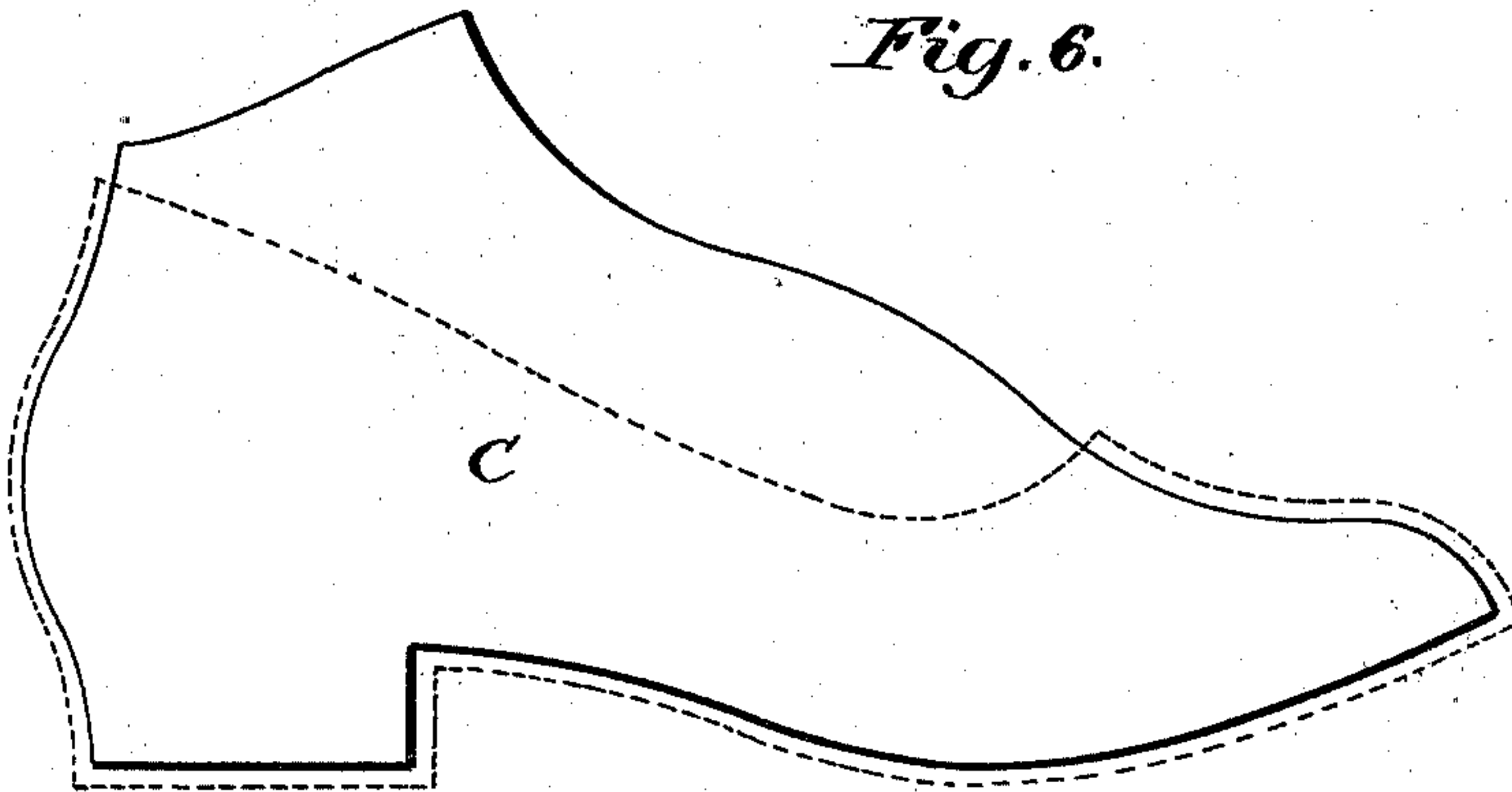


Fig. 7.



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UNITED STATES PATENT OFFICE.

HENRY J. DOUGHTY, OF PROVIDENCE, RHODE ISLAND.

MAKING RUBBER BOOTS OR SHOES.

SPECIFICATION forming part of Letters Patent No. 547,373, dated October 1, 1895.

Application filed May 23, 1895. Serial No. 550,350. (No model.)

To all whom it may concern:

Be it known that I, HENRY J. DOUGHTY, a citizen of the United States, residing at Providence, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Making Rubber Boots or Shoes, of which the following is a specification.

My invention relates to the manufacture of that class of rubber shoes, boots, &c., consisting in whole or in part of vulcanizable material continuous throughout the shoe or a greater portion thereof; and my invention consists in forming the vamp in one piece with divided quarter-sections and with divided sole-sections, if desired, so that the material may be made into a completed shoe by merely cementing the edges of the sections together and then vulcanizing and finishing as usual.

In the accompanying drawings, Figure 1 is a face view of a form adapted for use in carrying out my improvement. Fig. 2 is a longitudinal section on the line 2 2, Fig. 1. Fig. 3 is a transverse section on the line 3 3, Fig. 2, showing how a die may be used. Fig. 4 is an inverted view showing the material as arranged on the last. Fig. 5 is a transverse section showing the position of the parts of material when brought together at the heel; Fig. 6, a side view of the last, illustrating the position of the material in dotted lines; Fig. 7, a side view of the sole and heel section of the shoe when formed separately from the upper portion.

In carrying out my invention I first prepare a "form," which corresponds either to the form of the outside or of the inside of a rubber shoe or a portion thereof when said shoe is divided longitudinally along the sole and heel and midway up the back and spread or distended so as to bring the two quarters and the vamp approximately into the same plane. Thus Fig. 1 illustrates such a form A, in which the portion in relief corresponds to the inside of the distended and divided shoe, the sections 5 5 of the parts in relief representing the inside shapes of the halves of the heel, the sections 6 6 representing the shape of the inside of the shoe at the quarters, and the section 7 corresponding in form to the inside of the vamp. There is at the toe a pro-

jection 8, inclined in both directions, as best illustrated in Fig. 2, the face *b* of which corresponds to the inside of the toe portion of the shoe, while the face *c* is triangular and corresponds to a triangular portion *w* of the sole, as shown in Fig. 4. The side edges of the portions 6 6 correspond in height each to the height of one of the divisions *d d* of the sole when the latter is to be formed in one part with the other sections of the shoe. With a form of this character I proceed to make a shoe by applying to the relief portions of the form sheets of prepared rubber composition or rubber cloth or fabric of such character as can be properly fitted to all of the parts in relief beyond the face of the base *f*, from which the portion in relief projects. If it is desired to have any portion of the shoe—as, for instance, the sole or heel—heavier or thicker than the other portions, I apply a heavier or thicker sheet or fabric, or superpose two or more layers of sheet or fabric, as may be required, at the points where the shoe is to be fixed.

If the shoe is to have a fabric lining, I first apply the lining fabric to the form, preferably dampening it, so as to shape itself readily to the contour of the part in relief, and I then lay the other sheet of fabric upon the lining fabric thus applied.

Where it is desired to impart any special surface ornamentation or finish to the exterior of the shoe, I may effect this expeditiously by means of a die *A'*, having a recess conforming in its general outlines to the relief portion of the form *A* with the thickness of material upon it, and also embossed in such manner that when pressed upon the said material lying upon the form *A* the outer surface thereof will be pressed into proper shape or ornamentation. After having thus applied the material of which the shoe is to be formed to the form *A* it may be set thereon by baking or vulcanizing or partially baking or vulcanizing or, as thus formed in complete shape without further perforation, it may be taken from the form *A* and applied to the exterior of a last *C*, as shown in dotted lines, Fig. 6. As thus applied to the last the quarter 6 6 will be bent down upon the last to bring the rear edges of the quarters together upon the line *x*, Figs. 4 and 5, the edges of the heel por-

tion being brought together on the line *y* and the edges of the sole portions *d d* being brought together on the line *v*, while the V-shaped portion *w*, which extends from the toe portion upon the form A, is bent inward upon the last, so that its diverging edges will meet corresponding edges of the sole portion. The parts are so pressed together upon the last as to bring the meeting edges into close contact, before which, however, if desired, a suitable cement may be applied to said edges. The last with the material upon it is now transferred to the vulcanizing-oven and there vulcanized, so that on the completion of this operation the shoe will be upon the last in one practical continuous homogeneous piece. If desired to thicken the sole or heel portion or to make a solid heel, the said heel or sole portion D, formed as illustrated in Fig. 7, may be applied to the other portion after it has been set upon the last. If desired, also, the sole and heel portion, as shown in Fig. 7, (with the heel either solid or properly recessed,) may be applied to the material after placing the latter upon the last, the said material being applied to and shaped upon the form A without covering the edges of the quarter-sections 6 or the part 5, so that the portion applied to the last represents only the quarters and vamp, and the heel and sole are completed by the application of the part D.

It will be evident that shoes of different shapes may thus be made of different materials vulcanizable in whole or in part with great facility and without requiring the services of skilled operators and without molding the material upon the last, which latter is simply used for convenience in joining the parts together, and not in any way as a mold or former for the shoe, which is practically formed before being put upon the last. I have found that by this method of manufacture I am enabled to make a shoe which is much lighter and neater in appearance and more durable than those made in the ordinary

way, while there is considerable saving in the expense of manufacture.

Without limiting myself to the use of any special material or to the shape shown, I claim as my invention—

1. The within described improvement in the manufacture of shoes and boots from vulcanizable material, the same consisting in forming from said material the vamp and divided quarters, and divided sole and heel portions in connection with each other in final shape, then bringing the edges of the divided parts together and cementing, vulcanizing and finishing to form an article in one continuous piece, substantially as set forth.

2. In the manufacture of shoes from vulcanizable material, first forming the vamp in one piece with the divided quarters of completed contour and surface shape, then bringing the edges of the divided parts together and then vulcanizing and finishing as usual, substantially as described.

3. In the manufacture of rubber shoes and boots, first forming into complete shape such sections of the shoe as when brought together without further shaping will constitute a complete shoe or boot, and then assembling, uniting and vulcanizing the whole to form a continuous article, substantially as described.

4. In the manufacture of shoes of vulcanizable material, first applying the material to a form in relief upon a substantially flat plane shaped to properly and completely form the upper part of the shoe, then bringing together the edges of the section thus formed and vulcanizing and finishing the same as usual, substantially as described.

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

HENRY J. DOUGHTY.

Witnesses:

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ROSE A. CALLAN.