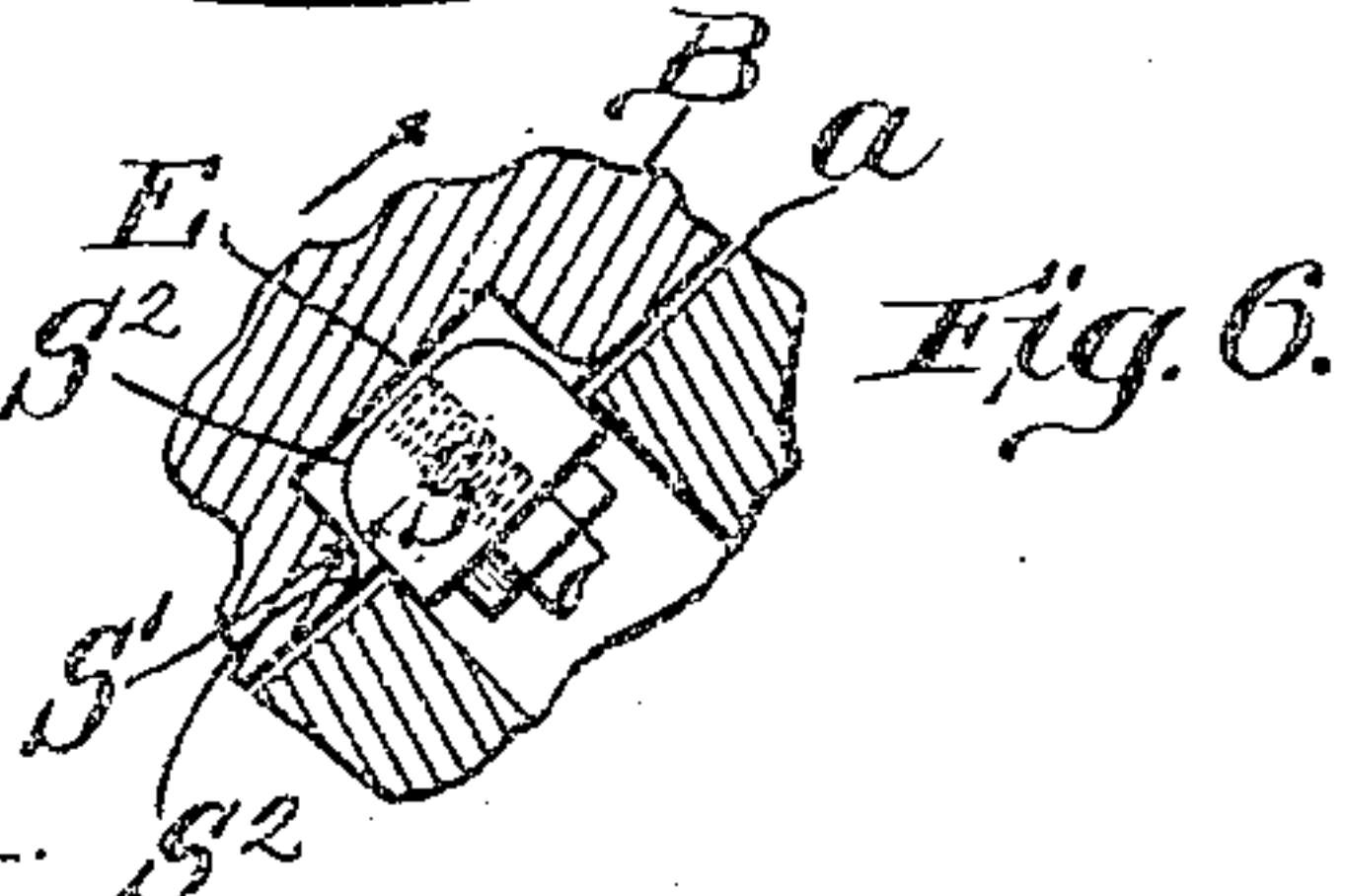
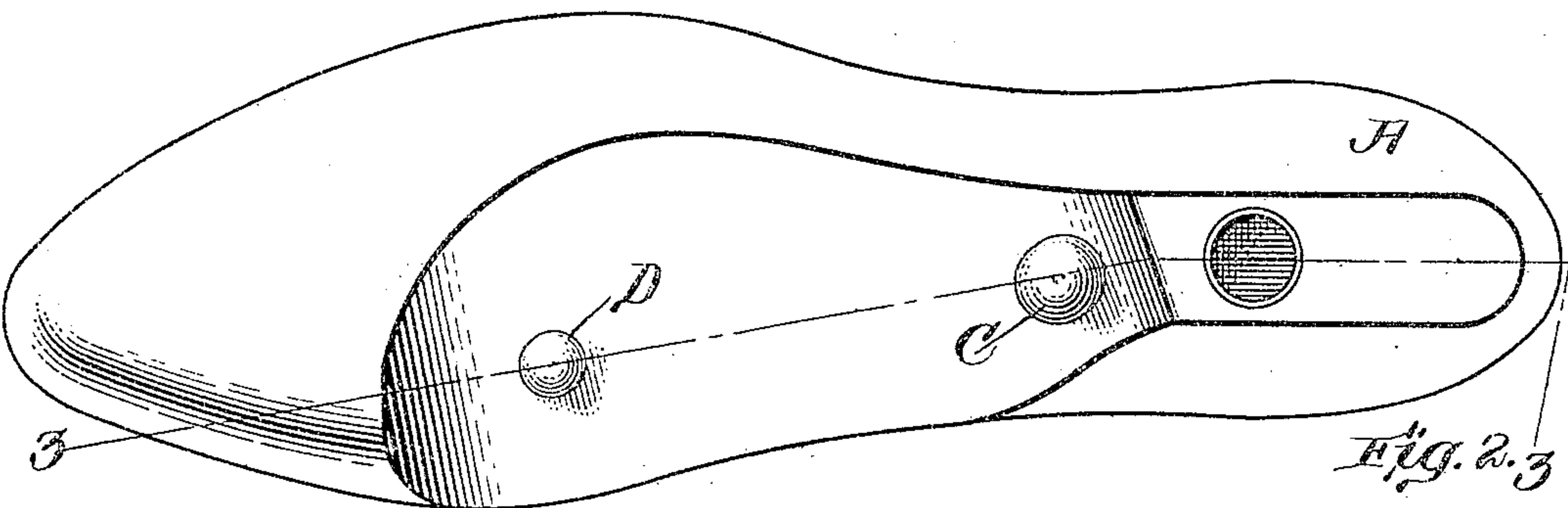
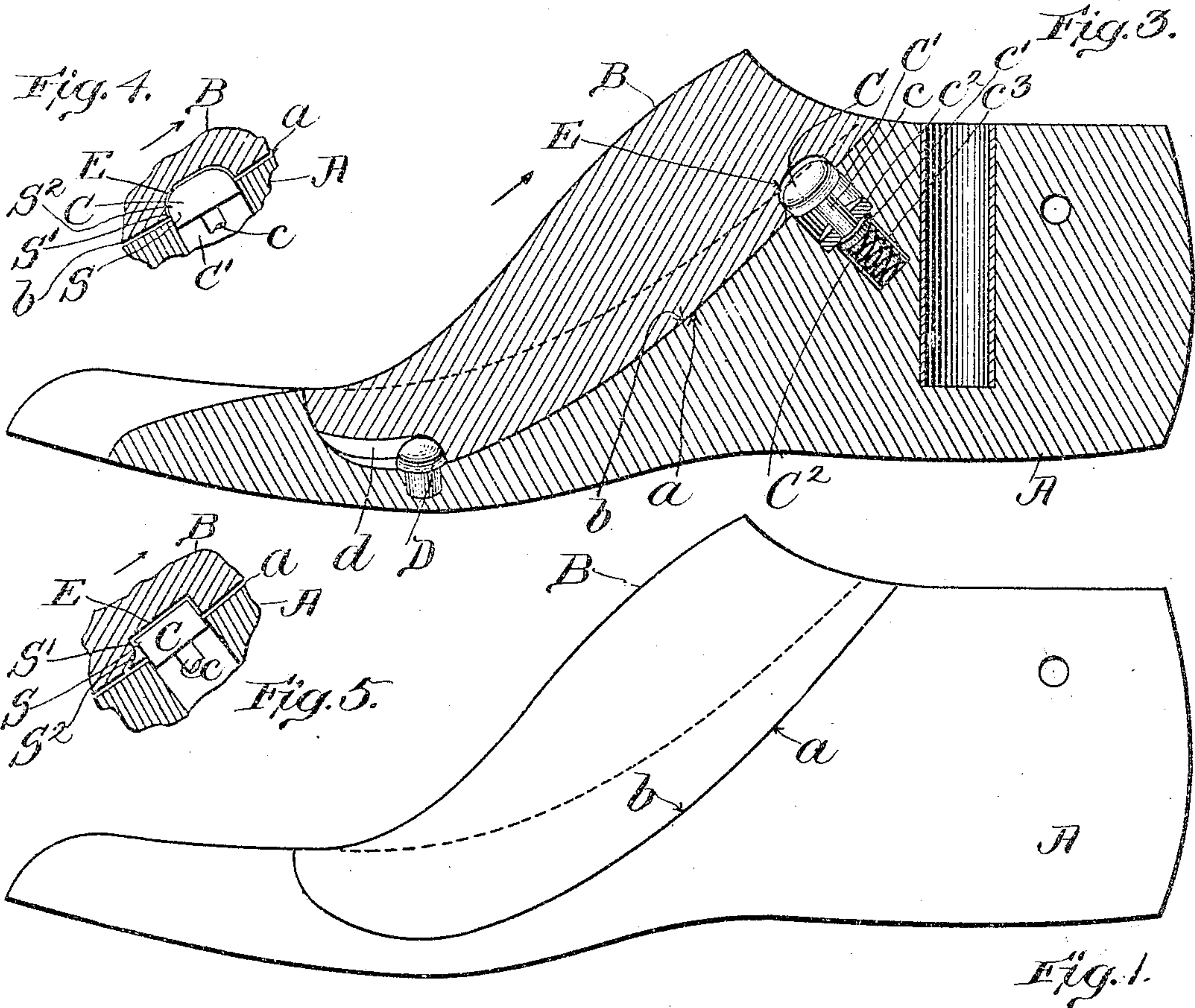


No. 778,505.

PATENTED DEC. 27, 1904.

W. C. PORTER.  
SHOE LAST.

APPLICATION FILED JAN. 22, 1903.



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# UNITED STATES PATENT OFFICE.

WALTER C. PORTER, OF WORCESTER, MASSACHUSETTS.

## SHOE-LAST.

SPECIFICATION forming part of Letters Patent No. 778,505, dated December 27, 1904.

Application filed January 22, 1903. Serial No. 140,080.

*To all whom it may concern:*

Be it known that I, WALTER C. PORTER, a citizen of the United States, and a resident of Worcester, in the county of Worcester and State of Massachusetts, have invented new and useful Improvements in Shoe-Lasts, of which the following is a specification.

My invention relates to the construction of divided lasts, and particularly to devices for securing the upper section or block of a divided last in place when the last is in a shoe and preventing the said block from slipping back under the pressure exerted upon it by the shoe. Prior to my invention there have been several modes of constructing lasts of this character with purposes in view similar to my own. One of these methods has been the provision of buttons or studs affixed to the lower portion of the last, which register with cavities in the upper section or block. These devices are adequate to hold the last and block together securely during the various manipulations of the shoe, but are subject to disadvantages—namely, in slipping the block upon the last it is necessary to lift the block over the studs or buttons until the holes register therewith, and as the studs have to be of sufficient height to hold the block securely even after they have become worn the block has to be lifted so far above its position when in place on the last for insertion and removal as to necessitate unlacing the upper for removal of the block after lasting or insertion in relasting. Another mode of construction is that which is illustrated in the reissued Letters Patent to George E. Belcher, No. 10,534, reissued October 28, 1884, whereof the original patent was numbered 300,195. This device consisted of a bolt yieldingly mounted in the lower portion of the last, and therefore movable downwardly, which when the block slid down upon the last and into the shoe was pressed into its socket until a hole in the block registered with the bolt, which thereupon shot into the hole and secured the last and block together. This device obviated the difficulty heretofore mentioned, but was subject, on the other hand, to a disadvantage which has proved an obstacle to universal adoption of the improvement—to wit, the bolt aforesaid locked

the last and block together, so that a key or rod was required to push the bolt down out of the hole in the block, so that the latter could be slid from the last and out of the shoe. This required the workman in the shoe-factory to carry properly shaped and sized rods or keys, and as the shoes passed from hand to hand a great many of such keys had to be provided. The complications and annoyances which result from this requirement have been such as to dissuade many manufacturers from using the Belcher last.

My invention and improvement is designed to embody in a last the good features of both the aforesaid old styles while avoiding their disadvantageous characteristics.

To this end I have invented the improvements illustrated in the drawings, wherein—

Figure 1 is a side elevation of a last and block attached. Fig. 2 is a top plan view of the lower section of the last. Fig. 3 is a section along the line 3 3 of Fig. 2, and Figs. 4, 5, and 6 are sectional details showing possible variations in the structure of my improved block-fastening.

In all the figures of the drawings, A is the lower portion, and B the separable block, which in conjunction constitute the divided last, the surface *a* of the lower portion meeting and substantially fitting the surface *b* of the block. At the lower portion of the surface *a* a fixed positioning-stud D is provided, with which a channeled socket or recess *d*, formed in the block B, registers when the block is in place on the member A. In the embodiment of my invention which I regard as preferable in structure and operation and which is illustrated in Figs. 1, 3, and 4 I provide a resilient button C, which in the instance illustrated in the said figures is a boss having a rounded top mounted upon a spindle *c*, the said spindle passing through a perforation in a washer *c*<sup>2</sup>, which is forced into and frictionally held in a chamber C'. A lower chamber C<sup>2</sup> of less diameter than the chamber C' contains the spring *c*<sup>3</sup> and the flange or foot *c*', which is secured to or formed upon the spindle *c*. The spindle *c* may be screwed into or otherwise secured to the head or boss C. When the connection is by means



of screw-threads, the boss C may obviously be adjusted longitudinally of the spindle *c*, and this is useful in case the engaging surface of the socket E becomes slightly worn, in which case the boss C may be very slightly moved longitudinally of its spindle to engage a new bearing-surface in the socket. In the block B, I form the socket E, which is of proper size to admit the boss C, which in the illustration shown in Figs. 1, 3, and 4 constitutes the resilient button. The button C and socket E are formed so that when the block B is in place on the lower member A the button C and socket E possess opposed and coöperating holding-surfaces of but slight extent, but which are ample to retain the block member B upon the lower member A when the last is inserted in the shoe. These holding-surfaces are substantially perpendicular to the surfaces *a* and *b* at and near the button C. Upon one of these coöperating parts, either the button C or the socket E, and contiguous to the block-holding surfaces of one or the other, or both, as the case may be, I provide a cam-surface—that is to say, a surface so disposed that pressure exerted in a direction parallel, or substantially so, to the surfaces *a* and *b* at or near the button C exerts a component of downward pressure upon the button C to force the same into its chamber C'. This cam-surface is preferably so developed upon the surface of the socket E or button C that the holding-surfaces contiguous thereto present no sharply-defined edge which is liable to be worn away by constant use, so that a very narrow holding-surface is preserved intact and with all its power for retention of the block B, which would not be the case if the holding-surfaces terminated in edges or shoulders which would inevitably become worn and rounded until the holding-surfaces themselves were destroyed. By this means I provide a block member B, which when inserted into a shoe (the lower member A having been previously placed in position) presses down the button C. This block when in place is secured by the springing of the button C into the socket E when the holding-surfaces presently to be described more in detail oppose positive and adequate resistance to all tendency of the block to slip out of place. Nevertheless, these holding-surfaces, by reason of my improved construction, are so restricted in extent that when it is desired to remove the block B the holding-surfaces are disengaged by an infinitesimal movement of the block B, when the cam-surface provided either on the surface of the socket E or the surface of the catch C comes into play and causes the catch to be pressed down into its chamber C' as the block B is withdrawn.

In Figs. 4 to 6, inclusive, I have illustrated, by showing modifications of my improved catch structure, the location and operation of

the holding and cam surfaces. In Fig. 4, which is a detail illustrative of the structure shown in Figs. 1 and 3, the catch C is cylindrical, or nearly so, at and near its base, presenting an annular cylindrical surface S, which is above the surface *a* of the lower member A of the divided last. Likewise the socket E is formed with a narrow cylindrical surface S' at or near the lower surface *b* of the block B. The button C is rounded or beveled, so as to form a cam-surface, as at S<sup>2</sup>. When, therefore, the block B is eased off from its seat upon the lower member A, pressure in the direction of the arrow, Fig. 4, causes the cam-surface S<sup>2</sup> to operate and thrust the button C against the action of its spring *c*<sup>3</sup> (see Fig. 3) into the socket C'. Then the block B can be withdrawn without being lifted further from the lower member A. In practice the preliminary lifting or easing of the block B from the lower member A is so slight as hardly to be noticeable. The opposed and coöperating holding-surfaces S S' may be made so narrow as to constitute merely a line of contact. Nevertheless their engagement is perfectly positive and amply suffices to hold the block B in place during all the manipulations of the shoe upon the last. If desired, the cam-surface S<sup>2</sup> may be located on one only of the two coöperating devices, as in Fig. 4, or, as illustrated in Fig. 5, when the button C is substantially cylindrical throughout its entire height and the holding-surface S is at and near the upper edge of the button C, with the coacting holding-surface S' near the bottom of the socket E. In this case I have shown a cam-surface S<sup>2</sup> as formed by beveling or countersinking the lip of the socket E, or, as shown in Fig. 6, the coöperating holding-surfaces S S' may be located at or near the middle portion both of the button C and socket E, and the cam-surface S<sup>2</sup> may be formed in two divisions, one on the block B at the lip of the socket E and the other on the top of the button C.

In all the illustrations shown and above described the button is located in the lower member A of the last and is shown as applied to a divided last of one well-known form. It is, however, obvious that my invention may be embodied in a divided last of other forms and one wherein the movable button is located in the block B and its coöperating socket in the lower member A.

The modes illustrated of forming a socket E which completely surrounds and covers the button I believe to be preferable. Nevertheless my invention does not require for its embodiment a complete socket. Any portion of the last A or block B which contains a holding-surface, such as S', to coöperate with a holding-surface, as S, on the button will serve as well as a socket, such as E. In all cases I consider it advisable to construct the holding-surfaces of the button and socket so that they are as nearly as is mechanically pos-



sible at right angles to the line of thrust of the block upon the last. This feature of perpendicularity may of course be modified within limits which vary with the conditions of use and with the character of the materials employed in the structure of the last and with the strength of the button-supporting spring, and if the holding-surfaces deviate from a mechanically-exact perpendicularity to the line of thrust they may do so safely so long as the cam action between the opposed surfaces is insufficient to overcome the spring supporting the button.

I claim—

1. A divided last comprising two last members provided respectively with a recess and a socket; a resilient button mounted in the recess in one of said last members and engaging, when projected, the socket provided in the other last member, the button and the socket being made with cooperating surfaces normal to the plane of the joint between the two members for positively holding said members against sliding apart, and a cam-surface being provided on one of said parts immediately contiguous to and forming a continuation of the holding-surface of that part for forcing the button from the socket under a slight separation of the two members followed by a relative sliding movement.

2. A divided last comprising two last members provided respectively with a recess and a socket; a resilient button mounted in the recess in one of said last members and engag-

ing, when projected, the socket provided in the other last member; the button and the socket being made with cooperating surfaces normal to the plane of the joint between the two members for positively holding said members against sliding apart, and said button being made with a cam-surface immediately contiguous to and forming a continuation of the holding-surface thereof for engaging the mouth of the socket and forcing the button out of the socket under a slight separation of the two members followed by a relative sliding movement.

3. A divided last comprising two last members provided respectively with a recess and a socket; a resilient button mounted in the recess in one of said last members and engaging when projected, the socket provided in the other last member; the button and the socket being made with cooperating surfaces normal to the plane of the joint between the two members for positively holding said members against sliding apart, and with cam-surfaces immediately contiguous to and forming continuations of said cooperating surfaces for forcing the button from the socket under a slight separation of the two members followed by a relative sliding movement.

Signed by me at Boston, Suffolk county, Massachusetts, this 9th day of January, 1903.

WALTER C. PORTER.

Witnesses:

ARTHUR F. RANDALL,  
FRANK S. HARTNELL.