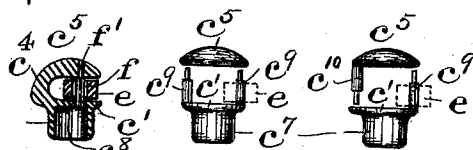
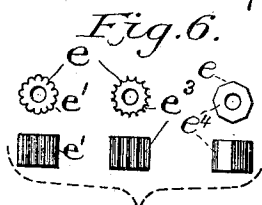
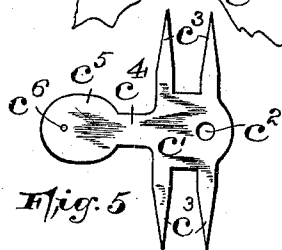
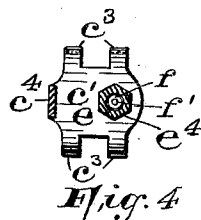
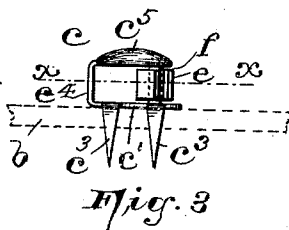
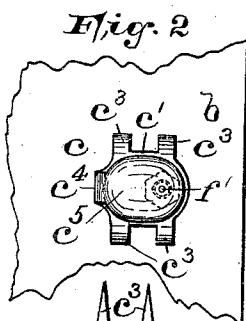
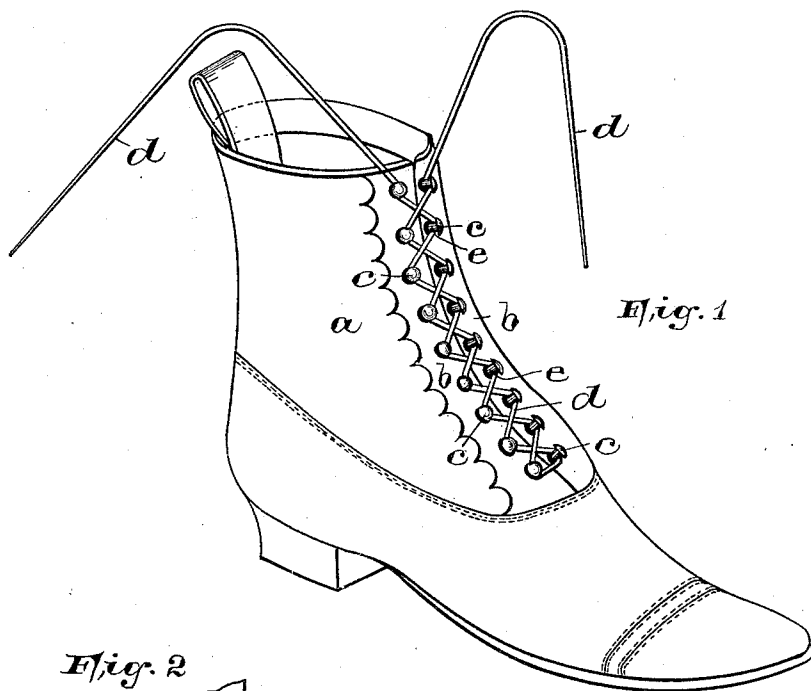


(No Model.)

G. TROXLER, Jr.
LACING STUD.

No. 466,811.

Patented Jan. 12, 1892.



WITNESSES: *Fig. 7.* *Fig. 8.* *Fig. 9.*

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UNITED STATES PATENT OFFICE.

GUSTAVUS TROXLER, JR., OF NEWARK, NEW JERSEY, ASSIGNOR OF ONE-HALF TO ISAAC L. SILVERBERG, OF SAME PLACE.

LACING-STUD.

SPECIFICATION forming part of Letters Patent No. 466,811, dated January 12, 1892.

Application filed July 30, 1891. Serial No. 401,167. (No model.)

To all whom it may concern:

Be it known that I, GUSTAVUS TROXLER, JR., a citizen of the United States, residing at Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Lacing-Studs; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

The present invention relates more especially to improvements in lacing-studs of that class provided with a forwardly-projecting head or face-plate.

The object of the invention is to provide a stud adapted to be secured near the meeting edges of the shoe-upper having a revolving pulley or sheave, and the lacing-cord so arranged that after the foot has been placed within the shoe it can be firmly laced by means of one pull on the ends of the lacing-cord, and the meeting edges of the shoe-upper thereby brought down the front of the foot.

The invention consists of certain arrangements and combinations of parts, as will be hereinafter more fully described, and finally embodied in the clauses of the claim.

In the accompanying sheet of drawings, in which similar letters of reference are employed to indicate corresponding parts in each of the several views, Figure 1 is a perspective view of a shoe provided with lacing-studs embodying my invention. Fig. 2 is a top view of one of the studs applied to the shoe-upper. Fig. 3 is a side view of the same, and Fig. 4 is a horizontal section taken on line x in said Fig. 3. Fig. 5 represents a blank of sheet metal from which the form of stud illustrated in Figs. 2, 3, and 4 has been struck up. In Fig. 6 are illustrated a number of pulleys or sheaves having angular or polygonal peripheral surfaces. Fig. 7 is a vertical section of a cast stud provided with a tubular post for attaching the stud to the shoe-upper and a vertical section of a pulley or sheave having an angular or polygonal peripheral surface arranged thereon, as shown. Figs. 8 and 9

are side elevations of modified forms of studs provided with differently-arranged posts for securing the parts together.

Referring to the drawings, a indicates the shoe-upper, and $b b$ the meeting edges adapted to come together down the front of the foot.

c indicates the lacing-studs, which are applied to each of said meeting edges, and d is a lacing-cord arranged in said studs, as will be clearly seen from Fig. 1. The lacing-studs may be of any shape, and may be provided with different kinds of means for attaching them to the shoe-upper, the different constructions shown herein serving to illustrate some of the various methods of carrying out the invention.

The stud illustrated in Figs. 2, 3, and 4 is struck up from a blank of sheet metal, (shown in Fig. 5,) which consists of a body portion c' , provided with a perforation or hole c^2 and oppositely-extending arms or prongs c^3 . From one end of the body portion c' projects a neck c^4 , in which is formed a head or face-plate c^5 , provided with a small hole c^6 . By means of the proper tools said blank is bent into the shape illustrated more especially in Fig. 3, and the downwardly-projecting prongs c^3 are forced through the material of the shoe-upper and firmly bent down upon the opposite side thereof. Before the parts of the stud are closed down a post or pin f , upon which rotates a pulley or sheave e , is inserted through the perforation c^2 in the body portion c' , and when the face-plate or head c^5 has been bent to project over and above the body portion, then the small end f' of the post is forced into said hole c^6 in the head, and the several parts are firmly riveted together. Of course the pulley or sheave e may be corrugated or fluted, as at e' and e^3 , but I prefer to use a pulley, the peripheral surface of which shall be angular or polygonal, a hexagon, or octagon, as at e^4 . It has been practically demonstrated by experiment made by myself that the polygonal form of pulley is better adapted for this use than a plain cylinder. Upon pulling on the ends of the cord I have found that when a cylindrical pulley is used, the cords slip and the pulleys will not rotate, caused by their small size, and hence the meeting edges cannot be properly pulled to-

gether; but in using a pulley of a polygonal outline this difficulty has been successfully overcome, and the pulleys are at all times caused to rotate, owing to the contact of the cords with the rough surfaces of the pulleys, and thereby preventing the slipping, and hence the meeting edges of the shoe-upper can be closely brought together.

In Fig. 7 is illustrated a slightly-modified form of stud, which is made from cast metal, being provided with a tubular shank c^7 , closed at the top c^8 , as will be seen from said figure. Said closed top c^8 is provided with a hole, in which the pin or post f is inserted, my novel form of pulley or sheave being arranged thereon, and the other end of said pin or post being secured in a perforation in the head or face-plate, as will be understood from said figure.

Fig. 8 is a view of a stud struck up from sheet metal, in which the body portion of the stud is provided with two posts c^9 , and to which a separately-formed head or face-plate can be secured.

Fig. 9 is still another modified form of construction in which the body portion has but one post c^9 , and the separately-formed head or face-plate is provided with a post c^{10} . The ends of these posts can be riveted in holes formed, respectively, in the said body portion, and the said head or face-plate and the parts comprising the stud can be firmly riveted together, as will be evident. Both of these last two forms of studs are provided with my improved form of rollers or pulleys, as indicated in dotted outline in said figures.

When the meeting edges of the shoe-upper have been spread apart, the foot can readily be placed in the shoe, and by pulling on the

ends of the lacing-cord all the pulleys in the studs are operated at one time, bringing the meeting edges of the shoe-upper together, and the ends of the cord can be secured at the top of the shoe. By releasing said ends of the cord the shoe can be removed from the foot by simply withdrawing the latter from between the meeting edges, as will be evident.

Having thus described my invention, what I claim is—

1. The herein-described lacing-stud, provided with means of attachment to the edges of the shoe-opening, comprising therein a base and head connected by a curved neck and having bearings for a roller or pulley, and a pulley mounted on an axis concentrically in said bearings and having an angular or polygonal peripheral surface, all constructed and adapted to operate substantially as described.

2. The herein-described lacing-stud, consisting, essentially, of a body portion c' , provided with means for attaching the same to the meeting edges of the shoe-upper, a neck c^4 , and a laterally-projecting and upwardly-curved head c^5 , a pin connecting said head with the plate c' , and a pulley concentrically pivoted and adapted to revolve freely on said pin and having an angular or polygonal peripheral surface concentric with the central hole, substantially as and for the purposes set forth.

In testimony that I claim the invention set forth above I have hereunto set my hand this 29th day of July, 1891.

GUSTAVUS TROXLER, JR.

Witnesses:

ISAAC L. SILVERBERG,
FREDK. C. FRAENTZEL.