C. J. LAUDERBACH.

Suspender Socket.

No. 201,428. Patented March 19, 1878.

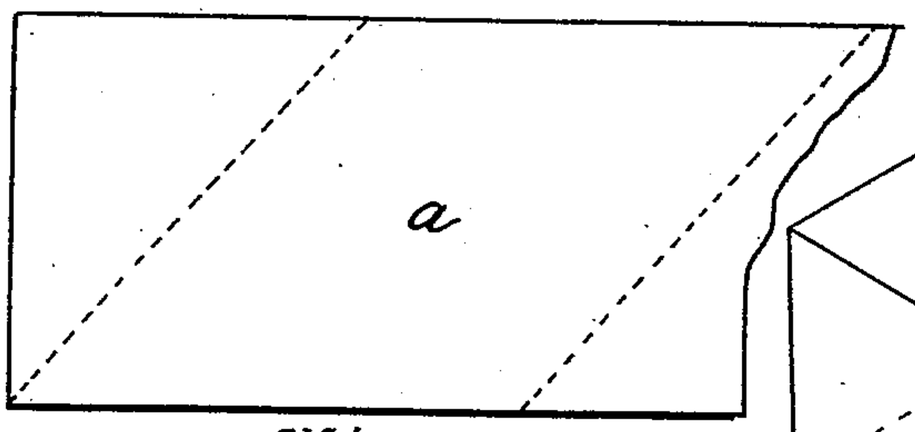


FIG. 1.

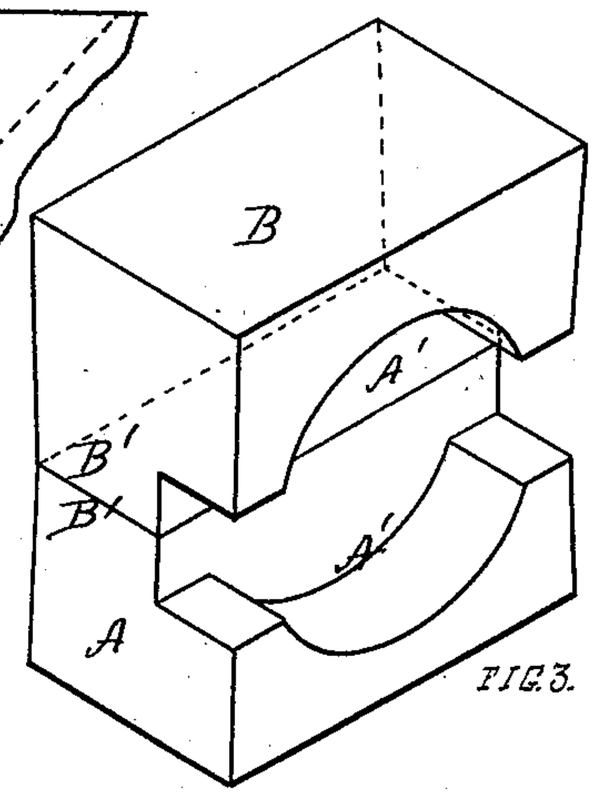


FIG. 3.

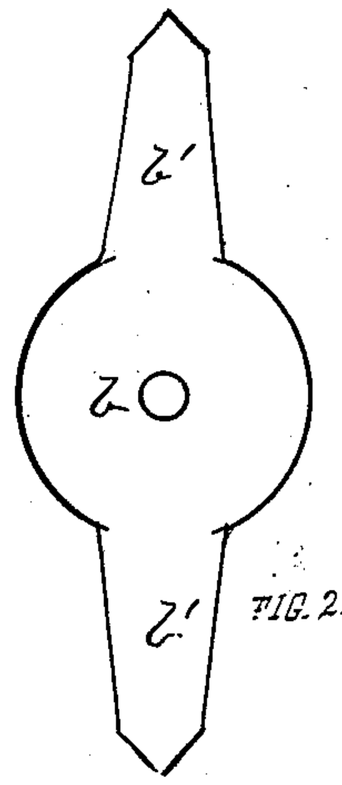


FIG. 2.

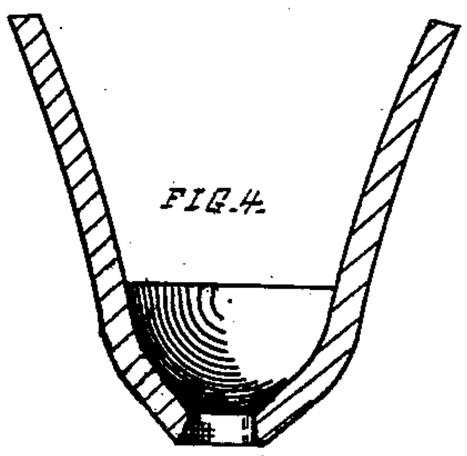


FIG. 4.

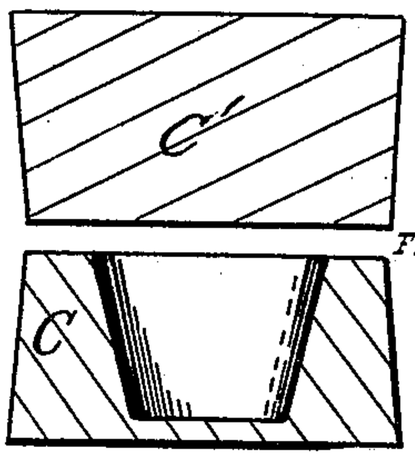
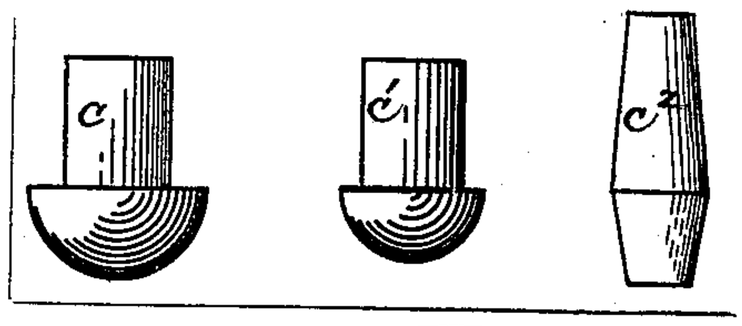


FIG. 5.



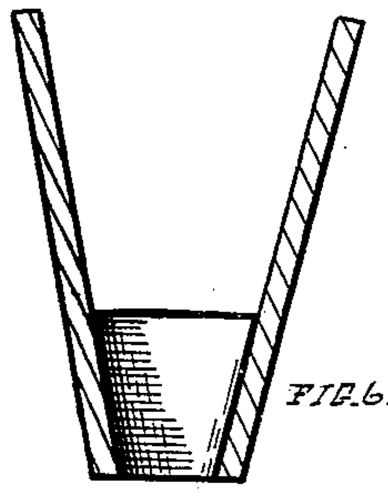


FIG. 6.

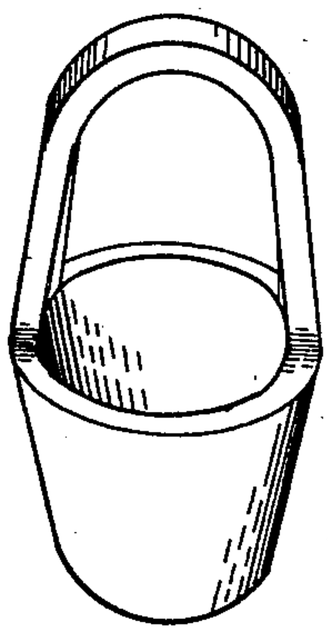


FIG. 8

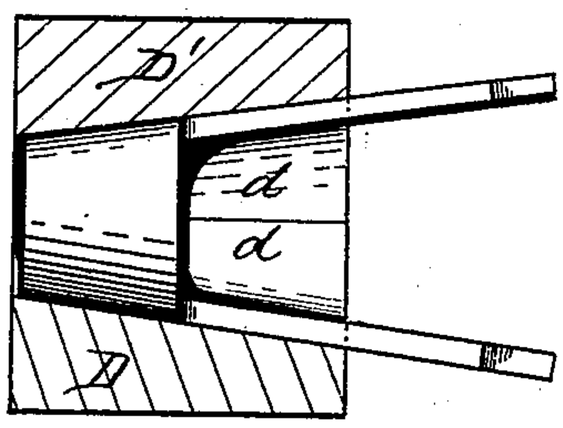


FIG. 7.

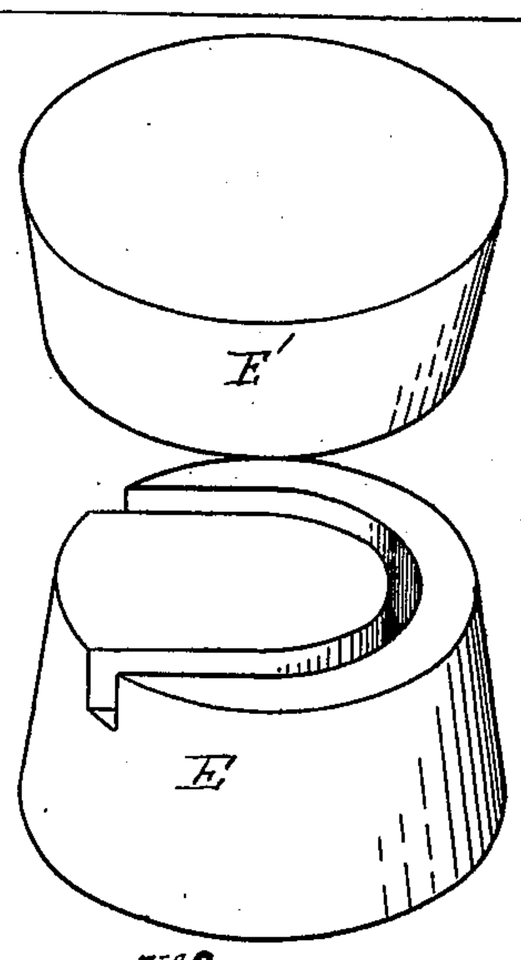


FIG. 9.

Witnesses.

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UNITED STATES PATENT OFFICE.

CHARLES J. LAUDERBACH, OF ALLEGHENY, PENNSYLVANIA, ASSIGNOR TO HIMSELF AND ROBERT C. ALBREE.

IMPROVEMENT IN SUSPENDER-SOCKETS.

Specification forming part of Letters Patent No. **201,428**, dated March 19, 1878; application filed January 29, 1878.

To all whom it may concern:

Be it known that I, CHARLES J. LAUDERBACH, of Allegheny, in the county of Allegheny and State of Pennsylvania, have invented new and useful Improvements in the Manufacture of Suspender-Sockets; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 represents a plate of metal, the dotted lines indicating the preferred manner of cutting the preliminary blank therefrom. Fig. 2 represents the initial form, given to the blank either by cutting or swaging, preferably by swaging. Fig. 3 represents anvil and hammer dies, which are suitable to form initial blank, Fig. 2, by swaging. Fig. 4 is a sectional view of the initial blank, Fig. 2, after it has been cupped. Fig. 5 is a view of dies and drifts or formers adapted to the cupping of the initial blank. Fig. 6 represents the article just before completion, the general form having been given to the socket. Fig. 7 is a sectional view of dies adapted to give the general form to the socket. Fig. 8 represents the completed article, and Fig. 9 dies adapted to the welding of the arms of the blank to form the suspension loop or bail.

Like letters refer to like parts wherever they occur.

My invention relates to rope or suspender sockets especially adapted to wire ropes, such as are used in the construction of suspension-bridges and for other purposes; and it also relates to the method of manufacturing such sockets.

It consists, first, in a rope-socket of the class specified, having the fiber of the metal in the socket between the arms of the bail transversely arranged with relation to the line of strain, and the fiber of the metal in the loop or bail parallel to the line of strain, so that the tension on the eye and bursting-strain exerted in the socket are the better resisted, whereby a stronger and more desirable suspender-socket is obtained; secondly, in manufacturing suspender-sockets by first cutting out or swaging up an initial blank or form having a body or center, and wings or arms, wherein the fiber of the metal is longitudinally arranged; secondly, cupping the body or center of the blank to form a socket; and, finally, bending and welding the arms to form a loop or bail, whereby a suspender-socket having the fiber in the loop or bail parallel to the line of strain and the fiber concentric in the socket is obtained.

The method now practiced in the manufacture of this class of sockets is as follows: A rod or bar of proper diameter and suitable length is heated and split centrally and longitudinally for, say, half its length, to form two arms. The unsplit or solid portion is then punched centrally or in the line of the fiber, and is subsequently spread and swaged to form the socket, the arms first formed being finally bent and welded together to form the suspension loop or bail. The frequent heatings and great labor involved render the manufacture very expensive, and in the socket produced the fiber of the socket runs parallel to the line of strain, so that the socket is very frequently split or burst open by the strain put on it at the time of testing. The maximum strain that is now required in a contract for such articles is about fifteen tons.

The object of my invention is to reduce the labor and cost of manufacture, and at the same time supply a stronger and more desirable article; and I have thus far succeeded in producing an article which stood a strain of seventy-one and one-half tons, at which point the rope broke.

I will now proceed to describe my invention, so that others skilled in the art to which it appertains may apply the same.

In carrying out my invention, I first obtain an initial blank or form similar to what is shown in Fig. 2 of the drawings. This may be sheared or punched from a plate of proper thickness, if desired; but, in order to avoid loss of material or waste, I prefer to form it as follows:

A plate or bar of suitable thickness and width is cut diagonally into diamond-shaped pieces *a*. These sections, after being properly heated, are submitted to the hammer, by

which the arms b' of the initial blank are drawn out and the body b rounded or swaged up.

For the purposes of this operation, I prefer dies, such as are shown in Fig. 3, in which A represents the anvil-die, and B the hammer-die, both formed with concavities A′, which, taken together, correspond to the general form to be given to the initial blank b, and each having a flat surface, B′, which can be used for drawing the arms b' of the blank, and for straightening the blank in case it buckles.

The diamond-shaped section, having been heated, is submitted to the dies A B, being first held on edge in cavity A′, with the acute angles projecting, and, after it has received a blow or two, the arms b are drawn out on the smooth surfaces B′, the buckle, if any occurs, taken out, and its final shape assured by inserting it in the die-cavity A′ for a final blow.

Either before, at the time of shaping, or subsequently, a central opening is preferably formed in the body of the initial blank; but this step is not absolutely required.

Having obtained the initial blank b b' by either of the methods specified, I next proceed to cut the same, preferably using for the purpose dies and mandrels, formers, or drifts similar to those shown in Fig. 5—that is to say, an anvil or bed die, C, having a cupped or tapered central cavity of a somewhat greater internal diameter than the external diameter of the finished socket, a plain hammer-face or die, C′, and a series of mandrels, formers, or drifts, c c^1 c^2, &c., which gradually diminish in size and change in form, as shown. The initial blank b b', having been properly heated, is laid upon the anvil C with its body b over the cupped cavity. The largest drift or former c is then held upon it, and the stroke of the hammer gives a slight cup to the blank. Another and smaller former, c^1, is then employed, and after that a third and fourth, if required, until the blank is properly cupped, as shown in Fig. 4. The cupped blank is then reheated, and should be submitted to dies D D′, Fig. 7, whose cavities d d form the frustum of a cone with internal diameters somewhat less than the diameters of the cavity in die C, and more nearly the form of the finished socket, though said cavity is usually somewhat longer than the finished socket. These dies draw in the arms b' and finish up the socket proper, leaving the article in substantially the condition illustrated in Fig. 6, after which the arms b' may be bent together and welded to form the suspension loop or bail.

For welding the eye or loop, I prefer to use dies like those shown in Fig. 9, the anvil or bottom die E having the U-shaped recess to receive the bent and lapped arms b' of the socket, and the top die or hammer-die E′ having a plain surface or hammer-face.

The foregoing description gives fully, step by step, the best method of working and the best instrumentalities for carrying out my process; but it will be evident to the skillful mechanic that certain steps only are essential, while others are simply desirable, as, for instance, the initial blank, Fig. 2, as a starting-point is necessary, as well as the subsequent cupping of the body and welding of the arms b' to form the loop or bail; but this blank can be punched or sheared, if desired.

The diamond-shaped preliminary blank, Fig. 1, and the subsequent swaging of the same into the form of the initial blank, Fig. 2, though not an essential method of procedure, is highly advantageous and desirable, as it avoids waste of material, leaves the ends of the arms scarfed or in the proper shape to complete the loop by lap-welding, reduces the amount of labor, and simplifies the machinery required to carry out the process.

The advantages of my invention are the greater strength of the article produced and the reduced labor and cost of manufacture.

Having thus described my invention, I claim and desire to secure by Letters Patent—

1. The suspender-socket herein described, wherein the fiber of the metal in that portion of the socket between the arms of the loop is transversely arranged with relation to the axis of the socket, and the fiber of the metal in the loop or bail is parallel to the axis of the socket or line of draft, substantially as specified.

2. The method herein described for forming suspender-sockets, by first forming an initial blank having body and arms, substantially as shown; secondly, cupping the body of the initial blank to form the socket; and, finally, bending and welding the arms to form the bail or loop of the socket, substantially as specified.

In testimony whereof I, the said CHARLES J. LAUDERBACH, have hereunto set my hand.

CHARLES J. LAUDERBACH.

Witnesses:

F. W. RITTER, Jr.,

JAMES I. KAY.