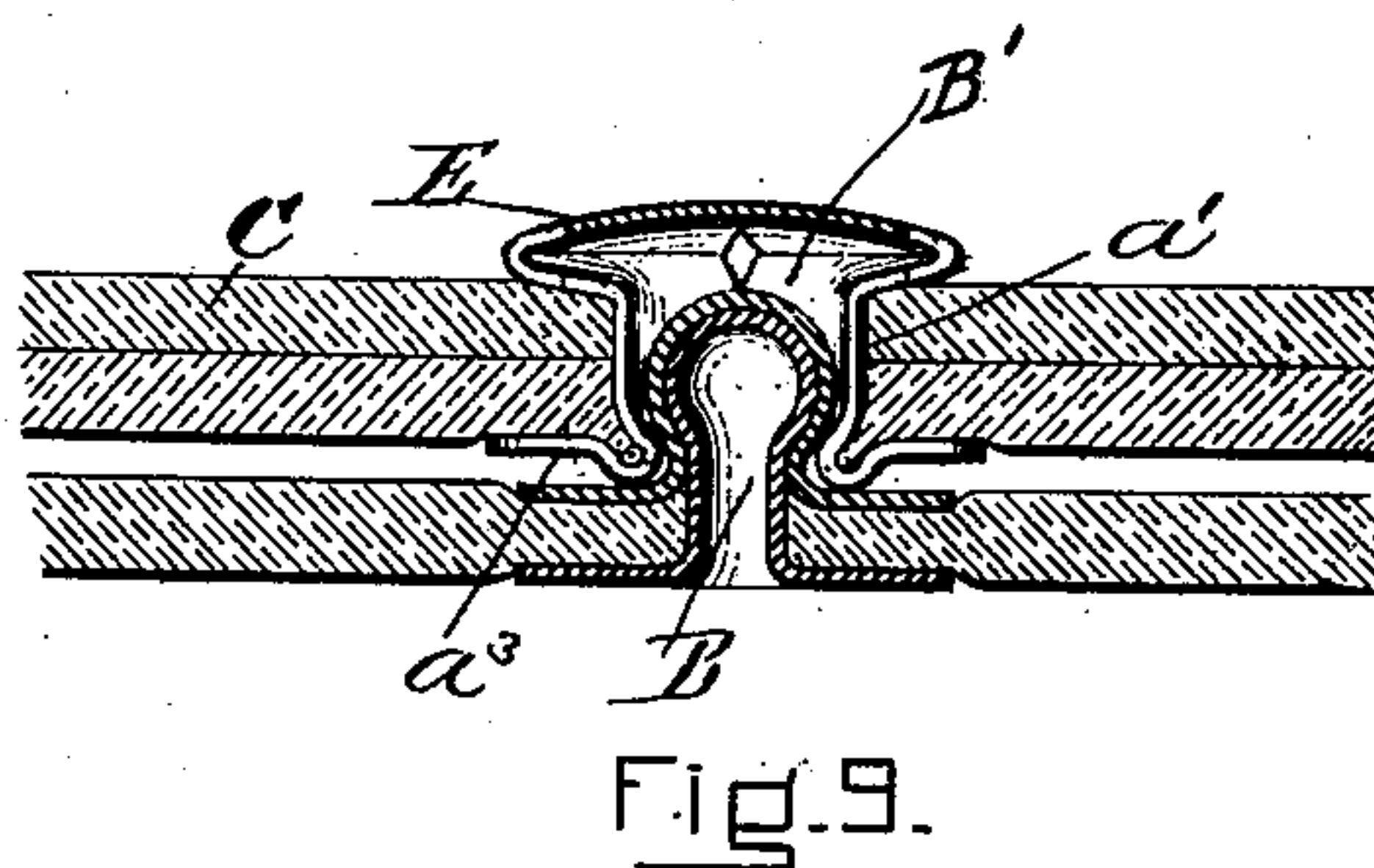
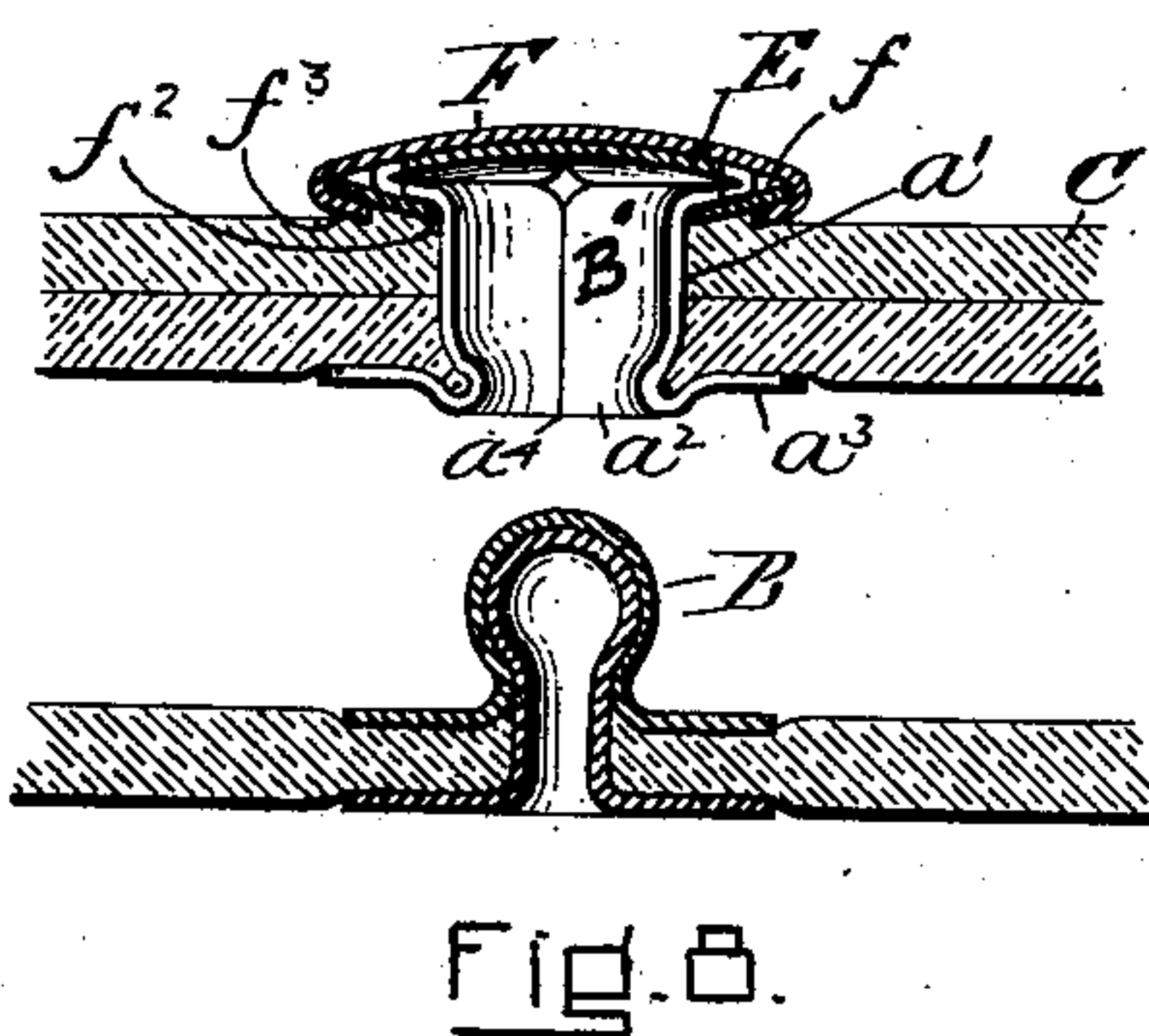
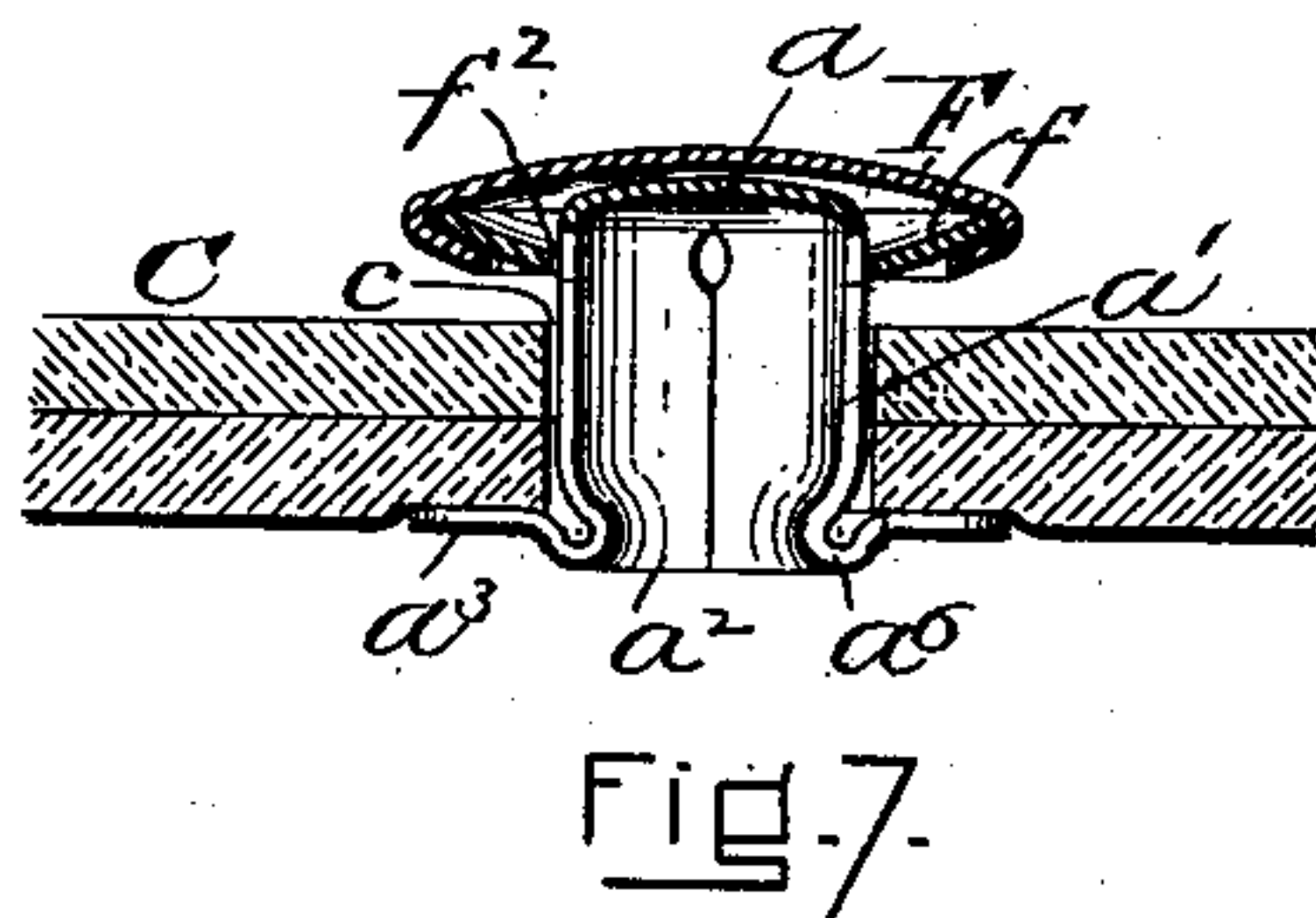
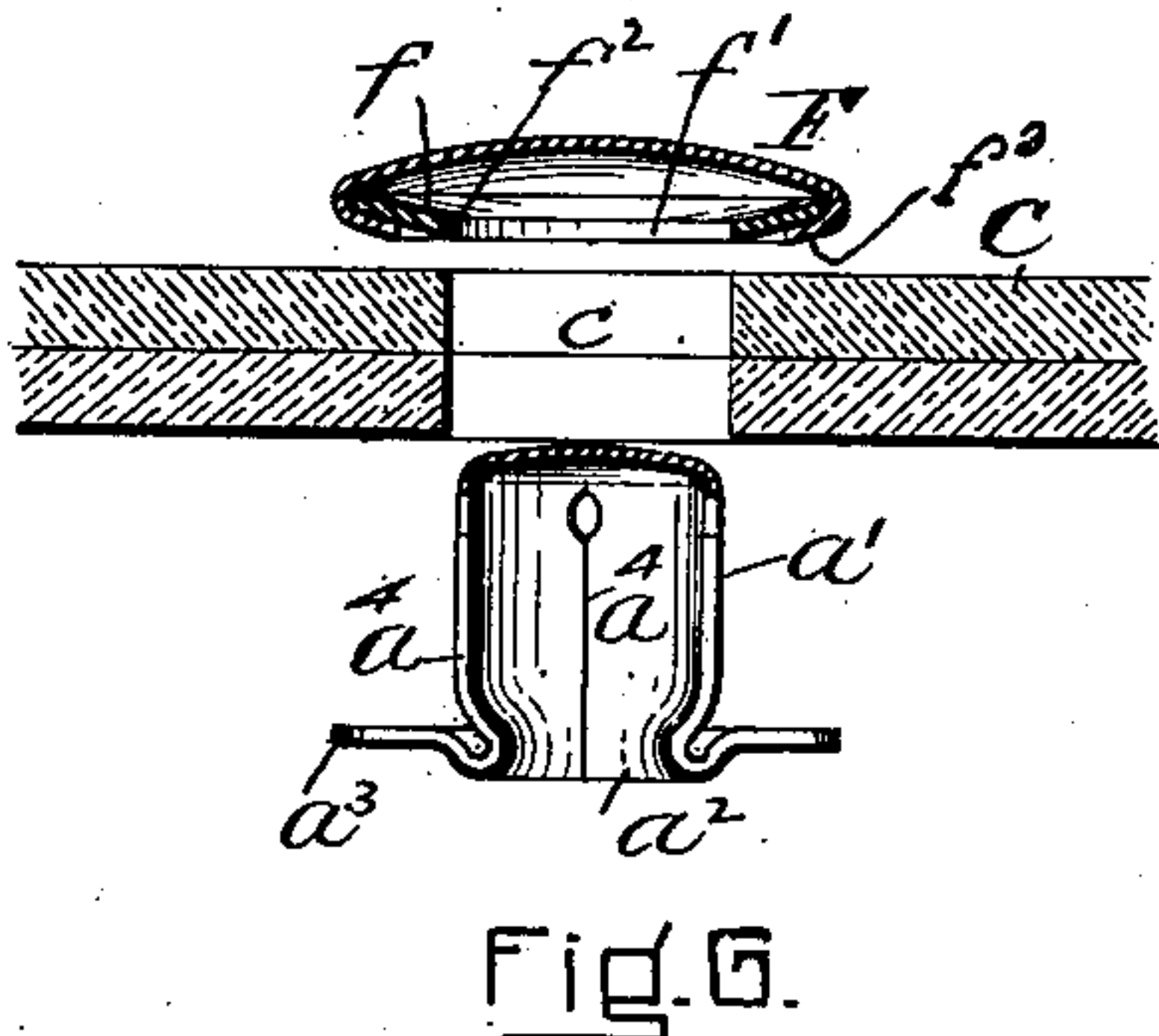
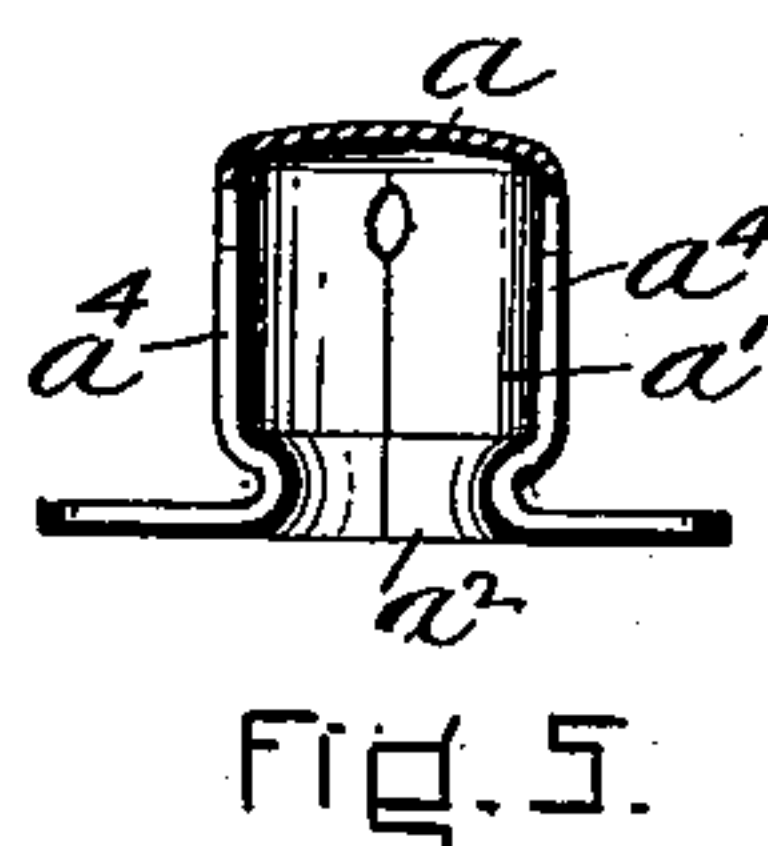
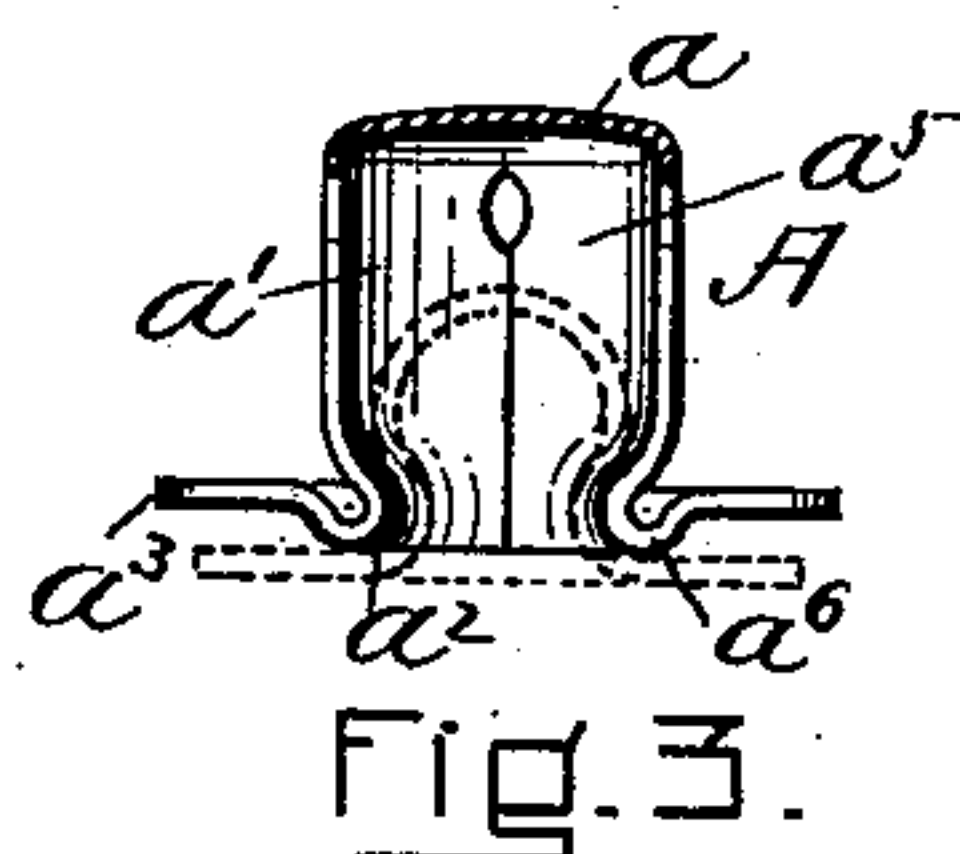
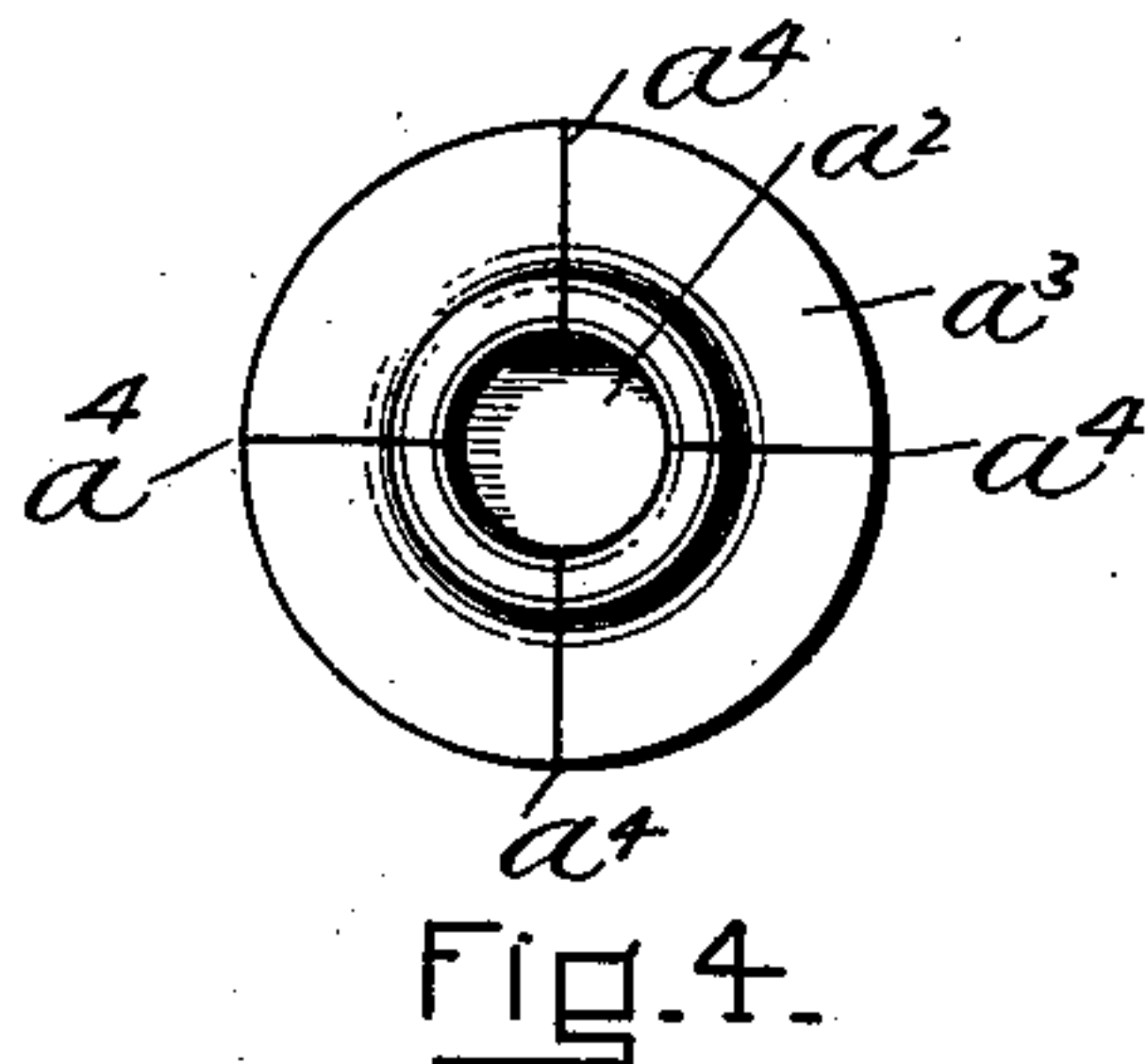
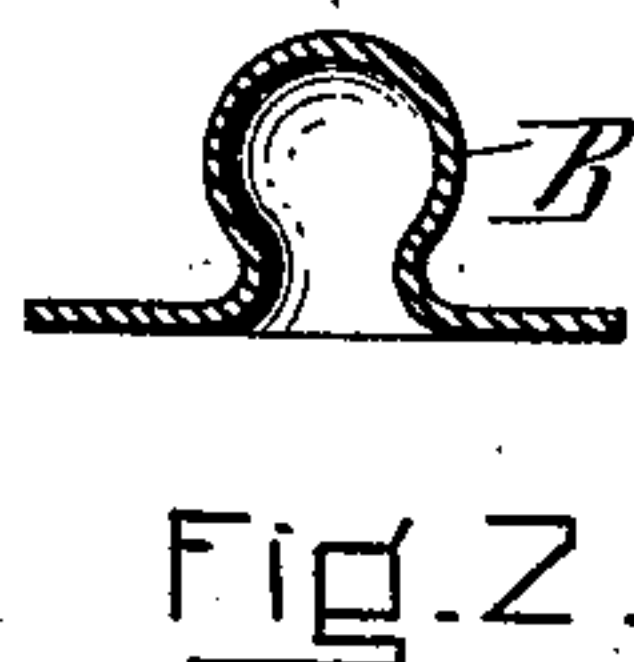
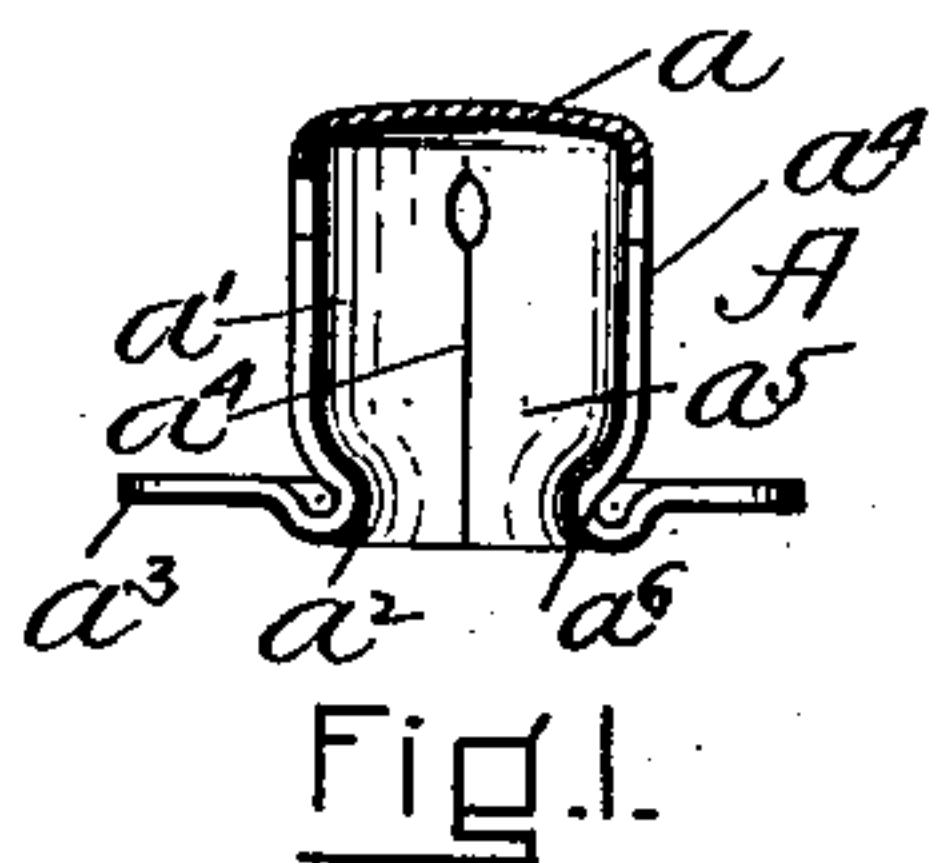


No. 756,184.

PATENTED MAR. 29, 1904.

W. S. RICHARDSON.
FASTENER SOCKET MEMBER.
APPLICATION FILED MAY 11, 1901.

NO MODEL.



WITNESSES:

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FASTENER SOCKET MEMBER.

SPECIFICATION forming part of Letters Patent No. 756,184, dated March 29, 1904.

Application filed May 11, 1901. Serial No. 59,724. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM S. RICHARDSON, a citizen of the United States, and a resident of Boston, in the county of Suffolk and State of Massachusetts, have invented a new and useful Improvement in Fastener Socket Members, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification, in explaining its nature.

The invention is an improvement upon that described in my Patent No. 605,833, dated June 14, 1898. The said patent describes a socket-piece and a socket member, which is the set-socket piece. The socket-piece of said patent consists of a tubular structure the inner end of which is closed, the outer end of which has a flange, and the sides and flange of which are separated by divisions or slits, so that a yielding entrance to the cavity of the socket is provided, and means for the transformation of the sides of the tubular structure in the setting of the socket-piece to a socket member is obtained, whereby a fastening-flange is then developed and an enlargement of the ball-holding cavity. The diameter of the cavity of the socket-piece immediately within the yielding entrance was slightly smaller than the diameter of the ball member which the set-socket received. The yielding socket-entrance of the socket-piece was of the same diameter, and I have found by large use and sale of these socket-pieces that it is successful for most requirements. There is, however, a use for which it is not as consistently successful, and that is in conjunction with thick firm stock—like, for instance, two or three thicknesses of thick buckskin. To understand a possible limitation under this condition of use, it should be borne in mind that to receive the socket-piece and permit of its setting into a socket member and its attachment it is necessary to first form a hole through the material. This hole ought to be of a size but slightly larger than the tubular part of

the socket-piece, which is thrust into it until its flange bears against one surface thereof, and for the reason that the flanges of the set-socket should extend sufficiently far upon each side of the material from the hole to provide a firm heading or riveting of the socket to the material. Now if the hole be in unyielding material, like thick leather, and of considerable height the tubular wall will be so restricted by it that in the act of setting, while a fastening-flange will be formed, the cavity or chamber immediately within the socket-entrance may not be sufficiently enlarged or flared outward from the socket-entrance to provide space enough for the ball. Consequently the socket-piece of the patented form cannot invariably be satisfactorily set into a desirable socket under these conditions. To overcome this defect in setting, I have changed the shape of the socket-piece in the following manner—that is, I have retained the same diameter of socket-entrance and have enlarged the diameter of the chamber immediately above the socket-entrance to a size slightly greater in diameter than the diameter of the ball member and so that the ball member would pass the socket-entrance of the socket-piece and be contained in the chamber of the socket-piece and the socket-entrance close upon the neck thereof before the socket-piece is transformed by setting into a socket member. This provides a socket-piece which possesses all the advantages of the socket-piece of the patent, besides the additional advantages that the length of hole in the material into which the tubular part of the socket-piece is put, the firmness or lack of firmness of such material, and the bore of the hole in the material will not singly or together exert any unfavorable effect upon the setting and attachment of the socket-piece whereby it becomes a socket member.

The diameter of the chamber of the improved socket immediately within the socket-entrance is not diminished by the setting of the socket-piece in any material. The por-

tion of the inner end of the socket-piece, which is converted into a fastening-flange, makes as effective a flange, if not a more effective flange, than that of the patented socket member, and a desirable union and coöperation between the socket-piece and the material is obtained, because the material may be provided with a hole of the size of the tubular part of the socket-piece or even a little smaller than it if it is stretchy, as no allowance is necessary for a deflection or enlargement of the portion of the tube which is in the hole. It is not now necessary that there should be any enlargement of this part of the socket-piece, and the fastening-flange may be formed entirely beyond or without the hole in the material and so as to form a sharp corner between the tubular part of the socket and the outwardly-extending arms, which form the fastening-flange. The tight fitting of the tubular section of the piece in the material secures a valuable reinforcing effect by the material of the spring-arms of the socket. The sharp outward bend of the flange provides a holding-grip which a more tapering flange does not have. To facilitate the formation of this sharp flange, a washer of the size of the tubular part of the socket-piece may be used upon the socket-piece immediately against the surface of the material and the fastening-flange of the socket-piece formed upon it. A collet or inner flange of a cap serves the same purpose when its hole is made of the size of the socket-piece tube. This relation between washer or cap-flange or collet and socket-piece is not possible with the patented structure, because it is necessary that the hole in the washer, cap-flange, or cap-collet be so large as to permit the portion of the tubular section of the piece on the inner side to be extended outward to provide sufficient width in the ball-holding cavity to receive the ball. Therefore when the material or a washer, collet, or cap-flange serves to hold the tubular part of the socket-piece from enlargement in the material there is a socket member which has a preformed, separable, or slitted flange surrounding a yielding socket-entrance and tubular extension from the socket-entrance somewhat larger in diameter than the socket-entrance, which is not changed in shape from the same portion of the socket-piece and which extends through the material and has the fastening-flange formed entirely on the outside of the material rather than partly in the material and partly out of it, as with the patented socket. These differences in shape of socket-piece, union, and combination of the material while not radical are very important, and their value is not confined to the certainty of result in setting under the conditions which I have named, as some of the improvements which they accomplish will also affect the socket member for whatever use or to whatever pur-

pose it may be put. Among these I would name an increased power or quickness of action of the yielding socket produced, demonstrating that the improved structure has a quickness and strength of resiliency or snap and holding power under all conditions which seem to be in excess of those provided by the patented socket member.

I will now describe the invention in connection with the drawings, wherein—

Figure 1 is a view in vertical section of a socket-piece. Fig. 2 is a view in vertical section of a ball member. Fig. 3 is a view representing the unset socket-piece and ball in dotted outline associated together. Fig. 4 is a view in plan of the socket-piece. Fig. 5 is a view in section representing a slight modification in the form of the socket-piece. Fig. 6 is a view representing the perforated material, socket-piece, and cap immediately before they have been combined or set. Fig. 7 represents them as further associated, but still not united. Fig. 8 represents them as united or set and also shows the ball member as secured to material, but separate from the socket member; and Fig. 9 represents the said socket member without washer or cap and also as in engagement with the ball member.

Referring to the drawings, A represents the socket-piece. a is its inner end; a' , its tubular portion.

a^2 is the yielding socket-entrance.

a^3 is the preformed, separable, or slitted flange surrounding the socket-entrance.

a^4 represents the lines of division of the tubular structure, socket-entrance, and preformed flange, which, in effect, divide them into a number of separate parts or arms.

The socket-entrance a^2 is of the diameter of the patented socket-piece and is of a diameter somewhat smaller than that of the ball member B. The tubular portion a' of the piece is larger in diameter than the corresponding part of my patented piece and enough larger to permit the ball B after it has passed the socket-entrance a^2 to enter the chamber a^5 immediately within the socket-entrance and to rest there unrestrained and so that the yielding socket-entrance may entirely close about its neck and not be in any way retarded in its closing action by the presence of the ball in the chamber a^5 . The socket-entrance a^2 may extend directly into the flange a^3 , as represented in Fig. 5, or it may be rounded downwardly into the flange a^3 , as represented in Fig. 1, in which event it provides the wall or shoulder a^6 for use with the setting-die referred to in my said patent. The socket-piece thus formed is then converted into a socket member B' in the following way:

The material C is provided with the hole c , which is preferably of the size of the tubular section a' of the socket-piece or somewhat smaller than it. The socket-piece is then "threaded," as it is called—that is, its tubular

section is placed or forced into the hole c in the material until its preformed flange a^3 comes in contact with one surface thereof. This will leave extending beyond the other surface of the material the portion of the socket-piece which upon the application of pressure to both ends of the socket-piece is transformed into a head E with outwardly-extending folded arms or flange to bear directly upon the surface of the material or upon an interposed washer or collet and form and fasten or rivet the socket to the material. (See Figs. 9 and 8.) Material of sufficient firmness or rigidity will on account of this quality and because the unset fastener snugly fits the hole in it serve to prevent the spreading of the sides of the socket within the hole and so that the fastening-flange will be formed by outwardly-extending arms, which are formed from the portions of the sides which extend beyond the surface of the material. (See Fig. 9.) This effect can also be obtained by employing a washer, cap, flange, or collet (see Fig. 8) having a hole of about the size of the barrel of the socket-piece above or within which the sides of the barrel providing the fastening-flange are formed, the washer, cap, flange, or collet (see Fig. 8) serving to prevent the separation of the sides of the barrel below or without it, and thus preserving or assisting to preserve the origin and shape of the part of the socket-piece not employed in forming the fastening-flange. This will produce generally a sharper flange, because the fold will more nearly approach a right angle on account of the restraint upon the sides caused by the material or the edge of the washer, cap, flange, or collet, (see Fig. 8,) and will thus form a fastening-flange which is stiffer and stronger than where the angle of the fold with respect to the barrel is less pronounced.

It should be understood that this invention is an improvement upon that shown and described in my Patent No. 605,833.

In Figs. 6, 7, and 8 F represents a cap, f its collet having a hole f' of the size of the tubular section of the piece or socket and having an inner edge f^2 . The flange f^3 of the cap extends around the outer edge of the collet, and the collet serves by its edges f^2 to hold or prevent the spreading of the sides or arms of the tube at that point, while said edge f^2 acts as a corner in defining the sharp bend of the flange, and thus causes a very rigid fastening-flange to be established upon its inner surface or within the cavity of the cap, the socket member then acting, of course, to attach the cap to the material as well as itself.

It will be seen that the socket member B' , so far as the preformed flange, the socket-entrance, and the ball-holding chamber within the socket-entrance go are of the same shape and dimensions as the same parts of the unset socket-piece.

Many of the advantages of the invention

have been already mentioned. I would say that a slight saving in metal is made in that I have found that a socket-piece having a somewhat shorter tubular section can be employed for the same purposes. There is also a certainty about the heading of the socket-piece due, I think, to the employment of a smaller hole in the material and the use of a smaller hole in the collet.

The size of the hole c for receiving the socket-piece may vary according to the nature of the material, its thickness, and the use of the fastener. For thick relatively unyielding stock it is generally desirable that the piece should fit the hole. In thinner fabrics the hole may be somewhat smaller than the piece and in quite thin or yielding material the hole may be considerably smaller than the piece. Perhaps, as a rule, (not an unvarying one, however,) the hole in the material should be such as to cause the material to hug and reinforce the tubular part of the socket-piece while it is being set and to hug, reinforce, and intensify the spring action of the member after it is set.

Having thus fully described my invention, I claim and desire to secure by Letters Patent of the United States—

1. The socket-piece herein described and from which a socket member is formed in the act of setting it to material, the same having a yielding socket-entrance, a yielding tubular enlargement slitted substantially its entire length above the socket-entrance, the portion of which adjacent to the socket-entrance forms a complete part of the ball-holding chamber of the socket-piece, and a portion of which beyond said part of said ball-holding chamber is adapted to be formed into a head or flange in the act of setting the socket-piece and a preformed slitted flange extending outward from the socket-entrance.

2. A socket-piece having a yielding socket-entrance of a diameter less than that of the ball member, a yielding tubular enlargement within said socket-entrance, having a chamber of a size to receive the ball before the socket-piece is set and permit the closing of the socket-entrance about the neck of the ball and also having a portion adapted to be formed into a fastening-flange in the act of setting, and a preformed, slitted flange surrounding the socket-entrance and having a wall or shoulder between its outer edge and the socket-entrance.

3. A socket member of a fastener having a yielding socket-entrance, an enlarged, yielding closed tubular section having arms extending from the socket-entrance and so formed in the socket-piece, a preformed, slitted flange surrounding the socket-entrance, and a fastening-flange formed by the end and a portion of the tubular section or side and comprising outwardly-folded arms extending from the end and the side of the socket member.

4. The combination with an unset socket-piece composed of a tubular section closed at one end and having a yielding restricted opening at the other end and a preformed flange
5 extending outward from said opening, of independent means embracing the closed end of said tubular section for causing a sharp corner or shoulder to be formed in such end of said section in the development of a folded fastening-flange.
10

5. The combination of a socket member having a preformed flange surrounding a resilient socket-entrance, a yielding tubular section of a larger diameter than the socket-entrance
15 extending from the socket-entrance and formed in the socket-piece, and a flange having a hole of about the diameter of the tubular section and the edge of which flange about said hole maintains the tubular shape of the
20 section below it and forms a sharp edge or shoulder over which the fastening-flange of the socket member is formed by extensions of its sides.

6. The combination of a socket member having a preformed flange surrounding a yielding socket-entrance, and a yielding tubular section within said socket-entrance and of a diameter greater than that of the socket-entrance and formed in the socket-piece, with material having a hole formed therein of substantially the size of the tubular section, and a fastening-flange formed in setting the socket member and comprising arms of the sides of the tubular section folded outward over the surface of the material outside said hole and
35 whereby the shape of that portion of the socket member, which is within the material is not changed in shape during the setting action and a close fit between the said section and the material thus permitted.

WILLIAM S. RICHARDSON.

Witnesses:

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