

(No Model.)

G. T. WARWICK.
COMPOUND TUBE.

No. 574,184.

Patented Dec. 29, 1896.

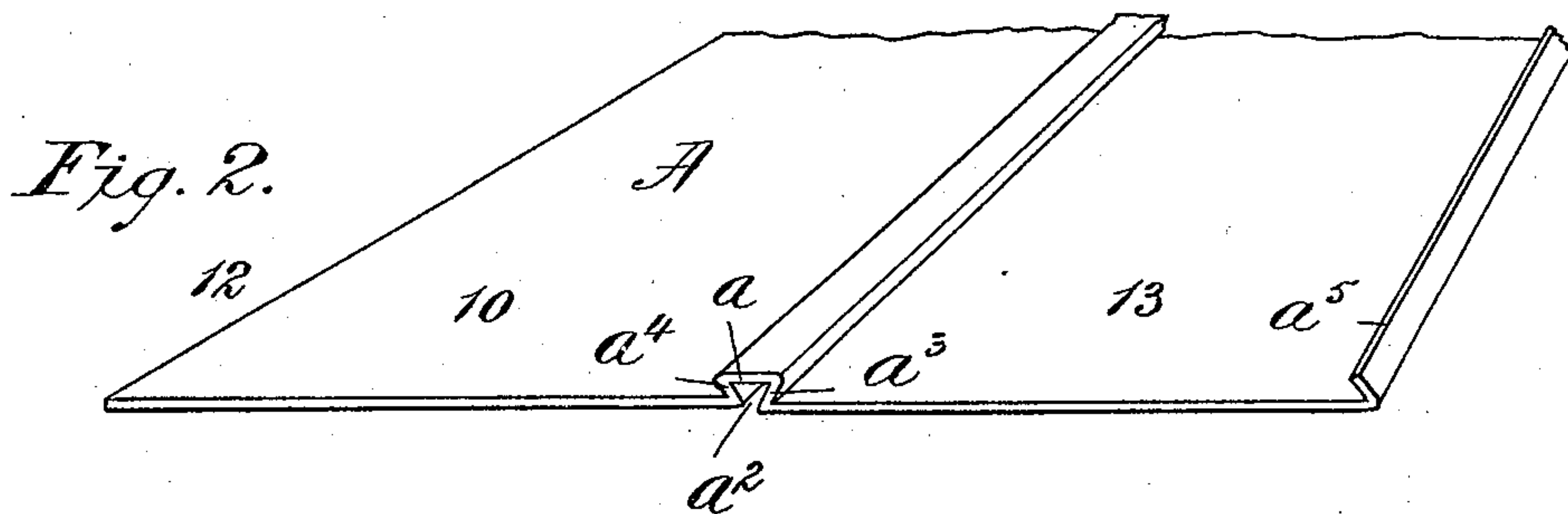
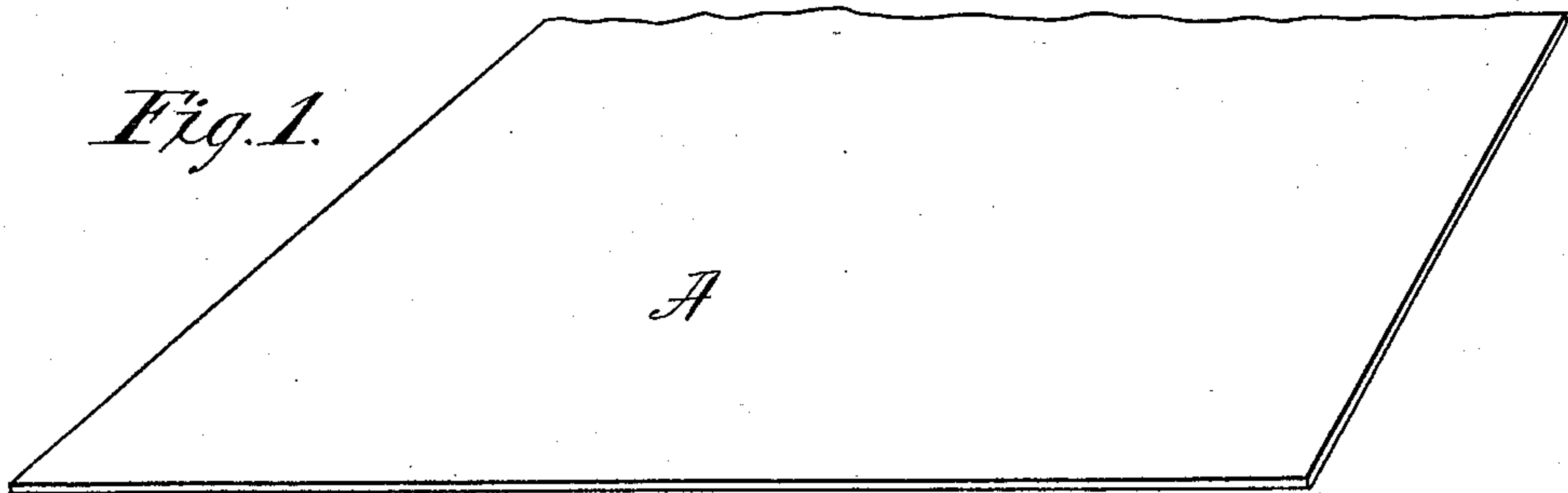


Fig. 3.

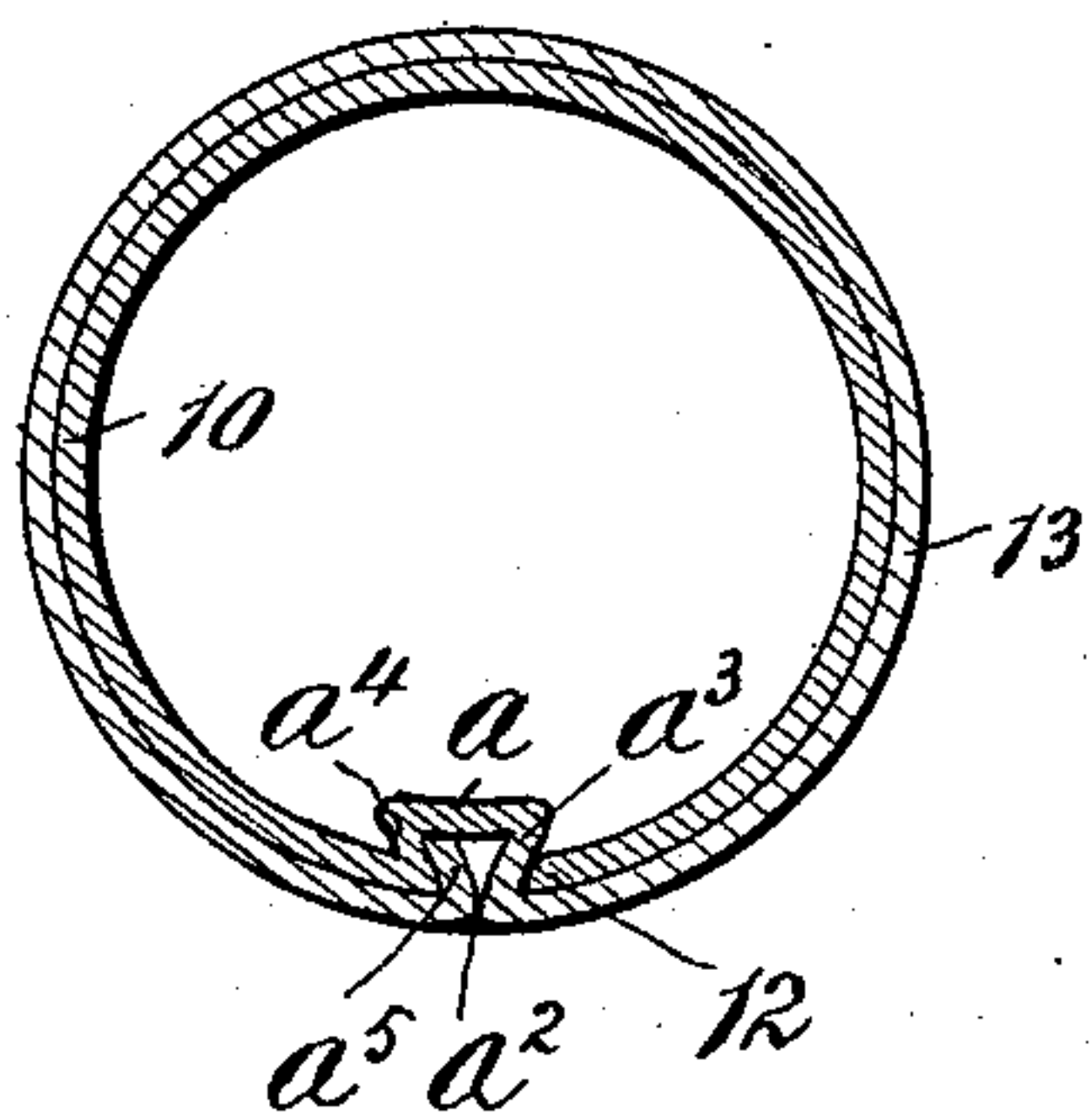
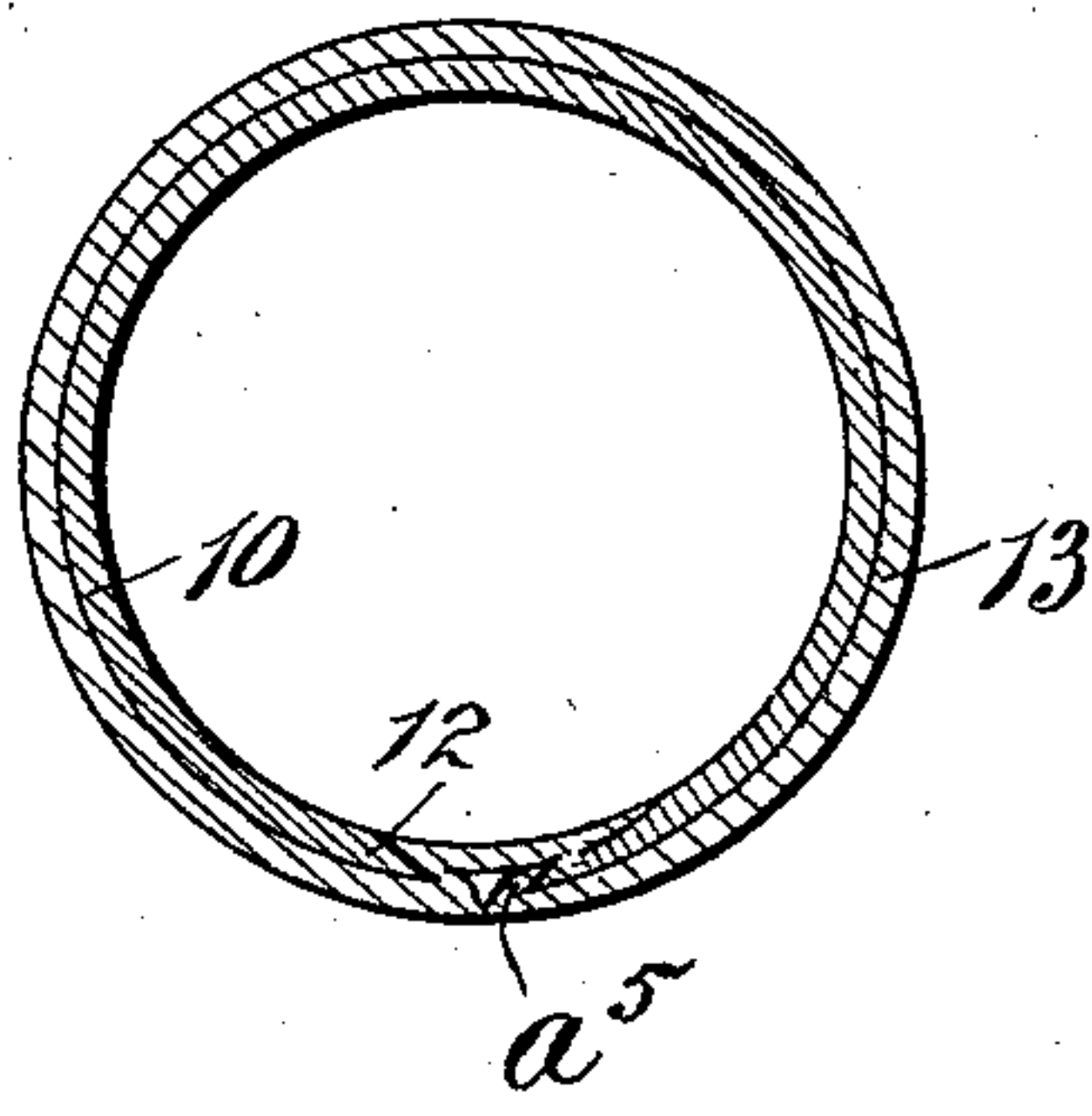


Fig. 4.



Witnesses.

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UNITED STATES PATENT OFFICE.

GEORGE T. WARWICK, OF NEWARK, NEW JERSEY.

COMPOUND TUBE.

SPECIFICATION forming part of Letters Patent No. 574,184, dated December 29, 1896.

Application filed March 25, 1896. Serial No. 584,756. (No model.)

To all whom it may concern:

Be it known that I, GEORGE T. WARWICK, a subject of the Queen of Great Britain, and a resident of Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Compound Tubing, of which the following is a specification.

This invention relates to improved tubing, especially steel and such as is extensively utilized in the manufacture of bicycle-frames and other similar structures where extreme lightness together with great strength and rigidity are requisites.

The class of tubing to which this invention particularly pertains is sometimes known as "compound reinforced" tubing.

The invention has for its object to produce a tube having a double wall, or formed "two-ply," all made from a single blank or strip of very thin sheet metal, the longitudinal seam or joint required being practically imperceptible and secure against becoming opened or weakened, and yet not necessitating brazing or welding; and to these ends the invention consists in a compound or double-wall tube made from a single strip of sheet metal, the same being bent longitudinally between its edges to produce a longitudinal channel, preferably of dovetail form in transverse contour, the metal to one side of the channel being bent around into tubular form and having its edge disposed against a side wall of the channel, while the metal to the other side of the channel is bent closely around the said tubular-formed part and has its edge portion introduced into and engaged within the said channel, and all substantially as will hereinafter fully appear, and be set forth in the claims.

The invention is fully and clearly illustrated in the accompanying drawings, in which—

Figure 1 is a representation in perspective of a blank, which may be of any required length, of sheet metal from which the improved tube may be made. Fig. 2 is a representation in perspective of the blank as formed preparatory to being bent to produce the tube. Fig. 3 is a cross-sectional view of the double-wall tube as made from the said blank. Fig. 4 is a cross-sectional view of the double-wall tube as it is preferably and finally

rendered, devoid of perceptible seam or shoulder, internally or externally.

In the drawings the blank or strip of sheet metal is represented by A and is of such a width that approximately two convolutions thereof as comprised in such width will produce the tube of the diameter required. The strip has produced therein a channel a by being bent longitudinally, the channel being preferably made like a dovetail, that is, with a contracted mouth at a^2 . It is also desirable to make one flank wall a^3 of the dovetail of slightly-greater extent or deeper than the opposite flank wall a^4 . One longitudinally-extending edge portion of the blank is bent up angularly, preferably hook-like, as seen at a^5 .

The portion 10 of the sheet-metal strip at one side of the channel, comprising slightly less than half the width thereof, is bent around into tubular form, with its edge 12 brought into proximity or contact with the flank wall a^3 of the channel. The other portion 13 of the strip, comprising, proximately, the half of the width of the latter, is bent around closely on the first tubularly-bent portion 10, the hooked edge a^5 being entered within the channel a .

Suitable implements and formers are of course employed in making up this tubing, and a mandrel or core-bar may be finally introduced, against which the edgewise portions in and adjacent the channel are evenly and effectually compressed, rendering the internal and external surfaces of the tube unbroken and devoid of perceptible seam, shoulder, or ridge and so firmly disposed and united not only at the interlocked and compressed seam, but also throughout the entire adjoined surfaces of the sheet metal, that a practically homogeneous tube is provided without the necessity of brazing or welding, the avoidance of which is a valuable and labor-saving result.

Sheet metal of very thin gage may be employed, the combined thickness of the two or more adjacent portions of which produce the finished tube, and a tube so formed, which in the completed product has, for instance, an 18 gage, or a thickness of wall so designated in the art, will be less liable to fracture and will withstand greater strains than a single-wall tube made in the ordinary way of 18-gage stock; and in the production of the tube of this invention, wherein the sheet metal is of

such extremely slight thickness, such metal may be formed with great facility and without any tendency to injury by a fracture or abrasion, as is not always true where heavy-
5 gage stock is bent sharply around to comparatively small cylindrical form.

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

1. A compound or double-wall tube made from a single strip of sheet metal, the same being bent longitudinally between its edges to produce a longitudinal channel, the metal to one side thereof being bent around into
15 tubular form and having its edge disposed adjacent the wall of the channel, while the metal to the other side of the channel is bent around the so-formed tube and has its edge portion introduced into and engaged within the said channel, substantially as described.

2. A compound or double-wall tube made from a single strip of sheet metal, the same being bent longitudinally between its edges to produce a longitudinal dovetail channel, the metal to one side thereof being bent
25 around into tubular form with its edge proximate to the flank at one side of the dovetail channel, while the sheet metal to the other side of the said channel is bent around on the so-formed tube and has its edge portion intro-
30 duced into and engaged within the said dovetail channel, substantially as described.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two witnesses.

GEO. T. WARWICK.

Witnesses:

T. H. DREYFUS,
A. SCHAEFFER.