

(No Model.)

G. T. WARWICK.
COMPOUND REINFORCED TUBING.

No. 569,261.

Patented Oct. 13, 1896.

Fig. 1.

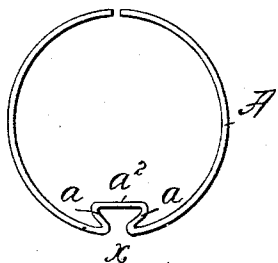


Fig. 2.

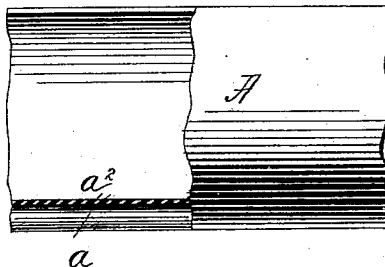


Fig. 3.

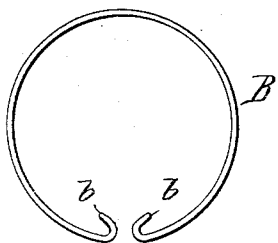


Fig. 4.

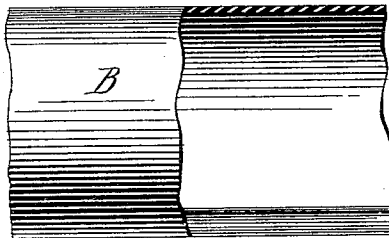


Fig. 5.

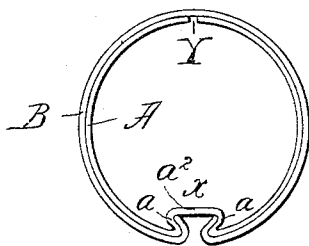


Fig. 6.

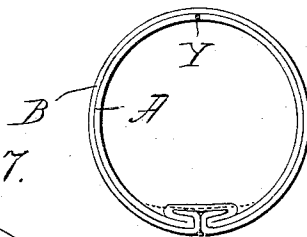
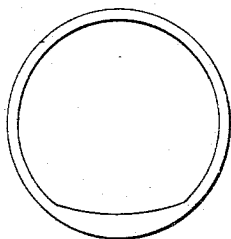


Fig. 7.



WITNESSES:

H M Bellows
M & Bellows

INVENTOR

Geo. T. Warwick,

BY

M. S. Bellows
ATTORNEY.

UNITED STATES PATENT OFFICE.

GEORGE T. WARWICK, OF NEWARK, NEW JERSEY.

COMPOUND REINFORCED TUBING.

SPECIFICATION forming part of Letters Patent No. 569,261, dated October 13, 1896.

Application filed January 24, 1896. Serial No. 576,692. (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 Reinforced Tubing, of which the following is a specification.

This invention relates to improvements in that class of tubing which is known as "compound reinforced metallic" tubing. This class of tubing enters largely into the construction of frames for cycles and other conveyances, and of other constructions where extreme lightness and great strength are both requisite. Heretofore, so far as known to me, this class of compound reinforced tubing has had a very prominent internal rib or longitudinal projection which has rendered difficult or impossible the placing telescopically and securing of the tube over another cylindrical or tubular part, as necessary in making joints and connections.

The object of this invention is to produce a two-part tube from light-gage stock with a peculiar reinforcing-seam which imparts the greatest strength where it is required, and wherein at such reinforcing-seam there is a flat, unshouldered, though thickened surface; and to this end the invention consists in two peculiarly-formed tubes, combined and united all substantially as will hereinafter fully appear, and be set forth in the claim.

Reference is to be had to the accompanying drawings, forming part of this specification, in which the invention is fully and clearly illustrated, and in which—

Figure 1 is a vertical cross-sectional view of the main inner tube-section. Fig. 2 is a partial side and partial longitudinal sectional view of said tube-section, the plane on which the section is taken being understood as vertically and diametrically of Fig. 1. Fig. 3 is a cross-sectional view of the outer or sheath tube section. Fig. 4 is a partial side and partial longitudinal sectional view of said outer tube-section, being vertically and diametrically of Fig. 3, indicating the plane on which the sectional portion of the view is taken. Fig. 5 is a cross-section of the two tubes combined. Fig. 6 is a cross-section of the finished compound reinforced tube. Fig. 7 is

an end view showing the general appearance of the completed tube.

In the drawings, A represents the inner tube-section, and B the outer tube-section, which, as a sheath, incloses the said tube-section A.

The tube-section A is produced from a sheet-steel strip or blank bent into tubular form, its edges being contiguous, and it has between the so contiguous edges, longitudinally extending, the reëntrant substantially dovetail formation seen at *x* and comprising the flanks *a a* and the span *a*². The sheath-section B is also produced from a sheet-steel strip of proper width and has its edge portions inwardly turned to constitute the internal longitudinal lips *b b* at either side of the longitudinal opening.

The tube-section B is telescoped closely over the section A, (or it may be wrapped or sprung about it,) whereupon the lips *b b* lie against the flank-walls *a a* of the reëntrant dovetail of the section A. Now by pressure properly applied—suitable implements being employed—the portions *a a* *a*² and *b b* of the two tubes are compressed most closely and firmly and in practice brazing is employed for uniting the two tubes for rendering solid the reinforcing-seam, and also preferably for uniting the concealed seam *Y* between the contiguous edge of tube A, which is opposite the reinforce-seam. At the time of the compression of the adjoined parts *a a*² *b* the inner surface of the tube becomes smooth and unshouldered and the external contour of the tube is as that of a cylinder, being smooth and unbroken, drawing, displacing, and compressing of the metal being possible and effective of this end.

It will be understood that the tubing having the structural characteristics described is susceptible of utilization for all the useful purposes of ordinary tubing. The inner wall of this tube may, as seen in the drawings, be in cross-section in substance slightly eccentric to the circle which corresponds to the contour of the outer wall of the tubing, as indicated in Fig. 7. Hence in the absence of a decided internal shoulder or rib in making a joint over another tubular or cylindrical piece no grooving or slotting becomes necessary, and a cross-section of the improved

tube will disclose in general aspect an appearance somewhat as indicated in said Fig. 7, the demarcation between the engaged sections or portions of the sheet metal at the seam or joint being imperceptible except on close scrutiny.

In the make-up of the compound tubing the tube-section A is usually of somewhat heavier gage than the sheath-section B. This, while preferable, is not essential. The gage of the compound tubing may be as light as any of the single tubes which are accepted for structural use in the manufacture of bicycle-frames and the like, while manifestly greatly-increased strength inures to the improved tubing described.

I claim—

In combination a tube-section A, formed from a sheet-metal blank by bending the

blank into tubular form and forming therein a reëntering dovetail between the seam, and a tube-section B, formed from a sheet-metal blank with its edges constituting the intumed lips, the latter section sheathing the first, and having its lips disposed upon the flanks of the said dovetail portion of the inclosed tube, the said so-disposed portions being compressed, leaving the inner wall of the tube unbroken and unshouldered, substantially as described.

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

GEO. T. WARWICK.

Witnesses:

E. F. MUNDY,
AMELIA SCHAEFFER.