

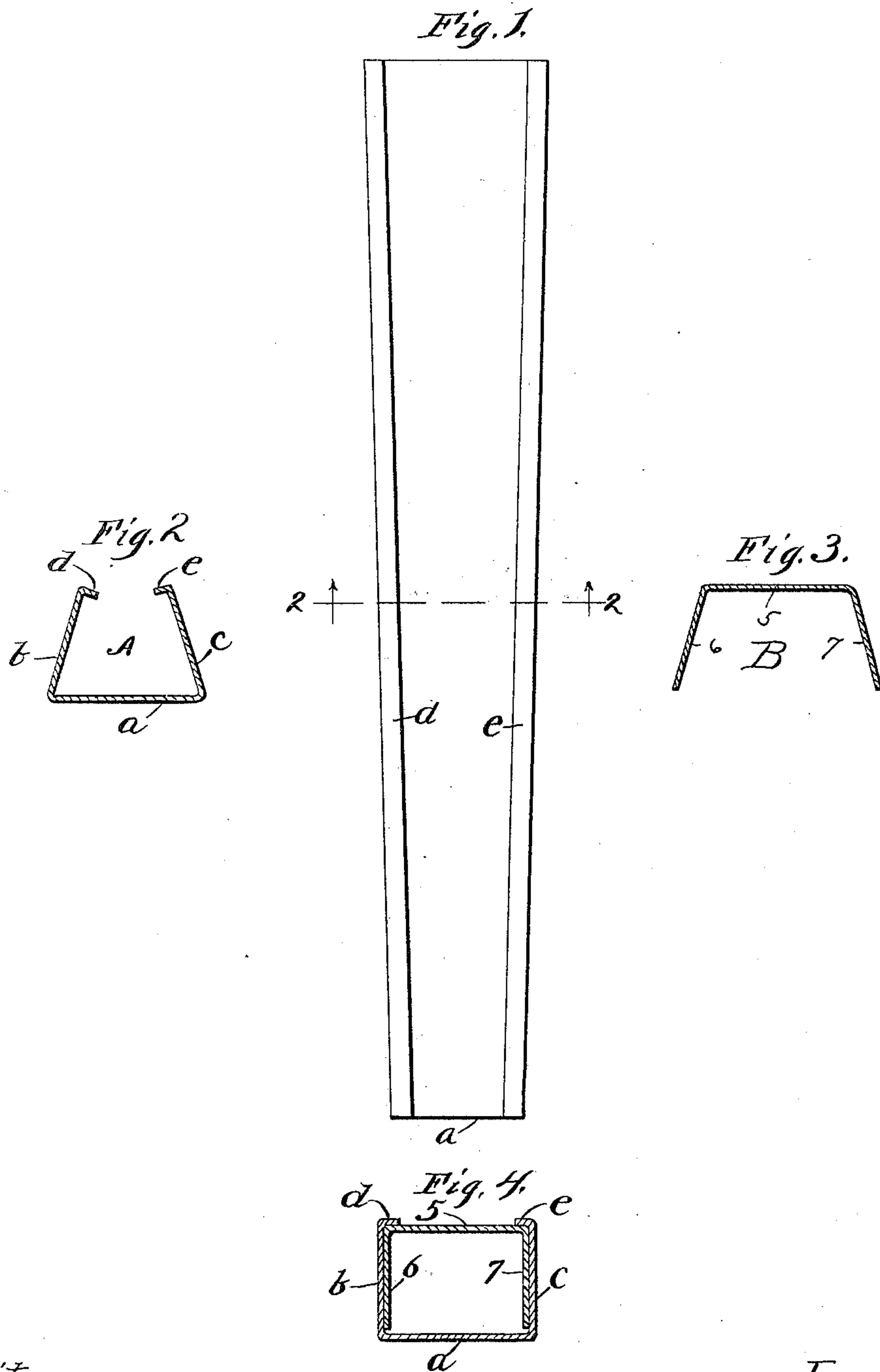
No. 686,816.

Patented Nov. 19, 1901.

J. MACPHAIL.  
TUBE.

(Application filed Feb. 17, 1900.)

(No Model.)



Witnesses:  
Dra E. Perry  
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# UNITED STATES PATENT OFFICE.

JAMES MACPHAIL, OF BLUE ISLAND, ILLINOIS.

## TUBE.

SPECIFICATION forming part of Letters Patent No. 686,816, dated November 19, 1901.

Application filed February 17, 1900. Serial No. 5,659. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES MACPHAIL, a citizen of the United States, residing at Blue Island, in the county of Cook and State of Illinois, have invented a new and useful Tube, of which the following is a specification.

This invention relates to tubes.

The object of the invention is to provide a tube of simple construction which is economical in manufacture and strong and durable in use.

The invention consists, substantially, in the construction, combination, location, and relative arrangement, all as will be more fully hereinafter set forth, as shown in the accompanying drawings, and finally pointed out in the appended claim.

Referring to the accompanying drawings, and to the various views and reference-signs appearing thereon, Figure 1 is a view in plan of one portion or section employed in the construction of a tube in accordance with my invention. Fig. 2 is a transverse section on the line 2 2, Fig. 2, looking in the direction of the arrows. Fig. 3 is a view similar to Fig. 2 of the cooperating portion or section of the tube. Fig. 4 is a similar view of the tube complete, the portions or sections being shown in assembled relation.

The same part is designated by the same reference-sign wherever it occurs.

In carrying out my invention I employ two sections or portions, designated generally in the drawings, respectively, by reference-signs A and B. These sections or portions of the tube may be of any suitable material, but preferably of sheet metal, and the said sections or portions may be made tapering in length, as clearly shown in Fig. 1. The section or portion A in the particular form shown, to which, however, the invention is not limited or restricted, comprises a web or base *a* and the sides *b c*, the latter terminating in flanges *d e*, respectively, the sides *b c* being deflected or bent toward each other from the base or web *a*, as clearly shown in Fig. 2, and the flanges *d e* being inwardly bent, as shown, thus forming a channel having a web or base and sides so inclined relative thereto as to form acute angles therewith. The section B is similarly formed into a channel having the base or web 5 and the sides 6 and 7. In the

case of section B, however, the sides 6 7 are bent or inclined outwardly or away from each other—that is, they form obtuse angles with reference to the base or web 5. The base or web 5 should correspond in transverse width to the transverse width of base or web *a*.

From the foregoing description it will be seen that the space inclosed by the web 5 and sides 6 7 of section B is of greater area than that inclosed by web *a* and sides *b c* of section A before said sections are assembled.

The assembling of the sections is effected by telescoping or forcing the section B endwise into section A, the sides 6 7 of section B projecting in an opposite direction to sides *b c* of section A, as clearly shown in Fig. 4, the flanges *d e* fitting over the edges of the base or web 5. In thus assembling the sections the sides *b c* of section A are forced outwardly by section B, and the sides 6 7 of section B are forced inwardly by section A, thereby forming a complete tube, which will be substantially rectangular in cross-section, as shown in Fig. 4, the resiliency of the material out of which the sections are made causing the embracing portions of the sections to efficiently hug each other, thereby forming an exceedingly strong and durable tube. It is evident that the flanges *d e* may be omitted; but they are preferable, for the reason that they serve to retain the engagement of the sections A B. It is also obvious, as above stated, that the sections may be tapering in length. This, however, is not a necessity, and this feature may be omitted without departure from the spirit and scope of my invention.

The sections A and B may be of any suitable or desirable length to produce a tube of the requisite longitudinal dimension, or, if desired, several sections of complete tubes constructed as above described may be assembled endwise by telescoping the end of one tube or section into the proximate end of the next adjacent tube or section, thus making up a tube of the desired length.

A tube constructed in accordance with the principles above set forth is of light weight, is strong and durable, is easily and cheaply constructed and assembled, and is adapted for use generally in the construction of framing or framework of all kinds, as beams,



braces, bars, columns, poles, and the like, or otherwise utilized.

Having now set forth the object and nature of my invention and a construction embody-  
5 ing the principles thereof, what I claim as new and useful and of my own invention, and desire to secure by Letters Patent of the United States, is—

As an article of manufacture, a tube com-  
10 posed of resilient sheet-metal sections, said sections being rectangularly channel-shaped in cross-section and assembled in inverted

and telescopic relation and adapted to hold fast to each other by the elastic opposing tension of their sides, as and for the purpose set forth. 15

In witness whereof I have hereunto set my hand, this 10th day of February, 1900, in the presence of the subscribing witnesses.

JAMES MACPHAIL.

Witnesses:

E. C. SEMPLE,  
S. E. DARBY.