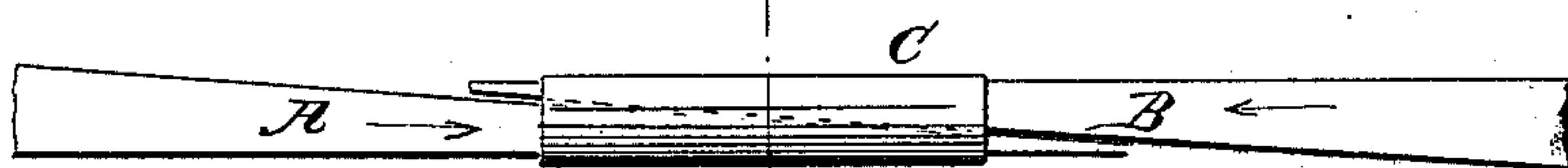


*T. B. Doolittle,*  
*Making Lamp Tubes.*  
*N<sup>o</sup> 80,464.      Patented July 28, 1868.*

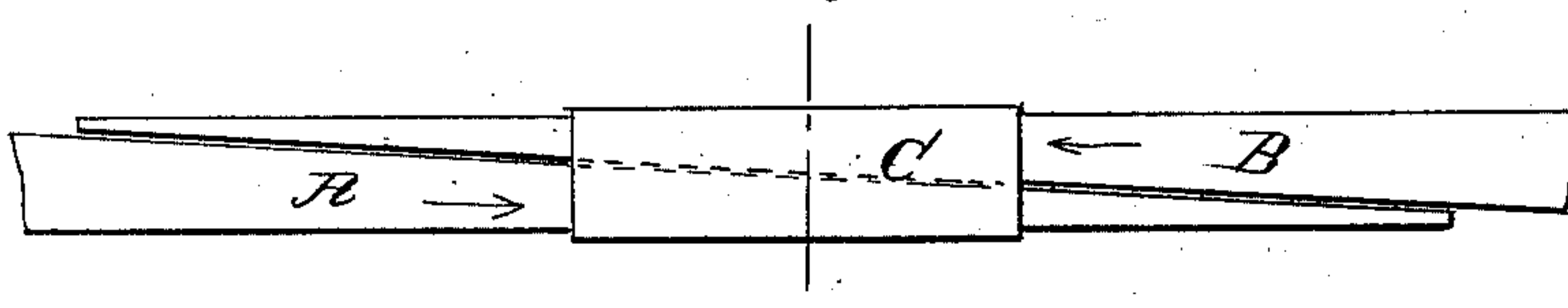
*Fig. 1*



*Fig. 2.*



*Fig. 3.*



*Fig. 4.*



*Witnesses:*  
*Charles H. Brown*  
*J. B. Beecher*

*Inventor*  
*T. B. Doolittle*  
*By Atty*  
*J. A. M. S. S. S. S.*

# United States Patent Office.

T. B. DOOLITTLE, OF BRIDGEPORT, CONNECTICUT, ASSIGNOR TO BRIDGEPORT BRASS COMPANY, OF SAME PLACE.

*Letters Patent No. 80,464, dated July 28, 1868.*

## IMPROVEMENT IN METHOD OF FORMING LAMP-TUBES.

The Schedule referred to in these Letters Patent and making part of the same.

### TO ALL WHOM IT MAY CONCERN:

Be it known that I, T. B. DOOLITTLE, of Bridgeport, of Fairfield county, in the State of Connecticut, have invented a certain new and useful "Improved Method of Forming Lamp-Tubes;" and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, making part of this application.

My invention relates to a new and useful improvement in the manufacture of flat lamp-tubes.

There are two modes or methods practised of producing this kind of lamp-tubes, one being that in which a strip of sheet metal is bent (round a flat mandrel) into the proper shape, having its edges overlapped or interlocked; this kind has a joint or seam where the edges are brought together.

In the other method of manufacture, a round seamless tube (which is "drawn-out" after the fashion of drawing cartridge-tubes) is flattened out into the required shape.

Previous to my invention this flattening out or transformation of the cylindrical tube into a seamless flat tube, has been effected, generally, by introducing a flat mandrel or former into the cylindrical tube, then placing tube and mandrel between the dies of a press, and, with a blow, flattening the tube down to the thickness of the mandrel; but, inasmuch as the mandrel can only be of a width equal to the diameter of the cylindrical tube, (before subjected to the operation performed by the flattening-dies,) it follows that the said mandrel does not fill the flattened tube, and therefore cannot act effectually as a core or former, to give perfect shape to the flattened tube.

Another device or means of flattening the cylindrical tube has been suggested, consisting in introducing into the tube two bars, which are afterward forced apart laterally, so as to stretch the tube into the required shape; but this method is objectionable, to a certain extent, (on account of the necessary complication of mechanism involved,) in the manufacture of plain flat tubes.

My invention has for its main objects a simple and effective means of stretching the cylindrical tube into a flat one, and consists in transforming the cylindrical tube into a flat one, of given width and thickness, by forcing into it (from opposite ends) wedge-shaped mandrels or formers, which distend or stretch the tube over their opposite exterior edges, as will be presently more fully explained.

To enable those skilled to make and use my invention, I will proceed to describe it more particularly, referring by letters to the accompanying drawing, in which—

Figure 1 is an elevation of a cylindrical tube (such as is used for the manufacture of flat lamp-tubes,) and a pair of forming or upsetting-arbors, such as I use.

Figure 2 is a cross-section of same at  $x x$ , fig. 1.

Figure 3 is an elevation, showing the tube flattened out by the stretcher-arbors, and

Figure 4 is a cross-section of same at  $y y$ .

At figs. 1 and 2, I have represented the wedge-shaped mandrels A B as just entered into the tube C, so as to touch on opposite points at  $e e$ , while at figs. 3 and 4, I have shown them as forced along until the tube has been spread or stretched out to the required size and shape.

Of course it will be understood that I propose to employ a suitable mechanism or machine for manipulating the arbors or stretching-wedges. They will be used practically in connection with an organized machine, in which the cylindrical tubes will be fed to them, transformed on them, and then automatically discharged from them; but this machinery will be made the subject-matter of another application for Letters Patent, and need not be shown or described in this application.

It will be seen that by introducing two wedge-shaped mandrels, A and B, into a cylindrical tube, C, (as seen at figs. 1 and 2,) with their oblique or inclined edges in contact, and forcing them along in the directions indicated by arrows, to the positions (relative to tube B) seen at figs. 3, 4, the said tube B will be effectually transformed into the desired shape, and this without any complication of parts, with great facility, and that the



finished flat tube will be perfect in shape and size; and it will be understood that it is not essential that both wedges, A and B, move together, and to the same extent, so long as they are brought into the proper relative position, and the tube is moved or held so as to be properly upset or transformed into the desired shape. The two wedges having a perfect bearing during the whole extent of the length of the tube, and sliding on each other, and sliding also within the tube, the upsetting is effected with great ease, accuracy, and smoothness.

It will be understood that the same mode of operation may be employed with wedge-shaped dies which are not of the precise shape in cross-section as those shown, to produce a differently-shaped lamp-tube, and that if deemed expedient, the spreading-mandrels may be so shaped as to produce a tube which will be a little narrower at one end than at the other, without departing from the gist of my invention, which rests in the idea of spreading and shaping the tube by means of the wedging-mandrels forced longitudinally into it, as explained.

Having fully described my invention, so that those skilled in the art can understand it, what I claim as new in the manufacture of flat tubes from cylindrical-tubes, (or those nearly so,) is—

Shaping or transforming the stock by means of wedging-mandrels forced longitudinally, in opposite directions, into the tube, to spread it laterally, and shape it, substantially as described.

T. B. DOOLITTLE. [L. s.]

Witnesses:

J. N. McINTIRE,  
CHAS. A. SCOTT.