J. BRADY.

Apparatus for Bending Tubes.

No. 204,527. Patented June 4, 1878.

*Fig. 1*

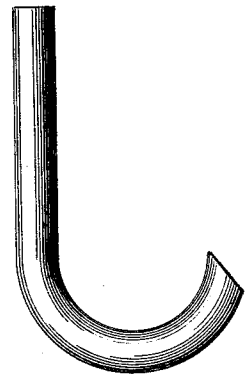


*Fig. 4.*

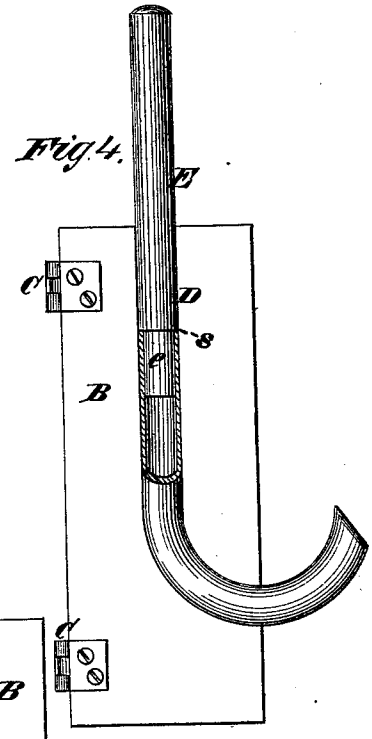



*Fig. 2.*

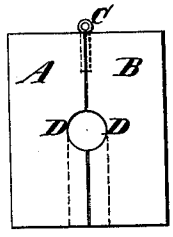
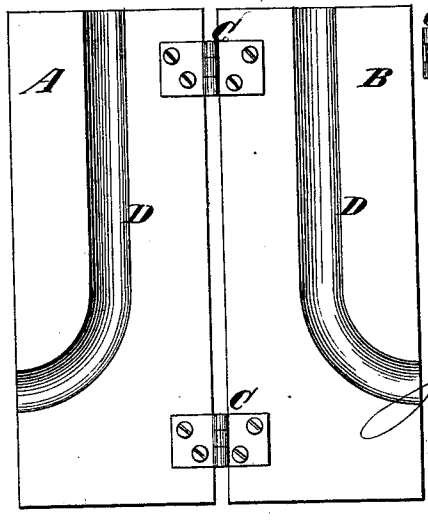



*Fig. 3.*




*Witnesses*

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# UNITED STATES PATENT OFFICE.

JAMES BRADY, OF BROOKLYN, NEW YORK.

## IMPROVEMENT IN APPARATUS FOR BENDING TUBES.

Specification forming part of Letters Patent No. **204,527**, dated June 4, 1878; application filed March 25, 1878.

*To all whom it may concern:*

Be it known that I, JAMES BRADY, of Brooklyn, in the county of Kings and State of New York, have invented an Improvement in Apparatus for Bending Tubes; and I hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawing, forming a part of this specification.

My invention has for its object the supply of convenient apparatus for bending tubes without the use of any core or filling, such as has heretofore been necessary to prevent the collapsing or crinkling of such tubes while bending.

The invention consists in the combination of a die having therein a bent channel of uniform cross-section throughout its extent, and a pusher having a portion fitted to enter a short distance into the end of the tube to be bent, and a shoulder, which abuts against the said end of the said tube, for pushing the said tube endwise into or through the said channel, the said part of said pusher which enters the tube insuring the square abutment of the said shoulder against the end of the tube in bending the said tube, as hereinafter described.

Figure 1 in the drawing represents a tube bent in my improved apparatus into the form required for a handle of an umbrella or walking-stick. The invention will be sufficiently illustrated by a description of it as applied to bending such a tube for an umbrella or walking stick. Fig. 2 in the drawing is an end view of a die which forms a part of the apparatus for bending such a tube, the two parts of the said die being closed together as when in use. Fig. 3 is a view of the said die with the two parts of which it is composed opened. Fig. 4 is a view of one of the parts of the said die disconnected from the other part, showing the tube and pusher placed in proper relation with each other and with the said die, as when used for bending the tube.

The die is composed of two parts, A and B, preferably, but not necessarily, hinged together as shown at C, in Fig. 4.

In the said die is formed a bent channel, D, of uniform cross-section throughout its extent, and of the form it is desired to give the tube after the same is bent.

E is a pusher, which is preferably made of a solid rod or bar. The principal part of the said pusher has a cross-section of the same size and shape as the cross-section of the bent channel D; but at the end which is applied to the tube in the process of bending a short portion is reduced in size sufficiently to fit the interior or the caliber of the tube. The said short portion of the pusher made to fit the interior of the tube is shown at *e* in Fig. 4.

At *s* is formed a shoulder on the said pusher, which, in use, abuts against the end of the tube, as shown in Fig. 4, the short portion of the pusher, which enters the tube in bending, serves to prevent the end of the tube from damage when pressure is applied to the pusher, as it insures the square abutment of the said pusher against the end of the tube.

The apparatus is used for bending a tube as follows: The tube to be bent is cut to the desired length, and one end thereof is inserted in the bent channel D of the die, when the two parts of the latter are closed, as shown in Fig. 2. The pusher is then applied to the said tube in such manner that the part *e* of the said pusher enters the end of the tube, as shown in Fig. 4, and the shoulder *s* abuts squarely against the end of the tube. Sufficient pressure is then applied to the pusher to force the tube into or through the bent channel.

The tube, when bent, is removed from the said channel by opening the die on the hinges C, which join the two parts of the same, when the shape of the said bent tube is such that it cannot otherwise be withdrawn without injuring its shape.

In all cases where the bent portion of the tube is such that the same may be withdrawn without injury to its shape, as is the case with a semicircle, the die may be made solid, instead of making it in parts hinged together as shown in the drawing.

I claim—

The combination of the die having therein a bent channel, D, the cross-section of which is of uniform size and shape throughout its extent, and a pusher, E, having the shoulder *s* formed thereon, and the part *e*, fitted to enter the end of the tube to be bent and secure the square abutment of the said shoulder against the end of the said tube, substantially as and for the purpose specified.

JAMES BRADY.

Witnesses:

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JOHN BECKER.