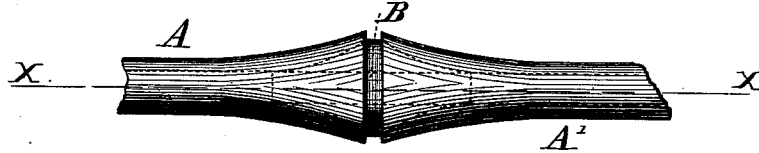


J. BRADLEY.  
Pipe-Coupling.

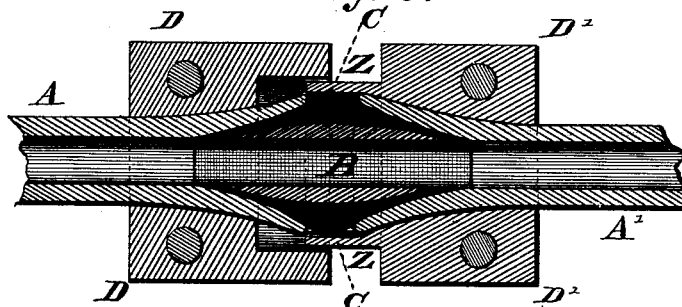
No. 220,910.

Patented Oct. 28, 1879.

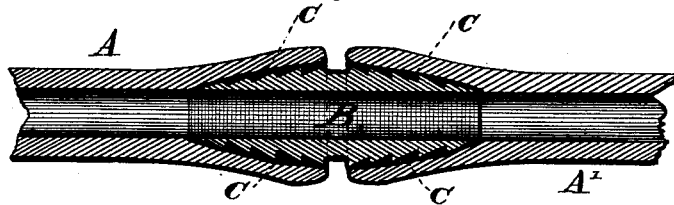
*Fig. 1.*



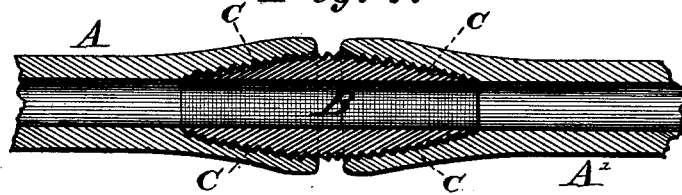
*Fig. 2.*



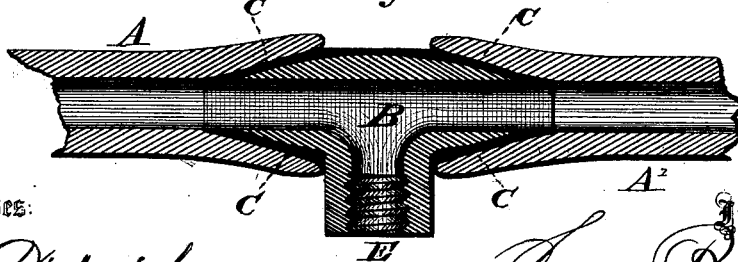
*Fig. 3.*



*Fig. 4.*



*Fig. 5.*



Witnesses:

*P. C. Distenich*

*Jno. A. Stockman*

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*Jerome Bradley*

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# UNITED STATES PATENT OFFICE

JEROME BRADLEY, OF PHILADELPHIA, PENNSYLVANIA.

## IMPROVEMENT IN PIPE-COUPPLINGS.

Specification forming part of Letters Patent No. **220,910**, dated October 28, 1879; application filed August 11, 1879.

*To all whom it may concern:*

Be it known that I, JEROME BRADLEY, of the city and county of Philadelphia, and State of Pennsylvania, have invented a new, useful, and Improved Pipe-Coupling; and I do hereby declare the following to be a sufficiently full, clear, and exact description thereof to enable others skilled in the art to make and use the said invention.

The object of this invention is to furnish a means of cheaply and promptly uniting tubes of ductile metal and inserting branches therein without requiring the services of a skilled workman or incurring risk of impairing the size and form or otherwise obstructing the bore or channel for fluid therein, and without diminishing the strength of the tube.

The nature of my invention consists in the use of a short tube, thimble, sleeve, or bushing having an alloy more fusible than itself attached to its surface, which, when heat and pressure both are applied, unites with the metal of the tubes and forms expeditiously a cheap, reliable, certain, and strong attachment, with a clear and full channel-way or bore.

I will now proceed to describe the mode of making and using this invention, referring in so doing to the drawings annexed and the letters of reference marked thereon.

Figure 1 shows an elevation, and Fig. 2 shows a longitudinal section in the plane indicated by the line *x x* in the first figure. Figs. 3, 4, and 5 show modifications of the same invention in longitudinal sections, the last with a branch connection.

The same letters of reference apply to like parts in the several figures.

A and A' represent the metallic pipes to be united; B, a bushing made of metal less fusible than an alloy applied to its outer surface, and susceptible of uniting by heat or pressure, or both, with the material of the pipes A and A'. The metallic alloy is indicated by the black portion marked C. The bushing B is tapered, and has annular grooves with intervening ridges formed in it, the grooves or spaces being filled with a metallic alloy or solder cast therein, and the bushing B is equal to that of the tubes to be united.

In applying this invention I expand the ends of the pipes A and A' to such dimensions and forms as to admit the introduction of the bushing or short tube B, and preferably cause them to fit closely thereon. Next I apply clamps D and D', embracing the expanded portion of the pipes A and A'. Upon the clean surface of the bushing B and inside surfaces of the tubes A and A', I prefer to apply a coating of rosin, or chloride of zinc, or sal-ammoniac, or other chemical agent adapted to the properties of the metal of the tube and alloy coating of the bushing, to prevent or remove oxidation and to act as a flux, although this is not absolutely essential.

The clamps D and D' may be made with a clear space, *y*, between them, as shown in Fig. 2, or with one part, *z*, cylindrical, so that it shall telescope into the other, and thus hold and retain without waste any portion of the alloy that might by unnecessary heat be wasted. Next I draw the parts together, and, applying heat by a torch or blow-pipe, or other means, fuse the alloy and unite the pipes A and A' with the bushing B.

The bushing B, in Fig. 5, has formed in it a branch attachment, E, by means of which branches may be connected with the pipes A and A'.

In applying heat it is convenient, although not essential, to lay a small portion of the alloy C on the bushing B or clamps D and D', in view of the operator, so that when it fuses further unnecessary application of heat may be avoided.

I am aware that plates of metal and tubes have been united by pressing previously-tinned surfaces closely to each other when heated by the process known in the arts as "sweating," which operation requires for its successful performance a close fitting of the surfaces of the parts united to each other, which in my invention is unnecessary, the solder cast in the grooves of the bushing B serving to fill the interstices between the bushing B and internal surfaces of the tubes A and A', the ridge between the grooves in the bushing B impinging upon the inner surfaces of the tubes A and A', retaining the solder in the grooves.

I am also aware that it has been proposed

to unite the ends of soft-metal tubes by inserting them in a tinned or solder-lined socket and applying heat thereto, which operation is objectionable from the risk incurred of obstructing the bore of the tube with solder, all of which invention I hereby disclaim; but

What I claim as my invention is—

A new, useful, and merchantable article of manufacture, consisting of a bushing or

branched tube having annularly-grooved tapering tinned ends, with solder cast thereon, adapted to be used for uniting soft-metal pipes by the aid of heat and pressure, applied in the manner substantially as set forth.

JEROME BRADLEY.

Witnesses:

WM. F. JOHNSON,

G. STROBEL SULLIVAN.