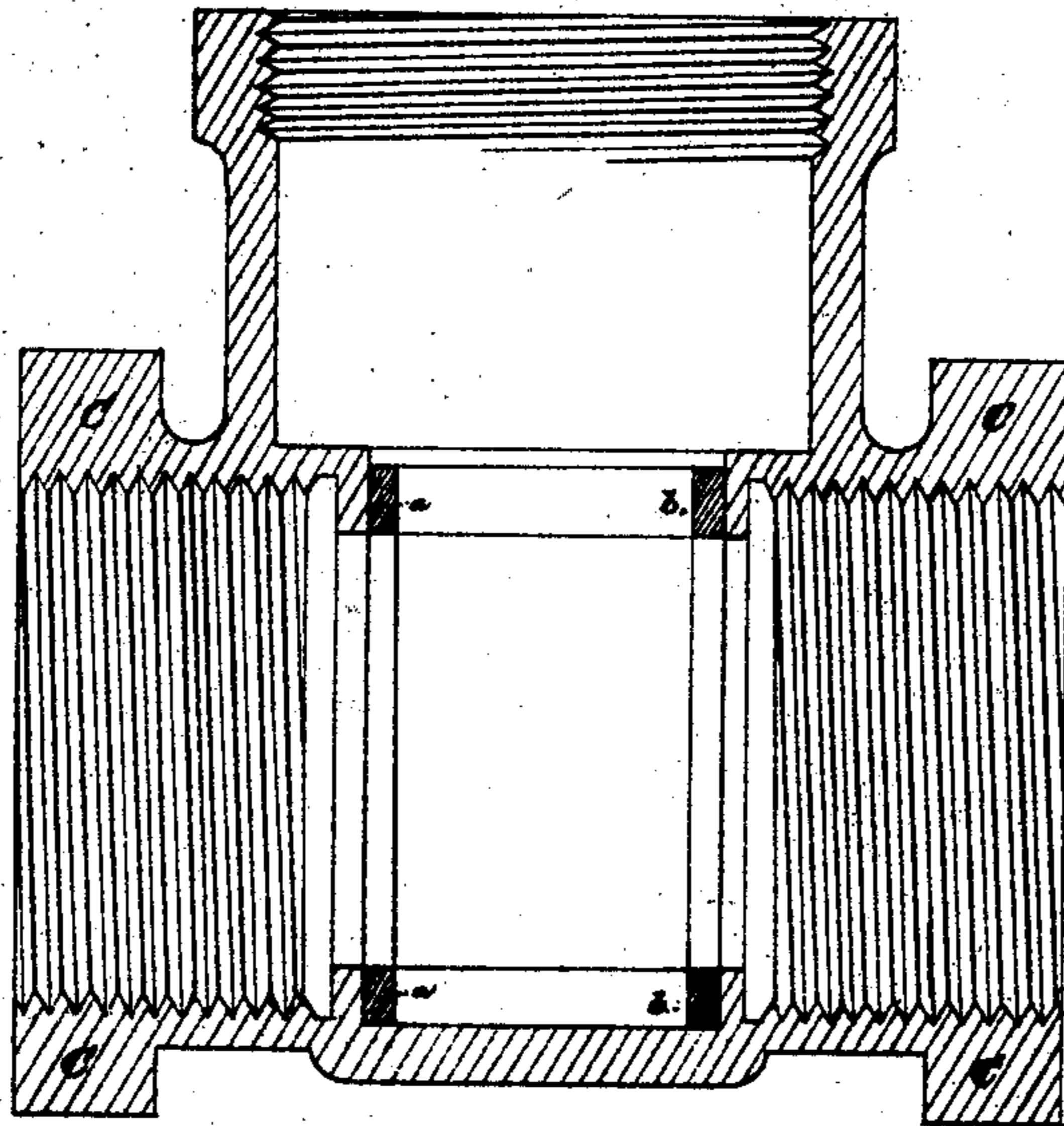


*S. J. Peet and J. W. Willis: Impt. in Uniting Brass and Iron*

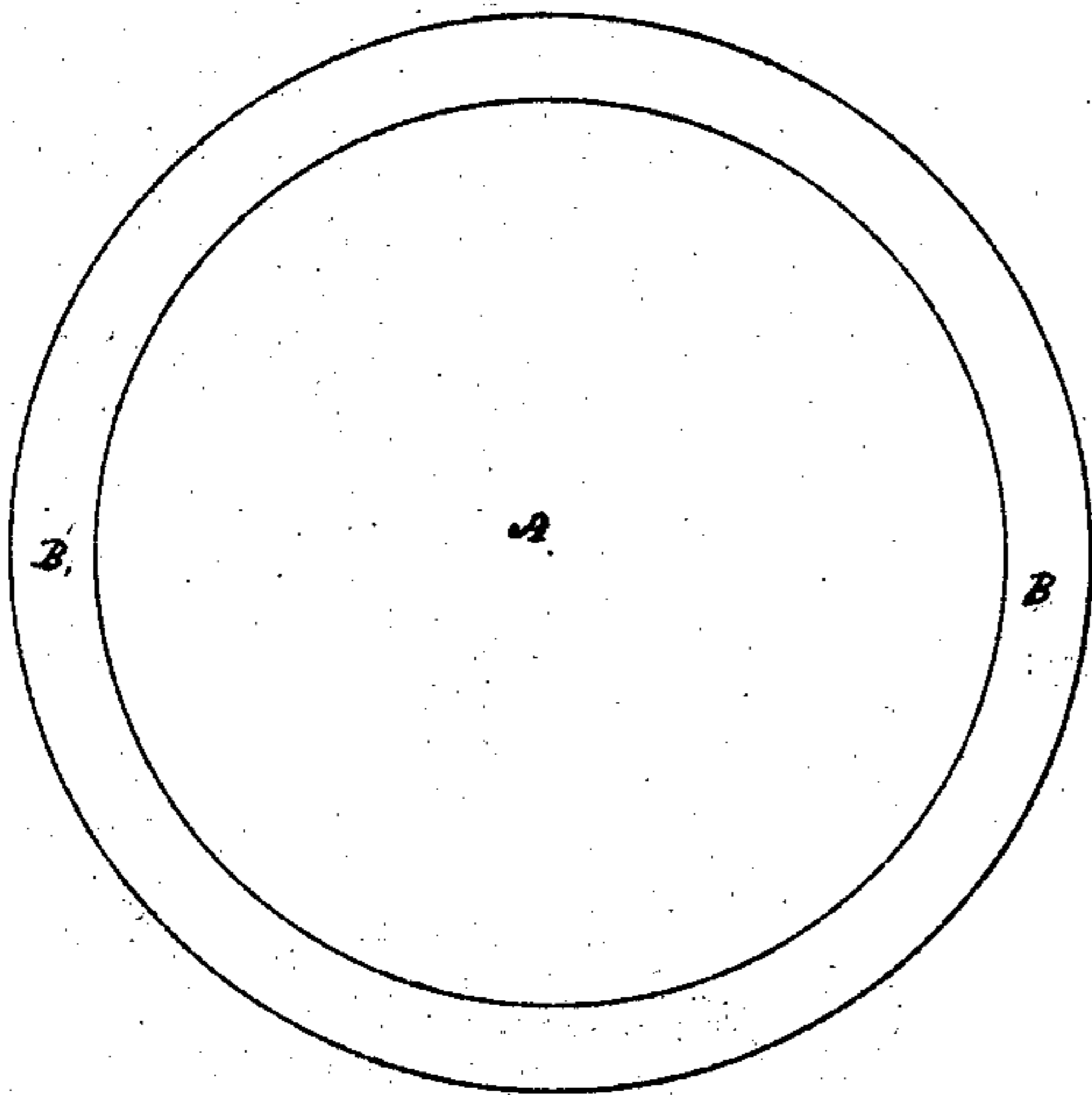
No. 121,542.

Patented Dec. 5, 1871.

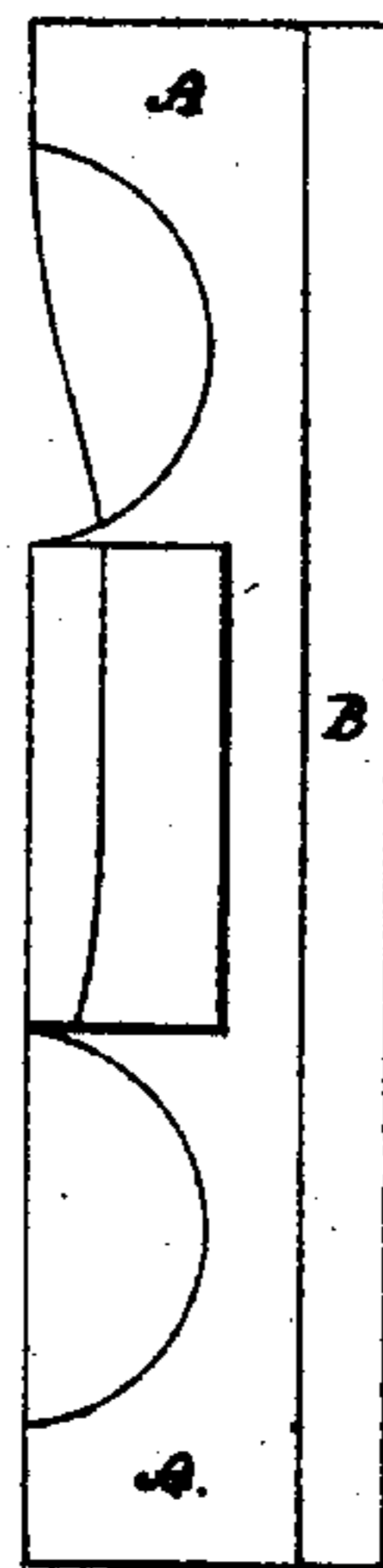
*Fig. 1.*



*Fig. 2.*



*Fig. 3.*



Witnesses.

Chas. Taylor,

Benj. Abbott

S. J. Peet and J. W. Willis.

by their attorney

A. P. Hale

# UNITED STATES PATENT OFFICE.

SAMUEL J. PEET AND JOSEPH W. WILLIS, OF BOSTON, MASSACHUSETTS,  
ASSIGNORS TO SAMUEL J. PEET, OF SAME PLACE.

## IMPROVEMENT IN PROCESSES OF CONSTRUCTING WATER AND STEAM VALVES.

Specification forming part of Letters Patent No. 121,542, dated December 5, 1871.

*To all whom it may concern:*

Be it known that we, SAMUEL J. PEET and JOSEPH W. WILLIS, of Boston, in the county of Suffolk and State of Massachusetts, have invented a new and useful Improvement in the Process of Constructing Water and Steam Valves and other devices in which a brass or composition bushing or facing is combined with an iron body or base; and do hereby declare the same to be fully described in the following specification and represented in the accompanying drawing, of which—

Figure 1 denotes a central and vertical section of the body or shell of a valve having a brass bushing applied thereto in accordance with our invention. Fig. 2 is a top view of a valve-disk provided with a brass facing applied in our improved manner. Fig. 3 is a side view of the same.

It is a fact well known that a simple and effective means of permanently uniting brass and iron so as to form a perfectly steam-tight connection has long been a desideratum. The methods heretofore adopted in applying a brass bushing to an iron shell or body, or a brass facing to an iron plate, have been attended with great labor and expense. The common mode is to unite the bushing to the shell by means of screw-connections, casting each part separately, and then forming a male screw on the bushing and a female screw on the inner surface of the shell. Another mode is to fit the bushing to the shell by means of dovetailing and then doweling or pinning the two together; so, also, in the application of a brass face or bearing-surface to a cast-iron disk or plate. The disk, cast with a groove corresponding in form with the brass facing to be affixed, the latter having been reduced to the required size, was inserted in such groove, and, by a series of powerful blows with a sledge-hammer, was shrunk or wedged therein, all of which, it is evident, involves a great amount of labor and expense. We are also aware that attempts have been made to unite brass and other soft metal or alloys of copper with iron by casting the iron in a molten state upon the brass, &c., which was coated with a paste composed of calcined borax-powder, sal ammoniac, arsenic, and iron and copper filings, reduced to the consistence of thick molasses by the addition of a small quantity of water. Such a paste or flux we do not employ, as we find that such gives too great porosity to

the metals at their points of fusion to insure a perfect incorporation or blending of them at their impinging surfaces.

To produce a simple, cheap, and effective means of permanently affixing a brass bushing or facing to a cast-iron shell or plate so as to make a perfectly steam-tight connection is the object of our invention, and which we effect in the following manner:

In carrying out our invention, in forming a steam-valve disk, for instance, as shown in Figs. 2 and 3, we first cast the brass annulus or facing of the desired form and size, and if there are any rough edges smooth them off with a file. Next, we heat such annulus to a moderate degree and apply to the surface to be incorporated with the iron, by means of a brush, a hydrated solution of borax. As soon as this has become dried the annulus is to be placed in the bottom of the matrix or mold in which the disk is to be formed, and the molten iron to form such disk is next poured into the mold, which is provided with an extra hole and gate, by which a quantity of the metal greater than that required to form such body is caused to pass through the mold, the object of such being to prevent the sudden chilling of the iron by impact against the brass and maintain it at such a temperature as to fuse the impinging surface of the brass. The coating of borax intervening between the brass and the molten iron serves to protect both surfaces thereof from oxidation, and acts as a flush in dissolving any incipient oxidation. The great heat of the molten metal, owing to its fusing point being so much higher than that of the brass, and, by being thus maintained, so acts upon the brass as to fuse the impacting surface of the latter to a sufficient degree to constitute a solder, whereby its own body is soldered or brazed to the iron, and thus a most perfect union of the two is effected. The application of the valve-seats to the shell of the valve may be effected in a similar manner, the brass or soft-metal seat, being placed in the shell-matrix or mold and on the core which forms the interior of the shell, is to be coated or covered with a solution of powdered borax having the consistency of cream, as before, and the shell cast onto the same; or, if preferable, the brass or metallic seats may be cast on the shell of the valves, in which case the surface of the shell to which the seat is to be united is to be first cleaned to remove any

oxide therefrom, and next is to have a coating of the said solution of borax applied to the said surface. The shell we prefer to heat to a moderate degree to prevent the chilling of the impinging surface of the brass. The shell so prepared is to be placed in the mold with a core of suitable size to form the seat and the molten brass or metal cast upon the prepared surface of the shell, which, by the action of the borax, will effect a perfect union of the two metals.

In Figure 1, C denotes the shell or case of a valve, and *a* and *b* the brass bushings applied thereto. In Figs. 2 and 3, A is a valve-disk, and B its brass facing or seat.

Our invention, although designed for the construction of steam and water valves in which the shell or case of the valve is made of cast-iron, is not limited to such, as it is equally adapted to all purposes in the arts where the fixed union of brass and cast-iron is desirable.

We do not claim uniting pieces of iron, whether cast, wrought, or steel, with copper, brass, bronze, or other alloys of copper by casting one metal on to a solid piece of the other, having interposed between the surfaces to be thus united a flux composed of the ingredients or their equivalents as specified in Letters Patent No. 39,351, as such will not attain the perfect results effected by our invention; therefore,

What we claim is—

The process of uniting dissimilar metals, as above set forth, the same consisting in casting one of such metals upon a solid piece of the other having interposed between the surfaces to be so united a flux consisting of the single ingredient, as above stated.

SAMUEL J. PEET.

JOSEPH W. WILLIS.

Witnesses:

F. P. HALE,

F. C. HALE.

(33)