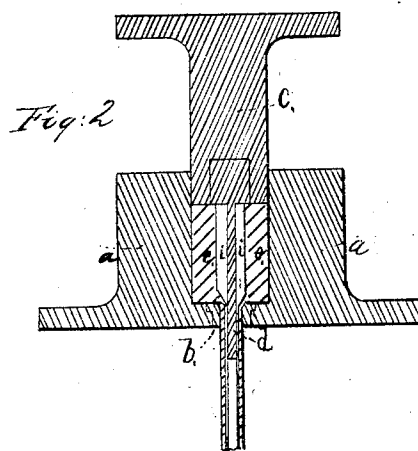
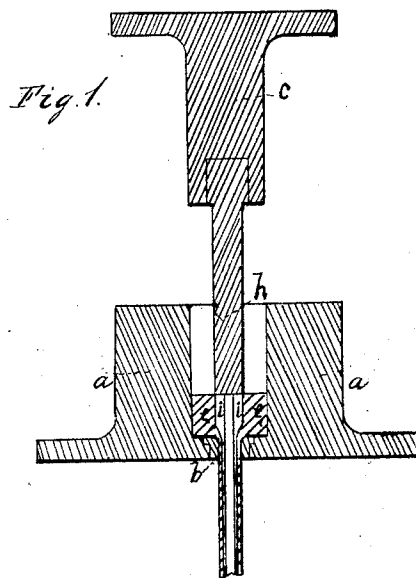


W.A. Shaw.
Lining Pipes with Tin.
Patented Mch 10. 1863

N^o 237,877-



Inventor

W. Anthony Shaw

Witnesses:

Samuel W. Correll
Chas. H. Smith

UNITED STATES PATENT OFFICE.

W. ANTHONY SHAW, OF NEW YORK, N. Y.

IMPROVEMENT IN LINING LEAD PIPES WITH TIN.

Specification forming part of Letters Patent No. 37,877, dated March 10, 1863.

To all whom it may concern:

Be it known that I, W. ANTHONY SHAW, of the city and State of New York, have invented, made, and applied to use, a certain new and useful Improvement in the Mode of Lining Lead Pipes with Tin or its Alloys; and I do hereby declare the following to be a full, clear, and exact description of my said invention, reference being had to the annexed drawings, making part of this specification, wherein—

Figure 1 is a section of my pipe-press as ready to receive the lead to form the ingot; and Fig. 2 is a similar section, showing the pipe as the same is being made.

Similar marks of reference denote the same parts.

The nature of my said invention consists in the manufacture of lead pipe with a lining of tin, by forcing an ingot of tin and an ingot of lead, while over a core, out of a cylinder through a die by hydraulic pressure, as specified.

Lead pipes have heretofore been tinned by melted metal inside of the pipe; but such tinning is very thin, and there is no certainty of its being entire over the whole interior of the pipe, besides which, said melted tin often runs into lumps and inequalities. My said invention overcomes all these difficulties, and allows of the pipe being made by hydraulic pressure, with a complete interior lining of tin, the surface of which is as smooth and perfect as the ordinary lead-pipe made in this manner.

In the drawings, *a* is a cylinder, made in any usual manner, with a die at *b* of the size required for the exterior of the pipe. *c* is a ram, fitting the cylinder *a*, all of the ordinary or desired construction. *d* is the core attached in the end of the ram *c*. A hydraulic press is to be employed as now usual, to cause the ram to press the ingot of lead through the cylinder and out at the said die *b*, between that and the core *d*, and form pipe.

I have represented in Fig. 2 this operation

of making pipe with my lining of tin or its alloys. In this *e* shows the ingot of lead (colored blue) and *i* the ingot of tin, (colored red, for greater clearness,) and it will be seen that as these two ingots are, by the hydraulic pressure applied to the ram *c*, driven out through the die *b* the tin forms a complete and perfect lining for the lead pipe. In order that these ingots may be introduced in the cylinder, the press must be fitted so that the ram *c* and core *d* can be drawn out of the cylinder, and I prefer that the core *d* be removed and a second core, *h*, introduced, as seen in Fig. 1, which core is to be the size of the exterior of the tin ingot. When this core is introduced, as shown, then the lead is to be cast into the cylinder, and when it has consolidated said core *h* is to be withdrawn and the core *d* introduced and passed into the hole of the previous ingots, a portion of which remains in the cylinder *a*, and after this core is introduced then the space between it and the lead is to be filled with melted tin. It will be evident that the tin might be cast separately and introduced within the lead ingot. I prefer to work off only about two-thirds of the contents of the cylinder before adding a new charge, as aforesaid. In case the tin ingot, in consequence of being harder than the lead, should draw through faster than the lead, it may be made rather longer and the end pass up into a recess around the base of the core *d*.

What I claim, and desire to secure by Letters Patent, is—

The manufacture of lead pipe with a lining of tin by forcing an ingot of tin and an ingot of lead, while over a core, out of a cylinder through a die by hydraulic pressure, as specified.

As witness my signature this 24th day of January, 1863.

W. ANTHONY SHAW.

Witnesses:

LEMUEL W. SERREL,
CHAS. H. SMITH.