

Chubbuck & Chadwick

Making Lead Pipe.

N^o 79,549.

Patented Jul. 7, 1868.

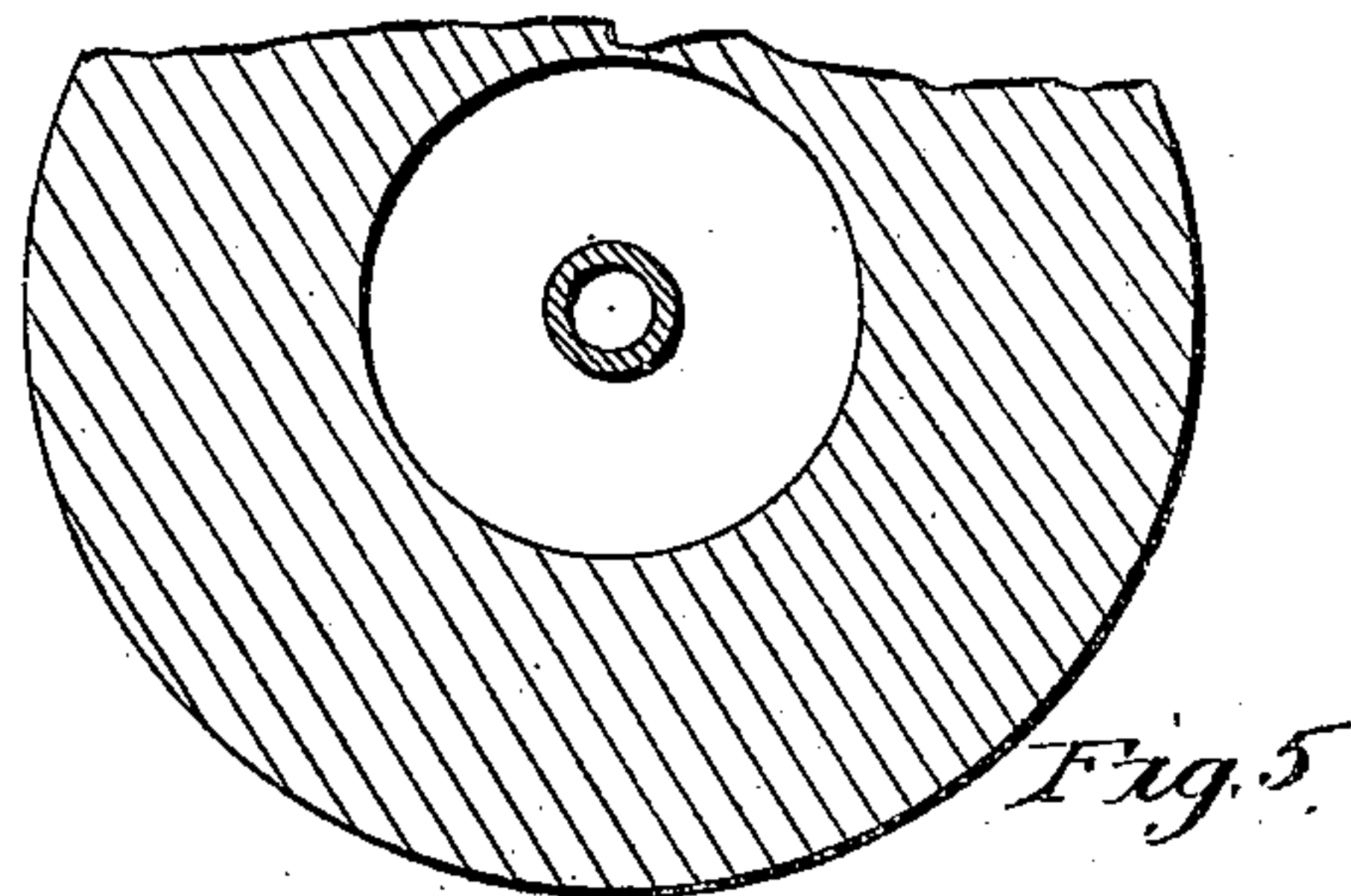


Fig. 5.

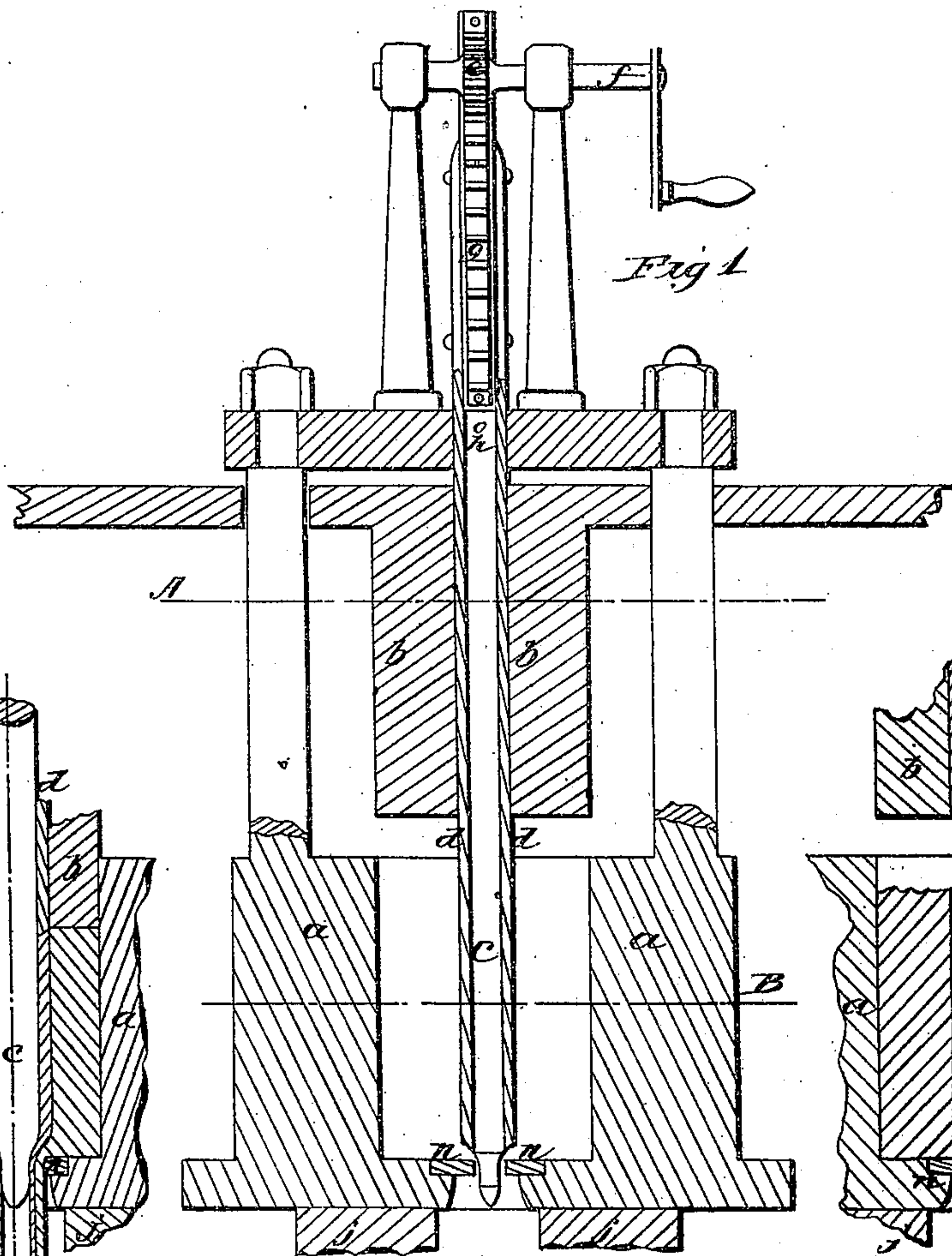


Fig. 1.

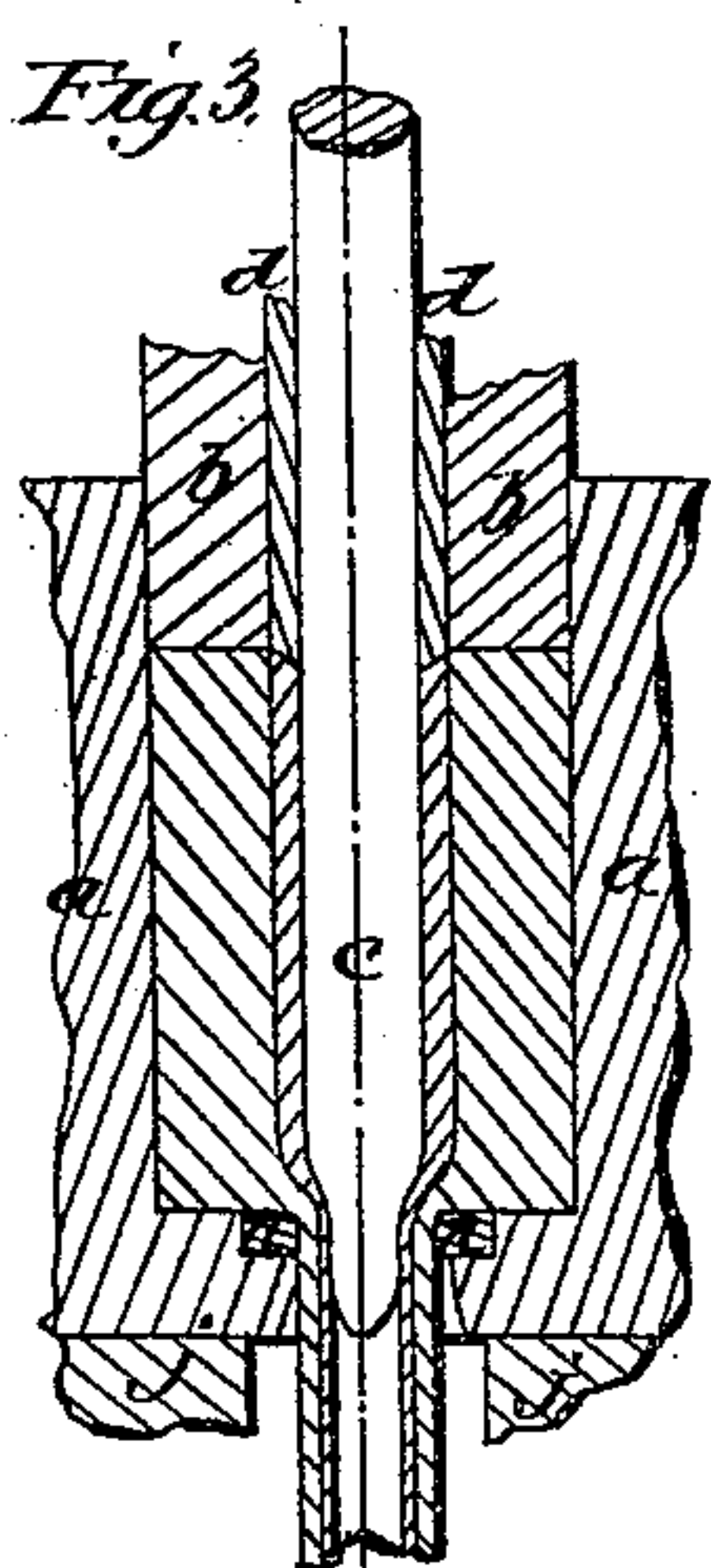


Fig. 3.

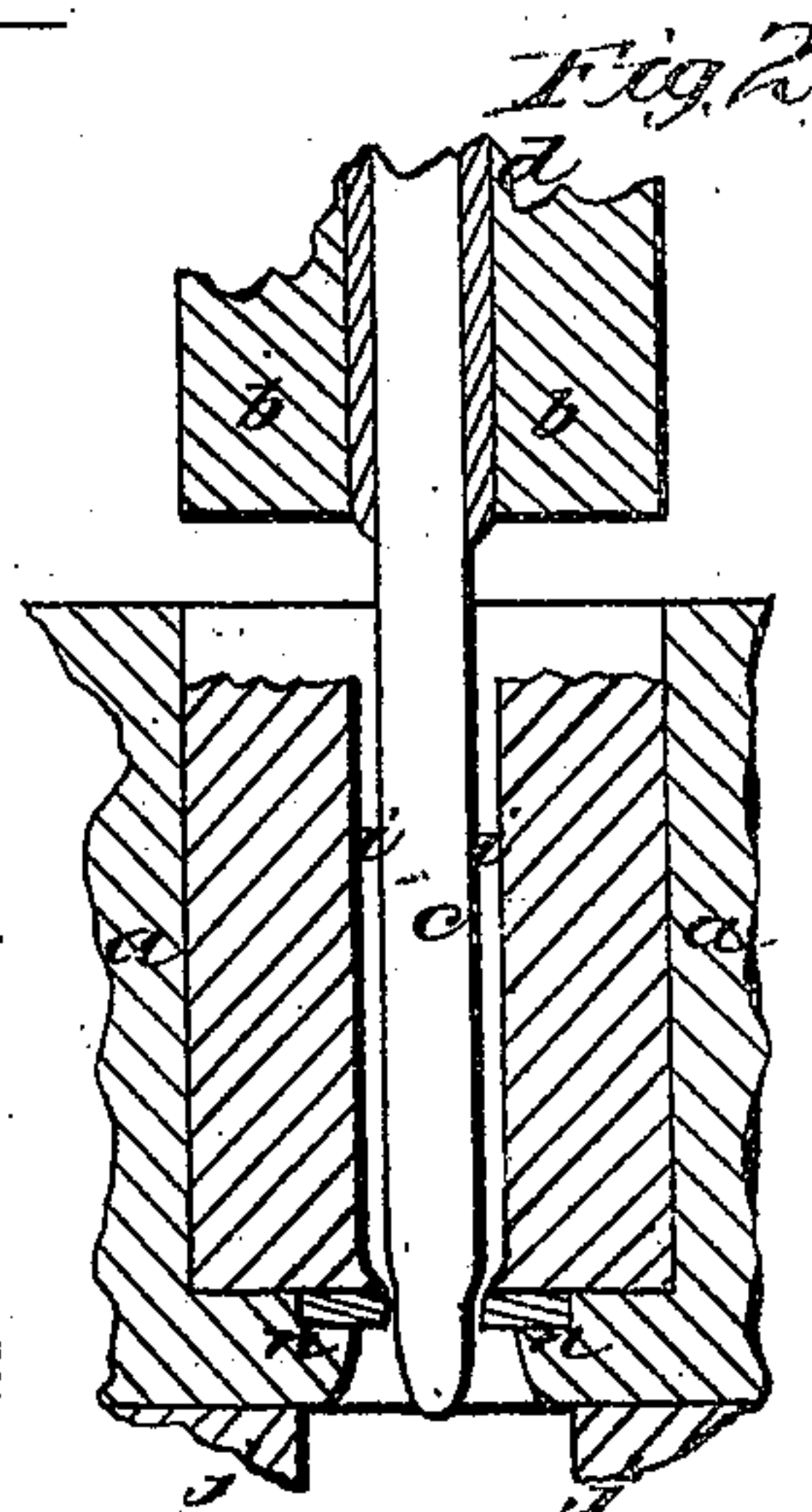


Fig. 2.

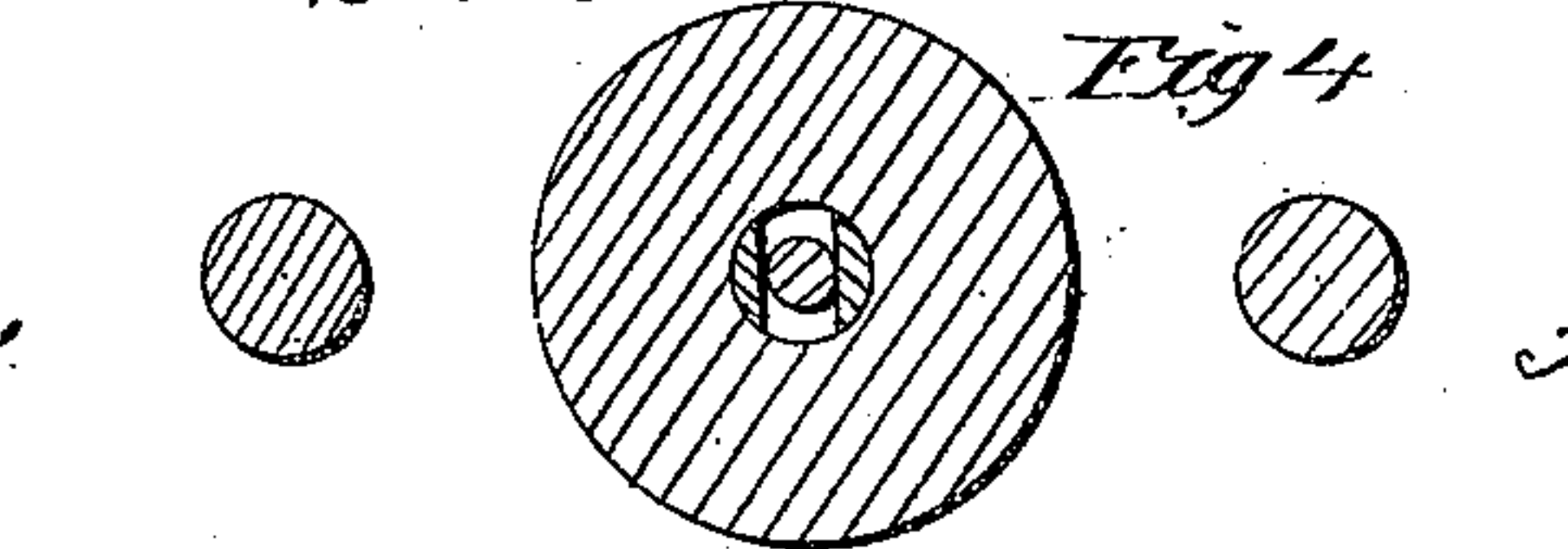


Fig. 4.

Witnesses
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UNITED STATES PATENT OFFICE.

S. E. CHUBBUCK AND J. H. CHADWICK, OF BOSTON, MASSACHUSETTS,
ASSIGNORS TO J. H. CHADWICK.

IMPROVED MACHINE FOR MAKING TIN-LINED LEAD PIPE.

Specification forming part of Letters Patent No. 79,549, dated July 7, 1868.

To all whom it may concern:

Be it known that we, S. E. CHUBBUCK and J. H. CHADWICK, both of Boston, in the county of Suffolk and State of Massachusetts, have invented certain Improvements in Machinery for Making Compound Pipe; and we do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

With reference to the accompanying drawings, Figure 1 is a sectional view of those parts of a machine to which our improvements relate. Fig. 2 is a similar sectional view, the metal for the exterior portion of the pipe being shown in the cylinder and the casing drawn up preparatory to the introduction of the metal for the interior or lining of the pipe. Fig. 3 shows a section of the same parts as they appear during the process of pressing and forming the compound pipe. Fig. 4 is a section taken at line A; Fig. 5, a section at line B.

In Fig. 1, *a* is a cylinder to receive the metal to be converted into pipe. *b* is the follower or ram. *c* is the mandrel which forms the inner surface of the pipe, and which is connected to and only movable with the cylinder *a*. *n* is the die which forms the exterior surface of the pipe.

Incasing the mandrel *c* is a casing, *d*, movable outward and inward through the follower *b*. A gear-wheel and crank, *e f*, and rack *g*, or any other suitable mechanism—such as hydraulic press or otherwise—is applied to the casing *d*, by which it may be drawn out, as shown in Fig. 2, or forced in, as shown in Fig. 1. A stop, *h*, is furnished, against which a shoulder in casing *d* rests when drawn out, as in Fig. 2, in which position the casing becomes a part of the follower or ram *b*, operating in harmony with it.

The operation of the machinery is as follows: The parts being in the position shown in Fig. 1, the metal for the exterior of the pipe is poured in a fused state into the cylinder *a*, and forms around casing *d*. The casing *d* is then drawn out, leaving the metal as represented in Fig. 2. The metal for the interior of the pipe is then poured in a fused or melted condition into space *i*, (see Fig. 2,) filling it, after which hydraulic or other pressure is applied, as by a

press, *j*, the follower or ram *b* being held stationary; or the pressure may be applied to the ram *b* and the cylinder be held stationary. In either case the metals occupying the proper proportionate annular space within the cylinder are made to pass out in similarly-proportionate quantity, and consequently in similarly-proportionate thickness, through the die *n* and around mandrel *c*, in proper compound-pipe form, as shown in Fig. 3.

It will be observed that if more than two component metals are to be used the case *d* should have one, two, or more cases in succession, incasing it and each other as it does the mandrel *c*, and one after another should be drawn out for the introduction of one metal after another in like manner, when they in like manner, forming a part of the ram, operate together in like manner in the pressing operation.

It will be observed that a considerable advantage is gained in the provision made by this improvement for the introduction of the outer metal (which is ordinarily the grosser, and requires the higher temperature to melt) first in order, and afterward the lining-metal in a sufficiently hot state to properly adhere or weld to the other, if desired, without the danger of the two mixing too much, which otherwise might occur.

It is also an advantage which this improvement affords to be able to introduce under so convenient an arrangement the several metals in a fused or melted state, while the pipe produced is certain to conform in the proportionate thickness and the distinctness of its several component materials to the proportions represented by the casing or enlarged prolongation *d* in the one part and the space around it and within the cylinder in the other.

The parts should be made of such materials as are commonly employed in the art, such as steel, iron, and other metals which recommend themselves to those conversant with the art.

We do not claim a cylinder, ram, or mandrel of themselves separately, nor the same as a combination, for both these devices and their combination are old and well known; nor do we claim the casing or sheath as a means simply of preventing the lead, when poured, from coming in contact with the tin, for this is ac-

complished in the machine patented to John Farrell, February 25, 1868, in which a sheath is used to protect the tin from the injurious effects of the hot lead, but which, after the lead has been poured, is entirely removed from the machine, thus leaving a void space between the two ingots, and the latter to that extent unsupported; but

What we do claim is—

The combination of the annular reciprocating casing *d* with the ram, cylinder, and die,

when all are arranged relative one to the other as and so as to operate in the manner described.

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J. H. CHADWICK.

Witnesses:

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