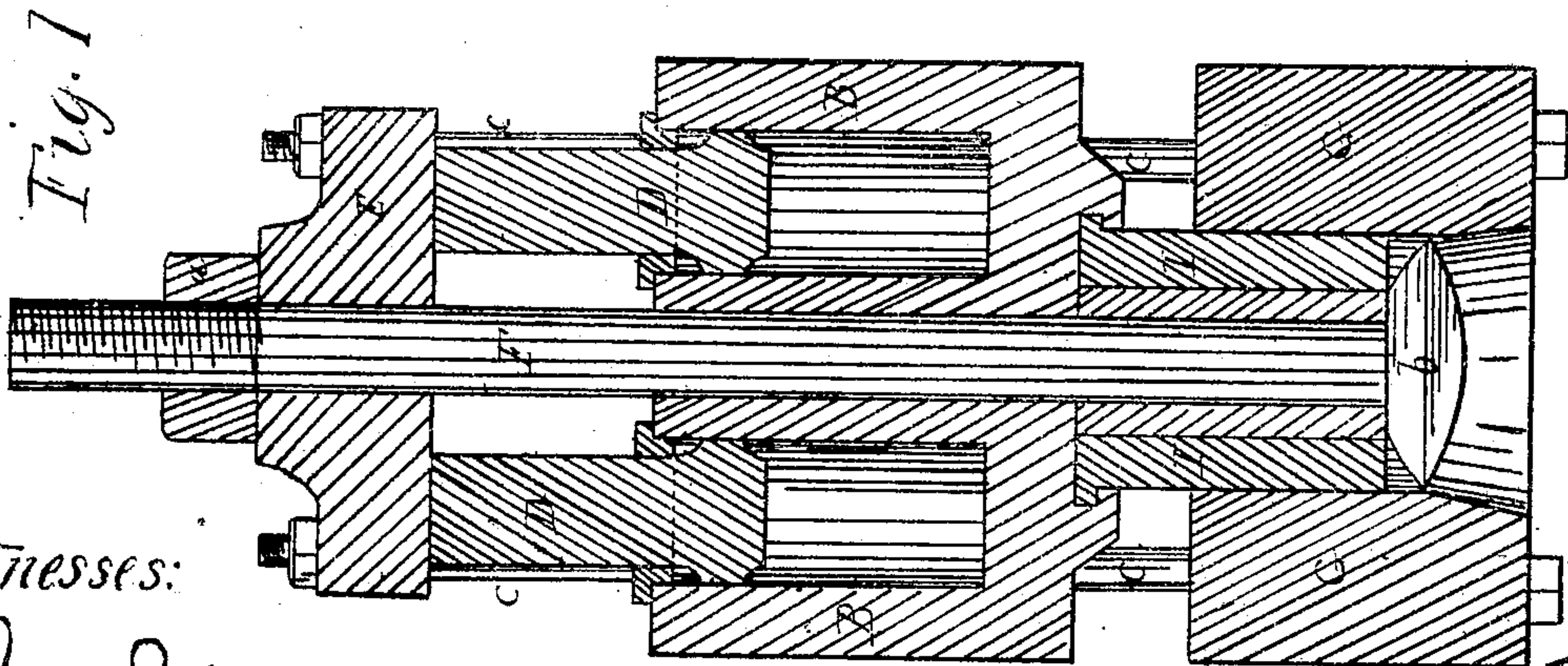
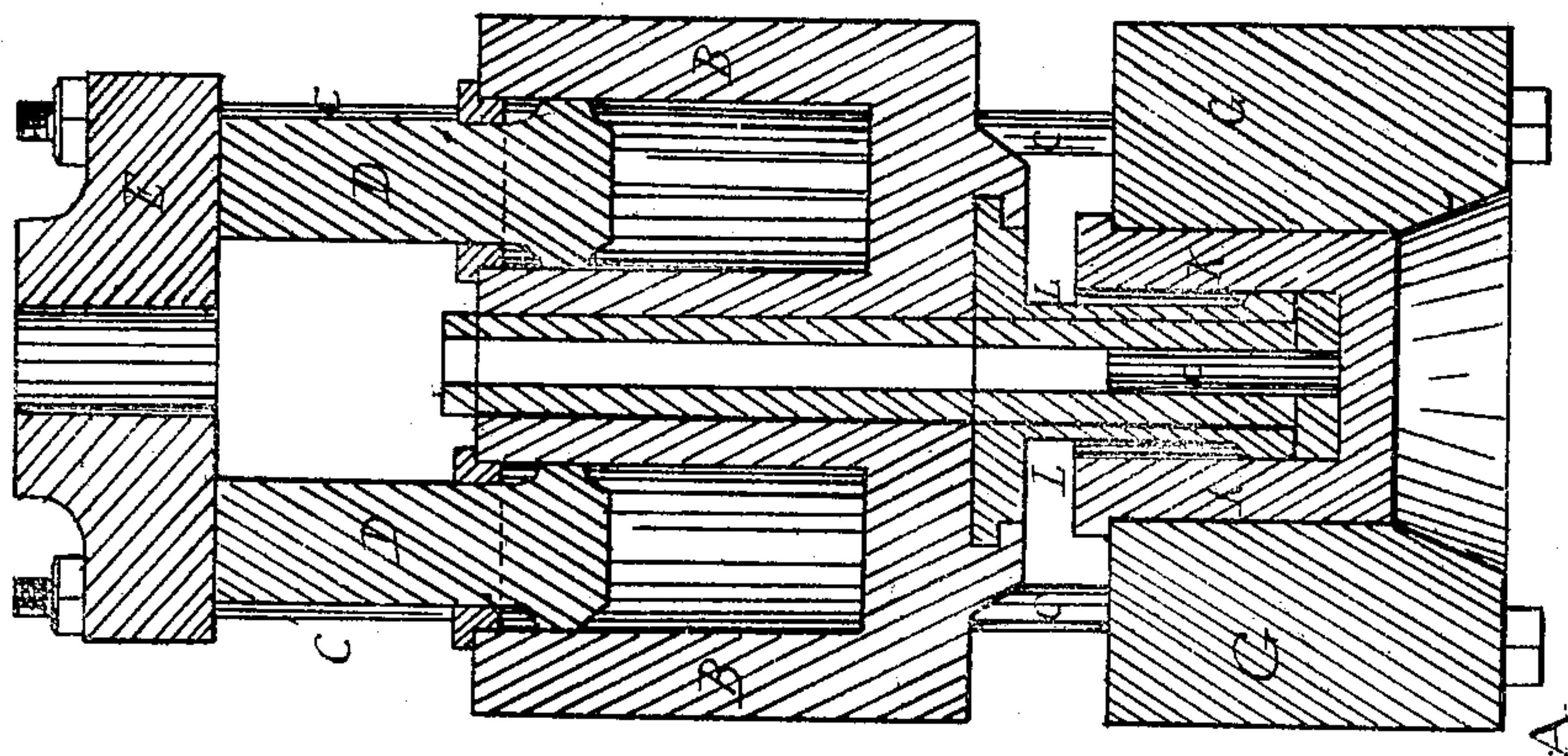
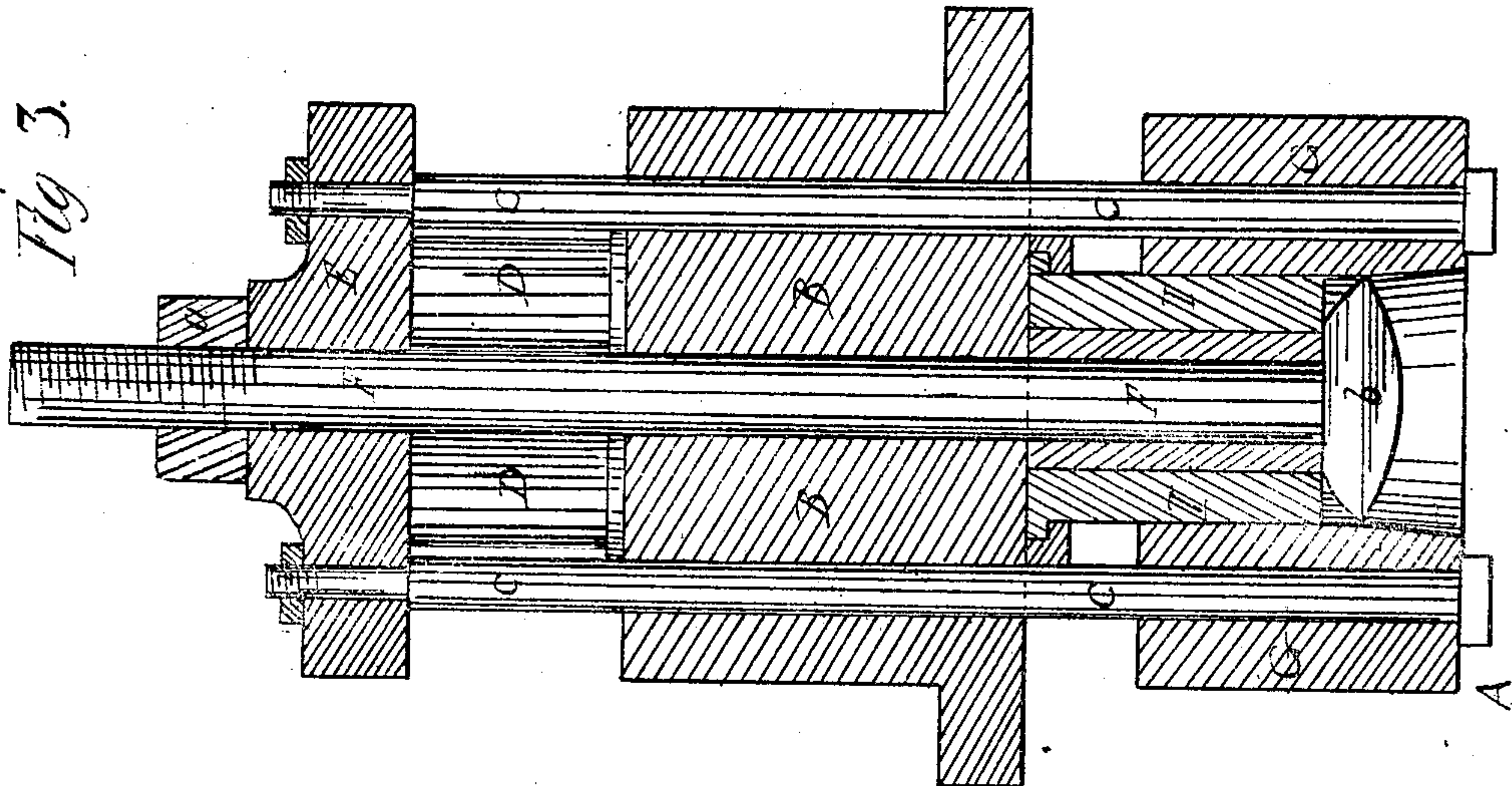


A. Dow.

Manufacturing Sheet Lead & Lead Pipe.  
N<sup>o</sup> 73585

Patented Jan. 21, 1868.



Witnesses:

*E. L. Ellsworth*  
A. M. Tanner

A. Dow Inventor.  
Per *Munroe*  
*attorney*



# United States Patent Office.

ANDREW DOW, OF BROOKLYN, NEW YORK.

*Letters Patent No. 73,585, dated January 21, 1868.*

## IMPROVED APPARATUS FOR MANUFACTURING SHEET LEAD AND LEAD PIPE.

The Schedule referred to in these Letters Patent and making part of the same.

### TO ALL WHOM IT MAY CONCERN:

Be it known that I, ANDREW DOW, of Brooklyn, New York, have invented an improved Machine for Manufacturing Sheet Lead and Lead Pipe; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification.

The object of this invention is to arrange a machine for making sheet lead, in such a manner that the same can be easily converted into a machine for making lead pipe.

A machine for making sheet lead was patented by John Robertson, on the 19th day of September, 1865. This machine is constructed on the Burr principle, that is to say, the pressure is applied to the lead, which is contained in an annular vessel, from above, while my machine is constructed on the Leroy principle, according to which, the vessel containing the molten lead is moved up against the end of a tube, fitting closely in the annular vessel. In either machine the lead is pressed through a narrow annular opening out of the vessel, and is thus formed into a pipe, which is afterwards to be cut open, and then flattened out, to make a sheet of required thickness and size. In Robertson's machine, the central rod can never be removed to enable the machine to make lead pipes, as, when he removes the rod, the inner wall of his annular water-cylinder is removed. The large cylinder which he uses makes a good close packing almost impossible, thereby impairing the practicability of the machine.

My machine overcomes all these difficulties, and does furthermore require less power than the other, and can be easily converted into a machine for making lead pipe. In the annexed drawing my machine is completely illustrated—

Figure 1 being a vertical central section of the same.

Figure 2 is a vertical central section of the same through the centre of the column C.

Figure 3 being a similar view, the machine being converted into a lead-pipe machine.

Similar letters of reference indicate corresponding parts.

A represents the base or foundation of the machine, which may be made of any suitable material, and in any desired style. The water-cylinder block B is supported by four (more or less) columns or posts C C, which rest upon the base, A. This cylinder-block B is provided with four (more or less) separate cylinders, in which are arranged close-fitting pistons D D. Water is forced into the lower end of the cylinders, and by hydraulic pressure the pistons are forced up, carrying with them a cross-head, E, to which the central bolt F is secured. The bolt F is adjustable up and down by means of a nut, *a*, on top, and thus the thickness of the sheet lead is regulated by raising or lowering the lower projecting head *b* of the bolt in the inclined lower end of the cylinder in the block G. To the stationary block B is further secured, by means of screws or bolts, or otherwise, a stationary cylindrical ram, I, which fits exactly the annular opening in the block G, wherein the molten lead is contained. Thus by forcing the pistons D D up, as described, the cross-head E pulls up the bolt F and block G in an equal manner, and the lead is thereby gradually forced out of the annular space in the block G, in the manner indicated in fig. 1, whereby the sheet lead is made by a very simple and complete method. By unscrewing the nut *a*, the central bolt F may be removed, and the machine can then be transformed into a lead-pipe machine. A cylindrical vessel, K, is placed into the opening in the block G, as shown in fig. 2, the bottom of said vessel being closed. Within the same, and in its centre, is arranged an upright pin, the diameter of which may be increased at will, by laying rings of the desired thickness round the same. The ram I is also removed from the block B, and a tube, L, secured in its place, the inner diameter of which corresponds with the centre opening in the block B, through which the bolt E did fit. The outer diameter of the tube L corresponds with the inner diameter of the vessel K, and so, when the said vessel is filled with molten lead, and the block G is forced up by the pressure of the water under the pistons D, a pipe will be formed and forced up through the central opening in the block B, as indicated in fig. 2. The diameter of the core *c* in K, regulates the inner diameter of the pipe, while the outer diameter of the same is to be the inner one of the tube L and central opening in B, which may also be decreased at will. So much less power is required for the formation of the lead pipe, that I can dispense with two of the pistons D for that purpose, applying hydraulic pressure to two only.

I claim as new, and desire to secure by Letters Patent—

1. The combination of the water-cylinder block B, posts C, piston, D, cross-head E having central bolt F, bearing head *b*, cylindrical ram I, and annular block G, all constructed as described, for the purpose specified.
2. The combination of the water-cylinder block B, tube L, vessel K having core C, and annular block G, constructed as described, for the purpose specified.

Witnesses:

WM. F. McNAMARA,  
ALEX. F. ROBERTS.

ANDREW DOW.