

F. V. De COPPET.
Ice-Machines.

No. 148,675.

Patented March 17, 1874.

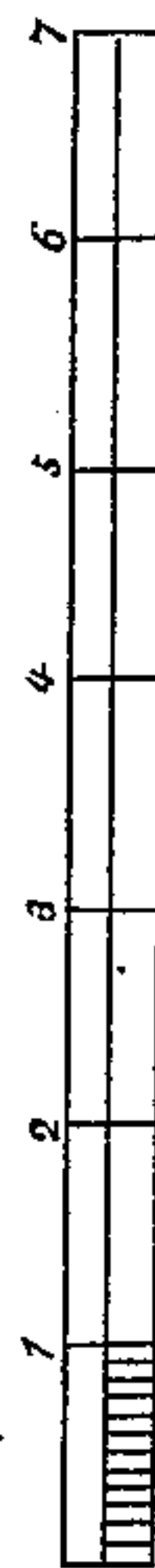
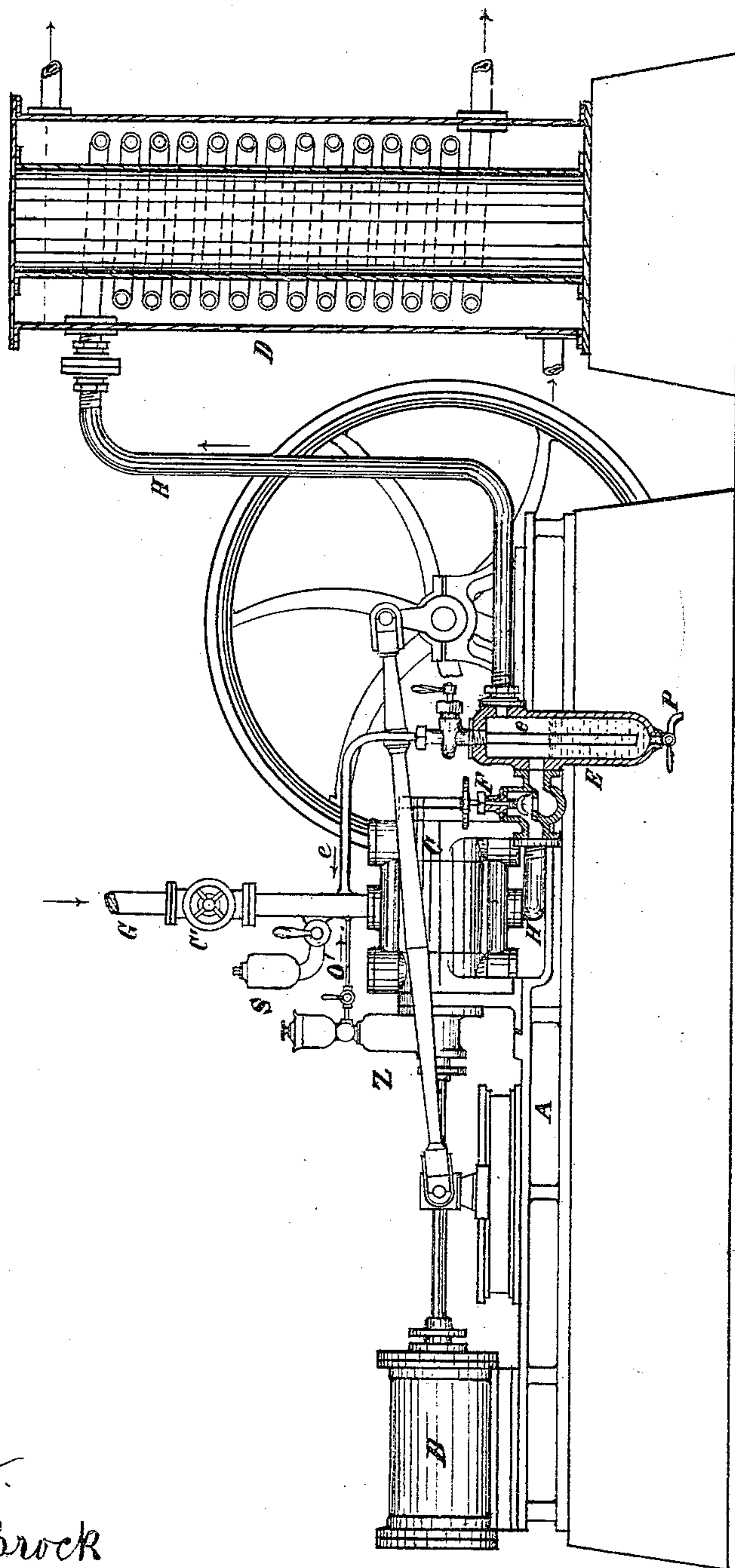


Fig. 1.

Witnesses.
Samuel Brock
J. R. Beckwith

Inventor
Francis V. De Coppet

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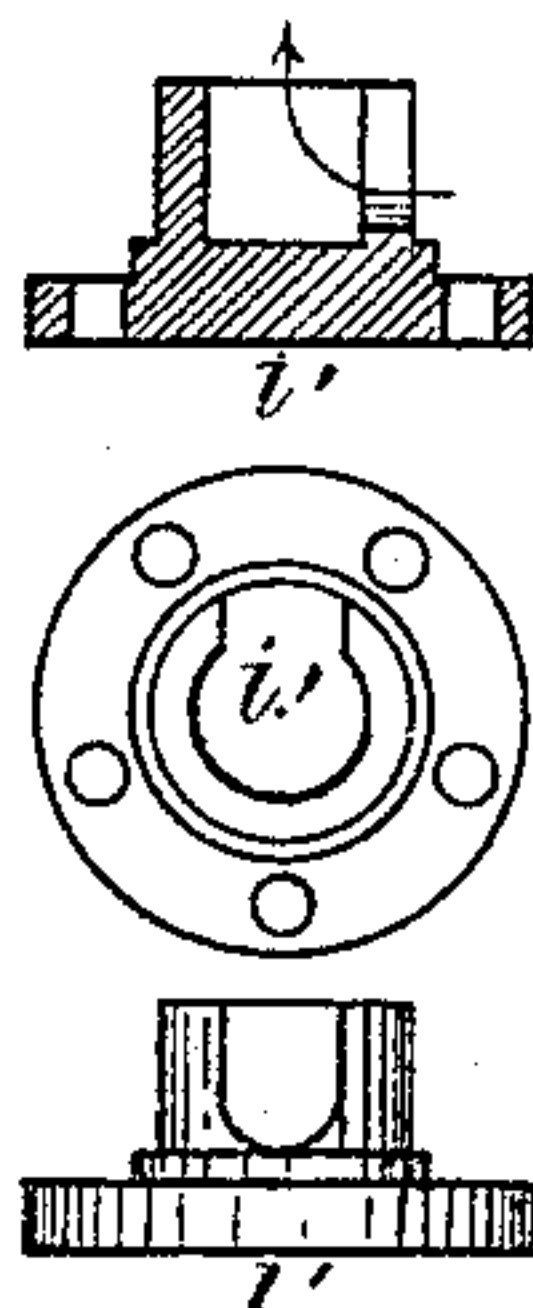
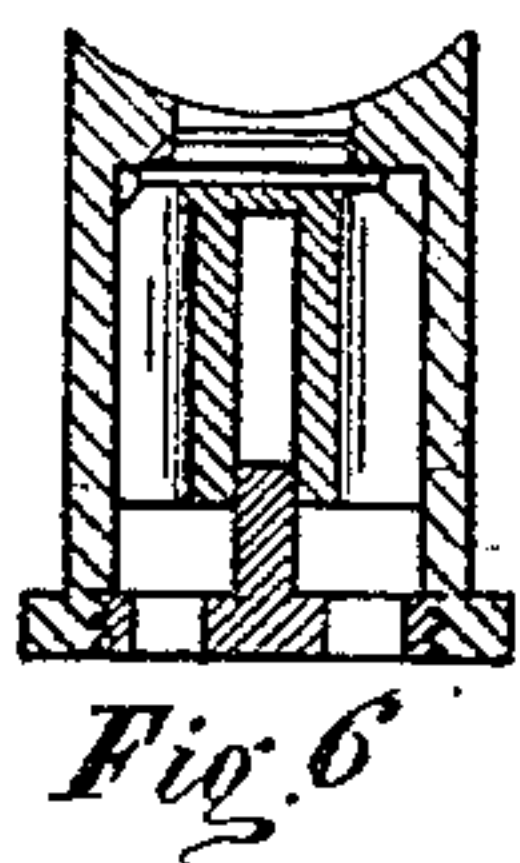
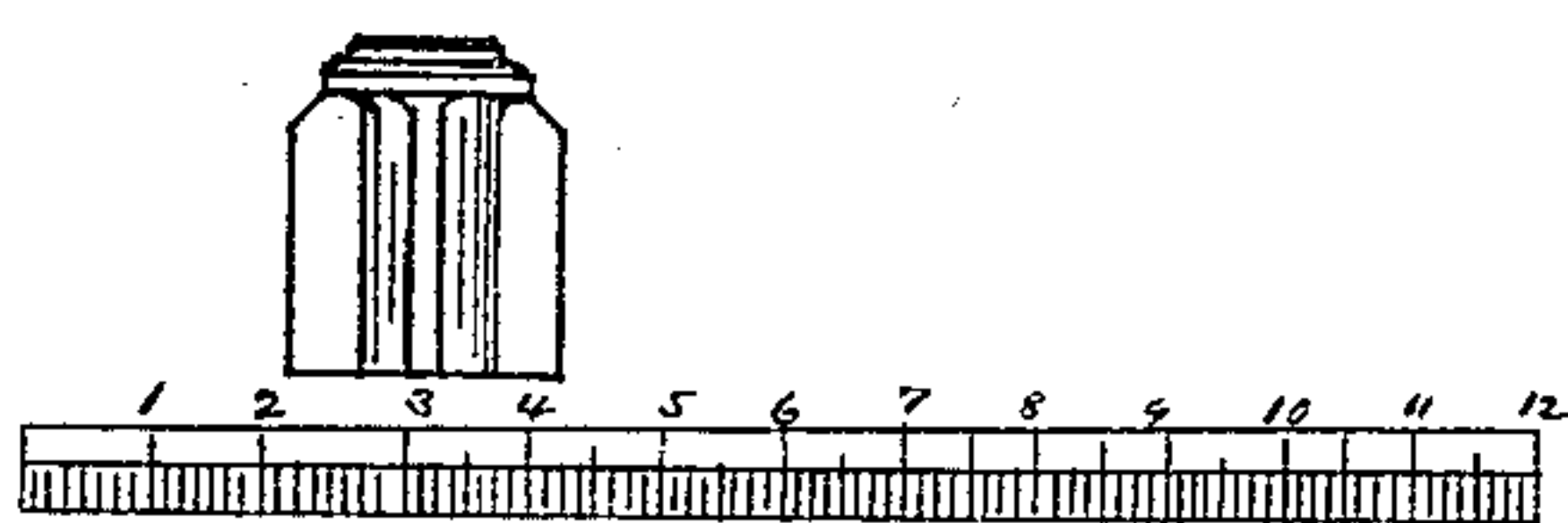


Fig. 4

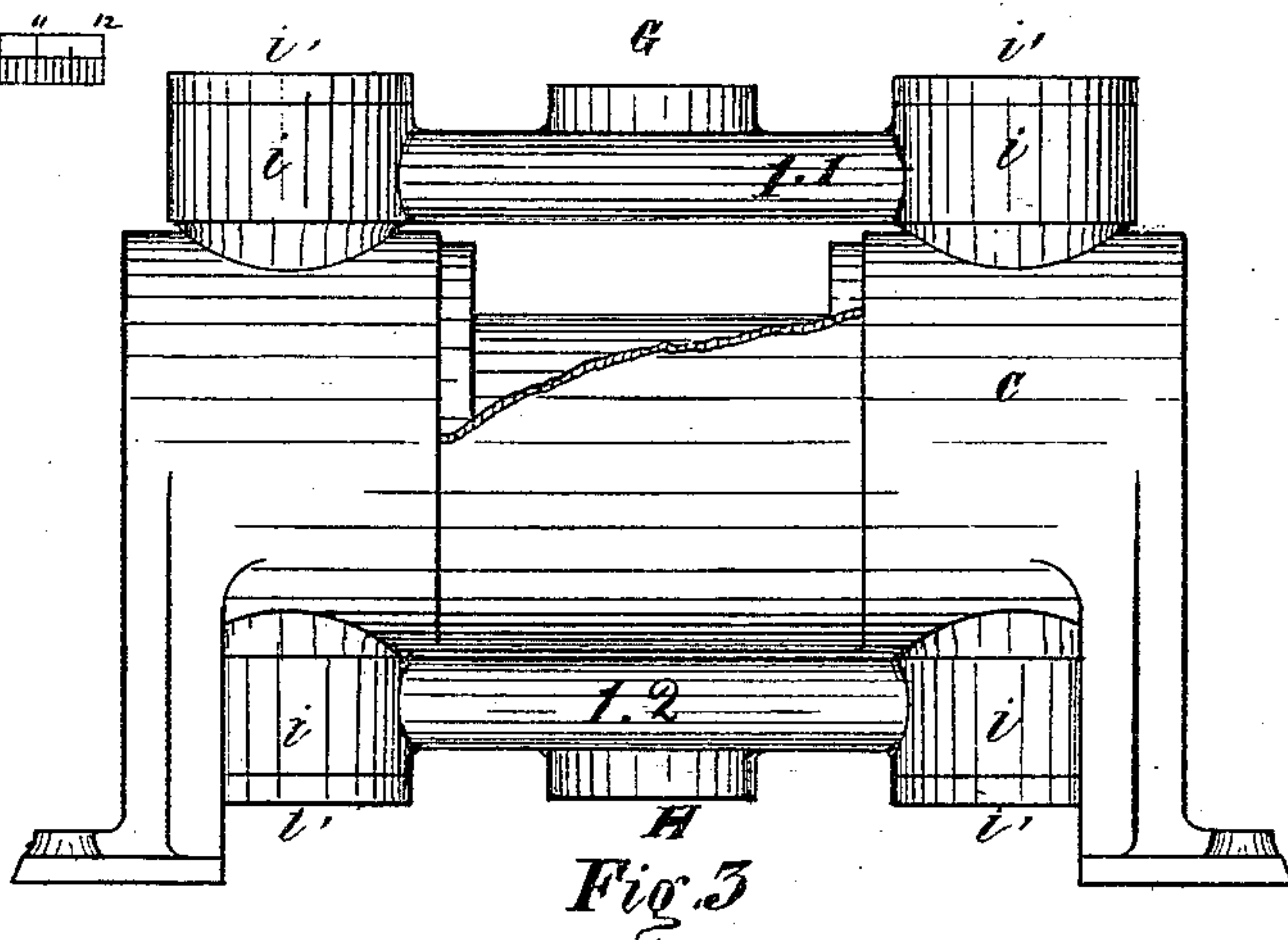


Fig. 3

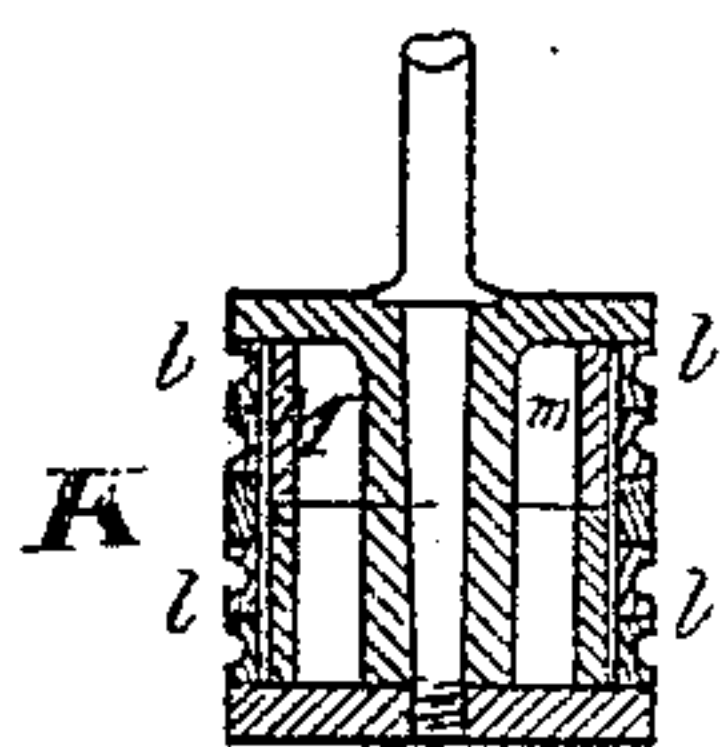


Fig. 5

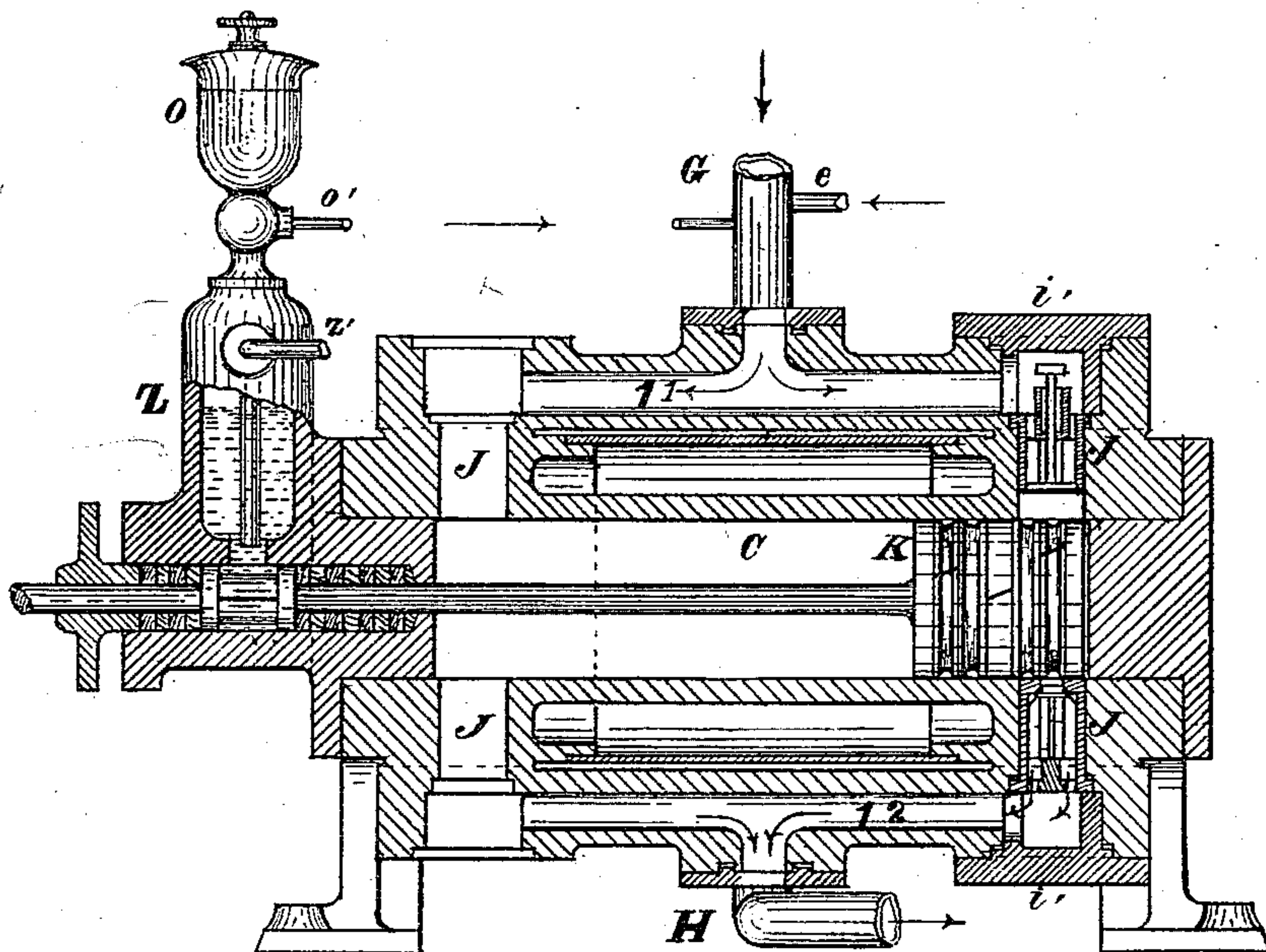
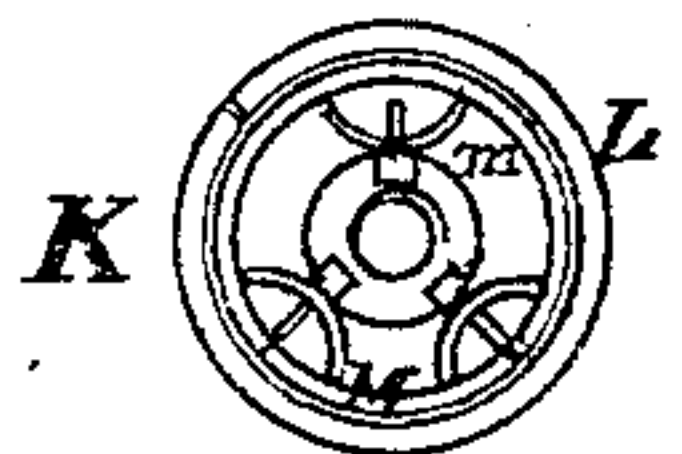
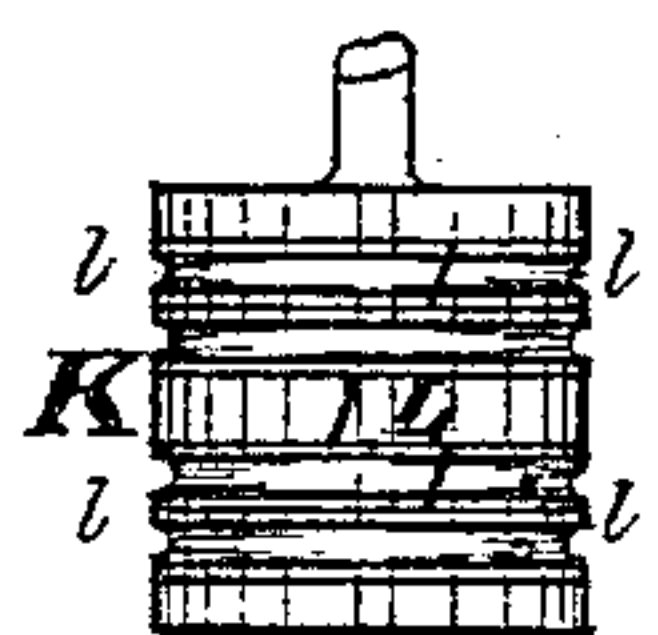
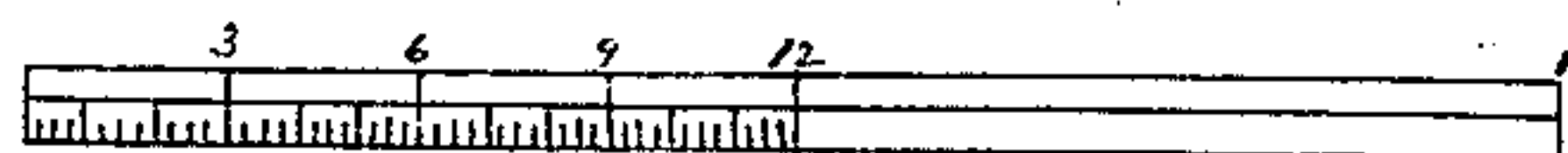


Fig. 2

Witnesses.
Samuel Brock,
J R Beckwith.



Inventor.
Francis V. DeCoppet.

UNITED STATES PATENT OFFICE.

FRANCIS V. DE COPPET, OF NEW ORLEANS, LOUISIANA.

IMPROVEMENT IN ICE-MACHINES.

Specification forming part of Letters Patent No. 148,675, dated March 17, 1874; application filed November 13, 1871.

To all whom it may concern:

Be it known that I, FRANCIS V. DE COPPET, of New Orleans, in the parish of Orleans and State of Louisiana, have invented certain Improvements in Ice-Machines, of which the following is a specification:

The object of my invention is, first, to provide for ice-machines using anhydrous ammoniacal vapors a piston-packing so constructed that the fibrous or rubber portion thereof will at all times be shielded from contact with the vapor by glycerine, or other similar non-deteriorating liquid, used as a lubricant as well as a liquid packing; and, secondly, to furnish automatic means for supplying the piston and its rod with the lubricant without waste.

In the annexed drawings, Figure 1 is a sectional side elevation of so much of an ice-machine of the character stated as will illustrate my improvements. Fig. 2 is a vertical longitudinal section of the pump. Fig. 3 is a side elevation of the same. Fig. 4 illustrates, in different views, the valve-chamber bonnets. Fig. 5 shows, in section, elevation, and plan, the construction of the piston. Fig. 6 represents the valve and its seat. Figs. 2 to 6 are drawn on an enlarged scale.

The same letters of reference indicate identical parts in all the figures.

The bed-plate A supports the steam-cylinder B and pump C, the pistons of which are attached to the opposite ends of the single piston-rod. The ammoniacal vapors are drawn by the pump from the refrigerating-vessel through the pipe G, and are exhausted into the coil of the condenser D through the pipe H. The piston of the pump is supplied with the lubricant from the closed cup S, attached to the induction-pipe G between the pump and the stop-cock C'. The lubricant passes through the valves into the barrel or cylinder of the pump, and any surplus is discharged therefrom, through the exhaust-pipe H, into the trap E, which is connected by a dip-pipe, e, with the induction-pipe G. The piston-rod is lubricated from the covered cup Z, which is attached to the stuffing-box of the head of the pump-cylinder, and is also in communica-

tion, through a pipe, O', with the induction-pipe G.

Sheet 2, 1¹ and 1² represent the openings in the side pipes of the pump. J J J J represent the receiving and delivery valves in their respective chambers. K K K represent the piston as constructed. L represents the outer series of open packing-rings. m represents the inner series or backing-rings; these rings are cut open also. M represents a sheet of india-rubber, enveloping the inner series or backing-rings. l l l l represent grooves or receptacles cut on the outer circumference of the outer series of packing-rings. i' i' i' i' represent the valve-chamber bonnets. i i i i represent the valve-chambers.

All attempts heretofore made to pack the piston of pumps or motor-cylinders with india-rubber or fibrous packing, where anhydrous ammoniacal gas or vapor is used, or to be compressed to liquefaction, have proved failures after being used a short time, requiring almost daily attentions in repacking of piston, requiring the removal of cylinder or pump-cover, and the consequent loss of ammoniacal vapor, and the introduction of air; also, the large increase of friction when the piston is first packed with india-rubber or fibrous packing.

The construction and operation of the piston-packing are as follows: The piston-head is constructed of iron, and with a tight-fitting follower, and in all respects similar to the piston-head of a steam-engine that uses iron or steel packing-rings. These packing and backing rings are cut open in order that they can expand and contract like a spring, and are expanded out against the cylinder by springs radiating out from the core of the piston-head, coming in contact with the inner series or backing-rings. These rings are covered on their outer circumference with a sheet of india-rubber; the outer series of rings are slipped over them, enveloping the india-rubber, thus forming a tight joint between the two series of rings. The outer series of packing-rings have grooves or receptacles cut around their outer circumference, for the purpose of catching and retaining the propylic alcohol or glyce-

erine when it is used in connection with them as a liquid packing, and at the same time serves as a lubricator. All other oils or fats, if used in direct contact with ammonia, would soon be converted to soap, and be useless.

The valves of the pump have flat faces, and are constructed in other respects substantially in the manner shown in Figs. 2 and 6. Some of the glycerine in passing through them will adhere to their faces and seats, and thus, in a measure, serve both as a liquid seal and a cushion.

The supplying of propylic alcohol or glycerine to the piston-packing, and to the valves and their seats, is quite novel, and you might say automatic in its action; it is as follows: A quantity of glycerine—say several gallons at one operation—is put in the cup S; then screw on the cover of the cup; then open the small cock between the cup and the induction-pipe G; the glycerine will then flow by gravity through the receiving side pipe and valves in the pump, and the movement of the pump-piston forces the glycerine around the piston-packing, filling the receptacles or grooves in the packing-rings and the valves and their seats with glycerine, and any surplus glycerine is forced on through the delivery side pipe, in and through pipe H in trap E, where it falls by gravity to the bottom of the trap, the ammoniacal vapor continuing on to the compression-coil, for compression to liquefaction.

To return the glycerine back again to the piston-packing valves and seats continually, and without loss of the ammoniacal vapor or glycerine, open the cock on the small pipe *e*, and the pressure on the surface of the glycerine in the trap will force it through the small pipe *e e* in the induction-pipe G, and from thence, as before described; and when the glycerine becomes deteriorated by absorbing moisture from the ammoniacal vapors, then it can be drawn off at cock P for purification and use again.

The lubricator Z is connected by a pipe with the cavity of the stuffing-box surrounding the piston-rod of the pump, and thus supplies the rod with the necessary amount of glycerine or other lubricant used. Its chamber is also connected by the pipe O' with the induction-pipe G, so that any ammoniacal vapor finding its way to the cavity in the stuffing-box will pass up through the lubricator, back into the induction-pipe, saving all leakage at this point.

I am aware that it has been heretofore proposed to use glycerine as a lubricant for pump-pistons of this class of ice-machines, and do not, therefore, now claim such use of glycerine.

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

1. The combination of the pump C, exhaust-pipe H, and trap E, substantially as and for the purpose specified.

2. The combination of the cylinder C, exhaust-pipe H, trap E, dip-pipe *e*, and induction-pipe G, substantially as and for the purpose specified.

3. The arrangement of the lubricator S above the induction-valves of the pump, so that the lubricant, in flowing through the pump, will bathe all the valves, as well as the piston thereof, substantially as specified.

4. The combination, with the stuffing-box of the pump, of the lubricator Z, pipe O', and induction-pipe G, substantially as and for the purpose specified.

5. The herein-described piston-packing, composed of the split backing-rings *m*, rubber cloth M, exterior split rings *l*, provided with annular grooves, and suitable springs for setting out the packing, substantially as and for the purpose specified.

FRANCIS VT. DE COPPET.

Witnesses:

SAMUEL BROCK,
I. R. BECKWITH.