

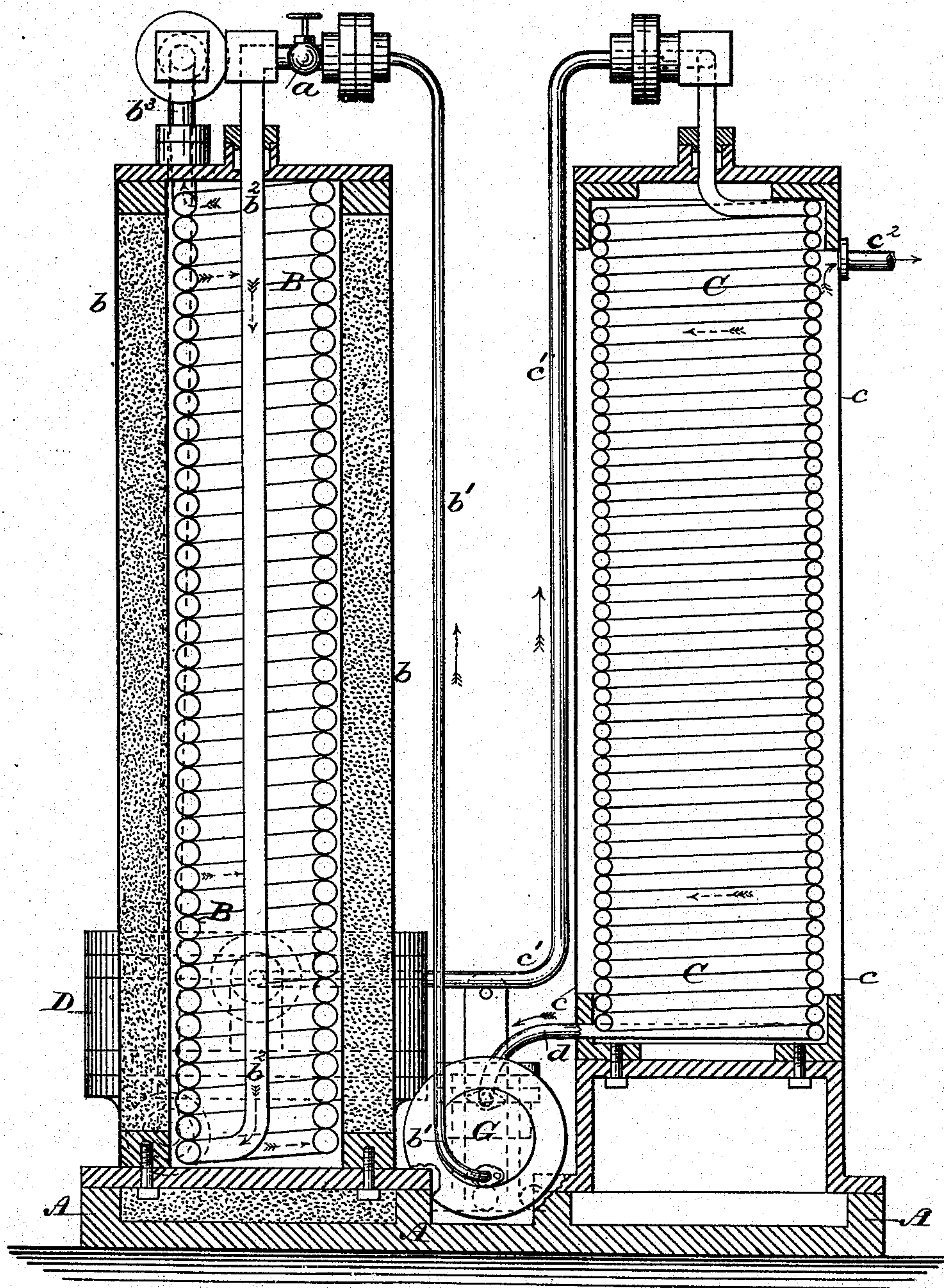
W. M. WOOD & W. L. BAILIE.

ICE MACHINE.

No. 283,054.

Patented Aug. 14, 1883.

Fig. 1.



Witnesses:

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(No Model.)

3 Sheets—Sheet 2.

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Fig. 2.

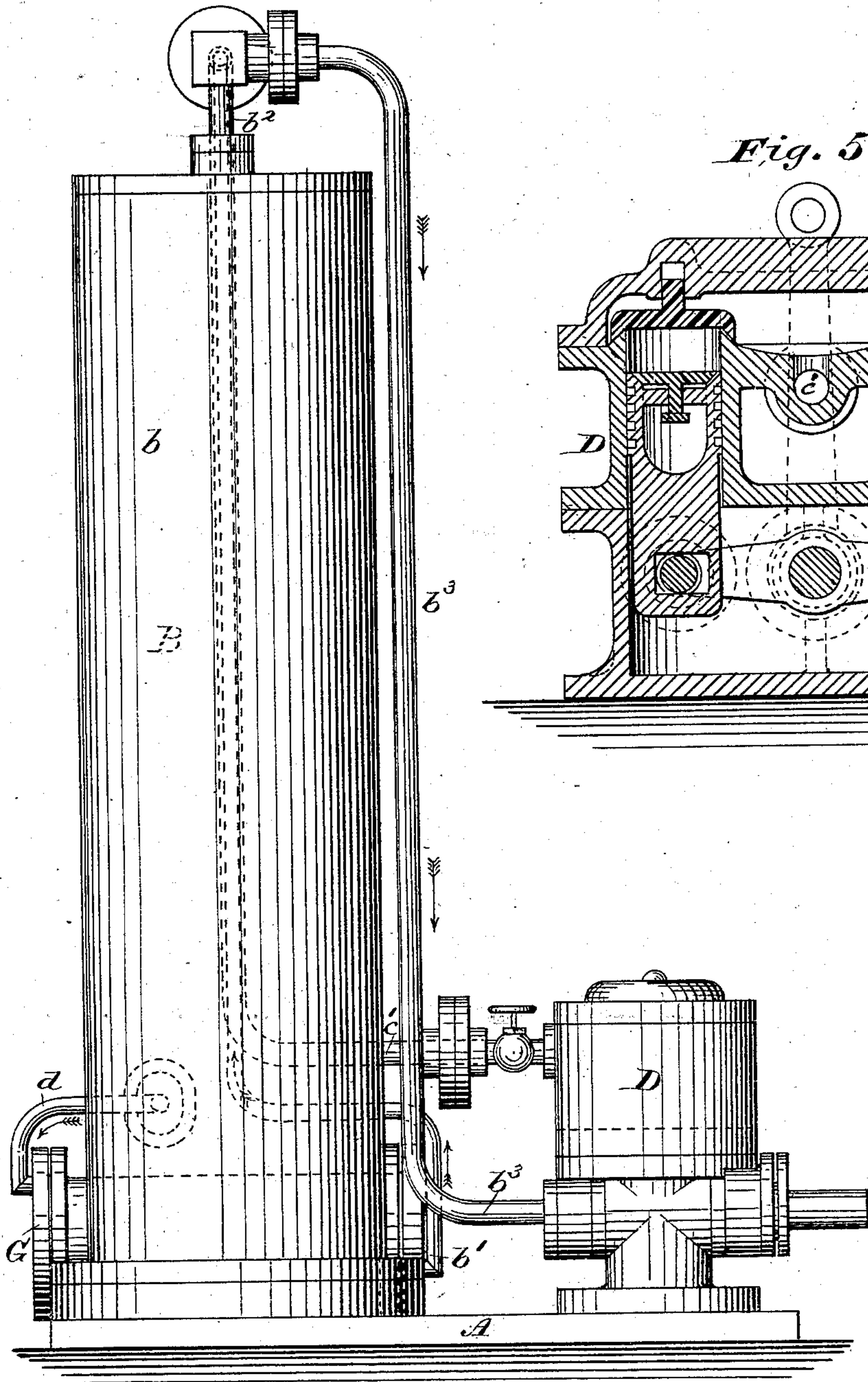
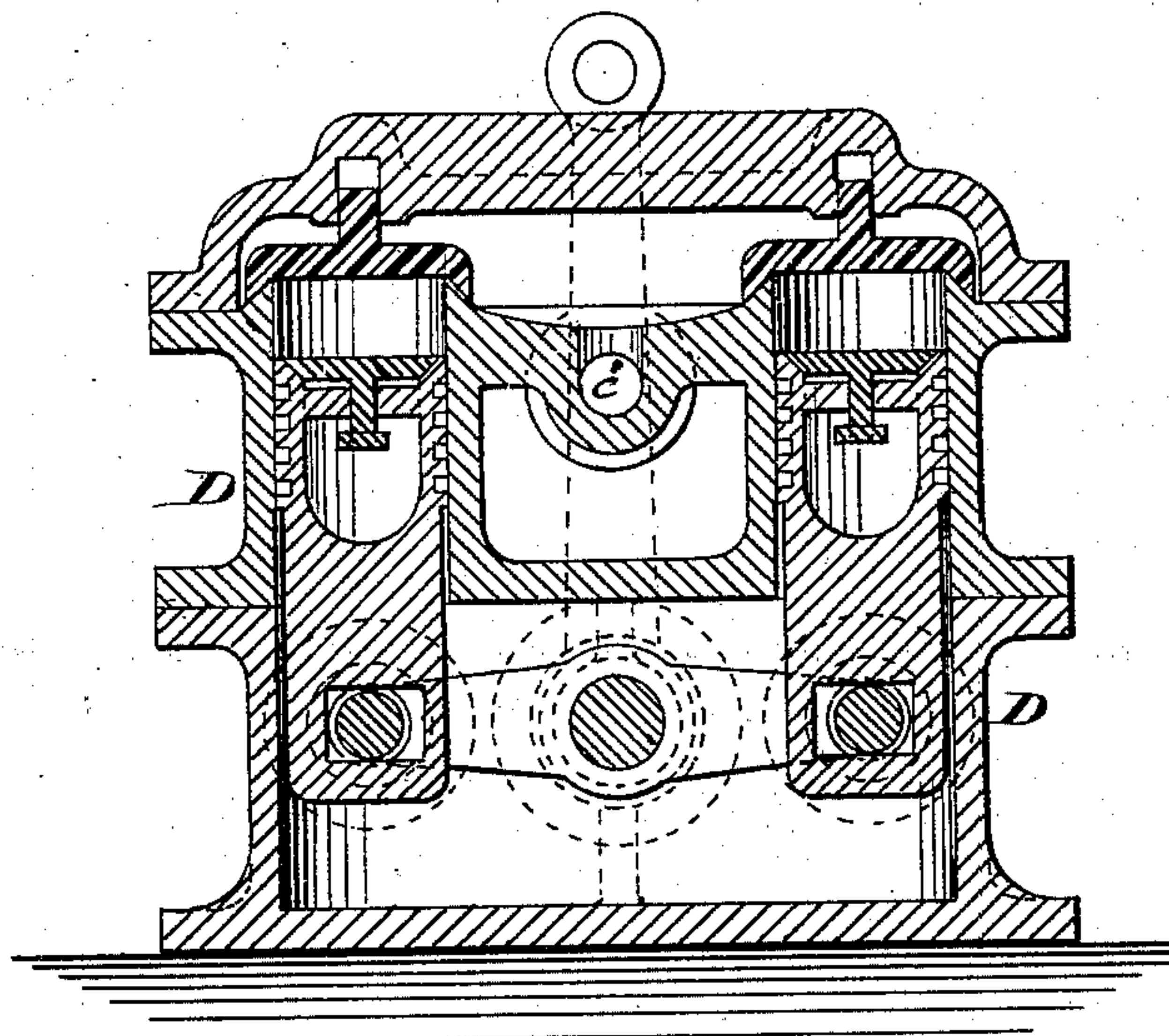


Fig. 5.



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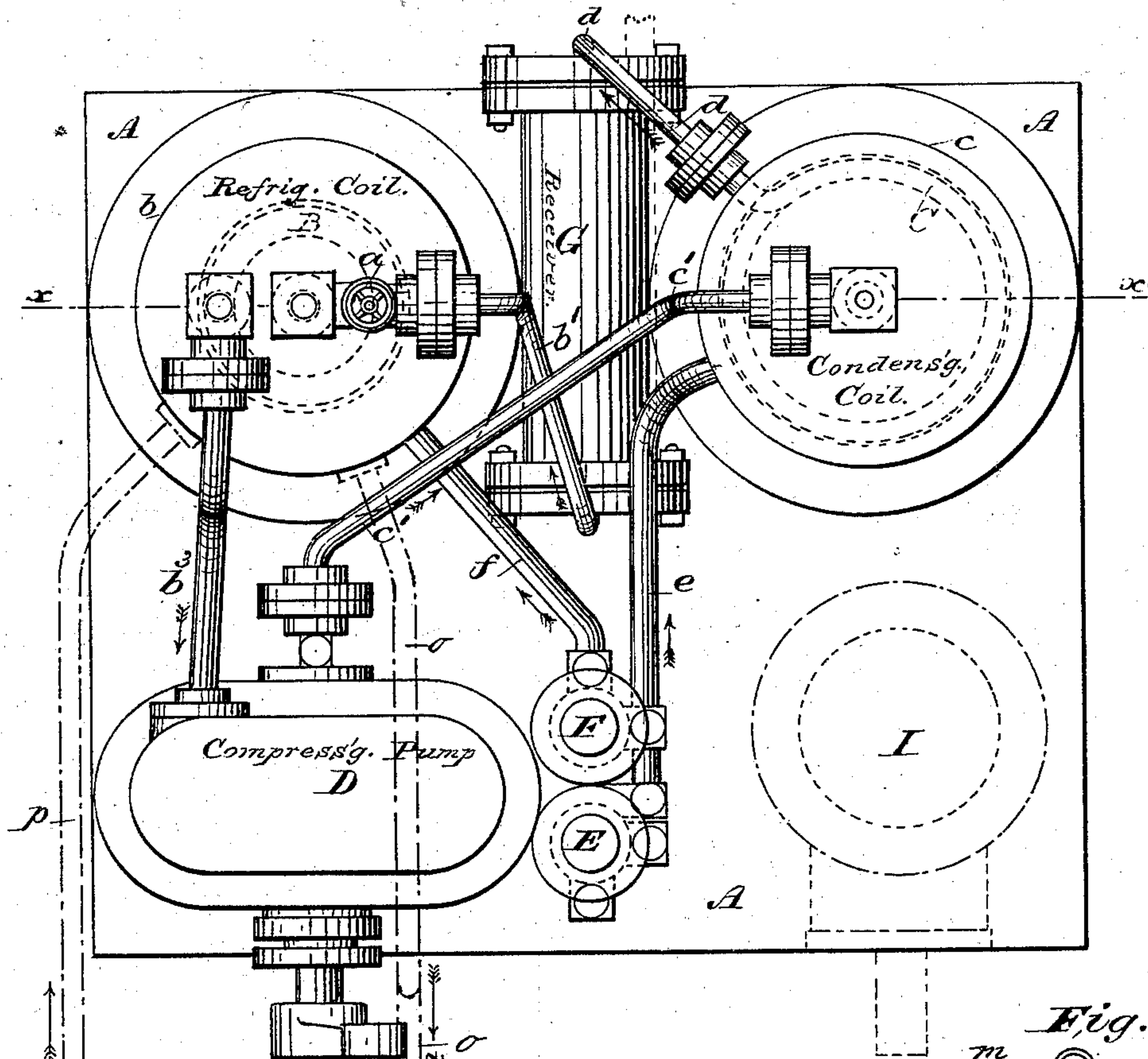
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Fig. 3.



from top of box H

to bottom of box H

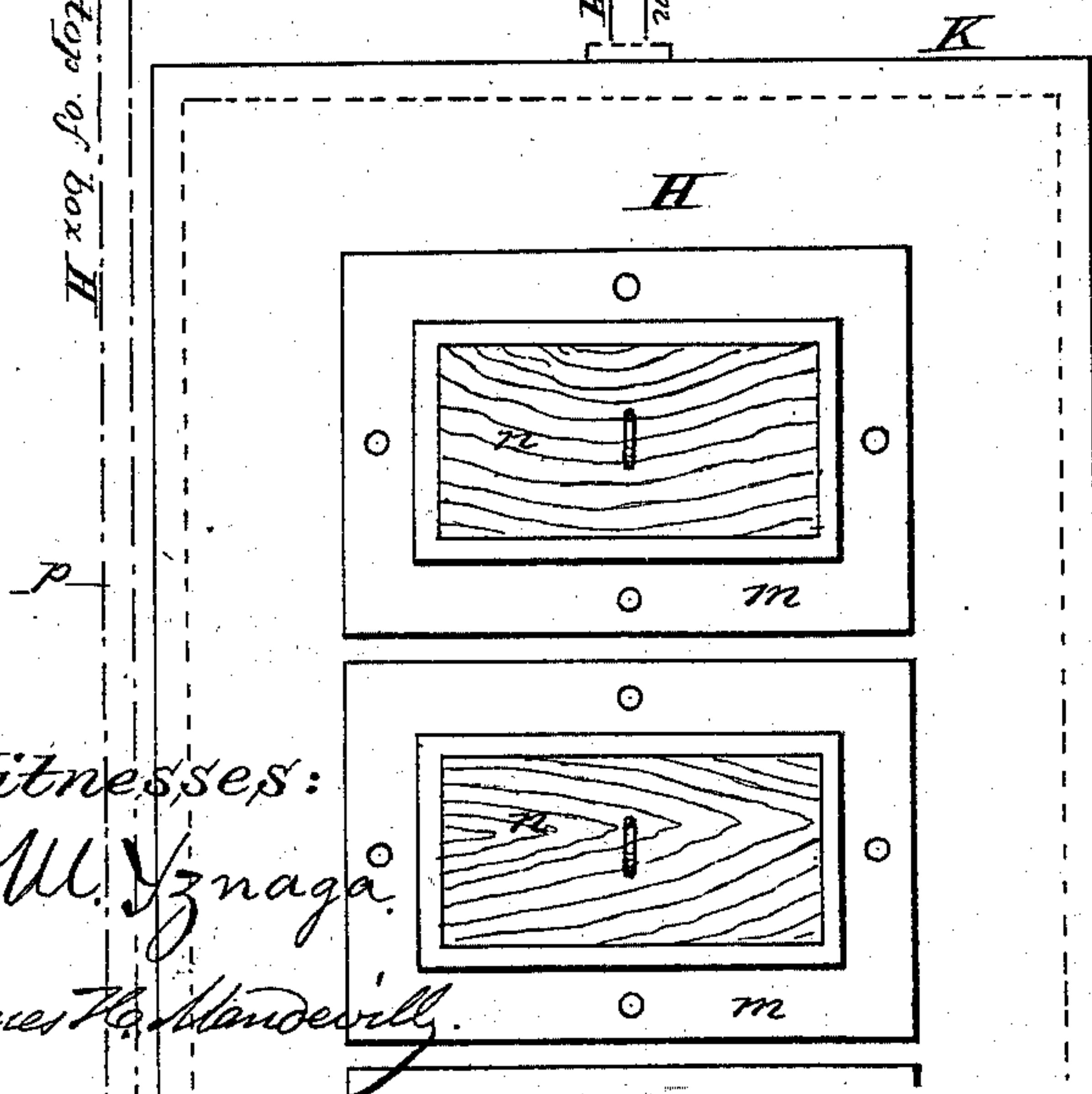
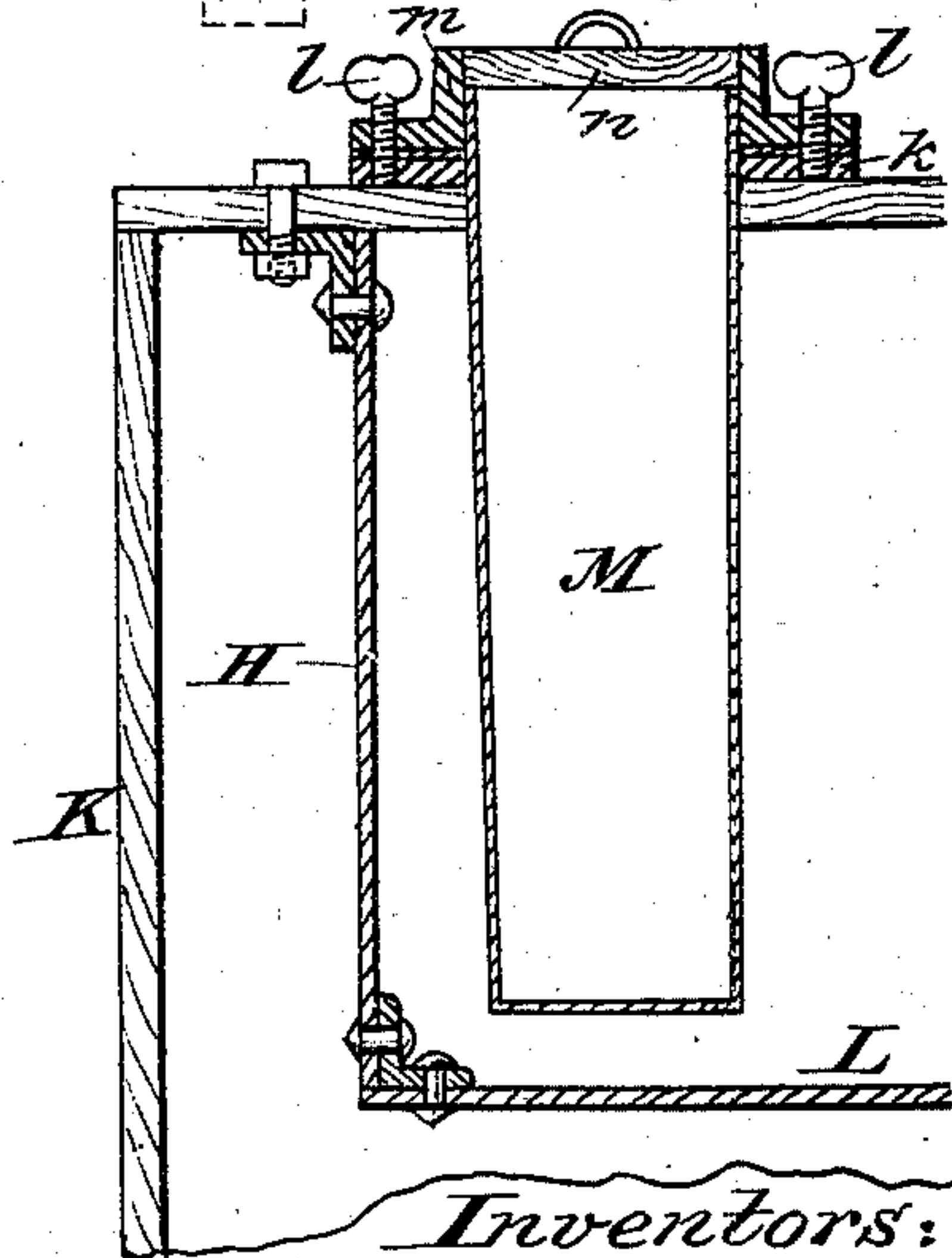


Fig. 4.



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UNITED STATES PATENT OFFICE.

WILLIAM M. WOOD AND WILLIAM L. BAILIE, OF WASHINGTON, D. C.

ICE-MACHINE.

SPECIFICATION forming part of Letters Patent No. 283,054, dated August 14, 1883.

Application filed June 20, 1883. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM M. WOOD and WILLIAM L. BAILIE, both citizens of the United States, residing at Washington, District of Columbia, have invented certain new and useful Improvements in Ice-Machines; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

Our invention relates to improvements in processes of and apparatus for the manufacture of ice or producing cold air; and the object is to produce ice or cold air in a more economical manner than has hitherto been done, and to furnish machinery that will be less complicated, take up less space, and that is especially adapted for vessels by placing all the main parts on a bed-plate made in one piece, so that the different joints are not affected by the working of the vessel, and thereby leakage of ammonia vapor is prevented and a more perfect machine is produced.

Our invention consists in the construction and arrangement of the parts, as will be more fully described hereinafter, and specifically pointed out in the claims, reference being had to the accompanying drawings and the letters of reference marked thereon.

Like letters indicate like parts in the different figures of the drawings, in which—

Figure 1 represents a vertical section on line *xx* of Fig. 3, showing the condensing-coil and the refrigerating-coil, &c. Fig. 2 is an end elevation of the apparatus. Fig. 3 is a plan view of the same. Fig. 4 is a detail view of the refrigerating-box. Fig. 5 is a vertical section of the compressing-pump.

In the drawings, A is the bed-plate, made sufficiently strong to resist the ordinary strains or workings of a vessel, and is preferably made of one piece of metal. To this bed-plate are bolted the refrigerating-coil B, the condensing-coil C, the compressing-pump D, the circulating-pumps E F, the receiver G, for the liquid ammonia, and a suitable engine, I. The refrigerating-coil is surrounded by a casing, *b*, filled with cork or other suitable non-conducting material, and is connected by a pipe, *b'*, with the lower end of the receiver G. The liquid ammonia is carried up the pipe *b'* until

it reaches a regulating-valve, *a*. At this point evaporation begins, and continues down the vertical pipe *b''*, through the coil B, through the pipe *b'''*, from whence it is conveyed to the receiving part of the compressing-pump D. In this pump it is compressed and forced through the pipe *c'* into the upper end of the condensing-coil C, in which it is liquefied, and falls back through the pipe *d* into the receiver, to be used over again. The pump E receives its water from any suitable source of supply, and forces it through a pipe, *e*, in at the bottom of the casing *c* of the condensing-coil C, and, after performing its work of condensation of the ammoniacal gas, it is discharged through a pipe, *c''*, at the top of the casing *c*. The pump F receives its source of supply of refrigerating medium from the top of the refrigerating-box H. From thence it is forced through the casing *b* by a pipe, *f*, at the bottom of refrigerating-coil B, and traverses the coil, thereby becoming deprived of its heat, is forced through an opening at the top of casing *b*, and is returned to the refrigerating-box, thus acting in a continuous cycle. By this arrangement of outlet and inlet it is impossible to overflow the refrigerating-box; or, if the pump F should cease to draw from the box, the supply to the box will also cease.

In case of very large machines the bed-plate may be made in pieces, but must be then bolted or jointed together so firmly as to form virtually one piece.

The refrigerating-box H consists of an outer wooden casing, K, to the top of which the supporting-plates *k* are secured. In this casing is arranged an iron tank, L, containing the refrigerating medium, into which the boxes M project. In said boxes the cakes of ice are formed, and they are detachably secured to said plate *k* by suitable thumb-screws, *l*, which pass through the annular flange *m*, attached to the boxes. A wooden cover, *n*, is then placed on the boxes. A pipe, *o*, connects with the top of the box H and bottom of the coil B, while a pipe, *p*, connects with the bottom of the box H and top of the coil B to form a complete circulation for the refrigerating medium.

If it is desired to cool the air, pipes may be arranged in the rooms to be cooled in the usual well-known manner.

It will be readily perceived that our ice-ma-

chine can be made of any desired size and capacity; but in all cases it will occupy a much smaller space in proportion to capacity than any other ice-machine. It is simple in construction. No leakage of ammonia can possibly occur, as there are no joints which cannot be properly packed. The joints will not be affected by the working of the vessel, as all the parts are on a solid bed-plate. The parts are not liable to get out of order, as they are very simple in construction. All the parts are easily accessible in case of needed repairs or replacement of any parts, and it can be furnished at a very small expense.

15 Having thus described our invention, what we claim, and desire to secure by Letters Patent, is—

1. In an ice-machine, the bed-plate A, cast in one piece, in combination with the refrigerating-coil, condensing-coil, receiver, circulating-pumps, and a compressing-pump, all constructed and arranged substantially as and for the purpose specified.

2. In an ice-machine, the combination of the 25 compressing-pump, constructed as shown, with a pipe, c' , condensing-coil C, pipe d , and a receiver, G, all arranged, substantially as set forth, on a bed-plate cast in one piece.

3. The combination of the compressing-pump 30 D, constructed as shown, with the receiver G, pipe b' , regulating-valve a , pipe b^2 , refrigerating-coil B, pipe b^3 , pipe c' , condensing-coil C, and pipe d , all arranged in the manner and for the purpose specified.

35 4. The combination of a bed-plate, A, a refrigerating-coil, B, a condensing-coil, C, a compressing-pump, D, circulating-pumps E F, a receiver, G, and an engine, all arranged on said bed-plate, substantially as specified.

40 5. The combination of a refrigerating-coil, B, and a pump, F, with a refrigerating-box, H, pipe o , connecting the top of casing b and the

bottom of said box H, and a pipe, p , connecting the bottom of casing b and the top of said box H to act as a cycle, substantially as and 45 for the purpose specified.

6. In an ice-machine, the combination of the condensing-coil C and casing c with a pump, E, a pipe, c' , communicating with the bottom of said casing, and a pipe, c^2 , for discharging 50 the water at the top of said casing, substantially as set forth.

7. The process herein described, consisting in drawing the liquid ammonia from a receiver, evaporating it at the upper part of a refrigerating-coil, drawing it to a compressing-pump, 55 then forcing it into a condensing-coil and returning the liquefied ammonia to the receiver, substantially as specified.

8. The process herein described, consisting 60 in forcing water by means of a pump into the bottom of a casing surrounding the condensing-coil of an ice-machine and discharging it at the top, while at the same time drawing a refrigerating medium from the top of a re- 65 frigerating-box, forcing it in at the bottom of a casing surrounding a refrigerating-coil, and after traversing said coil returning it to the bottom of the refrigerating-box, substantially as set forth. 70

9. The method herein described of drawing a refrigerating medium from the top of a refrigerating-box, forcing it in at the bottom of a casing surrounding a refrigerating-coil, and after traversing said coil, thereby depriving it 75 of its heat, returning it to the bottom of a refrigerating-coil.

In testimony whereof we affix our signatures in presence of two witnesses.

WILLIAM M. WOOD.
WM. L. BAILIE.

Witnesses:

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