

(No Model.)

L. STERNE & T. R. MURRAY.

REGULATOR FOR REFRIGERATING OR FREEZING MACHINES.

No. 509,263.

Patented Nov. 21, 1893.

FIG. 2.

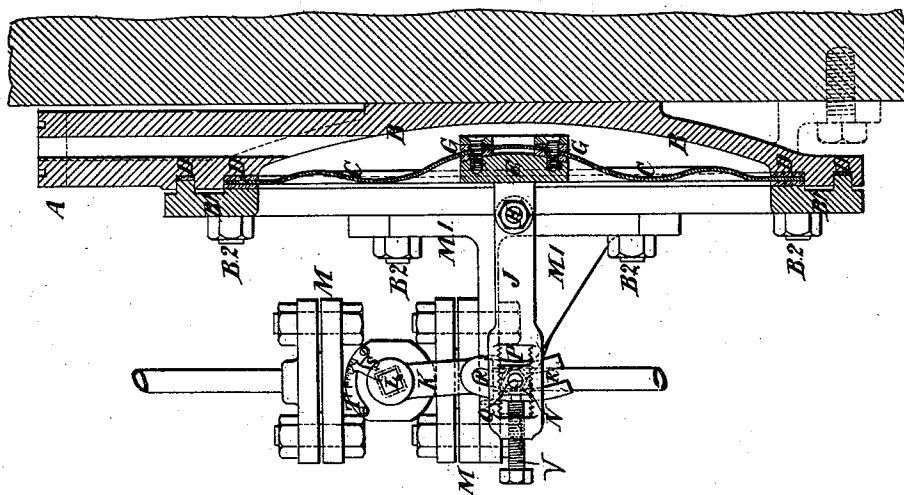
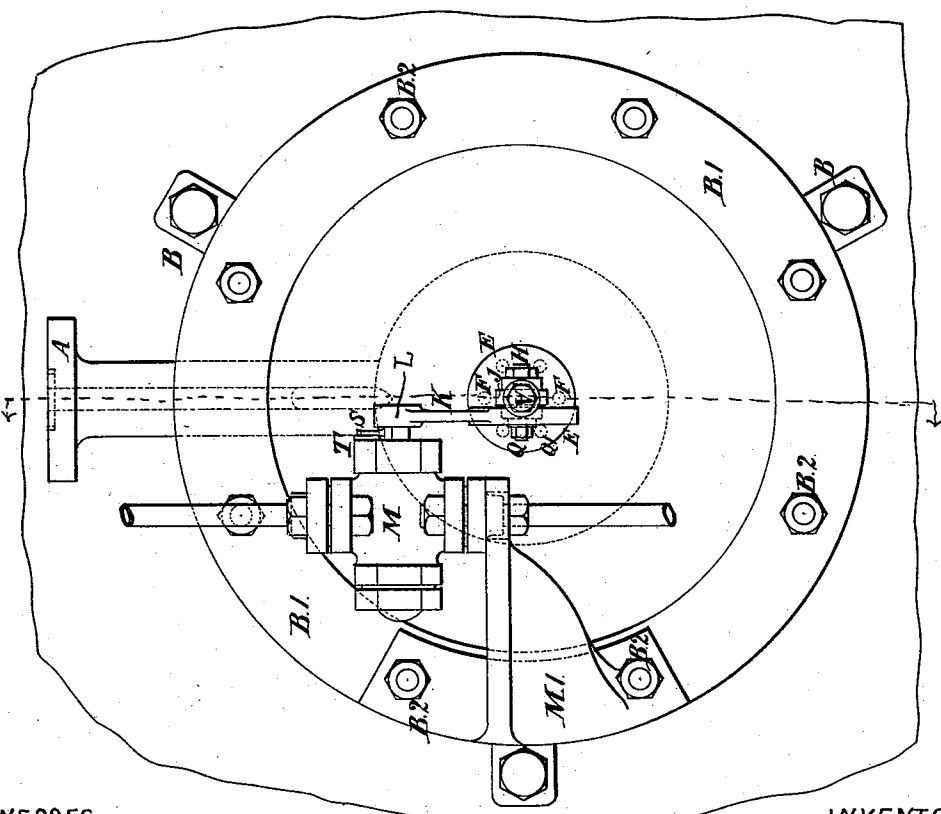


FIG. 1.



WITNESSES

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REGULATOR FOR REFRIGERATING OR FREEZING MACHINES.

SPECIFICATION forming part of Letters Patent No. 509,263, dated November 21, 1893.

Application filed July 8, 1892. Serial No. 439,327. (No model.)

To all whom it may concern:

Be it known that we, LOUIS STERNE, a citizen of the United States of America, and THOMAS ROBERTS MURRAY, a subject of the Queen of Great Britain and Ireland, residents of Glasgow, in the county of Lanark, Scotland, have invented certain Improvements in Regulators for Refrigerating or Freezing Machines, of which the following is a specification.

Our said invention has for its object the prevention automatically of certain objectionable actions which may take place in machines for refrigerating or freezing by means of volatile liquids. In machines of the kind referred to, the refrigerating or freezing action is due to the volatilization and expansion of liquid ammonia, or liquid carbonic acid, or ether, or other analogous agents, the volatilized agent, after acting, being returned to compressing pumps, and to a cooling tubular or other receiver to be restored to the liquid condition. In some cases when the regulation, which is ordinarily effected by hand, is imperfect, it is possible for the agent to return to the pumps in an incompletely expanded state, or occasionally even in the liquid form, and for it to expand when being drawn into the pumps and occasion inconvenience and trouble.

In carrying out our invention we apply automatic regulating mechanism to the cock or valve, through which the agent in its liquid condition passes to the expansion apparatus. For this purpose the return pipe by which the agent passes back to the pumps is connected to a shallow circular chamber, closed by a diaphragm of thin steel or other suitable metal, carefully secured with lead-packed or other suitable joints through which the agent cannot leak. The middle of the diaphragm is connected by a link to a lever, fixed on the spindle of the cock or valve in such a manner as to cause the closing or opening of the cock or valve, accordingly as the pressure of the returning agent rises or falls.

Figure 1, of the drawings is a front elevation and Fig. 2, a side elevation with the shallow circular chamber and diaphragm shown in section.

In the drawings the same reference letters are used to mark the same or like parts wherever they are repeated.

The return pipe (not shown) by which the volatile agent passes back to the pumps is connected to a flanged inlet pipe, A, communicating with a shallow circular chamber, B, closed by a diaphragm, C, of thin steel or other suitable material, carefully secured with joints, D, through which the agent cannot leak. There are two annular joints, D, the inner of which is preferably packed with lead the outer one being packed with a more compressible material such as rubber. The diaphragm, C, is held in position by means of a covering ring, B', which is fixed to the circular chamber, B, by means of the bolts, B². To the middle of the diaphragm, C, a boss, E, is fixed by screws, F, the joint, G, being made with lead or other suitable material so as to prevent any leakage of the volatile agent; and the boss, E, has jointed to it by a pin, H, a link, J, which is connected to a lever, K, fixed on the spindle, L, of the regulating cock or valve, M, in such a manner as to cause the closing or opening of the cock or valve accordingly as the pressure of the returning volatile agent rises or falls within the circular chamber, B. The cock or valve, M, is carried by a bracket, M', which is fixed to the ring or cover, B', by some of the bolts, B². The connection of the link, J, with the lever, K, is made minutely adjustable, as regards the effective length of the link, by means of a movable grooved block, N, which fits in counterpart grooves in the sides of a slot, P, formed in the link; and the connection of the link with the lever, K, is also made minutely adjustable, as regards the point of action on the lever, by means of a pin, Q, which projects through an eye in the block, N, and which can be adjusted in a slot or fork, R, formed in the lever, K, the pin Q, being fixed by a screw nut, Q'. A pointer, S, is attached to the spindle, L, of the cock or valve, M, and indicates on a graduated plate, T, fixed to the body of the cock, the extent of opening of the cock or valve at any particular moment. A screwed pin, V, working in the end of the link, J, is used for pinching the movable block, P, and for facilitating the operation of adjustment.

What we claim is—

1. In a pressure regulator, the combination with the controlling valve, and the diaphragm

of the pressure chamber, of a link connected to said diaphragm, a lever connected to the valve, with a double adjustable connection between the link and lever whereby the effective length of the link may be regulated and the fulcrum of the lever shifted as desired, substantially as described.

2. In a pressure regulator, the combination with the valve, and the diaphragm of the pressure chamber, of a link connected to the diaphragm provided at its upper end with a grooved slot, a block fitted in said slot, a lever connected with the valve and provided with a curved slot or fork, a pin adapted to said slot and connected with the block on the link, with means for adjusting the block,

whereby the double adjustment of the link and lever is effected, substantially as described.

In testimony whereof we have signed our names to this specification in the presence of subscribing witnesses.

LOUIS STERNE.
THOMAS ROBERTS MURRAY.

Witnesses to the signature of Louis Sterne:
CHAS. ROCHE,
HARRY PETER VENN.

Witnesses to the signature of Thomas Roberts Murray:

EDMUND HUNT,
DAVID FERGUSON.