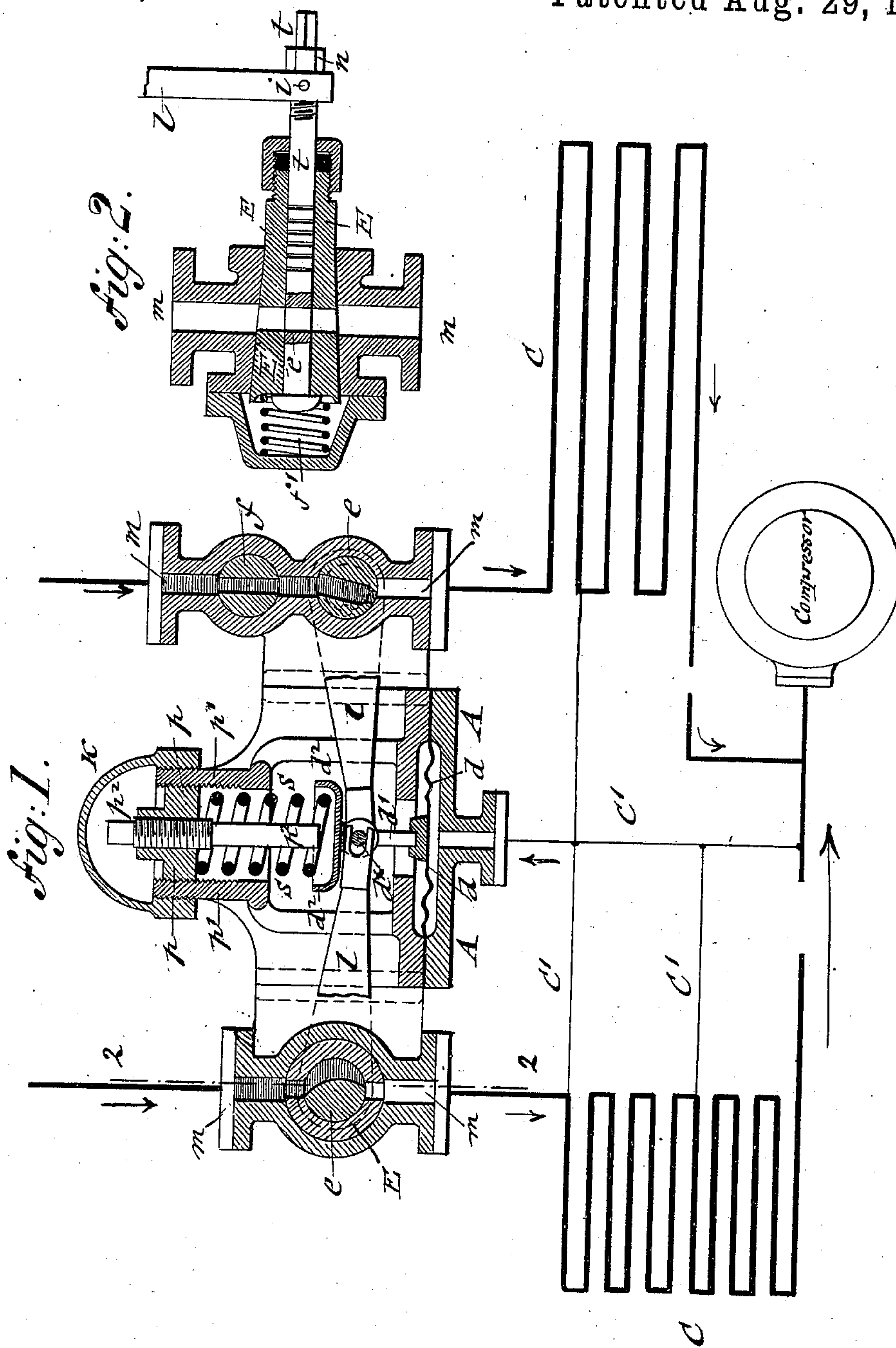


(No Model.)

P. I. SCHMALTZ.
AUTOMATIC PRESSURE REGULATOR FOR REFRIGERATING MACHINES.
No. 504,092.

Patented Aug. 29, 1893.



WITNESSES

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UNITED STATES PATENT OFFICE.

PAUL I. SCHMALTZ, OF HAMBURG, GERMANY.

AUTOMATIC PRESSURE-REGULATOR FOR REFRIGERATING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 504,092, dated August 29, 1893.

Application filed December 12, 1891. Serial No. 414,776. (No model.)

To all whom it may concern:

Be it known that I, PAUL I. SCHMALTZ, a subject of the German Emperor, residing in Hamburg, in the Empire of Germany, have invented certain new and useful Improvements in Pressure-Regulators, of which the following is a specification.

This invention relates to pressure regulators principally designed for use in connection with refrigerating apparatus.

In the accompanying drawings, Figure 1 represents a diagram of the low pressure coils of a refrigerating plant in which my improved pressure-regulator is drawn on a larger scale and in vertical longitudinal section; and Fig. 2 is a vertical longitudinal section on line 2 2, Fig. 1.

Similar letters of reference indicate corresponding parts.

Referring to the drawings, C C is a diagrammatic illustration of the low pressure-coils of a refrigerating apparatus, in which coils the refrigerating medium is permitted to expand so as to be at low tension therein. The low pressure-coils are connected by one or more pipes C' C' shown diagrammatically with each other and with a diaphragm-chamber A the flexible diaphragm d of which is acted upon at one side by the pressure of the expanded refrigerating medium in the coils C, while the other side of the diaphragm is acted upon by atmospheric pressure. To the center of the diaphragm d is attached a spindle d' to the upper end of which a cup-shaped plate d^2 is applied, between which and a screw-plug p a helical cushioning spring s is interposed. The screw-plug p screws into an interiorly-threaded fixed sleeve p' that is supported by the frame of the pressure-regulating device. In the plug p is adjusted a central rod p^2 which extends downward toward the spring-supporting cup d^2 and which serves as a stop for the diaphragm d when the maximum-expansion of the same is reached. The stop p^2 is adjusted in the plug p by applying a wrench to the square upper end of the same. The tension of the spring s is adjusted by the threaded plug p which is likewise provided with a head for applying the adjusting wrench. The fixed sleeve p' is further provided with an exterior screw-thread over which is screwed

a cap k which is preferably of hemispherical shape and which serves to protect the tension-adjusting devices of the spring and the stop-device against being tampered with.

The spindle d' is provided below the cup-shaped supporting plate d^2 with a fixed pivot-pin d^x to which are attached the forked end or ends of one or more levers l which are fastened at their opposite ends to the spindle or spindles of an expansion-cock or cocks e so that they are turned on their axes when the pressure in the refrigerating-coils C and the diaphragm-chamber A rises so that the supply-channel m is closed to a greater or less extent in proportion to the pressure, while the same is opened when the pressure is diminished so as to permit thereby a smaller or larger amount of the refrigerating medium to pass from the high-pressure side of the refrigerating apparatus to the low pressure or expansion-side of the same.

It may be advisable in some cases to have several connecting pipes C' between the low pressure coils C, so as to more uniformly equalize the pressure in the expanding coils C and produce thereby a mean pressure in the diaphragm-chamber. This however is not necessary in all cases, as for most purposes one connection C' between the expanding coils will be sufficient.

In addition to the expansion-cock or valve e it is advisable to use a stop-cock f in the supply-channel, by the use of which the expansion-cock e can be given a loose fit so that it will turn easier and can be adjusted with greater facility. The position of the stop-cock f relatively to the expansion-cock e is dependent on other arrangements of the refrigerating plant and may be located either on the high pressure or low pressure side of the expansion-cock. The stop-cock may also be arranged in the nature of a casing for the expansion-cock e , as shown at E on the left-hand side of Fig. 1 and in section in Fig. 2, in which case the entire arrangement is more compact and convenient for use. As shown on the right hand side of Fig. 1, it is located in the supply channel leading to the expansion cock. The lever l is in this case connected with the valve-spindle t , which is threaded at its outer end, by means of a threaded eye in its end,

a jam-nut n and after adjustment by a pin or key i . The spindle t may be of straight or tapering shape and provided with a recess at that part e which is in line with the supply-channel. To the spindle t is applied the stop-cock E which is shown in Fig. 2 to be of conical shape and retained in its seat by a spring f' that presses on the larger end of a stop-cock f and which is inclosed by a suitable casing f^2 . A stuffing-box is arranged at the outer end of the stop-cock where the spindle t passes to the outside so as to prevent any escape of the refrigerant. The expansion-cocks may be preferably packed with asbestos, which requires but a small degree of pressure to secure the tight fitting of the parts. The supply-channels are preferably made in one casting with the supporting-frame, one section of the diaphragm-chamber and the fixed sleeve in which the screw-plug for the pressure-regulating spring of the diaphragm is arranged.

By my improved pressure-regulator, the pressure in the low pressure-coils or chambers is automatically regulated and uniformly retained at the pressure required in said coils. It dispenses thereby with the unreliable regulating by hand and with the necessity for skillful and trained mechanics for attending to refrigerating plants.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination of a low pressure coil, a supply channel therefor, a regulating cock in said supply channel for regulating the flow of fluid thereto from the high pressure coil, a chamber a diaphragm in said chamber ex-

posed on one side to the fluid pressure of said low pressure coil, a spindle connected with said diaphragm and provided with a cup, a screw-threaded sleeve disposed opposite said diaphragm, a screw-plug in said sleeve, a spring, an adjustable stop pin extending through said plug, and a lever connecting said spindle with said regulating cock.

2. The combination of a low pressure coil, a diaphragm chamber, pipes connecting said coil with said diaphragm chamber, a diaphragm in said chamber, a regulating plug arranged in the supply channel for the low pressure coil, and a stop cock surrounding said regulating cock in said supply channel.

3. The combination of two low pressure coils or chambers, supply channels therefor, regulating cocks in said supply channels, a diaphragm chamber, a diaphragm in said chamber, pipes connecting said coils with said diaphragm chamber on one side of said diaphragm, a spindle attached to said diaphragm, levers connecting said diaphragm with said regulating cocks, a spring acting on said spindle, a threaded guide sleeve, a screw plug in said threaded guide sleeve for adjusting the tension of said spring, a stop device attached to said screw plug, and a protecting cap on said sleeve.

In testimony that I claim the foregoing as my invention I have signed my name in the presence of two subscribing witnesses.

PAUL I. SCHMALTZ.

Witnesses:

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Baumstr.