(No Model.)

A. KRASTIN.

PRESSURE REGULATOR.

No. 588,113. Patented Aug. 10, 1897.

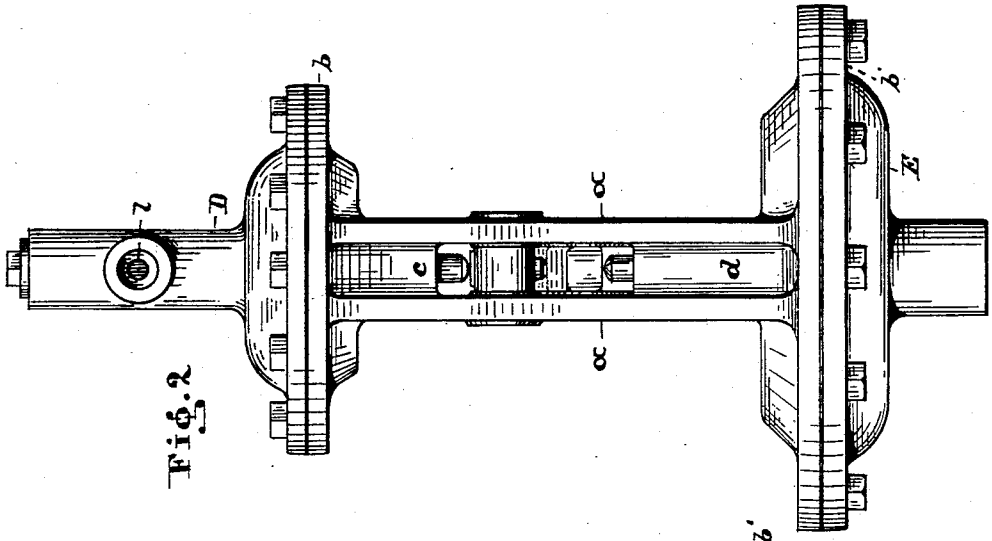

Fig. 2

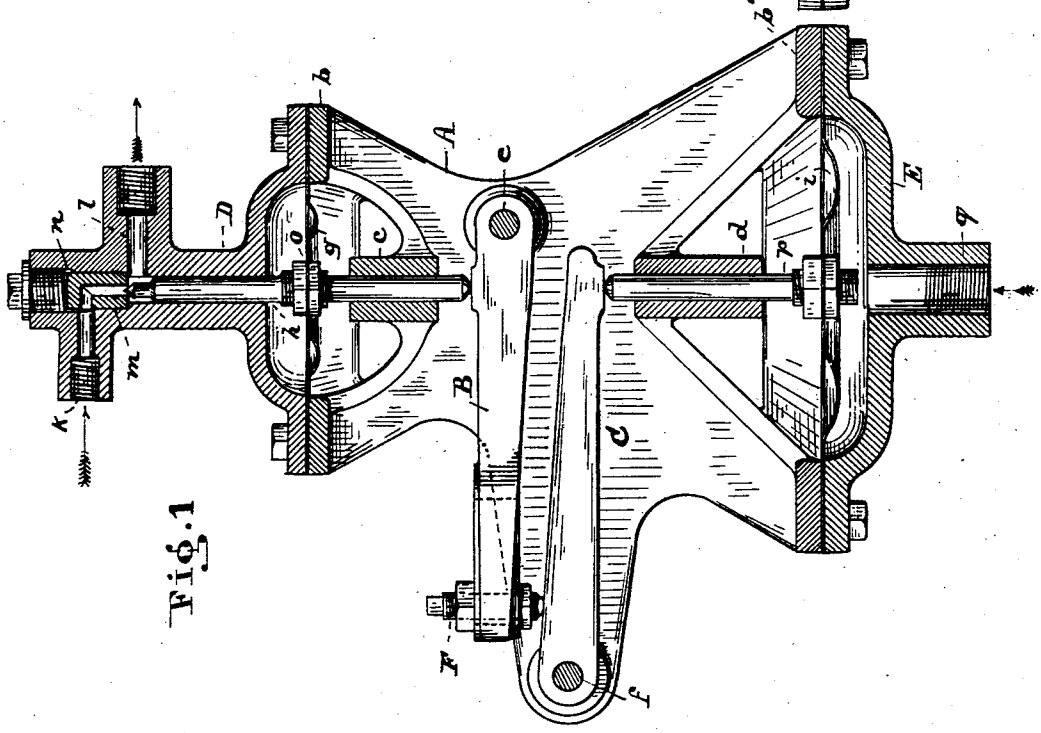

Fig. 1

WITNESSES

Paul Krastin

S. Q. Kerrnish

INVENTOR

August Krastin

BY B. F. Eibler

Atty.

UNITED STATES PATENT OFFICE.

AUGUST KRASTIN, OF CLEVELAND, OHIO.

PRESSURE-REGULATOR.

SPECIFICATION forming part of Letters Patent No. 588,113, dated August 10, 1897.

Application filed April 21, 1896. Serial No. 588,490. (No model.)

To all whom it may concern:

Be it known that I, AUGUST KRASTIN, a subject of the Czar of Russia, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Compound-Lever Pressure-Regulating Apparatus; and I 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.

My invention relates to an improved pressure-regulating apparatus which is more particularly adapted to serve in the capacity of a feed or automatic expansion valve in connection with refrigerating or ice-making machinery between the so-called "high and low pressure sides" thereof.

The objects of my improvement are, first, to render the apparatus extremely sensitive in operation, and, second, to afford facilities for a proper adjustment of the feed-controlling parts thereof. I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 represents a transverse sectional view of said apparatus, and Fig. 2 is an exterior side view of the same.

Like letters of reference denote like parts in the drawings and specification.

In pressure-regulating contrivances it is the peculiar application of compound levers which constitutes the essential feature of my invention. The said levers are interposed between the valve part of the apparatus or contrivance and the means of or for controlling the extent of "lift" of said valve from off its seat, and all of which parts being arranged in a neat, compact, and adjustable manner in and with a frame formed or constructed substantially as shown in Figs. 1 and 2. Said frame A proper consists of the sides *a a*, the flanges *b b'*, and the bearings *c d*. At *e* and *f* support is had for the levers B C, and attached to said flanges is the valve-casing D and bonnet E, each of which having interposed a metallic flexible disk or plate *g* and *i*. (See Fig. 1.) The plate *g* is employed in preference of a stuffing-box for the stem *h* of the valve, while the plate *i* serves as a pressure-yielding cover over said bonnet, which is thereby rendered useful as a means for applying a counter-pressure against the valve-stem *h* in the manner as hereinafter described.

As shown, the valve-casing D has its inlet at *k* and outlet at *l*, and the branches thereof are adapted for pipe connection, as shown in Figs. 1 and 2. The seat for the needle-point of the stem *h* is formed by means of the angularly-perforated plug *m*, which is inserted through the plugged opening *n*. This seat for the stem might be formed in the valve proper, but a plug of hardened steel is preferable for obvious reasons.

At *o* the stem *h* is securely fastened to the plate *g*, from where said stem extends through the guide or bearing *c* to make contact with the lever B. Likewise is fastened a pin *p* to the plate *i*, which extends through the guide *d* and bears against the free end of the lever C.

The levers B and C are held apart by means of the set-screw F, and the latter can be adjusted within the slotted free end of the lever B to effect a compound action of said levers in a degree and manner as required under variable conditions.

The bonnet E is equipped at *q* for connection with the pipe system leading from or being in open relation with the valve-outlet *l*. Thus the very pressure which is prevailing in said pipe system becomes active as an agent for controlling the feed from *k* to *l*, which parts respectively represent the high and low pressure sides of or in a refrigerating apparatus. In the high-pressure side a highly-volatile liquid is contained, and it is through the valve that said liquid is expanded into gaseous state of a predetermined pressure, which in passing through the low-pressure pipe system produces the refrigerating effect. A rise above the normal pressure thus causes a bulging out of the plate *i* in direction toward the valve-stem, which thereupon approaches its seat until by either an entire closing of the valve or a diminished feed through said valve the normal pressure becomes reëstablished.

The peculiar arrangement of the levers in relation to the stem *h* and the pin *p*, together with the movable set-screw F, permits of adjusting the apparatus with regard to the flexibility of the plates *g* and *i* as well as to the pressure which is to be maintained in the low-pressure pipe system.

Although the above-described apparatus has been pointed out as being particularly suited for use as an expansion-valve in refrigerating apparatuses, it is evident, however, that the same may generally be used in the capacity of an automatic pressure reducing or regulating valve.

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

1. In a pressure-regulating apparatus the combination with the valve D and needle-stem *h* of the flexible disk *g*, bonnet E with yielding cover *i*, frame A supporting said valve and bonnet, one opposite the other, and levers B, C, placed between the sides of said frame in contact with needle-stem *h* and yielding cover *i* and the free end of lever B having adjustable connection upon lever C near the pivot thereof, all constructed and arranged as and for the purpose set forth.

2. In a pressure-regulating apparatus the combination of the frame A comprising the sides *a a*, flanges *b b* and bearings *c d*, the bonnet E with pressure-yielding cover *i* secured to one of said flanges, the valve D with needle-stem *h* and flexible disk *g* attached to the other flange, the lever B pivoted at *e* in contact with the stem *h* and provided with a longitudinally-adjustable set-screw F, and the lever C pivoted at *f* bearing against screw F and resting upon said cover all constructed substantially as and for the purpose described.

In testimony whereof I affix my signature in presence of two witnesses.

AUGUST KRASTIN.

Witnesses:
B. F. EIBLER,
S. Q. KERRUISH.