

(No Model.)

E. RUEFF.
PRESSURE REGULATING STOP COCK.

No. 399,565.

Patented Mar. 12, 1889.

Fig. 1.

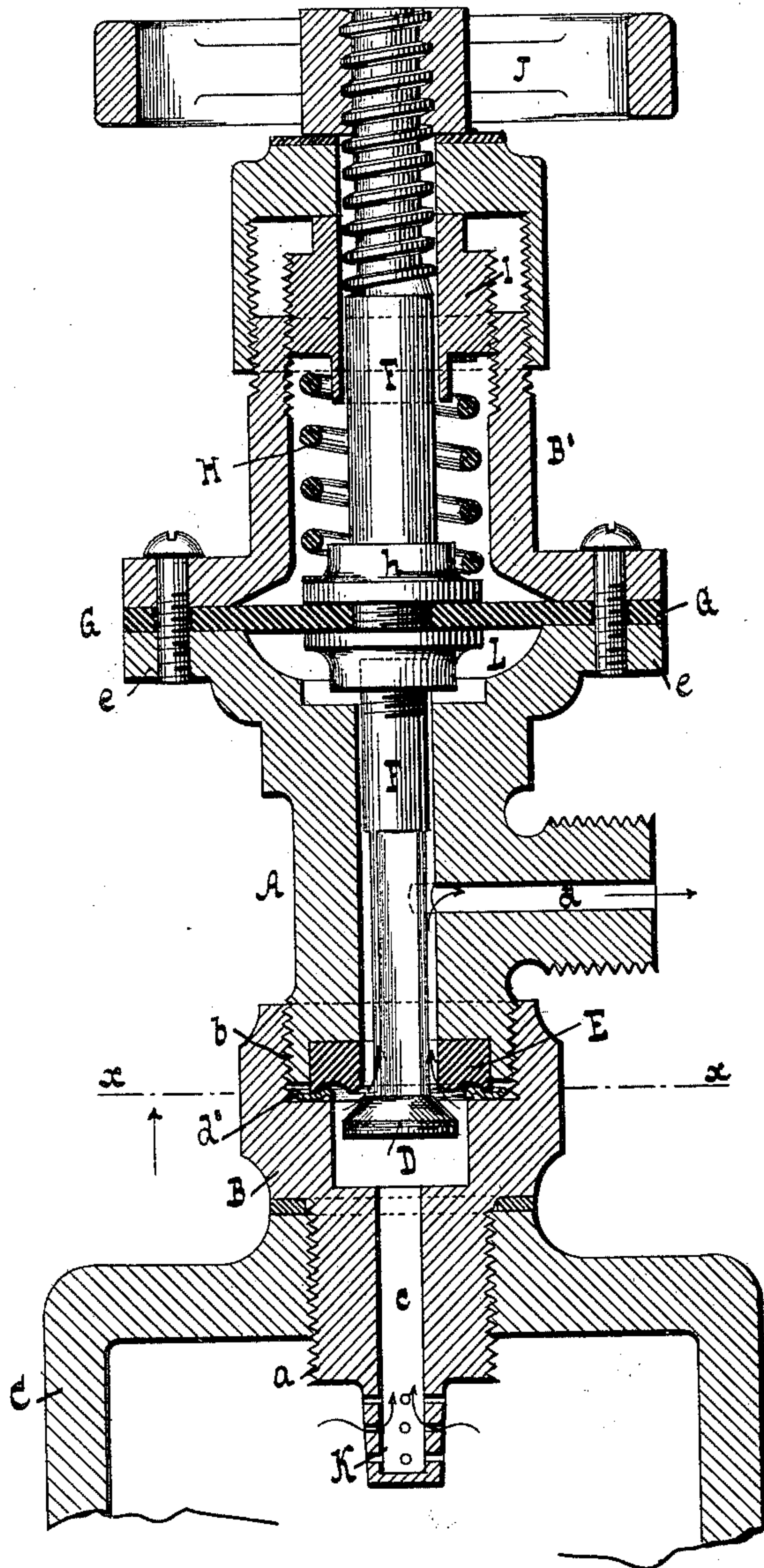
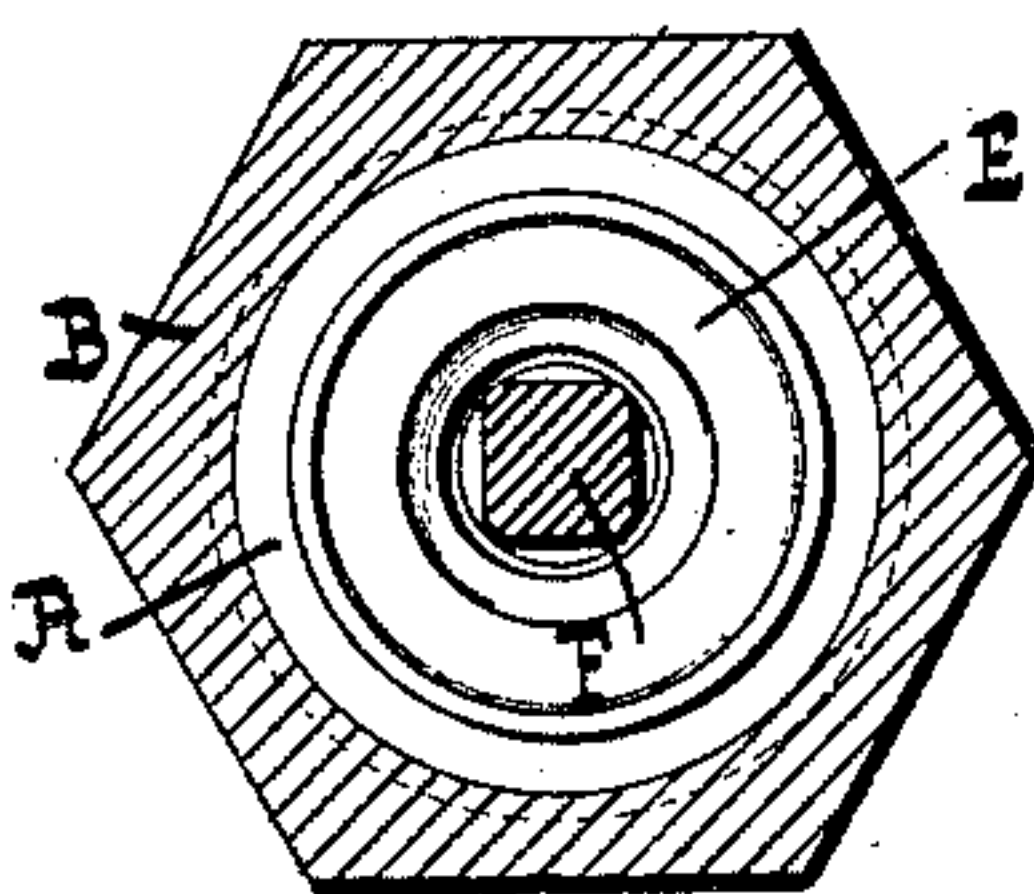


Fig. 2.



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PRESSURE-REGULATING STOP-COCK.

SPECIFICATION forming part of Letters Patent No. 399,565, dated March 12, 1889.

Application filed May 24, 1888. Serial No. 274,902. (No model.)

To all whom it may concern:

Be it known that I, EMIL RUEFF, a subject of the King of Bavaria, residing at New York, in the county and State of New York, have
5 invented new and useful Improvements in Pressure-Regulating Stop-Cocks, of which the following is a specification.

My invention relates to a pressure-regulating stop-cock which is especially intended
10 for use in dealing with fluids under a very high pressure—such, for instance, as liquid carbonic acid.

The object of my invention is, first, to provide a perfectly-tight cock without the use of
15 the ordinary stuffing-box about the exit of the valve-stem from the casing, such stuffing-boxes invariably causing trouble by leakage when fluids under a very high pressure are passed through the stop-cock; secondly, my
20 object is to cause the stop-cock to regulate the pressure of the fluid passing therethrough.

The peculiar and novel construction whereby the above-stated object is accomplished is more fully pointed out in the following specification and claim, and illustrated in the accompanying drawings, in which—

Figure 1 represents a longitudinal section of a stop-cock constructed according to my invention. Fig. 2 is a transverse section
30 thereof in the plane $x x$, Fig. 1.

Similar letters indicate corresponding parts.

In the drawings, the letter A designates the upper section of the casing of my stop-cock. B is the lower section, which is provided at
35 one end with a screw-nipple, a , by means of which it can be connected with the flask C, which contains the liquid carbonic acid or other fluid under a high pressure. A screw-socket at the upper end of the section B en-
40 gages with a screw-thread, b , at the lower end of the section A, whereby the two sections are united.

In the casing A B is formed the usual receiving-channel, c , and the delivery-channel
45 d , through which the fluid contained in the flask C passes for distribution.

D is the valve, which is located in the receiving-channel c and can be moved toward and from a seat, E, formed in the lower end
50 of the section A. In the example shown in the drawings the seat is made, by preference,

hard, of vulcanized rubber, and in the form of a ring, which is set into a circular recess in the end of the section A. A suitable metallic packing-ring, d' , placed in a recess in the
55 top of the casing-section B, bites into the material of the seat E when the two sections are united and forms a perfectly-tight joint, whereby leakage below the valve D is pre-
60 vented.

The valve-stem F, attached to the valve D, is extended upward through the casing, and in the length of the same is secured, by any
suitable means, a diaphragm, G, the edge of which is secured air-tight to a suitable flange, e , on the casing-section A.
65

In the example shown in the drawings the diaphragm is made of soft rubber, so as to be flexible; but it may be made of sheet metal or any other suitable material. To secure it
70 air-tight and firmly to the section A, its edges are clamped between the flange e of the same and a flanged cover, B'.

The exterior portion of the valve-stem F is subjected to the action of a spiral spring, H,
75 which is located between a shoulder, h , on the stem and an adjusting-screw, I, which is provided with a thread engaging an internal thread in the cover B'. By turning the screw I, the tension of the spring H on the valve-
80 stem, and consequently on the diaphragm G, can be regulated.

The exterior portion of the valve-stem is provided with a screw-thread, f , which is engaged by a hand-wheel or nut, J, resting on
85 the top of the cover. It is evident that instead of having the spring H in engagement with the valve-stem it could be made to engage directly with the diaphragm.

It will be noticed that by turning the hand-wheel or nut J in one direction the valve D is moved toward its seat E and closed by the action of the screw-thread on the valve-stem F and the screw-thread in the nut or hand-wheel. If the hand-wheel or nut is moved in
95 the opposite direction the spring H forces the valve-stem downward, and consequently opens the valve.

The action of the diaphragm and spring G, as in ordinary pressure-reducing valves, serves
100 to close the valve when the pressure on the inside of the diaphragm that is in the low-

pressure chamber L becomes greater than the pressure of the spring H on said diaphragm, and to open the said valve when the pressure again falls below the tension of the
5 spring.

It is evident that other mechanism can be substituted in place of the hand-wheel or nut and the screw-thread for moving the valve-spindle. To prevent particles of dirt or metal
10 from entering the interior of the casing and interfering with the action of the valve D, a suitable screen, K, is formed on the lower end of the casing-section B, such screen being best in the form of a nozzle closed at its lower end
15 and provided with perforations.

It will be readily seen that by properly securing the edges of the diaphragm G to the casing leakage cannot take place about the diaphragm, even at the excessive pressure met
20 with in dealing with liquid carbonic acid, and consequently by using such a diaphragm in place of the usual stuffing-box for the valve-stem a great advantage is gained, while at the same time the construction of the cock is simplified.
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What I claim as new, and desire to secure by Letters Patent, is—

The combination of the casing having the vertical receiving-channel c and the lateral
30 delivery-channel d, the valve-seat E, located between said receiving and delivery channels,

the valve D, arranged in the casing and closing upwardly upon the valve-seat with the pressure of the fluid, and having a valve-stem, F, rising through the valve-seat and extending to the outside of the casing at the upper
35 end thereof, a low-pressure chamber, L, in the casing above the lateral delivery-channel, a flexible diaphragm, G, closing the casing at the low-pressure chamber secured to the valve-
40 stem, and by its rising movement under the fluid-pressure lifting and closing the valve upon its seat, a spring, H, located in the valve-stem and pressing upon the diaphragm to force it downward and thereby lower and open the
45 valve, and against the pressure of which spring the valve closes on its seat, a wheel, J, outside the casing for lifting and closing the valve-stem against the pressure of the spring, the internally-screw-threaded cover B', and
50 the tubular screw-nut I, adjustable in the cover, pressing on the upper end of the spring and through which nut and spring the valve-stem passes to the hand-wheel, substantially as described.
55

In testimony whereof I have hereunto set my hand and seal in the presence of two subscribing witnesses.

EMIL RUEFF. [L. S.]

Witnesses:

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E. F. KASTENHUBER.