C. C. SCHMIDT.

Steam-Pressure Regulator.

No. 219,178. Patented Sept. 2, 1879.

Fig: 1

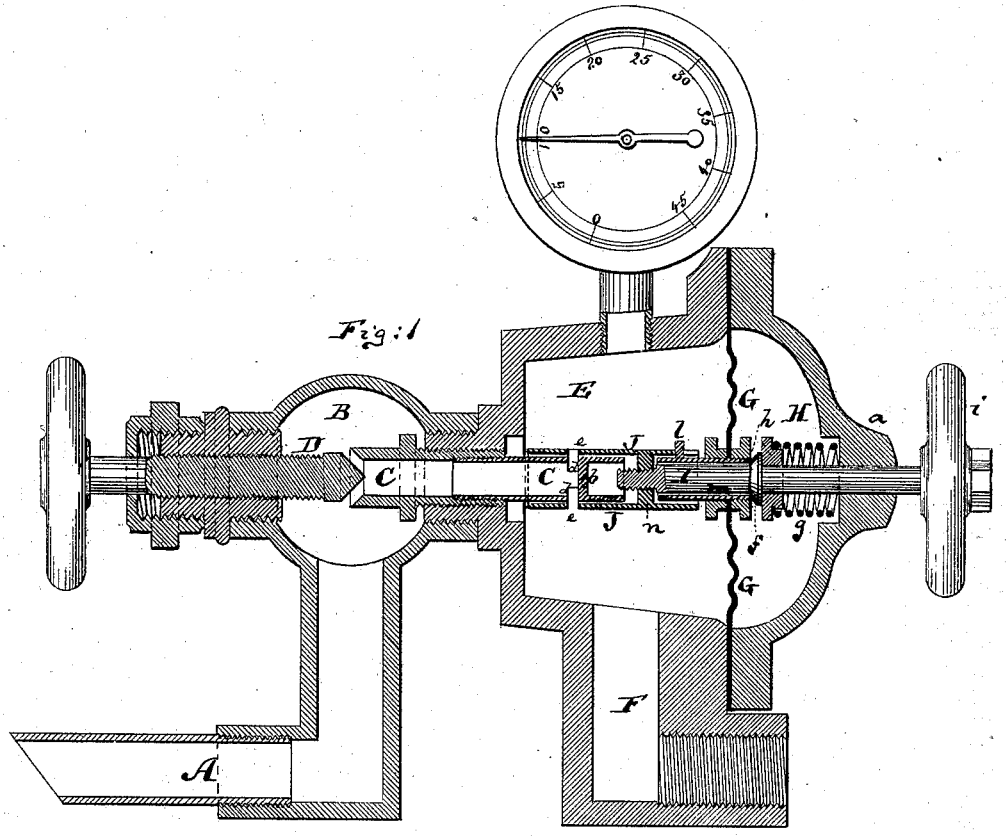


Fig: 2

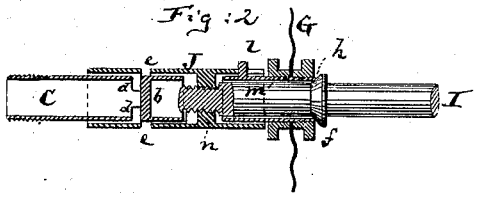


Fig: 3

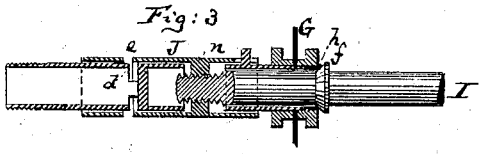
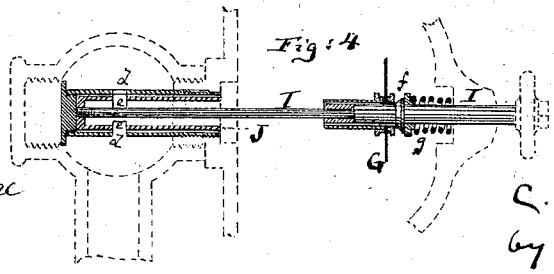


Fig: 4



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UNITED STATES PATENT OFFICE.

CHRISTIAN C. SCHMIDT, OF NEW YORK, N. Y.

IMPROVEMENT IN STEAM-PRESSURE REGULATORS.

Specification forming part of Letters Patent No. **219,178**, dated September 2, 1879; application filed April 21, 1879.

To all whom it may concern:

Be it known that I, CHRISTIAN CHARLES SCHMIDT, of the city and county of New York, State of New York, have invented a new and Improved Steam-Pressure Regulator, of which the following is a specification.

Figure 1 is a vertical central section of my improved steam-pressure regulator. Figs. 2 and 3 are detail sectional views of the slide-valve used therein, showing it in different positions. Fig. 4 is a sectional view of a modification thereof.

Similar letters of reference indicate corresponding parts in all the figures.

This invention relates to a new mechanism for automatically regulating the pressure of steam admitted to an engine or to heating apparatus; and consists of several new devices for utilizing the elasticity of a diaphragm, and of other details of improvement, hereinafter more clearly pointed out.

In the drawings, the letter A represents the steam-supply pipe, leading from the boiler or reservoir into a bulb or enlargement, B, into which enters a tube, C. The open end of this tube C, within the bulb B, may be more or less closed by a suitable valve, D. It will be perceived that the tube C traverses nearly one-half of the bulb, so that it will be surrounded by steam, which arrangement is to enable the water of condensation to collect in the bulb and flow off through the pipe A, instead of entering the pipe C.

The pipe C, or an extension thereof, reaches into a chamber, E, from the lower part of which a discharge-pipe, F, carries the steam to the engine or heating apparatus.

The back of the chamber E is formed by a flexible diaphragm, G, which constitutes a partition between the chamber E and another chamber, H.

I is a spindle passing through the outer wall, *a*, of the chamber H, and through the center of the diaphragm G, as shown. This spindle carries within the chamber E a slide-tube or slide-valve, J, which extends over and embraces the pipe C, as shown. The end of the pipe C, within the chamber E, is closed, as shown at *b;* but steam escapes from C into E through side apertures, *d d*, formed in the pipe C.

The pipe J has similar apertures *e e*, which, when in line with the apertures *d*, as in Fig. 1, allow a free escape of steam from the pipe C into the chamber E; but when the apertures *d* and *e* are entirely out of line, as in Fig. 2, the escape of steam from the pipe C will be entirely prevented. If the apertures *d e* are but partly in line, as in Fig. 3, less than the full amount of steam will be able to escape from the pipe C.

In order to effect these variations of discharge, the pipe J is made capable of longitudinal motion by being screwed upon the spindle I at *n*, as shown.

On the spindle I is formed a collar, *f*, which is contained within the chamber H, and which is, by a spring, *g*, constantly pressed against its seat *h* at the back of the diaphragm. Now, by turning the spindle I by means of a suitable hand-wheel, *i*, the collar *f* will always remain on its seat, and the only effect of the rotation will be to screw the pipe J forward or backward, and to thereby adjust the position of the apertures *e*, so as to attain the desired size of discharge-opening.

The rotation of the pipe J is prevented by a pin, *l*, which projects from a sleeve, *m*, into a straight slot of the pipe J. The sleeve *m* projects forward from the central bushing of the diaphragm and surrounds part of the spindle I.

If, after the apparatus has been set, the pressure of steam within the chamber E should exceed the desired limit it will move the diaphragm outward toward the chamber H, and thereby, as the diaphragm pushes the collar *f*, move the spindle I lengthwise, and cause the same to pull the tube J outward and close the holes *d e*, as in Fig. 2.

Now, although the slide-valve J, which is controlled by the diaphragm, and nevertheless independently adjustable, is shown in form of a tube, I desire to have it clearly understood that the tubular form is not at all essential, and that any other form of slide-valve will answer the purpose equally well.

In Fig. 4 I have shown a modification, according to which the slide-valve J on the spindle I enters the fixed pipe C within the bulb B, so that the entire adjustment may take place by means of the spindle I, the valve D being unnecessary.

I claim—

1. The combination, in a pressure-regulator, of the steam-pipe C, entering diaphragm-chamber E, with the valve J, spindle I, and diaphragm G, the spindle I passing through the diaphragm, all arranged so that the valve J is adjustable upon the spindle I independently of the action of the diaphragm, substantially as herein shown and described.

2. The annular diaphragm G, combined with the spindle I, carrying the collar *f*, and with the spring *g* and slide-valve J, said slide-valve being capable of independent motion on said spindle, substantially as herein shown and described.

3. The combination of the chambers E and H and intervening diaphragm with the spindle I, collar *f*, spring *g*, slide-valve J, and pipe C, substantially as herein shown and described.

4. The combination of spindle I, having collar *f*, with diaphragm G, sleeve *m*, pin *l*, slide-valve J, and pipe C, substantially as herein shown and described.

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Witnesses:
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