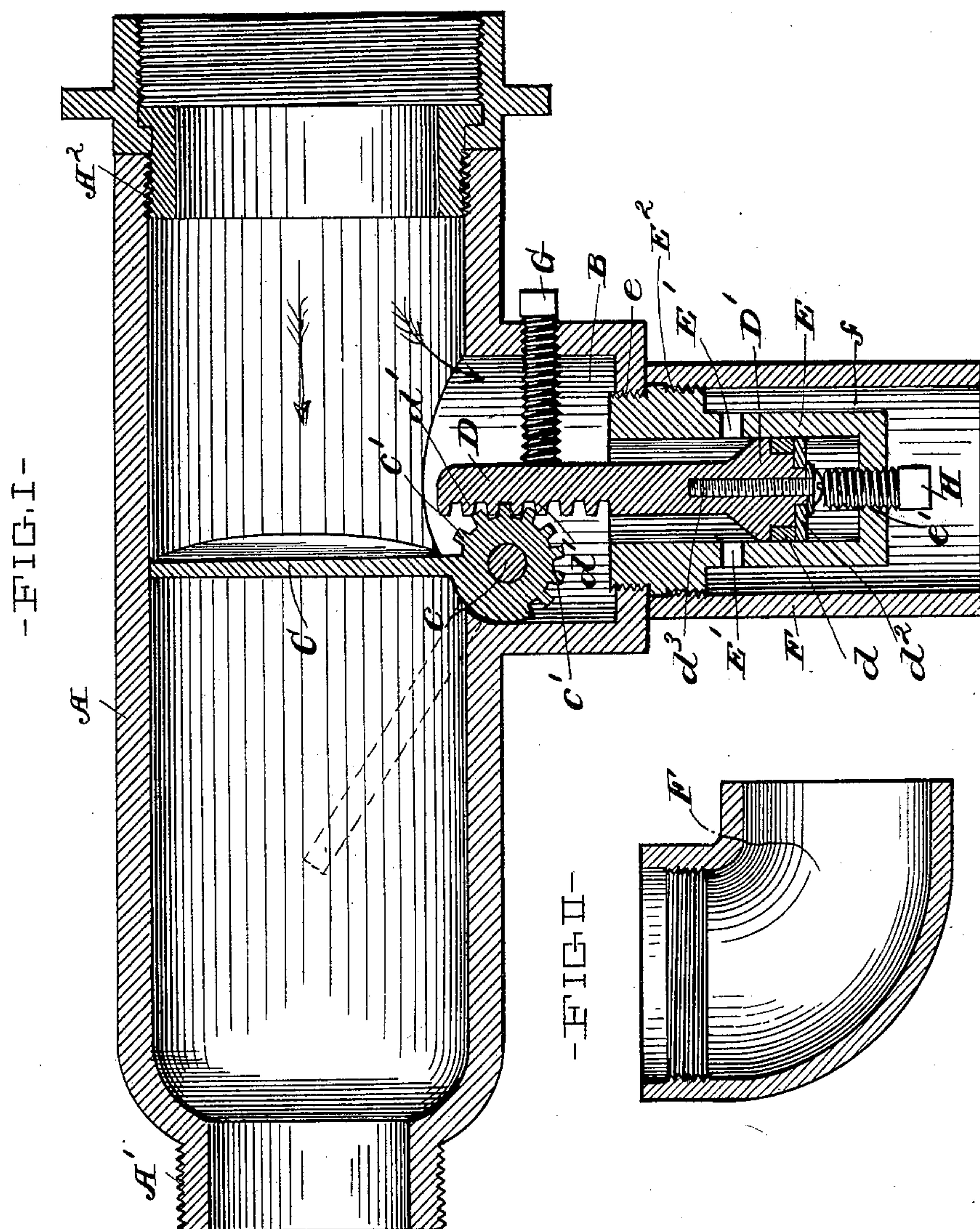


(No Model.)

L. O. DEHNEL.
RELIEF VALVE.

No. 606,053.

Patented June 21, 1898.



WITNESSES :

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Ella E. Tilden

INVENTOR

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BY

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UNITED STATES PATENT OFFICE.

LOUIS O. DEHNEL, OF SANDUSKY, OHIO.

RELIEF-VALVE.

SPECIFICATION forming part of Letters Patent No. 606,053, dated June 21, 1898.

Application filed September 20, 1897. Serial No. 652,323. (No model.)

To all whom it may concern:

Be it known that I, LOUIS O. DEHNEL, of Sandusky, Erie county, Ohio, have invented certain new and useful Improvements in Relief-Valves; 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 pertains to make and use the same.

My invention relates to so-called "relief-valves" for use in connection with fire steam-engines or fire-hydrants, or, in other words, to such valves as are connected between the water-supply and the water delivery, for the purpose of relieving the reaction or back action when the water is suddenly shut off at its outlet.

My invention consists in the peculiar construction of the valve, as will be hereinafter more fully set forth and claimed.

In the drawings, Figure I is a view in vertical section of a valve embodying my invention, showing the relief-valve of proper form. Fig. II is a view showing a modified form of shield.

Referring to the drawings, A represents the casing of my valve, which is provided at its ends A' A² with suitable screw-threads for attaching the coupling used to ordinarily connect the valve either to the hydrant and the hose, the engine and the hose, or the hose and the nozzle.

B represents a hub which is preferably formed integral to the casing A and communicates with it. This hub B is of sufficient internal area to contain the lower end of a flap-valve C, which is pivoted at *c* in the hub B. The flap-valve C at its lower end is provided with a segmental gear having teeth marked *c' c'*.

D represents a rack which is provided with teeth *d' d'*, adapted to engage with segmental gear-teeth *c c'* and be operated in a vertical direction thereby, or operate said segment, as will be hereinafter fully set forth. At the lower end of rack D is provided an enlarged portion D' of cylindrical shape. This portion D' forms the valve proper or cut-off for the relief-valve, and as it is raised upward closes small port-holes E' E', located in a casing E, which forms the cylinder for the valve D'. The casing E is preferably screw-

threaded, as at *e*, into the hub B, and is provided with an enlarged screw-thread E² for attaching a shield F. This shield F incloses the port-holes E' E' and keeps the water from spreading and throws it or carries it off in a downward direction. As shown in Fig. II of the drawings, the casing F may be formed elbow-shaped or curved, if desired. It will of course be understood that the casing F is large enough to leave a space, such as *f*, between the cylinder E and said casing to allow the water free passage.

In order to keep the rack D close against the teeth *c c'*, I provide a screw G, which passes through the hub and projects against the rear of the rack D. It will thus be seen that the rack can be adjusted to or from the teeth *c c'* of the flap-valve segment. As shown in Fig. I of the drawings, the valve D' is provided with a packing *d*, which is preferably formed of metal and is what is called the "ring" or "split" packing. This packing is kept in place on the lower end of the valve D' by means of a head or washer *d²*, in connection with a set-screw *d³*, the set-screw passing into the lower end of the valve D' and holding the head *d²* against the packing, thus holding the packing in place and allowing it to be removed or replaced at discretion.

I have provided at the lower end of the cylinder E a screw-threaded orifice or hole *e'* for admission of an adjusting-screw H. The turning of the screw H to the right or left adjusts the throw of the relief-valve and regulates the openings E' E' of the relief or cylinder E, as will be clearly seen.

The operation of my device is as follows: At the end A² of the casing A it is attached to the water-inlet, the water passing thence in the direction of the arrow. If the outlet is open, the flap-valve C assumes the position shown in dotted lines in Fig. I. This allows of the free passage of the water through the casing A to and through the outlet. However, as soon as the outlet or outflow of water is cut off or checked the pressure of the water is brought to bear in the direction of the curved arrow on the valve D', pushing said valve D' down along the cylinder E until it assumes the position shown in Fig. I, thus opening the ports E' E', of which there may

be four, six, eight, or more, and allowing the water to escape, thus preventing the reactive force caused by a too sudden check of the water from bursting the hose or reacting upon the parts of the engine or hydrant, thus distorting or breaking them.

It will thus be seen by my invention that I provide a valve which is positively sure and quick in its action, inasmuch as the relief is instantaneous with the cut off and the flow is instantaneous with the opening of the outlet.

What I claim is—

1. In a relief-valve of the character described, the combination with the main water-passage having a flap-valve located and operating therein, said flap-valve provided at its upper portion with a segmental gear, of an auxiliary casing extending from and communicating with the main water-passage, said auxiliary casing being provided with a relief-valve having at its lower end a rack meshing with the segmental gear of the flap-valve whereby the movement of the flap-valve will operate to close the valve in the auxiliary chamber when the water has free outlet, substantially as and for the purpose shown and described.

2. A relief-valve for fire-hose and the like comprising, a main waterway, an auxiliary chamber extending from and communicating with said main waterway, a flap-valve located in the main waterway and provided with a segmental gear, a relief-valve located in the auxiliary chamber and provided with a rack meshing with the gear of the flap-valve whereby the valves operate in unison, an adjusting-screw located at the rear of the rack and an adjusting-screw located at the end of the relief-valve, all operating substantially as and for the purpose shown and described.

3. In a relief-valve of the character described, the combination with the casing A, of flap-valve C, rack D, and valve or piston D', said valve or piston D' operated by the flap-valve C through the rack D and thus operated to open or close port-holes E' E' in the cylinder E, substantially as shown, for the purpose described.

In testimony whereof I sign this specification, in the presence of two witnesses, this 31st day of August, 1897.

LOUIS O. DEHNEL.

Witnesses:

W. E. DONNELLY,
ELLA E. TILDEN.