(No Model.)

R. H. ATWELL.

RELIEF VALVE FOR STEAM FIRE ENGINES.

No. 277,189. Patented May 8, 1883.

Fig. 1.

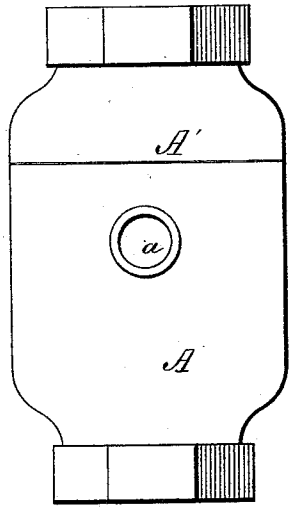


Fig. 2.

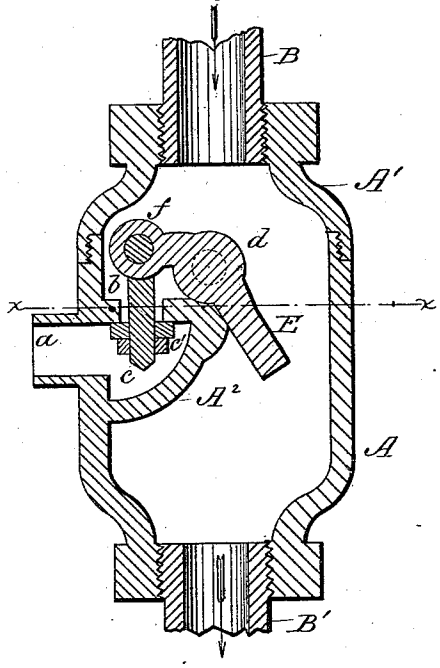


Fig. 4.

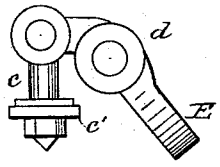
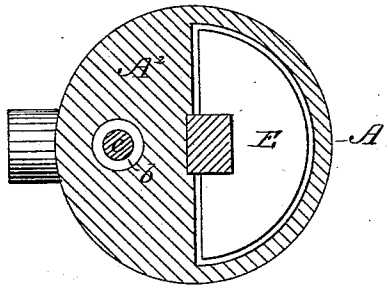


Fig. 3.



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RICHARD H. ATWELL, OF BALTIMORE, MARYLAND.

RELIEF-VALVE FOR STEAM FIRE-ENGINES.

SPECIFICATION forming part of Letters Patent No. 277,189, dated May 8, 1883.

Application filed September 20, 1881. (No model.)

To all whom it may concern:

Be it known that I, RICHARD H. ATWELL, of Baltimore city, State of Maryland, have invented a new and useful Improvement in Relief-Valves; and I do hereby declare that the following is a full, clear, and exact description of the same.

My invention relates to an improvement in relief-valves, designed more particularly for use in connection with steam fire-engines (but applicable to other uses) to prevent the occurrence of the water-hammer and reactionary force of the water when the jet from the hose is suddenly stopped.

My invention follows the general principle heretofore employed of an outwardly-opening valve whose closure is maintained during the normal passage of water by the pressure of the latter on a wing geared to the said valve the surface area of which wing is sufficient to cause the pressure of water on it to overbalance the pressure on the valve and hold the latter closed until the water suddenly ceases to be discharged from the hose, at which time the power exerted by the water on the wing ceases and the water is permitted to automatically open the relief-valve.

My invention consists in the peculiar construction of parts contained wholly within one case without extra valve-chamber, and which case forms a part of the water-conduit to the hose, the construction aiming at simplicity and sensitiveness, as will be more fully described hereinafter.

Figure 1 is an outside view of the relief-valve chamber. Fig. 2 is a central longitudinal section thereof. Fig. 3 is a transverse section through the line *x x*, and Fig. 4 is a detail view of the valve and controlling-wing.

A A′ represent the relief-valve chamber, which is in the nature of a cylindrical bulb of symmetrical ends, and of a somewhat larger diameter than the inlet and outlet pipe, with which it has a screw-threaded connection.

B is the inlet-pipe, which connects with the air-chamber of the fire-engine, and B′ is the outlet-pipe, which leads to the line of hose.

Occupying about one-half of the transverse area of the part A is the semicircular hollow chamber A^2. This chamber is cast with the part A, and to permit this to be done to advantage the upper section, A′, of the case is made detachable from the lower section, and is connected thereto by a screw-threaded peripheral joint.

The hollow chamber A^2 forms the relief-valve chamber proper, and it communicates outwardly with a pipe, *a*, and communicates with the chamber of the main case A A′ through an opening, *b*.

E is a semicircular wing filling up the complement of space in case A A′ at the hollow chamber, and mounted or fulcrumed at *d* upon the edge of the chamber. This wing has an extension, *f*, in the shape of an arm of very much less surface area on the opposite side of its fulcrum, which arm is jointed to a valve-stem, *c*, that passes through the relief-orifice *b* and carries upon the opposite side a valve, *c′*.

Now, it will be seen that with the water passing through the main chamber in the direction of the arrows the superior pressure of the water on the wing E forces it down in the position shown in Fig 2, allowing the water to escape past it and on to the hose, in which position the momentum of the water serves to hold the valve *c′* tightly against its seat at the lower side of orifice *b*. When, however, the discharge from the hose is suddenly cut off, the dynamic force of the water on the wing E ceases, and the pressure of the water then operates to open valve *c′* and allows the water to escape through pipe *a* without involving the objectionable results of the water-hammer or reactionary strain.

I am aware that relief-valves of various kinds have been provided in which a wing is operated upon by the dynamic force of the water to open a valve in a separate chamber against the pressure of the atmosphere and the friction of a packing; and my invention is distinctive with respect to the same, in that all the parts are contained in the case A A′, and the relief-valve in opening does not have to encounter either the pressure of the atmosphere or the friction of a packing, and is therefore very much more sensitive in its action.

My construction also recommends itself for its simplicity as well as its efficiency.

Having thus described my invention, what I claim as new is—

The relief-valve consisting of the cylindrical case A A′, made in two parts with peripheral joint, and having its section A cast with a hollow internal chamber, A^2, with opening *b*, in combination with the wing E, fulcrumed on the internal chamber, and having extension *f*, with valve-rod *c* and valve *c′*, arranged substantially as shown and described.

RICHARD HENRY ATWELL.

Witnesses:

JOSHUA M. MYERS,

DANDRIDGE KELLY.