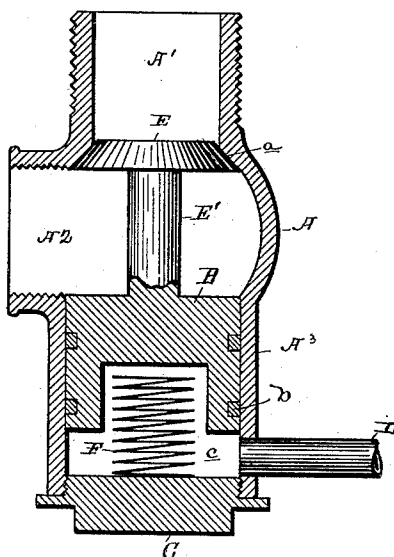


(No Model.)

G. A. MARSH, Jr.
RELIEF VALVE FOR STEAM ENGINES.

No. 417,329.

Patented Dec. 17, 1889.



Witnesses.

B. S. Loring
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UNITED STATES PATENT OFFICE.

GEORGE A. MARSH, JR., OF SANDUSKY, OHIO.

RELIEF-VALVE FOR STEAM-ENGINES.

SPECIFICATION forming part of Letters Patent No. 417,329, dated December 17, 1889.

Application filed August 26, 1889. Serial No. 321,923. (No model.)

To all whom it may concern:

Be it known that I, GEORGE A. MARSH, JR., of Sandusky, in the county of Erie and State of Ohio, have invented certain new and useful
5 Improvements in Relief-Valves for Steam-Engines; 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
10 the same.

My invention relates to improvements in relief-valves for steam-engines, such relief-valve being adapted to take the place of the ordinary cylinder-cock; and it consists in certain features of construction and in combination of parts, hereinafter described, and pointed out in the claim.

In the accompanying drawing, the figure is a side elevation in section through the center of the device.

A represents the casing, having a nozzle A', the latter being screw-threaded externally to engage a screw-threaded hole—for instance, in the cylinder-head, or in the cylinder at or
25 near the ends—so as to connect with the steam-port at either end of the cylinder, two such devices being employed, one for each end of the steam-cylinder.

A² is a nozzle discharging into the atmosphere, but may be screw-threaded, so as to attach a pipe to lead to wherever it may be desired to discharge the waste water from the cylinder.

The lower section A³ of the casing has a
35 cylindrical bore in which operates piston B. Some little distance below the piston the casing is closed by a plug or cap C—we will suppose the former. Just above such plug is a lateral screw-threaded hole in the casing for receiving steam-pipe D, the latter connecting, for instance, with the boiler, main steam-pipe, or steam-chest, or from where it may admit steam at approximately boiler-pressure into chamber c, between the piston
40 and plug. Piston B is provided with suitable packing-rings, (shown at b.)

The upper section of the casing has a seat a, adapted to engage valve E, the valve being connected by stem E' with piston B. The
50 valve-stem and piston are shown integral;

but this, although a preferable construction on account of cheapness, is not otherwise material, as the three members could be constructed separately and attached together in any suitable manner.

The area of piston B as exposed to steam-pressure in cylinder c is somewhat greater than the area of the valve exposed through the opening in nozzle A', and hence with equal steam-pressure per square inch on piston and valve the latter will remain closed. If, however, from any cause—such, for instance, as the accumulation of condensed water, or too much compression of vapor at the end of the stroke in the engine-cylinder—an
65 excessive pressure is had, valve E will be forced downward and opened and relieve such pressure, after which the pressure of steam in chamber c will again close the valve.

The device operates equally well under any
70 pressure of steam and without any adjustment or manipulation and effects a considerable saving of steam over the old methods of opening cylinder-cocks.

F is a spiral spring secured to plug C in position to engage the piston when the valve shall have partially opened. The spring is intended to help cushion the piston in case the valve should be violently forced open for a considerable distance, and in such case
80 the spring co-operates with the steam-pressure in cylinder c in quickly closing the valve after the relief of such pressure in the engine-cylinder, and the spring causes the piston to act noiselessly under all circumstances.

The relief-valve is comparatively small and inexpensive, and from the fact that a valve is connected to each end of the cylinder and that the route through the relief-valve from the cylinder to the atmosphere is short, there
90 is little resistance offered to the escape of condensed water, and there can be but a nominal waste of steam after the passage of water and before the closing of the valve.

What I claim is—

The combination, with a casing having a cylindrical bore and a valve-seat, the said cylindrical bore being greater in area than the valve-seat at the smaller end thereof, the said casing having a passage-way through same, 100

of a valve for closing said passage-way and
opening outward, a piston rigidly secured to
the valve and fitting closely within the cylin-
drical bore of the casing, and a steam-pipe
5 for admitting steam to the bore back of the
piston, substantially as set forth.

In testimony whereof I sign this specifica-

tion, in the presence of two witnesses, this
17th day of June, 1889.

GEORGE A. MARSH, JR.

Witnesses:

W. F. MOORE,

EDGAR R. HORNE.