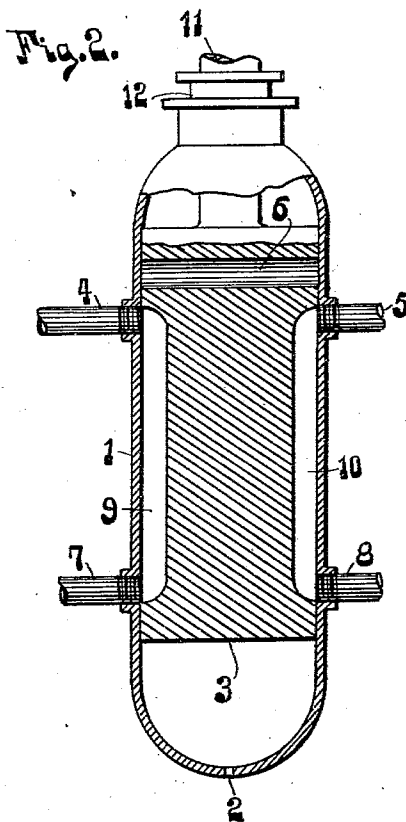
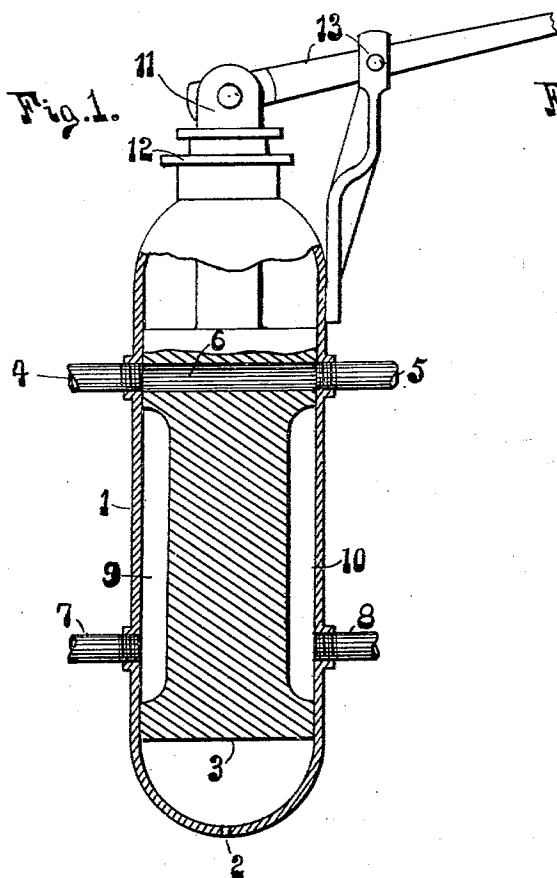


No. 752,204.

PATENTED FEB. 16, 1904.

W. COOPER.
EMERGENCY VALVE.
APPLICATION FILED NOV. 8, 1902.

NO MODEL.



WITNESSES

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WILLIAM COOPER, OF DENVER, COLORADO.

EMERGENCY-VALVE.

SPECIFICATION forming part of Letters Patent No. 752,204, dated February 16, 1904.

Application filed November 8, 1902. Serial No. 130,480. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM COOPER, a citizen of the United States of America, and a resident of the city of Denver, county of Arapahoe, and State of Colorado, have invented certain new and useful Improvements in Emergency-Valves, of which the following is a specification.

In the drawings which make part of this specification, Figure 1 is an elevation of my improved valve, shown open, having the casing partly cut away and the plug partly in section for the sake of clearness; and Fig. 2 is a like view showing the valve closed, the operating-lever being omitted.

My invention consists in certain new and useful improvements in emergency-valves for use in power-lines, such as a steam-line connecting boiler and engine. In the use of a stop-valve of the ordinary type under such circumstances a sudden closing of the valve, as in cases of emergency, causes a considerable and immediate rise in pressure in the steam-line between the boilers and the valve, frequently resulting in bursting or straining the line, and, moreover, the steam contained in the portion of the line between the valve and the engine retains its pressure, causing the engine to continue to operate until such pressure becomes dissipated. The result of this last phenomenon is that only a gradual cessation or stoppage of the engine is effected and a complete and immediate stoppage of the machinery is impossible. In the case of motor-driven vehicles, such as locomobiles, it is frequently necessary to make a quick stop to avoid accidents, and the inability of the engine to respond promptly to the operation of the stop-valve often results in disaster.

My valve in one operation not only cuts off the supply of steam from boiler to engine, but also performs two additional offices—first, relieving the power-line between boiler and valve from a sudden and disastrous rise in pressure upon the closing of the valve, and, second, relieving the pressure of steam in the other portion of the power-line from the engine, allowing the engine to come to a speedy and complete stop. My valve belongs to the class of valves which may be termed "piston-

valves" in contradistinction to the class of valves operated by the partial revolution of the plug in the casing.

The following is a detailed description of my invention, reference being had to the drawings.

1 is the valve-casing, preferably provided at one extremity with aperture 2 to allow the passage of air in and out of the casing, thus preventing the formation of an air-cushion in the casing. 3 is the valve-plug, adapted to move in a longitudinal direction in said casing. 4 is the port leading from the boiler end of the steam-line into said valve, and 5 is the port leading from said valve toward the engine.

6 is a passage bored through plug 3 and so located that when the valve is open the passage 6 registers with ports 4 and 5, thus allowing the steam to pass through the valve from boiler to engine.

7 is a port in the casing directly in line longitudinally of the casing with port 4, and 8 is another port likewise in line with port 5, said ports 7 and 8 being directly opposite one another in the casing.

Diametrically opposite one another in the face of plug 3 are cut longitudinal grooves 9 and 10 and of such length and so located that when the plug 3 is in position shown in Fig. 2 said groove 9 registers with ports 4 and 7 and said groove registers with ports 5 and 8; but when plug 3 occupies the position in the casing shown in Fig. 1 groove 9 registers with port 7 only and groove 10 with port 8 only. Plug 3 is fitted with stem 11, which extends through stuffing-box 12 at the opposite end of casing 1 from aperture 2 and at its exterior extremity is pivoted with a suitable pivotal connection to lever mechanism 13. (Shown only in Fig. 1.)

The operation of my device is as follows: When the valve is in the position shown in Fig. 1 of the drawings, the steam coming from the boiler enters the valve through port 4 and passes on through passage 6 and port 5 to the engine, the valve thus being open. When it is desired to close the valve to effect a sudden stoppage of the machinery, the lever mechanism is depressed, moving the plug into the

position shown in Fig. 2. In this position passage 6 no longer registers with ports 4 and 5, thus interrupting the passage of steam from boiler to engine, while groove 9 now registers with ports 4 and 7, thus allowing the steam in the boiler end of the line to relieve its pressure into the open air. At the same time groove 10 registers with ports 5 and 8, thus allowing the steam in the engine end of the line to be exhausted through port 8 into the open air, and thereby relieving the engines of the steam-pressure and permitting a quick and complete stoppage.

It is apparent that not only has the steam been cut off in its passage from the boiler to the engine, but in addition the sudden rise in pressure in the boiler end of the steam-line attendant on the action of the old form of stop-valve is avoided by exhausting the pressure in this portion of the steam-line to a degree sufficient to insure the safety of the line, and at the same time the exhausting of the steam-pressure on the engine allows the same to come to a sudden stop in obedience to the action of the valve.

It is preferable to construct port 7 of somewhat less capacity than port 4 and passage 6, so that the pressure in the boiler end of the line will not be completely exhausted when the valve is closed, but simply relieved to the degree necessary to obviate danger of bursting or straining the steam-line. The port 8, on the other hand, is preferably of equal size with port 5, thus permitting the entire pressure of steam on the engines to be exhausted upon closing the valve, permitting a quick stoppage of the machinery.

In the case of motor-driven vehicles when standing in cold weather the engine or motor frequently freezes. By providing some sort of a jacket for the engine and conducting the exhaust from port 7 into said jacket the engine may be protected from such occurrence while standing for any length of time or the exhaust-steam may be utilized to warm the feed-water for the boiler or conducted into a device for warming the feet of the passengers in the vehicle.

My valve is primarily intended for use as an emergency-valve to be placed between the boiler and the regular throttle-valve and to be resorted to only when an emergency stop is necessary; but it may be substituted for and

used as a throttle, if desired, and may, if desired, be connected with the brake mechanism, so that the setting of the brake will in one and the same operation shut the emergency-valve.

I have shown for the sake of clearness a simple lever mechanism for operating this valve; but it will be understood that any suitable method of controlling the valve may be employed to enable the operator to maintain perfect control over the engine.

I have described my invention as applied to the use of steam; but it is apparent that it is equally applicable where power of any kind is delivered from source to destination under pressure.

My valve can be used not only with motor-driven vehicles, but with any kind of machinery where sudden and complete stops are required.

In the drawings I have shown the valve in a vertical position for the sake of illustration; but it will be readily seen that it may equally well be reversed or connected up, so that the casing occupies a horizontal position without impairing the operation of the valve.

Having described my invention minutely, I do not, however, desire to limit myself thereby, but claim, broadly—

1. In a valve for power-lines, a valve-casing interposed between two sections of said line, a longitudinal plug in said casing, a transverse port in said plug, said port adapted to communicate with said power-line sections, exhaust-ports in said casing and longitudinal ports in said plug respectively communicating with the said sections of said power-line for the purpose described when said valve is closed.

2. In a valve for power-lines, a valve-casing, said casing interposed between two sections of the power-line, a longitudinally-movable plug in said casing, a transverse port through said plug adapted to connect said power-line sections, and a longitudinal passage in said plug adapted to register with said power-line and said exhaust-port when said valve is closed.

Signed by me at Georgetown, Colorado, this 14th day of October, A. D. 1902.

WILLIAM COOPER.

Witnesses:

JOHN W. RODDA,
JAMES McDONALD.