

P. CARPENTER.

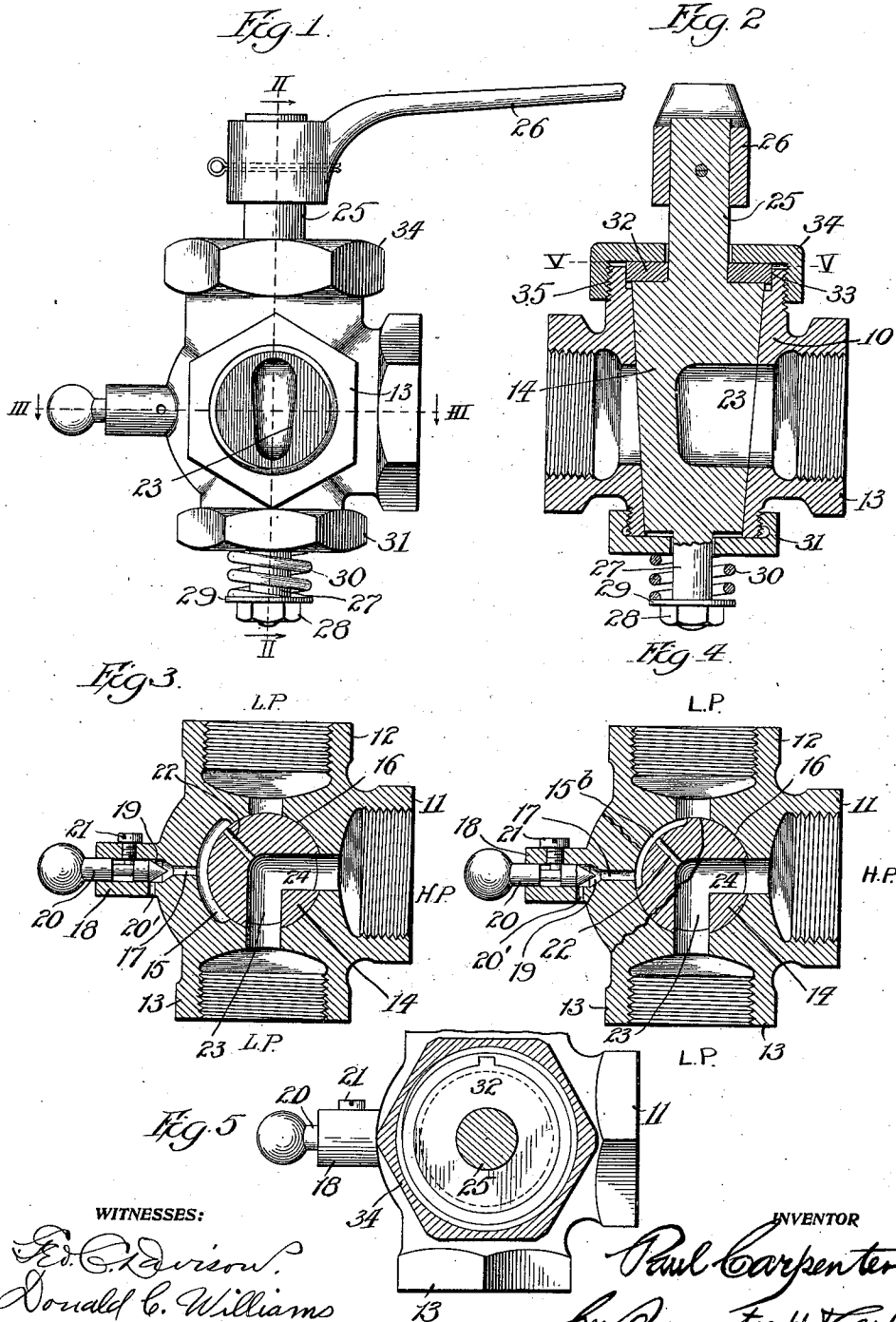
ALARM VALVE.

APPLICATION FILED JULY 22, 1909.

1,023,104.

Patented Apr. 9, 1912.

2 SHEETS—SHEET 1.



WITNESSES:

Ed. C. Davison.
Donald C. Williams

INVENTOR

Paul Carpenter
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ATTORNEYS

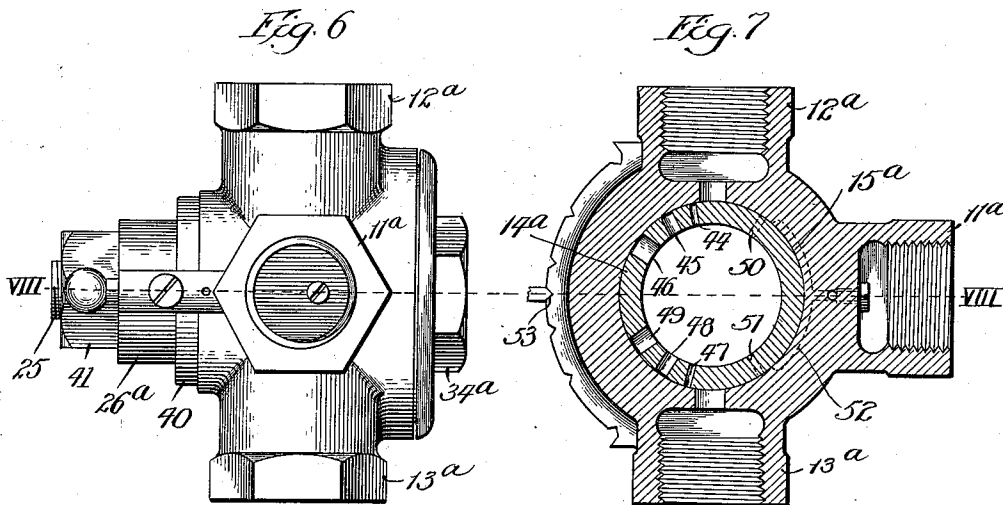
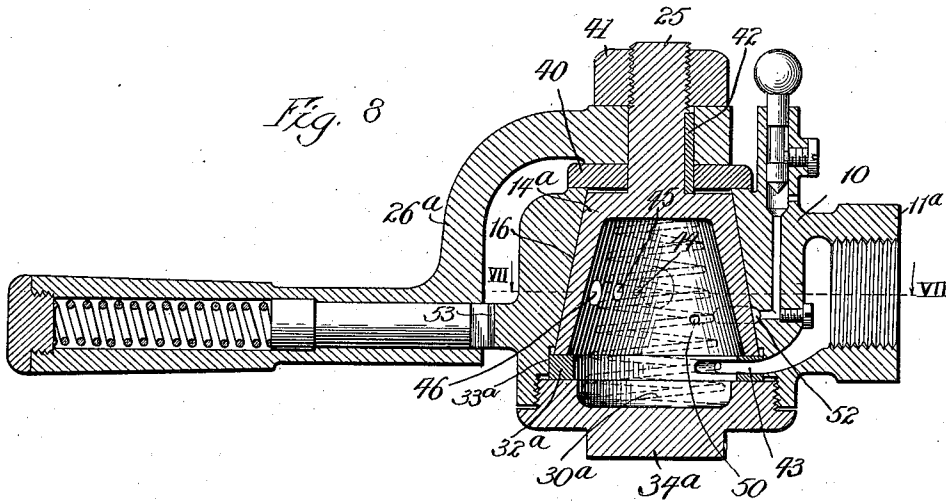
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UNITED STATES PATENT OFFICE.

PAUL CARPENTER, OF CHICAGO, ILLINOIS.

ALARM-VALVE.

1,023,104.

Specification of Letters Patent.

Patented Apr. 9, 1912.

Application filed July 22, 1909. Serial No. 508,966.

To all whom it may concern:

Be it known that I, PAUL CARPENTER, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Alarm-Valves, of which the following is a specification.

The present invention relates to valves in general and more particularly to valves of the tapering plug type and has special reference to the provision of a plug valve adapted for controlling the admission of air or other operative fluid under high pressure to one or more low pressure conduits and contemplates the provision of a valve of the character referred to having applied thereto an alarm or warning device, such as it is at times expedient to utilize to the end that the user may at all times be informed when the valve is open, and thereby avoid waste of air pressure and needless wear of the actuated device, valves of this general class being useful in the operation of sundry apparatus commonly located at a distance from the operator, among which may be specified railway track sanding apparatus and other mechanism customarily controlled from a locomotive cab, valves designed for the present purposes being shown in the co-pending applications of Harry Vissering Numbers 502,729 and 502,730, filed June 17, 1909 upon which the present invention is an improvement.

The principal objects of this invention are the provision of an improved valve of the character specified, and one wherein the warning port will be positively closed at all times when the main operating valve is closed, and wherein the operating port and the alarm port are simultaneously opened and closed, the provision of an improved plug valve device adapted to control the admission of pressure to a plurality of ports from successive members of a series of ports graduated in size whereby an initial inrush of pressure and a consequent waste thereof or unnecessary strain may be avoided, the provision of a valve of the character described which is so constructed as to permit ready removal of the valve proper, to the end that it may be reground or a new valve inserted, or the seat refinished, without disturbance to the piping

with which the valve is connected; the provision of a plug valve device of the character specified which may be uniformly held tight against high pressure without danger of becoming too firmly wedged in its seat to permit of facile operation, or of becoming loosened in service so that the fluid cannot be maintained under pressure, together with such other objects as will hereinafter appear.

In the attainment of the objects above referred to, as well as to secure the production of a valve which may be economically and inexpensively manufactured and operated, together with certain additional features of advantage which will be apparent to those who are skilled in the art, I have provided the constructions illustrated in preferred form in the accompanying drawings wherein—

Figure 1 is an elevation of a valve embodying my improvements; Fig. 2 is a sectional view taken on the line II—II of Fig. 1; Fig. 3 is a sectional view taken on the line III—III of Fig. 1, a certain port being here shown as formed in the casing; Fig. 4 is an illustration of a modification of the valve illustrated in Figs. 1 to 3, the said port being here shown as formed in the valve stem. Fig. 5 is a sectional view of a detail taken on the line V—V of Fig. 2; Fig. 6 is an elevation of another exemplification of my present invention; Fig. 7 is a sectional view taken on the line VII—VII of Fig. 8 and Fig. 8 is a sectional view taken on the line VIII—VIII of Figs. 6 and 7.

Referring now more particularly to Figs. 1 to 3 of the drawings it will be observed that in carrying out my invention I make use of a valve casing 10 provided with a suitable connection 11 to an inlet or high pressure conduit and suitable connections 12 and 13 to outlet or low pressure conduits, the casing 10 being provided to form a seat 16 for a plug valve 14 adapted for rotation therein, such seat and plug being preferably made to taper toward one end so that their frictional engagement relatively to each other may be varied as desired for the reasons below set forth. The casing 10 is also provided with an internal groove 15 formed in the valve seat 16, communicating with a passage 17 leading to the alarm de-

vice, which I have here shown as comprising a casing 18 formed integrally with the valve casing 10, the said alarm device having a passage 19 and a port 20' for establishing connection with the atmosphere, the casing 19 being provided with a valve 20 slidably mounted therein and prevented by the screw 21 from being blown out of the casing by the pressure acting thereupon.

As will be seen on viewing Figs. 1 and 2 the connection between the high pressure passage 11 on one side, and the low pressure passages 12 and 13, and the alarm passage 15, on the other, is interrupted by the plug valve 14, such plug being provided with passages 22, 23 and 24, the passage 22 communicating with the passage 15, the passage 23 with the connection 13, and the passage 24 with the passage 11, when the valve is in the position shown in Fig. 3, pressure then being permitted to pass to the outlet 13 and communication with the alarm device established. When it is desired that pressure be admitted to the outlet 12, the valve is given a one-eighth turn from its lap position when communication will remain established between the passages 22 and 15, and will be established between the passages 23 and 11, and 24 and 12.

It will be noted from an inspection of Fig. 2, that the valve 14 is provided at one end with a stem 25 upon which the operating handle 26 is carried. In the exemplification of my invention here shown, the opposite end of the valve is formed with a projecting stem 27 having screw threaded thereon a nut 28 with a washer 29. To hold the valve 14 in contact with its seat 16 a spring 30 is provided between the washer 29 and the cap 31 having threaded engagement with the casing 10. The cap is here shown as apertured to allow the passage of the stem 27 therethrough, but should have a close fit with the stem 27 to avoid leakage therebetween. To further guard against the escape of pressure between the valve 14 and seat 16, I provide a packing ring 32 having dovetailed engagement with a seat 33 formed in the valve casing, (see Fig. 5) a cap 34 having screw threaded engagement 35 with the valve casing being adapted to force the backing therein down upon the valve, whereby not only is any escape of pressure at the ends of the valve prevented, but also the wear of the valve and seat may be compensated for and the valve may be adjusted to turn more or less easily as may be desired.

Referring to the exemplification of my invention illustrated in Fig. 4 it will be apparent that the passage for establishing communication between the passages 22 and 17 is here formed in the plug 14 as indicated at 15^b instead of in the valve seat 16, the

passage 15^b and the passages connecting therewith being formed on a plane other than that of the connections 12 and 13, as indicated by the broken line in said figure, and the passage 22 being drilled on an angle to the axis of the valve 14 to prevent establishment of communication with the outlet 12 when the outlet 13 is in operative connection with the passage 11 or vice versa.

Referring now to the embodiments of my invention illustrated in Figs. 6, 7 and 8 it will be observed that in this exemplification the valve 14^a and seat 16 taper toward the stem 25, the handle 26^a being interposed between a cover plate 40 and a jam nut 41, a key 42 being provided to prevent relative rotation between the handle, plate and valve. To force the valve into contact with the seat and regulate such contact I provide at the opposite end a packing ring 32^a having dovetailed engagement with the seat 33^a formed in the casing 10 (similarly to the construction illustrated in Fig. 5). The ring 32^a being forced against the valve by the cap 34^a and a spring 30^a pressing at one end against the interior of the valve and at the other end against said cap; the desired range of adjustability of the valve relative to its seat is attainable by the construction here shown, for the purposes above referred to.

From an inspection of Figs. 7 and 8 particularly it will be noted that communication between the high pressure inlet 11^a and the low pressure outlets 12^a and 13^a is interrupted by the valve 14^a which is of an inverted cup shape. The inlet 11^a communicates with the interior of the said valve 14^a by means of a passage 43 formed in the ring 32^a, the valve 14^a being formed with two series of ports 44, 45, 46 and 47, 48, 49 adapted to register respectively with the outlets 12^a and 13^a, and ports 50 and 51 on a plane other than that of the two series of ports above referred to respectively being adapted to register with the passage 15^a leading to the alarm device.

The operation of my improved valves are as follows: When the user moves the handle 26, establishing communication between the connections, 11 and 13, by the passages 24 and 23, (or between the connections 11 and 12 by the passages 23 and 24) simultaneously communication will be established between the inlet and the atmosphere by means of the passages 22, 15 and 20', the air rushing therethrough under high pressure making a hissing or whistling sound which will continue to attract the user's attention to the fact that the valve is open and operative connection established until the handle be moved into lap position. Where the valve is in continuous use for substantial periods of time, the operator may shut off

the alarm sound by manual pressure upon the valve 20 which will close the port 20', but if for any reason he removes such manual pressure, the air pressure will force the valve 20 outward and the warning sound will recommence.

In the operation of the modified form of device it will be observed that owing to the fact that the two series of ports 44, 45, 46, and 47, 48, 49 are graduated in size, pressure may be admitted gradually to the outlets 12^a and 13^a respectively connecting therewith, to the end that waste of pressure may be avoided or controlled and the apparatus operated at different speeds or its speed of operation gradually increased. It will be further observed that by means of the constructions here illustrated, I have been able to combine in one structure the requisite valve devices for ejecting sand at the point of contact of the locomotive with the rail only, whether such locomotive be running forward or backward, which construction is advantageous in this that in the use of two sets of valve devices, the waste of sand incidental to supplying it both in front of and behind the point of contact, is avoided.

Having thus described my invention and illustrated its use what I claim as new and desire to secure by Letters Patent is the following:—

1. A valve device comprising a casing, a conical valve member rotatable therein, connections in the casing to an inlet conduit, to a plurality of outlet conduits, and to an atmospheric alarm port, passages in said valve member adapted to register with said connections, means for operating said valve whereby said connections and passages may be brought into register and communication with said atmospheric alarm may be established when the valve is open and means for preventing longitudinal movement between said valve and casing.

2. A valve device comprising a casing, a conical valve member rotatable therein, connections in the casing to an inlet conduit, to an outlet conduit, and to an atmospheric alarm port, passages in said valve member adapted to register with said connections, means for operating said valve whereby said connections and passages may be brought into register and communication with said atmospheric alarm may be established when the valve is open and means for preventing longitudinal movement between said valve and casing.

3. A valve device comprising a casing, a conical valve member rotatable therein, connections in the casing to an inlet conduit, to an outlet conduit, and to an atmospheric alarm port, passages in said valve member adapted to register with said connections,

means for operating said valve whereby said connections and passages may be brought into register, and communication with said atmospheric alarm may be established when the valve is open, a ring bearing on the plug and a cap screw threaded to the casing and bearing on the ring to prevent longitudinal movement between said valve and casing.

4. A valve device comprising a casing, a conical valve member rotatable therein, connections in the casing to an inlet conduit, to an outlet conduit, and to an atmospheric alarm port, passages in said valve member adapted to register with said connections, means for operating said valve whereby said connections and passages may be brought into register and communication with said atmospheric alarm may be established when the valve is open, and a spring operating at one end against the valve and at the other end against the casing.

5. A valve device comprising a casing, a conical valve member rotatable therein, connections in the casing to an inlet conduit, to an outlet conduit, and to an atmospheric alarm port, passages in said valve member adapted to register with said connections, means for operating said valve whereby said connections and passages may be brought into register and communication with said atmospheric alarm may be established when the valve is open, a ring bearing on the plug and a cap screw threaded to the casing and bearing on the ring to prevent longitudinal movement between said valve and casing, the said ring having engagement with the casing to prevent rotation of the ring relative to the casing.

6. A valve device comprising a casing, a valve member rotatable therein, connections in the casing to an inlet conduit, to an outlet conduit, and to an atmospheric alarm port, passages in said valve member adapted to register with said connections, means for operating said valve whereby said connections and passages may be brought into register and communication with said atmospheric alarm may be established when the valve is open and means for normally preventing longitudinal movement between said valve and casing.

7. A valve device comprising a casing, a valve member rotatable therein, connections in the casing to an inlet conduit, to an outlet conduit, and to an atmospheric alarm port, passages in said valve member adapted to register with said connections, means for operating said valve whereby said connections and passages may be brought into register and communication with said atmospheric alarm may be established when the valve is open, a ring bearing on the plug and a cap screw threaded to the casing and

bearing on the ring to prevent longitudinal movement between said valve and casing.

8. A valve device comprising a casing, a plug valve rotatable therein, an alarm port, connections in the casing to an inlet conduit, to an outlet conduit, and to the alarm port, passages in said valve member adapted to register with said connections, means carried by the valve for operating said valve whereby said connections and passages may be brought into register and communication with said atmospheric alarm may be established when the valve is open and means for normally preventing longitudinal movement between said valve and casing.

9. A valve device comprising a casing, a conical valve member rotatable therein, connections in the casing to an inlet conduit, to an outlet conduit, and to an atmospheric alarm port, passages in said valve member adapted to register with said connections, an operating handle for said valve whereby said connections and passages may be brought into register, and communication with said atmospheric alarm port may be established when the valve is open and a spring operating at one end against an extension on the valve and at the other end against the exterior of the casing.

10. A valve device comprising a casing, a conical valve member rotatable therein, connections in the casing to an inlet conduit, to an outlet conduit, and to an atmospheric alarm port, passages in said valve member adapted to register with said connections, an operating handle for said valve whereby said connections and passages may be brought into register, and communication with said atmospheric alarm port may be established when the valve is open and a spring operating at one end against the casing and means for varying the tension on the spring.

11. A valve device comprising a casing, a conical valve member rotatable therein, connections in the casing to an inlet conduit, to an outlet conduit, and to an atmospheric alarm port, passages in said valve member adapted to register with said connections, an operating handle for said valve whereby said connections and passages may be brought into register, and communication with said atmospheric alarm port may be established when the valve is open and a spring operating at one end against an extension on the valve and at the other end against the exterior of the casing, and means for varying the tension on the spring.

12. A valve device comprising a casing, a valve member rotatable therein, connections in the casing to an inlet conduit, to an outlet conduit, and to the atmosphere, passages

in said valve member adapted to register with said connections whereby when communication is established between the inlet and outlet conduits communication is also established with the atmosphere, means for operating said valve whereby said connections and passages may be brought into register, and means for preventing longitudinal movement between said valve and casing.

13. A valve device comprising a casing, a valve member rotatable therein, connections in the casing to an inlet conduit, to a plurality of outlet conduits and to the atmosphere, passages in said valve member adapted to register with said connections whereby when communication is established between the inlet and with either of said outlet conduits communication is also established with the atmosphere, means for operating said valve whereby said connections and passages may be brought into register, and means for preventing longitudinal movement between said valve and casing.

14. A valve device comprising a casing, a plug rotatable therein, an alarm port, connections in the casing to an inlet conduit, to a plurality of outlet conduits, and to the alarm port, passages in said valve member adapted to register with said connections whereby when communication is established between the inlet and either of the outlet conduits, communication is also established with said alarm port, means for operating said valve whereby said connection and passages may be brought into register, a ring bearing on the plug and a screw cap threaded to the casing and bearing on the ring to prevent longitudinal movement between said valve and casing.

15. A valve device comprising a casing, a plug rotatable therein, an alarm port, connections in the casing to an inlet conduit, to a plurality of outlet conduits, and to the alarm port, passages in said valve member adapted to register with said connections whereby when communication is established between the inlet and either of the outlet conduits, communication is also established with said alarm port, means for operating said valve whereby said connection and passages may be brought into register, a ring bearing on the plug and a screw cap threaded to the casing and bearing on the ring to prevent longitudinal movement between said valve and casing, the said ring having engagement with the casing to prevent rotation of the ring relative to the casing.

16. A valve device comprising a casing, a plug valve rotatable therein, an alarm port, connections in the casing to an inlet conduit, to a plurality of outlet conduits and to the alarm port, passages in said valve member adapted to register with said connec-

5 tions, means carried by the valve for operating said valve whereby said connections and passages may be brought into register and means for normally preventing longitudinal movement between said valve and casing.

In testimony whereof I have hereunto

signed my name in the presence of the two subscribed witnesses.

PAUL CARPENTER.

Witnesses:

DONALD C. WILLIAMS,
JOHN FORREST.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."