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PATENTED MAR. 24, 1908.

S. MATTHES & J. B. RINEHART.
VALVE.

APPLICATION FILED MAY 3, 1907

Fig. 7.

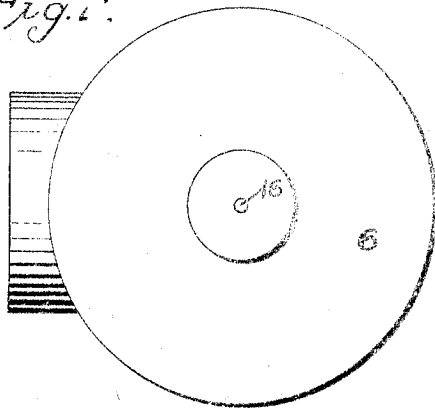


Fig. 6.



Fig. 5.



Fig. 1.

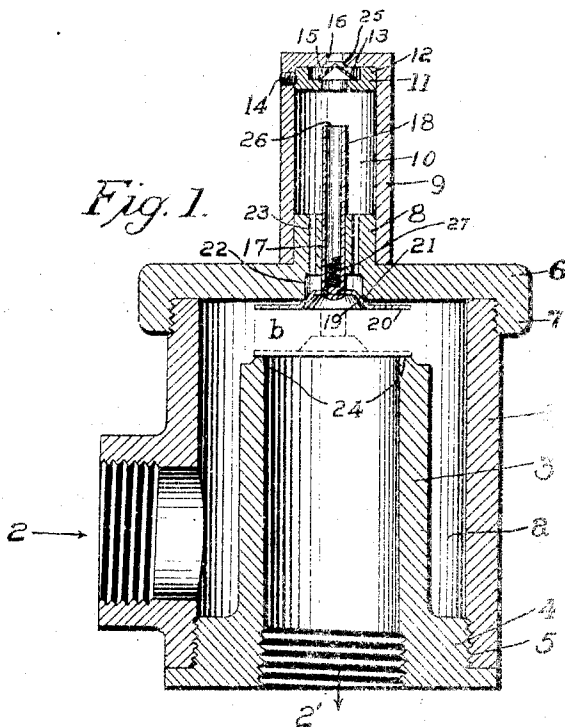


Fig. 4.

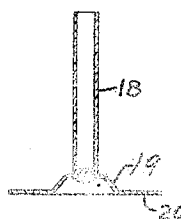
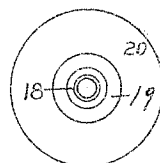


Fig. 3.

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UNITED STATES PATENT OFFICE.

SAMUEL MATTHES AND JOHN BARTLETT RINEHART, OF MANSFIELD, OHIO.

VALVE.

No. 882,831.

Specification of Letters Patent.

Patented March 24, 1908.

Application filed May 3, 1907. Serial No. 371,645.

To all whom it may concern:

Be it known that we, SAMUEL MATTHES and JOHN BARTLETT RINEHART, citizens of the United States, residing at Mansfield, in the county of Richland and State of Ohio, have invented certain new and useful Improvements in Valves, of which the following is a specification.

Our invention relates to a valve adapted to be used with natural or artificial gas and has for its objects a means of closing the valve and preventing the flow of gas there-through when the pressure in the service pipe is reduced below a pre-determined amount.

Our invention consists in constructing a valve casing or body provided with an upwardly extending tubular plug which extends into the upper portion of the valve body casing leaving the free end of the tubular portion slightly below the top of the valve casing, upon which a valve seat is formed.

It further consists in providing a cap which is fitted to the upper portion of a valve casing having a tubular projection in alinement with the tubular projecting plug into which a tubular valve stem is fitted carrying a tubular and flat disk valve and adapted to close the outlet in the tubular plug and valve opening in the cap.

It further consists in the application of a hollow cone-shape auxiliary valve placed in the upper portion of a tubular casing by means of which the gas is prevented from escaping when the valve is closed on account of low pressure or otherwise.

Another object of our invention is the construction of a valve in such a manner as to afford means of making the movable parts light in weight to permit them to be responsive to a slight pressure in opening or sustaining the valve and means to hold the valve in close contact with its seat when it drops by gravity on account of low pressure and to keep it firmly in contact with its seat until manually raised therefrom.

In the drawings, Figure 1 represents a vertical sectional elevation of our improved valve. Fig. 2 represents a plan view. Fig. 3 represents a cross-sectional vertical elevation of the tubular valve and stem. Fig. 4 represents a plan view of Fig. 3. Fig. 5, represents a sectional view of a small cone-shaped valve, used to prevent the escape of

gas when the valve is closed. Fig. 6 is a plan view of Fig. 4.

In the drawings, 1 represents a valve casing formed tubular in shape with an inlet 2 and outlet 2' formed thereon. An upwardly extending tubular plug 3 is provided extending upwardly into the valve body casing with the free end terminating slightly below the upper portion of the valve casing and is connected thereto through the medium of the enlarged screw-threaded outer periphery 4 formed thereon which engages with the threaded inner periphery 5 of the valve casing. When the tubular plug is fitted to the inner periphery of the valve casing, as described, an annular chamber (a) is provided communicating with the chamber (b) formed between the top of the tubular plug and the upper portion of the valve body casing. A cap 6 having an annular depending flange 7, 75 interiorly screw-threaded to engage with the threaded outer periphery of the valve is provided and is also provided with a boss 8 extending upwardly from the cap 6 to which the removable tubular casing 9 is secured in any preferred manner forming the chamber 10. In the upper portion of the tubular casing a cup-shaped washer 11 is inserted and held in place with the face of the annular flange 12 abutting against the inner wall 85 of the top of the tubular casing forming a chamber 13. The washer is retained in place by the set screw 14. A cone-shaped hollow valve 15 is fitted within the chamber 13 with the apex of the cone in alinement 90 with the aperture 16 formed in the top of the tubular casing 9. An aperture 17 is provided in the center of the boss into which the tubular stem 18 of the tubular valves 19 and flat disk valve 20 is fitted. The tubular valve 19 is adapted to contact with the seat 21 and close the chamber 22 when the valves 19 and 20 are suspended by the pressure of the gas which passes into the valve casing and out through the outlet opening.

Communication from the main valve chambers a and b is had through the medium of the apertures 23 provided in the boss 8. In the drawings, the full lines show the tubular valve 19 in contact with its seat 21 and the disk valve 20 in its open position closing communication from the main valve casing into the chamber 22 in the cap.

The dotted lines show the position of the tubular and disk valves when the pressure is

reduced below a predetermined amount with the disk valve 20 in contact with its seat 24 closing the outlet to the service pipe.

Attention is called to the fact that the tubular valve stem 18 is open at the upper extremity 26 to provide a means of increasing or decreasing the weight of the valves 19 and 20 and their appliances to regulate the amount of pressure required to open and maintain the valve 20 in its open position for the purpose intended. We prefer to regulate the weight by inserting or removing from the tubular stem, ordinary shot 27 of varying sizes and weight.

The operation of our valve is as follows: The gas at a predetermined pressure is admitted through the inlet aperture 2 of the valve casing passing into the chambers *a* and *b* and when the valves 19 and 20 are manually raised they are held in suspension at the predetermined pressure or any excess thereof permitting the gas to flow through the outlet (2') for use. When the pressure is reduced below the predetermined amount, the valves 19 and 20 fall by gravity and the valve 20 closes the outlet (2') and seats upon the seat 24 formed on the upper extremity of the tubular plug 3 cutting off all communication with the service pipe. If the pressure is increased above the predetermined amount, it exerts its pressure against the top of the valve holding it firmly to its seat and it cannot be opened except by removing the tubular casing 9 and manually lifting the valve 20 from its seat. The gas is prevented from escaping through the cap and tubular casing by the hollow cone valve 15 which is forced by the pressure to contact with the seat 25 on the inner face of the top of the tubular casing.

In the use of valves of ordinary construction for burning natural or artificial gas, if for any reason the pressure is reduced below the safety factor and a stove or light left burning, it is highly dangerous to life and property unless some means is provided to shut off the gas automatically when the pressure is reduced from any cause below such an amount as will make it safe to burn. In the construction heretofore of valves for this purpose, this has been an extremely difficult problem because of the construction of the ordinary valve body which is such that the weight of the valve and its appliances are necessarily heavier than the ordinary pressure of gas can sustain.

We have designed a valve that will operate at a very low pressure in the consumption of natural or artificial gas and will close automatically when the pressure is reduced below a predetermined amount which amount is usually determined by the pressure at which it is safe to burn either gas.

Having fully described our invention,

what we claim and desire to secure by Letters Patent is:

1. A gas safety mechanism comprising a casing substantially tubular in form, said casing having inlet and outlet openings at right angles with each other, a separable upwardly extending tubular member secured to the valve casing and extending above the inlet opening, a valve seat formed upon the upper extremity of said tubular member, a cap threadably connected to the valve casing having a chamber formed therein with a valve seat formed upon the lower extremity of the wall of the chamber, a double faced valve of light specific gravity provided with an upwardly extending tubular stem loosely fitted to an aperture in the cap and adapted to move within the casing and close communication between the inlet and outlet apertures and the chamber in the cap, and means to increase or decrease the weight of the tubular valve.

2. A gas safety valve comprising a casing having an inlet and outlet opening, a tubular member extending within the casing having a valve seat formed upon the free end, a cap secured to the casing provided with a chamber and a valve seat, a double faced valve formed of sheet metal with one disk cone shape and the other flat, said valve being adapted to close communication between the outlet and inlet apertures by its own specific gravity aided by the pressure of gas and to prevent the escape of gas when the valve is maintained in open position by the pressure, a tubular stem fitted to said double faced valve whereby the inner periphery can be fitted with shot or other foreign substance to vary the specific gravity of the valve to maintain said valve in open position at a predetermined pressure.

3. A safety valve for gas comprising a casing with inlet and outlet openings, a tubular member fitted to the outlet opening and projecting above the inlet opening, a double faced valve formed of sheet metal with one disk formed cone shape and the other flat mounted within the casing, a tubular stem fitted to said double faced valve, means to increase the weight of said valve, a cap provided with a boss secured to said valve casing, a removable casing fitted to the periphery of said boss to inclose the tubular stem of the valve stem and to provide means to manually raise the valve without disassembling any other part of the valve mechanism.

In testimony whereof we affix our signatures in presence of two witnesses.

SAMUEL MATTHES.

JOHN BARTLETT RINEHART.

Witnesses:-

DAVID J. DAVIES,
JOHN H. COSS.