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R. C. BAYNE

2,244,483

VALVE

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FIG. 1

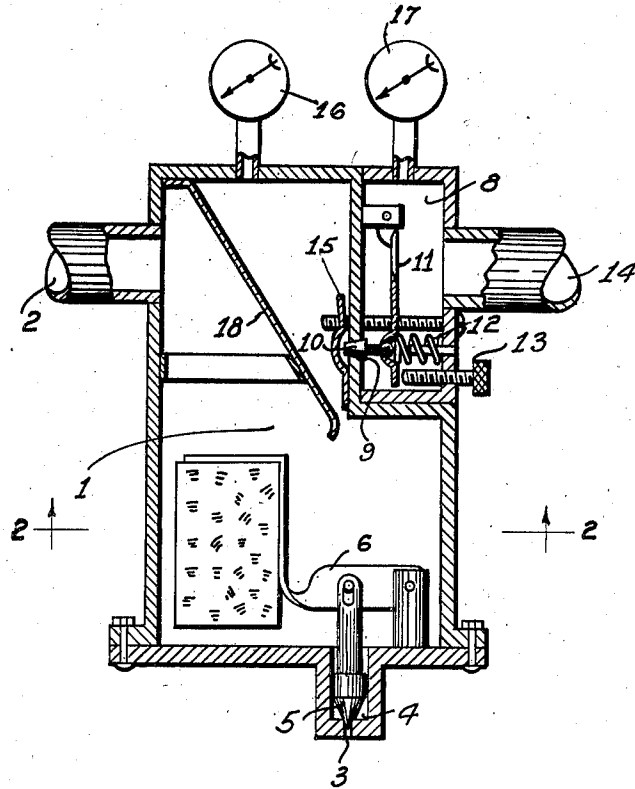
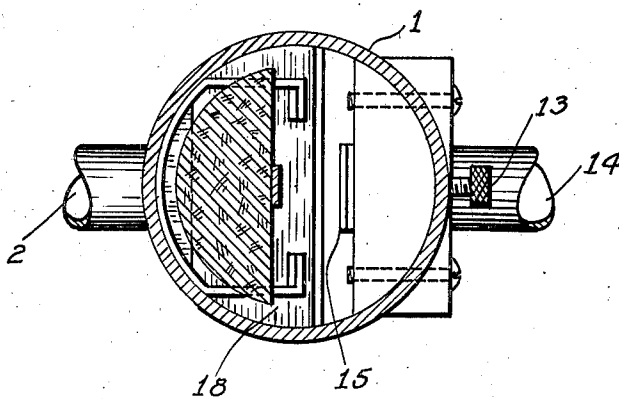


FIG. 2



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UNITED STATES PATENT OFFICE

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VALVE

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1 Claim. (Cl. 251—125)

The invention relates broadly to a valve to be used with means for removing the water or other liquid from air or other gas under pressure, prior to the discharge of said gas to some other cooperating device, such as the nozzle of a spray gun or the like. In the application of paints, enamels, etc., to the surfaces to be finished, the work is done quite often with a spray gun, wherein air under pressure combines immediately prior to the point or area of application onto the surface to be treated, with the enamel, paint, lacquer, porcelain, etc., and all who do this sort of work know that it is substantially impossible to prevent some water, perhaps in the form of condensation, from being carried over with the supposedly dry air and being deposited on the work. The water so deposited is the cause of blisters and other objectionable appearance of the finished surfaces.

The invention has among its other objects, the production of a device of the kind described, that will be neat and simple in appearance and construction, small and compact so as to occupy a minimum of space and weight, having but few moving parts, and which will be otherwise satisfactory and efficient for use wherever deemed applicable.

Many other objects and advantages of the construction herein shown and described, and the uses mentioned, will be obvious to those skilled in the art to which this invention appertains, as will be apparent from the disclosures herein given.

To this end, my invention consists in the novel construction, arrangement and combination of parts herein shown and described, and the uses mentioned, as will be more clearly pointed out in the claim hereunto appended.

In the drawing, wherein like reference characters indicate like or corresponding parts throughout the views,

Figure 1 is a vertical cross-section view taken through the device; and

Figure 2 is a transverse cross-sectional view of the same, taken substantially along the line 2—2 of Fig. 1.

Referring more particularly to the drawing, wherein I have illustrated a preferred embodiment of my invention, there is shown a housing, casing or chamber 1 of metal or some other material capable of withstanding the pressures of the air or other gas to be conducted thereinto, with perfect safety, this casing being called the high-pressure chamber to distinguish it from

another chamber wherein lower pressures are maintained, and about to be described.

The high-pressure chamber 1 is provided, preferably adjacent its upper portion, with an inlet 2, and through which the air or other gas under pressure enters into the device for treatment therein. Adjacent the bottom of the chamber 1 is an opening 3, through which the water or other liquid collected in the device in any desired manner may be discharged into the atmosphere or elsewhere as desired. A valve seat 4 may be provided in the opening 3 for receiving a float controlled tapered valve 5 which is carried loosely intermediate the ends of a lever arm 6 having one end pivotally mounted within the chamber.

Integral with the casing 1, or constructed separately therefrom, as in the present instance, is a second chamber 8, adapted to maintain a lower pressure than that in the first chamber and termed the low-pressure chamber. This low-pressure chamber is provided with a port 9 communicating with the high-pressure chamber, somewhat as shown, and a tapered valve 10 is arranged within the chamber 8 to control the passage through the port 9. Any suitable means may be provided for supporting the valve in assembled relation, as for example, a rocker arm 11 having a ball-and-socket connection with the valve to permit of perfect seating of the latter, the arm 11 being pivoted adjacent its upper end to a fixed supporting wall.

A spring 12 may be used to retrieve the valve to closed position when the device is not in service, or for any other reason it is not desired that the gas discharge from the device, and an adjusting screw 13 operable from without the casing, may be positioned to bear on the rocker arm 11 to adjustably limit and determine the amount of opening of the valve 10 from its seat 9.

The outlet or delivery opening 14 is formed through the wall of the chamber 8, and to this outlet there may be affixed the hose (not shown) for connection to the spray gun, or it may lead to any other sort of a cooperating device requiring gas under pressure, and especially such gas that is substantially free of moisture for best results.

A baffle plate 15 may be arranged within the chamber 1, across the communicating port 9, and sufficiently closely adjacent thereto as to restrict and constrict the effective size of the said opening. In this way, the pressure within the chamber 8 will be held below that in the chamber 1, even though the valve 10 be opened to its fullest extent.

Gauges 16 and 17 may be placed to communicate with the chambers 1 and 8, respectively, so that the respective pressures therein may be ascertained at all times.

A main baffle or striker plate 18 may be arranged within the high-pressure chamber 1, the same extending downwardly from the top of the said chamber at a point closely adjacent the inlet 2 into the latter, and whose lower end or bottom edge terminates slightly above the top level of the liquid that is permitted to collect in the bottom of the chamber 1, and if so desired, the bottom edge or tip of the baffle may be curled forwardly, toward the inlet 2 to form a trough therealong.

As the air or other gas under high pressure enters into the chamber 1 through the inlet 2, it strikes and impinges on the plate 18 positioned directly across its path of entry into the chamber, and the water or other liquid that may be entrapped or entrained in the gas is released onto this baffle and will follow the surface of the latter to the bottom edge, and drop off into the bottom of the chamber. The gas can not pass to the other side of the baffle in any other manner except by travelling downwardly of the same and then upwardly behind the baffle to adjacent the communicating port 9. There is little or no likelihood of the gas carrying the entrapped liquid through such a tortuous path, and especially so, when the metal baffle 18 is directly across its path, as the tendency is for the water or other liquid to be released immediately on contact with the metal plate.

The smaller baffle 15 provides additional assurance against the carrying over of moisture in the event that an infinitesimal amount escapes upwardly past the lowermost edge of the baffle 18.

The high or line pressure of the gas is materially reduced before it passes out through the delivery opening 14 of the low-pressure chamber, as it will be seen that the port 9 is materially smaller in cross-section or size than the inlet port 2, so that only a reduced flow is permitted through this communicating port. Further, the baffle 15 cuts off quite a bit of the normal flow of gas from the main or high-pressure chamber into the second chamber. The valve 10 is preferably tapered in cross-section and the port 9 correspondingly tapered, so that the valve may be

self-seating and compensating for wear. The spring 12 normally presses the valve closed, but as soon as the pressure in the space between the baffle 15 and said port becomes strong enough to overcome the spring pressure, the valve unseats, and this low-pressure gas is delivered through the delivery opening 14. The spring acts as a governor so as to tend to feed the gas at substantially uniform pressure from the low-pressure chamber. For any delivery at increased pressures from the chamber 8, the adjusting screw 13 may be opened or backed away from the valve, thereby permitting the pressure in the main chamber to enter through the communicating port and maintain the valve farther away from its seat, and thereby increasing the effective size of the port opening at the time.

When interposing a device such as just described, in the air line of a paint or enamel spray gun, the air will be discharged at the final point perfectly dry, and hence the objectionable drops of water that cause blistering and other unsightly and damaged finishes are eliminated.

Having thus described my invention, it is obvious that various immaterial modifications may be made in the same without departing from the spirit of my invention; hence I do not wish to be understood as limiting myself to the exact form, arrangement, construction and combination of parts or the uses mentioned, except as limited by the state of the art to which this invention appertains or the claim hereunto appended.

What I claim as new and desire to secure by Letters Patent is:

In a separator device for feeding substantially moisture-free gas and comprising a chamber having a tapered gas inlet port having gas at high pressure delivered thereto and a gas outlet, a valve carrier, a spring pressed tapered valve insertable in said inlet port for normally closing said inlet port and connected to said carrier through a universal connection, means for pivotally mounting said carrier, and means independent of said carrier and said last-mentioned means and adjustable from without said chamber for limiting the opening movement of said valve to control the effective opening of said inlet port.

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