May 26, 1931. F. A. TITTEMORE 1,807,230

COMBINED PRESSURE CONTROL AND WATER SEPARATOR DEVICE FOR PAINT SPRAYING MACHINES

Filed March 20 1928

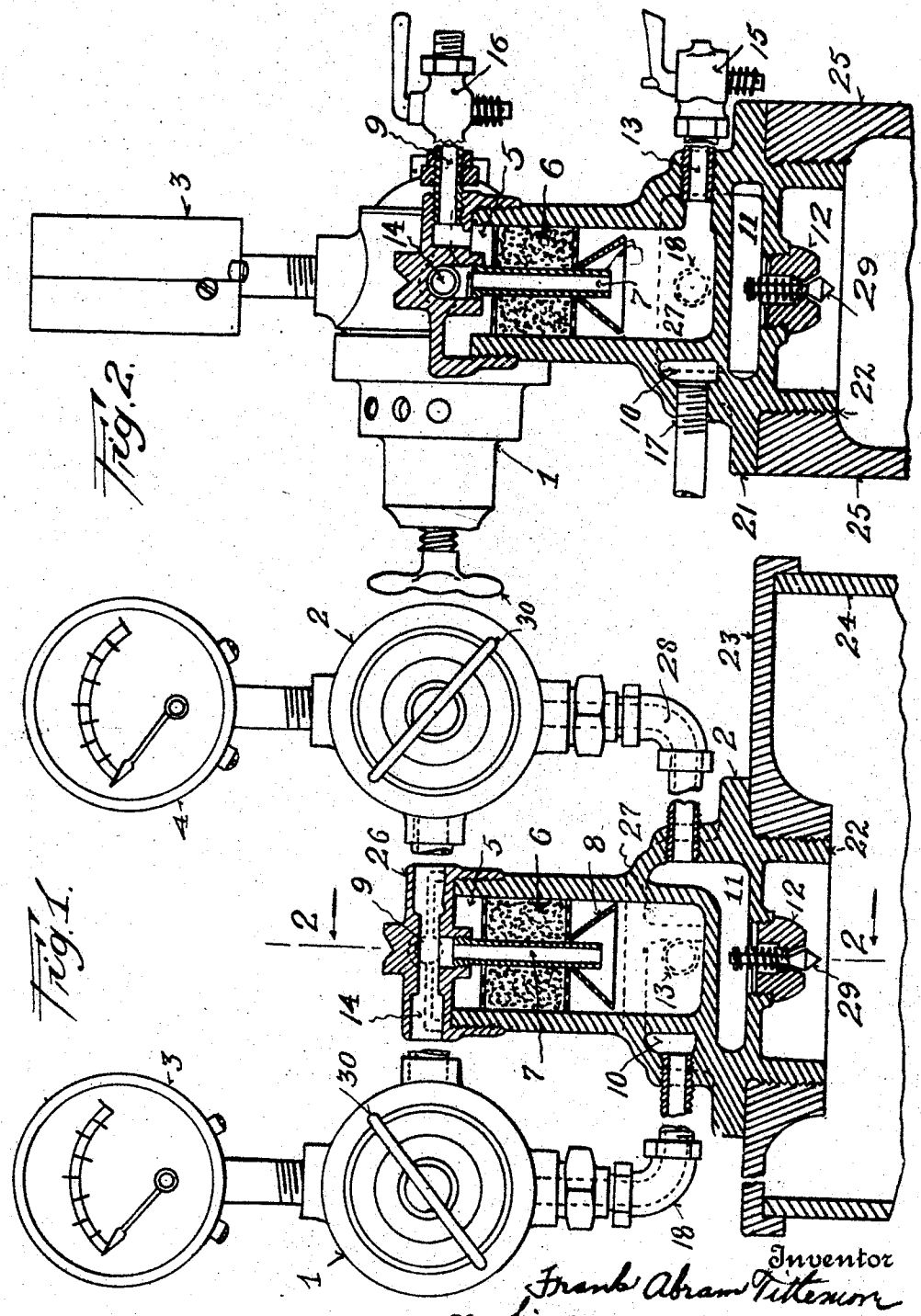


Fig. 2.

Fig. 1.

Inventor
Frank Abram Tittemore

By his Attorneys,
Darby & Darby

Patented May 26, 1931 1,807,230

UNITED STATES PATENT OFFICE

FRANK ABRAM TITTEMORE, OF RICHMOND, CALIFORNIA, ASSIGNOR TO HOPKINS SPRAY EQUIPMENT COMPANY, OF SAN FRANCISCO, CALIFORNIA, A CORPORATION OF NEVADA

COMBINED PRESSURE CONTROL AND WATER SEPARATOR DEVICE FOR PAINT SPRAYING MACHINES

Application filed March 20, 1928. Serial No. 263,020.

This invention relates to a combined pressure controlling and water separating device for paint spraying machines.

The object of the invention is to provide a combined pressure controlling and water separating device for paint spraying machines which is simple in structure, efficient in operation, compact and convenient for use and application.

A further object of the invention is to provide a device of the nature referred to wherein there is combined within a single structural unit pressure controlling and water separating means for use in connection with paint spraying devices.

A further object of the invention is to provide a device of the nature referred to which is incorporated into a cap or cover capable of application to a paint pot or container for paint spraying machines.

Further objects of the invention will appear more fully hereinafter.

The invention consists substantially in the construction, combination, location, and relative arrangement of parts all as will be more fully hereinafter set forth, as shown in the accompanying drawings, and finally pointed out in the appended claims.

In the accompanying drawings—

Figure 1 is a view partly in elevation and partly in vertical section of a combined pressure controlling and water separating device for paint spraying machines embodying the principles of my invention.

Figure 2 is a view in vertical section on the line 2—2 of Fig. 1 looking in the direction of the arrows.

The same part is designated by the same reference numeral wherever it occurs throughout the several views.

In the use and operation of paint spraying apparatus of the pressure feed type it is usual to employ a pressure medium supplied into the paint pot or container to force the paint material to the nozzle or gun to be sprayed onto the surface to be painted. It is also usual to supply a pressure medium to and through the gun to effect the atomization of the paint material as the latter is delivered from the nozzle of the gun, and to project the atomized paint material onto the surface to be painted. To secure the best results it is desirable that the pressure supplied into the paint pot or container to feed the material to the gun be under adjustable control in order to meet the practical requirements encountered in painting operations and, likewise, it is desirable to supply the atomizer pressure medium to the gun under adjustable control, for the same purpose. It is also desirable to maintain the pressures when once adjusted and correlated each with respect to the other, substantially uniform and constant so that the painting operations may be uniform for any condition to which the apparatus may be adjusted and coordinated. Where compressed air is employed for the pressure medium to effect the feed of the paint material and the atomization thereof difficulty has been encountered by reason of the accumulation of water of condensation from the compressed air employed within the system. Any condensation, moisture, water in the system is exceedingly detrimental in the application of paints, lacquers, and the like, by reason of the water coming in contact with and commingling with the paint material either in the pot or container or in the spray of the paint material at the delivery end of the gun. It is also desirable in order to secure the best results to eliminate or remove from the pressure medium any particles of foreign matter, dust, dirt, or the like, contained in the pressure medium employed, the presence of which in said medium not only effects undue wear on the hose and passages of the gun but also frequently mars or impairs the smoothness, evenness, and uniform appearance of the painted surface.

In order to avoid these and similar objections it has been the practice to employ some sort of separating means for trapping the condensation from the compressed air or filtering such air. Ordinarily a water trap or separator as a separate unit is employed and located at some point in the system usually at a point near to or adjacent the container or paint pot, or attached or mounted at some point in the compressed air line leading from the compressor to the container. Frequently

the source of air pressure supply, such for example as an air compressor, is located at a considerable distance from the paint pot or container. It sometimes happens where a separator unit is employed that the operator on the job frequently neglects to couple up the separator into the system. Moreover, practical experience in the manufacture and use of pressure paint spraying apparatus has demonstrated that condensation takes place in the air lines where compressed air traverses the length even of ten feet of hose, and consequently if the separator is located ten or more feet away from the pot or container more or less water of condensation develops which reaches the pot or container and becomes mixed with the paint material.

In order to avoid the objections noted, to prevent the possibility of failure through negligence or otherwise of properly hooking up the separator into the system, and to insure the location of the separator at the closest possible proximity to the point where the compressed air is delivered into the pot or container to effect the feed of the paint material therefrom, I propose in accordance with the principles of my invention to incorporate the pressure controlling devices of the water separator and filter into a single unit which is capable of being attached as a unit directly to the top or cover of the paint pot or container, or it may in and of itself constitute the whole or a part of such top or cover.

In carrying out my invention I provide a casing 20 having an interior chamber and formed at its base end with an annular flange 21 and a threaded nipple portion 22 by which said casing may be removably screwed into a threaded opening in the top or lid 23 of a pot or container 24, as shown in Fig. 1, or directly into a threaded opening in the mouth or open end of the paint pot or container 25, as shown in Fig. 2. Mounted upon the upper end of the casing 20 is a cap 26 to form a chamber 5 within the casing. A source of compressed air delivers into the space or chamber 5 through an air inlet opening 9 under the control of a cut off valve 16. Disposed within the interior of the casing 20 below the chamber 5 is a thick layer 6 of suitable filtering material, such as felt or the like, through which the compressed air passes from said chamber 5. The purpose of this filtering material is to separate out from the air any particle of dirt, scale, or other foreign matter as well as to cushion or retard the velocity of flow of the incoming compressed air. Vertically disposed within the casing and extending through the bed of filtering material 6 is a section of pipe 7 having an open lower end and delivering at its upper end into a passage 14 formed in the cap 26. Disposed within the casing beneath the bed of filtering material 6 and surrounding the open end of the pipe or tube 7 is an inverted metal cone shaped member 8, the smaller end of which encompasses the tube 7 and the rim of its larger end extending into close proximity to the inner surface of the casing, a very small clearance being allowed between this width or rim and the inner wall of the casing. Any water of condensation contained in the air is deposited upon the upper inclined surface of the cone shaped member 8 and flows down such surface through the small clearance between its lower edge or lip and the inner wall of the casing, being forced by the air pressure through said space while the capillary attraction of the casing wall at the restricted passage referred to picks up any such condensation and allows it to flow down the inner wall of the casing into the lower portion 27 of the interior chamber of the casing which serves as a receiving sump and from which the collected condensation may be drawn or forced off through a connection 13 controlled by a cut off valve 15.

The compressed air after passing through the filter material 6 and after the removal of the water of condensation therefrom in the manner described passes upwardly through the lower open end of the pipe 7 and into the passage 14. From the passage 14 the dry air under pressure passes into the pressure tank to effect the feed of the paint material therefrom to the gun, and also from said passage 14 the dry compressed air passes to the gun for atomizing the paint material delivered to the latter and for projecting such material onto the surface to be painted.

In order to secure the proper coordination of the pressures referred to, that is the paint feed pressure supplied into the tank or pot and that supplied to the gun for atomization, either one or both of these pressure supplies may be adjustably regulated and when so adjusted and regulated automatically maintain at the desired coordination or ratio with respect to each other. In the particular embodiment of my invention as shown, to which, however, my invention is not to be limited or restricted in its broadest scope, I propose to adjustably regulate and control each of these pressures in the combined pressure controlling and water separating unit structure of my invention. To this end the dry air pressure delivers from passage 14 through a suitable connection into and through an adjustable pressure reducing or controlling device 2 with which is connected a pressure indicator 4 and by means of which pressure reducer and adjustable and regulated and controlled pressure of uniform value is delivered through a convenient connection 28 (see Fig. 1) into a space 11 formed in the base body of the casing 20. This space delivers through an opening in a plug 12 which is controlled by a splash valve 29, the function of which is to prevent the air pressure contained within the paint

container or pot from splashing paint material from the container or pot into the space 11 and thence into the passage 28 and reducing valve 2. For this purpose the valve 29 unseats inwardly towards the interior of the paint pot or container but is yieldingly held seated when no air pressure is being supplied into the pot.

Where the atomizing air pressure is also supplied under adjustable control and automatically maintained at its adjusted ratio to the gun for atomizing and projecting the paint material, I employ in the particular embodiment of my invention shown an adjustable automatic pressure reducing valve 1 similar in construction and operation in all respects to the pressure controller 2 above referred to. Associated with the pressure reducer 1 is a pressure gauge 3. The regulated air is delivered from the pressure reducer 1 through connection 18 into a chamber or space 10 formed in the casing 20 from which such regulated air pressure is delivered by means of a hose or a pipe connection in the usual manner, through connection 17 (see Fig. 2).

The desired adjustments of the pressure regulators 1 and 2 may be effected in any suitable or convenient manner, such for instance as by means of the adjusting screws 30, whereby the said pressure reducers may each be adjusted so as to secure the desired relative coordination of the two pressures each or either with respect to the other, said pressure reducers operating in the usual manner of such devices to deliver and uniformly maintain a constant pressure supply into the paint pot or tank and also to the gun for atomization.

The relative location of the two pressure valves employed, 1 and 2, with respect to each other is quite unimportant so long as they function to effect the desired correlation of the two pressures.

From the foregoing description it will be seen that I provide a very simple, compact, combined unit of pressure regulating valve or valves and water separator which may be applied to or form a part of the lid or cover for the paint tank, thereby securing compactness in assembly and effecting the filtering and separation from the compressed air of any water of condensation and at a point so closely adjacent to the point of delivery into the paint tank as to preclude the danger of the water of condensation reaching and becoming commingled with the paint material in the pot. If desired, and as above indicated, this combined unit may constitute a necessary part of the paint pot or tank construction and must be applied whenever the paint pot or tank is employed thereby preventing the omission of the water separator by accident, inattention purposely or otherwise to this element of the equipment.

It is obvious that many changes in the details of structure and arrangement will readily occur to persons skilled in the art and still fall within the spirit and scope of my invention. While, therefore, I have shown and described a specific structure embodying my invention I do not desire to be limited or restricted to the exact details disclosed.

But having now set forth the objects and nature of my invention and a structure embodying the purposes thereof what I claim as new and useful and of my own invention and desire to secure by Letters Patent is:

1. A combined pressure controlling and water separating unit including a casing having a base portion for attachment to a paint pot or container, a compressed air receiving chamber, an atomizing air passage and a paint feed passage, pressure reducing devices carried by said chamber and respectively delivering to said atomizing and paint feed passages, a pipe connection delivering from the interior of said casing to said pressure controlling devices and water separating means disposed within said casing and being in the path of the air before it reaches the pressure regulating device.

2. A combined pressure controlling and water separating unit comprising a casing having a base portion for attachment to a paint pot or container, an air pressure receiving chamber, a sump chamber, an atomizing air pressure passage and a paint feed pressure passage, pressure regulating devices carried by said casing and delivering respectively to said atomizing air pressure passage and said paint feed pressure passage, a water separating device disposed within said casing above said sump chamber, said receiving chamber delivering to said water separator, a pipe connection delivering from the water separator to said pressure reducing devices, and a drain connection delivering from said sump chamber, the air passing through the water separator before reaching the pressure regulating devices.

3. A combined pressure regulating and air conditioning unit in the form of a container cap, comprising a head having a base by which the unit may be applied to the container, filtering means in the head, said head having an air feed passage near the top, a tube connecting said passage with the interior of the head and extending through the filtering means, a conical member into which the tube projects, said conical member being of slightly less diameter than the internal diameter of the head, pressure regulating devices in communication with the head above the filtering means, said head having an atomizing air passage and a paint feed passage in communication with said pressure reducing devices and a valve on said head at the base for establishing communication between the

paint feed passage and the container when the unit is applied thereto.

4. An air conditioning unit comprising a casing, filtering means in said casing dividing it into two chambers in communication solely through said filtering means, an air inlet passage into one of the chambers and an air outlet passage for the other chamber, a tube projecting through the filtering means and connected to the air outlet passage, and a conical member encircling the projecting tube near its apex and at its base being of a slightly less diameter than the internal diameter of the casing.

In testimony whereof I have hereunto set my hand on this 13th day of March A. D., 1928.

FRANK ABRAM TITTEMORE.