Sept. 25, 1956 J. A. PAASCHE 2,764,177

REGULATOR STRUCTURE

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Fig. 1.

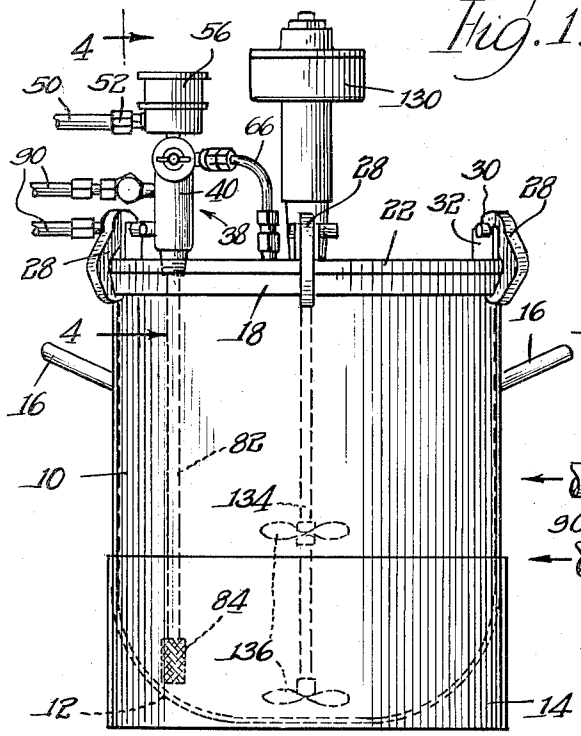


Fig. 3.

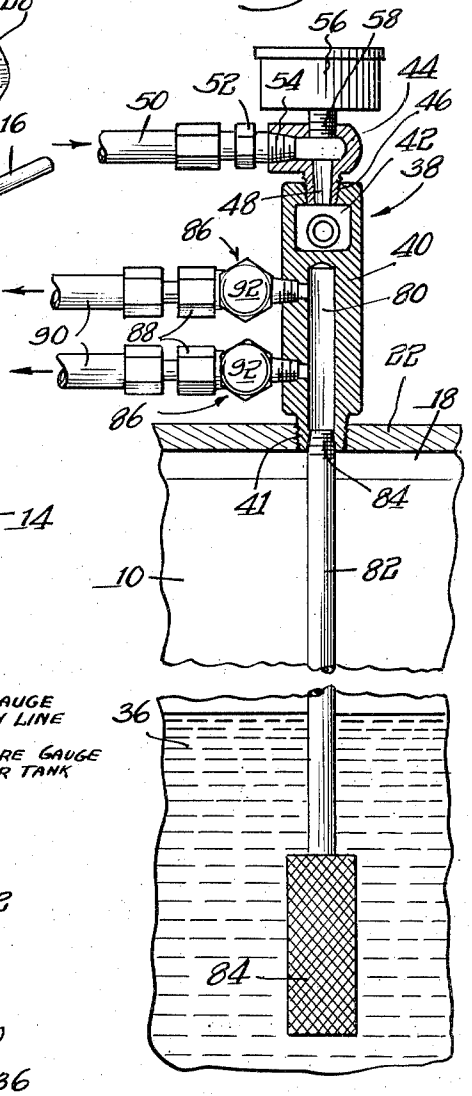
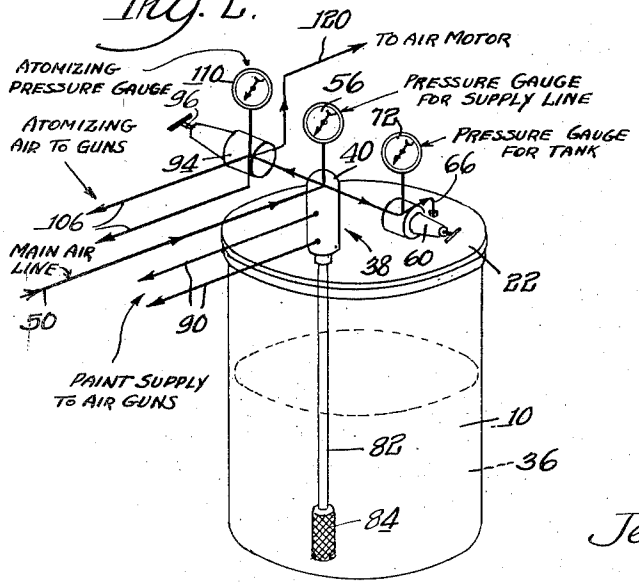


Fig. 2.



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Fig. 4.

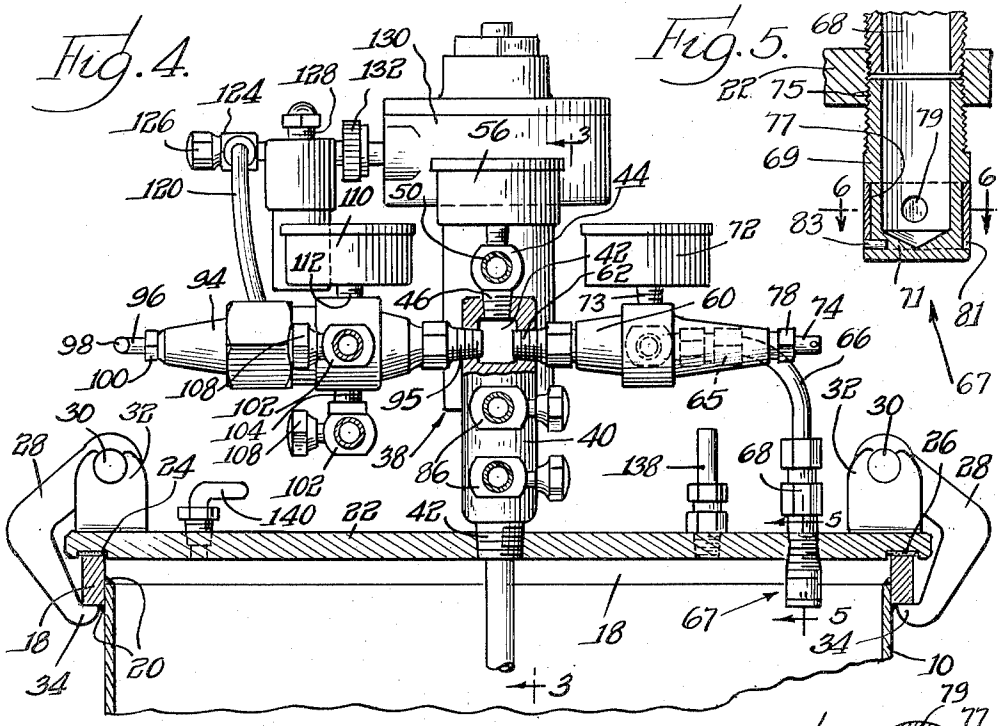


Fig. 5.

Fig. 6.

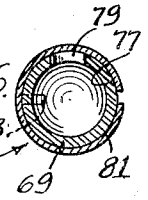


Fig. 7.

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REGULATOR STRUCTURE

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Application January 24, 1952, Serial No. 268,092

1 Claim. (Cl. 137—209)

This invention is concerned generally with airpainting and the like and specifically with an air distributing and regulating structure.

In airpainting with one preferred type of gun or airbrush, paint or other liquid is supplied under pressure from a tank to the gun or airbrush for atomizing by air under pressure. The pressure required on the liquid in the tank depends on the consistency of the liquid, the length of the hose used, the height to which the liquid must be raised, and the painting rate. The tank pressure generally will range from about two pounds per square inch up. Approximately one pound per square inch of pressure must be added for every foot of elevation the paint must be raised from the tank to the airbrush. Excessive pressure on the fluid forces the paint out faster than it can be atomized by the airbrush, and an orange peel finish results.

The air pressure required for atomizing depends upon the consistency of the paint to be atomized, the painting rate, and, to some extent, the atmospheric conditions. Light materials require from ten to fifty pounds pressure for proper atomization whereas heavy materials will require from fifty to one hundred pounds per square inch or sometimes even higher pressures. It is preferable to use the lowest possible atomizing pressure so that fumes and mist will be held to a minimum and waste of materials eliminated.

Thus, for best and most efficient airpainting the air pressure to the airbrush or brushes and the pressure on the paint or other fluid must be known. As these depend on the air supply line pressure, the supply line pressure also must be known.

An object of this invention is to provide a new or improved structure for distributing and regulating air under pressure.

An object of this invention is to provide a simple and compact structure for distributing air from a supply line to a fluid pressure tank and to atomizing guns or airbrushes used in conjunction therewith, and to an air motor agitator if one is used.

Another object of this invention is to provide a regulator for distributing air from a supply line and having closely grouped gauges readily readable at a glance and easily replaced when damaged.

A further object of this invention is to provide a unitary structure for distributing and regulating air and paint or other liquid to be atomized.

Another object of this invention is to provide an improved means for introducing air under pressure into a tank.

Other objects and advantages of the present invention will be apparent from the following description when taken in connection with the accompanying drawings wherein:

Fig. 1 is a side view of a pressure tank having an air distributing and regulating structure embodying the principles of my invention;

Fig. 2 is a somewhat schematic view in perspective of the apparatus shown in Fig. 1 and illustrating the air distribution;

Fig. 3 is a vertical sectional view taken substantially along the line 3—3 of Fig. 4;

Fig. 4 is a vertical sectional view taken substantially along the line 4—4 of Fig. 1;

Fig. 5 is a sectional view of the air inlet fitting taken along the line 5—5 of Fig. 4;

Fig. 6 is a cross sectional view of the air inlet fitting taken along the line 6—6 of Fig. 5; and

Fig. 7 is a fragmentary top view of the apparatus.

Referring first to Fig. 1, there is illustrated a generally cylindrical pressure tank 10 adapted to contain paint or other liquid under pressure. The bottom of the tank is rounded at 12 in order best to withstand the internal pressure, and a ring-like skirt 14 is welded or otherwise secured to the side of the tank and depends below the round bottom so that the tank can be placed on the floor or other level surface without danger of tipping. The tank is provided with diametrically opposite handles 16 for lifting and transporting the tank.

A ring 18 encircles the top of the tank and extends slightly thereabove and is welded to the tank at 20 as shown in Fig. 4. The tank is provided with an explosion proof flat lid or cover 22 which is quickly removable in its entirety for replenishing the supply of paint or other liquid in the tank. A gasket 24 of rubber or the like is set in an annular groove 26 in the bottom face of the cover 22 and bears against the ring 18 for sealing the lid to the tank. A plurality of clamps 28 is spaced about the periphery of the lid for uniformly clamping the lid on the tank. The clamps are pivotally mounted on eccentric pins 30 carried by brackets 32 mounted on the cover 22. The clamps 28 are provided with holding teeth or fingers 34 fitting beneath the ring 18 and drawn up against the ring by rotation of the eccentric pins 30 to clamp the cover 22 firmly on the tank. The construction and operation of the clamps and the explosion proof feature of the flat lid are set forth more fully in my copending application, Clamp for Pressure Tank, Serial No. 268,091, filed January 24, 1952.

The tank is adapted to contain paint 36 (Figs. 2 and 3) or other liquid and air is supplied under pressure to the top of the tank to force paint out through an outlet pipe extending into the paint 36 below the surface thereof as will be apparent hereinafter. In order to supply air under pressure to the top of the tank for expelling paint therefrom and also to supply air from a supply line to the atomizing guns or airbrushes and to an air motor agitator, I have provided my distributing and regulating structures 38.

The regulator 38 includes a substantially cylindrical block 40 having a reduced lower end 41 threaded into an aperture in the cover 22. The upper portion of the cylindrical block 40 is hollow at 42 and a substantially T-shaped air line inlet 44 is threaded into the top of the block 40 at 46 and has a channel 48 communicating with the space 42. An air supply line 50 is provided with a conventional coupler 52 threaded into the air line inlet 44 at 54 and is in fluid communication with the channel 48. A pressure gauge 56 is threaded into the inlet 44 at 58 and likewise is in fluid communication with the channel 48 so that pressure of air in the supply line can be read directly. The gauge illustrated reads up to 160 pounds per square inch air pressure.

A regulator assembly 60 is threaded into one side of the block 40 at 62 in fluid communication with the space 42. A connector 64 is threaded into the back of the regulator assembly 60 and is connected at 65 to a pipe or tube 66 curving downwardly and communicating with the inside of the tank 10 through a connector 68 threaded into an aperture in the tank cover at 70.

To prevent paint or the like from running into the air pipe **66** I have provided an air inlet fitting **67** threaded into the tank cover **22** from the bottom in alignment with the connector **68**. The air inlet fitting **67** comprises a hollow cylindrical body **69** closed at one end **71** and open at the other. The body **69** is threaded at **75** adjacent the open end. A neck portion **77** of reduced diameter communicates with the interior of the body **69** by means of a transverse aperture **79**. A splash cap seal **81** in the form of a resilient split ring is sprung into the neck portion **77** and preferably has the gap in the ring displaced 90° from the aperture **79**. The seal **81** clamps tightly against the body to prevent entrance of paint and the like through the aperture **79**. Air under pressure inside the body springs the seal **81** outwardly to allow the air to pass into the tank. A pin **83** passes through the edge of the seal **81** and into the body **69** to prevent rotation of the seal and possible alignment of the seal gap with the aperture **79**.

An air pressure gauge **72** illustrated as reading up to 60 pounds per square inch is threaded into the top of the regulator assembly **60** at **73** and is in fluid communication with the connector **64** by means of a central open space in the assembly **60** in order to indicate the internal pressure of the tank **10**. A stub shaft **74** having a cross pin **76** is rotatably and threadedly mounted in a suitable nut-like element **78** threaded into the end of the regulator assembly **60**, and controls the fluid connection between the open space **42** in the block **40** and the air line **66** leading to the tank **10**. The valve mechanism utilized in the regulator assembly **60** preferably is of the type having a spring pressed plunger adapted to maintain a substantially constant pressure from the assembly **60** depending upon the setting of the stub shaft **74** in order to maintain a predetermined pressure in the tank.

The lower portion of the block **40** is provided with an axial bore forming a manifold **80** and having a fluid pipe or paint outlet pipe **82** threaded into the bottom thereof at **84**. The lower end of the pipe **82** terminates toward the bottom of the tank **10** and is provided with a screen **84** to prevent the intake of paint skin or other solid or semisolid substances in the paint. One or more valves **86** illustrated as two in number are threaded into the side of the block **40** in communication with the manifold aperture **80**. Suitable connectors **88** join atomizing gun paint lines **90** to the valves **86**, the number of lines **90** and valves **86** depending upon the number of atomizing guns or airbrushes that are to be used. Each of the valves **86** is provided with a knob **92** adapted individually to control a suitable valve member so that paint is supplied only to the atomizing guns or airbrushes that are to be used.

An air regulator assembly **94** is threaded into the block **40** at **95** substantially opposite to the regulator assembly **60** in communication with the open space **42**. As will be seen in Fig. 7, the regulator assemblies are positioned at an angle of somewhat less than 180° relative to one another so that both assemblies are positioned inwardly from the edge of the cover where they are well protected from physical damage and allow easy access to the clamping mechanisms. The air regulator assembly **94** is provided with a stub shaft **96** having a cross pin **98** and threaded into a nut-like member **100** which in turn is threaded into the regulator assembly **94**. The stub shaft **96** similarly to the stub shaft **74** preferably controls a spring actuated valve plunger adapted to maintain a predetermined pressure output to maintain a desired pressure within the regulator assembly **94** and hence to supply air at that pressure to a plurality of valves **102** threaded into the assembly **94** as at **104**. It will be understood that another valve could be threaded into the bottom of the lower valve **102** etc. so that substantially any number of atomizing gun air lines **106** can be supplied with air at a predetermined pressure. Each valve **102** is provided with an actuating knob **108** fixed

to a suitable valve member for individual control over the air lines **106**.

An air pressure gauge **110** is threaded into the top of the assembly **94** at **112** for measuring the pressure supplied to the atomizing gun air lines **106**. This gauge has been illustrated similarly to the gauge **56** as reading up to 160 pounds per square inch.

A coupling **114** is threadedly connected to the rear of the regulator assembly **94** and communicates with the interior thereof for supplying air through an elbow **116** and another connector **118** to a flexible hose or conduit **120**. The hose **120** is connected by means of a connector **122** to a valve **124** having a stub valve member controlled by a knob **126**. Connection is made from the valve **124** through an automatic oiler **128** to an air motor **130** supplied with a suitable motor speed control exhaust muffler **132**. The air motor **130** is supported from the cover **22** and drives a shaft **134** extending down into the paint or other liquid in the tank and bearing a propeller **136** at its lower end for agitating or constantly mixing the paint.

The explosion proof pressure tank may be supplied with fitting in addition to those heretofore shown and described and essential ones of such fittings include a pressure safety release **138** threaded into the cover **22** to relieve excessive internal pressures and a pressure release **140** threaded into the cover **22** and to be removed therefrom to relieve internal pressures before the cover **22** is removed.

The structure herein set forth for regulating and distributing air from a pressure line to a tank, to atomizing guns, and to an air motor agitator may be seen to be compact in structure with the various gauges closely spaced for ready readability. The structure is substantially unitary but at the same time is capable of ready modification such, for example, as connecting an atomizing gun air line directly to the block **40** in place of the regulator **94** if it is desired to omit the air motor and regulator.

Although an example of my invention has been shown and described, it is to be understood that this example is for illustrative purposes only and does not constitute any limitation on my invention. My invention includes all that which falls within the spirit and scope of the appended claim.

I claim:

Control structure for a pressure tank comprising a substantially cylindrical compressed air inlet fitting having a hollow upper portion opening into a threaded connector adapted for connection with an air supply line, the lower portion of said inlet fitting being provided with a chamber and adapted for threaded connection to a pressure tank cover or the like, said lower portion having threaded connecting means communicating with said chamber and adapted for connection to a liquid dispensing line, an air pressure gage threadedly mounted on the first mentioned connector for indicating the pressure of incoming air, a first compressed air distributing mechanism threaded into one side of said inlet fitting near the top thereof and at substantially right angles to said inlet fitting, said distributing mechanism having threaded outlet means adapted for interconnection with an air inlet of an air pressure tank or the like, an air pressure gage threaded into said distributing mechanism for indicating the pressure of air supplied to said outlet means, a second compressed air distributing mechanism threaded into said inlet fitting adjacent the top thereof and substantially diametrically opposite said first air distributing mechanism, said second air distributing mechanism having a threaded connection adapted for supplying air under pressure to an airbrush or the like, and an air pressure gage threaded into said second air distributing fitting for indicating the pressure of air supplied to the threaded connector of said second air distributing mechanism.

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