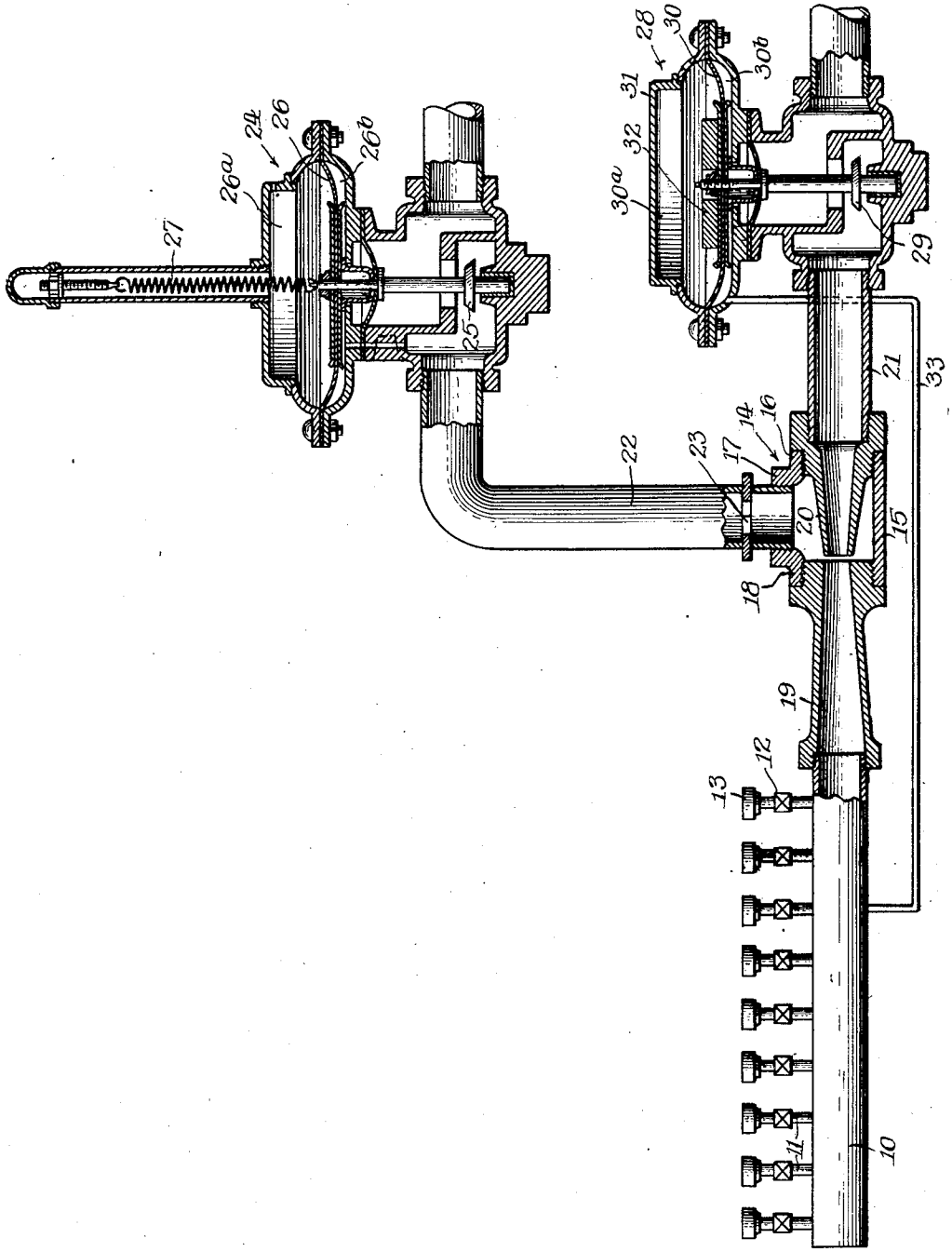
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FLUID CONTROL SYSTEM

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FLUID CONTROL SYSTEM

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The present invention relates to improvements in means for governing the supply of fluids, and has particular reference to control means for gas burner supply lines.

In many industrial appliances, a plurality of gas burners are fed from a single manifold to which gas and air in the desired ratio are supplied through a suitable mixing device, such as a Venturi suction T. The supply of gas is controlled by a zero governor. The supply of air is controlled by means of a cock or valve, and the volume of the fuel mixture is automatically controlled by the flow of air.

The burners in many instances are independently adjustable to provide flames of different intensities. Accurate independent adjustment of the burners often is of vital importance in the manufacturing process in which they are used. Changes in the flame intensity from a predetermined intensity at any one of the burners may spoil the work in the process of manufacture. In the foregoing construction, by reason of the remote control, adjustment of one or more burners influences the pressure in the manifold and hence influences all the other burners. This is decidedly objectionable and renders adjustment difficult.

The primary object of the present invention therefore resides in the provision of novel means for controlling the regulator by the pressure in the feed line or manifold so as to maintain the pressure constant regardless of any relative adjustments of the burners.

Further objects and advantages will become apparent as the description proceeds.

In the accompanying drawing, the figure is a diagrammatic representation of a burner supply system comprising the features of my invention.

While the invention is susceptible of various modifications and alternative constructions, I have shown in the drawing and will herein describe in detail the preferred embodiment, but it is to be understood that I do not thereby intend to limit the invention to the specific form disclosed, but intend to cover all modifications and alternative constructions falling within the spirit and scope of the invention as expressed in the appended claims.

Referring more specifically to the drawing, the exemplary embodiment of the invention comprises a fluid supply manifold 10. Connected in parallel to the manifold 10 in spaced relation along its length are a plurality of fluid outlet pipes 11, nine being provided in the present instance. Each pipe 11 is provided with an adjusting means, such as a suitable hand cock 12. While the invention is not limited to the distribution of any particular fluid, it is particularly adapted for the distribution of a gaseous fuel mixture, and hence a gas burner 13 of suitable construction is shown connected to each pipe 11. The manifold 10 may be of any suitable construction, and in the present instance is cylindrical in form, and closed at one end.

Fuel mixture is supplied to the other end of the manifold 10 from a suitable mixing and proportioning device designated generally as 14. In the present instance, this device is in the form of a Venturi suction T comprising a casing 15 having inlet openings 16 and 17 and an outlet opening 18. Secured to the opening 18 and connected to the manifold 10 is an outlet expanding cone 19. A tapering nozzle 20 connected to a suitable air supply pipe 21 is secured in the opening 16, and terminates at a point slightly spaced from and in front of the inlet end of cone 19. The opening 17 is connected to a suitable gas supply pipe 22 in which a restricted and adjustable orifice 23 is interposed. Air from the nozzle 20 enters the cone 19 at a relatively high velocity, and creates a suction which causes gas to be drawn about the nozzle into the cone with the air. The supply of gas by this action is proportional to the supply of air, and is adjustable by adjusting the orifice 23.

Interposed in the gas pipe 22 is a suitable zero governor 24 preferably of standard construction. The governor 24 comprises a valve 25 in the pipe 22 responsive to the movements of a diaphragm 26. The space 26ª at one side of the diaphragm 26 remote from the valve 25 is exposed to the atmosphere. The

space 26b at the other side is exposed to the pressure in the pipe 22 at the outlet side of the valve 25. An adjustable spring 27 tends to close the valve 25.

Where relatively high gas pressures are used, it is advisable to put a service governor on the line to produce a gas pressure at the inlet of the zero governor of not more than a few inches of water column.

Interposed in the pipe 21 is a suitable air regulator 28 preferably of standard construction. The regulator 28 comprises a valve 29 in the pipe 21 and connected to a diaphragm 30 in a casing 31. The space 30a remote from the valve 29 at one side of the diaphragm 30 is vented to the atmosphere, and a weight 32 on the diaphragm tends to open the valve 29. An important object of the present invention resides in connecting the space 30b below the diaphragm through a tube 33 to the manifold 10 so as to impress the pressure therein on the underside of the diaphragm. By this construction, the air is regulated from down the line, and a constant predetermined pressure is maintained in the manifold 10. Hence, the pressure of the fuel mixture in the header 10 is not disturbed by the adjustment of any one or more of the burners 13. After a burner is once adjusted for a desired pressure in the burner head by adjusting the valve 12, that pressure will remain while the other burners are being adjusted. It is true that the adjusting of the burners to the correct burner head pressure may change the air-gas ratio of the mixture in the pipe 10 but this can afterwards be adjusted once and for all by adjusting the orifice 23.

I claim as my invention:

1. A fluid control system comprising, in combination, a manifold, a plurality of burners connected to said manifold, a mixing device for supplying a mixture of air and gas to said manifold, a line for supplying air to said mixing device, a line for supplying gas to said mixing device, said mixing device including means for inducing a flow of gas in proportion to the air supplied, a regulator interposed in said air line, and means connecting said regulator to said manifold so as to render said regulator responsive to the pressure in said manifold.

2. A fluid control system comprising, in combination, a manifold, a plurality of burners connected to said manifold, means for regulating the supply of fluid to said burners, a mixing device for supplying a mixture of air and gas to said manifold, a line for supplying air to said mixing device, a line for supplying gas to said mixing device, said mixing device including means for inducing a flow of gas in proportion to the flow of air thereto, a regulator interposed in said air line, and means connecting said regulator to said manifold so as to render said regulator responsive to the pressure in said manifold.

3. A fluid control system comprising, in combination, an elongated manifold closed at one end, a plurality of discharge pipes connected to said manifold along its length, means for individually controlling the discharge of fluid through said pipes, a mixing device connected to the other end of said manifold, means for supplying a fluid to said mixing device, a zero governor in said last mentioned means, other means for supplying another fluid to said mixing device, the flow of said last mentioned fluid inducing a proportional flow of said first mentioned fluid, a regulator in said other means for controlling the supply of said last mentioned fluid, and a pressure line connecting said regulator to said manifold so as to render said regulator responsive to the pressure in said manifold.

4. A fluid control system comprising, in combination, an elongated manifold, a plurality of spaced discharge means opening from said manifold, means for adjusting said discharge means, a mixing device connected to said manifold, a fluid line discharging to said mixing device, a zero governor in said line, an adjustable orifice in said line between said mixing device and said governor, a second fluid line for discharging to said mixing device, a regulator in said second fluid line, and a pressure line connecting said regulator to said manifold so as to render said regulator responsive to the pressure in said manifold.

5. A fluid control system comprising, in combination, a manifold, a plurality of independently adjustable burners connected to said manifold, a mixing device for supplying a mixture of air and gas to said manifold, a line for supplying air to said mixing device, a regulator interposed in said line responsive to the pressure beyond the outlet, a line for supplying gas to said mixing device, and a zero governor in said last mentioned gas line.

In testimony whereof, I have hereunto affixed my signature.

GARNET W. McKEE.