March 6, 1934. A. G. E. NORDQUIST 1,949,873

AUTOMATIC VALVE CONTROL

Filed Oct. 26, 1931

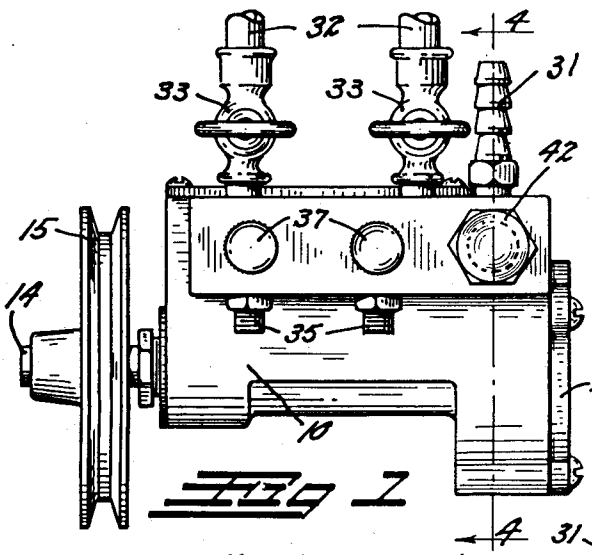


Fig 1

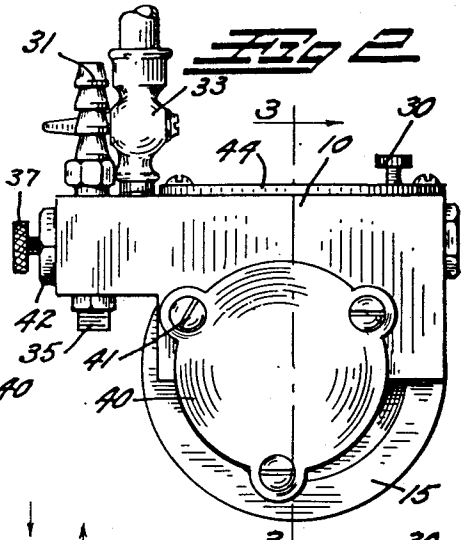


Fig 2

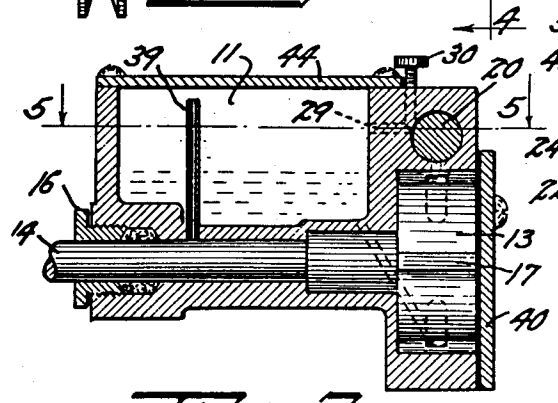


Fig 3

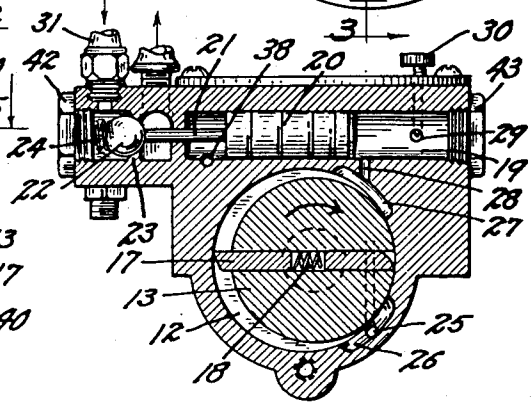


Fig 4

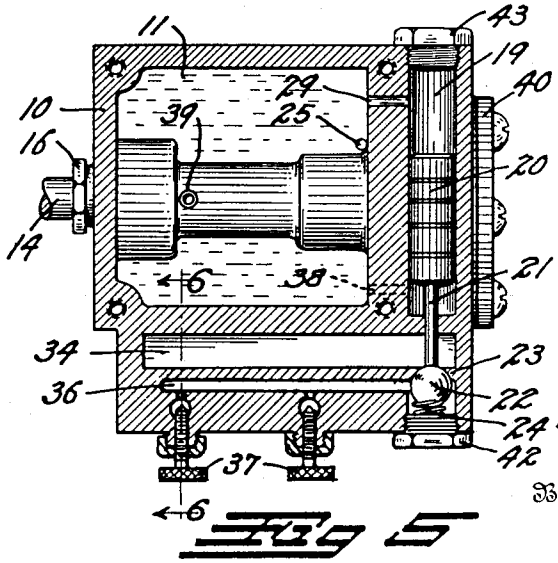


Fig 5

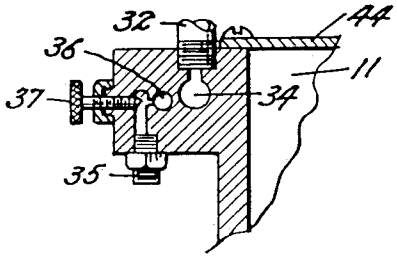


Fig 6

Inventor

ANTON G.E. NORDQUIST

By

Attorney

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AUTOMATIC VALVE CONTROL

Anton G. E. Nordquist, Denver, Colo.

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5 Claims. (Cl. 137—139)

This invention relates to an automatic valve mechanism. It is more particularly designed for automatically turning the gas into the static removing flames of a printing press when the press is started and automatically turning off the gas when the press is stopped.

If the gas controls of a printing press are left to the manual operation of the operator, he will often forget to shut off the burners when stopping the press or should the press accidentally stop the operator will be unable to shut off the burners before great damage is done to the tapes and guide slats by the flames. The principal object of this invention is to provide an automatic valve control which will function to control the gas in accordance with the operation of the press without attention from the operator.

A further object of the invention is to provide a device of this character which may be set to operate the valve with the first movement of the press and which will not be dependent on speed or centrifugal action.

Still another object of the invention is to so construct the device that its cycle of operation can be regulated so as to turn the gas on or off at any desired press speed.

A still further object of the invention is to so construct the device that any desired number of gas lines or pilot burners can be fed and controlled from a single device.

Other objects and advantages reside in the detail construction of the invention, which is designed for simplicity, economy, and efficiency. These will become more apparent from the following description.

In the following detailed description of the invention reference is had to the accompanying drawing which forms a part hereof. Like numerals refer to like parts in all views of the drawing and throughout the description.

In the drawing:

Fig. 1 is a side elevation of the improved automatic valve control.

Fig. 2 is an end elevation thereof.

Fig. 3 is a vertical longitudinal section therethrough taken on the line 3—3, Fig. 2.

Fig. 4 is a vertical cross section taken on the line 4—4, Fig. 1.

Fig. 5 is a horizontal section taken on the line 5—5, Fig. 3.

Fig. 6 is a detail section taken on the line 6—6, Fig. 5.

The invention comprises a main casting 10 in which is formed a reservoir 11. Any suitable liquid may be placed in the reservoir 11. It is preferred to use a slightly viscuous non-volatile oil such as a medium cylinder oil.

At one extremity of the casting 10 an eccentric pump chamber 12 is formed. A pump rotor 13 rotates eccentrically within the pump chamber 12. The pump rotor 13 is formed on the extremity of a pump shaft 14 which extends entirely through the casting 10 terminating in a drive pulley 15. The shaft 14 is sealed at the point of exit by means of a packing nut 16.

The pump rotor 13 is provided with two sliding pump vanes 17 which are constantly forced outwardly against the interior surface of the chamber 12 by means of a compression spring 18. A piston bore 19 is formed in the casting 10 immediately above the pump cylinder 12. A piston 20 is arranged to reciprocate in the bore 19 and is provided with a stem 21. The stem 21 acts against a ball valve 22 which is maintained against a valve seat 23 by means of a valve spring 24.

The oil flows from the reservoir 11 through a pump feed passage 25 to a feed groove 26 formed in the pump chamber 12. The oil discharges from the pump through a pressure groove 27 and a pressure passage 28 to the bore 19. A return passage 29 communicates between the bore 19 and the reservoir 11. The return passage is controlled by means of a needle control valve 30.

The gas to be controlled is fed to the device in any desired manner, such as through a hose nipple 31 which communicates with the casting 10 outside of the ball valve 22. Gas is delivered to the burners through one or more feed pipes 32 controlled by means of suitable gas cocks 33. The feed pipes communicate with a feed passage 34 formed in the casting 10.

It is customary to employ pilot lights for lighting the burners when the gas is turned into the feed pipes 32. The gas for these pilot lights is furnished through suitable nipples 35, which communicate with a gas passage 36 formed in the casting 10 through suitable pilot-adjusting needle valves 37. The gas to the gas passage 36 is not controlled by the ball valve 22.

The pulley 15 is connected by means of a belt to the actuating mechanism such as one of the rolls of a printing press. The operation of the press will then act to rotate the pump rotor 13. This causes the pump to create a fluid pressure in the bore 19, the pressure depending upon the restriction or setting of the needle valve 30. This pressure acts to force the piston 20 outward, causing the stem 21 to push the ball valve 22 from its seat against the action of the valve spring 24.

This allows gas to flow past the ball valve to the burner passage 34, thence to the burners through the feed pipes 32.

Should the press be stopped, the pressure will immediately fall in the bore 19 allowing the valve spring 24 to force the ball valve 22 back to its seat so as to extinguish the burners.

Should any oil leak past the piston 20 it will gather in the bore 19 at the rear of the piston and will then be returned to the reservoir through a drain passage 38. Should any oil leak past the pump rotor 13 along the shaft 14 it will be stopped by the packing and nut 16 and will build up a pressure which will cause it to rise in a riser pipe 39 which will return it to the reservoir 11.

The pump chamber 12 is closed by means of a suitable cap plate 40 held in place by means of cap screws 41. The top of the reservoir 11 is closed by means of a suitable cover plate 44. The supply to any or all the burners can be shut off if desired by means of the cocks 33 and the supply to the pilot burners can be shut off or regulated by means of the needle valves 37. Access can be had to the ball valve through a screw plug 42. Access can be had to the bore 19 through a similar screw plug 43.

Regulation of the device can also be accomplished by placing gaskets of varying thicknesses under the cap plate 40, so as to allow more or less oil to escape past the pump vanes 17. This effects the sensitiveness of operation of the device.

While a specific form of the improvement has been described and illustrated herein, it is desired to be understood that the same may be varied, within the scope of the appended claims, without departing from the spirit of the invention.

Having thus described the invention, what is claimed and desired secured by Letters Patent is:—

1. Means for controlling a valve in consequence of the operation of a machine comprising: a reservoir; a pump chamber formed adjacent said reservoir and communicating therewith; a pump rotor adapted to be rotated eccentrically within said pump chamber by the operation of said machine; vanes projecting from said rotor against the eccentric surface of said pump chamber; a pressure bore adjacent said pump chamber; a passage conveying the discharge of said pump to said pressure bore; a piston arranged to reciprocate in said pressure bore; a stem formed on said piston and adapted to contact with said valve so as to open the valve when the pressure in said bore reaches a predetermined point; a return passage communicating between said pressure bore and said reservoir; a pump shaft extending from said rotor beneath said reservoir; a packing gland preventing the escape of fluid around said pump shaft; and a riser arranged to convey fluid from said pump shaft back to said reservoir.

2. An automatic valve mechanism comprising: a main unit; a reservoir formed in said main unit and opening through the top thereof; a pump chamber formed in said main unit and opening through the end thereof, said pump chamber being positioned below the liquid level in said reservoir; a pump rotor in said pump chamber; a drive shaft for said pump rotor, said shaft extending through said unit below said reservoir; a cap for closing the open side of said pump chamber; a packing gland for sealing said pump shaft in said unit; and means for causing the pressure of said pump to operate a valve; and a riser tube extending from said pump shaft upwardly into said reservoir above the liquid level therein.

3. An automatic valve mechanism comprising: a main unit; a reservoir formed in said main unit and opening through the top thereof; a pump chamber formed in said main unit and opening through the end thereof, said pump chamber being positioned below the liquid level in said reservoir a pump rotor in said pump chamber; a drive shaft for said pump rotor, said shaft extending through said unit below said reservoir; a cap for closing the open side of said pump chamber; a horizontal pressure bore formed in said unit over said pump chamber and above the liquid level in said reservoir; a piston arranged to reciprocate in said pressure bore; a stem formed on said piston and extending through the rear extremity of said pressure bore; a gravity feed passage from said reservoir to said pump chamber; a pressure passage from said pump chamber to the forward extremity of said pressure bore; a return passage from the forward extremity of said pressure bore to said reservoir; a ball valve adapted to be actuated by the stem on said piston; a feed chamber extending into said main unit from one side of said ball valve; and an outlet chamber extending into said main unit from the other side of said ball valve.

4. An automatic valve mechanism comprising: a main unit; a reservoir formed in said main unit and opening through the top thereof; a pump chamber formed in said main unit and opening through the end thereof, said pump chamber being positioned below the liquid level in said reservoir a pump rotor in said pump chamber; a drive shaft for said pump rotor, said shaft extending through said unit below said reservoir; a cap for closing the open side of said pump chamber; a horizontal pressure bore formed in said unit over said pump chamber and above the liquid level in said reservoir; a piston arranged to reciprocate in said pressure bore; a stem formed on said piston and extending through the rear extremity of said pressure bore; a gravity feed passage from said reservoir to said pump chamber; a pressure passage from said pump chamber to the forward extremity of said pressure bore; a return passage from the forward extremity of said pressure bore to said reservoir; a ball valve adapted to be actuated by the stem on said piston; a feed chamber extending into said main unit from one side of said ball valve; and an outlet chamber extending into said main unit from the other side of said ball valve; means for supplying a fluid under pressure to said feed chamber and a series of valve controlled outlets from said outlet chamber.

5. An automatic valve mechanism comprising: a main unit; a reservoir formed in said main unit and opening through the top thereof; a pump chamber formed in said main unit and opening through the end thereof, said pump chamber being positioned below the liquid level in said reservoir a pump rotor in said pump chamber; a drive shaft for said pump rotor, said shaft extending through said unit below said reservoir; a cap for closing the open side of said pump chamber; a horizontal pressure bore formed in said unit over said pump chamber and above the liquid level in said reservoir; a piston arranged to reciprocate in said pressure bore; a stem formed on said piston and extending through the rear extremity of said pressure bore; a gravity feed passage from said reservoir to said pump chamber; a pressure passage from said pump

chamber to the forward extremity of said pressure bore; a return passage from the forward extremity of said pressure bore to said reservoir; a ball valve adapted to be actuated by the stem on said piston; a feed chamber extending into said main unit from one side of said ball valve; and an outlet chamber extending into said main unit from the other side of said ball valve; and a drain passage extending from the forward extremity of said pressure bore to said reservoir so as to return leakage from said piston thereto.

ANTON G. E. NORDQUIST.