Sept. 23, 1941. W. R. HILDEBRAND 2,257,010

AUTOMATIC GAS HEATER FOR PRINTING PRESSES

Filed April 24, 1939 3 Sheets-Sheet 1

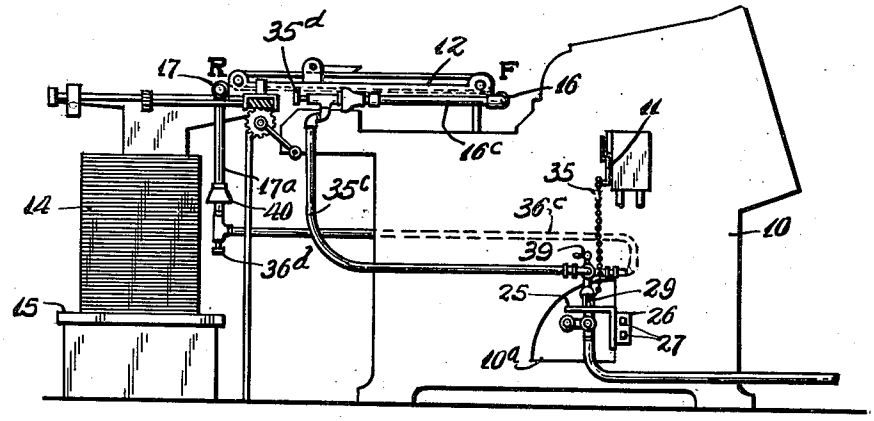


Fig. 1.

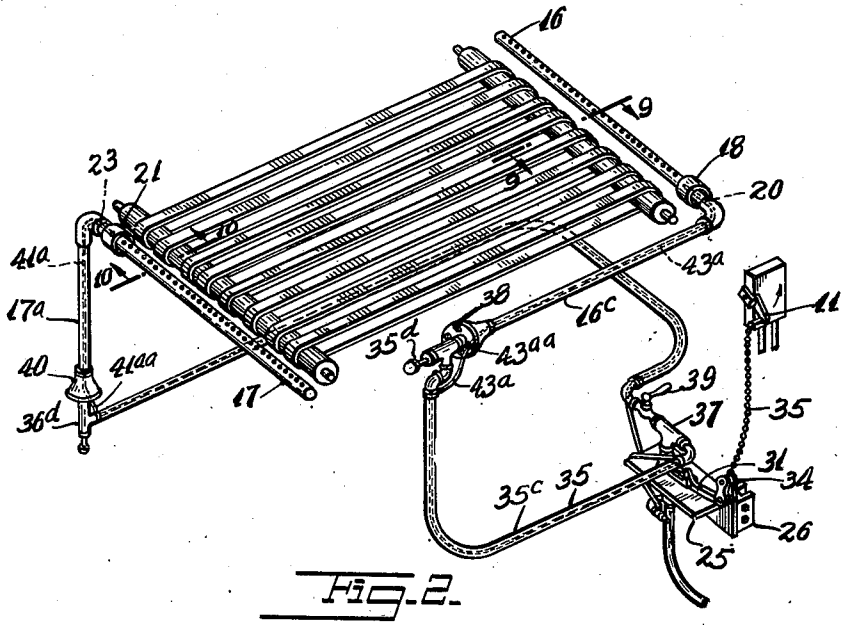


Fig. 2.

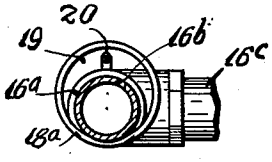


Fig. 9.

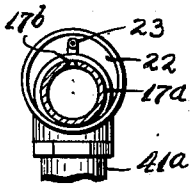


Fig. 10.

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AUTOMATIC GAS HEATER FOR PRINTING PRESSES

Filed April 24, 1939 3 Sheets-Sheet 2

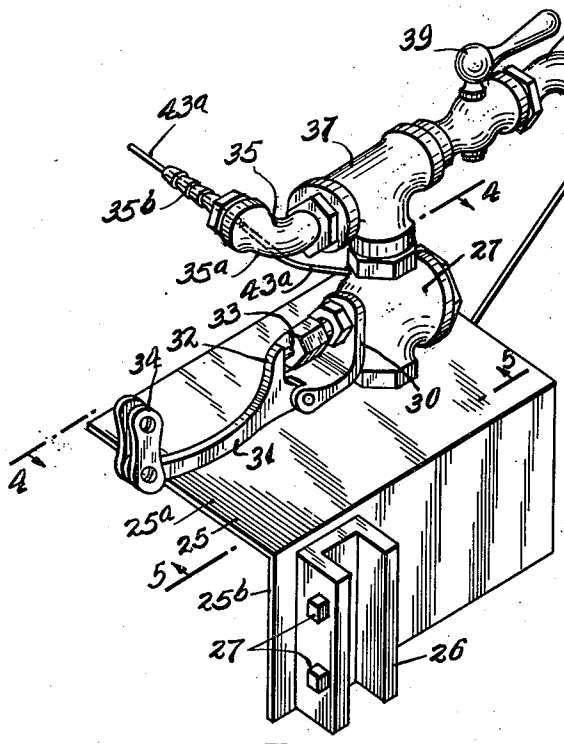


Fig. 3.

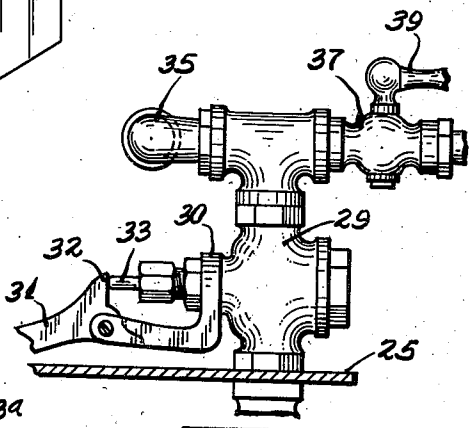


Fig. 5.

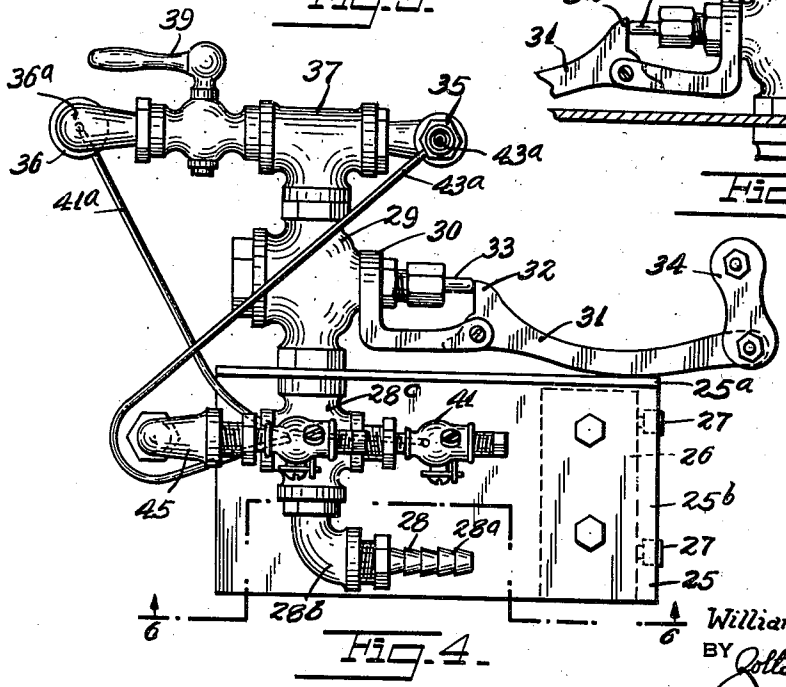


Fig. 4.

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AUTOMATIC GAS HEATER FOR PRINTING PRESSES

Filed April 24, 1939 3 Sheets-Sheet 3

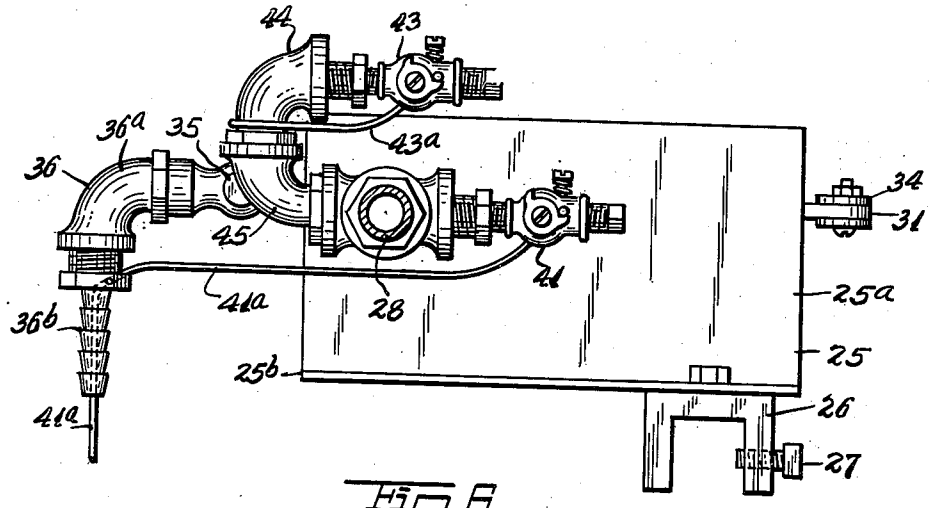


Fig. 6.

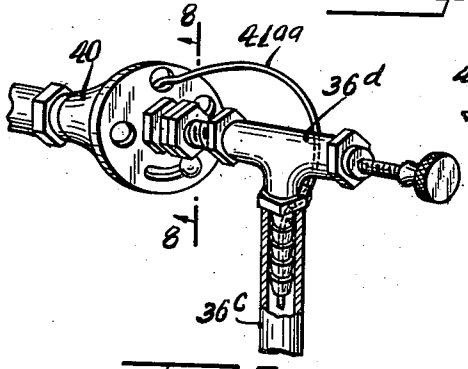


Fig. 7.

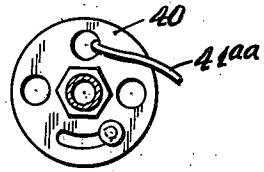


Fig. 8.

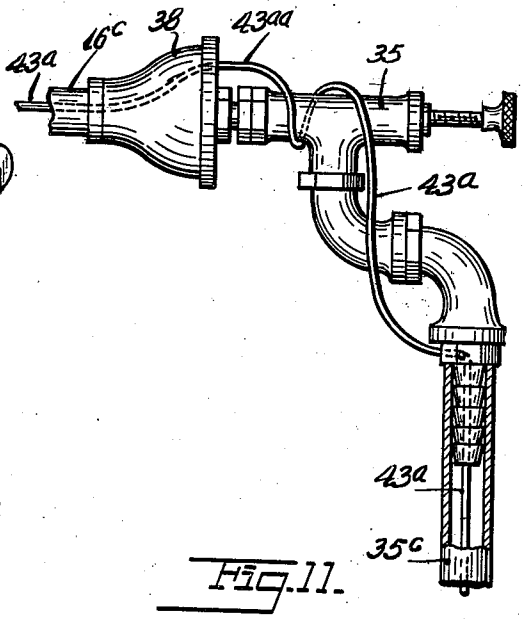


Fig. 11.

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UNITED STATES PATENT OFFICE

2,257,010

AUTOMATIC GAS HEATER FOR PRINTING PRESSES

William R. Hildebrand, New York, N. Y.

Application April 24, 1939, Serial No. 269,821

1 Claim. (Cl. 101—416)

This invention relates to new and useful improvements in an automatic gas heater for a printing press and a method for drying printed material.

The invention proposes the use of gas burners to the front and to the rear of an extension delivery of a printing press, and a novel arrangement for controlling said burners. The purpose of locating the burners at different points relative to the extension delivery is that the amount of heat applicable at one point of the delivery is limited. If the heat exceeds a certain amount the paper will be scorched or burnt. The application of burners at spaced positions permits the paper to cool off before it is re-heated when reaching the second position. The first heating, subsequent cooling, and subsequent re-heating will dry the printed paper to a degree impossible with the heretofore one point heating arrangement. The ink, with the instant arrangement, will be so dry as to reduce, if not completely eliminate, smudging and smearing.

Still further the invention resides in the specific arrangement for controlling the burners.

Another object of the invention resides in the teaching of a method for the drying of the ink.

For further comprehension of the invention, and of the objects and advantages thereof, reference will be had to the following description and accompanying drawings, and to the appended claim in which the various novel features of the invention are more particularly set forth.

In the accompanying drawings forming a material part of this disclosure:

Fig. 1 is a side elevational view of a printing press having an extension delivery and an automatic gas heater constructed according to this invention.

Fig. 2 is a perspective schematic view of the extension delivery and the automatic gas heater applied thereto.

Fig. 3 is a fragmentary perspective view of that portion of the automatic gas heater which is mounted upon the printing press immediately below the operating control handle thereof.

Fig. 4 is an elevational view looking in the direction of the line 4—4 of Fig. 3.

Fig. 5 is a fragmentary sectional view taken on the line 5—5 of Fig. 3.

Fig. 6 is a fragmentary sectional view taken on the line 6—6 of Fig. 4.

Fig. 7 is a perspective view of one of the valves for controlling one of the burners.

Fig. 8 is a vertical sectional view taken on the line 8—8 of Fig. 7.

Fig. 9 is a fragmentary enlarged sectional view taken on the line 9—9 of Fig. 2.

Fig. 10 is a fragmentary enlarged sectional view taken on the line 10—10 of Fig. 2.

Fig. 11 is a side elevational view of another valve for controlling another one of the gas burners.

The automatic gas heater for printing presses, according to this invention, is used in combination with a printing press 10 schematically illustrated in Fig. 1, and of any design and construction provided that it has a movable handle 11 to set it in operation. In conjunction with the printing press it is required that there be an extension delivery 12 which may also be of any design or construction and serves to receive the printed sheets as they leave the press and convey them to an extended point. Such extension deliveries are used at the present time. The extension delivery 12 stacks the printed sheets upon a pile 14 supported upon a suitable table 15. The invention contemplates the use of gas burners 16 and 17 at the front and to the rear, respectively, of said extension delivery 12 to apply heat to the printed material at these points. The burner 16 comprises merely a tube 16a formed with a longitudinally extending row of burner apertures 16b through which the gas discharges. These apertures 16b preferably are directed at an angle frontwise (see Fig. 9) so that the full force of the heat of the flame is not imparted to the sheet of printed material as it passes. At one end the burner 16 is provided with an annular housing 18 attached at its bottom side 18a to the bottom side of the pipe 16a and at its top being spaced from the top of the pipe 16a so that there is a passage 19. A pilot tube 20 is disposed within this passage 19 and is adapted to light the burner 16 as hereinafter more fully described.

The burner 17 also comprises a tube 17a formed with a plurality of apertures 17b extended in a line along the longitudinal length of the tube 17a, but upon the top thereof so that the full force of the heat of the flame may be imparted to the sheet of printed material as it passes. At one end of the tube 17b there is an annular housing 21 attached to the tube 17a and at the top spaced therefrom to form a passage 22. Within this passage there is a pilot tube 23 adapted to light the burner as hereinafter more fully described.

A body 25 is mounted upon the press 10 at a point directly beneath the handle 11 (see Fig. 1). This body comprises sheet metal bent in the form of an angle to have a top arm 25a and a

vertical arm 25b. A channel member 26 is attached to the vertical arm 25b and is adapted to straddle the edge of an opening 10a formed in the frame of the printing press 10. Several clamp screws 27 are mounted upon one of the arms of the channel member 26 and are adapted to clamp the frame of the printing press 10 to fixedly support the body 25 at a desired location from the handle 11 as hereinafter more fully described.

A gas supply pipe 28 is mounted upon the body 25 and includes a nipple 28a for receiving a flexible hose for supplying gas, an elbow 28b connected with the nipple 28a, and in turn connected with a cross pipe fitting 28c. This cross pipe fitting 28c is mounted beneath the top arm 25a of the body 25. The top arm of the cross fitting 28c connects with a main control valve 29 which is located upon the top of the arm 25a.

A means is provided for connecting the handle 11 with the main valve 29 for controlling the valve. This means includes a bracket 30 mounted upon the valve 29 and pivotally supporting the lever 31 having a finger 32 normally engaging against a plunger 33 of the valve 29. The lever 32 at its extremity is provided with a link 34 which connects with a chain 35 connected with the handle 11. The arrangement is such that when the handle 11 is thrown to start the printing press the chain 35 will be drawn to lift the lever 32, which in turn indirectly will press in the plunger 33 and so open the valve 29.

Branch pipe systems 35 and 36 connect with the gas supply valve 29 past the said valve for supplying gas to the gas burners. These branch pipe systems may be traced by starting at the valve 29 which connects with a T-pipe connection 37. The branch pipe system 35 is connected with one side of this T 37, while the branch pipe system 36 connects with the other side of the T. The branch pipe system 35 includes an elbow 35a directly connected with the T 37, a nipple 35b connecting with the elbow 35, a hose 35c and a valve 35d controlling the burner 16. The burner 16 has a side arm 16c which terminates in an air mixing member 38. The valve 35d controls passage of gas through this air mixing member 38.

The branch pipe system 36 includes an elbow 36a which connects with a valve 39, in turn connected with one side of the T-pipe fitting 37. The elbow 36a also connects with a nipple 36b which in turn is connected with a pipe 36c which extends to and connects to a burner control valve 36d. This burner control valve controls the burner 17. An air mixing member 40 is associated with the burner 17 for mixing the correct amount of air with the burner so that it operates properly. The burner 17 has an extension arm 17a and it is upon the end of this arm that the air mixing member 40 is mounted.

Pilot bleed pipes are also connected with the gas supply pipe 28, but to the front of the main valve, for the purpose of continuously supplying the pilot burners with gas. There is one pilot bleed pipe system which may be traced from a control valve 41 mounted upon one side of the cross fitting 28c. This control valve 41 is adapted to be adjusted to regulate the size of the pilot flame. This control valve 41 controls the passage of gas through a tube 41a which enters through the side of the nipple 36b so as to extend coaxially from the nipple as illustrated in Fig. 3. This tube 41a extends through the entire length of the pipe 36b emerging at the point 41aa (see Fig. 2) and at this point entering through one of the openings of the air supply member 40 so as to extend through the arm 17a of the burner 17. This tube 41a continues through the arm 17a of the burner and connects with the pilot burner 23 which is on the outside of the tube 17a but beneath the annular member 21.

The other pilot bleed system is controlled by a valve 43 which is mounted upon a elbow 44 connected with another elbow 45 which in turn connects with the other side of the cross fitting 28. The valve 43 is constructed so as to control the supply of gas through a pilot tube 43a. This pilot tube 43a extends upwards and through one side of the nipple 35b (see Fig. 3) and continues and extends coaxially thereof. The tube 43a continues through the pipe 35c until a point slightly before the valve 35d. At this point the tube 43a emerges from the side of the tube 35c, is turned several times about the valve 35 merely for the purpose of support, and at the point 43aa enters through one of the openings of the air mixing member 38. The tube 43a then continues through the arm 16c of the burner and finally emerges at one point and connects with the pilot burner 20 which is exterior of the pipe 16a.

The operation of the device is as follows:

The valves 41 and 43 are regulated to supply the necessary amount of gas to the pilot burners 20 and 23. These pilot burners are lit and burn continuously. Whenever the handle of the printing press is thrown to start the operation of the press the motion will be transmitted by the chain 35 to the lever 31 which opens the valve 29. This permits the gas from the main supply 28 to flow to the burners 16 and 17. Immediately the pilots 20 and 23 light the gas emerging from the burners and thus the burners become lit. As the paper leaves the printing press it will first pass over the burner 16 which supplies an initial quantity of heat to quickly dry the ink on the paper to a certain degree. The burner 16 has its flame directed at an angle towards the moving paper and the size of the flame of the burner 16 may be controlled by the valve 35d so that a suitable quantity of heat will be supplied without scorching or damaging the paper.

When the extension delivery 12 moves the paper to the rear, a certain interval of time will elapse during which the heated paper will have an opportunity to cool. It now is ready to be re-heated by the burner 17. This heating, then cooling, and re-heating of the paper will act to more quickly dry the printed ink than was heretofore possible when having but one heater in operation. The size of the flame of the burner 17 may be controlled by the valve 36d.

While I have illustrated and described the preferred embodiments of my invention, it is to be understood that I do not limit myself to the precise constructions herein disclosed and the right is reserved to all changes and modifications coming within the scope of the invention as defined in the appended claim.

Having thus described my invention, what I claim as new, and desire to secure by United States Letters Patent is:

In a printing press having a delivery conveyor, a horizontally disposed, elongated tubular main burner having a plurality of flame apertures in the top thereof, means supporting the burner beneath said conveyor, a main supply conduit for gas connected with said main burner, a shut-off valve in said main supply conduit

adapted to be moved frequently between open and shut conditions, an air mixing valve in said conduit between said shut-off valve and said main burner, said air mixing valve including a plurality of apertures exposed to the atmosphere, an adjustable control valve in said main supply conduit between said shut-off valve and said air-mixing valve, a pilot burner in said main burner, and conduit means connecting said pilot burner to said main supply conduit, said conduit means comprising a relatively small pipe having one end tapped into said main conduit in front of said shut-off valve, said pipe externally by-passing said shut-off valve and said control valve and entering said main conduit through one of said apertures in said air mixing valve, and thence passing through said main conduit to said pilot burner in said main burner.

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