May 1, 1928. 1,668,154

W. M. KELLY

HEATER FOR SHEET DELIVERIES

Filed April 7, 1926 2 Sheets-Sheet 1

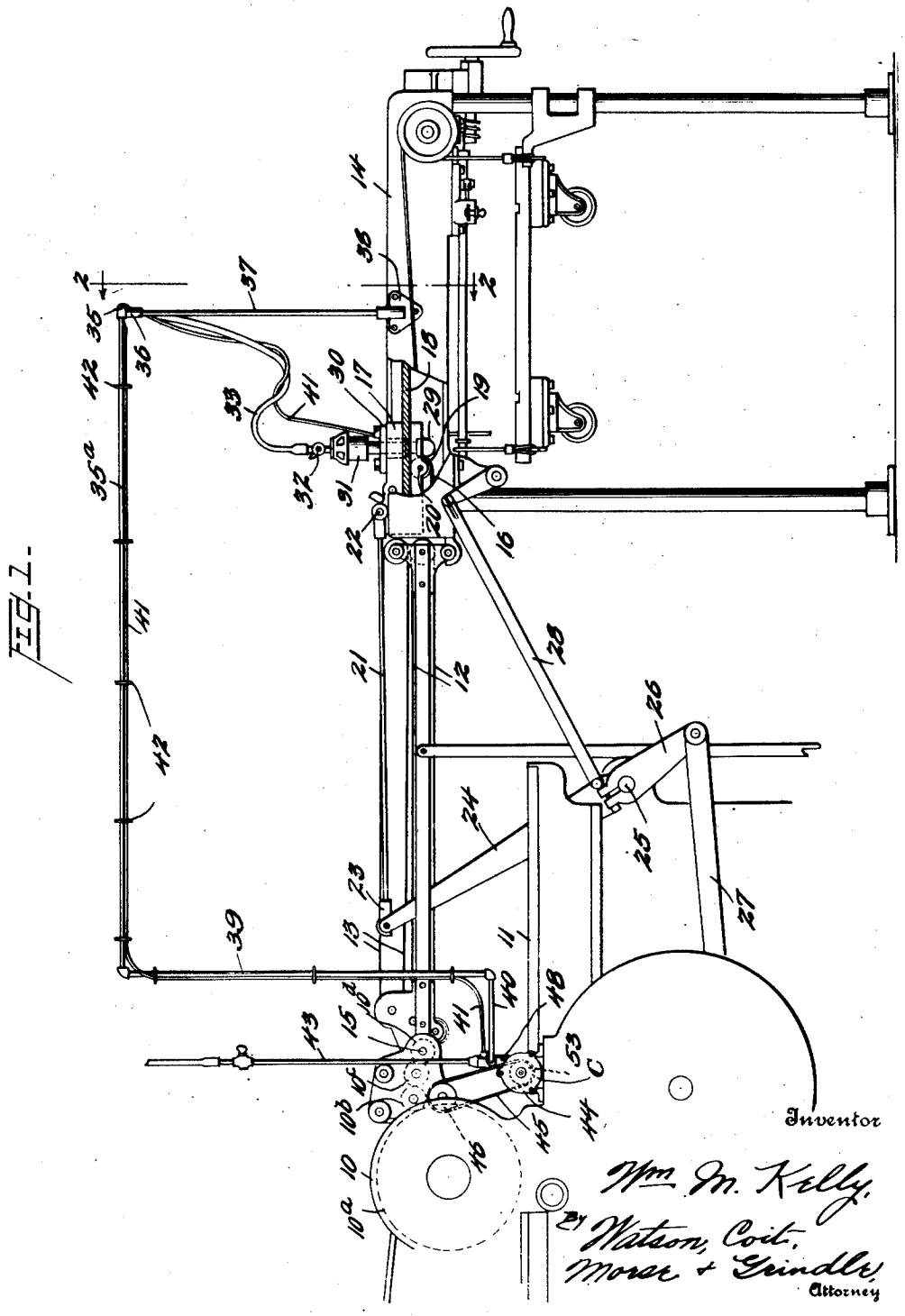


FIG. 1.

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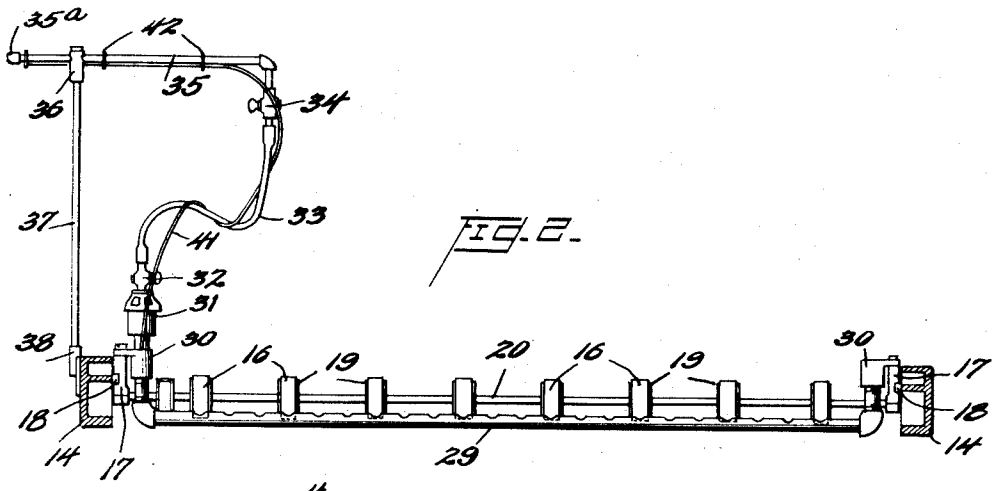


FIG. 2.

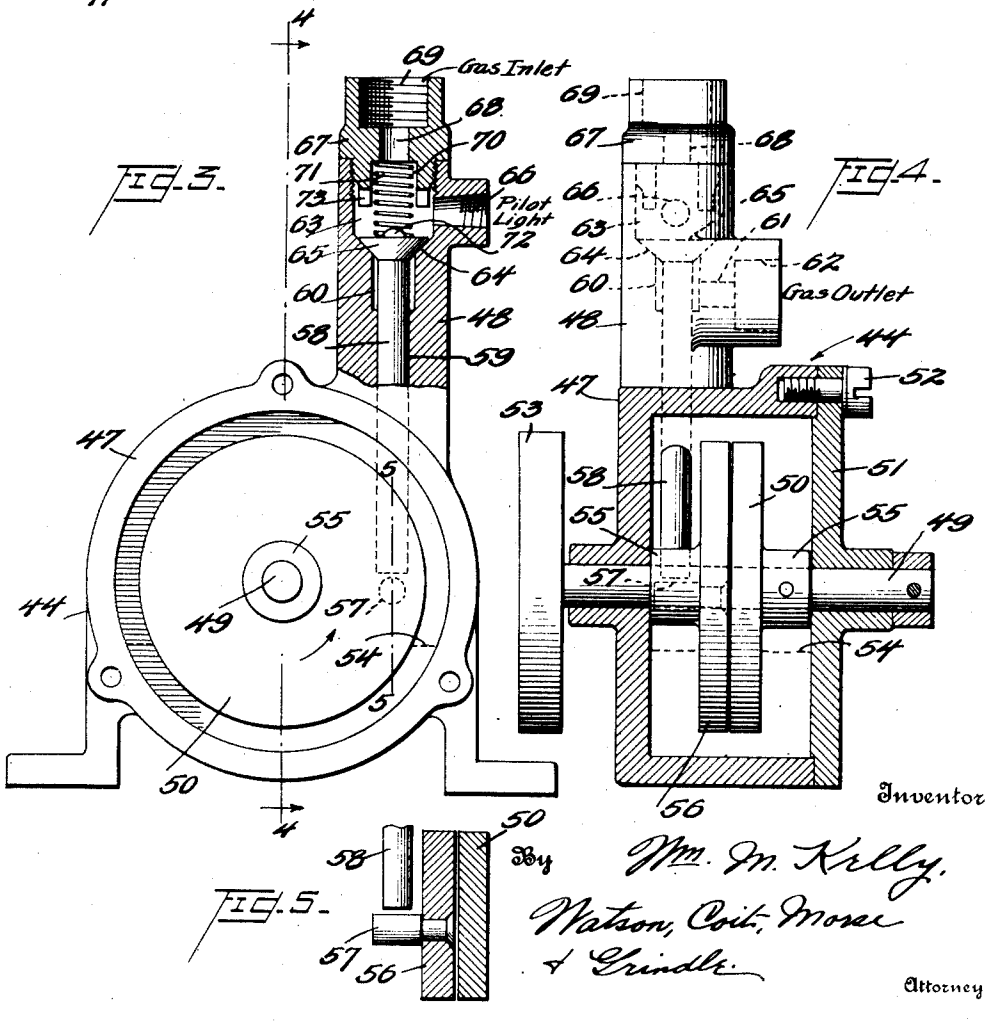


FIG. 3.

FIG. 4.

FIG. 5.

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UNITED STATES PATENT OFFICE

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HEATER FOR SHEET DELIVERIES.

Application filed April 7, 1926. Serial No. 100,434.

The present invention relates to heaters for sheet deliveries and more particularly to an improved means for controlling the same.

It has been proposed to heat sheets as they have been delivered, for such purposes as dispelling the static electricity and drying the ink. To this end the sheets have been passed over a gas flame. Obviously, if the machine should stop while a sheet is over the flame, the sheet would be ignited. To avoid this, burners have been proposed in which the gas is turned off when the machine stops. In one form, this is effected electromagnetically. In another form a centrifugal governor driven by the machine is employed. These automatic devices are expensive to build and install and in operation have not fully satisfied all of the requirements.

It is the principal aim of the present invention to provide a simple device that, without fail, will turn off the supply of gas whenever the machine stops, and will turn it on when the machine starts.

To these ends, the invention comprises a gas valve controlling the supply of gas to the burner. This valve is yieldingly held closed and means is provided to open it when the machine starts and hold it open only as long as the machine is in operation. For the purpose of thus opening and holding open the valve, a frictional device is employed. A member moving as long as the machine is in operation frictionally transmits motion to open the valve, and then slips but continues to hold the valve open. When the speed of the machine slows down sufficiently, or stops, the force transmitted is not sufficient to hold the valve open and it closes immediately.

Other objects and features of novelty will be apparent from the description taken in connection with the drawings, in which,

Fig. 1 is a side elevation of a portion of a printing press and an extension sheet delivery having one embodiment of the present invention associated therewith;

Fig. 2 is a vertical cross sectional view taken substantially on the line 2—2 of Fig. 1;

Fig. 3 is a side elevation of the burner control device of the present invention, a part being shown in section in order to show the construction of the valve more in detail;

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

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

Referring to the drawings, one form of the invention has been shown in connection with a bed and cylinder press of the two revolution type and an extension delivery. It is to be distinctly understood that the invention is not limited to this specific installation, but by mere changes in the piping can be adapted to all forms of sheet deliveries.

As shown, the press includes an impression cylinder 10 and a frame 11. The printed sheets from the cylinder 10 are delivered to the continuously running tapes 12 and 13 and conveyed thereby to a reciprocating sheet delivery mechanism slidably mounted on the frame 14 spaced from the end of the press frame 11. The tapes 12 pass over pulleys secured to the shaft 15 which is continuously rotated in one direction, during the operation of the press, by means of the large gear 10^a coaxial with the cylinder, and the gears 10^b, 10^c and 10^d clearly indicated in Figure 1.

The conveyor mechanism adapted to take sheets from the tapes 12 and deliver them to the pile supporting table may be of any form. As shown, this mechanism includes a set of endless tapes 16 supported on a reciprocating carriage comprising the connected end slides 17 mounted on parallel ways 18 secured to the side members of the frame 14. These tapes pass over pulleys 19 on a shaft 20 journalled in the slide 17. The shaft 20 is driven by a gear and rack connection with the frame 14, the drive including a clutch so that the tapes are alternately driven and not driven, to thereby discharge the sheets at the proper time. As this drive structure constitutes no part of the present invention, it has not been illustrated. The carriage is reciprocated by a pair of links 21 pivoted at one of their ends to the ears 22 on the slide 17, and at their other ends by means of hooks 23 connected with the upper ends of arms 24 secured to the rock shaft 25 extending across the delivery end of the press. The shaft 25 is rocked by means of an arm

26 and a link 27, the latter being connected to some suitable rotating element of the press. The arm 28 is for operating jogger mechanism which constitutes no part of this invention.

The gas burner is mounted immediately in front of the pulleys 19 and slightly below the plane of the upper runs of these tapes, so that the path of the sheets is just above this burner. As shown in Figure 2, the burner 29 consists of a perforated pipe having an elbow at each end and a short pipe connecting the elbow to the supporting brackets 30 secured to the slides 17. The bracket 30 at the right hand end of the burner as viewed in Figure 2 provides a closure. The bracket at the other end, however, is in communication with the air mixer 31 provided with the gas cock 32. The carriage is reciprocating whereas the pipe for supplying the gas to the burner is stationary. Consequently means must be provided conducting the gas from the stationary supply pipe to the mixer 31. This may be accomplished in any known manner. As shown, a flexible tube 33 connects the gas cock 32 with a similar gas valve 34 carried by a pipe 35. This pipe extends through a fitting 36 which is supported at the upper end of a rod 37, the lower end of which is seated in a pad 38 secured to the frame 14. The transverse pipe 35 at the end opposite the valve 34 is connected to a longitudinally extending pipe 35^a (Figure 1), which, by means of pipes 39 and 40, is in communication with the control device C. The gas is supplied to this device by means of the supply pipe 43.

A small bore flexible gas tube 41 conducts gas from the control device C to the pilot light of the gas burner, this tube being supported on the gas pipes 39, 35^a, and 35 by means of the hangers 42.

The control device C is designed so that gas is supplied to the burner only so long as the press is in operation. If the press stops the supply of gas is cut off immediately. As shown in Figures 3, 4 and 5, this control device C comprises a casing 47 having a vertical tubular extension 48 and an open side closed by a cover plate 51 secured thereto by cap screws 52.

A shaft 49 extends through the casing, being journalled in bosses carried by one end of the casing and the cover plate. Secured to the shaft for rotation therewith as by means of a pin connection, is a disk 50. Facing this disk and just out of contact therewith is a similar disk mounted on the shaft for free rotation relative thereto. Both disks are provided with hubs or bosses 55, one of which abuts against the inside of the end wall of the casing, and the other against the inner side of the cover plate 51, so that the disks are prevented from separating beyond the desired amount. Secured to one end of the shaft 49 on the outside of the casing is a pulley 53 which is driven from the pulley 46 by means of a belt 45 (see Figure 1). In this manner the shaft 49 is always rotated whenever the press or the sheet delivery are in operation but is stationary when they stop.

The tubular extension 48 is provided with a bore 59 for the stem 58 of a gas valve. Adjacent the head 65 of this valve the bore 59 is enlarged to form a small chamber 60, and this in turn is enlarged to form a larger chamber 63. The chamber 60 through the bore 61 is in communication with the tapped opening 62 receiving the gas pipe 40. The main chamber 63 has a lateral outlet 66 which is tapped for connection to the pilot light gas tubing. The upper end of chamber 63 is closed by the fitting 67 which is screwed into the upper end of the tubular extension 48. The upper end of the fitting 67 is provided with the tapped opening 69 for connection with the gas supply pipe and this opening 69 is in communication with the chamber 63 through the bore 68. The valve 65 is always forced towards its seat 64 and thus yieldingly held closed by means of the spring 71 interposed between the top of the valve and the fitting 67, and centered with respect to the valve by the projection 72 on the top of the valve. The lower end of the fitting 67 is provided with lugs 63 affording stops limiting the extent of upward movement of the valve 65.

The casing 47 is provided with a small quantity of oil, the level of the same when the parts are at rest being indicated by the dotted line 54. When the disk 50 is rotated, a thin film of oil coats the same and acts to transmit rotation to the disk 56. This disk is provided with a pin 57 projecting from the face thereof and disposed just below the lower end of the valve stem 58. So when the free disk 56 is rotated, pin 57 strikes the lower end of the valve stem 58 and opens the valve against the resistance of the spring 70. The continued rotation of the disk 50 frictionally tends to continue to rotate disk 56 but the further movement of disk 56 is prevented by the valve. Thus the valve is held open as long as disk 50 rotates. As soon as the press stops, of course rotation of disk 50 ceases and then spring 71 forces the valve 65 to its seat, cutting off the supply of gas to the burner.

In operation, when the press is started the gas valve 65 is opened in the manner just described, thus placing gas supply inlet 69 in communication with the gas outlet opening 62 so that gas flows to the gas burner. Whenever the press or sheet delivery stops, the spring 71 immediately forces the valve 65 to its seat, thus cutting off the supply of gas to the burner so that the flame is extin-

guished as soon as the press stops and there is no danger of igniting a sheet. The pilot light opening 66 is always in communication with the gas supply so that the pilot light is continually furnished with the gas to keep it burning.

While the press is in operation, the gas valve is always wide open and the extent of opening does not vary. Consequently the gas burner is supplied with gas at a uniform rate so that the flame is steady.

Although one embodiment of the invention has been described in detail, it is to be understood that the invention is not thus limited, but includes modifications and changes which come within the scope of the appended claims.

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent is:

1. Apparatus of the character described including in combination, sheet delivery mechanism, a burner adjacent the path of delivery of the sheets, a valve controlling the supply of gas to said burner, means yieldingly holding said valve closed, and means including a friction device holding said valve open only while the apparatus is in operation whereby said valve closes when the mechanism stops.

2. Apparatus of the character described including in combination, sheet delivery mechanism, a burner adjacent the path of the sheets, a valve controlling the supply of gas to the burner, means yieldingly holding said valve closed, a member moving while the apparatus is in operation, and means to frictionally transmit motion from said member to said valve to open it and hold it open only as long as the member moves, and permitting it to close when the member stops.

3. The combination with a printing press having delivery mechanism, of a gas burner adjacent the path of the sheets, and a control device for said burner driven by said press, said device comprising a casing having a yieldingly closed gas valve and friction means for opening the valve when the press starts and permitting immediate closing when the press stops.

4. The combination with a printing press having sheet delivery mechanism, of a gas burner mounted just below the path of the sheets delivered from said mechanism, a gas supply pipe for said burner, a control device connected thereto comprising an oil tight casing and a valve chamber, a valve in said chamber, a shaft journalled in said casing and driven by said press, a disk keyed to said shaft, a free disk on said shaft, oil in said casing supplying a thin film of oil between said disks, whereby the driven disk tends to rotate the free disk, and means on said free disk for actuating said valve, the valve closing when the keyed disk stops.

5. A gas burner control device for sheet deliveries comprising a valve chamber, a yieldingly closed valve in said chamber, a driving disk, a free disk coaxial with, and slightly spaced from, said driving disk, a casing enclosing said disks and constituting an oil chamber, and a pin on said free disk adapted to open said valve, said free disk being actuated by said driving disk through the viscosity of the oil, the valve closing when the driving disk stops.

6. A gas burner control device for sheet deliveries comprising in combination, a yieldingly closed valve, a rotating member, a free member journalled for rotation adjacent thereto, means for urging said free member to turn with the rotating member, and means on said free member for opening said valve when said free member is turned, said valve closing when the said rotating member stops.

7. A gas burner control device for sheet deliveries comprising in combination, a casing containing oil, a shaft journalled in said casing, a disk keyed to said shaft, a free disk journalled for rotation adjacent said keyed disk whereby the oil transmits motion from the keyed disk to said free disk, a valve chamber, a valve in said chamber, a stem for said valve slidably mounted in said casing, and a pin on said free disk engaging said stem for operating the valve, and arranged to permit the valve to close when the keyed disk stops.

8. A gas burner control device for sheet deliveries comprising in combination, a driving disk, a driven disk facing and slightly spaced from the driving disk, means for supplying a film of oil between said disks, whereby the torque is transmitted from the driving to the driven disks by the viscosity of the oil, and a valve actuated by said driven disk, said valve closing when the delivery stops.

9. A gas burner control device for sheet deliveries comprising in combination, a valve chamber, a valve in said chamber, a spring forcing said valve closed, a rotatably mounted driving member, a free member, a film of oil between said members whereby torque is transmitted from said driving member to said free member, and means connecting said free member with said valve, whereby the valve is held open against the action of said spring when said driving member is rotated, and closed when the delivery stops.

10. A gas burner comprising in combination, a valve chamber, a yieldingly closed valve in said chamber, a rotatable driving member, a driven member, means for maintaining a film of oil between said members whereby motion is frictionally transmitted from the driving to the driven member, and means actuated by movement of said driven

member to open said valve, said oil permitting the valve to close when the driving member stops.

11. A gas burner control device for sheet deliveries comprising in combination, an oil tight casing, an extension on said casing centrally bored to form a valve chamber, a valve in said chamber having a stem, a gas inlet above said valve, a gas outlet below said valve, a shaft journalled in said casing carrying a keyed disk and a mating free disk, oil in said casing supplying a thin film of oil between said disks, whereby the keyed disk tends to rotate the free disk, and means on said free disk engaging said valve stem to open the valve, said oil film permitting the valve to close when the machine stops.

12. A gas burner control device for sheet deliveries comprising in combination, an oil tight casing, an extension on said casing having a valve chamber, a valve in said chamber, a gas supply pipe connected to said chamber on one side of said valve, a gas delivery pipe connected to said chamber on the other side of said valve, a shaft journalled in said casing, a disk keyed to said shaft, a mating disk free on said shaft, and means for actuating said free disk from said keyed disk to open said valve when said shaft is rotated, said valve closing when the shaft stops.

13. Apparatus of the character described, including in combination, sheet manipulating mechanism, sheet heating means adjacent the path of the sheets, and friction means for turning on said heating means operated from the mechanism, said heating means being rendered inoperative when the mechanism stops.

14. Apparatus of the character described, including in combination, sheet manipulating mechanism, sheet heating means adjacent the path of the sheets, an element driven in timed relation to the operation of the sheet manipulating mechanism, and means operated by frictional relation to said element for turning on said heating means when the sheet manipulating mechanism stops, said heating means being rendered inoperative.

In testimony whereof I hereunto affix my signature.

WILLIAM M. KELLY.