

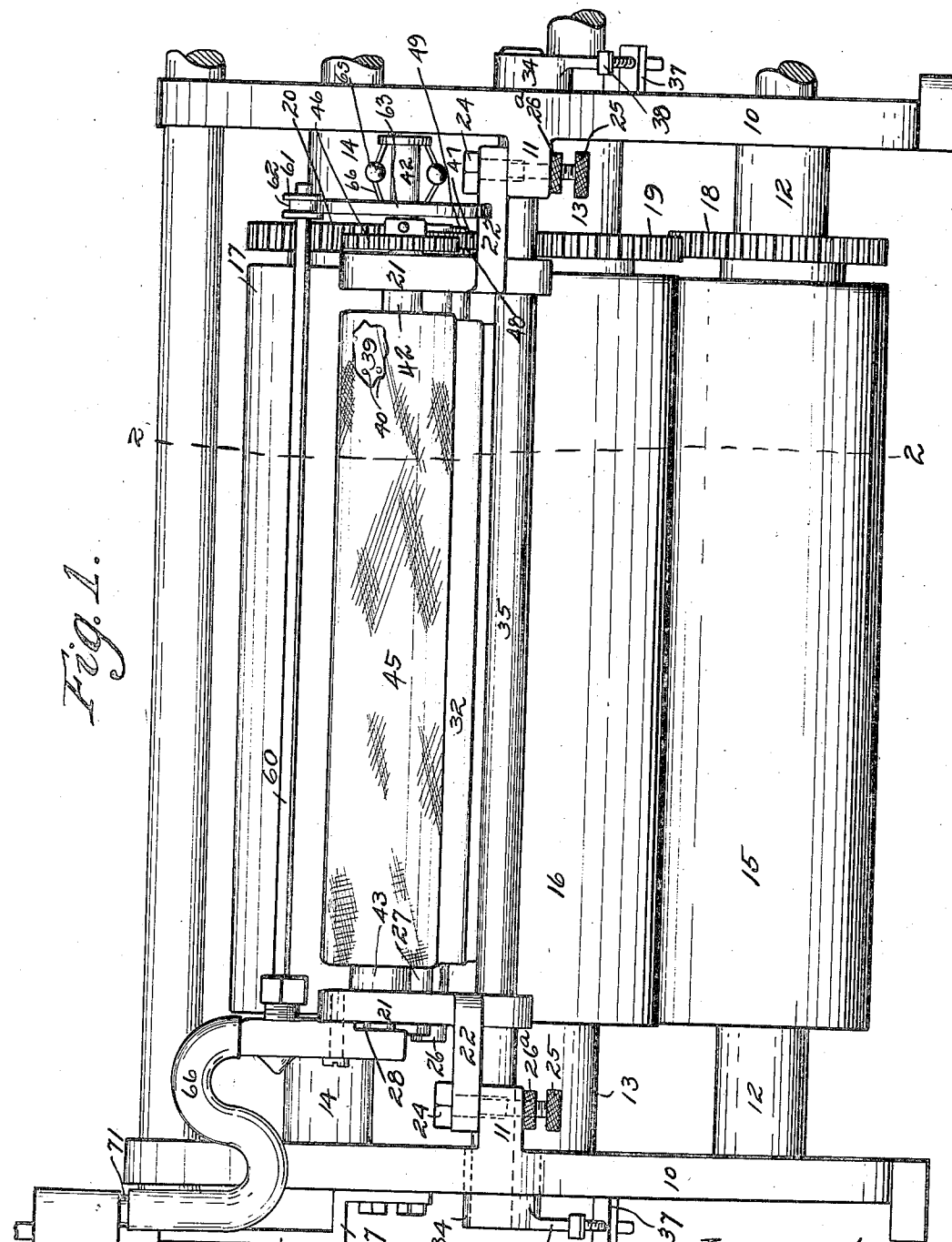


Fig. 1.

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Fig. 4.

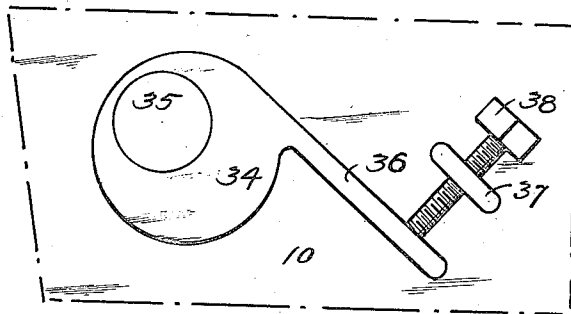
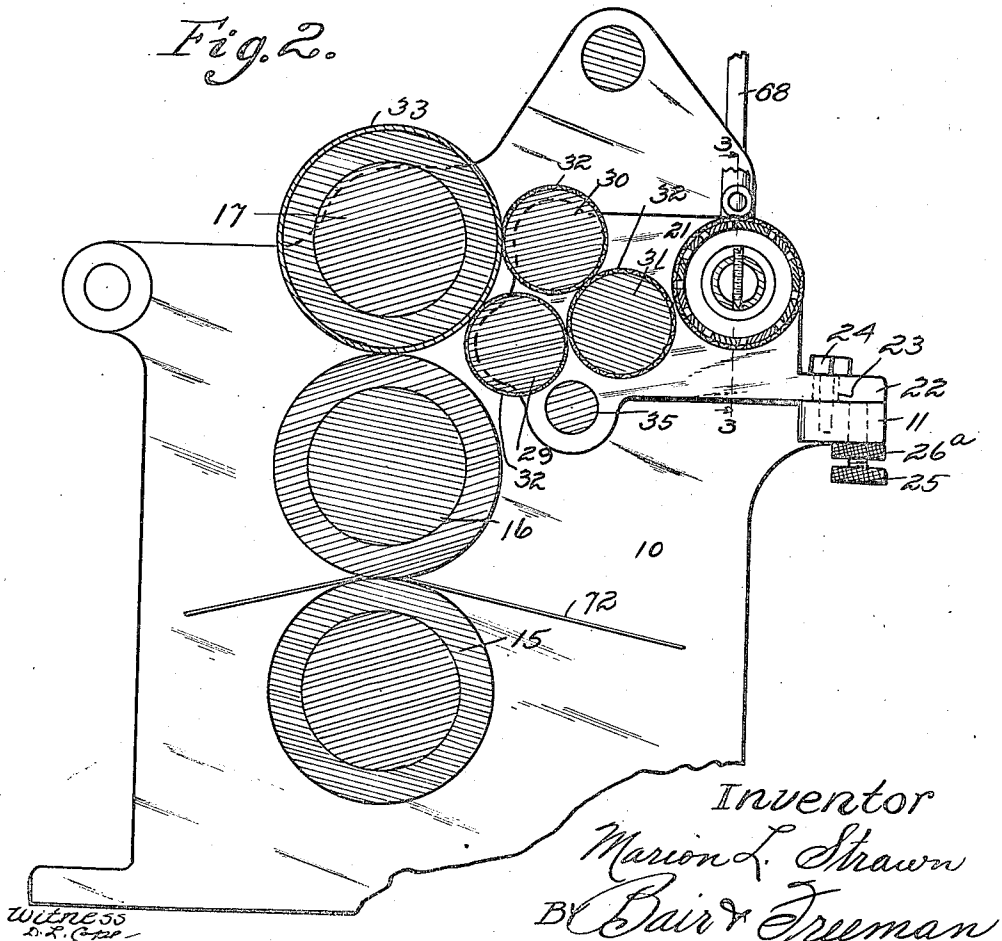
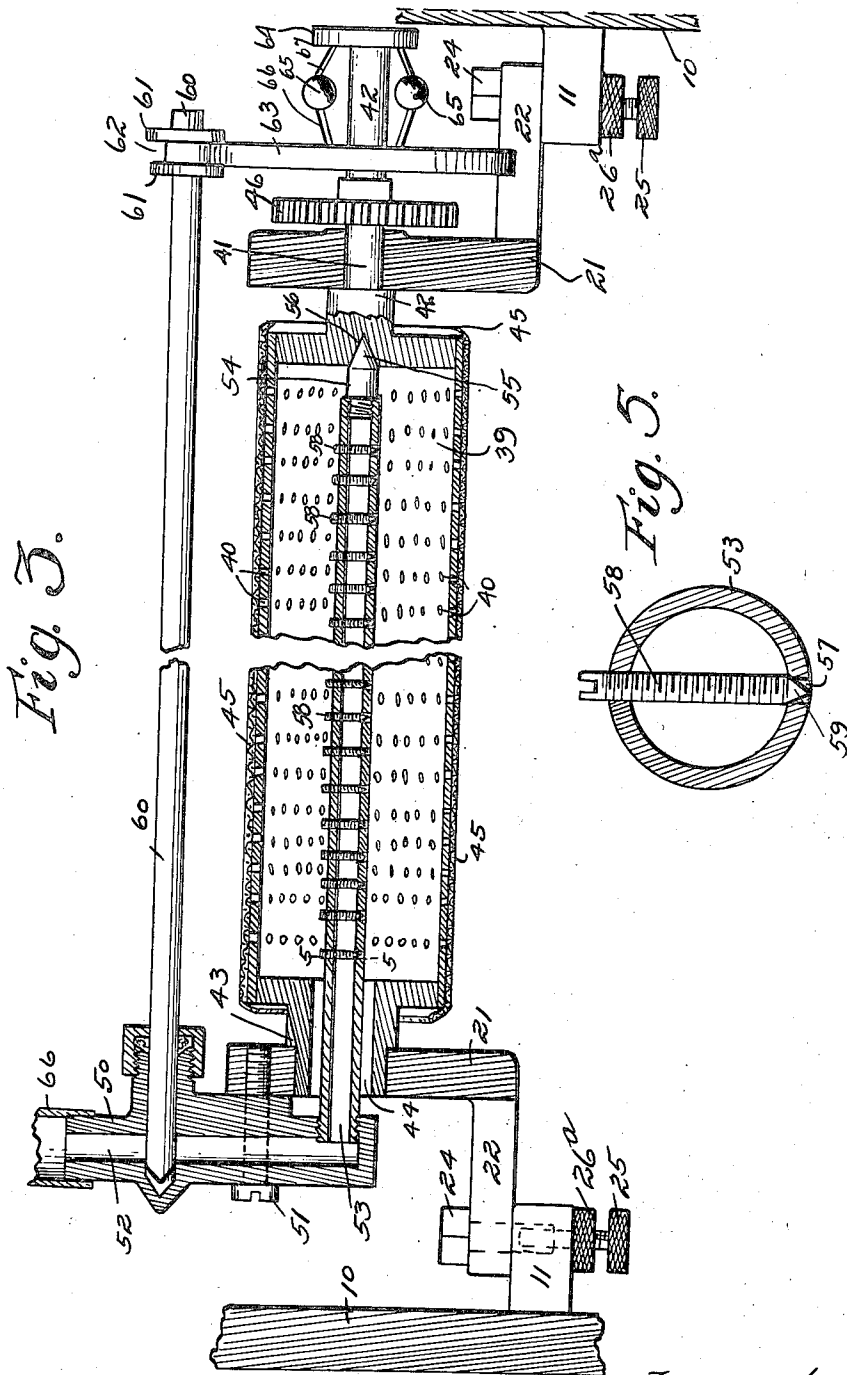


Fig. 2.



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WITNESSES
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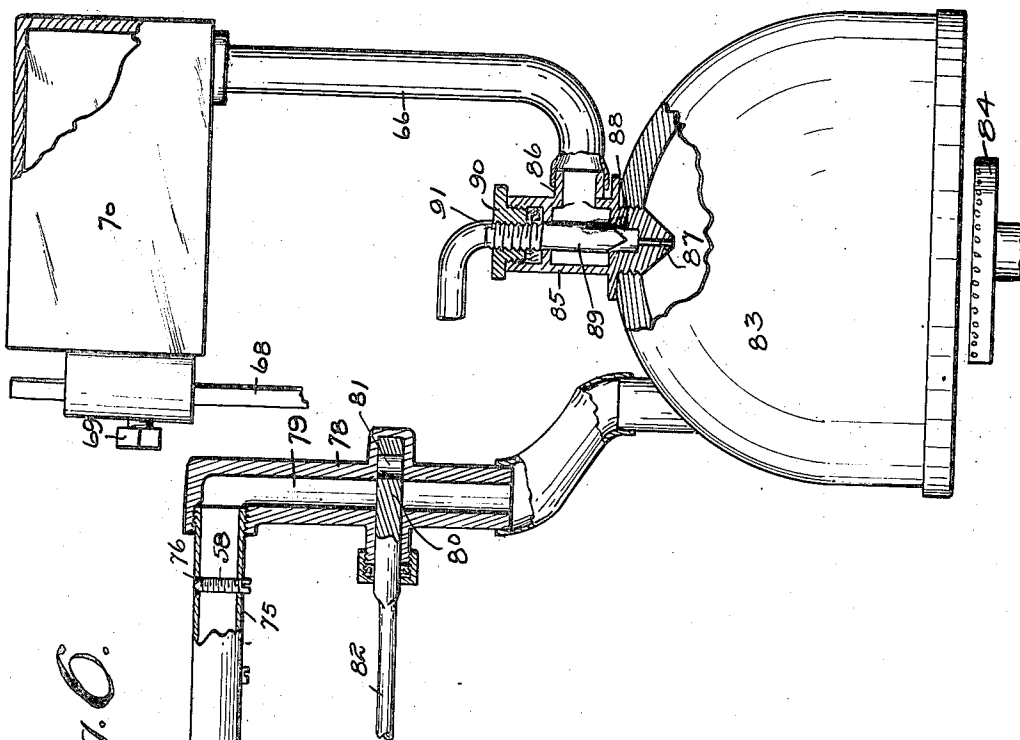


Fig. 6.

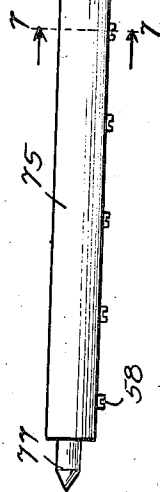
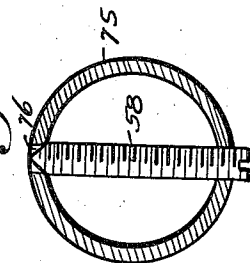


Fig. 7.



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UNITED STATES PATENT OFFICE.

MARION L. STRAWN, OF DES MOINES, IOWA.

MOISTURE-SUPPLYING DEVICE FOR LITHOGRAPHIC-PRINTING MACHINES.

Application filed May 16, 1921. Serial No. 469,902.

To all whom it may concern:

Be it known that I, MARION L. STRAWN, a citizen of the United States, and a resident of Des Moines, in the county of Polk and State of Iowa, have invented a certain new and useful Moisture-Supplying Device for Lithographic-Printing Machines, of which the following is a specification.

The object of my invention is to provide a moisture supplying device of simple construction adapted for use with lithographic printing machines.

In so-called lithographic printing machines, there are used zinc plates or the like. On these plates, a drawing or picture or other matter is drawn or transferred from a drawing or engraving by a process which results in the existence of a water-repellent surface co-extensible with the matter to be printed. Where such plates or the like are used, printers use a process in which moisture is supplied to the zinc plate or the like. This moisture will adhere to the plate at all points, except where the drawing or other matter having the water-repellent surface exists. After subjecting the plate to moisture, the plate is inked and the ink will adhere to the moisture-repellent portion of the surface of the plate, but not to those portions, which have been moistened. The zinc plate may be mounted on a printing roller.

The roller is then moved to position where the zinc plate contacts with a composition roller, which receives the ink impression from the zinc plate. Printing is then done from the blanket. In the composition roller, ordinarily rubber enters as one of the elements.

In the above process, considerable difficulty has been encountered in the supply of the moisture in finely divided state and in uniform amount.

The object of the present invention therefore is to provide a moisture supplying device, whereby the supply of moisture can be uniformly furnished and can be properly regulated for the purpose of printing.

A further and important object of my invention is to provide means for using steam for supplying the moisture.

With these and other objects in view, my

invention consists in the construction, arrangement and combination of the various parts of my device, whereby the objects contemplated are attained, as hereinafter more fully set forth, pointed out in my claims, and illustrated in the accompanying drawings, in which:

Figure 1 shows a rear elevation of a portion of the frame of a printing machine, having my moisture supplying device installed thereon.

Figure 2 shows a detailed, sectional view taken on the line 2—2 of Figure 1.

Figure 3 shows a longitudinal, sectional view through the primary moisture roller.

Figure 4 shows an end view of a portion of a roller regulating mechanism.

Figure 5 shows a detailed, sectional view taken on the line 5—5 of Figure 3.

Figure 6 shows a detailed view, partly in section of a modified form of my invention, with which steam is employed; and

Figure 7 shows a detailed, sectional view taken on the line 7—7 of Figure 6.

In the accompanying drawings, I have used the reference character 10 to indicate generally portions of the frame of a printing machine. Projecting inwardly toward each other from the spaced frame members 10 are supports 11.

Suitably mounted on the main frame members 10 are the shafts 12, 13 and 14 of rollers 15, 16 and 17. On the shaft 12 is a gear 18, which meshes with the gear 19 on the shaft 13. The gear 19 meshes with the gear 20 on the shaft 14.

Supported on the main frame is an auxiliary frame consisting of end frame members 21 spaced from each other, as shown for instance in Figure 1, and having at their rear ends, laterally extending supporting arms 22, the ends of which rest upon the supporting members 11.

The arms 22 have extending through them holes 23, illustrated for instance by the dotted lines in Figure 2. A screw bolt 24 is extended through each hole 23 and screwed into the support 11. The holes 23 are of greater diameter than the shanks of the screw bolts 24. A screw bolt 25 is screwed into each support 11 rearwardly

with relation to the screw bolt 24 thereof, and is designed to have its upper end bear against the lower surface of the arm 22.

On each screw bolt 25 is a lock nut 26^a.

5 By means of the screw bolts 24 and 25, the auxiliary frame members 21 may be locked in various adjusted positions with relation to the main frame.

Mounted in the auxiliary frame members 10 21 are shafts 26, 27 and 28 of moisture distributing rollers 29, 30 and 31.

The rollers 29, 30 and 31 are covered with absorbent material 32.

15 The roller 31 is what is called a vibration roller and is arranged with its surface in contact with the surfaces of the rollers 29 and 30.

On the rollers 17 is a zinc printing plate or the like 33.

20 The absorbent material 32 on the rollers 29 and 30 is designed to contact with the plate 33, as shown in Figure 2.

Mounted in the frame members 10 and arranged to register with each other are bearing members 34, shown in Figure 1. The 25 bearing members 34 are mounted for rotation.

A transverse shaft 35 projects through the frame members 21 and is journaled at its 30 ends eccentrically in the bearing members 34.

The bearing members 34 have arms 36 projecting downwardly and rearwardly in the form shown in the drawings, as illustrated for instance in Figures 1 and 4.

35 On the frame members 10 are brackets 37, in which are mounted set screws 38, the ends of which bear against the arms 36.

By loosening the screws 24 and then adjusting the screw bolts 38, the bearing member 34 may be rotated for thereby raising 40 or lowering the eccentrically mounted shaft 35 and thereby causing either the roller 30 or the roller 29 to press more firmly against the roller 17.

45 It is thus obvious that the pressure contact of the rollers 30 and 29 against the roller 17 may be regulated as may be desired.

Suitably supported on the auxiliary frame rearwardly with relation to the moisture 50 rollers is what I may for convenience call the primary moisture roller 39, shown in detail in Figure 3.

The moisture roller 39 has substantially the form of a hollow drum provided in its 55 surface with a large number of small perforations 40.

At one end of the drum 39 is a spindle 41 mounted in the frame member 21. On the spindle 41 adjacent to the frame member 21 is a shoulder 42. At the other end 60 of the drum 39 is a larger spindle 43 rotatably mounted in the frame member 21 and having a central bore 44. The drum 39 is covered with suitable absorbent material 45.

65 On the shaft or spindle 42 is a gear 46,

which meshes with a gear 47 on the shaft of the roller 31. The gear 47 meshes with gears 48 and 49 on the shafts of the rollers 30 and 29. The gears 48 and 49 are meshed with the gear 20 on the shaft of the roller 17. 70

Mounted on the left-hand frame member 21, as shown in Figures 1 and 3, is a block or casting 50, which is held in place by means of a screw bolt 51. Extending vertically 75 through the block or body 50 is a passage 52. Screwed into the lower end of the block or body 50 and communicating with the lower end of the passage 52 is a tube 53, which projects through the bore 44 and longitudinally through the hollow roller 39. 80

In the opposite end of the tube 53 is a screw plug 54, having a pointed end 55 rotatably mounted in a socket 56 in the end of the roller 39 on the inside thereof. In the lower 85 part of the tube 53 is a series of spaced openings 57.

A series of screws 58 are mounted in the upper wall of the tube 53 and have their lower ends pointed, as at 59, to form valves for coacting with the openings 57. 90

By adjusting the screw valves 58, the flow of water through the openings 57 may be quite accurately regulated.

Mounted in the body 50 is a rod 60, the end portion of which forms a controlling 95 valve for regulating the flow of water or the like downwardly through the passage 52.

At the opposite end of the rod 60 are spaced flanges 61 between which there is formed a guide-way 62. 100

On the shaft 41 outside the frame members 21, as shown for instance in Figure 3, is slidably mounted a disc 63, the periphery of which travels in the guideway 62 between the flanges 61. Fixed to the outer end 105 of the shaft 41 is a disc 64.

Between the discs 63 and 64 are centrifugal ball governors 65, which are connected with the respective discs 63 and 64 by means of springs 66 and 67 or other suitable de- 110 vices for the purpose.

It will be seen that when the shaft 41 is rotated and as the rapidity of such rotation increases, the balls 65 will be thrown outwardly by centrifugal force and will pull the 115 disc 63 to the right, for pulling the rod 60 to the right and thereby opening the way through the passage 52 past the valve formed by the inner or left-hand end of the rod 60. 120

Connected with the upper end of the block or casing 50 is a flexible tube 66, which communicates with the passage 52.

On one of the frame members 10 is mounted a bracket 67 having a portion 68 125 projecting upwardly, as shown for instance in Figure 1. Supported on the bracket member 68 and held in adjusted position by means of the set screw 69 is a water tank 70, having at its lower portion a short dis- 130

charge tube 71, communicating with the upper end of the flexible tube 66.

The tank or receptacle 70 may be vertically adjusted on the bracket member 68 for varying the pressure of the water and thereby controlling the flow of the water from the tank to the interior of the hollow tubular roller 39.

In the practical use of the form of my device, which has been described, when the press is being operated, power is imparted to the shaft 12 in any suitable way, and from the shaft 12 is imparted through the various gears hereinbefore described to the other rollers, which have been described and explained.

Water will flow from the tank 70 downwardly through the flexible tube 66 and thence through the passage 52 past the valve formed by the left-hand end of the rod 60 and into the tube 53. From the tube 53, the water flows through the openings 57 to the interior of the hollow roller 39, from whence it passes through the openings 40 to the absorbent material 45.

The water is then distributed by the roller 32 to the rollers 29 and 30 and from them to the plate 33. The plate 33 is inked by mechanism not shown, and leaves an impression on the blanket on the roller 16, from which the paper 72 is printed.

The flow of water may be adjusted by raising or lowering the tank 70, after the set screw 69 has been loosened. By tightening the set screw 69, the tank can be supported in any of its vertical positions.

As the machine operates, it will be seen that when it travels at low speed, the disc 63 will be near its left-hand limit of movement, and the valve formed at the left-hand end of the rod or shaft 60 will be almost closed. As the speed of the machine increases, such increased speed will cause an increase in the amount of moisture necessary for the printing operations, and it will be obvious that the balls 65 will tend to be thrown outwardly and will pull the rod 60 to the right for increasing the size of the passage through the opening 52 and permitting a somewhat corresponding increase in the flow of water from the tank 70 to the interior of the hollow roller 39.

It will be seen that with a structure of the type herein shown, the machine may be adjusted to almost the exact positions of its parts, which are desirable to secure the best results.

Quick and easy adjustment may also be had, even during the operation of the machine, by raising or lowering the tank 70, thereby varying the pressure on the water discharging through the openings 57.

In Figures 6 and 7, I have illustrated other forms of certain parts of my improved device.

I have found that there are certain advantages in the use of steam rather than in the use of ordinary water for furnishing moisture for the purposes hereinbefore more fully explained.

In Figures 6 and 7 just mentioned, I have shown mechanism adapted for use with my device, where it is desired to use steam.

In the modified form of my structure, instead of using the tube or pipe 53, I employ a similar tube or pipe, indicated by the reference character 75, shown in Figure 6. This pipe is viewed from the opposite direction, from that from which the moisture pipe in Figure 9 is viewed.

The pipe 75 has in its upper end a series of openings 76 preferably corresponding in arrangement and function with the openings 57. Screw-threaded bolts or the like 58, similar to those already described are mounted in the lower part of the pipe 75 and form control valves for the holes in the upper part of said pipe.

The spindle 77, at the left-hand end of the pipe 66, as viewed in Figure 6, is similar to the spindle or pointed end 55, as shown in Figure 3.

Instead of the member 50, there is provided in the modified form of the device, a fitting or the like 78, designed to be mounted on the frame 21, and having extending downwardly from the tube or pipe 75 a valve structure. The fitting 78 is provided with an opening 79, which communicates with the passage 75 at one end.

Projected into the fitting 78 is a valve 80, having a hole 81 therein. The opening 81 of the valve is adapted when in one position to register with the passage 79, and when in another position to leave the passage 79 closed.

The valve 80 has a stem 82 similar in construction to the rod 60 above described, and designed to be operated in the same way as the rod 60.

Where the device of the modified form is employed, the tank 70 is mounted on the bracket member 68 in the manner already described. There is provided a steam generator, comprising the receptacle 83 beneath which is a burner 84. At the top of the receptacle 83 is a valve casing 85, having a laterally extending tubular member 86, connected with the lower end of the flexible tube 66, as shown in Figure 6. In the lower part of the valve casing 85 is a passage 87, communicating with the interior of the receptacle 83.

At the upper end of the passage 87 is a valve seat 88 controlled by a needle valve 89, the stem of which is screwed into the screw plug cap 90 of the valve casing 85, as indicated at 91.

Where the form of the device illustrated in Figure 6 is employed, the flow of steam to

the tube 75 and from thence to the hollow roller 39 is controlled by means of the governors and the valve 80.

It is obvious also that the flow of water to the steam generator can be regulated by the needle valve, and also by raising and lowering the tank 70.

On account of the variety of adjustments provided for in the device herein described, I find that I can regulate and control the flow of moisture to the vibrator roller 31 and thus control the supply of moisture to the plate 33. The machine can be set by the adjustment of the screws 58, so as to do approximately its best work.

The flow of moisture is also automatically controlled thereafter according to the speed of operation of the press, for thereby furnishing moisture to the printing plate in proper amounts.

For meeting conditions that may vary somewhat, which would not be taken care of to the best advantage by the automatic valve control, there is provided the vertical adjustment of the water supply tank. Frequently during one day's run, the humidity of the air varies, making highly desirable a quick and easy adjustment for controlling the water supply. This desirable adjustment is found in the feature of the adjustable tank just mentioned.

It has been one of my objects in the development and experimenting with my present machine to provide means whereby the moisture will be thoroughly distributed before being carried to the printing plate 33, so that no moisture may be carried in the form of drops. This thorough distribution is accomplished by supplying moisture to the inside of a roller, having an absorbent surface, so that the water is passed through such surface and in such passage is thoroughly broken up.

Any or all of the means of control herein described may be employed, and it is obvious that varied combinations of such means might be used under various circumstances.

Some changes may be made in the construction and arrangement of the parts of my improved moisture supplying device for offset printing rollers, without departing from the essential features and purposes of my invention, and it is my intention to cover by my claims, any modified forms of structure or use of mechanical equivalents, that may be reasonably included within their scope.

I claim as my invention:

1. A moisture roller for printing machines, comprising a hollow tubular roller, said roller being perforated and having an absorbent cover, a moisture conducting tube projected into said roller and supported independently with relation to the roller, said tube having valve controlled openings, a

moisture supply tank, and means for conducting moisture from said tank to said tube.

2. A moisture roller for printing machines, comprising a hollow tubular roller, said roller being perforated and having an absorbent cover, a moisture conducting tube projected into said roller and supported independently with relation to the roller, said tube having valve controlled openings, a moisture supply tank, and means for conducting moisture from said tank to said tube, said means including a member, having a passage therein, a valve for controlling said passage, and a governor device for regulating said valve according to the speed of rotation of said roller.

3. A moisture roller for printing machines, comprising a hollow tubular roller, said roller being perforated and having an absorbent cover, a moisture conducting tube projected into said roller, and supported independently with relation to the roller, said tube having valve controlled openings, a moisture supply tank, and means for conducting moisture from said tank to said tube, and means for automatically controlling the flow of moisture from said tank to said tube according to the speed of rotation of said roller.

4. A moisture roller for printing machines, comprising a hollow tubular roller, said roller being perforated and having an absorbent cover, a moisture conducting tube projected into said roller and supported independently with relation to the roller, said tube having valve controlled openings, a moisture supply tank, and means for conducting moisture from said tank to said tube, said means including a member, having a passage therein, a valve for controlling said passage, and a governor device for regulating said valve according to the speed of rotation of said roller, said tank being adjustable for regulating the flow of moisture supply.

5. A moisture roller for printing machines, comprising a hollow tubular roller, said roller being perforated and having an absorbent cover, a moisture conducting tube projected into said roller and supported independently with relation to the roller, said tube having valve controlled openings, a moisture supply tank, and means for conducting moisture from said tank to said tube, said means including a member, having a passage therein, a valve for controlling said passage, and a governor device for regulating said valve according to the speed of rotation of said roller, said tank being adjustable for regulating the flow of moisture supply, and a steam generator interposed in the path of travel of moisture from the tank to the roller.

6. In a device of the class described, a moisture roller, a supply tank, means for

conducting moisture from said tank to said roller, and means for automatically controlling the supply of moisture from the tank to the roller according to the speed of rotation of the roller, said tank being vertically adjustable for regulating the supply of moisture therefrom.

7. In a device of the class described, a moisture roller, a supply tank, means for conducting moisture from said tank to said roller, and means for automatically controlling the supply of moisture from the tank to the roller according to the speed of rotation of the roller, said tank being vertically adjustable for regulating the supply of moisture therefrom, and a steam generator interposed between said tank and said roller.

8. In a device of the class described, a moisture roller, a supply tank, means for conducting moisture from said tank to said roller, said tank being vertically adjustable for regulating the supply of moisture from the tank to the roller, a steam generator interposed between said tank and said roller.

9. In a machine of the class described, a roller having an absorbent surface, means for supplying moisture to the interior of said surface, and distributing rollers for carrying moisture from said surface to a

printing roller, whereby the moisture is distributed by its passage through the surface of said first roller, and means for automatically regulating the supply of moisture to the interior of said first roller.

10. In a machine of the class described, a moisture supply roller having an absorbent surface, means for supplying moisture to the interior of said roller, whereby moisture distributed from the outer surface of the roller passes through such absorbent surface, means for imparting rotation to said roller, and means for automatically controlling the flow of moisture to the interior of said roller according to the speed of said roller.

11. In a machine of the class described, a moisture supply roller having an absorbent surface, means for supplying moisture to the interior of said roller, whereby moisture distributed from the outer surface of the roller passes through such absorbent surface, means for imparting rotation to said roller, and means for automatically controlling the flow of moisture to the interior of said roller according to the speed of said roller, and an additional means for controlling the flow of moisture to the interior of said roller.

Des Moines, Iowa, January 28, 1921.

MARION L. STRAWN.