

No. 731,530.

PATENTED JUNE 23, 1903.

H. A. W. WOOD.
PRINTING PRESS.

APPLICATION FILED MAR. 4, 1898. RENEWED OCT. 30, 1902.

NO MODEL.

3 SHEETS—SHEET 1.

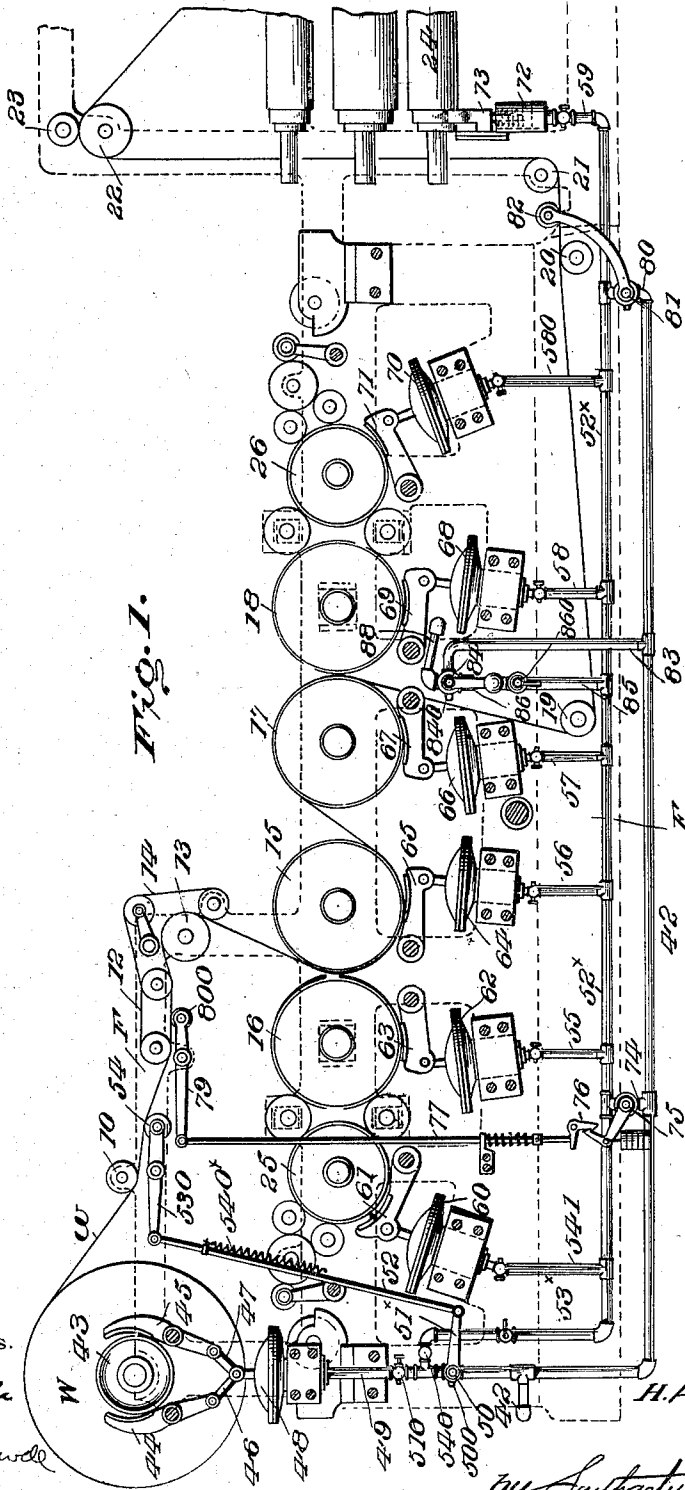


FIG. 1.

Witnesses.

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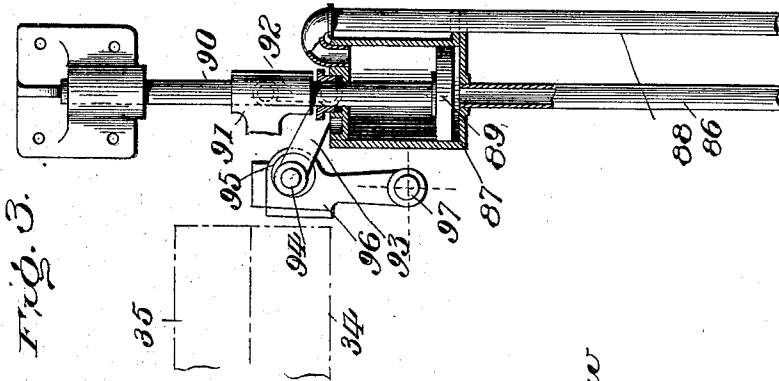


Fig. 3.

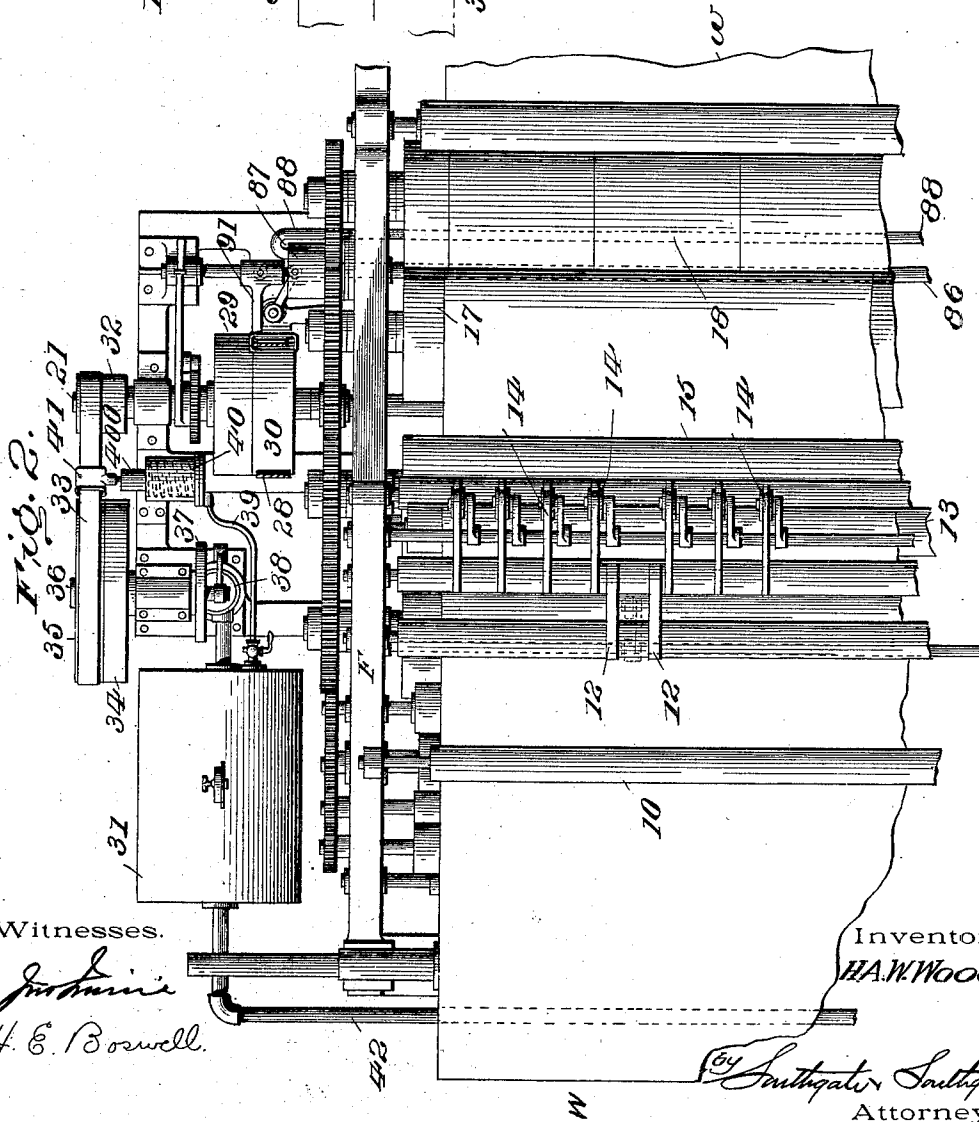


Fig. 2.
35, 36, 38, 41, 21

Witnesses.

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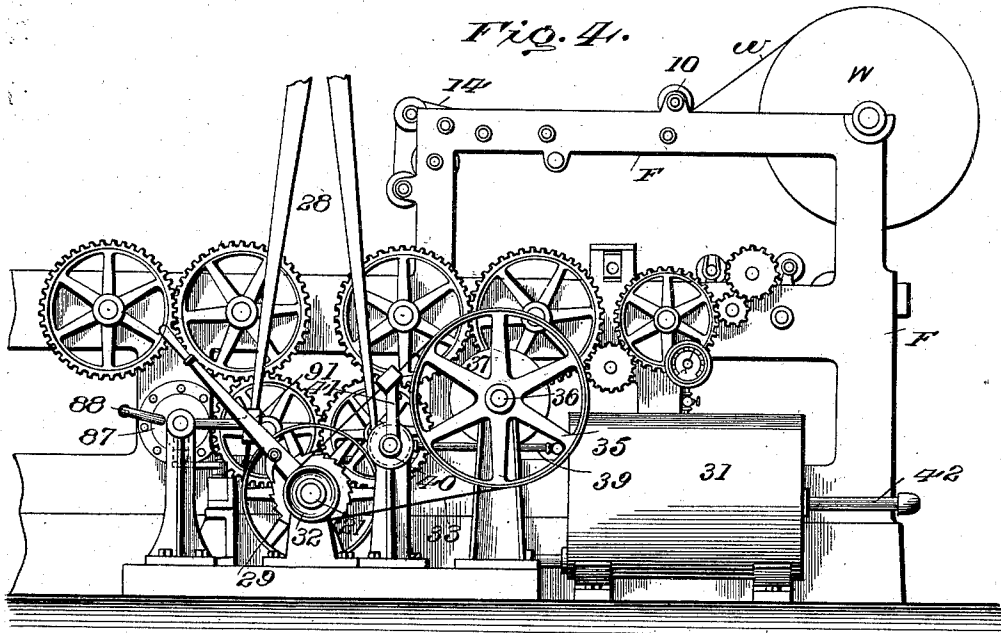
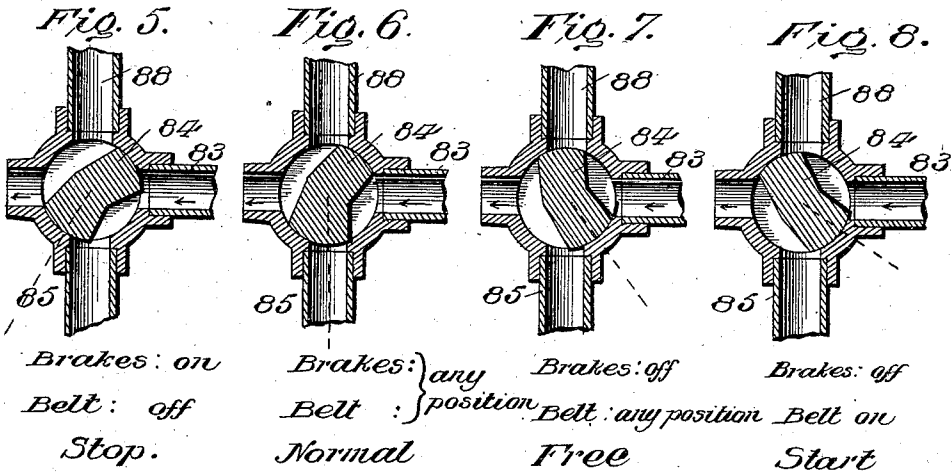
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3 SHEETS—SHEET 3.



Witnesses

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UNITED STATES PATENT OFFICE.

HENRY A. WISE WOOD, OF NEW YORK, N. Y., ASSIGNOR TO THE CAMPBELL PRINTING PRESS & MANUFACTURING COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

PRINTING-PRESS.

SPECIFICATION forming part of Letters Patent No. 731,530, dated June 23, 1903.

Application filed March 4, 1898. Renewed October 30, 1902. Serial No. 129,507. (No model.)

To all whom it may concern:

Be it known that I, HENRY A. WISE WOOD, a citizen of the United States, residing at New York, in the county of New York and State
5 of New York, have invented a new and useful Printing-Press, of which the following is a specification.

My invention relates to an improved controlling mechanism for printing-presses.

10 Web-printing presses to-day are driven at a high rate of speed. In most web-printing presses it is necessary to maintain the web under a substantially constant tension. The customary way of doing this is to apply a
15 brake to the shafts of the web-roll. This brake is ordinarily hand-operated. As the web is drawn into the press the web-roll diminishes in size and the speed of rotation of the web-roll increases. In order that a uni-
20 form tension may be kept upon the web, it is therefore necessary to gradually release or diminish the friction of the brake as the web-roll decreases in size. This has heretofore
25 ordinarily been done by hand and requires the constant supervision and attendance of the operator.

One aim of my invention is to provide automatic means for regulating the tension of the web.

30 The moving parts of the web-printing presses weigh many hundreds of pounds. The momentum of these moving parts is such that it is impossible to stop the press quickly by means of a single brake.

35 A further object of my invention is therefore to provide a plurality of brakes which are arranged to act simultaneously upon different parts of the printing-press and also, if desired, to provide brakes which act simultaneously upon the shaft of the web-roll and upon the folding-machine which is ordinarily employed in connection with web-
40 presses.

If the web in the press or in the folding-machine breaks, a "choke" is very apt to occur—that is, the incoming web is apt to wind up upon one of the cylinders or other moving parts, thus wedging the operating parts away from each other and breaking or
50 damaging the machine.

A still further object of my invention is therefore to provide means for automatically throwing off the driving-belt and applying the brakes whenever the web is ruptured.

A further improvement which I have de- 55 vised consists of a hand-operated device which may be manipulated to shift the driving-belt and to set or release the brakes as desired.

The specific means which I have invented 60 for accomplishing these purposes comprises an air-pump, which is automatically actuated to maintain a constant pressure in a suitable receiver or air-chamber. Extending from the air-chamber is a pipe which I term the "pres- 65 sure-pipe." A pneumatic belt-shifting device is arranged to throw the driving-belt either to the tight or the loose pulley of the machine. A plurality of fluid-pressure brakes are arranged to act upon different moving 70 parts of the press and folding-machine. A pneumatic brake is also arranged to act upon the shaft of the web-roll. The pneumatic brakes and the belt-shifting device are all connected to a pipe, which I term the "serv- 75 ice-pipe." The brake for the web-roll is also independently connected to the pressure-pipe. The service-pipe is connected to the pressure-pipe by pipes or passages. In one or more of these pipes or passages is a valve, 80 which I arrange to open automatically whenever the web is broken, so as to admit pressure from the pressure-pipe into the service-pipe. In a separate pipe, which connects the pressure-pipe and the service-pipe, I provide 85 a valve which may be moved to different positions by hand, so as to admit pressure from the pressure-pipe to the service-pipe or to cut the same off.

It will be seen that in this application I 90 have illustrated a controlling device for printing-presses comprising means for automatically regulating the tension of the web, a plurality of brakes for simultaneously acting upon various parts of the press, means for 95 automatically shifting the belt and applying the brakes when the web is ruptured, and a device which can be operated by hand for shifting the belt and for setting or releasing the brake, as desired. While I prefer to em- 100

ploy all of these devices in a controlling mechanism constructed according to my invention, it is obvious that these features are independent and may be used in different locations or applied in different manners without departing from the scope of my invention as hereinafter described.

In the accompanying three sheets of drawings, Figure 1 is a side view of a press provided with controlling devices constructed according to my invention. Fig. 2 is a partial plan view of the press. Fig. 3 is a detail view illustrating the automatic belt-shifting device. Fig. 4 is a partial side view showing the opposite side of the press from that illustrated in Fig. 1; and Figs. 5, 6, 7, and 8 are detail views illustrating different positions of the controlling-valve.

Referring to the drawings and in detail, F designates one of the usual side frames. Journalled in the side frames in the ordinary manner is a web-roll W. From the web-roll W the web *w* passes under a guide-roller 10, under two tapes or belts 12, around the guiding or drawing roller 13, coating with which is a set of drawing-tapes 14, to the first impression-cylinder 15, coating with which is the first printing-cylinder 16, around the second impression-cylinder 17 in position to be acted upon by the second printing-cylinder 18, under a guide-roller 19, over a guide-roller 20, under a guide-roller 21, between the rollers 22 and 23, from whence it passes into the folding-machine, which may be of any of the ordinary or approved constructions and is represented as being provided with one or more sets of drawing-rolls, as 24.

The inking appliances may be of any of the ordinary or approved constructions, and, as illustrated, they comprise ink-drums 25 and 26 for receiving and spreading ink, so that the same may be properly applied to the printing-cylinders 16 and 18.

The driving-shaft 21, Fig. 2, is provided with the ordinary loose pulley 29 and tight pulley 30.

28 designates the main driving-belt.

Secured on the end of the driving-shaft 21 is a pulley 32, which drives the belt 33 for actuating the air-pump. The belt 33 engages with the loose pulley 35 or the tight pulley 34, secured upon the pump-actuating shaft 36. Upon the opposite end of the pump-actuating shaft 36 is a crank-disk 37, which is connected to operate the piston of an air-pump 38 in the ordinary manner. The air pump or compressor 38 is connected to an air chamber or receiver 31. The air-chamber 31 is connected by a pipe 39 with a cylinder 40. When the air in the chamber 31 has reached the desired pressure, a spring-pressed plunger 400, mounted in the cylinder 40, will be forced out, so as to shift the belt 33 onto the loose pulley 35, thus stopping the air-compressor. When the pressure in the receiver 31 falls, the spring-plunger 400 will move back under the tension of its spring and will

automatically start the pump in operation, thus maintaining a substantially constant pressure in the receiver.

Leading from the receiver 31 is a pipe 42, which extends around to the opposite side of the press and constitutes what I term the "pressure-pipe."

Fastened on the web-roll shaft is a disk 43. Arranged to engage with and act upon the disk 43 are pivoted brake-shoes 44 and 45, which are connected by toggle-links 46 and 47, so as to be simultaneously operated by a diaphragm mounted in a casing 48. The diaphragm-case 48 is connected by a pipe 49 to the pressure-pipe 42. A valve 510 may be provided in the pipe 49 in order to cut off the diaphragm-case 48 when desired. Also arranged in the pipe 49 is a throttle-valve 50, having an outlet or exhaust passage 500. The arm 51^x of the throttle-valve 50 is connected by link 52 to a lever 530, carrying a roller 54. A spring 540^x is arranged to normally move the roller 54 into engagement with the web. When the tension upon the web drawn from the web-roll is too light, the roller 54 will move under the influence of the spring 540^x, and the throttle-valve 50 will be opened, so as to admit pressure to operate the brake-shoes 44 and 45 to increase the tension upon the web-roll. When the tension of the web is too great, the roller 54 will be forced down against the tension of the spring 540, and the throttle-valve 50 will be actuated to release the air-pressure on the diaphragm to decrease the tension upon the shaft of the web-roll. It will thus be seen that I have provided automatic means for regulating and maintaining a constant tension upon the web.

Extending along the side of the press parallel with the pressure-pipe 42 is a pipe 52^x, which I term the "service-pipe." The service-pipe 52^x is provided with branches 53^x, 541, 55, 56, 57, 58, 580, and 59. The branch 53^x is provided with a check-valve 540 and connects with the pipe 49, before referred to. The branch 541 leads to a casing 60, having a diaphragm which is connected to actuate a brake-shoe 61, which engages with the ink-drum 25. The branch 55 leads to a casing 62, in which is mounted a diaphragm which is connected to actuate a brake-shoe 63 for engaging the first printing-cylinder 16. The branch 56 leads to a casing 64, in which is mounted a diaphragm which is connected to actuate a brake-shoe 65 for the first impression-cylinder 15. The branch 57 leads to a casing 66, in which is mounted a diaphragm which is connected to actuate a brake-shoe 67 for the second impression-cylinder 17. The branch 58 connects to a casing 68, in which is mounted a diaphragm which is connected to actuate a brake-shoe 69 for the second printing-cylinder 18. The branch 580 leads to a casing 70, in which is mounted a diaphragm which is connected to actuate a brake-shoe 71 for the ink-drum 26. The branch 59 leads to a cylinder 72, having a spring-plun-

ger connected to a brake-shoe 73 for the roller 24 of the folding-machine. The branches connected to the casings are each provided with suitable valves, as shown, which may be operated to cut out one or more of the brakes, as desired.

The pressure-pipe 42 is provided with a branch 83, which leads to the main controlling-valve 84. The main controlling-valve 84 is a four-way valve and has an upwardly-extending passage which connects to a pipe 88, a downwardly-extending passage which leads into a branch 85 of the service-pipe 52^x, and an exhaust-passage 840. The pipe 88 and a branch 86, leading from the pipe 85, are connected to opposite ends of a cylinder 87, as illustrated in Fig. 3. Mounted in the cylinder 87 is a piston 89. Secured on the piston-rod 90 is a belt-shifter 91 for moving the main driving-belt. I also preferably provide a brake for engaging the tight pulley 30 when the driving-belt is shifted onto the loose pulley 29. As illustrated, the piston-rod 90 is connected by means of links 92 and 93, so as to turn a vertical shaft 94. Fastened on the vertical shaft 94 is an eccentric 95, which engages with and actuates a brake-shoe 96, journaled upon a stud 97. By means of this construction when the piston 89 is forced outwardly the vertical shaft 94 will be turned and the brake-shoe 96 will be forced into engagement with the tight pulley 30.

The operation of the main controlling-valve 84 is most clearly illustrated in Figs. 5 to 8, inclusive. When the handle of the controlling-valve is turned to the left, as illustrated in Fig. 5, pressure will be admitted from the pressure-pipe 42 to the service-pipe 52^x, the brakes will be set, the pipe 88 will be connected with the exhaust-passage, and pressure will be admitted to the pipe 86 to shift the driving-belt and apply the brake to the tight pulley. When the handle of the controlling-valve is in its central position, as illustrated in Fig. 6, the pressure from the pressure-pipe is cut off from the service-pipe, and there will be no action upon the brakes on the belt-shifting devices. When the handle is thrown to the right, as illustrated in Fig. 7, the service-pipe will be connected with the exhaust-passage, thus releasing the brakes, and the parts of the press will then be free to be turned by hand. When the handle of the controlling-valve is thrown still farther to the right, as illustrated in Fig. 8, pressure from the pressure-pipe will be admitted from the pipe 88, so as to shift the belt onto the tight pulley, so as to start the press. Thus by the use of a single controlling device it will be seen that I am enabled to shift the driving-belt and to simultaneously apply or release the brakes, as desired.

The main controlling-valve 84 can be cut off from the service-pipe 52^x by shutting the valve 860. When this has been done, the valve can be utilized to control the belt-shift-

ing device and the brake for the tight pulley alone.

The pressure-pipe 42 is also connected with the service-pipe 52^x by means of branches 74 and 80. In the branch 74 is an automatic normally closed valve 75. The valve 75 is held in its closed position by means of a catch 76. Engaging with the catch 76 is a rod 77, having a spring 78 for forcing the same down. At its upper end the rod 77 is connected to a lever 79, having a roller 800, which engages with and bears against the web between the tapes 12. Whenever the web breaks, the roll 800 will be left free to move up under the tension of the spring 78, the catch 76 will be released, and the valve 75 will be automatically opened to admit pressure to the service-pipe 52^x, so as to throw off the driving-belt and apply the brakes.

I also preferably provide a normally closed automatic valve 81 in the passage 80 near the opposite end of the press. As illustrated, the valve 81 is controlled by an arm having a roller 82, which rests upon and is supported by the web. Whenever the web breaks, so as to be withdrawn from under the roll 82, the same will be left free to move down by gravity, thus automatically opening the valve 81 to shift the driving-belt and stop the press.

It is obvious that I may employ a single automatic valve; but I prefer to employ two or more automatic valves, one being located in position to be operated if the web is broken near the web-roll and the other being located near the delivery end of the press in position to be operated if the web should be broken near the central part of the press.

I am aware that very many changes in my controlling device may be made by those who are skilled in the art without departing from the scope of my invention as expressed in the claims.

My automatic tension-controlling devices can, if desired, be used without employing the automatic brakes. The means for regulating and controlling the brakes and belt-shifting devices by hand can be used without employing means for automatically actuating the same, and various other features of my invention can be used in different combinations and in different locations by skilled mechanics. I do not wish, therefore, to be at all limited to the construction which I have shown and described; but

What I do claim, and desire to secure by Letters Patent of the United States, is—

1. The combination in a rotary printing-press, of a plurality of printing-couples, a fluid-pressure brake applied to each of said printing-couples, and a valve for controlling the pressure, arranged so that the brakes can be simultaneously operated.

2. The combination in a rotary printing-press of a plurality of printing-couples, a fluid-pressure brake applied to each couple, a driving mechanism for the press, and a valve

having connections to said brakes, and to the controlling means of the driving mechanism, arranged so that said brakes can be thrown out of and into operation, and the press simultaneously started or stopped.

3. The combination in a rotary printing-press, of impression-cylinders and printing-cylinders, fluid-pressure brakes applied thereto, and a valve for controlling said pressure-brakes.

4. The combination in a rotary printing-press of the cylinders thereof, fluid-pressure brakes applied to said cylinders, driving mechanism for the press, and a valve having connections to said brakes and said driving mechanism, whereby said brakes can be thrown out of and into operation and the press simultaneously started or stopped.

5. The combination in a web-printing press, of a plurality of printing-couples, a series of fluid-pressure brakes applied thereto, a valve controlling the admission of pressure to said brakes, and connections to said valve arranged so that if the web in the press should break, the brakes will be set.

6. The combination in a rotary web-printing press, of a plurality of printing-couples, a series of fluid-pressure brakes applied thereto, a starting and stopping mechanism for the press also actuated by fluid-pressure, a valve

controlling the supply of pressure to these parts, and connections to the valve arranged so that if the web should break the machine will be automatically stopped and the brakes set on the printing-couples.

7. The combination in a rotary web-printing press having a plurality of printing-couples, of a series of fluid-pressure brakes applied thereto, a driving mechanism for the press, means whereby said driving mechanism can be controlled by fluid-pressure, and a hand-valve arranged so that said press may be stopped and the brakes applied, or so that the brakes may be released and the press started.

8. The combination in a rotary web-printing press, of a plurality of printing-couples, inking apparatuses therefor having rotating ink-drums, fluid-pressure brakes applied to said printing-couples and ink-drums, and a valve for controlling said fluid-pressure brakes.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

H. A. WISE WOOD.

Witnesses:

HENRY W. COZZENS, Jr.,
LOUIS W. SOUTHGATE.