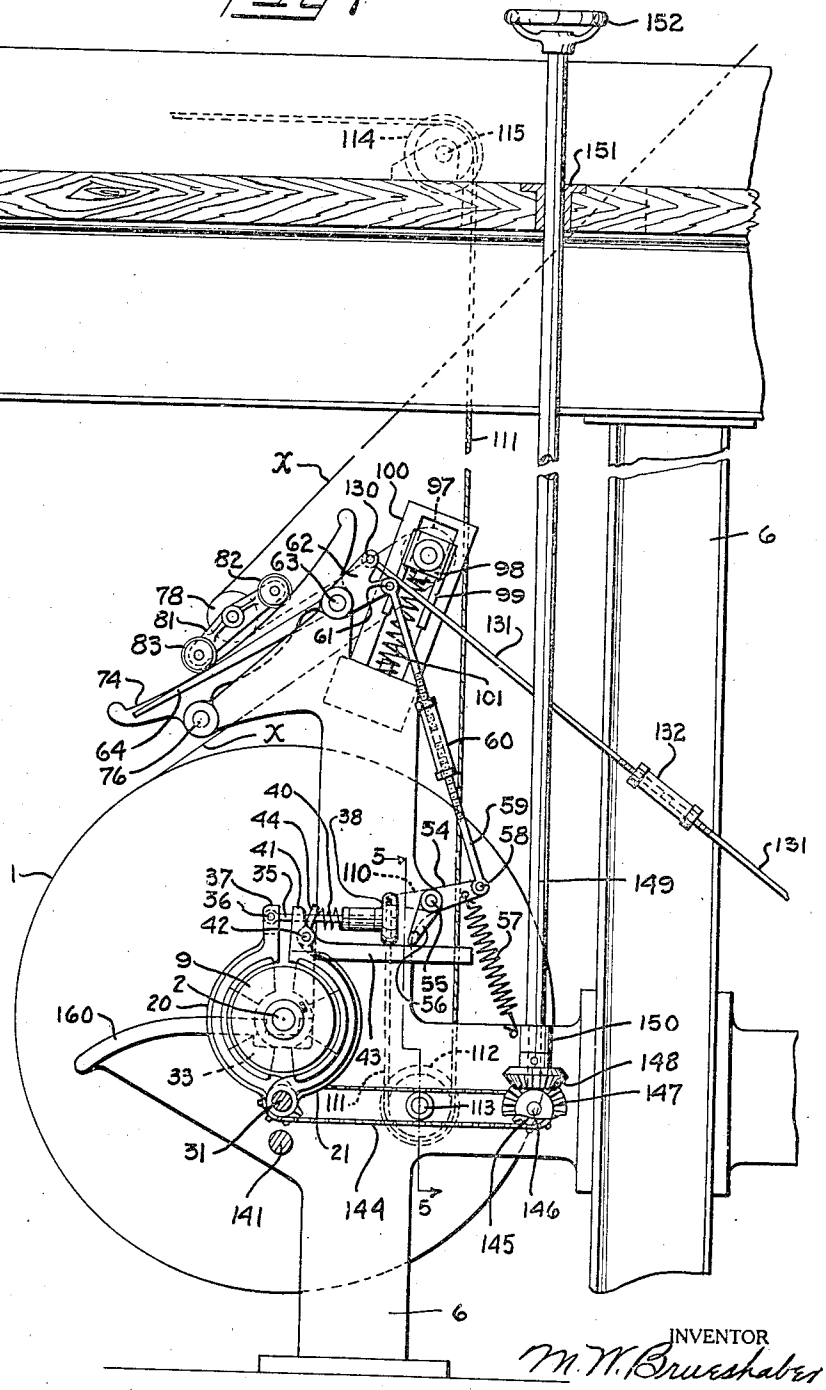
Oct. 27, 1931. M. W. BRUESHABER 1,829,337

WEB SUPPLYING AND CONTROLLING MECHANISM

Filed Aug. 6, 1924 4 Sheets-Sheet 1

Fig 1



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WEB SUPPLYING AND CONTROLLING MECHANISM

Filed Aug. 6, 1924 4 Sheets-Sheet 2

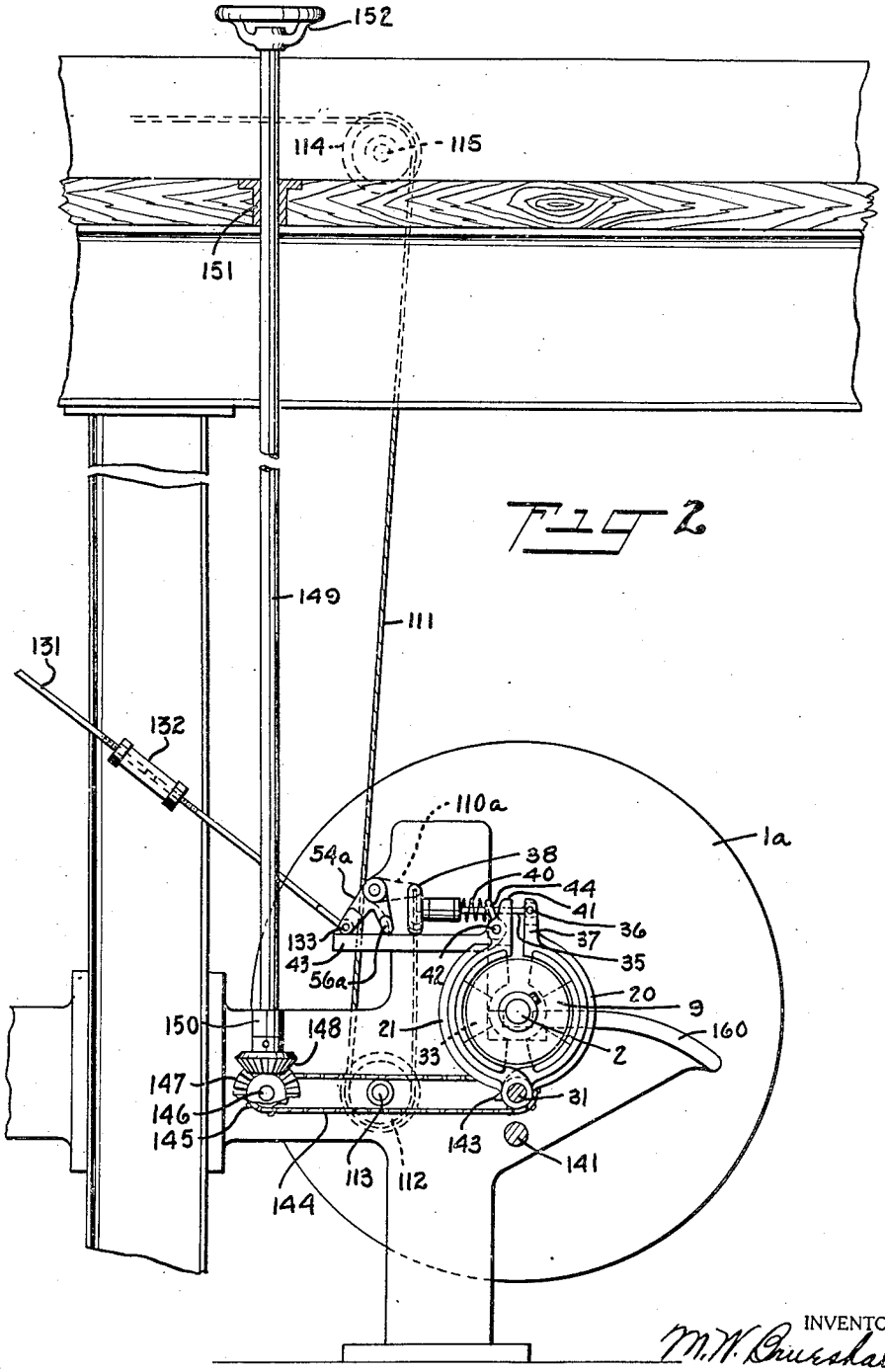


Fig 2

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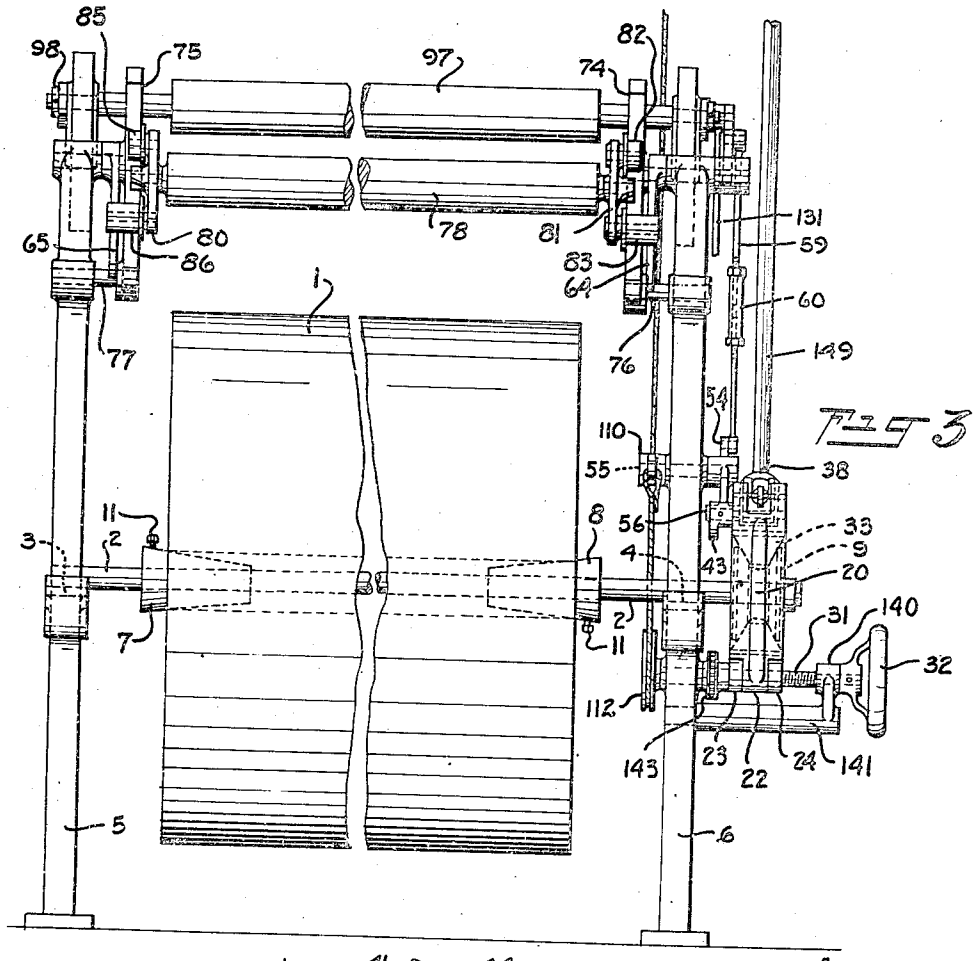


Fig 3

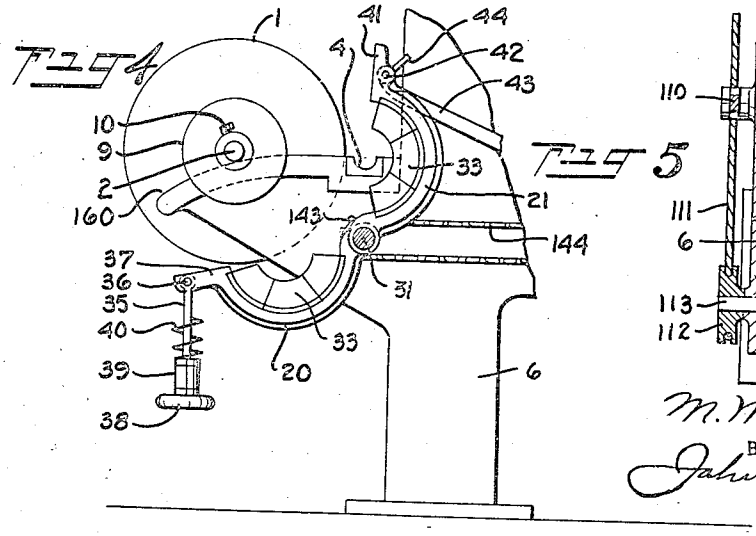


Fig 4

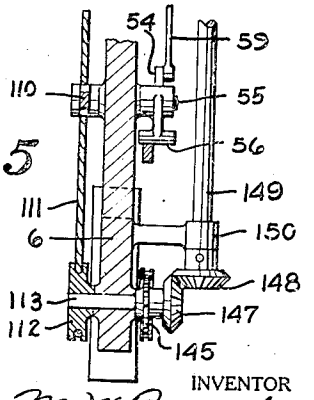


Fig 5

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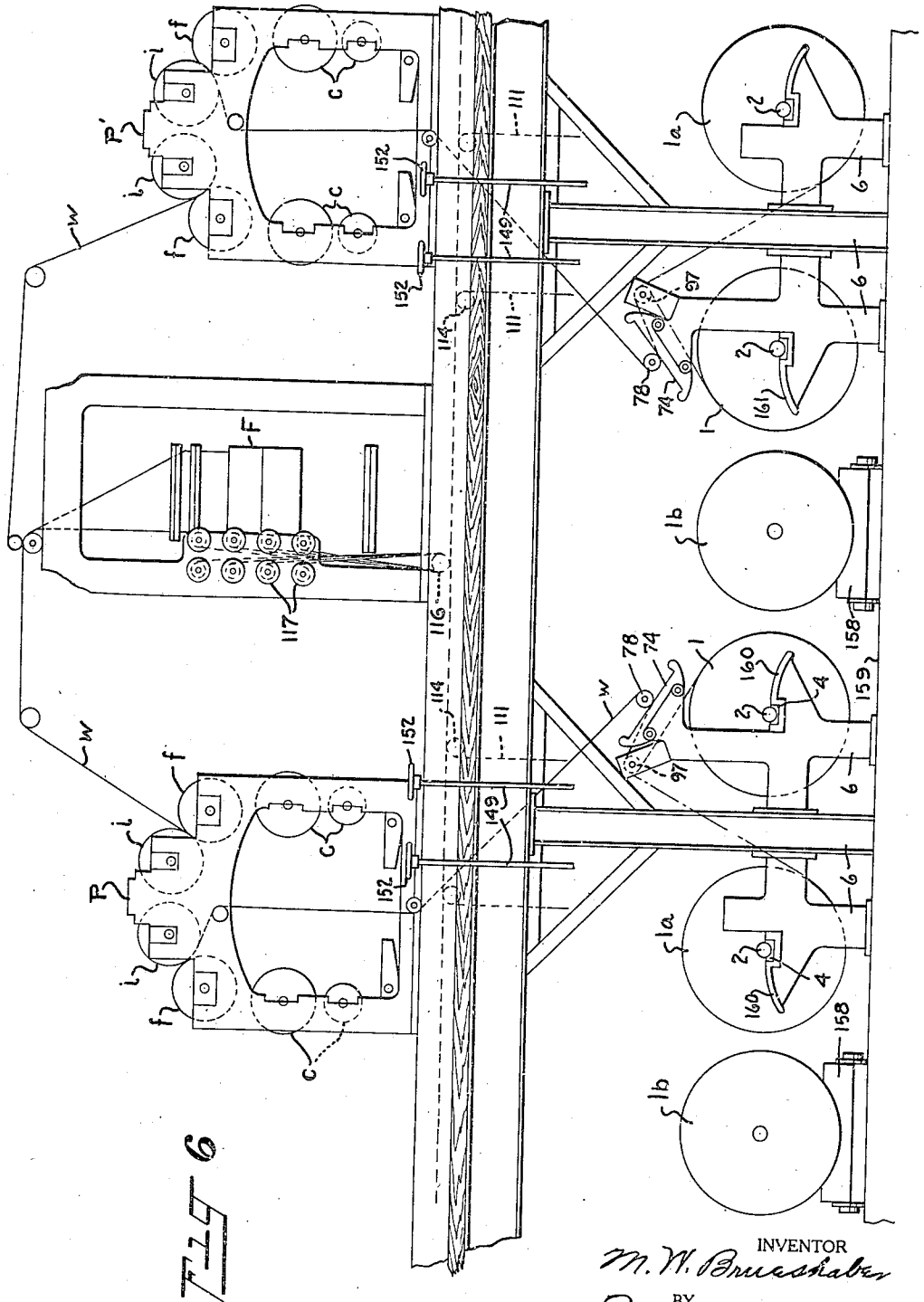
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WEB SUPPLYING AND CONTROLLING MECHANISM

Filed Aug. 6, 1924 4 Sheets-Sheet 4



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UNITED STATES PATENT OFFICE

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WEB SUPPLYING AND CONTROLLING MECHANISM

Application filed August 6, 1924. Serial No. 730,378.

The invention relates to a novel web supplying and controlling mechanism, and more especially in certain of its features to such a mechanism for supplying and controlling webs for printing presses and folders.

Objects and advantages of the invention will be set forth in part hereinafter and in part will be obvious herefrom, or may be learned by practice with the invention, the same being realized and attained by means of the instrumentalities and combinations pointed out in the appended claims.

The invention consists in the novel parts, constructions, arrangements, combinations and improvements herein shown and described.

The accompanying drawings, referred to herein and constituting a part hereof, illustrate one embodiment of the invention, and together with the description, serve to explain the principles of the invention.

Of the drawings:—

Fig. 1 is a vertical fragmentary elevation of a mechanism embodying the invention;

Fig. 2 is a like view of another part of the mechanism.

These two figures can be read together by placing Fig. 2 at the right of Fig. 1.

Fig. 3 is an end elevation looking at Fig. 1 from the left;

Fig. 4 is a fragmentary elevation of the brake mechanism in the open position;

Fig. 5 is a vertical section on line 5—5 of Fig. 1; and

Fig. 6 is a diagrammatic elevation of a press and folder embodying the invention.

The invention in the present preferred and exemplified embodiment is shown (Fig. 6) applied to a rotary web press of the single-deck type, with separate perfecting units and a common central folder, set directly upon the floor and being substantially of man height, and with the web supply on the floor beneath. In certain of its features the invention has special advantages and adaptations with respect to a press of this type; but in most of its aspects it is applicable to, and advantageous with, web presses of other types as well.

Means are provided by the invention for automatically regulating and controlling the unrolling or paying off of the web supply roll in conformity with the speed of the web into the printing mechanism, such means operating automatically, and also having its automatic operation regulable and controllable from a distant station, namely, by a workman located at the press; on the floor above in the present instance, or wherever the press may be.

In the embodied form of said means, the web supply roll 1 is mounted on a shaft or mandrel 2, which is journaled in bearings 3 and 4, mounted in the respective vertical side frames 5 and 6 of the press. The supply roll 1 is fixed in position longitudinally on its shaft 2 by suitable means, such as the conoidal chucks or locking members 7 and 8, which in turn are held from longitudinal movement by any suitable means, such as clamping screws 11. The shaft 2 at one of its ends projects outwardly beyond the bearing 4 in the side frame, and has fixed thereto a grooved pulley 9, which is held in fixed position on the shaft 2 by suitable means, such as a clamping screw 10; in accordance with certain features of the invention, it acts as a braking pulley and also as an alining device, as will be later described; although so far as concerns other features, the braking and alining devices could be entirely separate.

In said embodied form, cooperating with the pulley 9 is a braking device, which likewise in certain aspects of the invention, serves also as a part of the alining mechanism. This device comprises two arcuate and substantially semi-circular members 20 and 21, having a common hinged joint, comprising a central cylindrical lug 22 on one end of the member 20, and two cylindrical lugs 23 and 24 fixed to one end of the member 21 and fitting at either side of the lug 22 on the member 20.

To effect the alining function, these three cylindrical lugs are centrally screw-threaded, on their hinge mounting, as will be later described. The lugs 22, 23 and 24 are pivotally mounted upon the screw-threaded shaft 31, their pivotal or hinged movement effecting the braking action, and their travel along

the shaft effecting their alining action. Shaft 31 is rotatably mounted at one end thereof in the side frame 6, and is provided with a hand-wheel 32. This hand wheel provides actuating means for the alining mechanism adjacent to the supply roll.

The semi-circular members 20 and 21 have arcuate and also undercut recesses on their inner faces in which are mounted segmental blocks 33 which are of beveled or wedge shaped form both at their ends and sides, the latter enabling them to fit within the correspondingly shaped groove in the pulley 9, and these blocks participate both in the braking and alining action on the web supply roll.

Means are preferably provided whereby the frictional action of the members 20 and 21 upon the pulley 9 is spring-exerted and automatically controlled, and cooperating therewith are workman controlled means for regulating or controlling this automatically-operating spring action. As embodied, a rod 35 is pivoted at 36 to an arm 37, extending outwardly from the outer end of the member 20. Rod 35 has a hand-wheel 38 fixed thereto, the wheel having a hub 39. Encircling the rod 37 is a helical spring 40, with one end abutting against the hub 39. The outer end of the member 21 has also an outwardly extending arm 41, which has a recess in the end thereof, which receives the rod 35 when it is swung into the position shown in Figs. 1 and 2.

Pivotally mounted at 42 on the arm 41 of the member 21 is a lever 43, having an upwardly-extending forked end 44, the rod 35 lying in the recess therein, and one end of the spring 40 abuts thereon, whereby the spring is compressed between the lever arm 44 and the hub 39 of the hand wheel. Pressure is thus exerted on the pivoted arcuate members 20 and 21, and this effects a resilient braking pressure upon the pulley 9 fixed to the shaft 2 of the supply roll, this pressure being regulable by moving lever 43.

Means are provided by the invention for varying automatically this spring pressure, and in the embodied form thereof it is controlled by mechanism cooperating with a loop in the web. This mechanism operates to automatically rock the lever 43, and thus vary the action of the spring 40, through the braking mechanism, upon the pulley 9. For this purpose, as embodied, a lever 54 is fixed to a shaft 55 pivoted upon the side frame 6. The laterally-extending tail 56 of lever 54 (Figs. 1, 2 and 5) is in contact with the tail of the lever 43. A helical tension spring 57 has one end connected to the lever 54 and the other end to the frame 6, and tends to rock the lever 54 away from the lever 43. Pivoted to the other end of lever 54 at 58 is a connecting link 59, provided preferably with a turn buckle 60. Link 59 at its opposite end 61 is pivoted to a lever 62, fixed to a shaft 63, journaled in the side frame 6. Fixed also to shaft 63, on the inner side of the frame, and extending downwardly from the shaft is a regulating arm 64. A similar and cooperating regulating arm 65 is likewise fixed to shaft 63 at the opposite end thereof.

Adjacent to the arm 64 is a trackway 74, preferably arcuate, mounted upon the side frame 6, and at the opposite side of the press, and adjacent to the corresponding regulating arm 65, is a similar trackway 75, mounted on the side frame 5. These tracks are spaced inwardly away from the frames, and at their bottom ends, respectively, are supported by rods 76 and 77. Next their upper ends the tracks 74 and 75 are supported on shaft 63. A relatively heavy roller 78 is journaled at either end thereof in carriages 80 and 81, respectively. Carriage 81 has at either end thereof a pair of rollers 82 and 83, running upon the trackway 74. The carriage 80 has at either end thereof rollers 85 and 86, which run upon the trackway 75. The rollers 83 and 86 are broad enough to extend over the arms 64 and 65, thereby to control the movement of these arms under the action of spring 57.

The web x as it leaves the supply roll 1 passes over a guiding and supporting roller 97, having bearings in the side frames, and being variably positionable. In the preferred embodiment, this roller is journaled at either end in corresponding blocks 98, which are slidable in guideways 99, formed in inclined, upwardly-projecting frame pieces 100. A pair of helical springs 101 are in compression between the sliding journal boxes 98 and suitable abutments on the frames, thereby resiliently maintaining the guiding and supporting roller 97 in position.

In the automatic operation of the mechanism, if the supply roll 1 is rotating too rapidly, and is paying off the web faster than it is running into the press, the loop formed about the roller 78 will increase in size, and the roller 78 will run downwardly on the tracks 74 and 75. By this movement rollers 83 and 86 will run downwardly along the levers 64 and 65, and rock them downwardly (in counter-clockwise direction in Fig. 1), will rock lever 62 upwardly, and the tail 56 of lever 54 will be rocked downwardly in counterclockwise direction. Lever 43 will thus be rocked in clockwise direction and will increase the tension on spring 40, and thereby will increase the braking action upon the pulley 9, and thus will slow down the supply roll 1.

As the press catches up on the paying off of the web from the roll 1, the loop about roller 78 will be shortened, and the roller will be drawn upwardly along the tracks 74 and 75. Spring 57 will cause levers 64 and 65 to move

upwardly (in the clockwise direction in Fig. 1) so far as the guiding rollers 83 and 86 will permit. This will swing the tail 56 of lever 54 in the clockwise direction, and lever 43 will yield in the counter-clockwise direction, and the tension of spring 40 will be decreased, and the braking friction on pulley 9 will likewise be lessened, and the web will be unwound more rapidly to catch up with the press. The interaction of these forces and mechanisms thus will regulate the paying off of the web on the roll 1 in conformity with the speed of the paper through the printing mechanism.

Means are provided by the invention for imposing, when desired, a workman-operated control upon the automatically-operating web feed regulating mechanism. This control is preferably located at the press and usually at the folder. This feature is of great value, as it enables the workman to determine the degree of web tension which is preferable or most successful under given operating conditions and with any particular kind of work or material, and the mechanism will automatically maintain the web feed in harmony and accordance with such adjustment by the workman. Also, it enables the workman to secure or effect the desired tension without going to and fro between the folder or other press mechanisms and the supply roll station, and also enables him to change the tension and to observe the effect of such changes at the folder, which would otherwise be impossible.

In the embodied form thereof, fixed to shaft 55 (which is the pivotal mounting of lever 54) is an arm 110. Attached to the outer end of lever arm 110 is a cord 111, which runs over pulley 112, mounted loosely on a stub-shaft 113, fixed to and projecting inwardly from the frame member 6. This cord passes upwardly over a guiding pulley 114, journaled at 115 on a support on the base frame of the press, and about a similar pulley 116. From thence it is wound upon the hub of a hand-wheel 117, mounted on the frame of the folder.

Suitable means will be used for holding the wheel 117 in adjusted position, such as any ratchet and detent mechanism or other suitable device (not shown). When the web is paying off too freely from the supply roll 1, the workman can wind the cord upon the hand reel 117, which will rock the lever 54, in counter-clockwise direction. This will increase the tension on the spring 40, and therewith the braking effect on the pulley 9, and will retard the paying off of the web from the supply roll. If, on the other hand, it is desired to increase or decrease the tension of the web, the cord 111 will be unwound slightly from the hand wheel 117. Thereby spring 57 will rock lever 54 in clockwise direction, lever 43 will move in the counter clockwise direction, tension of spring 40 will be decreased, and the web will pay off slightly more freely from the supply roll 1.

The arms 64 and 65 will move with the lever 54 during these movements, but it will be noted that this will not affect the action of the loop controlling roller 78 thereon. As soon as the web begins to pay off more freely than is required for the tension set by the workman, the loop about this roller will increase, and the roller 78 will act upon the lever arms 64 and 65, as already described, to decrease the rate of paying off until it corresponds to the tension set by the workman.

On the other hand, should the rate of paying off the web from the supply roll be or become less than that set by the workman, the loop about roller 78 will decrease, and spring 57 will rock lever 54 in clockwise direction. This will release tension on spring 40, and the braking action on pulley 9, and increase the rate of paying off the web from the supply roll. Thus the mechanism will not only regulate the paying off of the web in harmony with the speed of its feed into the printing mechanism, but will also do this so as to maintain the tension desired and set by the workman.

In Fig. 6 the workman-operated tension controls at the folder are shown as eight in number, while only two tension controls are shown on the web supply mechanism on the floor below. It will be understood that the showing of Fig. 6 is largely diagrammatic and the details of the various mechanisms are omitted therefrom.

Means are provided by the invention whereby a single detector or mechanism cooperating with the web is adapted to control a plurality of web supply rolls, and preferably this feature is utilized to control alternatively two rolls constituting alternatively or successively the web supply for a single press. As embodied, each supply roll supporting and controlling mechanism may be substantially the same or similar except in the connection between the loop control mechanism and the brake mechanism and its regulating devices. If Figs. 1 and 2 are placed side by side the supply rolls 1 and 1^a may be regarded as alternative supply rolls for the same press, the lead of a fresh roll from one mechanism being pasted or otherwise affixed to the end of the exhausted web from the other mechanism in a usual or other suitable manner.

For effecting the single automatic control from the web, the lever 62 is shown having two arms, and pivoted at 130 to one arm thereof is a connecting link 131, provided with a turn buckle 132. Link 131 is pivoted at 133 to one arm of a lever 54^a, of slightly different but generally similar construction to the lever 54. An additional spring 57 may be employed, or the one spring 57 will

suffice for both mechanisms. From the preceding explanation and description, it will be seen that if either web is led over the guiding and supporting roller 97, and about roller 78, mounted on the traveling carriage, the mechanism will control the live supply roll, whichever it may be.

Means are provided for transversely centering the web supply roll, that is, for thereby positioning or registering the web transversely relatively to the press cylinders and the folder. This means is operable from a distant station, and usually and preferably from closely adjacent to the printing mechanism to which the web is supplied. In the embodied form thereof, the pulley 9 and the brake mechanism are cooperatively utilized for this purpose as already indicated.

It will be recalled that the pulley 9 is fixed on the shaft 2, and that the shoes 33 project into the peripheral groove of the pulley. In the embodied form of web positioning means, and as previously indicated, the members 20 and 21 are moved along the screw-shaft 31, by rotating the shaft, to longitudinally slide the web roll shaft 2 in its bearings, carrying with it the supply roll 1. It will be understood, of course, that this is a very fine and nice adjustment, and that the transverse movement of the web is very small.

The screw shaft 31 has a bearing 140, mounted upon a supporting bar 141, projecting outwardly from the press side frame 6. Shaft 31 is provided with a hand wheel 32, as already described, constituting a local actuating means whereby the roll may be positioned.

The embodied form of means for transversely positioning or registering the supply roll from the distant press station comprises a sprocket wheel 143 fixed on shaft 31. A sprocket chain 144 passes over this wheel and over a sprocket wheel 145 fixed on a shaft 146. Fixed also on this shaft is a beveled gear wheel 147, meshing with a beveled gear wheel 148. Bevel gear 148 is fixed on an upwardly-extending shaft 149, which shaft is journaled in suitable bearings 150 and 151. This shaft is provided with a hand-wheel 152, preferably located close to the corresponding press mechanism. In the drawings this shaft is shown extending up through the floor of the press room and the hand wheel is closely adjacent to the printing cylinders. Thus the pressman can very nicely and accurately register or position the supply roll while watching the run of the web through the printing couples.

The application of the hereinbefore described features of the invention to one type of press is diagrammatically shown in Fig. 6. In this figure a plurality of one deck high perfecting printing mechanisms P, P′ are shown set on the floor of the press room with a common folder set between the mechanisms. Each printing mechanism has two printing couples, each comprising an impression cylinder *i* and form cylinder *f*, and an inking mechanism *c*.

In Fig. 6 only one printing mechanism is shown at either side of the folder F, but it will be understood that additional printing mechanisms may be similarly arranged. Thus the entire printing and folding mechanisms are within easy reach of the pressman standing on the floor of the press room.

The web supply is on the floor beneath, and is shown with a pair of supply rolls 1 and 1^a for each printing couple, these two rolls and the speed and register controlling means therefor are shown side by side and closely adjacent. Fig. 6 is largely diagrammatic and most of the details are omitted, and the figure is to be read in the light of the other figures of the drawings.

In accordance with one feature of the invention, means for furnishing new web rolls are provided comprising a suitable carrier, such as a wheeled truck 158. This will run on the floor 159 or upon a track therefor, bringing in the new supply roll 1^b endwise between, and closely adjacent to, two of the supporting and regulating mechanisms for the live web rolls. The press side frames are provided with trackways or guideways 160, by which the new web roll 1^b may be rolled from the truck 158, either to the right or to the left, into position upon either of the mechanisms which may need replenishing.

In case of a break in the web, or the sudden stopping of the press, the tension upon the web is released and roller 78 would run down to the bottom of the track, thereby suddenly and forcefully increasing the tension on the shaft of the web roll, and would prevent the roll from running ahead or unwinding. Usually when a web of paper breaks in the press, the roll will unwind often hundreds of feet of paper, which frequently fouls with other rolls or webs, causing other breaks in the various webs. Frequently the same trouble is experienced when the press is stopped suddenly, even though the web is not broken.

From all the foregoing it will be understood that a mechanism has been provided constituting an exemplary embodiment of the invention, and realizing the objects and advantages herein set forth, together with other objects and advantages. It will be understood further that departures may be made from the exact mechanism as shown and described, within the scope of the accompanying claims, without departing from the principles of the invention and without sacrificing its chief advantages.

What I claim is:—

1. A web feeding and controlling mechanism for a printing press having a series of printing units and a folder including in com-

bination a web supply roll, a spring actuated brake on the roll, means coacting with the web for controlling the brake spring pressure to maintain uniform the desired web tension through the press and means on the folder for varying the spring pressure independently of the operation of the first mentioned means transmitted to the brake whereby a workman while observing the operation of the folder can vary the web tension.

2. A web feeding and controlling mechanism for printing press having a series of printing units and a folder including in combination, means for rotatably supporting a pair of web rolls, a roller coacting with the web and movable by the tension of the web, a brake for each web roll mechanically connected with the roller and instantly responsive to movements of the roller and means on the press and acting on the brakes independently of the roller for controlling the tension of the web, whereby a workman while observing the operation of the folder can vary the tension of the web.

3. A web feeding and controlling mechanism for a printing press having a series of printing units and a folder including in combination, means for rotatably supporting a web roll, a roller coacting with the web and movable by the tension of the web, a brake for tensioning the web and controlled by the roller to maintain the tension of the web constant, and means on the the press and acting on the brakes independently of the roller for controlling the tension of the web, whereby a workman while observing the operation of the folder can vary the tension of the web while continuing control of the web by the roller.

In testimony whereof, I have signed my name to this specification.

MARTIN W. BRUESHABER.