July 25, 1961 J. ROHRER 2,993,439

MEANS FOR RELEASING AND RESETTING THE PRINTING PRESSURE IN PRINTING PRESSES

Filed May 31, 1960 2 Sheets-Sheet 1

Fig. 3

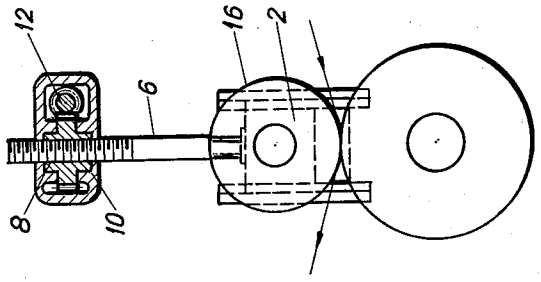


Fig. 1

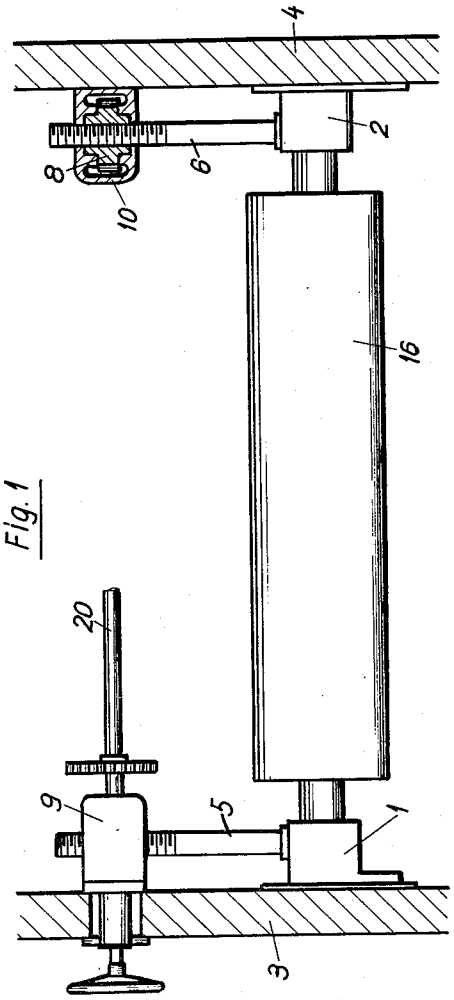
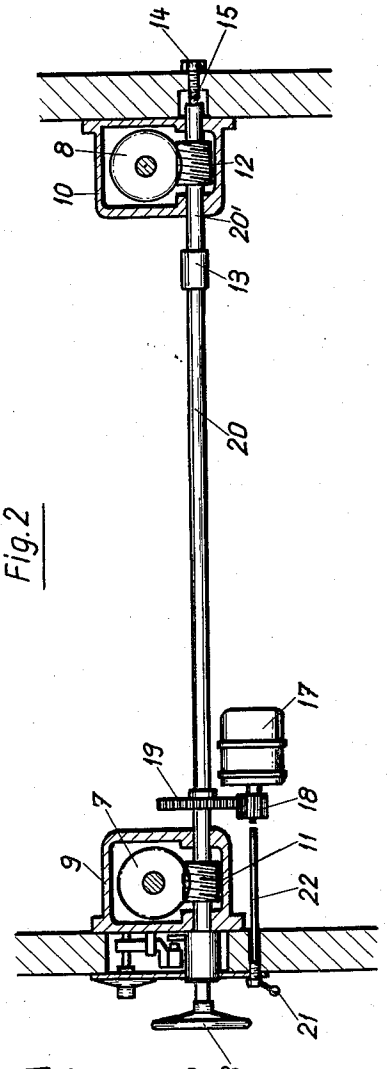


Fig. 2



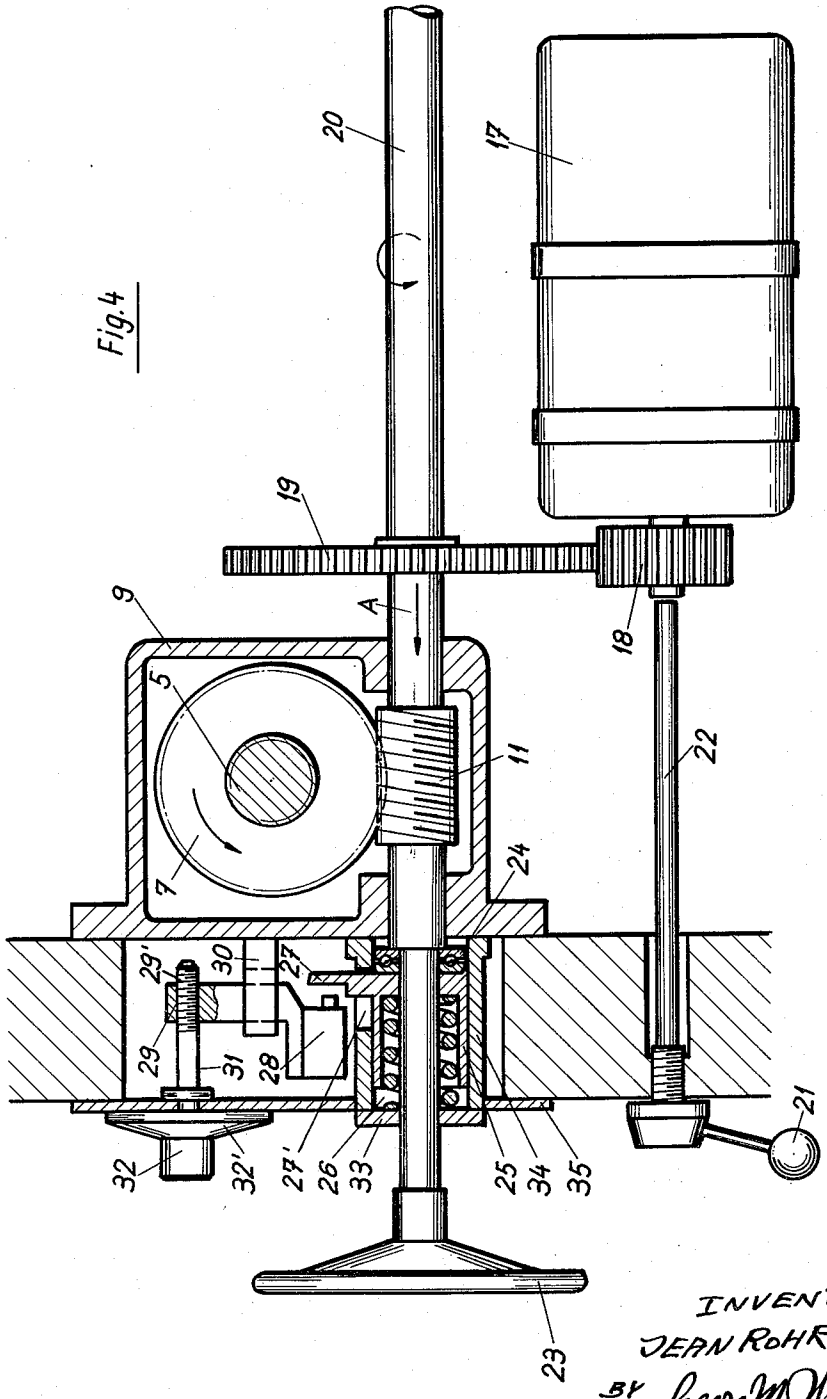
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MEANS FOR RELEASING AND RESETTING THE PRINTING PRESSURE IN PRINTING PRESSES

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Fig. 4



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MEANS FOR RELEASING AND RESETTING THE PRINTING PRESSURE IN PRINTING PRESSES

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4 Claims. (Cl. 101—247)

This invention relates to devices for applying printing pressure, in particular, in rotary printing presses, especially rotogravure presses, and concerns devices for releasing and resetting said printing pressure and also for presetting a desired printing pressure.

It always has been considered to be necessary to employ in a rotogravure printing press a pressure setting device which may be adjusted to a certain printing pressure.

However, it was not possible heretofore, neither by mechanical, electrical, hydraulic nor pneumatic means, to release this pressure, for example, when the printing cylinder is changed from one size to another, and to release again precisely the same preset pressure automatically, when the printing is continued, without requiring the necessity of re-adjusting the pressure device.

This invention contemplates therefore comparatively simple means, to return always precisely to the same preset printing pressure independent of the printing cylinder size.

It is another object of this invention to provide means instrumental to rapidly and accurately presetting the pressure device in printing presses, particularly in rotogravure presses, to maintain a certain printing pressure.

Another object of the invention is to provide means affording the employment of contrivances for automatically resetting the pressure device to a preset printing pressure after said pressure had been released in the course of a printing cylinder change or for any other necessary press operation.

A further object of this invention is to provide means facilitating setting and automatically resetting a certain printing pressure by means of simple, reliable, precise manipulations and instrumentalities which require but little space.

The invention, therefore, consists of such novel features, arrangements and combinations of parts as may be shown and described in connection with the device herein disclosed, by way of example only, and as illustrative of a preferred embodiment.

Various further and more specific objects and advantages will clearly appear from the detailed description given below, taken in connection with the accompanying drawings which form part of the specification and illustrate merely by way of example one preferred embodiment of the invention.

Like reference characters denote like parts in the several figures of the attached drawings, in which—

FIG. 1 shows a pressure roller and a pressure device, partly in section of a rotogravure press embodying the invention;

FIG. 2 is a top plan view of the device of FIG. 1;

FIG. 3 is a side view of the pressure device of FIG. 1, partly in section; and

FIG. 4 is an enlarged detailed section of the pressure device, seen in FIG. 2.

Referring now in more detail to the drawings illustrating a preferred embodiment by which the invention may be realized, there is disclosed in FIG. 1 a pressure roller 16 of a conventional rotogravure printing press, which is rotatably arranged in bearings 1 and 2, which can be slidably lifted and lowered along the side frames 3 and 4 of said rotogravure printing press.

These bearings are suspended on strong screw spindles

5 and 6 which can be moved upwardly and downwardly by heavy worm gears 7 and 8 which may also be helical gears engaged by worms or helical gears, respectively, 11 and 12. The worms or helical gears 11 and 12 and the worm gears 7, 8, respectively, are journalled and enclosed in housings 9 and 10, which in turn, are secured on the inside of the side frames 3 and 4 of the printing press. The worms or helical gears 11, 12 form part of shaft sections 20 and 20' which are interconnected by a coupling 13. On one side of the printing press (on side frame 4) the shaft 20' is axially positioned by an adjustable stop consisting of a screw 14 and of a ball or thrust bearing support 15.

By this screw 14 and axial support 15 an abutment for lifting of the printing cylinder 16 and for adjusting a minimum printing pressure can be set. On the other side of the printing press (on side frame 3) there is disclosed a handwheel 23 attached to the shaft 20. The mechanism for releasing and resetting the printing pressure by lifting and lowering the pressure roller 16 is driven by an electric motor 17 having an internal brake (not shown) and by means of a spur gear 19 which is attached to the shaft section 20 and by a pinion 18 which is mounted on the shaft of motor 17 and which engages said spur gear 19.

Opposite the pinion 18 extends a threaded spindle 22, located in the frame 3 and having a locking lever 21 screwed thereon. By operating said locking lever 21 axial pressure can be exerted on the shaft of the motor 17, whereby the brake inside said motor 17 is controlled or released so that the printing pressure can be adjusted and preset by means of the handwheel 23.

As is shown in FIG. 4, the mechanism for setting and precisely resetting the printing pressure after release is composed of an axial ball bearing 24 on the shaft 20 and a support bushing 25 in which a compression spring 26 is located.

The spring 26 abuts on one side against the end or bottom of bushing 25 and on the other side against a cover plate 33 which is secured to a housing 34 in which the bushing 25 is slidably received. The bushing 25 has a transverse extension arm 27 which protrudes through an opening or slot 27' in the wall of housing 34.

A bracket 30 is attached to the wall of the gear housing 9 and in this bracket a support bar 29 is slidably arranged. Support bar 29 mounts a limit switch 28 in such way that the protruding arm 27 can operate same, when the shaft 20 and all parts operatively connected to or mounted on it are shifted axially. The support bar 29 has a threaded aperture or hole 29' into which a threaded rod 31 is threadedly engaged. This threaded rod 31 extends through a cover plate 35, is mounted thereon and carries outside said cover plate 35 a hand knob 32 which cooperates with an indicating dial 32' on the cover plate. Spring 26 may be replaced by any other resilient means, such as hydraulic or pneumatic apparatus. The spring may also be replaced by any other suitable elastic or resilient abutment means to be precisely regulated or adjusted and fulfilling the axial displacement or shifting of the shaft.

The operation of the aforementioned device is as follows: The desired printing pressure is set upon releasing the brake inside the motor 17 by operating the lever 21 via rod 22, and by rotating the handwheel 23, whereby the shaft sections 20, 20' are axially shifted against the spring 26 (see arrow A), thus tensioning same corresponding to the axial thrust from the worms 11, 12. Hereafter, by turning knob 32 and screw rod 31, the limit switch 28 is set for action by protruding arm 27.

If now the motor 17 is set in motion for rotating the shaft 20, 20' and therewith the worms 11 and 12, the threaded spindles 5 and 6 are

screwed downwardly by worm and worm gear or nuts 7 and 8. Obviously, there will be an increasing axial thrust from the worms 11 and 12 in the direction of the arrow A on shaft 20 (FIG. 4), corresponding to the increasing pressure exerted by the spindles 5 and 6 on the pressure roller 16 (FIG. 1). This axial thrust shifts the shaft assembly 20, 21 against the spring 26 by means of the spring-biased bushing 25 and the axial bearing 24, until eventually the extending arm 27 abuts against and operates limit switch 28 and switches the motor 17 off.

It can be readily understood that always the same end pressure, the control of which has been set by positioning the limit switch 28 at 32, 32' is reached, when after a printing pressure release for any reason concerning the printing operation, the printing pressure again is reset by merely operating the motor 17.

It can thus be seen that there has been provided according to the invention a release mechanism for printing presses and the like characterized by an axially shiftable worm shaft, means for driving said shaft, adjustable stop means for limiting the axial shifting movement of said shaft in one direction, an axial thrust bearing on said shaft, a spring-biased bushing circumposed about said shaft, said spring-biased bushing abutting against said axial thrust bearing and being provided with a protruding arm, a support including a limit switch attached thereto, said limit switch being operated by said protruding arm, said support bar having a threaded aperture, a threaded rod engaging said aperture, and a hand knob on said rod for rotating the latter and axially displacing said support and said limit switch mounted thereon relative to said arm.

While the invention has been described and illustrated with respect to a certain particular preferred example which gives satisfactory results, it will be understood by those skilled in the art after understanding the principle of the invention, that various other changes and modifications may be made without departing from the spirit and scope of the invention and it is intended therefore in the appended claims to cover all such changes and modifications.

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

1. In a rotogravure printing press having a pressure roller and screw spindles operated by worm and worm gear drive means for moving said pressure roller in up- and downward position; a printing pressure release and resetting device comprising an axially shiftable worm shaft, means for driving said shaft, adjustable stop means for limiting the axial shifting movement of said shaft in one direction, an axial thrust bearing on said shaft, a spring-biased bushing circumposed about said shaft, said spring-biased bushing abutting against said axial thrust bearing and being provided with a protruding arm, a support including a limit switch attached thereto, said limit switch being operated by said protruding arm, said support bar having a threaded aperture, a threaded rod engaging said aperture, and a hand knob on said rod for rotating the latter and axially displacing said support and said limit switch mounted thereon relative to said arm.

2. In a rotogravure printing press having a pressure roller and screw spindles operated by internally threaded helical gears for moving said pressure roller in up- and downward directions; printing pressure releasing and resetting means comprising an axially shiftable shaft, internally threaded gear means, gear means mounted on said shaft and meshing with said internally theaded gear means, means for driving said shaft, adjustable stop means for defining the axial shifting movement of said shaft in one direction, an axial thrust bearing on said shaft, axially resilient thrust means arranged on said shaft, actuating means on said resilient thrust means, hand-operated positioning means, and limit switch means operable by said positioning means, said limit switch means being operated by said actuating means on said resilient thrust means of said shaft.

3. In a rotogravure printing press according to claim 2, said axially resilient thrust means being in the form of a spring.

4. In a rotogravure printing press according to claim 2, said axially resilient thrust means comprising elastic abutment means.

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