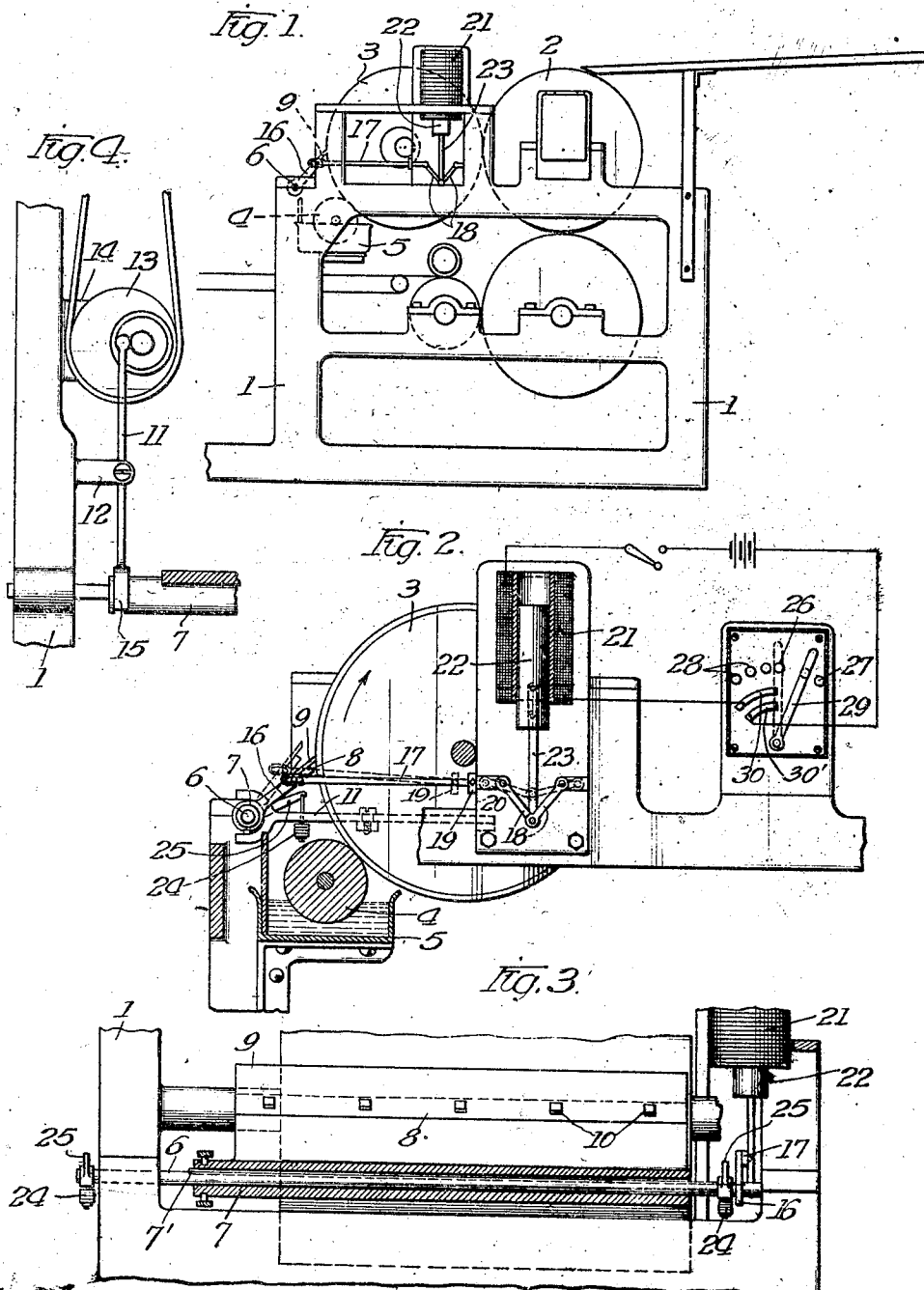


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 AUTOMATIC SCRAPER CONTROL FOR ROTOGRAVURE PRINTING PRESSES.
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UNITED STATES PATENT OFFICE.

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AUTOMATIC SCRAPER CONTROL FOR ROTOGRAVURE PRINTING-PRESSES.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, JOHN C. YETTER, citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Automatic Scraper Control for Rotogravure Printing-Presses; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to improvements in so-called rotogravure printing presses. In this character of presses the printing is done by a copper cylinder, the face of which is engraved or etched, so that all of the outermost face portions of the illustration on the face of the cylinder are perfectly smooth, and are intended and adapted to be entirely devoid of ink, the latter being contained in the etched out or recessed portions and being thus applied to the paper in varying depths to reproduce the pictorial illustrations. The printing ink, which is relatively fluent, is fed to this cylinder by means of a printing roller in relatively large quantities and the surplus is then scraped off by means of a steel scraper knife having a very sharp edge disposed parallel with the axis of rotation of the cylinder and which is reciprocated in the direction of said axis. The purpose of this scraper is to remove all the ink from the outermost surfaces of the etched surface of the copper cylinder. In the operation of these presses it becomes necessary sometimes to reverse the direction of rotation of the said copper cylinder and, unless care is exercised to first throw the said scraper knife out of engagement with the surface of the cylinder, the slightest reverse movement of the latter will cause the sharp edge of the steel knife to dig into and score the surface of the cylinder and thus render the latter unfit for further use. The reverse movement spoken of may be occasioned by the fact that a sheet is not properly fed to the press, or the cylinder may be rotated backward in adjusting the press preparatory to operation, or the press may be accidentally started in the wrong direction. As this reverse movement frequently occurs, the object of my present invention is to provide means for automatically throwing the scraper knife out of engagement with the copper cylinder as soon as the press is stopped, and maintaining it

out of engagement therewith during reverse movement. While various kinds of power may be utilized for automatically lifting the knife I have preferred to illustrate a form of my invention in which I make use of electricity for such purpose.

In the accompanying drawings illustrating a suitable embodiment of the invention: Figure —1— is a fragmentary view in side elevation of a rotogravure printing press equipped with automatic scraper knife actuating means constructed in accordance with my invention. Fig. —2— is a fragmentary detail vertical longitudinal sectional view showing the scraper knife actuating mechanism and the electric circuit controlling the same. Fig. —3— is a fragmentary detail view in end elevation showing the mechanism for reciprocating the said scraper knife. Fig. —4— is a fragmentary detail plan view showing the said means for reciprocating the scraper knife.

In said drawings the frame 1 of the printing press is shown as carrying the impression roll 2, the copper printing roll 3, a drier roll 30, a pair of delivery rolls 31 and 32 and a delivery belt 33, but as such parts constitute no part of the present invention, they will, therefore, not be herein specifically described, such mechanism, however, being fully described and illustrated in my copending application for patent filed December 20, 1915, Serial No. 67,886. Associated with the said printing roll 3 is an inking roll 4 which projects into a pan or vat 5 adapted to contain the printing ink which is carried upward by the inking roll and applied to the surface of the printing roll. Mounted on a rock-shaft 6 journaled in bearings on the frame of the machine, is the hub 7 of a scraper knife supporting plate 8 to which the scraper knife 9 is removably secured by means of the set screws 10. The said hub 7 is keyed upon the shaft 6 by the key 7' and is adapted to be reciprocated on the shaft 6 and is oscillated with the latter. The reciprocatory movement is imparted to said hub 7 by means of the lever 11 pivotally secured between its ends to the projection 12 on the frame of the machine and which is at one end, equipped with an anti-friction roller engaging in the eccentric cam-groove in one face of a horizontally disposed disk 13 mounted on a projection 14 on a horizontal rail of the frame of the machine. The said lever is adapted to be rocked, a will be

obvious, and is equipped in its other forked end 15 with anti-friction rollers engaging in an annular groove in one end of the hub 7 of the knife-support, thus imparting to the latter a reciprocatory movement in a direction parallel to the axis of rotation of the printing roll 3. The shaft 6 is adapted, as aforesaid, to be rocked in its bearings, the hub 7 being keyed thereon. Said shaft is provided at one end with an arm 16 extending parallel with and in alinement with the said knife blade carrier 8. Said arm 16 is pivotally and slidably connected with one end of a plunger having a longitudinal slot in said end in which a crank-pin at the end of the arm 16 engages. The said plunger 17 is pivotally connected at its other end with one end of one of a pair of toggle levers 18 pivotally connected with each other, and the other ends of which have a limited sliding pivotal connection with the frame of the machine. On said plunger 17 is a collar 19 which is adapted to engage one end of the guide 20 for said plunger to limit the movement of the latter in one direction. Disposed above the said toggle levers is a solenoid 21 to the reciprocable armature 22 of which one end of a connecting-rod 23 is pivotally secured, the other end of said rod being pivotally connected with the toggle levers at their point of pivotal connection with each other.

The weight of the armature serves to normally maintain the toggle levers in the position shown in full lines in Figs. —1— and —2—, but does not act to hold the edge of the knife 10 in contact with the surface of the cylinder 3. Upon closing the electric circuit through the solenoid, the said armature will be raised, thus causing a relative movement of the toggle levers to throw them into the position shown in dotted lines in Fig. —2—, thereby moving the plunger connected with the arm 16 outwardly and rocking said shaft 6, thereby throwing the knife edge out of contact with the face of the cylinder 3. It will be noted that the initial outward movement of the plunger 17 is free and does not impart motion to the arm 16 until the end of the slot in said plunger engages the pin of said arm, the purpose of this being to avoid interference with the action of weights 24 suspended from arms 25 at the ends of the shaft 6 which serve to hold the knife edge normally in contact with the cylinder surface with a uniform pressure.

The circuit through the electro-magnet is auxiliary to the circuit controlling the motor driving the press. The last-named circuit, which is not illustrated herein, is controlled by the switch having a plurality of contact points 26, 27 and 28, the contact point 26 being a dead point which, when engaged by the switch lever 29, shuts off the circuit through the motor, thus stopping

the press. The contact points 27 control the forward movement of the press at several different speeds, while the contact points 28 control the reverse movement of the press at various speeds. Associated with the said lever 29 are two electric contact-strips 30 and 30' constituting respective terminals of the circuit through the solenoid. These contact strips are so disposed that when the lever is positioned to engage the contact point 26 to stop the motor, the circuit through the solenoid will be closed, thereby causing the scraper knife to be thrown out of engagement with the surface of the printing cylinder, and is further so arranged that said circuit will remain closed during the movement of the switch lever 29 in a direction to effect a reverse movement of the press. Said strip is further so arranged that the moment the switch lever 29 is moved to contact with the first of the contact points 27 the circuit through the solenoid will be opened, thus permitting the armature to drop and thereby throwing the knife into contact with the surface of the cylinder.

The current for the solenoid circuit above described may be the same as that controlling the motor, or it may be an independent source such as a battery circuit.

It will be understood, of course, that the embodiment illustrated in the drawings and above described, is merely the preferred embodiment of the invention. The latter resides broadly in the provision of means for automatically throwing the scraper knife out of engagement with the surface of the printing roll prior to the beginning of any reverse movement of the latter, thus preventing the scoring or injury to the printing roll which would result from the knife edge cutting into the latter by reversing said printing roll while said knife is engaged with the surface thereof. Hence, while the drawings show an electrically actuated press and knife throw mechanism, the switch-lever 29 may be regarded merely as a hand-lever controlling the movements of the press and which is common to the reversing gear and the knife, regardless of the nature of the press-drive.

I claim as my invention:—

1. In a printing press equipped with a printing cylinder, means for applying ink to the cylinder surface, and a scraper for removing surplus ink from the cylinder surface, a manually operable part controlling the forward and reverse movements of the press, and operative connection between the said manually operable part and said scraper for automatically throwing the latter out of engaging relation to the cylinder surface before said manually operable part attains a position adapted to cause reverse movement of the press.

2. In a power actuated printing press

adapted to be reversed and equipped with a printing cylinder, means for feeding ink thereto, and a scraper for removing surplus ink therefrom, a manually operable lever controlling the movements of the press; and means controlled by said lever for automatically throwing the scraper out of contact with the printing cylinder before said lever attains a position adapted to cause reverse movement of the press and for maintaining said scraper in engagement with said cylinder during manual rotation of the latter.

3. In a printing press equipped with a

rotatable printing cylinder, means for feeding ink thereto, and a scraper for removing surplus ink therefrom, and means for lifting said scraper free of the cylinder, and controlling means for causing the lifting means to operate in advance of any reverse rotation of the printing cylinder.

In testimony whereof I have signed my name in presence of two subscribing witnesses.

JOHN C. YETTER.

Witnesses:

M. M. BOYLE,

G. M. WALKER, Jr.