

May 3, 1932.

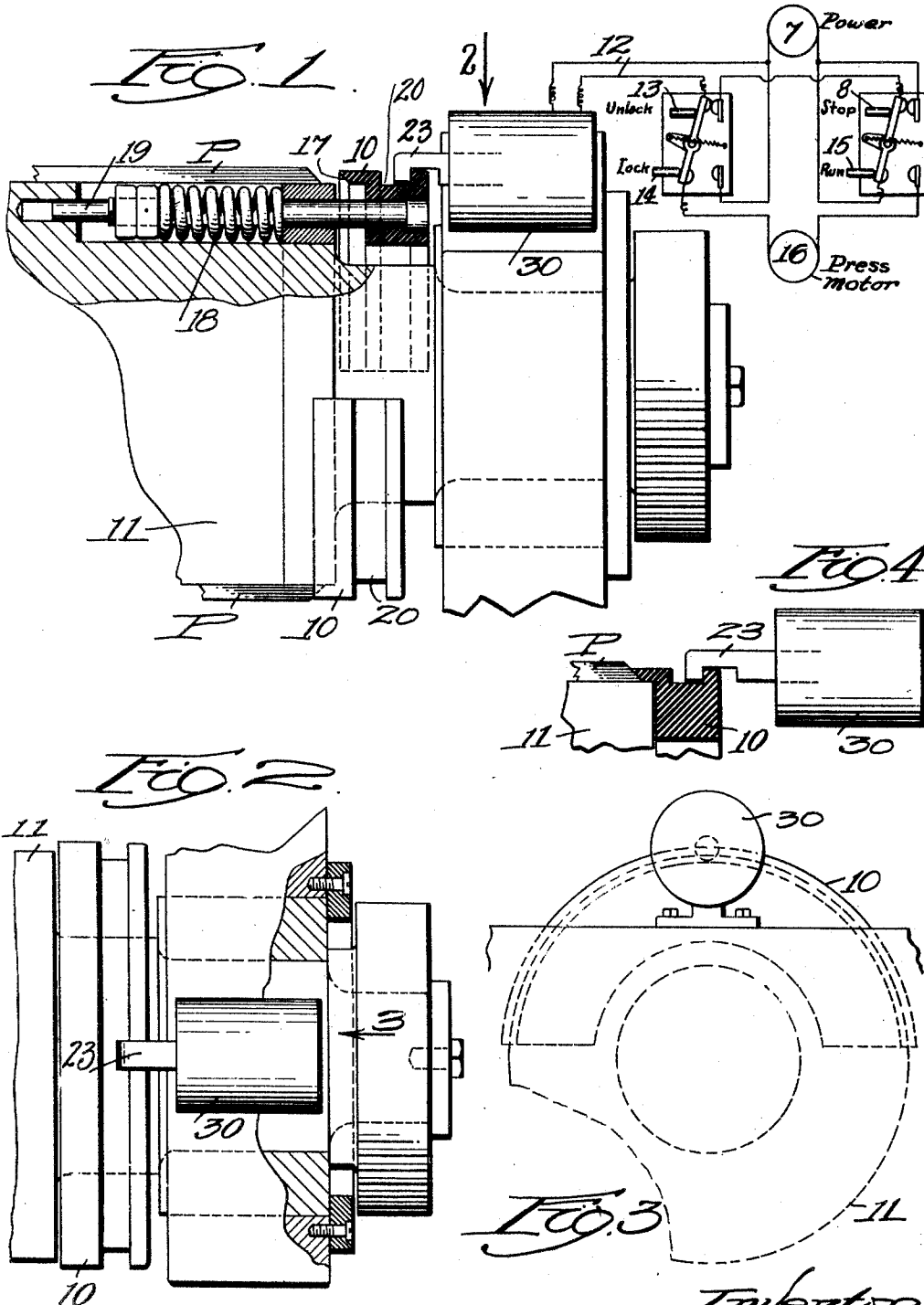
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1,856,162

POWER PLATE LOCKUP

Original Filed Feb. 24, 1927

2 Sheets-Sheet 1



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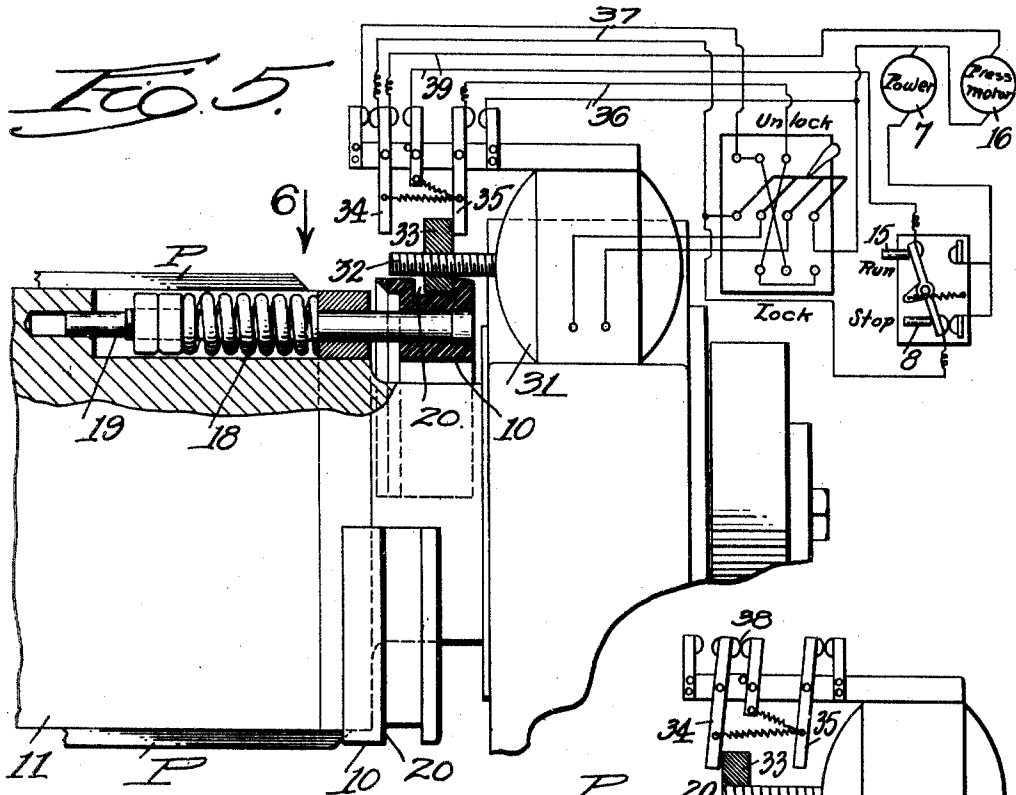
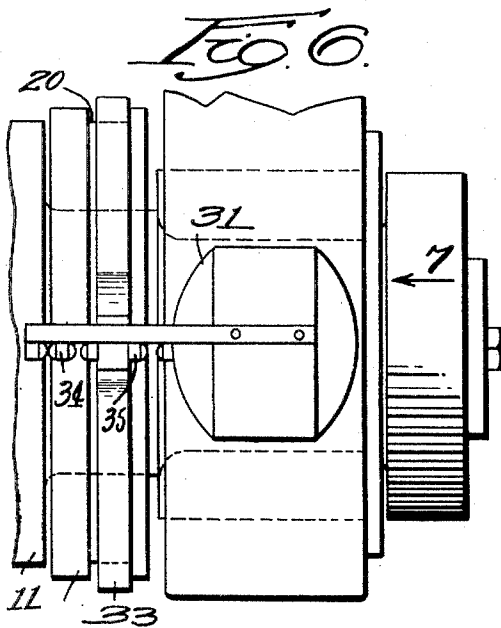
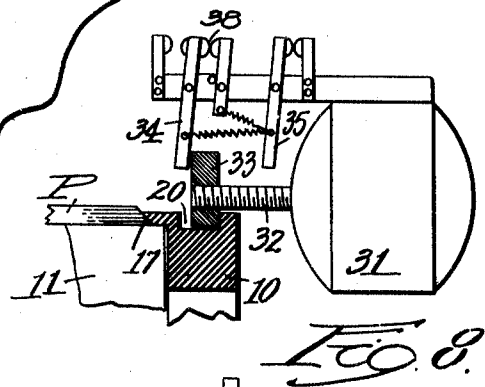
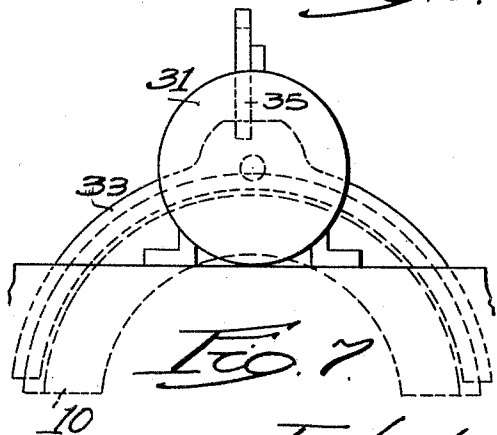
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POWER PLATE LOCKUP

Original Filed Feb. 24, 1927

2 Sheets-Sheet 2



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POWER PLATE LOCKUP

Application filed February 24, 1927, Serial No. 170,458. Renewed March 8, 1930.

This invention relates to means for furnishing power for locking the plates on the cylinders of printing presses.

The invention has a certain relation to two applications of Henry A. Wise Wood, Serial No. 95,333, filed March 17, 1926, and Serial No. 120,097, filed July 2, 1926. In those cases the locking means for the plates were operated by the rotation of the plate cylinder itself. In this case substantially the same locking means can be employed, but they are operated by an electric or mechanical means while the cylinder is stationary and independently of the cylinder.

The invention also involves the provision of safety devices for preventing the unlocking of the plates at any time except when the press is stopped, this being connected with the stop push button, and for preventing the starting of the press when any plate is unlocked.

Other objects and advantages of the invention will appear hereinafter.

Reference is to be had to the accompanying drawings, in which

Fig. 1 is a side view of a plate cylinder, partly in central section, showing the application of a preferred embodiment of this invention thereto and showing the plate locked on one side and unlocked on the other;

Fig. 2 is a plan of the same;

Fig. 3 is an end view taken outside the frame and showing most of the features, therefore, in dotted lines;

Fig. 4 is a sectional view like part of Fig. 1, showing the plate locked;

Fig. 5 is a view similar to Fig. 1, showing a modified form of the invention;

Fig. 6 is a plan of the same;

Fig. 7 is an end view; and

Fig. 8 is a sectional view similar to part of Fig. 1, showing the device in position for locking the plate.

I have shown the invention in a form in which the cylinder 11 receives the several printing plates P, and they are locked by two semi-cylindrical locking rings 10 at each end. Each of the locking rings 10 extends half way around the cylinder and locks half the plates at that end of the cylinder, and the

four rings on each cylinder, of course, lock all the plates thereon. In the form shown, the locking ring 10 has a bevelled edge 17 which engages the bevelled edge of the plate P and holds the plate on the cylinder as is well understood. The actual force which holds the plate is supplied by a plurality of springs 18 on guide rods 19 extending longitudinally of the cylinder and having their heads inserted in recesses in the ring 10, so that this ring is normally held by the springs with sufficient force to clamp the plates firmly in position. I employ yielding force for this purpose so that the ring can be pulled back to release the plates and so that, when the means for pulling the plate back is out of operative connection with the ring 10, the springs will quickly and automatically draw the ring back into the locking position as is indicated by comparison of Figs. 4 and 1.

In the operation of the device, the rings 10 are operated upon by a hook or plunger 23 which is a part of a solenoid 30 for operating the lock. The solenoid is connected up with an operating circuit 12 which is connected with a generator 7 and adapted to be closed at two points by a stop push button 8 and an unlock push button 13. It will be obvious that when the circuit in the solenoid is energized the hook 23 will be drawn back and the plate lock 10 drawn back as shown in Fig. 1. It will be observed that this can occur only when the stop push button is closed and the unlock push button is closed. If either one is open the circuit is broken.

The unlock push button is located on a lever, at the other end of which is a lock push button 14, which, of course, opens its circuit when the parts are in the position shown in Fig. 1. Also the stop push button 8 is on a similar lever which has at the other end a starting or running push button 15. These two push buttons 14 and 15 open a circuit which connects the generator 7 with the press motor 16 and when either one of them is open, this motor cannot operate and the press cannot run. It is necessary to have the plates locked by pushing in the button 14 and to have the run button 15 pushed in in order that the press can start and operate. When

either one of these buttons is pressed, the circuit 12 is broken and the power for the hook 23 is gone, so that the springs 18 can pull in the plate lock 10 and lock the plate as shown in Fig. 4.

This provides the necessary safety features between the running and the unlocking circuits, so that the plate cannot be unlocked while the press is running. Also the press cannot be started or run when the plates are unlocked.

On the second sheet of drawings, I have shown an arrangement which is substantially the same as that shown in the first four figures, except that the motive power is supplied by an electric motor 31 having a shaft provided with a screw-threaded extension 32 on which is a nut 33 which is of non-circular form and fits into the groove 20 in the plate clamp 10.

The motor is reversible by the circuits indicated, and the rotation of the motor causes the nut to travel in one way or the other along the shaft of the motor. This nut, being in the groove 20, will move the plate clamp 10 back and forth, and when drawn back, will positively pull it out into the unlocked position indicated in Fig. 5, but when moved forward it will allow the springs 18 to draw the clamp against the plate as shown in Fig. 8.

The movement of the nut is controlled by a suitable limit switch comprising two levers 34 and 35 with the contacts on their end connected up with the circuit. In the position shown in Fig. 1, the motor has locked the plate and has been brought to a stand-still by the opening of the limit switch 35. This breaks the unlock circuit 36 to the motor in spite of the fact that the four pull-switch is connected with the unlock contact.

In Fig. 8, the motor has been reversed and the nut has come into contact with the limit switch 34, breaking the circuit 37 which has to be connected up in order to rotate the motor in that direction. In each case the motor is stopped by the nut coming into contact with the limit switch.

It will be noted that the movement of the limit switch 34 to the position shown in Fig. 8 completes a contact at 38, completing a circuit 39 which will permit the motor to be run when the run push-button 15 is pressed. In this embodiment of the invention also, there is no possibility of unlocking the plate at any time, except when the push-button 8, marked "Stop", is operated. The generator 7 and motor 16 are also employed as in the other case, of course, and they are connected up with the motor 31 in a manner similar to that described in connection with Fig. 1.

It will be seen that in both forms, the same objects are accomplished, and that the device is absolutely safe against the accidents that ordinarily might happen with a mechanical plate lock. Furthermore, it will be under-

stood that as in Mr. Wood's prior applications this invention is intended to be used with a battery of presses, and that they can be run individually or collectively as stated in said applications, with the use of this invention. The invention is not necessarily limited to electrical or magnetic operating means, but the operation is independent of the rotation of the printing cylinder.

Although I have illustrated and described only two forms of the invention, I am aware of the fact that many other modifications can be made therein by any person skilled in the art without departing from the scope of the invention as expressed in the claims. Therefore I do not wish to be limited to details of construction, but what I do claim is:—

1. In a printing press, the combination with a clamp for a printing plate and means for forcing it into clamping position, of means located beyond the plate cylinder for pulling the clamping device back to free the plate independently of the rotation of the plate cylinder.

2. In a printing press, the combination with a clamping device for a printing plate and springs for yieldingly forcing it into clamping position, of electrically controlled means for pulling the clamping device back in opposition to the springs to free the plate, an electric circuit for supplying said electrically controlled means with power, and means for interrupting said electric circuit at all times when the machine is running.

3. The combination with a printing plate cylinder and a plate thereon, of a plate clamp at the end of the cylinder having means for engaging the ends of the plates and clamping them on the cylinder, means for holding the plate clamp in clamping position, of a hook engaging said plate clamp, whereby when the hook is drawn back the plate clamp will be drawn back, and means independent of the plate cylinder for drawing the hook back.

4. The combination with a printing plate cylinder and a plate thereon, of a plate clamp at the end of the cylinder having means for engaging the end of the plate and clamping it on the cylinder and springs for holding the plate clamp in clamping position with a yielding action, of a solenoid having a plunger provided with a hook engaging said plate clamp, whereby when the solenoid is energized the hook will be withdrawn and the plate clamp drawn back in opposition to the springs, a circuit for supplying the solenoid with power, a stop and start switch, an electric motor for operating the press, a circuit for supplying the motor with power in which said stop and start switch is located in such position that when it is turned to stop the motor it will close the circuit to the solenoid and when it is turned to start the motor it will open the solenoid circuit.

5. The combination with a printing plate

cylinder and a plate thereon, of a plate clamp at the end of the cylinder having means for engaging the ends of the plate and clamping it on the cylinder and springs for holding the
5 plate clamp in clamping position with a yielding action, of an electrically operated hook engaging said plate clamp, to withdraw the clamp in opposition to the springs, a motor for operating the press, a circuit in which
10 said motor is located, a stop and start switch in said motor circuit, and a locking and unlocking switch in the motor circuit in such position that when the latter switch is turned to unlock the plates the motor circuit will be
15 left open and the press cannot be started.

6. In a printing press, the combination with a clamping device for a printing plate and springs for yieldingly forcing it into clamping position, of an electric motor connected to pull the clamping device back in
20 opposition to the springs to free the plate, an electric circuit for supplying said motor with power, and means for interrupting said electric circuit at all times when the machine is running and connecting the circuit
25 to the motor when the machine is stopped.

7. In a printing press, the combination with a printing cylinder and a plate clamp, of a reversible motor having a screw thread
30 on its shaft, a nut on the screw thread engaging the plate clamp to move it back to unclamp the plate when the motor runs in one direction and to move it forward to allow the clamp to engage the plate when the motor is
35 operated in the other direction, and means actuated by said nut for stopping the motor after it has moved the clamp in one direction or the other.

8. In a printing press, the combination
40 with a printing cylinder and a plate clamp thereon normally in position to engage a plate, of a reversible motor having a nut engaging the plate clamp to move it back to unclamp the plate when the motor runs in one
45 direction and to move it forward to allow the clamp to engage the plate when the motor is operated in the other direction, and limit stop switches actuated by said nut for stopping the motor after it has moved the clamp
50 in one direction or the other and to close the circuit so that the motor can then be started in spite of the limit stops.

In testimony whereof I have hereunto affixed my signature.

55 JOHN A. ISBELL.

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