No. 799,457. PATENTED SEPT. 12, 1905.

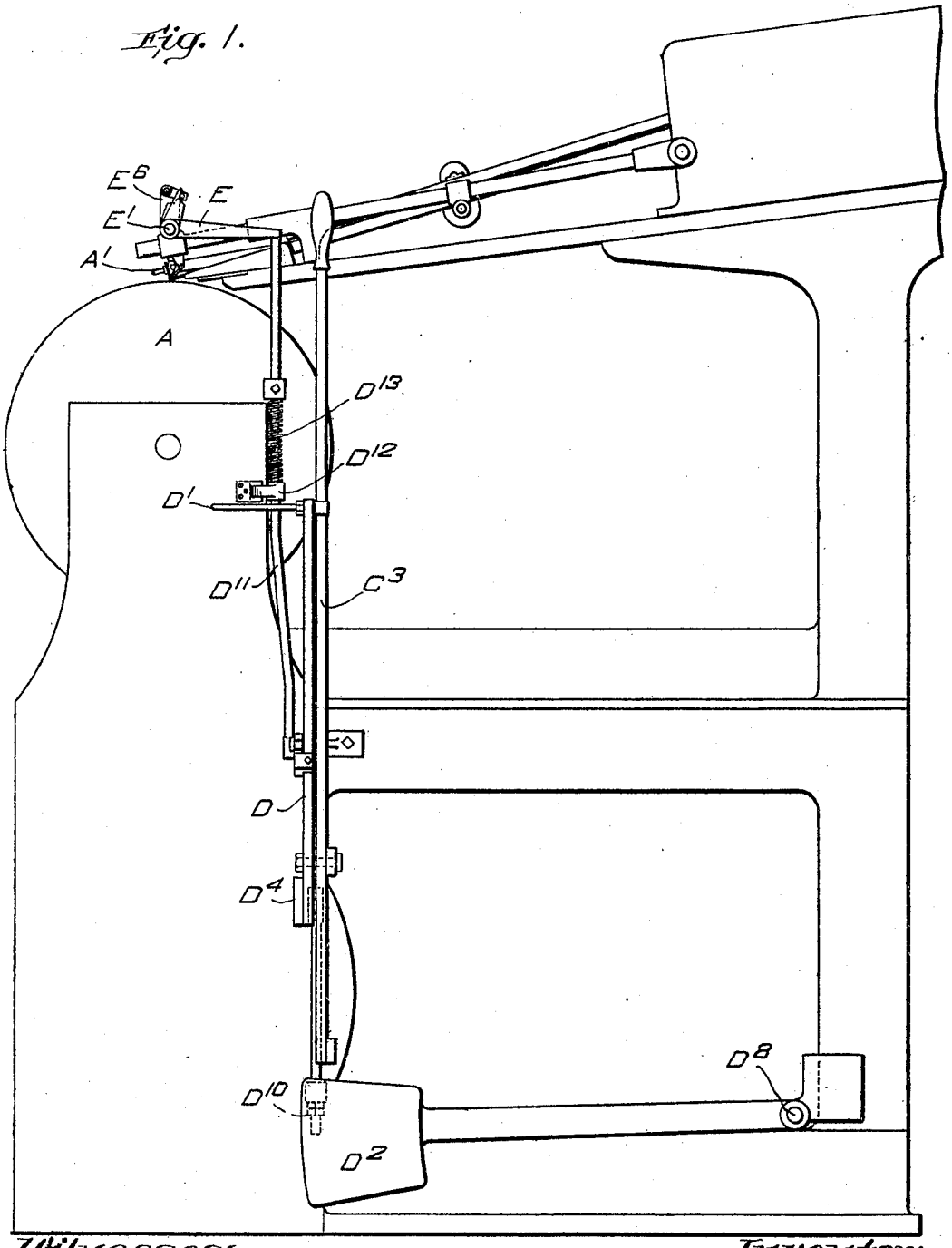
F. L. CROSS.

CONTROLLING MECHANISM FOR MACHINES ACTING ON SHEETS.

APPLICATION FILED NOV. 22, 1902.

3 SHEETS—SHEET 1.

Fig. 1.



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Katharine A. Dugan

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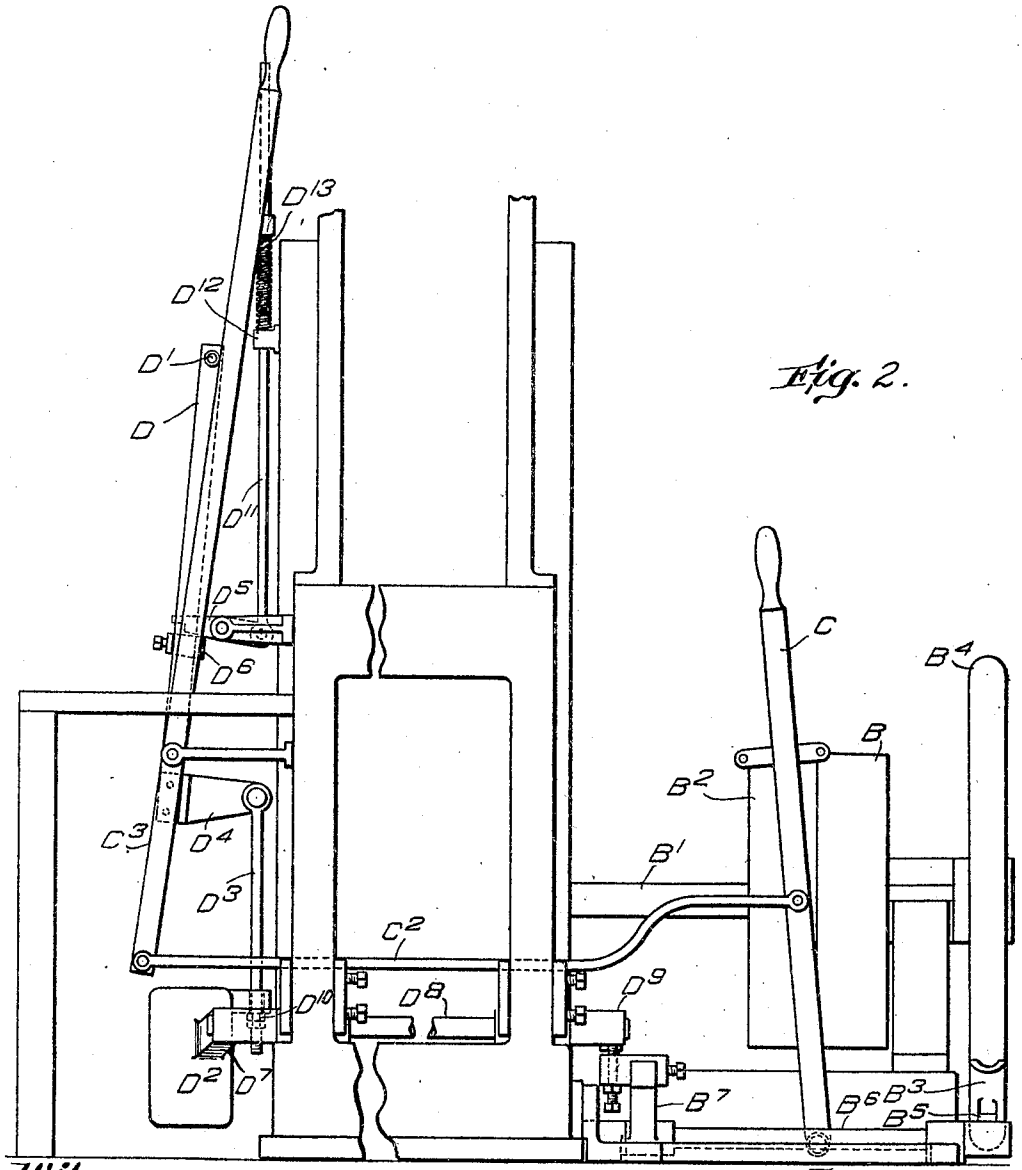


Fig. 2.

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3 SHEETS—SHEET 3.

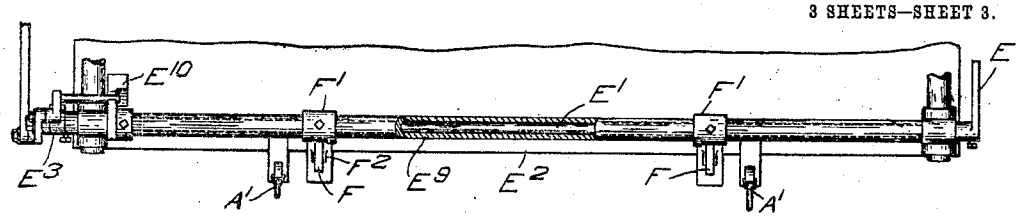


Fig. 3.

Fig. 4

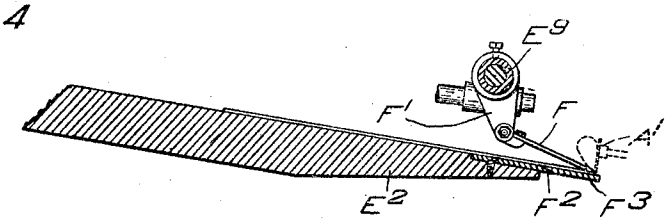


Fig. 5.

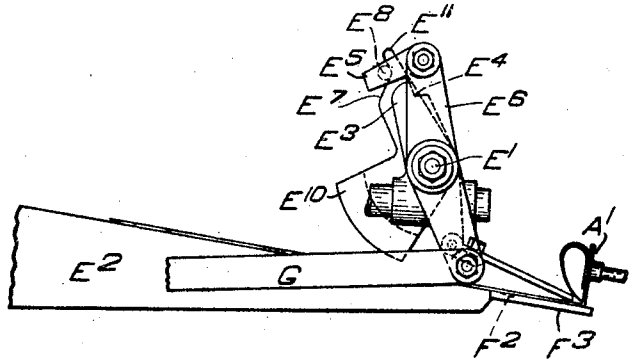
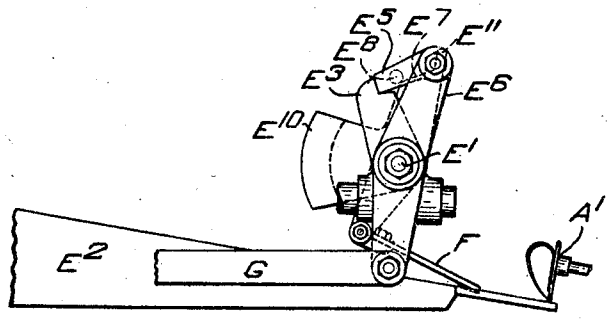


Fig. 6



Witnesses
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UNITED STATES PATENT OFFICE.

FRANK L. CROSS, OF MYSTIC, CONNECTICUT, ASSIGNOR TO CROSS PAPER FEEDER COMPANY, OF BOSTON, MASSACHUSETTS, A CORPORATION OF MAINE.

CONTROLLING MECHANISM FOR MACHINES ACTING ON SHEETS.

No. 799,457. Specification of Letters Patent. Patented Sept. 12, 1905.

Application filed November 22, 1902. Serial No. 132,392.

To all whom it may concern.

Be it known that I, FRANK L. CROSS, of Mystic, in the county of New London and State of Connecticut, have invented certain new and useful Improvements in Controlling Mechanism for Machines Acting on Sheets, of which the following is a specification.

The invention relates to mechanism for controlling machines for acting upon sheets so that the machine may be automatically stopped or thrown out of operation whenever a sheet is not fed into the proper position to be acted upon; and its object is to provide a mechanism of this character which shall be simple in construction and reliable in operation. In accomplishing this result I employ a moving controller the arrest of which renders active the mechanism which throws the machine out of operation, and provide a stop for arresting the movement of the controller so arranged that the engagement of the controller with the stop is prevented by the sheet. So long as the sheets are properly fed the movement of the controller is not arrested and the mechanism for throwing the machine out of operation is inactive; but should a sheet not be properly fed then the controller engages the stop, so that its movement is arrested, and this causes the mechanism which throws the machine out of operation to become active, thus either stopping the machine or putting it into such condition that no injury results from the failure of the sheet to be properly presented. The specific construction of the controller and of the devices whereby its arrest causes the machine to be thrown out of operation is not material so far as the broad scope of the invention is concerned. I prefer, however, to throw the machine out of operation by means of a mechanism the driving part of which is normally held out of operation by a guard which moves with said part and is connected with a controlling-finger arranged to be guided over the stop by the sheet when in proper position to be acted upon. When the sheet is not in proper position, the controlling-finger as it moves forward engages the stop and is arrested, thereby arresting the movement of the guard, so that the driving part, no longer held out of operation by the guard, operates the mechanism to throw the machine out of operation. The machine may be thrown out of operation by operating or releasing any suitable or well-known form of stop mechanism or device, as by shifting a belt or clutch or operating an electric switch.

The various features of the invention will be understood from a detailed description of the mechanism shown in the accompanying drawings, which embodies the features in the form in which I prefer to use them in connection with a printing-press.

In the drawings, Figure 1 is a side elevation of so much of a printing-press and feeder as is necessary for an understanding of the invention. Fig. 2 is an end view of the press, showing only the stop mechanism. Fig. 3 is a plan view of the front end of the feed-board. Fig. 4 is a sectional view showing the controller-finger. Fig. 5 is a side elevation showing the controlling mechanism when a sheet is properly fed, and Fig. 6 is a similar view showing the controlling mechanism when the sheet is not properly fed.

In the drawings, A indicates the impression-cylinder of a printing-press to which the sheets are successively presented by being moved into position against the front gages A′ of the press. The sheets may be either fed by hand or may be automatically fed by any suitable mechanism, and when automatically fed the feeding mechanism will be driven by suitable connections with the mechanism for operating the press, so that both the feeding mechanism and the press may be stopped by the same stop mechanism. As indicated, the press is driven by a belt, which runs over a pulley B, secured to the driving-shaft B′, and the press is stopped by shifting the belt onto a loose pulley B^2 and at the same time applying a brake B^3 to a wheel B^4, also secured to the driving-shaft. The belt is shifted from one pulley to the other by means of a belt-shifter C, pivoted at C′ and connected by means of a link C^2 with an operating-lever C^3. The belt may be shifted manually by operating the shifter C either directly or through the operating-lever C^3. The lever C^3 may be operated automatically to shift the belt from pulley B to pulley B^2 by the movement of a lever D, mounted on the same pivot with lever C^3 and provided with a pin D′, engaging one side of the lever C^3. The lever D is

rocked in a direction to operate lever C^3 by means of a weight D^2, connected by means of a rod D^3 with an arm D^4, secured to the lever D. The lever D is normally restrained by means of a latching-lever D^5, one end of which engages a plate D^6, secured to lever D. The weight D^2 is carried by an arm D^7, secured to a rock-shaft D^8, and acts to apply the brake B^3 as well as to shift the belt. The brake is carried by an arm B^5, secured to a rock-shaft B^6. The shaft B^6 carries an arm B^7, to which a block B^8 is adjustably secured, and the shaft D^8 carries an arm D^9, which engages a screw B^9, mounted in the block B^8. By adjusting the block B^8 the pressure of the brake due to the action of weight D^2 may be varied. When the lever D is held in normal position by the latch D^5, the weight D^2 is supported upon the nuts D^{10}, adjustably secured on rod D^3, and the brake is not applied to the wheel B^4. With the stopping mechanism in this position the lever C may be operated to start and stop the machine at the will of the operator. When the belt is on the pulley B, the lever C^3 is against the pin D', and the stopping mechanism may be thrown into operation and the brake applied by operating the latch D'. When the latch is operated to disengage the plate D^6, the weight D^2 swings the lever C into the position shown in the drawings, thereby throwing the driving mechanism out of operation by shifting the driving-belt onto pulley B^2. At the same time the weight rocks shaft D^8 and through the connections described applies the brake. The stopping mechanism is reset by moving the lever D to the left until the latch D^5 again engages the plate D^6 and locks the lever D in position. The latch D^5 is operated by a rod D^{11}, connected to the lever and guided in a guide D^{12}. A spring D^{13} acts to hold the rod and latch yieldingly in normal position and to return the latch into position to engage plate D^6 when the lever D is moved into position to support the weight D^2. The mechanism for depressing the rod D^{11}, and thus throwing the driving mechanism out of operation, does not act upon the rod so long as the sheets are properly fed to the front gages; but should the sheet not be in position at the proper time then this mechanism acts upon rod D^{11} and causes the stopping of the machine.

The mechanism thus far described is shown and described merely as one form of mechanism which may be operated to stop the machine to which sheets are being fed, and its special construction forms no part of the invention. This mechanism or any other form of mechanism or device which may be employed to throw the driving mechanism out of operation is automatically operated, when the sheets are not properly fed, by the devices which embody the features of my invention.

The rod D^{11} is so arranged that its upper end may be engaged by an arm E, secured to a shaft E', extending transversely above the feed board or support E^2, over which the sheets pass in coming to the front gages A'. A second arm E^3 is secured to shaft E' and is provided with a shoulder or notch E^4, arranged to be engaged by a reciprocating pawl E^5. The pawl is pivoted to a lever E^6, loosely mounted on the end of shaft E' and continuously reciprocated by means of a link G, pivoted to the lever and operated by any suitable connection with a moving part of the operating mechanism. (Not shown.) The engagement of the pawl with the shoulder E^4 is controlled by a guard E^7, arranged to engage a pin E^8 on the pawl and hold said pawl out of engagement with the shoulder. The guard is carried by a sleeve E^9, mounted on shaft E', and is caused to move with the pawl as it advances by a weight E^{10}, connected with the sleeve E^9, which holds a finger E^{11} on the guard against the pin E^8. So long as the guard moves with the pawl the pawl will reciprocate without affecting the shaft E'; but in case the advance of the guard with the pawl is arrested when the pawl is back of the shoulder E^4 then as the pawl advances the pin E^8 will move off of the guard, so that the pawl will engage the shoulder E^4 and positively rock the shaft E'. This movement of the shaft will carry arm E downward, thus causing the driving mechanism to be thrown out of operation. The movement of the guard is arrested when a sheet is not fed into proper position by means of one or more controlling-fingers F, pivoted to arms F', carried by the sleeve E^9 and arranged to engage stops F^2 in case the stops are not covered by a sheet. These stops are in the form of recesses formed in plates F^3 at the front of the feed-board and are arranged just back of the front edge of the sheet when against the front gages. When the sheets are properly fed, they lie between the controlling-finger and stops when the pawl E^5 advances and the fingers slide along the top of the sheet as the guard advances with the pawl. In case the sheet does not cover the stops when the pawl advances then as the controller slides along the plate at the front of the feed-board it enters the stopping-recess and arrests the movement of the guard, so that the pawl operates the mechanism for stopping the machine.

With this construction the stop may be formed in a thin strip of sheet metal, which will lie close to the surface of an impression-cylinder, so that the edge of the sheet is in proper relation to the cylinder to be properly and accurately seized by the gripper. The stop may also be arranged as near the front edge of the sheet as desired. There is no material strain put upon the stop or controller, since they merely support the weight E^{10}, which need be only sufficient to make the parts move with the pawl, and the mechanism for throwing the machine is positively

and surely operated by the pawl. Consequently the mechanism is accurate and reliable.

What I claim, and desire to secure by Letters Patent, is—

1. Mechanism for controlling machines operating upon sheets having in combination, mechanism for throwing the machine out of operation, a guard moving with the driving part of said mechanism, a controller connected with said guard, and a stop so arranged that the engagement of the controller therewith is prevented by the sheet, substantially as described.

2. Mechanism for controlling machines operating upon sheets having in combination, mechanism for throwing the machine out of operation including a reciprocating pawl, a guard moving with said pawl for holding it out of operation, a controlling-finger connected with said guard, and a stop arranged to be covered by the sheet when in proper position, substantially as described.

3. Mechanism for controlling machines operating upon sheets having in combination, a stop arranged to be covered by the sheet when in proper position, a reciprocating pawl, a guard for holding said pawl out of operation, a weight for causing said guard to move with the pawl, and a controller connected with said guard and arranged to engage said stop, substantially as described.

4. Mechanism for controlling machines operating upon sheets, having in combination, a stop F^2, a controller-finger F for engaging said stop, a weighted guard E^7 with which said controller is connected, a reciprocating pawl E^5 supported by said pawl, and a rock-arm E^3 with which said pawl engages when released by the guard, substantially as described.

In testimony whereof I have affixed my signature in presence of two witnesses.

FRANK L. CROSS.

Witnesses:
IRA L. FISH,
KATHARINE A. DUGAN.