

No. 854,078.

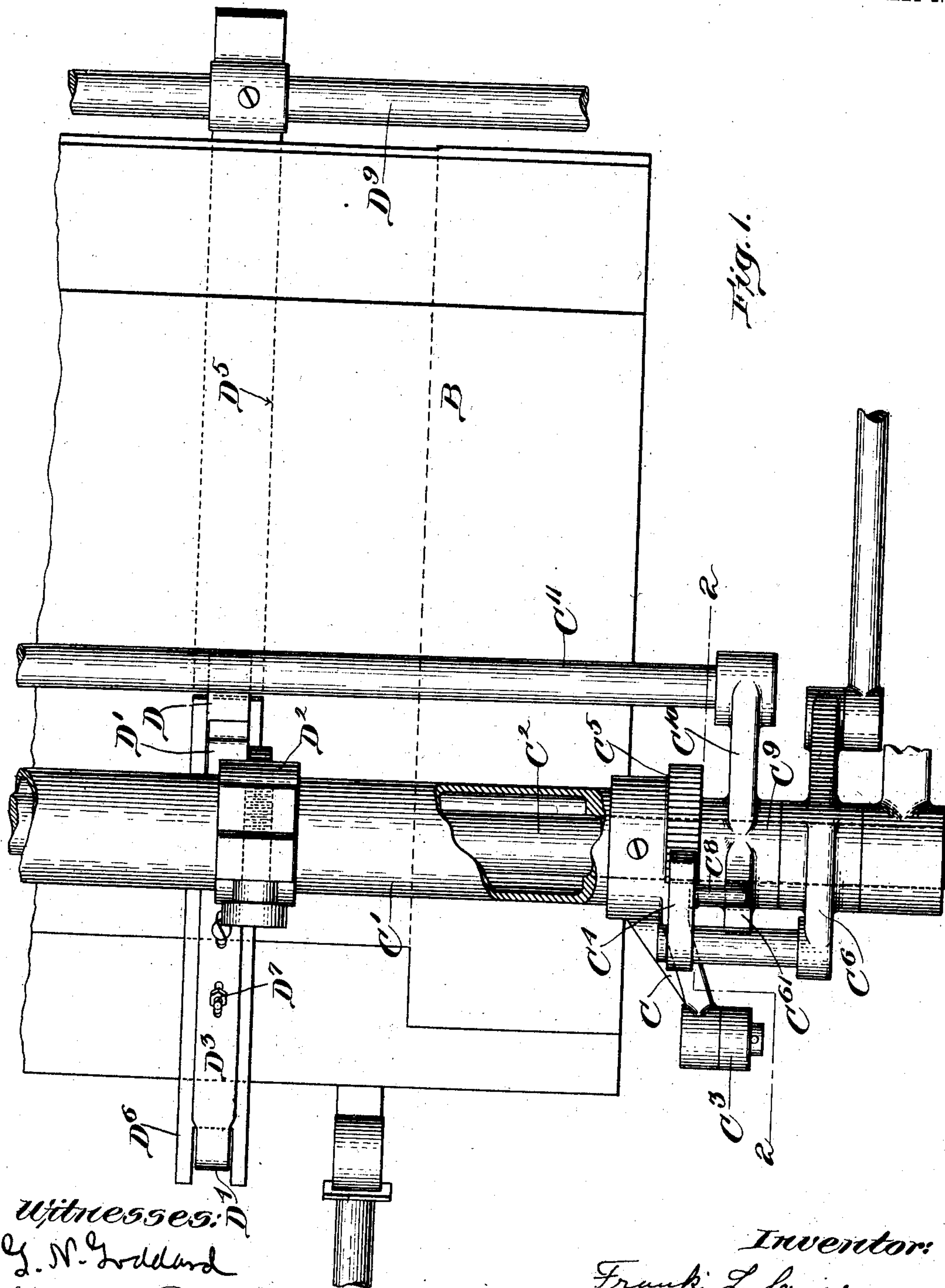
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CONTROLLING MECHANISM FOR MACHINES ACTING ON SHEETS.  
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2 SHEETS—SHEET 1.



Witnesses:  
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Katherine G. Dugan

Inventor:  
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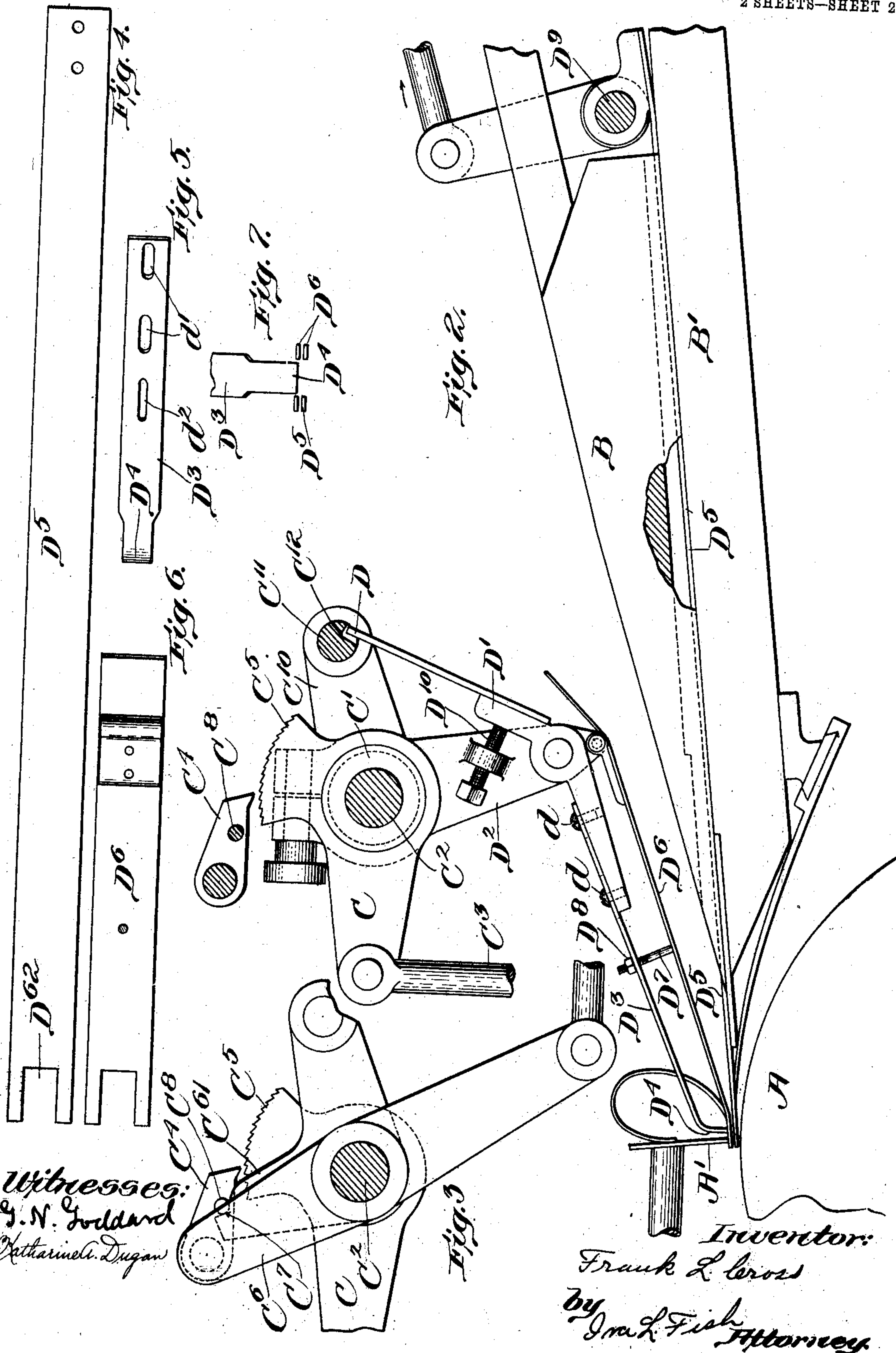
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# UNITED STATES PATENT OFFICE.

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## CONTROLLING MECHANISM FOR MACHINES ACTING ON SHEETS.

No. 854,078.

Specification of Letters Patent.

Patented May 21, 1907.

Application filed April 3, 1905. Serial No. 253,647.

*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 designed to act 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.

The object of the invention is to provide a controlling mechanism of this character which shall be simple in construction and reliable in operation and which is adapted for use in connection with printing presses to which sheets are automatically fed by sheet feeding mechanism.

In practicing my invention I control the mechanism which throws the machine out of operation through a finger arranged to one side and out of the path of the sheet. The surface of the sheet is brought against this finger and moves it out of normal position in case the sheet is properly fed into position. So long as the finger is thus moved through the movement of the sheet against it, the throw-out mechanism remains inactive. Should the sheet fail to come into proper position to be carried against the finger however, the finger would remain in normal position and in such case the throw-out mechanism will be rendered active and the machine be thrown out of operation.

In adapting my invention for use in connection with printing presses I arrange the finger above the path of the sheets and with the part which is acted upon by the sheets just back of the front edge of the sheet when the sheet is against the front gages of the printing press. When the sheet is brought into proper position with the front edge against the front gages, it is lifted by a reciprocating plate arranged below the path of the sheets and its upper surface is carried against the finger, thereby moving the finger out of normal position. If the front edge of the sheet is not in proper position against the front gages when the reciprocating plate rises, the finger remains in normal position thus causing the throw-out mechanism to be-

come active. With this construction and arrangement, the finger may be operated in an efficient and reliable manner even when the machine is operating upon thin paper or paper the edge of which is easily bent or crumpled. The finger, or fingers, may also be adjusted close to the line of the front gages without danger of being brought too near the surface of the impression cylinder. With this construction and arrangement also there is no danger of failure to operate by reason of failure of the front edge of the sheet to properly act upon and operate the finger as is the case where fingers or similar devices for controlling the throw-out mechanism are arranged across the path of the sheet and are operated by the onward movement of the sheet.

The various features of the invention will be understood from the following detailed description of the mechanism shown in the accompanying drawings, which embodies the various features of the invention in the forms in which I prefer to use them.

In these drawings Figure 1 is a plan view showing one side of the feed board of a press provided with the controlling mechanism for throwing the machine out of operation. Fig. 2 is a sectional elevation on line 2—2 Fig. 1. Fig. 3 is a detail elevation showing the throw-out mechanism and a part of the devices for controlling its operation. Figs. 4, 5 and 6 are details of parts shown in Figs. 1 and 2, which will be more fully described hereafter. Fig. 7 is a detail front elevation showing the controlling finger and the ends of the plates cooperating therewith.

In the construction shown in the drawings, A indicates the impression cylinder of a printing press to which the sheets are successively presented by being moved or fed into position against the front gages A' of the press. The sheets may be fed by any suitable mechanism or by hand and when automatically fed the feeding mechanism should be driven by suitable connections with the mechanism for operating the press so that both the feeding mechanism and the press may be thrown out of operation simultaneously in case a sheet is not properly presented at the front gages.

In the construction shown in the drawings the sheet is supposed to be fed by automatic



mechanism over the support B which is arranged on the front end of the feed board B' of the press.

The mechanism shown for throwing the machine out of operation comprises an arm C secured to a sleeve C' which is mounted to turn upon a rod C<sup>2</sup> extending transversely above the sheet support B. The arm C is connected by means of a link C<sup>3</sup> with any suitable form of stop mechanism which will be thrown into operation by the upward movement of the link C<sup>3</sup>. The stop motion may be of any suitable and well known construction, such for instance as an electric switch or a mechanism which is either released or positively operated by the movement of the link C<sup>3</sup>.

The means for operating the arm C to throw the machine out of operation consists of a pawl C<sup>4</sup> arranged to cooperate with a toothed segment C<sup>5</sup> formed on the arm C. The pawl C<sup>4</sup> is carried on a pawl carrying arm C<sup>6</sup> which is loosely mounted on the rod C<sup>2</sup> and is constantly oscillated through its connection with any suitable operating means. The pawl C<sup>4</sup> during the normal running of the machine reciprocates idly out of engagement with the toothed segment C<sup>5</sup>. The pawl is supported during its idle reciprocation by means of a guard C<sup>61</sup> provided with a notch C<sup>7</sup> which is engaged by a pin C<sup>8</sup> projecting from the pawl. The guard C<sup>61</sup> projects upward from a collar C<sup>9</sup> which is loosely mounted on the rod C<sup>2</sup>. The collar C<sup>9</sup> is provided with an arm C<sup>10</sup> in the outer end of which is secured one end of a transverse bar C<sup>11</sup>. The other end of this bar is secured in an arm similar to the arm C<sup>10</sup> projecting from a collar similar to the collar C<sup>9</sup> mounted on the opposite end of the rod C<sup>2</sup>. The weight of the arm C<sup>10</sup> and transverse bar C<sup>11</sup> acts to hold the guard C<sup>61</sup> in engagement with the pin C<sup>8</sup> as the pawl reciprocates. So long as the guard and parts connected therewith are free to oscillate about the rod C<sup>2</sup> they will therefore move in unison with the reciprocating movements of the pawl C<sup>4</sup> and the pawl will be held out of engagement with the toothed segment C<sup>5</sup>. If the movement of the guard and the parts connected therewith is arrested however, when the pawl is in its retracted position, then as the pawl advances the pin C<sup>8</sup> will ride off of the guard C<sup>61</sup> so that the pawl will drop down into engagement with the segment C<sup>5</sup>. When this occurs continued movement of the pawl will rock the arm C thus causing the machine to be thrown out of operation. Thus the bar C<sup>11</sup> and connected guard C<sup>61</sup> form a reciprocating controlling device by the arrest of which the throw-out mechanism may be rendered active. In order that the movement of this controlling device may be arrested in case the sheet is not properly fed to the front guides A', the bar C<sup>11</sup> is provided with a longitudinal notch or

recess C<sup>12</sup> adapted to be engaged by a stop D. The stop D is carried by a lever D' which is pivoted to an arm D<sup>2</sup> adjustably secured upon the sleeve C'. The stop D is moved out of active position in case a sheet is properly positioned against the front gages A' through a finger D<sup>3</sup> secured to the lever D' and having its front end D<sup>4</sup> arranged above the path of the sheets and directly back of the line of the front gages. The finger D<sup>3</sup> is operated to render the stop D inactive by means of a plate D<sup>5</sup> arranged below the path of the sheets and provided with an opening D<sup>62</sup> at its front end underlying the end D<sup>4</sup> of the finger. The passage of the front edge of the sheet between the plate D<sup>5</sup> and fingers D<sup>3</sup> is insured by a guard plate D<sup>6</sup> pivoted to the lower end of the arm D<sup>2</sup> and supported from the finger D<sup>3</sup> by a screw threaded stud D<sup>7</sup> and nut D<sup>8</sup>. By turning the nut D<sup>8</sup> the position of the guard D<sup>6</sup> with relation to the finger D<sup>3</sup> may be properly adjusted. The plate D<sup>5</sup> is operated at proper intervals to move the plate toward and away from the finger D<sup>3</sup> by means of a rock shaft D<sup>9</sup> to which the rear end of the plate D<sup>5</sup> is secured. The rock shaft D<sup>9</sup> extends transversely of the machine and may be rocked at proper intervals by connection with any suitable moving part of the machine not shown.

As a sheet is being fed to the front gages, the parts occupy the position indicated in Fig. 2, the lever D' being held in position against the stop screw D<sup>10</sup> by the weight of the finger D<sup>3</sup> and the guard D<sup>6</sup>. After the sheet has been positioned against the front gages, the rock shaft D<sup>9</sup> is operated to raise the bar D<sup>5</sup>, thus carrying the upper surface of the sheet against the end of the finger D<sup>3</sup> and rocking the lever D'. This movement of the lever D' carries the stop D out of the path of the bar C<sup>11</sup> so that the bar and connected guard C<sup>61</sup> are free to oscillate about the rod C<sup>2</sup> as the pawl C<sup>4</sup> moves forward.

The parts are so timed and operated that the bar D<sup>5</sup> is raised just after the front edge of the sheet engages the front gages in case the sheets are being properly fed, and the pawl C<sup>4</sup> moves forward immediately following the raising of the bar D<sup>5</sup>. If for any reason a sheet is not fed in proper time to be seized by the grippers of the press, or in case the sheet is improperly fed so that its front edge is not properly registered against the front gages, then when the bar D<sup>5</sup> is raised it merely lifts the guard D<sup>6</sup> without effecting any movement of the finger D<sup>3</sup>. In this case the stop D remains in the path of the bar C<sup>11</sup> and arrests the movement of this bar and of the connected guard C<sup>61</sup>. The pawl C<sup>4</sup> is therefore allowed to engage the toothed segment C<sup>5</sup> and the throw-out mechanism thus rendered active and the press and feeding mechanism stopped. In order that the finger D<sup>3</sup> may be adjusted to bring it into proper



relation to the front gages, it is secured to the lever  $D'$  by means of screws  $d$  passing through slots  $d'$  formed in the finger. The stud  $D'$  also extends through a slot  $d^2$  in the finger  $D^3$ , in order to accommodate the adjustment of the finger. The position of the finger with relation to the top of the sheet may be adjusted by turning the stop screw  $D^{10}$ .

In applying the controlling mechanism to a printing press I provide two or more fingers  $D^3$  and coöperating plates  $D^5$ , either of which will act to control the operation of the throw-out mechanism and to cause the operation of such mechanism in case the front edge of the sheet is not brought into proper position between the plates and fingers. I arrange these fingers and coöperating plates adjacent to the front gages and I adjust them transversely of the machine as occasion requires, to correspond to the adjustment of the front gages. The transverse adjustment of the fingers and connected stops may be effected by unclamping the arms  $D^2$  and sliding them along the sleeve  $C'$ . A corresponding adjustment of the plates  $D^5$  may be effected by sliding them along a rock shaft  $D^9$ . Since the bar  $C^{11}$  extends transversely across the machine, the stops  $D$  will be in proper relation to coöperate with the bar in any adjustment of the fingers  $D^3$  transversely of the machine.

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

1. Controlling mechanism for machines acting on sheets, having in combination front gages against which the sheet is registered, a movable finger arranged above the path of the sheets back of the line of the front gages, means for lifting the sheet against the finger, and throw-out mechanism controlled through the movement of said finger.

2. Controlling mechanism for machines acting on sheets having in combination, throw-out mechanism, a finger arranged above the path of the sheets, means for lifting the sheet against the finger, and devices for controlling the operation of the throw-out mechanism through said finger.

3. Controlling mechanism for machines acting on sheets, having in combination front gages against which the sheet is registered, a movable finger arranged above the path of the sheets back of the line of the front gages, a lifting device extending between the sheet and the cylinder when the sheet is against the front gages, means for operating the lifting device to lift the sheet against the finger, and throw-out mechanism controlled through said finger.

4. Controlling mechanism for machines acting on sheets, having in combination throw-out mechanism, a moving controlling device the arrest of which renders said mechanism active, a stop for arresting the con-

trolling device, a finger connected to operate said stop and arranged out of the path of the sheet, and means for pressing the sheet against said finger to render the stop inactive.

5. Controlling mechanism for machines acting on sheets, having in combination throw-out mechanism, a moving controlling device the arrest of which renders said mechanism active, a stop for arresting the controlling device, a finger connected to operate said stop and arranged above the path of the sheet, and a coöperating plate for carrying the sheet against said finger.

6. Controlling mechanism for machines acting on sheets having in combination throw-out mechanism, a finger arranged above the path of the sheets, intermediate devices for controlling the operation of the throw-out mechanism, a guard for directing the edge of the sheet under the finger, and a coöperating plate for lifting the sheet against the finger.

7. Controlling mechanism for machines acting on sheets, having in combination front gages against which the sheet is registered, a movable finger arranged above the path of the sheets and back of the line of the front gages, a coöperating plate below the path of the sheets, means for moving the plate toward the finger, and throw-out mechanism controlled through said finger.

8. Controlling mechanism for machines acting on sheets, having in combination a finger arranged out of the path of the sheets, a guard movable independently of the finger for directing the edge of the sheet past the finger, a coöperating plate on the opposite side of the path of the sheets, means for forcing the plate toward the finger, and throw-out mechanism controlled through said finger.

9. Controlling mechanism for machines acting on sheets, having in combination front gages against which the sheet is registered, a finger having its front end arranged back of the line of the front gages and above the path of the sheet, a plate extending from the front of the feed board beneath the finger, means for raising and lowering said plate, and throw-out mechanism controlled through said finger.

10. Controlling mechanism for machines acting on sheets, having in combination front gages against which the sheets are registered, a finger having its front end arranged back of the line of the front gages and above the path of the sheets, a guard extending below the front end of the finger, a plate projecting from the front end of the feed board below the finger, means for raising and lowering the plate, and throw-out mechanism controlled through said finger.

11. Controlling mechanism for machines acting on sheets, having in combination a



pivoted finger D<sup>3</sup> having its front end arranged above the path of the sheets, a stop D connected with said finger, a plate D<sup>5</sup> extending below said finger, means for raising and  
5 lowering said plate, a moving device the movement of which is arrested by the stop when in normal position, and throw-out mechanism rendered active by the arrest of said moving device.

10 12. Controlling mechanism for machines acting on sheets, having in combination a pivoted finger D<sup>3</sup> having its front end arranged above the path of the sheets, a pivoted guard D<sup>6</sup> arranged below said finger, a  
15 plate D<sup>5</sup> extending below the end of said finger, means for raising and lowering the plate, and throw-out mechanism controlled through said finger.

13. Controlling mechanism for machines acting on sheets, having in combination a fin- 20 ger arranged out of the path of the sheets, a transversely adjustable support for said finger, a stop connected with said finger, a transverse bar adapted to be engaged by said stop, means for reciprocating said bar, 25 throw-out mechanism rendered active by the arrest of said bar, a transversely adjustable plate arranged to press the sheet against said finger, and means for moving said plate toward and away from said finger. 30

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

FRANK L. CROSS.

Witnesses:

IRA L. FISH,

KATHARINE A. DUGAN.