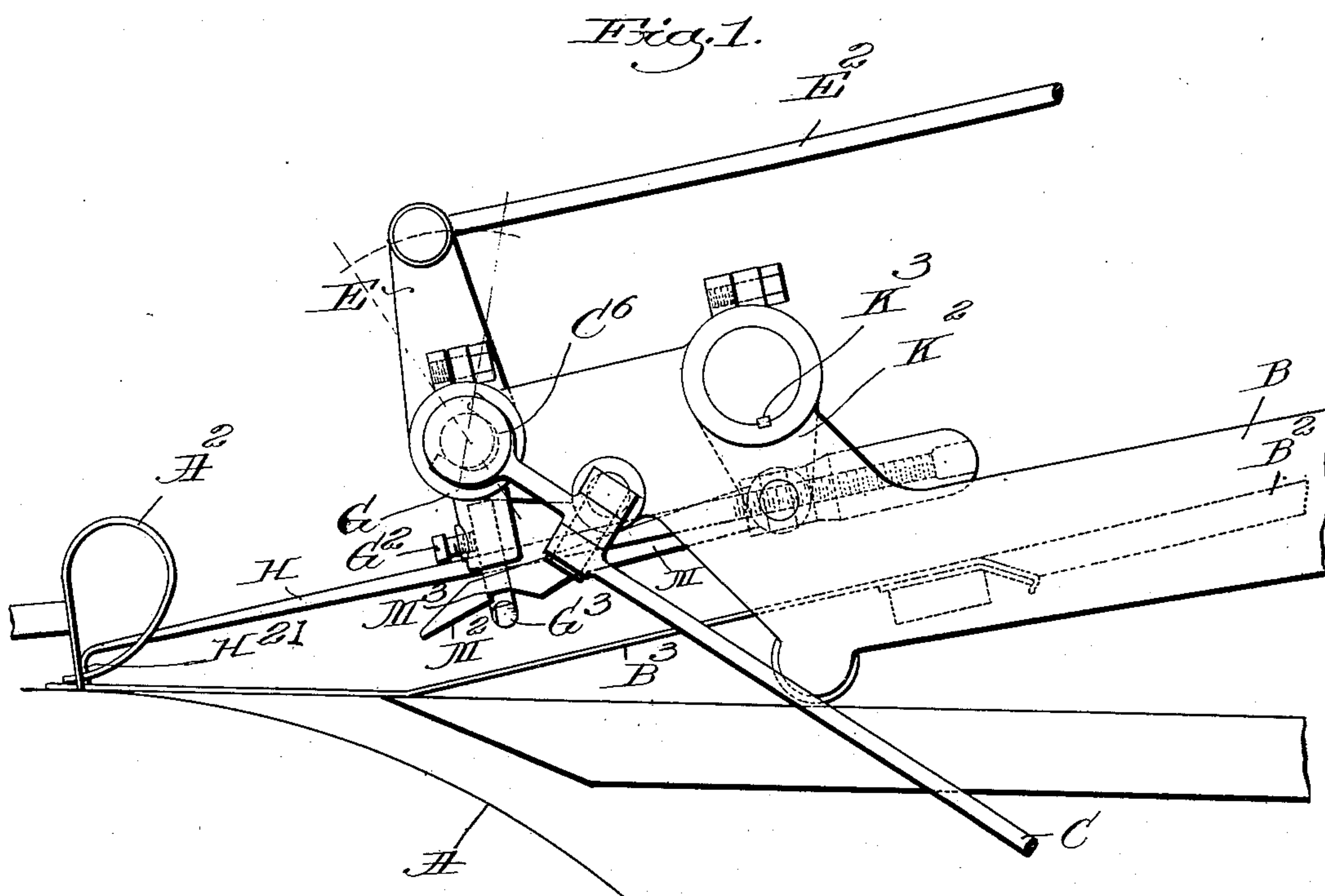


B. GUSTAFSON.
CONTROLLING MECHANISM FOR SHEET FEEDING MACHINES.
APPLICATION FILED JULY 1, 1908.

912,562.

Patented Feb. 16, 1909.

2 SHEETS—SHEET 1.

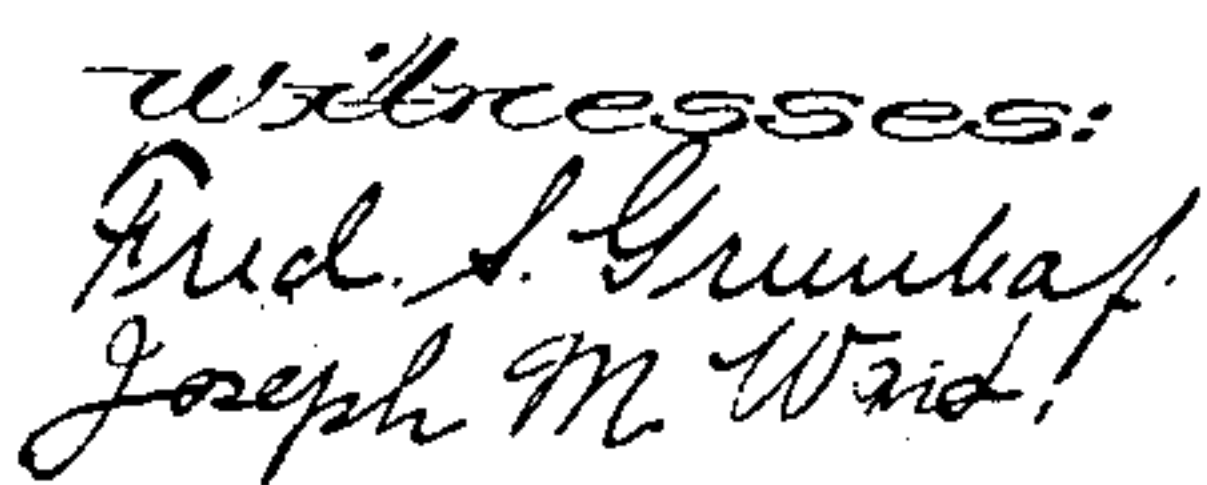


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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

BERNHARD GUSTAFSON, OF BOSTON, MASSACHUSETTS.

CONTROLLING MECHANISM FOR SHEET-FEEDING MACHINES.

No. 912,562.

Specification of Letters Patent.

Patented Feb. 16, 1909.

Application filed July 1, 1908, Serial No. 441,268.

To all whom it may concern:

Be it known that I, BERNHARD GUSTAFSON, a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented an Improvement in Controlling Mechanism for Sheet-Feeding Machines, of which the following description, in connection with the accompanying drawing, is a specification, like letters on the drawing representing like parts.

This invention relates to mechanism designed to control automatically a machine for acting upon sheets in such a manner that the machine may be stopped or thrown out of operation whenever a sheet is not fed to it in the proper position, or whenever a torn or imperfect sheet is fed into position.

The object of the invention is to provide a simple and reliable mechanism to be used in connection with machines for acting upon sheets, and in particular to be used in connection with printing presses to which sheets are fed automatically by a suitable form of sheet feeding mechanism.

The invention will more fully appear from the accompanying description and drawings and will be particularly pointed out in the claims.

The drawings illustrate the preferred embodiment of the invention, and are confined to those parts which are necessary to disclose the invention.

In the drawings, Figure 1 is a side elevation of mechanism shown in connection with the cylinder of a rotary printing press; Fig. 2 is a top plan view of the mechanism shown in Fig. 1. Fig. 3 is a detail to be described. Fig. 4 is a plan view of the detector finger and hook shown disconnected.

It is very important in connection with machines for acting upon sheets of paper, such for example as the printing press, if each sheet is not fed into exactly the proper position to be seized and carried through the machine in the precise manner required, or if any sheet is fed into the required position in a torn or mutilated condition, that the machine shall be stopped or thrown out of position before the sheet passes through it to be acted upon by it. The present invention secures the stopping or throwing out of operation of the machine in a simple and efficient manner, upon the occurrence of such an event.

It will be obvious that the invention is not concerned with the particular form of

machine for acting upon the sheets, nor with any particular form of stopping mechanism or throwing out mechanism, nor even with the particular form of sheet feeding mechanism, because any or all of these may be varied and may be of different types. The mechanism of the present invention is a controlling mechanism, and has to do only with the controlling of a stopping or throwing out mechanism, and is governed by the presence or absence of the sheet in proper position, or by the presence of a mutilated or torn sheet.

The mechanism in which the invention is preferably embodied is controlled by one or more finger detectors arranged above the path of the sheet. When the sheet is properly positioned this detector rests against the upper surface of the sheet and holds the throwing out mechanism inactive. When, however, the sheet is improperly positioned, or when a torn or mutilated sheet is presented in position, there will be nothing to hold the detector up and it will accordingly drop below its normal position, and this action results in rendering the throwing out mechanism active. The mechanism also involves a movable element herein shown as an oscillating arm which is connected with or arranged in any suitable manner to have a movement in time with the machine for acting upon the sheets. The movement of this movable element is utilized to render active the throwing out mechanism when the detector has its downward movement due to causes already noted. The mechanism of this invention is also provided with means whereby the detector finger may be adjusted to have its feeling or detecting end at any required position without disturbing in any way the accuracy of the action of the mechanism as a whole.

In the preferred form of the invention illustrated herein the impression cylinder of a printing press has been represented at A, and is shown as provided with a usual form of front gages A². The sheets may be fed into position against the front gages A² by any suitable form of feeding mechanism which is driven by suitable connections and in time with the press so that both the feeding mechanism and the press may be stopped or thrown out of operation at the same time upon the action of the controlling mechanism.

The forward end of the frame B only of

suitable sheet feeding mechanism is illustrated. This frame is shown as supporting a common form of supporting sticks B^2 , down which the sheets are fed to the guide tongues B^3 , which in turn direct the sheet to the position against the press gages. The throwing out or stopping mechanism is not herein illustrated because not involved in the present invention, but a link or rod C is shown which is supposed to be connected directly therewith, and when moved longitudinally in one or the other direction to render the said throwing out mechanism active or inactive. The rod C is connected at its forward end C^2 with a bell-crank lever C^3 , pivotally mounted at C^4 on a stud C^5 projecting from the frame B . A hollow shaft D is journaled in bearings B^4 , B^5 , of the frame B , and has mounted upon its end portion beyond the bearing B^4 a collar D^2 , held in place by a set-screw D^3 , and provided with an outer cam face D^4 . A lever arm E is mounted on the hollow shaft D and provided on its face with a cam-shaped surface E^4 , complementary to the cam surface D^4 on the collar D^2 . The lever arm E is connected by means of a rod or link E^2 with any suitable operating means, not shown, in such a manner as to cause the oscillation of the lever E in time with the printing press. A rod F extends through the hollow shaft D and carries at one end a grooved collar F^2 , which receives the forked arm C^6 of the bell crank lever C^3 . A spring F^3 is interposed between the collar F^2 and the frame B , so that the rod F is normally thrown to move the collar away from the frame and the connections are so arranged as when in this position to maintain the throwing out mechanism inactive. In order to render the throwing out mechanism active, therefore, it is only necessary to move the rod F in the opposite direction. The rod F extends through to the opposite end of the hollow shaft D and is provided with a nut F^4 , and washer F^5 contacting with the outer surface of the lever arm E , so that when the throwing out mechanism is in inactive position the spring F^3 will act through the parts described to maintain the cam surfaces E^4 and D^4 in contact with the surfaces in complementary position as illustrated in Fig. 2.

Any desired number of detecting fingers may be employed to detect at suitable intervals the position of the forward edge of the sheet. These detecting fingers and the mechanism oscillated therewith is the same for each and hence but one is illustrated and will be described. A guide tongue B^3 extends beneath the path of the sheet and is slotted at its forward end, as shown at B^6 . The detector finger H is shown as a long slender device turned downwardly at its forward or detecting end H^{21} and arranged so that the detecting end H^{21} is directly over

this slot B^6 . A shaft K is mounted in the frame B and extends transversely thereof and is provided with a depending arm K^2 , splined thereto at K^3 . The detecting finger H is mounted in a stud H^2 , journaled in the lower end of the lever arm K^2 , so that the detecting finger is pivotally mounted therein. In order to allow of the precise and exact adjustment of the feeling end of the detecting finger H , the detecting finger is made adjustable in the stud H^2 . In the form shown this is secured by splining the detecting finger H , as indicated at H^3 , in the stud H^2 by forming the end of the stud H^2 in the shape of a fork and providing a nut H^4 between the prongs of the fork screw-threaded to the detecting finger. A lock nut H^5 screws on to the end of the detecting finger. It will thus be seen that unlocking the nut H^5 and rotating the nut H^4 the detecting finger may be moved longitudinally and then locked in position by screwing up the locking nut H^5 . The stud H^2 also carries the catch arm M , held fast thereon by the nut M^2 , and hence it will be seen that the catch arm M will swing with the detecting finger H . The catch arm M is provided at its forward end with an inclined surface M^2 , and with a recess M^3 . A second lever arm G is clamped upon the hollow shaft D and depends therefrom above the catch arm M . The lever arm G has adjustably mounted therein by means of the set-screw G^2 a hook member G^3 , the end of which is shaped to fit the recess M^3 . As the hook member G^3 is oscillated with the shaft D it swings beneath the inclined surface M^2 and raises the catch arm M and consequently the detecting finger H . The parts are so adjusted that when the sheet of paper is upon the guide tongue B^3 and the feeling end H^{21} of the finger H rests thereupon the recess M^3 of the catch arm M will be out of engagement with the hook G^3 , but when the sheet is absent or is so torn or mutilated as to allow the end H^{21} of the finger H to drop into the slot B^6 then the recess M^3 will engage with the hook G^3 .

The operation of the mechanism is as follows. The spring F^3 holding the cam surfaces E^4 and D^4 in contact, the shaft D is oscillated by means of the connection E^2 with the lever arm E in time with the printing and sheet feeding mechanisms, and at each oscillation the hook G^3 riding on the cam surface of the arm M acts to raise and lower the detecting finger H . As the sheet is fed forward against the press gages the oscillations of the parts are so timed that the detecting finger comes down. If the sheet is present it will act to support the detecting finger H and prevent the engagement of the recess M^3 with the hook G^3 . If the sheet is absent from its proper position or if it is torn or mutilated thereat the de-

detecting finger H drops into the slot B⁶, and there is nothing to prevent the recess M³ of the catch arm M from dropping down on to the hook G³. This it accordingly does 5 and as the arm E is oscillated the arm M restrains the hook G³ from oscillating. The shaft D is consequently restrained from oscillating, and therefore the collar D² remains fixed in position so that with the continued oscillation of the cam E the cam 10 surfaces E¹ and D¹ act to move the arm E downwardly or away from the frame B against the tension of the spring F³. The rod F is connected with the arm E and it 15 accordingly moves longitudinally, and in turn moves the bell crank lever C³ and the connection C to the throwing out mechanism, thus immediately rendering the latter active and effecting the throwing out of operation the printing and sheet feeding 20 mechanisms.

The position of the detecting fingers may be adjusted laterally as desired and for that reason the arms G and K are shown as secured to their respective shafts by splines 25 and by clamping screws G¹⁰, K¹⁰, respectively. The adjustment already described of the detecting finger H with respect to its pivotal point enables the feeling end H²¹ to be positioned with great nicety and without 30 affecting in any way the adjustment or operation of the controlling mechanism. The lock-nut H⁵ is preferably made of a sufficient weight to nearly counterbalance 35 the detecting finger and catch at the other side of the pivot, so that the parts are extremely delicate in their operation.

Having described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. Controlling mechanism for sheet feeding machines comprising a detecting finger, a stationary slotted guide, means for moving said detecting finger toward and from the slot 45 of said guide to feel for and detect the presence or absence of a sheet, a member moving in time with the delivery of the sheet, a second member in frictional engagement with and normally moving with said member, means 50 rendered operative by the downward movement of the detecting finger into the slot of said guide upon the absence of the sheet for restraining the movement of said second member, and connections between said moving 55 member and the throwing-out mechanism whereby the latter is actuated upon the restraining of the second member.

2. Controlling mechanism for sheet feeding machines comprising a detecting finger 60 to feel for and detect the presence or absence of a sheet at the desired position, a member moving in time with the delivery of the sheet and capable of a transverse additional movement, a second member in frictional 65 engagement with and normally moving

ing with said first member, means rendered operative by the detecting finger upon the absence of the sheet for restraining the movement of said second member and causing a transverse movement of said moving 70 member, and connections between said moving member and the throwing out mechanism whereby the latter is actuated upon the restraining of the second member by said transverse movement of said moving member. 75

3. Controlling mechanism for sheet feeding machines comprising a detecting finger to feel for and detect the presence or absence 80 of the sheet at the desired position, a lever arm moving in time with the delivery of the sheet, a shaft, the said shaft and lever arm being provided with complementary cam surfaces, means for holding the said surfaces normally in frictional engagement, a second 85 lever arm mounted on said shaft, means rendered operative by the detecting finger upon the absence of the sheet for restraining the movement of said second lever arm, whereby 90 the shaft is restrained from movement and the complementary cam surfaces act to shift the first lever arm, and connections between said first lever arm and the throwing out mechanism whereby the latter is actuated 95 upon such shifting movement.

4. Controlling mechanism for sheet feeding machines comprising a detecting finger pivoted above the path of the sheet and provided with a feeling point to feel for and detect the presence or absence of the sheet 100 at the desired point, a catch arm connected to and movable with the detecting finger, a hollow shaft, and means for oscillating it normally in time with the delivery of the sheet, a lever arm mounted on said shaft and 105 adapted to engage the catch arm upon the movement thereof resulting from the absence of the sheet beneath the detecting finger, a rod extending through said hollow shaft and connected to the throw-out mechanism; and means actuated by or through 110 engagement of the lever arm with the catch arm for causing a longitudinal movement of said rod to actuate the throwing out mechanism. 115

5. Controlling mechanism for sheet feeding machines comprising a detecting finger to feel for and detect the presence or absence of the sheet at the desired position, a member moving in time with the delivery of the 120 sheet and capable of a transverse additional movement, means controlled by or through said detecting finger upon the absence of the sheet for causing the transverse movement of said moving member, connections 125 between said moving member and throwing out mechanism whereby the latter is actuated by said transverse movement, and means for adjusting said detecting finger longitudinally to vary the point at which 130

detection shall take place without affecting the timing or operation of the other parts of the mechanism.

5 6. Controlling mechanism for sheet feed-
ing machines comprising a frame, two par-
allel shafts, one fixed and the other movable,
mounted therein transversely of the path of
movement of the sheets, an arm mounted on
and longitudinally adjustable of said fixed
10 shaft, a detecting finger pivotally mounted
on said arm and provided with a feeling
point to feel for and detect the presence or
absence of the sheet at the desired point, a
catch arm provided with a cam face and a
15 notch and connected to and movable with said
detecting finger, a lever arm mounted on
and longitudinally adjustable of said mov-
able shaft and having an end cooperating
with the cam face and notch of the catch
20 arm, means for oscillating the movable shaft
normally in time with the delivery of the
sheet, each oscillation by the engagement of
the lever end and cam face of the catch arm

raising and lowering the detecting finger,
means actuated by or through the engage- 25
ment of the lever end with the catch arm re-
sulting from the absence of the sheet at the
detecting point for causing the actuation of
the throwing out mechanism.

7. Controlling mechanism for sheet feed- 30
ing machines comprising a stud pivoted
above the path of the sheet, a detecting fin-
ger provided with a feeling point to feel
for and detect the presence or absence of the
sheet at the desired point mounted on said 35
stud, means for adjusting the said detecting
finger transversely of said stud, said means
forming a counterbalance for the detecting
finger.

In testimony whereof, I have signed my 40
name to this specification, in the presence of
two subscribing witnesses.

BERNHARD GUSTAFSON.

Witnesses:

MABEL PARTELOW,

FREDERICK S. GREENLEAF.