E. J. F. REA & C. E. CLARK.

CONTROLLING MECHANISM.

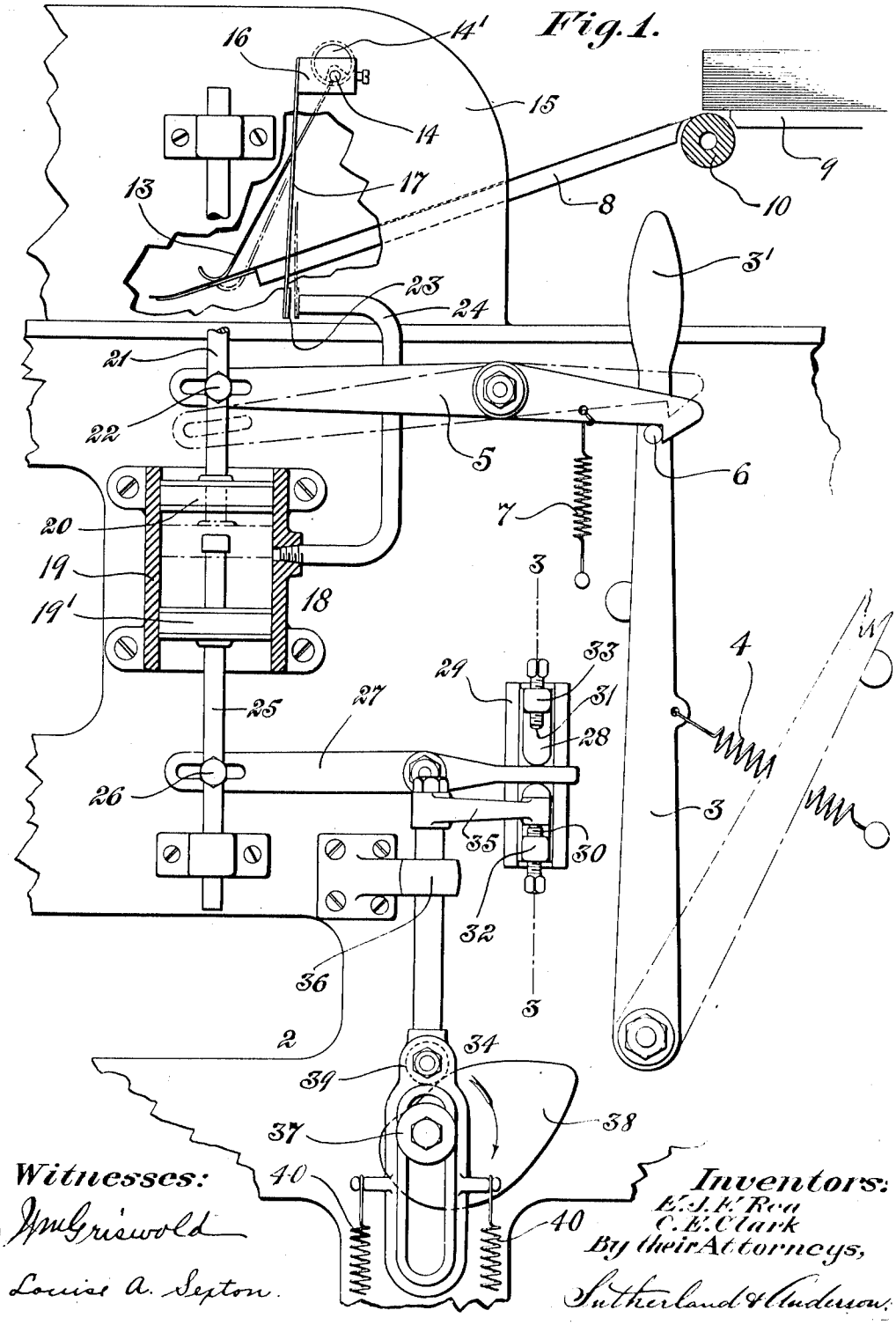
APPLICATION FILED APR. 26, 1912.

1,074,065.

Patented Sept. 23, 1913.

2 SHEETS—SHEET 1.

Fig. 1.



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2 SHEETS—SHEET 2.

Fig. 2.

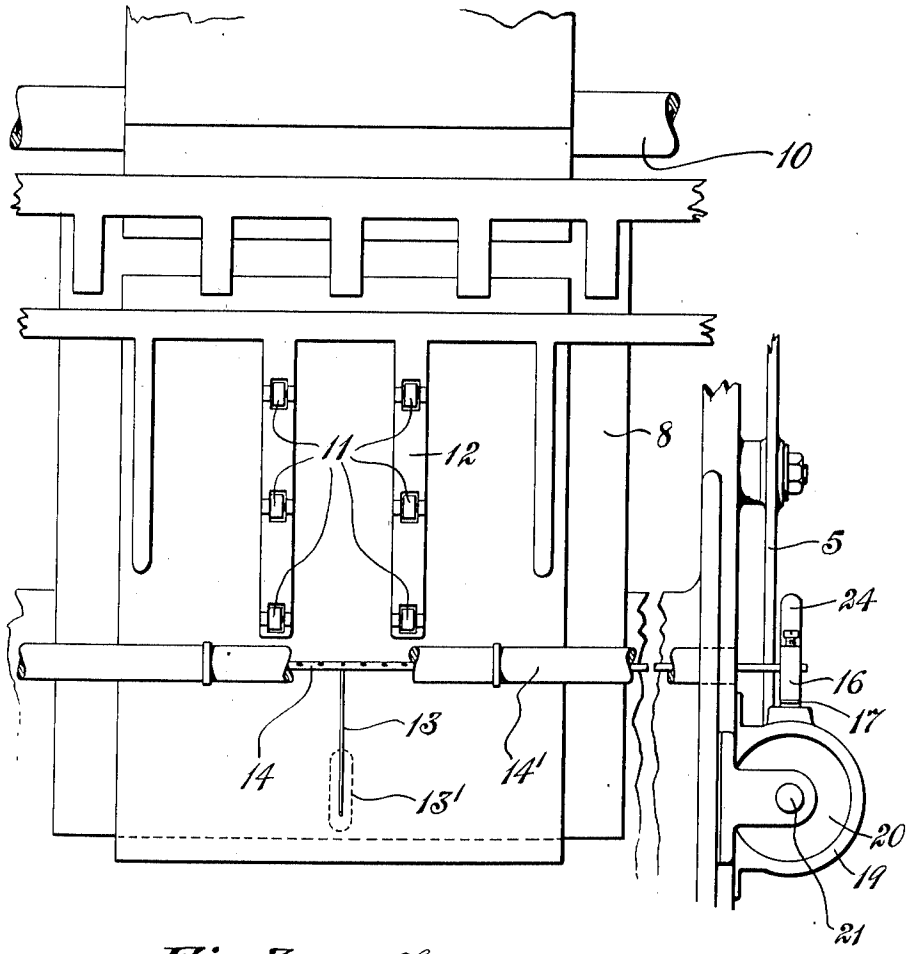
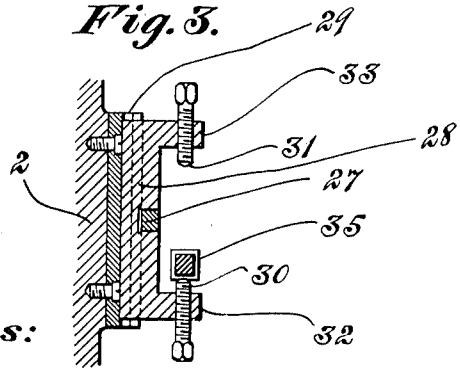


Fig. 3.



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UNITED STATES PATENT OFFICE.

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CONTROLLING MECHANISM.

1,074,065. Specification of Letters Patent. Patented Sept. 23, 1913.

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To all whom it may concern:

Be it known that we, EDWARD J. F. REA and CHARLES E. CLARK, citizens of the United States, residing at Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Controlling Mechanism, of which the following is a specification.

This invention relates to what will for convenience be termed "Controlling mechanism."

Controlling mechanism involving the invention may be utilized with advantage in many and widely different connections. For example it may be combined with or form part of a feeding apparatus irrespective of the character of the articles or stock supplied by said apparatus, that is whether the same be sheets of material such as in the case of a printing press, book folding or labeling machine or the blanks to a metal working machine, these being cited merely as instances of the various uses to which said mechanism may be put. When the controlling mechanism is associated with a feeding or analogous device, it can be employed for controlling the feed of the articles or for governing any other function, and in this particular connection it may if desired, effect the operation of a controlling member or throw-out means or cause the operation of such a part either to arrest or limit the action of the machine in conjunction with which said controlling mechanism is employed, or to stop said machine, or said controlling member could be employed to arrest, limit or to throw out of action completely one of the sub-mechanisms or devices of such a machine. In arresting or limiting the action of the machine or any part thereof it is not essential that the same be wholly stopped as a machine or part thereof which is regulated by said controlling mechanism, could merely have its speed or velocity modified or reduced.

Controlling mechanism is provided, which is certain and precise in action, simple in construction and by which any or all, of the objects hereinbefore named and others, can be accomplished with facility and promptness.

The mechanism possesses other advantageous features which with the foregoing will hereinafter be more fully set forth.

In the drawings accompanying and forming part of the present specification there is illustrated in detail one of the several forms of embodiment of the invention, which to enable those skilled in the art to practise the same, and merely for this purpose, will be set forth fully in the following description, while the novelty of said invention will be included in the claims. The invention, therefore, contemplates certain broad relations as defined in said claims, and it is not necessary that the specific or particular means hereinafter described be employed; radical departures therefrom in many respects, may be made within the scope of said claims.

Referring to said drawings: Figure 1 is a side elevation of controlling mechanism involving the invention, certain of the parts being in section and a portion of the frame being broken out to more clearly illustrate a certain device. Fig. 2 is a top plan view of the same, and, Fig. 3 is a detail sectional view on the line 3—3 of Fig. 1.

Like characters refer to like parts throughout the several figures.

In certain classes of machines, such as printing presses, book folders, labelers, etc., it is desirable and in most cases essential, that the feed of the articles which pass therethrough, should be continuous or practically so and mechanism (which in the present case is wholly automatic) is provided for insuring a certain result or results (for instance throwing some part out of action,) should there be any interruption or cessation of or anything abnormal with, the feed, and the utility of this is probably at once obvious. Nevertheless it is proper to make specific allusion at this point to at least one prime advantage when the mechanism is associated with a printing press: A controlling member such as that to which brief reference has been made, might be utilized by its action to stop, through the intervention of suitable means, the supply of ink, and such a controlling member can be automatically put into action to secure this effect, in case the feed of paper be stopped or be otherwise than normal, notwithstanding that the machine be otherwise in operation, the consequence being that no ink will be supplied. As will be evident the foregoing is cited merely as an

illustration in that as already observed, it is quite immaterial generally speaking, to what use said controlling mechanism be put.

The different parts of the mechanism or machine may be sustained by any suitable framework; that shown is denoted in a general way by 2, but as it forms no specific part of the invention, it is needless to describe the same in detail.

Ordinarily but not necessarily, the mechanism will include in its organization what might be considered a controlling member, and it is preferable that this controlling member be automatic in its action; from this controlling member a belt might be shipped, a clutch shifted or some other part might be actuated to attain any of the functions to which reference has hereinbefore been made. This controlling member may take any suitable form; that shown is denoted by 3 and it consists of a lever pivoted or otherwise suitably mounted. It has not been deemed necessary to show any means whereby any of the hereinbefore named acts may be obtained when said controlling member of lever 3 is shifted. Any desirable means may be utilized for effecting the automatic action of said lever, a spring as 4 satisfactorily answering the requirement, said spring being shown as connected with the lever between the ends thereof and also with the frame 2. In the present case this controlling member or lever 3 is normally held against action and this result can be accomplished in several ways for example by the latch 5 pivotally mounted on the frame 2 and the shouldered or working end of which is adapted to normally engage a catch (shown as a pin 6) on said lever 3, such relation being maintained preferably in some positive manner for instance as by a spring as 7 connected with said latch and with the frame. When the shouldered or working portion of said latch is raised free of said catch or pin, the lever 3 is released and can be instantly shifted by the spring 4. The lever may be equipped at its free end with a handle as 3′ which may be grasped to restore said lever to its primary position as indicated in full lines in Fig. 1 the shifted position thereof being represented by dotted lines in said view. In the present instance the release of the controlling member is automatically effected when there is an interruption in the feed of the stock of whatever nature the latter may be, although the feed table shown in the drawings is especially applicable for the passage of material in sheet form. Said feed table is designated by 8, and it receives the sheets from a platform or like support as 9 on which said sheets are laid in a pile, said sheets being taken from the platform or support 9 and being represented singly to the table 8 for which purpose a suction feed pipe or tube as 10 may be employed, being mounted as illustrated between the platform and feed table. The description just made applies to an existing type of feeding apparatus of which a table such as 8 forms a part. The sheets might be positively advanced toward the delivery end of said table, by upper and lower sets of rolls only the upper rolls 11 being shown, and the same being rotatively supported by a carrier as 12.

As a part of the mechanism there is preferably a feeler or finger and the action thereof is governed by the stock being fed and said feeler in turn governs means of which in the present case the controlling member or lever 3 forms a part. The instrumentalities between the feeler and controlling member may take various forms, although the same preferably is fluid-actuated in its operation, and the term "fluid" is used in its most generic sense and compressed air is a satisfactory fluid as will hereinafter appear. A feeler such as that denoted by 13 answers the purpose, although its particular construction and mode of mounting will depend in a measure upon the stock being handled. Preferably however, in the case of sheet material, such as paper, the feeler or finger 13 will be of some light, comparatively stiff material delicately poised or suspended to secure the utmost precision in the particular connection noted. The shape of the feeler is not a matter of consequence, although the working end of that illustrated is shown as rounded so as not to cause any injury to the stock or hinder the quick action of the feeler. The latter is shown as adjustably and normally connected rigidly to a rock-shaft as 14, and it is usually disposed between the sides of the feed table 8 and over the same. Said rock-shaft 14 is shown mounted for oscillation in a longitudinal groove or channel in the periphery of the stationary shaft 14′ shown as sustained by the frame members 15. The normal position of said feeler is indicated by full lines in Fig. 1, while the shifted position thereof is shown by dotted lines therein. By "normal position" I mean that which said feeler normally occupies or when the feed or the stock is substantially continuous, said feeler during this time being held in an advanced position by such stock. When, however, a sheet passes free of said feeler, the latter at once assumes its shifted position automatically, as it also does when the feed stops. This feeler or its equivalent, through intermediate agents governs the controlling member when the same is present, and in the case of a sheet-feeding device it is preferable to provide timing mechanism as will hereinafter appear which coacts with the said feeler. It is not essential that the timing mechanism or its equivalent be present but as set forth it is preferable that it or

something of an equivalent nature be present where the stock handled is in sheet form, the sheets as is well-known not being in contact with each other or overlapping as they are advanced along the feed device or otherwise. There are cases where it would not be necessary to employ a timing mechanism, such for example where there was no interval between the articles being supplied by the feed device. For instance in a machine for feeding metal blanks there would be a train or absolute continuity of blanks and in such an event it would probably not be advisable to employ timing mechanism, the controlling member being released or an equivalent act being effected when there is a break in this continuity. In the present case, however, there is an interdependence or mutual relation between the feeler and the timing mechanism. It naturally follows that the feeler 13 is retracted during the interval between each two sheets, although the controlling member 3 is not released each time said feeler shifts rearward owing to the presence of said timing mechanism. Should, however, there be an unusual interval or space between two sheets the controlling member is automatically released through the joint agency of the feeler and timing mechanism, and this abnormal interval may occur from a variety of causes such for instance as the stoppage of feed from the pile of sheets on the platform 9 or when the supply of sheet material is exhausted. The tip or working end of the feeler is disposed in a slot or opening as 13′ in the feed-table 8 when the feeler is retracted.

There is shown fastened to the outer end of the rock-shaft 14 a block 16 and to the block there is preferably rigidly united a carrier 17 represented as consisting of an arm which supports an element which puts into effective action at a predetermined point a releasing device, such as a motor for effecting the action of a controlling member such as that to which allusion has been made. This motor may take several different forms, although an air pump which is preferably continuously operative, satisfactorily answers the purpose. The function of the pump is to create a vacuum, and this vacuum is what is relied upon in the present case to trip, through an intermediate member, the latch 5. The pump may take various forms; that illustrated is denoted in a general way by 18 and it embodies a suitably mounted stationary shell or cylinder as 19 in which is reciprocative a piston 19′. The trip device for the said latch is also shown as consisting of a piston 20, the stem 21 of which has a sliding connection as at 22 with the tail of said latch 5. During the normal operation of the apparatus or when the feed of the stock is substantially continuous, the upper piston 20 remains at rest. When, however, a vacuum is created in the shell or cylinder 19 said upper piston is caused to descend by the action of the vacuum or suction, and as it does so it serves to trip the latch 5 and effect the release of the controlling member 3. Preferably the entrance of air to the pump 18 is governed by a valve as 23 fastened to the arm 17 at or near the free end thereof and which is shown located opposite the inlet of a duct or pipe as 24, the opposite end of the latter being shown as connected with the shell or cylinder at a point between the two pistons 19′ and 20. On the up or compression stroke of the piston 19′ it forces air from out the cylinder or shell through the pipe 24 to the atmosphere and naturally tends to move the valve 23 away from the inlet of said pipe, although as will be apparent this relation of the valve is normally maintained by the feed of the stock. Should there be any abnormal space between the stock or should its feed be wholly stopped, the piston 19′ when it descends will draw the companion piston 20 downward, owing to the fact that the valve 23 automatically or by gravity has closed the entering end of the duct or pipe 24. The piston 19′ is preferably continuously operative, and it will be evident from what has been stated that the valve 23 might be permitted by an almost imperceptible break in the feed to assume its inlet-closing position and hence effect the release of the latch 5 or perform some analogous act, but means for otherwise controlling the parts are preferably provided, so that there will be an action of the controlling member only when some unusual interval between the articles occurs or otherwise.

The rod 25 of the lower piston has a sliding connection as 26 with a rock-lever as 27 fulcrumed between its ends on the framework 2. In the present case the said lever coöperates with a slide as 28 shown as slotted between its ends to receive the tip or outer end of said lever. As will be understood said slide is power-operated, although it is preferably not given a continuous or unbroken movement, it being intermittently operated for a purpose that will hereinafter appear. Said slide is supported by a suitable way or box as 29 on the frame 2 and is shown having two adjustable stops as 30 and 31 which may consist of screws tapped through lugs or projections as 32 and 33 respectively on said slide. Said stops as will be obvious, provide for a certain amount of lost motion or time between the prime actuating element of whatever nature it may be and the pump 18 and the amount of lost motion may be regulated by the adjustment of said stops.

The actuator for the slide 28 is denoted in a general way by 34 and is shown consisting

of a rod having a lateral extension or arm 35 at its upper end which moves between and coöperates with said stops, said actuator or rod being represented as guided by a bracket as 36 on the frame 2 and a projection as 37 extending outward from the axis of motion of a cam as 38 mounted for rotation on said frame 2 and preferably continuously operated in any desirable manner. It might be stated that in the present instance this cam is the prime actuating element for the pump 18. The projection 37 extends through a loop or slot at the lower end of the actuator or rod 34. The active surface of the said cam is represented as engaging a stud as 39 on said actuator 34, which may consist of an anti-friction roller. As a means for operating said actuator 34 in opposition to said cam, spring means may be provided, two springs as 40 being illustrated for such purpose. By the construction described it will be clear that said springs tend to constantly pull the actuator 34 downward, the up-stroke of said actuator being secured by said cam. In Fig. 1 it is assumed that the cam 38 is turning in the direction of the arrow, and it follows, therefore, that the actuator or rod 34 is being drawn downward, the roller being in contact with the low part of the said cam. When the high part of the cam strikes said roller 39 the rod 34 will be thrust upward, after which it will be again drawn downward when the low part or releasing portion of the cam comes opposite to said roller.

It is believed that the action of the mechanism will be clearly apparent from what has been hereinbefore stated when taken in connection with the drawings. Nevertheless it is desirable to briefly set forth the same. As long as the stock holds the feeler 13 in its advanced position as indicated in full lines the pump 18 can not effect the tripping of the latch 5. While the piston 19′ is continuously in action, its movement is very slow with respect to the cam 38. In practice the parts will be so operated that the piston 19′ will be making its upstroke during the descent of the actuator, and while the latter action is taking place, there will be an appreciable interval of time between the point at which the arm leaves the stop 31 and engages the stop 30. On the ascent of the said actuator 34 there will be an equal interval of time after the arm 35 leaves the stop 30 before it engages the stop 31. When said stop 31 is thus engaged the slide 28 will be elevated, the outer branch of the lever 27 being similarly operated while the inner branch of said lever 27 is moved downward. Now the lapse of time which ensues between the commencement of the upstroke of said piston 19′ and the commencement of the downstroke thereof is ample enough to compensate for any ordinary or desired distance which may be between the rear end of one sheet and the leading end of a second sheet while traversing the mechanism. During the time that the two sheets may free the feeler or finger 13 nothing can occur even though said feeler assume its dotted line position in said Fig. 1 owing to the fact that the pump is on what might be considered its compression stroke as distinguished from the suction or working stroke thereof. Should there be a stoppage in the feed of the sheets the feeler 13 can assume its dotted line position, and the valve 23 can close the entering end of the duct or pipe and when the piston 19′ descends it can draw the piston 20 downward and therefore effect as set forth the tripping of the latch 5 and the consequent release of the controlling member 3 by the power of the spring 4 until said controlling member is arrested by a stop as 4′.

What we claim is:

1. Controlling mechanism comprising a controlling-member, means for normally preventing movement of said controlling member, a vacuum-creating device having an inlet from the atmosphere, means shiftable by the vacuum when created, for effecting the release of said controlling member, stock-feeding means, a valve for said inlet, and means governed by the stock, for holding said valve open.

2. Controlling mechanism comprising a controlling-member, a vacuum creating device having an inlet from the atmosphere, a latch for preventing movement of said controlling member, means shiftable by the vacuum when created for tripping said latch and thereby releasing said controlling member, stock-feeding means, a valve for said inlet, and means governed by the stock for holding the valve open.

3. Controlling mechanism comprising a controlling-member, means for normally preventing movement of said controlling-member, a vacuum-creating device having an inlet from the atmosphere, means shiftable by the vacuum when created, for effecting the release of said controlling-member, stock-feeding means, a valve for said inlet, and means governed by the stock for holding the valve open, the valve being closable by gravity.

4. Controlling mechanism comprising a spring operated controlling-member, means for holding said controlling-member normally against movement by its spring, a vacuum-creating device having an inlet from the atmosphere, means shiftable by the vacuum when created for effecting the release of said controlling-member, stock-feeding means, a valve for said inlet, and means governed by the stock, for holding said valve open.

5. Controlling mechanism comprising a shiftable member, means for normally hold-

ing said shiftable member against movement, a vacuum-creating device having an inlet from the atmosphere, means shiftable by the vacuum when created for effecting the release of said shiftable member, stock-feeding means, valve means for said inlet, means governed by the stock, for holding said valve open, an operating device, and mechanism, including a lost motion connection, for transferring the effect of said operating device to said vacuum creating device.

6. Controlling mechanism comprising a controlling-member, means for normally holding the controlling-member against movement, a vacuum-creating device having an inlet from the atmosphere, means shiftable by the vacuum when created, for effecting the release of said controlling-member, stock-feeding means, a valve for said inlet, and a feeler in the path of the stock and held advanced thereby during normal feed of the stock, said feeler being connected with said valve and being adapted to hold the same open during such normal feed.

7. Controlling mechanism comprising stock-feeding means, a feeler in the path of the stock and adapted to be held advanced thereby during normal feed thereof, a controlling-member, a piston, a second piston spaced from the first piston, means for incasing the two pistons, a duct extending into the space between the two pistons, means for positively operating the second piston, a valve located at the inlet end of said duct, means connected with the feeler for holding the valve open when said feeler is in its advanced position, and means connected with the first piston for effecting the release of said controlling member on the movement of said second piston.

In testimony whereof we affix our signatures in presence of two witnesses.

EDWARD J. F. REA.
CHARLES E. CLARK.

Witnesses:
WM. GRISWOLD,
F. E. ANDERSON.