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SIGNATURE GATHERING MACHINE.

APPLICATION FILED DEC. 15, 1908.

1,109,127.

Patented Sept. 1, 1914.

2 SHEETS SHEET 1.

Fig. 1.

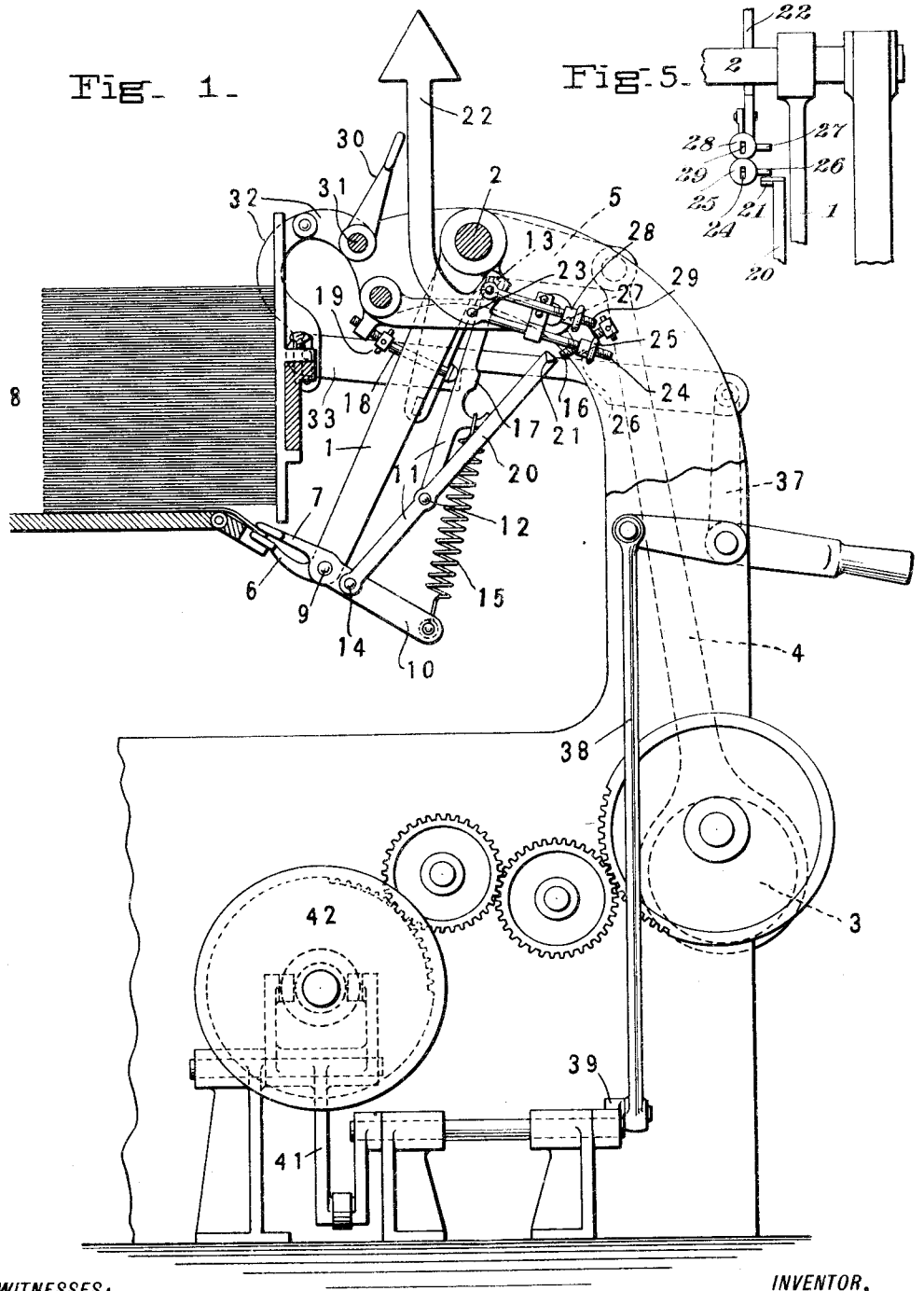


Fig. 5.

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2 SHEETS-SHEET 2.

Fig. 2.

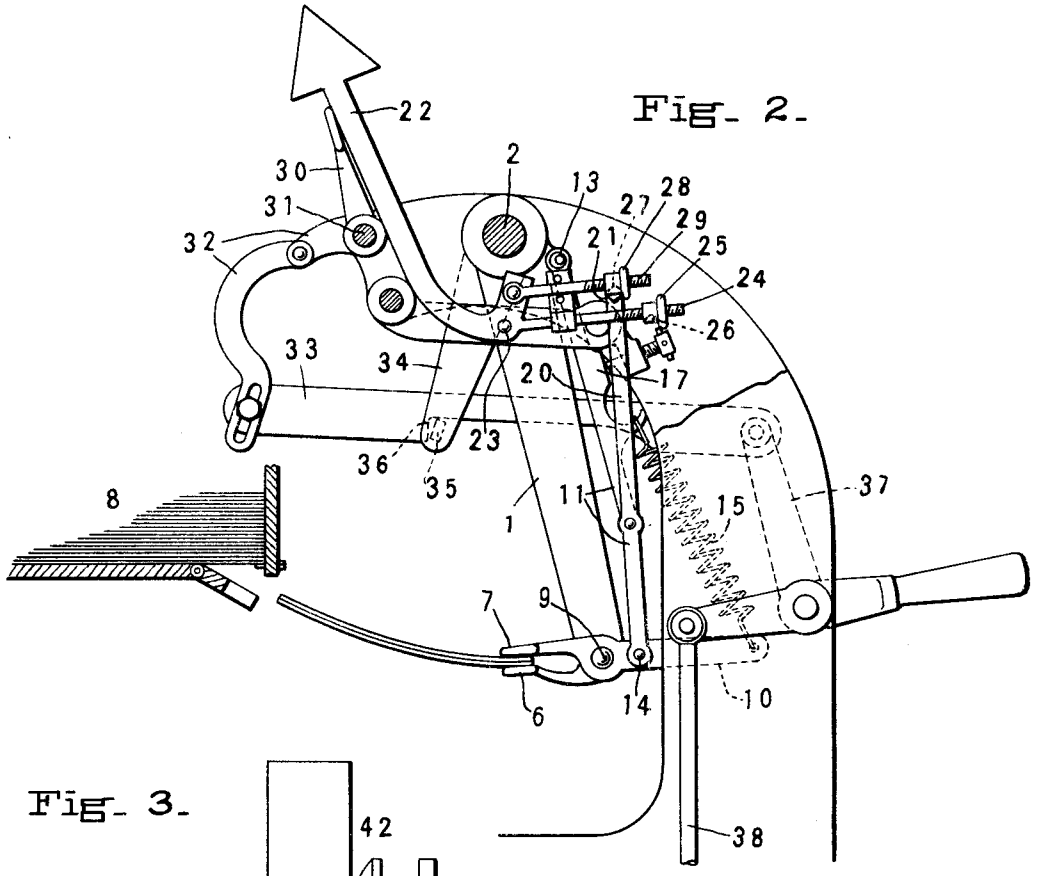


Fig. 3.

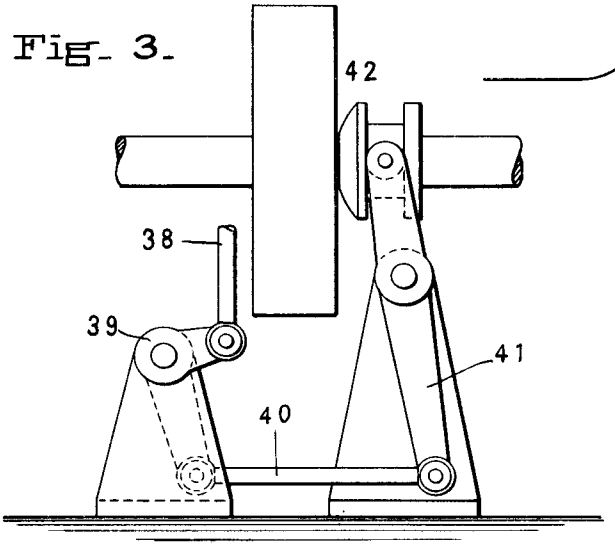
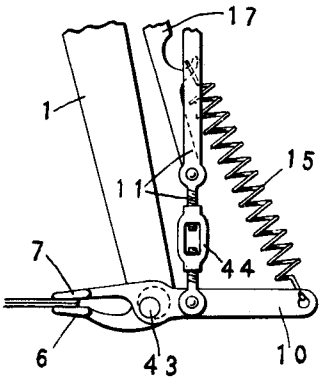


Fig. 4.



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SIGNATURE-GATHERING MACHINE.

1,109,127. Specification of Letters Patent. Patented Sept. 1, 1914.

Application filed December 15, 1908. Serial No. 467,585.

To all whom it may concern:

Be it known that I, CHARLES A. JUENGST, a citizen of the United States, and resident of Croton Falls, in the county of Westchester and State of New York, have invented certain new and useful Improvements in Signature-Gathering Machines, of which the following is a specification.

My invention relates to improvements in signature gathering machines and in particular to the means for detecting faulty signatures handled by such machines.

The main object of my invention is to provide an improved detector mechanism of extremely simple construction and which will be very sensitive in operation so as to detect the slightest defect in the signatures or sheets handled by the machine.

Another object of my invention is to provide such a detector mechanism which may readily be applied to existing forms of signature gathering machines.

One feature of the invention consists in providing a detector arm, the free end of which has a linear movement with reference to a relatively fixed point greater than the movement of one gripper jaw in relation to the other jaw. The detector arm under normal conditions is adapted to pass through a gate or opening and should the gripper jaws take a sheet which is either too thick or too thin or should the jaws fail to take any sheet at all, the position of the detector will be varied and instead of passing through the gate, it will engage the member comprising the gate and impart a certain movement to said member. Also should the gripper jaws take two signatures or sheets or if the signature should be reversed, then the detector arm will be correspondingly shifted so as to engage the gate member. In all these cases some defect has arisen either in the sheet or signature itself or else in the manner of handling the same, so I have used the word "defective" to comprehend all these various faults and the word will be so construed where it appears in the specification and claims. This gate member is in the form of a stop device or controls the operation of the machine in some way. Preferably this member would stop the machine as soon as a defect which the machine is capable of recognizing has been detected, but it might be operated to control the machine in some other way, as for instance to actuate certain parts which when the book containing the faulty sheet or signature reached the end of the machine would cause said book to be separated from the perfect books. This gate or controlling member would preferably be adjustable so that the gripper jaws would be adapted to seize signatures of different sizes and the detector mechanism could be adjusted accordingly.

In the preferred form of my invention the gripper jaws are carried by a swinging gripper arm, and a pair of pivoted toggle bars are used for opening and closing the jaws. One of the toggle bars is preferably extended beyond the pivotal point of connection between the two bars to constitute a detector member and the end of this member is provided with an angular finger to pass through the gate of the controlling member. This prolongation of the toggle bar acts to magnify the opening and closing movement of the gripper jaws so that the detector finger has a much greater movement than the closing movement of the gripper jaws.

In the accompanying drawings I have illustrated the preferred embodiment of my invention but various changes may be made in the construction and arrangement of the different parts thereof without departing from the spirit of the invention.

In the said drawings: Figure 1, is a view of my improved detector mechanism applied to a signature gathering machine, only as much of the machine being illustrated as is necessary to show application of my invention thereto. Fig. 2, is a detail view of the invention in the act of detecting a faulty signature. Fig. 3 is a broken detail view of the clutch device which in the preferred form of the invention constitutes the means for stopping the machine when the detector has acted upon the controlling mechanism. Fig. 4 is a broken detail view of a slight modification of the invention. Fig. 5 is a broken detail view taken on a plane at right angles to the view shown in Fig. 1, for the purpose of illustrating the relation of the detector finger 21 with respect to the gate members 26 and 27. For the sake of clearness all parts which are not essential to the illustration of these particular parts have been omitted in this view.

In the drawings like reference characters

refer to corresponding parts throughout the several views.

The gripper jaws are carried by a gripper arm 1, dependent from a rock shaft 2, which is operated from a cam 3, by means of a connection 4, and rocker arm 5. Relatively fixed and pivoted gripper jaws 6 and 7, respectively, are carried by the gripper arm and the gripper arm is actuated by the means aforesaid, to swing the gripper jaws between the signature hopper 8, and the conveyer of the machine. (The latter not being shown). The movable gripper jaw is pivoted on the center 9, and is provided with an extension 10, projecting in rear of this pivotal point.

As the means for opening and closing the jaws I prefer to use a pair of toggle bars 11, having a connecting pivot 12, connected to the upper end of the gripper arm at 13, and pivoted to the extension of the pivoted jaw at 14. A spring 15, connected between the upper toggle bar and the extension of the pivoted jaw serves to hold the jaws either open or closed, dependent upon the position of the toggle. The jaws are opened or closed by alternately straightening and bending the toggle. This is accomplished preferably by means of an abutment 16, which engages the lug 17, on the upper toggle bar when the gripper arm swings back, thereby causing the toggle to be straightened, and by means of a pin 18, slidably carried in the gripper arm which strikes the abutment 19, on the forward stroke of the gripper arm and causes the toggle to be collapsed or bent. It will be apparent that this so-called expanding and contracting motion of the toggle bars will alternately open and close the gripper jaws.

My improved detector mechanism is very simple and consists preferably in prolonging one of the toggle bars, usually the lower one, into an extension constituting a detector arm 20, the detector arm having at its end the angular detector finger 21.

The controlling member consists preferably of a signal arm 22, pivoted at the point 23, and having a part 24, on which is mounted a member 25, having an angular part 26 constituting one of the members of the so-called gate. The other angular member 27, of the gate is carried by a member 28, on the part 29. These gate members are preferably adjustable as shown, so that when handling signatures of different sizes the detector parts may be set accordingly. It will be evident that instead of having the gate on the controlling member, the gate part might be carried by the detector member, and instead of making the parts of the controlling member adjustable, the detector member might as well be made adjustable.

After the parts have been properly set, the detector finger under normal conditions will just pass between the gate members as the gripper arm swings to and fro between the signature pile and the conveyer. If the gripper jaws should fail to take a sheet or signature or if the signature should be either too thick or too thin, the relative position of the detector finger will be correspondingly altered and as the gripper arm swings back, instead of passing between the gate members, the detector finger will engage one of said gate members and rock the signal arm forward as shown in Fig. 2. The signal arm then engages the rocker arm 30, on the rock shaft 31, thereby imparting a rocking movement to said shaft. Supporting links 32, carried by the said shaft normally support the link 33, out of the path of a rocker arm 34, also carried by the rock shaft which supports the gripper arm. When the rock shaft 31, is thus rocked forward, the link 33 is lowered so that at the next forward stroke of the rocker arm 34, the lug 35 on said arm, engages a corresponding shoulder 36, on the link 33, and draws the said link forward. This movement by reason of the bell crank 37, imparts a downward movement to the rod 38, and this rod imparts a rocking motion to the bell crank 39. This latter bell crank is connected by a rod 40, to the shifting lever 41, which is actuated in the manner described, to disengage the clutch 42 and stop the machine.

I do not wish to limit myself to the use of a clutch as other forms of stopping or controlling means might be employed.

From the foregoing it is evident that since the gripper jaws are opened and closed by straightening and breaking the toggle, the movement of the jaws with respect to each other will always bear a certain relation to the movement of the toggle and hence to the movement of the free end of the detector arm which is carried by the toggle. The position of the free end of the detector arm being thus dependent upon the relative position of the jaws with respect to each other, the detector arm will occupy a position dependent upon the thickness of material between the jaws. Now since the detector arm forms in reality an extension or prolongation of the lower toggle bar any movement of the toggle bar will be magnified at the free end of the detector arm. A comparatively slight movement at the pivot 12 of the toggle bars will therefore be multiplied into an appreciable movement at the free end of the detector arm. By reason of this arrangement it will therefore be seen that a comparatively slight variation in the distance between the gripper jaws occasioned say by a slight variation in thickness of a signature from the standard thickness will cause a much greater variation in the relative position of the free end of the detector arm. The detector arm is

thus made very sensitive so that even very slight variations in thickness may be positively detected.

For the purpose of allowing a certain amount of adjustment between the fixed and movable gripper jaws as when changing from one size signature to another, or for other reasons, I may construct the parts as shown in Fig. 4, where the movable gripper jaw is pivoted upon an eccentric stud 43. It will be apparent that by adjusting this stud or pivot mounting rotatively, the movable gripper jaw may be caused to approach or recede from the fixed jaw and this same movement will cause a certain displacement in the position of the detector member. Furthermore I may, as shown in this figure, provide a toggle with an adjustable part as the turnbuckle 44. Adjustment of this turnbuckle will vary the relative position of the detector member. With this latter construction the detector parts may be set for signatures of varying sizes either by means of the turnbuckle or by means of the adjustable gate parts. The connection of the toggle at point 13 is also preferably made adjustable by means of an eccentric pivot, as shown.

What is claimed, is:

1. In a signature gathering machine, the combination with gripper jaws, of pivoted toggle bars for opening and closing the jaws, an extension on one of said toggle bars, an element on said extension, and a controlling member having a gate through which the element on the extension passes when the gripper jaws take a signature of normal thickness.

2. In a signature gathering machine, gripper jaws, a toggle for opening and closing the jaws, controlling mechanism, and an extension on one of the members of the toggle having a detector member the movement of which in reference to a relatively fixed point is greater than the closing movement of the jaws, adapted when the gripper jaws take a signature of improper thickness or fail to take any signature, to actively engage the controlling mechanism.

3. In a signature gathering machine, a gripper arm, gripper jaws carried thereby, means for opening and closing said jaws, a detector member forming an extension of the means for opening and closing the jaws and having a movement in reference to a relatively fixed point relatively greater than the closing movement of the gripper jaws, and means controlling the operation of the machine adapted to be operatively engaged by the detector member when the gripper jaws take an improper thickness of material.

4. In a signature gathering machine, gripper jaws, toggle bars, means for actuating said toggle bars to cause them to open and close the jaws, a detector extension on one of the toggle bars, and mechanism controlling the operation of the machine adapted to be actively engaged by the detector extension should the gripper jaws take an improper thickness of signature or fail to take a signature.

5. In combination, a hopper for signatures, a conveyer, a gripper arm traveling back and forth between the signature hopper and conveyer, gripper jaws carried by the gripper arm, pivoted toggle bars connected with one of the gripper jaws for opening and closing the jaws with respect to each other, means for operating the toggle bars for opening and closing the jaws, one of said toggle bars having an extension constituting a detector member, and means exercising a control over the machine having a gate through which the detector member passes when the gripper jaws take a signature of normal thickness.

6. In a signature gathering or like machine, the combination of a swinging gripper arm, gripper jaws carried by the said arm, pivoted toggle bars pivoted between one of the jaws and the gripper arm, means for making and breaking the toggle for the purpose of opening and closing the jaws, a detector arm forming an extension of one of the toggle bars, and means controlling the operation of the machine arranged to be operatively engaged by the detector arm when the gripper jaws take an abnormal thickness of material.

7. A signature gathering or sheet handling machine, comprising in combination with the gripper jaws and the toggle bars for opening and closing the jaws, a detector arm carried by one of the toggle bars having an angular finger on the end thereof, and means for controlling the operation of the machine having an adjustable gate to permit the passage of the detector finger under normal conditions.

8. In combination, gripper jaws and pivoted toggle bars adapted to open and close said jaws, one of the said toggle bars being extended past the point of pivotal connection between the two bars and terminating in an angular finger, and a member exercising a control over the operation of the machine having a gate to permit the passage therethrough of the said angular finger under normal conditions.

9. In a signature gathering machine, a gripper arm, relatively fixed and pivoted gripper jaws carried thereby, a detector arm connected to the pivoted gripper jaw and a bar pivoted to the detector arm and gripper arm, said bar and detector arm thereby constituting a toggle.

10. In a signature gathering machine, a support, relatively fixed and pivoted gripper jaws carried by said support, a detector arm connected to the pivoted gripper jaw and

a bar pivoted to the detector arm and to the gripper support, said bar and pivoted arm thereby constituting a toggle, and means for controlling the machine adapted to be operatively engaged by the detector arm under any but normal conditions.

11. In a signature gathering machine, the combination with fixed and pivoted gripper jaws, of adjustable toggle bars for opening and closing said jaws, an extension on one of the toggle bars carrying on its end a detector finger, and mechanism exercising a control over the machine, having a gate for the passage of the detector finger under normal conditions.

12. In a signature gathering machine, the combination of relatively fixed and pivoted gripper jaws, adjustable toggle bars for opening and closing said jaws, an adjustable mounting for the pivoted jaw whereby the relation between the jaws may be altered, a detector finger carried by one of the toggle bars and stop mechanism having a gate for the passage of the detector finger under normal conditions.

13. The combination in a signature gathering machine, of controlling mechanism for interrupting the operation of the machine, a hopper for the signatures, gripper jaws for handling the signatures, a toggle for opening and closing the gripper jaws, an extension on one of the members forming the toggle, a detector finger carried by said extension, said controlling mechanism having a gate for the normal passage of the detector finger.

14. The combination in a signature gathering machine, of controlling mechanism for interrupting the operation of the machine, a hopper for the signatures, gripper jaws for handling the signatures, a toggle for opening and closing the gripper jaws, an extension on one of the members forming the toggle, a detector finger carried by said extension, said controlling mechanism having a gate for the normal passage of the detector finger, and means for adjusting the relation of the gate member and detector finger to adapt the machine for handling signatures of different thicknesses.

15. In a signature gathering machine, the combination with gripper jaws, of pivoted toggle bars for opening and closing the jaws, means acting on the toggle bars to make and break the toggle for the purpose of opening and closing the jaws, one of the toggle bars aforesaid being extended a considerable distance past the point of its pivotal connection with the other toggle bar, whereby the movement of the toggles in opening and closing the jaws will be magnified by the said extension, and means controlling the operation of the machine having a gate through which the outer end of the extension passes when the gripper jaws take a signature of normal thickness.

16. In a signature gathering or like machine, the combination of relatively fixed and pivoted gripper jaws, a toggle for opening and closing said jaws, an adjustable mounting for the pivoted jaw whereby the relation of the pivoted jaw to the relatively fixed jaw may be altered, a detector finger carried by one of the members of the toggle, and means controlling the operation of the machine arranged to be operatively engaged by the detector finger when the jaws take an abnormal thickness of material.

17. In a signature gathering or like machine, gripper jaws, a toggle for opening and closing said jaws, means for controlling the operation of the machine having a gate therein, a detector forming an extension of one of the members of the toggle which passes through the gate aforesaid when the gripper jaws take a signature of normal thickness, and means for adjusting the detector arm and gate in respect to each other.

Signed at New York, borough of Manhattan, in the county of New York, and State of New York, this 14th day of December A. D. 1908.

CHARLES A. JUENGST.

Witnesses:

GEO. A. MARSHALL,

PHILIP S. MCLEAN.