No. 811,509. PATENTED JAN. 30, 1906.

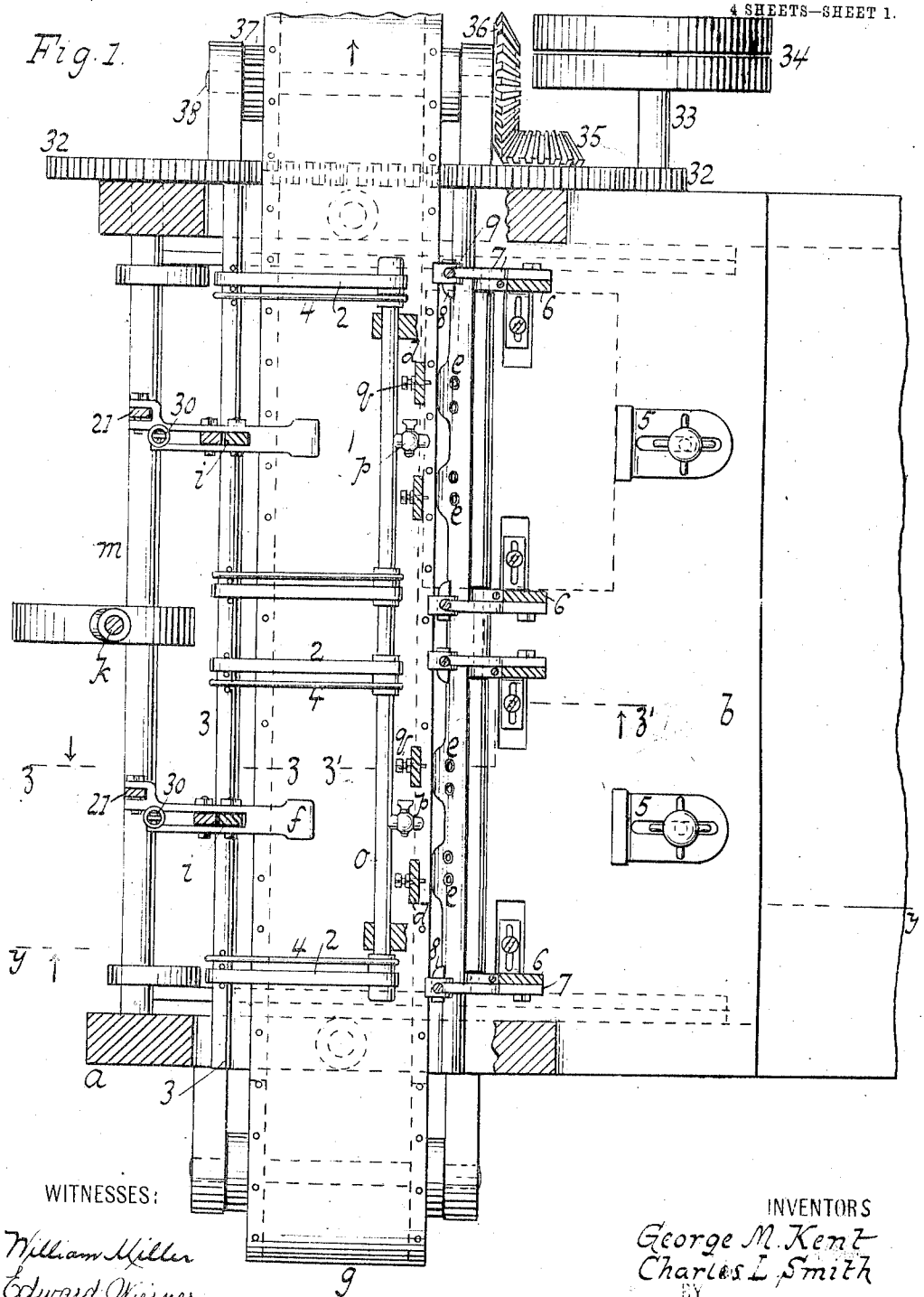
G. M. KENT & C. L. SMITH.

SIGNATURE GATHERER.

APPLICATION FILED MAY 2, 1905.

4 SHEETS—SHEET 1.

Fig. 1.



WITNESSES:

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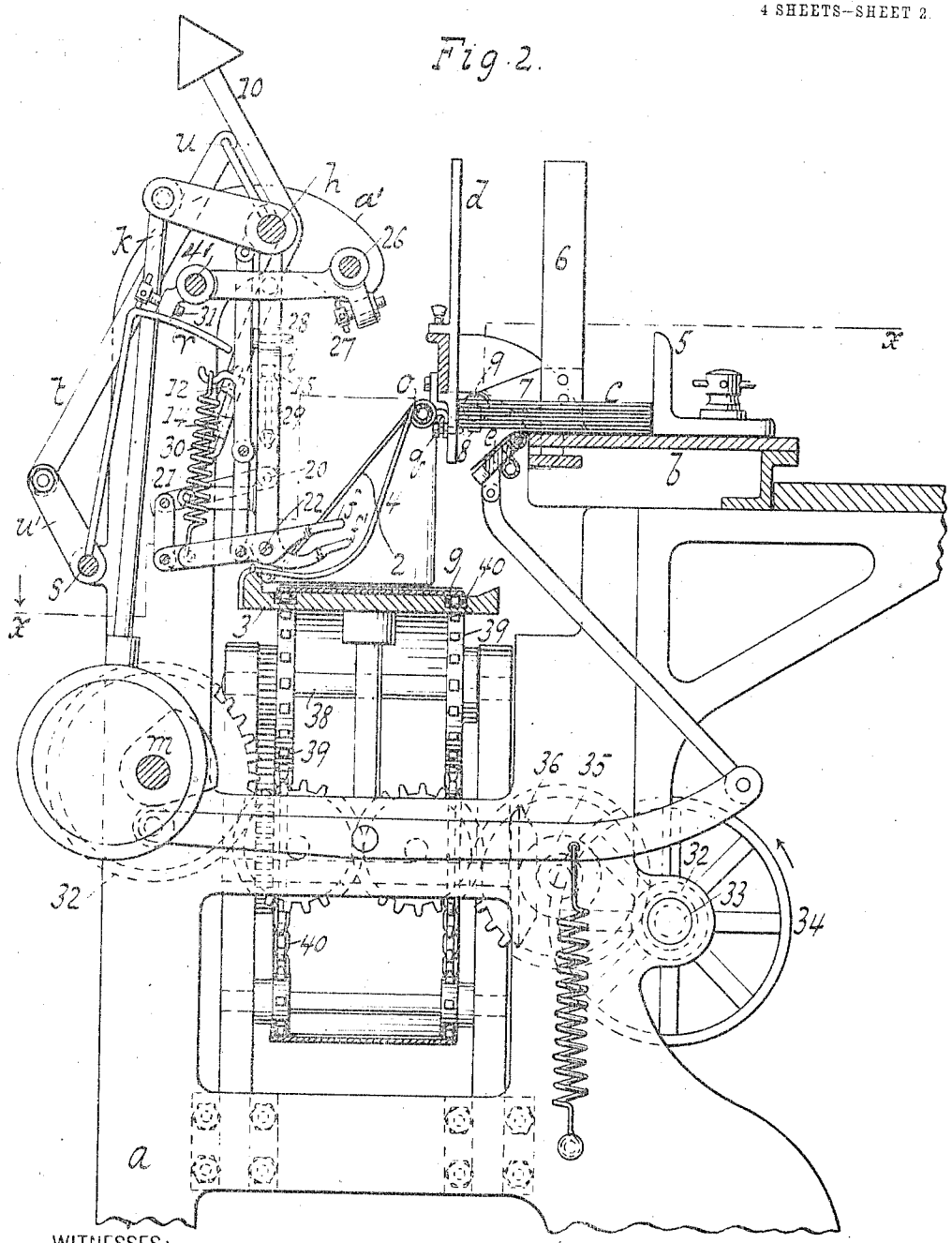
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4 SHEETS—SHEET 2.

Fig. 2.



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4 SHEETS—SHEET 3.

Fig. 3.

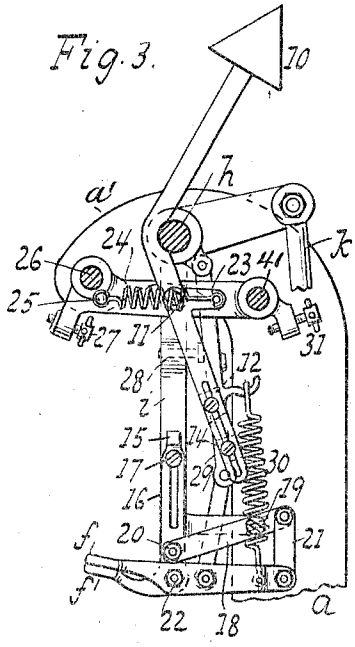


Fig. 4.

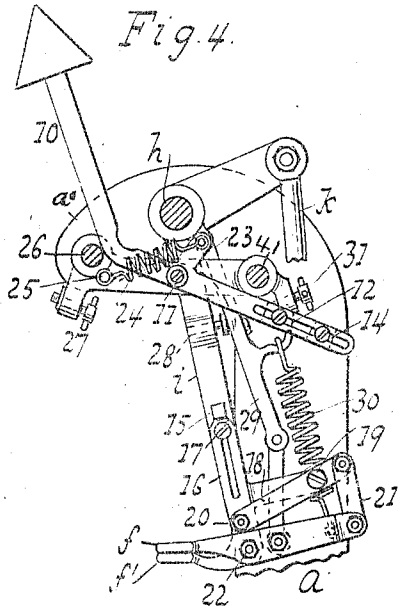
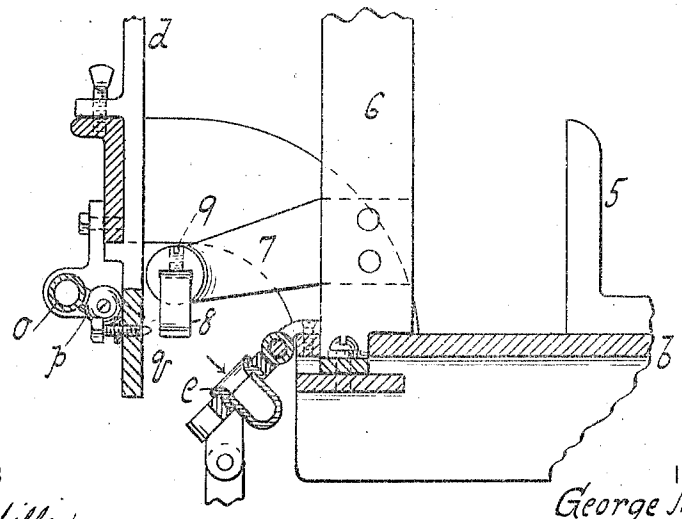


Fig. 5



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APPLICATION FILED MAY 2, 1905.

4 SHEETS—SHEET 4.

Fig. 6.

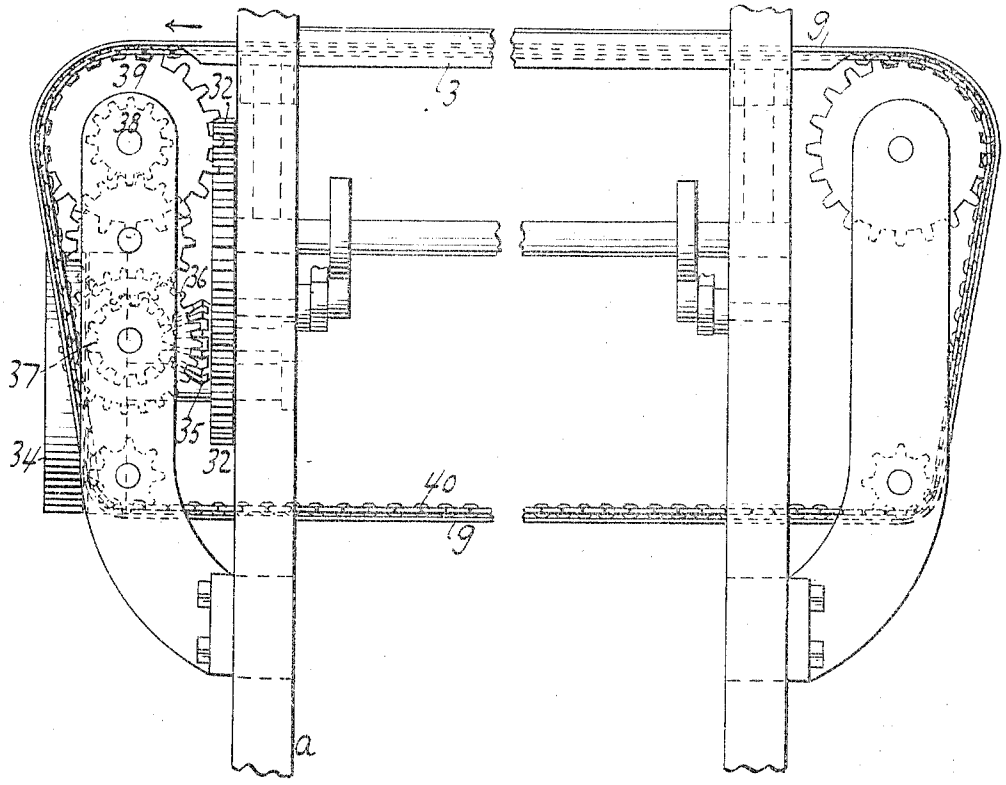
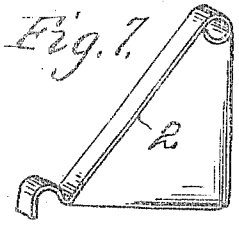


Fig. 7.



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UNITED STATES PATENT OFFICE.

GEORGE M. KENT AND CHARLES L. SMITH, OF NEW YORK, N. Y.

SIGNATURE-GATHERER.

No. 811,509. Specification of Letters Patent. Patented Jan. 30, 1906.

Application filed May 2, 1905. Serial No. 258,528.

To all whom it may concern:

Be it known that we, GEORGE M. KENT and CHARLES L. SMITH, citizens of the United States, residing in Manhattan borough, in the county and State of New York, have invented new and useful Improvements in Signature-Gatherers, of which the following is a specification.

By means of this invention a gathering-machine can be made to work accurately or to take but one sheet at a time, as required, and maintain such sheet in proper position relative to other sheets being gathered by the machine.

This invention is set forth in the following specification and claims and illustrated in the annexed drawings, in which—

Figure 1 is a plan view of a gathering-machine embodying this invention, partly in section, along line *x x*, Fig. 2. Fig. 2 is a section along *y y*, Fig. 1. Fig. 3 shows means for operating a signal sectioned along line *z z*, Fig. 1, the gripper-jaws being closed. Fig. 4 is a view like Fig. 3, but with parts in a different position. Fig. 5 is a section along *x' x'*, Fig. 1. Fig. 6 shows a front view of driving and cam mechanism. Fig. 7 shows a detail view of a partition.

In the drawings is shown a frame or foot *a* and a delivery-board *b* for a pile of sheets *c* butting against a front guide or guides *d*. A number of swinging suction-cups *e* coming against an edge or edge part of the lowermost sheet of the pile and bending down such edge on the downward swing cause such edge to be in position for engagement by a swinging gripper or jaws *f f'*, of which jaw *f'* is fixed to arm *i*, while the movable or swinging jaw is shown at *f*. As the gripper comes to a sheet and grasps the same and returns such sheet is drawn off to be dropped by the proper opening or release of the jaws on a delivery *g*, such as a band or chain. By the expression "sheet" is not only included single sheets, but also signatures of any required thickness. These parts thus far described are not new. The gripper or jaws are swung, as also opened and closed at suitable intervals, by proper mechanism.

A rock-shaft *h* carries a gripper-supporting arm *i* for the grippers to be swung to and from the sheets. A rod or connection *k* to a cam or crank on shaft *m* can be made to rock or oscillate the rock shaft or arm *i*.

In practice it has been found that at times instead of only one sheet or signature being taken or slipped from the bottom of the pile more than one sheet or signature would be withdrawn. Such objection can be overcome by applying a blast or blower. In the drawings is shown a blow or blast tube *o*. Such blast or its outlet or spout can have a valve *p* to regulate the outgoing blast of air. The blast of air being directed against the pile of sheets or signatures or against the edges of the bottom sheets will separate such sheets on their edge portions. As the suckers adhere to or bend down the lowermost sheet the blast prevents an upper sheet or sheets from sticking or adhering to such bottom sheet. Only the bottom sheet or signature being bent down or its edge freed from the pile and the oncoming gripper seizing or withdrawing only such one sheet or signature satisfactory work or single withdrawal of sheet for sheet from the pile is attained. In the drawings are also shown separators *q*. Each separator can be made as a screw run more or less into a front guide or other convenient point and made to project under the sheet pile a suitable distance. The extent of projection of the separator or stud under an edge of the pile can be regulated according to the gage or stiffness of the paper. Such separators or studs in connection with the air-blast prevent the suckers *e* from bending down any other except the lowermost sheet at a time. As a sheet is being carried to the conveyer and released by the gripper a presser-finger *r* forces or presses said sheet onto the delivery to be properly carried along. Such presser-finger is shown as a rod or wire extending from rock-shaft *s*, actuated by link or connection *u' t*, and arms *u* from the gripper-shaft *h*.

The partitions 2 can be formed of pieces of tin or other suitable material and secured or supported on an edge of the conveyer guide or channel 3 and on a rail or part of a front guide *d* or on the blast-tube *o* or other suitable point. The partitions are held up or a certain distance clear from the bottom or conveyer of the guide 3 to allow the sheets to be carried under the same by the conveyer; but said partitions prevent a sheet when carried or released by the gripper from sliding or being displaced laterally. The partitions can be set more or less apart, as required by the size of sheet.

A guide or wire 4, adjustably applied and bent into the conveyer-channel, tends to bend or guide a sheet carried by the gripper

downward or toward the conveyer. Such guide is sufficiently raised or clear from the conveyer to allow a sheet or signature to pass thereunder, but as it bends an oncoming sheet into the guide or conveyer channel it aids the sheet in correctly landing in place.

Gages are shown at 5 and at 6 which are adjustable, as by clamp or nut, so as to fit the sheet or signature. The lateral or side gages 6 have arms 7, carrying lateral separators 8. These lateral separators are carried by or adjusted with the side gages, and they can also be separately adjusted, being held by screws 9, which can be loosened to allow shifting of the separators. By having the separators suitably rounded or their contact-points free from sharp portions or angles these separators will not cut or injure a sheet or signature, while at the same time forming a hold for succeeding leaves or sheets.

A signal is shown at 10 in form of a lever pivoted at 11, Figs. 3 and 4, and is arranged to move or give warning when its gripper either misses a sheet or signature or takes an excess. This pivot 11 is mounted in the upper frame part *a'* between two bars 26 and 41, fixed parallel to one another along the machine. This signal has two lugs or dogs 12 and 14, and on the gripper-arm *i* is a dog 15, which is formed with or carried by a slide 16, movable on arm *i*. A pin-and-slot connection can hold the slide shiftably to the arm, the pin being shown at 17. This dog 15 is shifted or set by a lever 18, fulcrumed at 19 and pivoted to the slide 16, as shown at 20. A link 21 connects this lever 18 with an arm of the gripper or jaw *f*. (Shown in form of a lever fulcrumed at 22.) When the gripper is holding a sheet or signature, said gripper is open a certain extent and the link 21, with lever 18 and slide 16, are in such position that the dog 15 swings between the signal-dogs 12 and 14, thus clearing both and leaving the signal unaffected. If, however, the gripper has seized an excess of matter and is open to an excessive extent, the link 21 has pulled lever 18 so that the dog 15 will have been shifted and that on the swing of arm *i* said dog is brought against the signal-dog 12 and the signal is moved, whereby the operator or attendant is warned. If, on the other hand, the gripper has seized too little or has failed to seize anything, the jaws or gripper being closed the link 21 will have pushed lever 18 to shift dog 15 into position to swing against signal-dog 14. The signal is thus again actuated and is moved as well when the gripper has not seized enough or has failed to seize or is entirely shut, as when the gripper has taken an excess or the gripper-jaws are too far separated or excessively open.

It is noted that the arms of lever 18 are unequal, the longer one being connected to dog 15 and the shorter one to link 21. Also the link 21 connects with the end portion of the longer arm of the gripper-jaw *f*. This arrangement can be varied, but has been found practical, as thereby the motion of lug 15 is much greater than the movement of the gripping end of jaw *f* actuating said dog or lug 15. Even if the gripper is taking thin sheets or signatures and such gripper is not to any great extent held open by a grasped thin sheet, still the dog 15 will have been shifted sufficiently to clear dog 14 or pass between the signal-dogs 12 and 14 to clear the same. The dogs 12 and 14 are adjustable on the signal; but by reason of the excessive shift just explained relative to dog 15 the adjustment of dogs 12 and 14 is facilitated or need not be made with excessive nicety to be effective.

The signal 10 is shown with an arm 23, to the outer or free end of which is secured a spring 24, fastened to a suitable point 25. When the dog 15 starts the signal so as to move point 23 past the dead-center or past the line drawn through points 11 and 25, the spring 24 will give said signal motion to such an extent as to attract attention. The signal will thus give what might be called a "full" stroke or make a full movement. The signal is shown limited in its movement by the shaft *h* at one side and rod 26 at the other. The rod or bar 26 is fixed to the frame or side pieces of the device and carries a screw or stop 27, which can be adjusted so that as arm *i* brings sliding pin 28 to this stop 27 the pin 28 is caused to press on the upper arm of the toggle connection 29 and to bend or flex the toggle connection 29 to the position shown in Fig. 4 for the movable gripper-jaw *f* to be snapped or closed to the member or jaw *f'* by the spring 30. The jaw *f'* is shown cast or fixed to arm *i*. As the arm *i* swings toward the screw or suitably-adjusted stop 31 the toggle is actuated or straightened to open the gripper or sheet-withdrawing mechanism *f*.

The shaft *m* above referred to is driven by a train of gears 32, Fig. 1, and shaft 33, having the usual fast and loose pulleys 34.

A pair of miter-gears 35 and 36 drive gears 37, Fig. 6, to actuate the shaft 38 of one of the sprocket-wheels 39 of the chain secured to or forming part of the conveyer-belt *g*. Such chains are shown at 40 in Fig. 6.

What we claim as our invention, and desire to secure by Letters Patent, is—

1. A gathering-machine provided with a fixed sheet-support or delivery-board, a fixed front guide spaced from the board for enabling sheets to be set thereagainst in an overhanging position on the board, a fixed blast device directed against that edge of the lowermost sheet which is at the guide so as to separate or bend down the lowermost sheet, swinging grippers for withdrawing said lowermost sheet, a conveyer-belt for receiving the sheets from the grippers and sheet-guiding

plates between which the grippers swing and which are fixed above the belt a suitable distance for sheets or signatures to be carried past thereunder.

2. A gathering-machine comprising a conveyer, a set of grippers, a rock-shaft for the grippers provided with an arm, a link connected to the arm, a second rock-shaft extending along a side of the conveyer and having fixed bearings and an arm engaged by the link, and a set of pressers extended from the second rock-shaft toward a side of the conveyer so as to press down on the signatures therein.

3. A gathering-machine comprising a plain delivery-belt, a fixed guide or channel for the belt, and sheet-guiding plates fixed to the guide at suitable intervals to receive signatures therebetween and sufficiently far above the belt to allow signatures to be carried by the belt past underneath the plates.

4. A gathering-machine comprising a guide *d*, a blower-tube, a delivery-channel, a movable belt forming the bottom of the channel and sheet-guiding plates along the channel carried by the channel and the blower-tube, said guide-plates being extended across the channel to form fixed transverse partitions along the same.

5. A gathering-machine comprising sheet or signature withdrawing gripper-jaws, mechanism for actuating one of the jaws to come to open or closed position, a signal and signal-actuating lug and a lug-actuating lever linked to the last-named jaw independently of its opening and closing mechanism.

6. A gathering-machine comprising a gripper-jaw and an oscillating arm to which said jaw is fixed, a second jaw pivoted to the fixed jaw, a signal and signal-actuating lug sliding on the arm of the fixed jaw, a lug-actuating lever linked to one part of the pivoted jaw, and a jaw-opening and jaw-closing toggle connected to another part of the pivoted jaw.

7. A gathering-machine comprising a gripper and a signal with signal-actuating dog, arms for opening the gripper, a lever for setting the dog, and a link for connecting the lever to the gripper, said link and arms being connected at different points to the gripper and said lever having the arm connected to the dog of greater length than the other lever-arm.

8. A gathering-machine comprising a gripper composed of jaws, one of which is in the form of a lever with arms of unequal length, a carrying-arm for the gripper, a dog slidingly mounted on the carrying-arm, a lever having arms of unequal length and having its longer arm directly pivoted to the dog, and a link between the shorter arm of the lever and the longer arm of the lever forming one of the gripper-jaws.

9. A gripper having a signal-actuator, a signal actuated thereby, a pivot on which the signal is mounted, an arm extended from the pivot portion of the signal and an actuating-spring for the signal, said spring being attached to the free or outer end of said arm and extended past its inner end and secured so that as the arm swings the spring is carried to one side or another of the pivot.

10. In a gathering-machine, a gripper having a movable jaw, a swinging gripper-supporting arm, a signal-actuator slidingly mounted on the supporting-arm, a lever-and-link connection between the movable jaw and the signal-actuator, a pivoted signal-lever actuated thereby, an arm connected to and extending laterally from the pivot portion of the signal, and a spring connected to the arm for moving the lever as the arm is swung to one side of the lever pivot or fulcrum.

11. A gripper having a signal-actuator, a pivoted signal-lever actuated thereby and having an arm extended to one side of the pivot, a fixed stud at the opposite side of the pivot, and a spring connected to the arm and stud so that as the signal-actuator moves the free end of the arm past the pivot-point the spring will move the signal.

In testimony whereof we have hereunto set our hands in the presence of two subscribing witnesses.

GEORGE M. KENT.
CHARLES L. SMITH.

Witnesses:
EDWARD WIESNER,
GEORGE HULSBERG.