

Dec. 3, 1929.

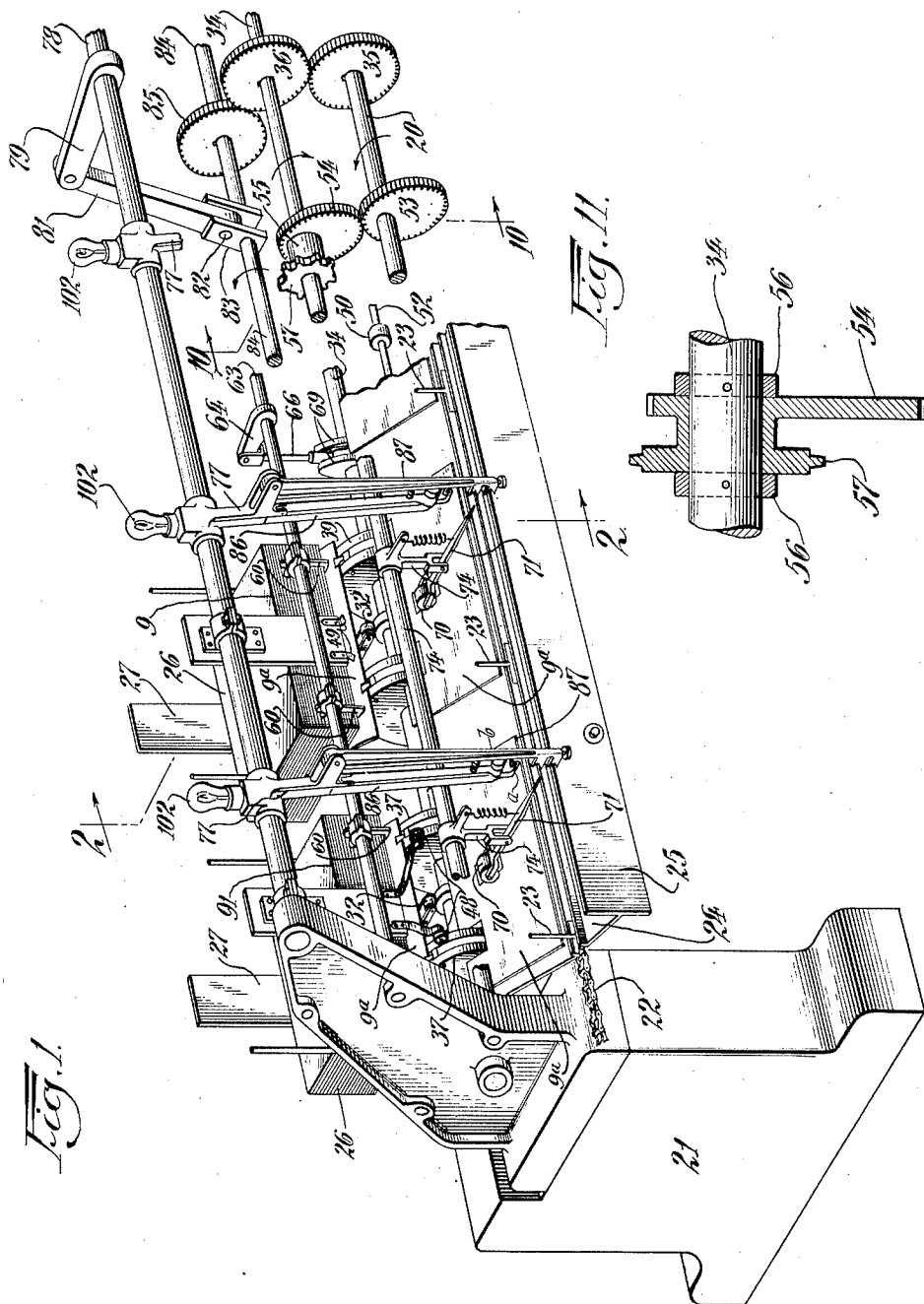
P. A. FRAZIER

1,738,180

SIGNATURE GATHERING MACHINE

Filed Aug. 1, 1928

7 Sheets-Sheet 1



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7 Sheets-Sheet 2

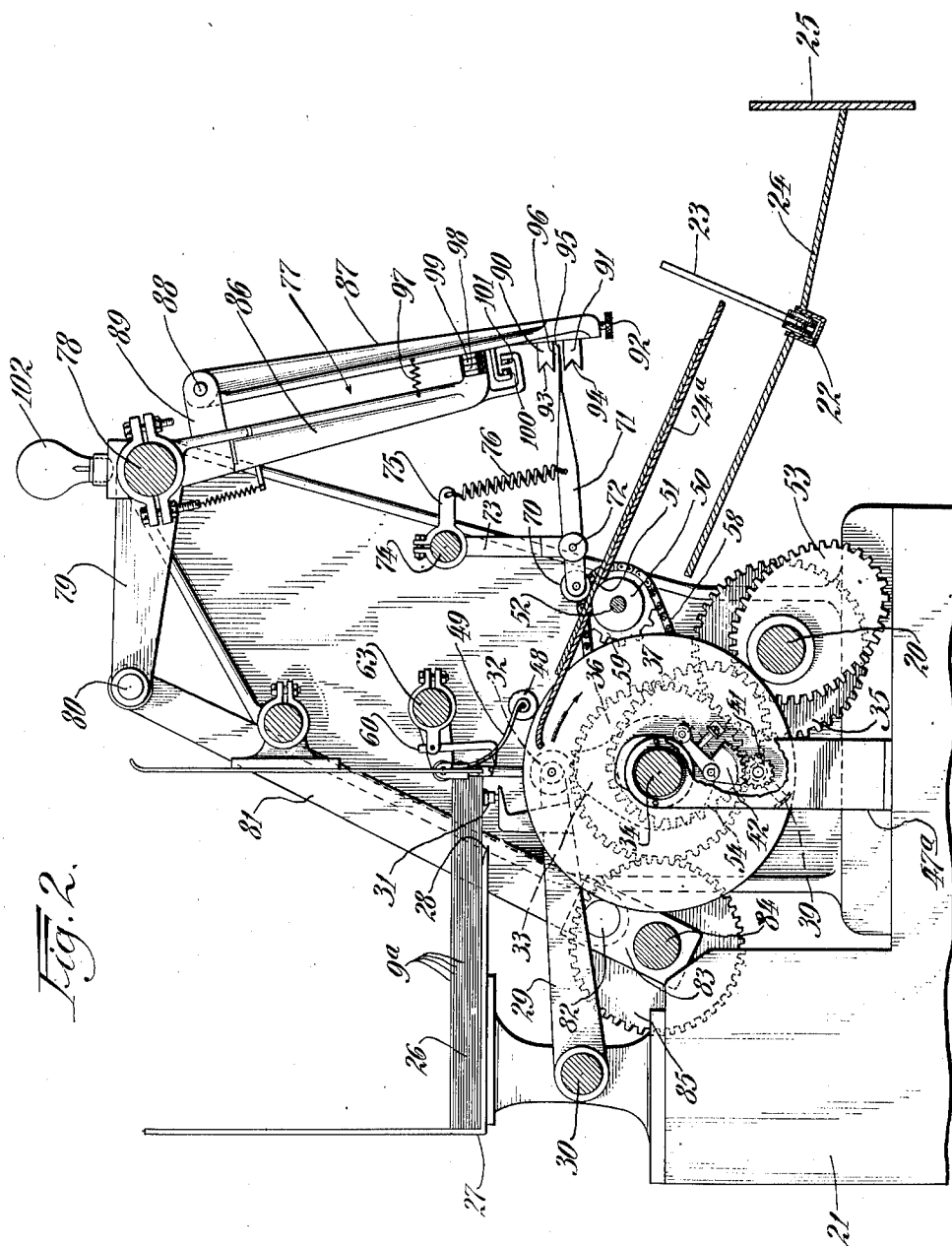


Fig. 2.

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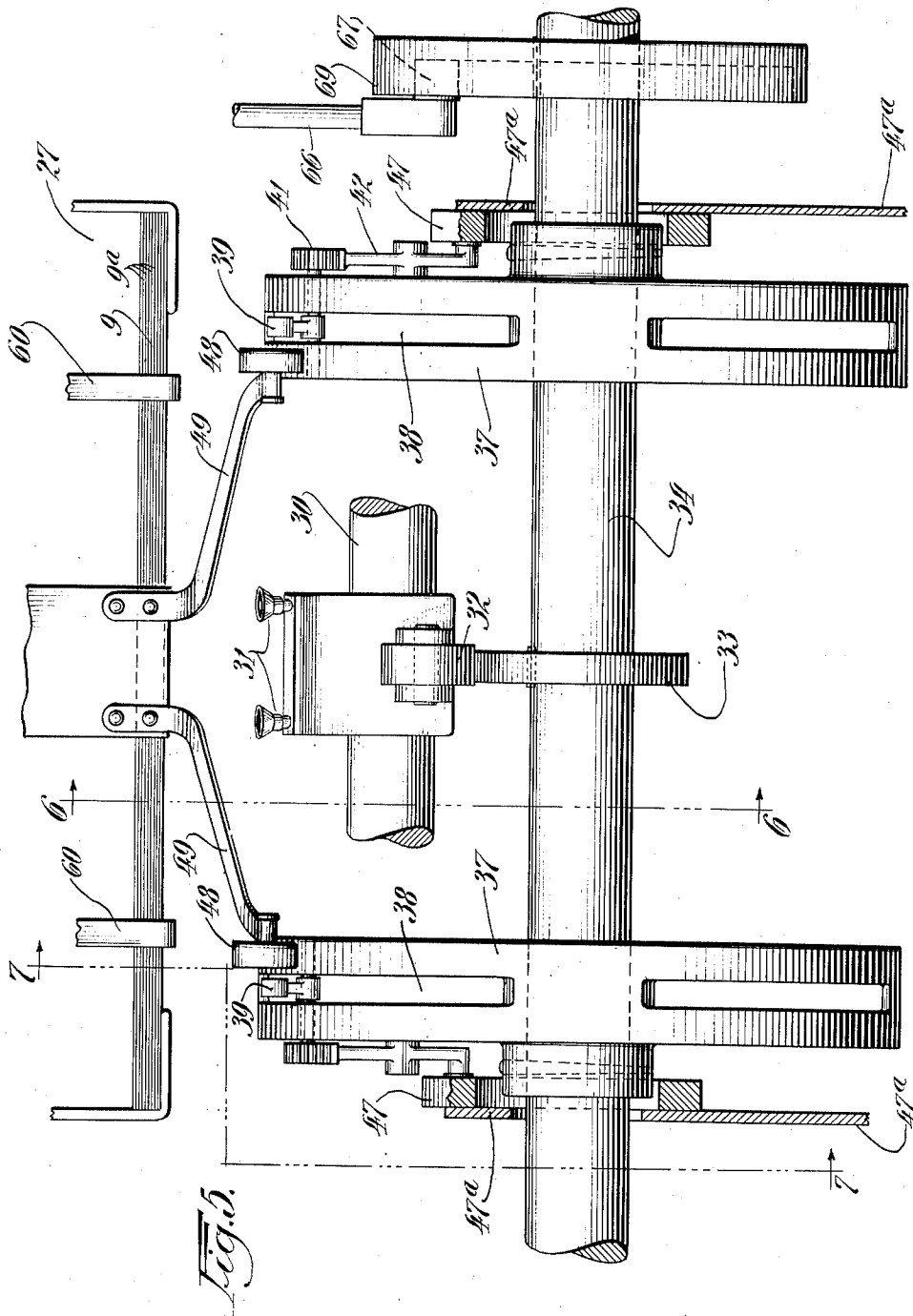
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7 Sheets-Sheet 4



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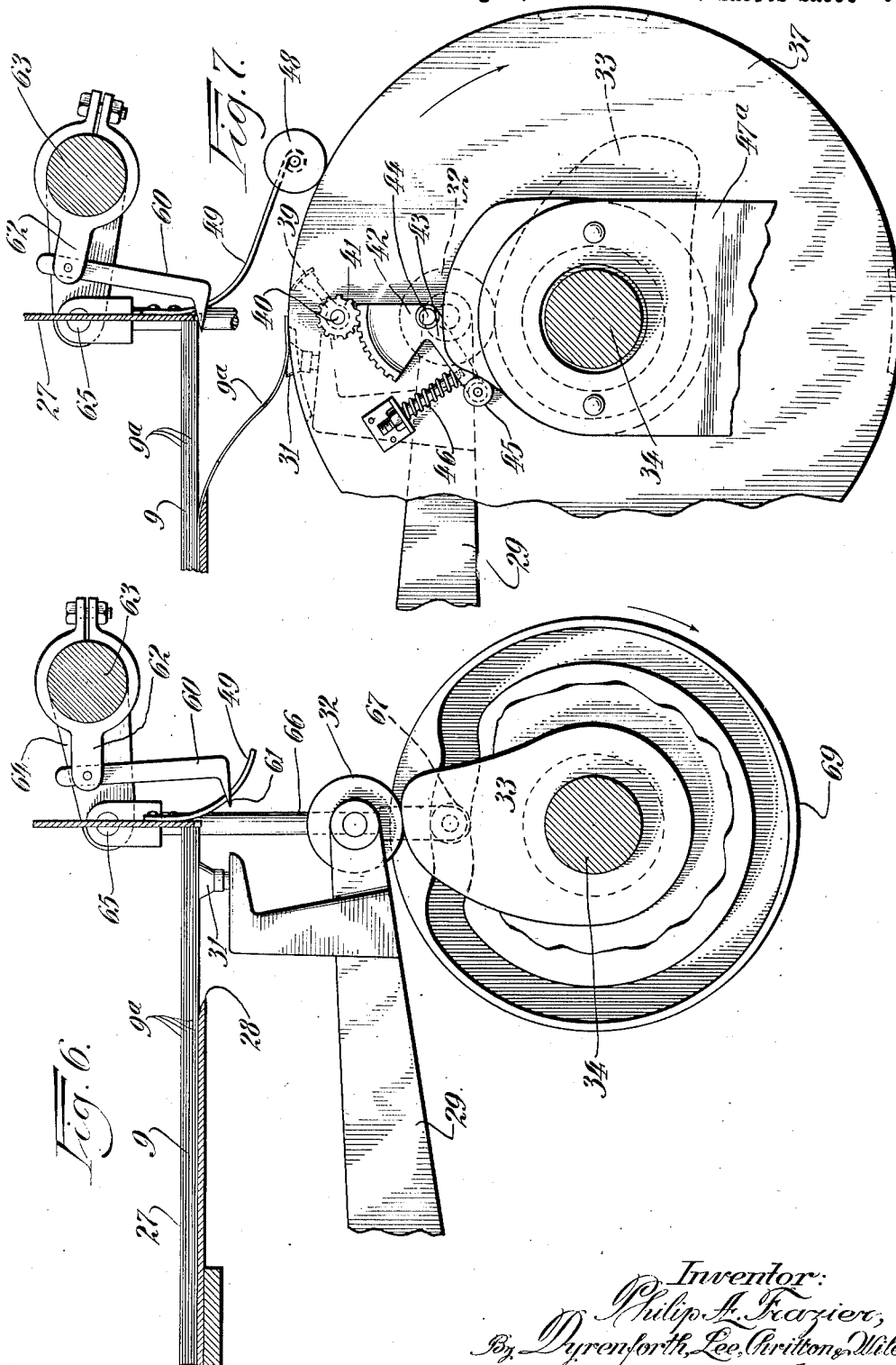
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SIGNATURE GATHERING MACHINE

Filed Aug. 1, 1928

7 Sheets-Sheet 5



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SIGNATURE GATHERING MACHINE

Filed Aug. 1, 1928

7 Sheets-Sheet 6

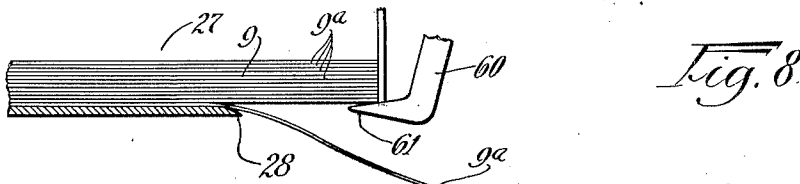


Fig. 8.

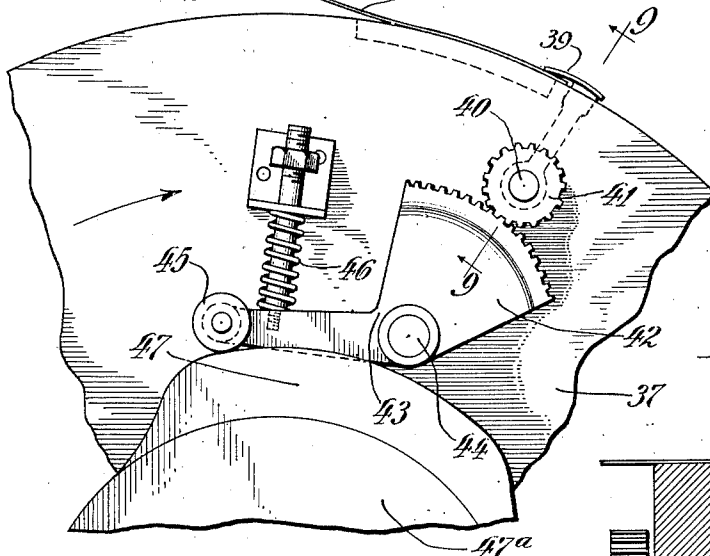


Fig. 9.

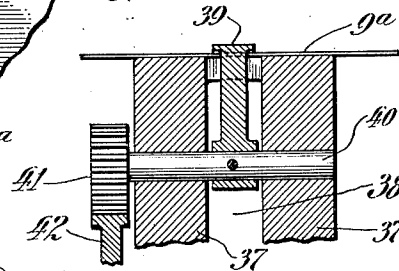


Fig. 10.

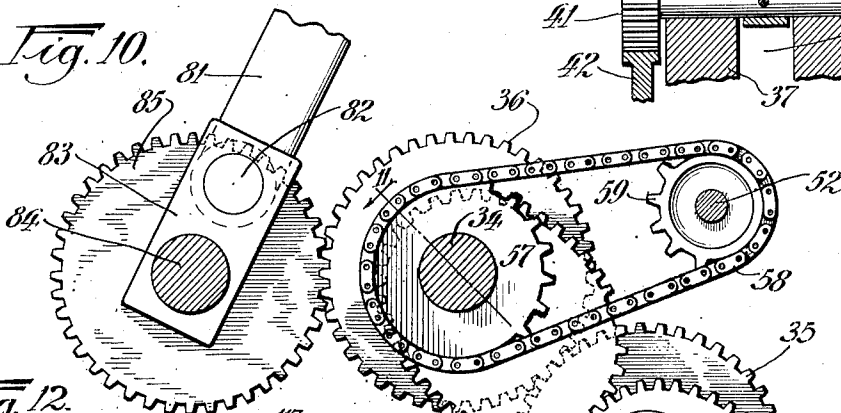
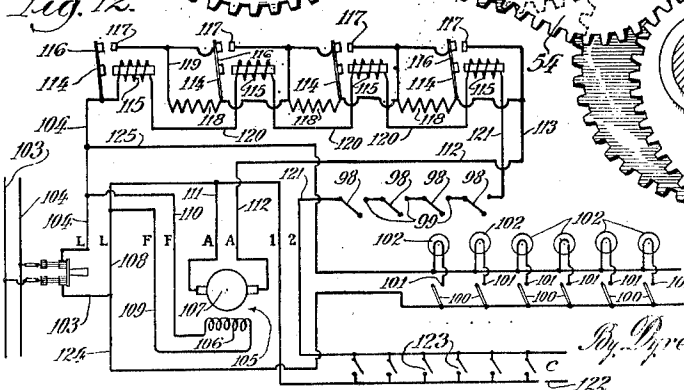


Fig. 12.



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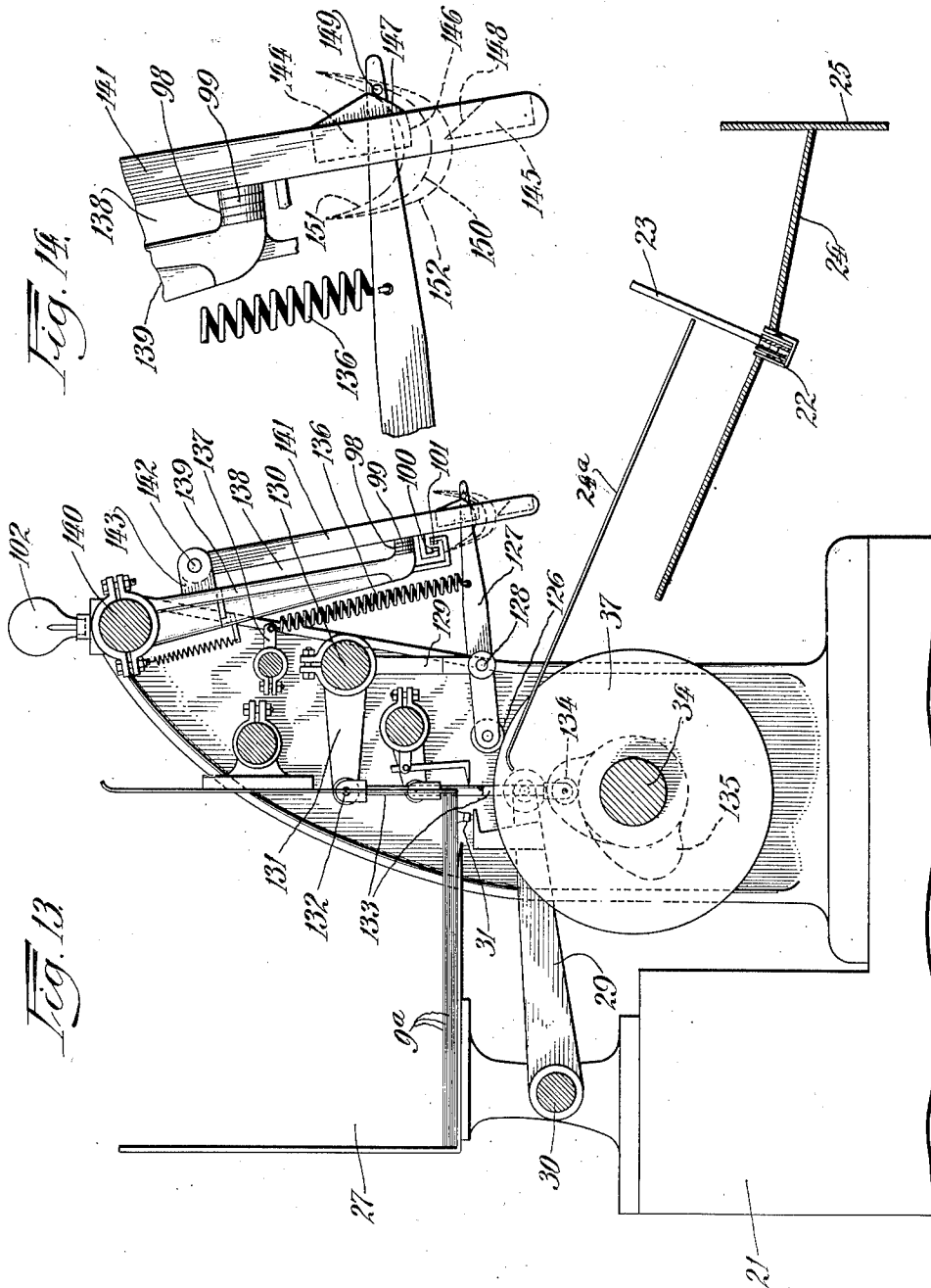
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SIGNATURE GATHERING MACHINE

Filed Aug. 1, 1928

7 Sheets-Sheet 7



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UNITED STATES PATENT OFFICE

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SIGNATURE-GATHERING MACHINE

Application filed August 1, 1928. Serial No. 296,798.

My invention relates to signature-gathering machines in which the signatures to be gathered together to form the books are located in piles at different points along the machine and mechanism is provided for gathering the signatures in succession and in proper order to form the books, my invention relating, more particularly, to the so-called rotary type of such machines designed for continuous operation.

One of the objects of my invention is to provide novel, simple and positively operating mechanism by which imperfect signatures, because of a lack of the full number of sheets or an excess thereof, and failure of delivery of signatures, will be detected and the machine will be caused to automatically stop to permit of the removal or rectification of the defective signature or the supplying of the missing signature.

Another object is to provide such a mechanism requiring relatively slight movement of its parts to the end that the minimum amount of vibration will be produced in the operation of the machine.

Another object is to provide improvements in the means for feeding the signatures from the piles thereof to the mechanism by which the signatures, upon becoming successively grouped together in the proper order, are moved along the machine, to the end that the signatures may be moved from the piles thereof to the position stated at a greater speed than hitherto possible and without resultant rebounding of the signatures and consequent non-alignment of the grouped delivered signatures, thereby increasing the capacity of the machine; and other objects as will be manifest from the following description.

Referring to the accompanying drawings:—

Figure 1 is a perspective, fragmentary, view of a signature-gathering machine embodying my improvements, this view showing an end only of the machine.

Figure 2 is an enlarged sectional view taken at the line 2—2 on Fig. 1 and viewed in the direction of the arrows, the parts of

the machine being shown in a position different from that shown in Fig. 1.

Figure 3 is a similar view with certain parts omitted showing the illustrated parts in another position.

Figure 4 is a similar fragmentary view showing the positions of the illustrated parts when a signature containing an excess number of sheets and thus imperfect, is withdrawn from the pile of signatures by the signature-delivery mechanism.

Figure 5 is an enlarged broken face view of signature-delivery mechanism forming a part of the machine, with the lowermost signature omitted.

Figure 6 is a section taken at the line 6—6 on Fig. 5 and viewed in the direction of the arrow.

Figure 7 is a broken section taken at the irregular line 7—7 on Fig. 5 and viewed in the direction of the arrow, the parts being shown in a different position.

Figure 8 is a view like 7 showing still another position of the mechanism.

Figure 9 is a broken section taken at the line 9—9 on Fig. 8 and viewed in the direction of the arrows.

Figure 10 is a fragmentary elevational view taken at the line 10—10 on Fig. 1 and viewed in the direction of the arrows.

Figure 11 is a sectional detail of a part of the mechanism shown in Fig. 10.

Figure 12 is a diagrammatic view of the electric circuits by which the operation of the machine is controlled.

Figure 13 is a view like Fig. 2 of a modification of the means controlling the stopping of the machine when a signature fails of delivery or a signature having an excess, or a deficiency, of sheets is delivered; and

Figure 14, a similar view of a portion of the mechanism of Fig. 13.

The particular machine shown, as to its general features, comprises a drive shaft 20 journaled in the frame 21 of the machine to extend lengthwise thereof and having driving connection (in a manner not shown but well known in the art) with an endless conveyor chain 22 extending along the front of the machine and provided at intervals with

upwardly-extending lugs 23 forming pushers which operate to advance the signatures, as they are assembled, along the machine, to the mechanism (not shown) for binding the signatures together, the upper reach of the conveyor-chain 22 travelling in a trough 24 the front wall 25 of which forms a stop against which the signatures abut when delivered to the trough, as hereinafter described, to be acted on by the conveyor chain 22.

The several piles of signatures to be assembled successively to form the books, are represented at 26, the showing of certain of these piles being omitted, these piles being located in holders 27 arranged at intervals along the back of the machine and having outlets 28 at the forward edges of their bottom portions (Fig. 2) for the withdrawal therefrom of the lowermost sheets.

In front of each holder 27 and inclining downwardly and forwardly therefrom and overlapping, at its front edge, the rear edge-portion of the trough 24, is a plate 24^a forming a support along which the signatures delivered thereto are fed to the trough.

The feeding of the signatures from each pile thereof, (individual ones of which signatures are represented at 9^a) to the trough in properly timed relation to the movement of the conveyor 22 is effected by suction means which engage the underside of the lowermost signature and draw its forward edge down through the outlet 28 below it, and deliver it to a clamp rotary-feeder which latter in turn delivers it to another rotary feeder which completes the delivery movement.

Each suction feeder referred to comprises an arm 29 connected at its rear end to a rock shaft 30 journaled on the frame of the machine and provided at its forward end with suction cups 31 connected, in accordance with common practice, with a source (not shown) of vacuum.

The front end of arm 29 carries a roller 32 which rides on a cam 33 secured to a shaft 34 journaled in the frame of the machine and driven from the drive shaft 20 by gears 35 and 36 rigid on these shafts, this mechanism operating to draw down the forward edge of the lowermost signature 9^a through the outlet 28.

The mechanism to which the suction-feeder delivers the signature comprises a pair of disks 37 rigidly secured to the shaft 34 in spaced relation and at opposite sides of the adjacent arm 33 and plate 24^a, each disk 37 containing in a slot 38 in its periphery a gripper-jaw 39 fixed on a shaft 40 journaled in the disk and having a pinion 41 on its outer, protruding, end, the jaws 39 extending radially beyond the peripheries of the disks.

The pinion 41 meshes with a gear-segment 42 forming one end of a bell-crank lever 43 pivoted at 44 on the disk 37, the other end of this lever being provided with a roller 45

pressed by a spring-device 46 on the disk against the periphery of a stationary cam 47 surrounding the shaft 34, and supported from a plate 47^a rising from the base-portion of the frame 21 these parts being so proportioned and arranged that upon the delivery of the signature to the disks, the jaws 39 are moved by the gear-segment 42 in a direction counter to the rotation of the disks and grip the forward edge of the signature at its opposite ends, the continued rotation of the disks 37 drawing the signature from the holder.

The jaws 39 remain clamped to the signature during a small portion only of the rotation of the disks, but sufficiently long to move the signature into gripping engagement with idler rollers 48 mounted on spring arms 49 secured to the front wall of the adjacent holder 27, which presses them toward the peripheries of the disks 37 beneath them whereby the latter serve to feed the signature forwardly.

The mechanism to which the disks 37 thus deliver the signature comprises a roll 50 extending upwardly, at its periphery, through a slot 51 in the adjacent plate 24^a and located midway between the sides of the adjacent signature-holder 27, and roller mechanism hereinafter described for forcing the signature against the roller 50. The rollers 50, one for cooperation with each holder 27, are secured to a shaft 52 actuated from the shaft 20 by mechanism hereinafter described and operating to cause the signatures to be advanced rapidly toward the front wall of the trough throughout the greater portion of their movement but with a slowing down of their speed before they engage said wall.

The mechanism just referred to comprises a pair of elliptical intermeshing gears 53 and 54, the gear 53 being rigid with the shaft 20 and the gear 54 rigid with a sleeve 55 journaled on the shaft 34 and confined thereon by collars 56 on this shaft. It also comprises a sprocket 57 rigid with the sleeve 55 connected by a sprocket chain 58 with a sprocket 59 on the shaft 52, thereby producing irregular drive of the shaft 52 as hereinabove stated.

The machine is above shown as comprising means operating to prevent the signatures above the one being withdrawn from the holder, from becoming displaced in the holder, these means comprising a finger 60, having a rearwardly-extending sharpened stop-portion 61, secured at its upper end to an arm 62 on a rock-shaft 63 journaled in the frame of the machine and having a lever portion 64 pivotally connected at 65 to the upper end of a link 66 the lower end of which is provided with a roller 67 which travels in similar cam-grooves 68 on the opposed surfaces of disks 69 secured to the shaft 34, the parts being so proportioned and arranged that as the suction mechanism begins to lower the lowermost signature in the holder the portion 61

of the finger 60 is projected rearwardly beneath the next lowermost signature as shown in Fig. 7, withdrawing from this position before the suction mechanism again operates against the next signature to be withdrawn.

The roller mechanism above referred to and operating to press the signature into driving engagement with the roller 50, according to the showing in Figs. 1 to 12, inclusive, comprises a roller 70 on the rear end of a lever 71 pivoted between its ends, at 72, on an arm 73 depending from a rod 74 fixed in the machine-frame and provided with a horizontal fixed arm 75 to which, and to the forward end of the lever 71, a spring 76 is connected which operates to yieldingly force the roller 70 toward the roller 50 for producing the pressure necessary for driving the signature by the roller 50.

The machine also comprises means whereby should the signature-delivery mechanisms above described, fail to deliver a signature, or should a signature operated on by this mechanism contain an excess, or a deficiency, of sheets the machine will automatically stop and a signal will be displayed indicating the station at which there was failure of delivery of a signature or the delivery of an imperfect one.

These means comprise the several levers 71, rollers 50 and levers 77, one for each lever 71, rigid on a rock-shaft 78 journaled in the frame of the machine and actuated by an arm 79 thereon pivoted at its rear end, as indicated at 80, to the upper end of a link 81 connected at its lower end to the crank-pin 82 of a crank 83 carried by a shaft 84 journaled in the frame of the machine and driven from the gear 36 by a gear 85 on the shaft 84.

Each lever 77 is formed of two lever-sections 86 and 87, the section 86 being rigid with the shaft 78 and the section 87 pivoted at its upper end, at 88, to an arm 89 on section 86, the lower end of section 87 being provided with a pair of spaced apart rearwardly-extending blocks 90 and 91, the lower one of which is adjustable toward and away from the other thereof by a screw 92.

The rear faces of the blocks 90 and 91 contain V-shaped recesses 93 and 94, respectively, and these blocks are so spaced apart that as the levers 77 are swung downwardly and rearwardly after signatures have become positioned between the rolls 70 and 50, the forward thin extremities 95 of the levers 71 will be received within the spaces 96 between adjacent blocks, provided the signatures so positioned contain the proper number of sheets, as shown in Fig. 2, but if they do not, either because of an excess or deficiency of sheets, the forward edge of the particular one of the levers 71 associated with such imperfect signature will be in such position that it will enter the recess 93 or 94 as the case may be, as shown in Fig. 4 when there is an

excess of sheets, or will enter recess 93 if no signature is delivered, and will form a stop preventing continued rearward swinging of the lever-section 87, whereupon lever section 86 will continue its rearward movement against the action of the spring 97 yieldingly normally holding these lever sections together in the position shown in Fig. 2.

In the particular illustrated embodiment of my invention the machine is electrically controlled and the sectional lever mechanisms 77 are provided to discontinue the supplying of operating current to the machine and flash a signal, in case the lever-sections of any one of the mechanisms 77 be operated relative to each other as above stated by failure of delivery of a signature or the delivery of an imperfect one thereof, the lever sections 86 and 87 to this end being provided with electrical contacts 98 and 99, respectively, and 100 and 101, respectively, the contacts 98 and 99 being normally in engagement and the contacts 100 and 101, which control electric lamps 102, being normally disengaged.

In Figure 12 I have illustrated a circuit arrangement which may be used in controlling the operation of the machine. In this arrangement the line wires are represented at 103 and 104 and the motor for driving the shaft 20 at 105, the field winding and armature being shown at 106 and 107, respectively.

The field winding 106 is continually in circuit with the line through a wire 108 connected with line wire 103 and a wire 109 connected with wire 108, and a wire 110 connected with wire 104. The armature winding is connected to line wire 103 by wire 111 connected with wire 108, and with line wire 104 by a wire 112 connected with a wire 113 having interposed between it and the wire 104 a series of step-up switches 114.

Each switch 114 comprises a solenoid 115 and a contact-arm 116 cooperating with a fixed contact 117, the contacts 117 and contact arms 116 being arranged in series with the wires 113 and 104, the construction and arrangement of the several switches being such, as is well understood in the art, that the air-gaps between the cores of the solenoids and the contact arms 116 cooperating therewith, are of progressively increasing lengths from the left to the right in Fig. 12 for the successive closing of these switches when the solenoids are simultaneously energized.

The control mechanism also comprises a series of resistance coils 118 arranged in series and connected at one end of the series with the wire 113 and at the other end, by a wire 119, with the stationary contact 117 of the first of the switches to close, the stationary contact 117 of the next switch being connected with the series of coils 118 between the coil at the left-hand side of Fig. 12 and

the one next thereto and the stationary contact 117 of the next switch being connected with the series of coils 118 between the second and third one of said coils 118.

5 The solenoids 15 are connected in series by wires 120 one end of this series being connected with the wire 104 and its opposite end with a wire 121 between which latter and wire 122 manually-operated starting
10 switches 123 are arranged in parallel, the wire 122 being connected with the wire 108. Thus when any one of the switches 123, which are arranged at intervals along the front of the machine, is operated current is supplied
15 to all of the solenoids 115 and the switches 114 are thereby closed in succession to supply current to the armature 107 at a gradually increasing rate due to the successive cutting out of the resistance coils 118.

20 The various switches on the detector lever-mechanism 77 and comprising the contacts 98 and 99, are shown as interposed in series in the wire 121, all of them being normally in closed condition, though they are shown as all
25 open in Fig. 12 to more clearly indicate that they are switches. Thus when any one of these switches is opened as by the failure of delivery of a signature, or the delivery of an imperfect signature, the current to the solenoids 115 is broken and the switches 114
30 move to open condition and the motor stops.

The circuit arrangement for the flashing of signals as hereinabove mentioned comprises wires 124 and 125 connected with the
35 wires 103 and 104, respectively, and across which the several lamps 102 and the contacts 100 and 101 on the detector lever-mechanisms 77 are arranged in parallel, these contacts, in the normal positions of the lever mechanisms
40 77, being disengaged. Thus when any of the signature-delivering mechanisms fails to deliver a signature or delivers an imperfect one, the contacts 100 and 101 on the particular detector lever-mechanism 77 which cooperates
45 with such delivery mechanism engage and cause the lamp at this detector device to become energized and serve as a signal to the operator.

Referring now to the modification of the
50 detector means shown in Figs. 13 and 14, the machine shown is the same as that of the preceding figures except for the construction of the detector means, those parts of the machine represented in these figures and corresponding
55 with the parts of the construction shown in the preceding figures being given the same numerals.

In this construction the pressure roller for cooperation with the disk 37, and represented
60 at 126 is journaled on the rear end of a lever 127 fulcrumed at 128 on one end of an arm 129 rigid on a rock shaft 130, the latter being provided with a rearwardly extending arm 131 and pivotally connected at 132 with
65 the upper end of a rod 133 provided at its

lower end with a roller 134 bearing against the periphery of a cam 135 mounted on the shaft 34, this cam operating to rock the shaft 130 and move the lever 127 back and forth with the roller 126 in contact with the signature between it and the disk 37 when the signature is delivered into such interposed position, a spring 136 connected at one end with a stationary member 137 on the machine and at its lower end with the forward end of the lever 127 operating to cause the roller 126 to be yieldingly pressed toward the disk 37.

This modified construction also comprises an arm structure 138 comprising an arm 139 rigidly connected at its upper end with a stationary shaft 140 secured in the frame of a machine; and a second, arm section 141 pivotally connected at its upper end, as indicated at 142, to a forwardly extending lug 143 on the arm section 139, the lower end of the arm section 141 extending below the lower end of the arm section 139.

The arm sections 139 and 141 carry the normally engaged contacts 98 and 99 and the normally disengaged contacts 100 and 101 which serve the same purpose as the corresponding contacts of the construction shown in the preceding figures of the drawing.

The arm section 141 at its lower end contains laterally extending bosses 144 and 145 vertically spaced apart, the undersurface of the boss 144 being preferably shaped as shown to provide the lower terminal surface 146 which is slightly convexed and merges into a more or less abruptly, forwardly, and upwardly extending surface 147. The upper surface of the boss 145 is downwardly and forwardly inclined as represented at 148.

The parts described are so constructed and arranged that in the movement of the lever 127 back and forth in contact with the signature interposed between it and the disk 37 the lever 127 moves, at a laterally projecting pin 149 thereon, in a direction transverse of the arm section 141. When a signature containing the proper number of sheets is delivered between the roller 126 and disk 37, the path through which the pin 149 moves, in the back and forth movements of the lever 127, is that shown by the dotted line 150 and thus, in such movement, the arm section 141 is not disturbed. However, should the signature be imperfect because it contains an excess, or a deficiency of sheets, the path of movement of the pin 149 will be such that in its forward movement it will strike one or the other of the bosses 144 and 145 as the case may be. Should there be a deficiency of sheets the pin 149 will strike the boss 144 and in case of an excess of sheets will strike the boss 145. The dotted lines 151 and 152 indicate paths which the pin 149 will follow in case of a deficiency of one sheet and an excess of one sheet, respectively.

Also should no signature be delivered be-

tween the roller 126 and the disk 37 in the operation of the sheet-delivering mechanism, the pin 149 will strike the boss 144.

Thus if there is a failure of the delivery of a signature or the delivery of an imperfect signature the arm section 141 will be rocked forwardly and upwardly thereby separating the contacts 98 and 99 and causing the contacts 100 and 101 to engage with the results as explained in connection with the construction shown in the preceding figures of the drawing.

It will be understood from the foregoing description that detector mechanism constructed in accordance with my invention involves relatively slight movement of its parts, thereby producing the minimum vibration in the operation of the machine.

Furthermore, the machine is caused to present relatively great capacity, by reason of the speed at which the signatures are delivered to the conveyor mechanism 22, the construction of the delivery mechanism, to provide for the slowing down of the speed of the sheet in its final delivery against the front wall 25 of the trough, permitting of the high initial speed of the sheet.

While I have illustrated and described certain particular constructions constituting embodiments of my invention, I do not wish to be understood as intending to limit it thereto as the same may be variously modified and altered without departing from the spirit of my invention.

What I claim as new, and desire to secure by Letters Patent, is:

1. In a signature-gathering machine, the combination of driving means for the machine, conveyor-means, mechanisms for delivering signatures to said conveyor-means from separate piles of signatures and comprising feed rolls, and means controlled by certain of said feed rolls, respectively, for effecting discontinuation of the operation of said first-named means upon delivery of an imperfect signature by any one of said signature-delivering mechanisms.

2. In a signature-gathering machine, the combination of driving means for the machine, conveyor-means, mechanisms for delivering signatures to said conveyor-means from separate piles of signatures and comprising feed rolls, and means cooperating with said signature-delivering mechanisms, respectively, for signalling the operator of the machine upon delivery of an imperfect signature by any one of said signature-delivering mechanisms.

3. In a signature-gathering machine, the combination of driving means for the machine, conveyor-means, mechanisms for delivering signatures to said conveyor-means from separate piles of signatures and comprising feed rolls, and means cooperating with said signature-delivering mechanisms,

respectively, for effecting discontinuation of the operation of said driving means and signalling the operator of the machine upon delivery of an imperfect signature by any one of said signature-delivering mechanisms.

4. In a signature-gathering machine, the combination of driving means for the machine, conveyor-means, mechanisms for delivering signatures to said conveyor-means from separate piles of signatures, and electrical means cooperating with said signature-delivering mechanisms, respectively, for interrupting the operation of said driving means and signalling the operator of the machine upon delivery of an imperfect signature by any one of said signature-delivering mechanisms.

5. In a signature gathering-machine, the combination of driving means for the machine, conveyor-means, mechanisms for delivering signatures to said conveyor-means from separate piles of signatures and comprising feed rolls, members between which and certain of said feed rolls the signatures become interposed in the signature-delivering operations, said members being movably supported and the positions occupied by them determined by the thicknesses of the signatures engaged thereby, and means cooperating with said members, respectively, for effecting discontinuation of the operation of said driving means upon delivery of an imperfect signature by any one of said signature-delivering mechanisms.

6. In a signature-gathering machine, the combination of driving means for the machine, conveyor-means, mechanisms for delivering signatures to said conveyor-means from separate piles of signatures and comprising feed rolls, members between which and certain of said feed rolls the signatures become interposed in the signature-delivering operations, said members being movably supported and the positions occupied by them determined by the thicknesses of the signatures engaged thereby, and means cooperating with said members, respectively, for signalling the operator of the machine upon delivery of an imperfect signature by any one of said signature-delivering mechanisms.

7. In a signature-gathering machine, the combination of driving means for the machine, conveyor-means, mechanisms for delivering signatures to said conveyor-means from separate piles of signatures and comprising feed rolls, members between which and certain of said feed rolls the signatures become interposed in the signature-delivering operations, said members being movably supported and the positions occupied by them determined by the thicknesses of the signatures engaged thereby, and means cooperating with said members, respectively, for effecting discontinuation of the operation of said driving means and signalling the operator of the machine upon delivery of an imperfect signature

by any one of said signature-delivering mechanisms.

8. In a signature-gathering machine, the combination of driving means for the machine, conveyor-means, mechanisms for delivering signatures to said conveyor-means from separate piles of signatures and comprising feed rolls, members between which and certain of said feed rolls the signatures become interposed in the signature-delivering operations, said members being movably supported and the positions occupied by them determined by the thicknesses of the signatures engaged thereby, and movable control members cooperating with said first-named members, respectively, and the positions of which are controlled by said first-named members when engaging with imperfect signatures.

9. In a signature-gathering machine, the combination of driving means for the machine, conveyor-means, mechanisms for delivering signatures to said conveyor-means from separate piles of signatures and comprising feed rolls, members between which and certain of said feed rolls the signatures become interposed in the signature-delivering operations, said members being movably supported and the positions occupied by them determined by the thicknesses of the signatures engaged thereby, and a series of swingably-supported members operated in timed relation to said signature-delivering mechanisms and each formed of relatively movable sections, one section of each of said last-named members cooperating with one of said first-named members and its position relative to the other of said sections being controlled by the cooperating one of said first-named members when the latter engages with an imperfect signature.

10. In a signature-gathering machine, the combination of driving means for the machine, conveyor-means, mechanisms for delivering signatures to said conveyor-means from separate piles of signatures and comprising feed rolls, members between which and certain of said feed rolls the signatures become interposed in the signature-delivering operations, said members being movably supported and the positions occupied by them determined by the thicknesses of the signatures engaged thereby, a series of levers fulcrumed on the machine and operated in timed relation to said signature-delivering mechanisms and each formed of a lever-section at which the lever is fulcrumed and a second lever-section fulcrumed on said first-referred-to lever-section, said second lever-section cooperating with one of said members and its position relative to said first-named lever-section being controlled by the cooperating one of said members when the latter engages with an imperfect signature.

11. In a signature-gathering machine, the combination of driving means for the ma-

chine, conveyor-means mechanisms for delivering signatures to said conveyor-means from separate piles of signatures and comprising feed rolls, arms having portions between which and certain of said feed-rolls the signatures become interposed in the signature-delivering operations, said members being movably supported and the positions occupied by them determined by the thicknesses of the signatures engaged thereby, a series of swingably-supported members operated in timed relation to said signature-delivering mechanisms and each formed of relatively movable sections, one section of said members cooperating with another portion of said arm and its position relative to the other of said sections being controlled by the cooperating one of said arms when the latter engages with an imperfect signature.

12. In a signature-gathering machine, the combination of driving means for the machine, conveyor-means, mechanisms for delivering signatures to said conveyor-means from separate piles of signatures and comprising feed rolls, rock-members between which and certain of said feed rolls the signatures become interposed in the signature-delivering operations, the positions occupied by said rock-members being determined by the thicknesses of the signatures engaged thereby, and a series of swingably-supported members operated in timed relation to said signature-delivering mechanisms and each formed of relatively movable sections, one section of each of said last-named members cooperating with one of said first-named members and its position relative to the other of said sections being controlled by the cooperating one of said first-named members when the latter engages with an imperfect signature.

13. In a signature-gathering machine, the combination of a rock-member, a second member fulcrumed on said rock-member and having a portion into engagement with which the signatures move and the angular position of which is controlled by the thicknesses of the signatures engaging therewith, means for actuating said rock-member when engaged with a signature, and a control-device comprising a movable portion cooperating with said second member and the position of which is controlled by said second member when engaging an imperfect signature.

14. In a signature-gathering machine, the combination of driving means for the machine, conveyor-means, mechanisms for delivering signatures to said conveyor-means from separate piles of signatures and comprising positively driven feed rolls, movably supported members having rolls and between which and certain of said feed rolls the signatures become interposed in the signature-delivering operations, the positions occupied by said members being determined by the

thicknesses of the signatures engaged thereby, and means cooperating with said members, respectively, for effecting discontinuation of the operation of said driving means upon delivery of an imperfect signature by any one of said signature-delivering mechanisms.

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