C. D. CURRY.

SIGNATURE INSETTING MACHINE.

APPLICATION FILED MAY 27, 1914.

1,202,809.

Patented Oct. 31, 1916.

6 SHEETS—SHEET 1.

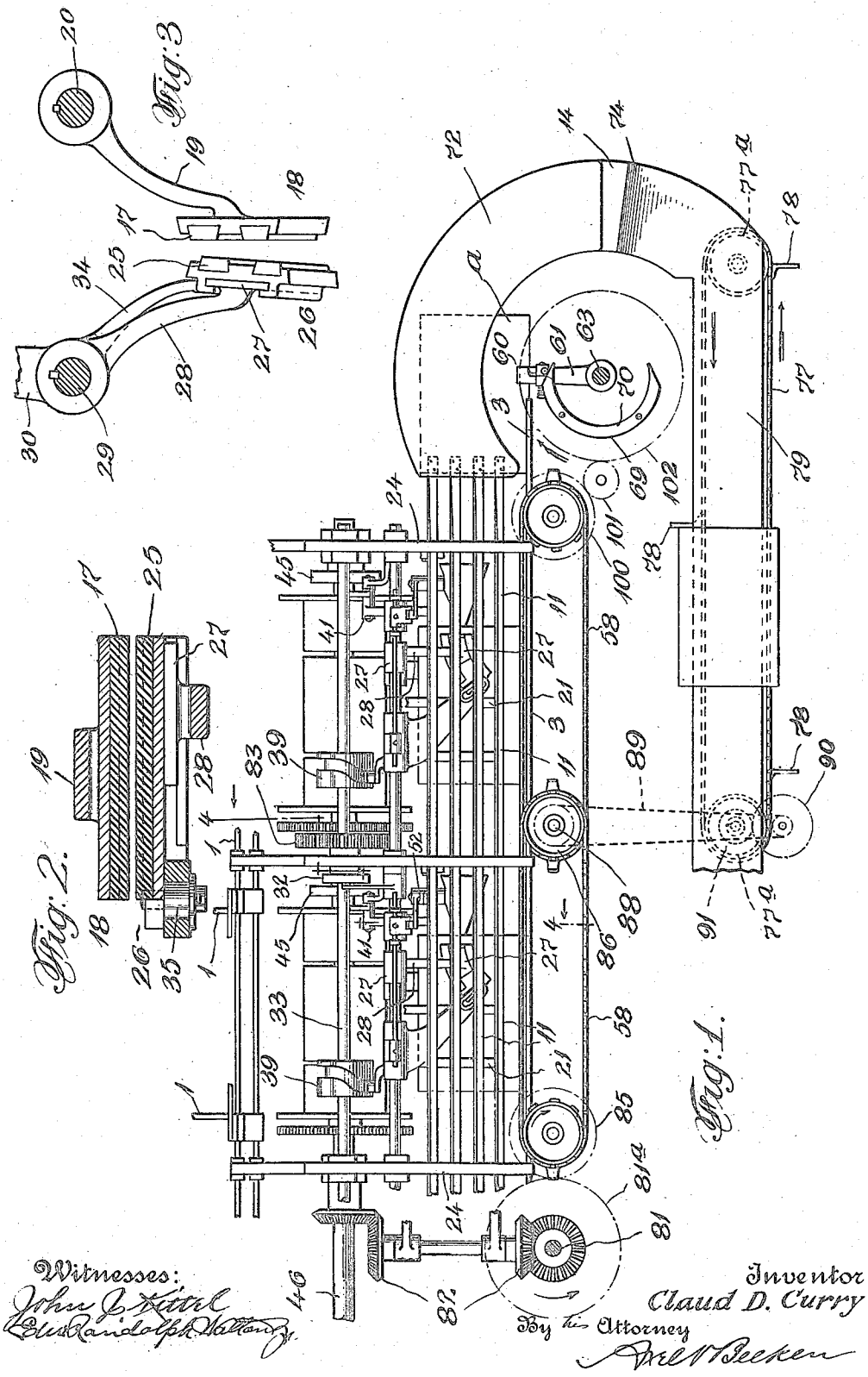


Fig. 1.

Fig. 2.

Fig. 3.

Witnesses:

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6 SHEETS—SHEET 2.

Fig. 4.

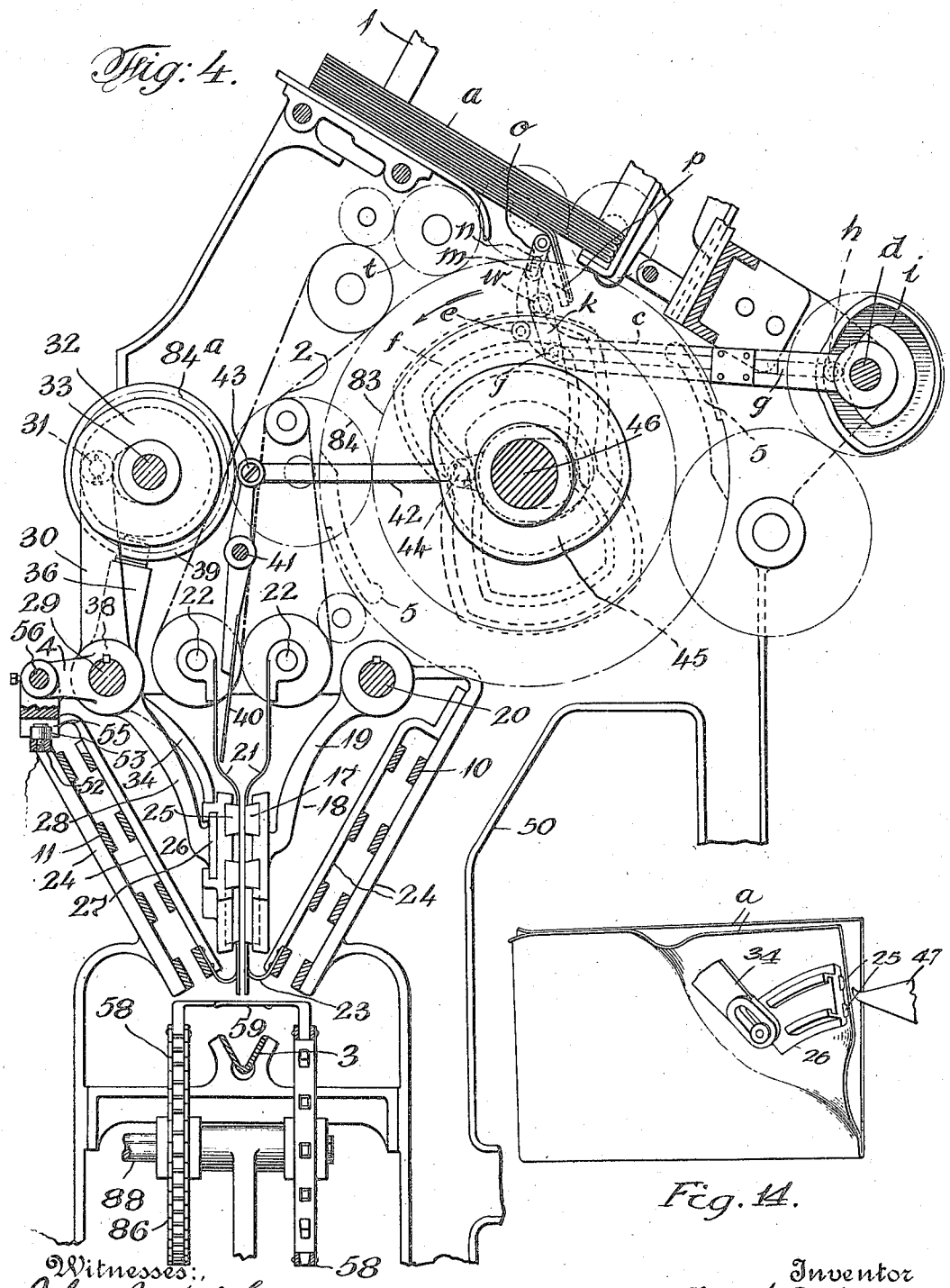


Fig. 14.

Witnesses:

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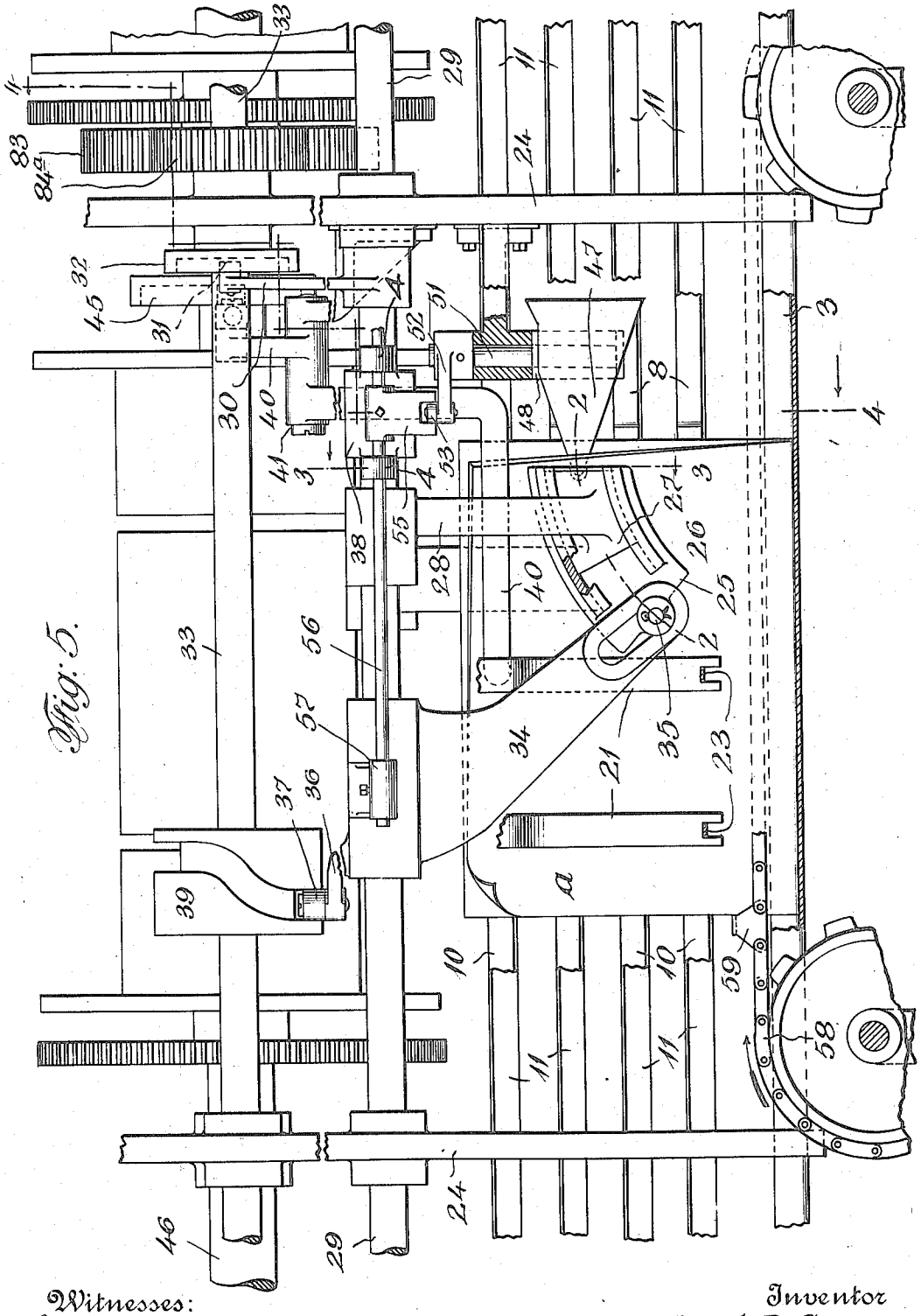


Fig. 5.

Witnesses:

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6 SHEETS—SHEET 4.

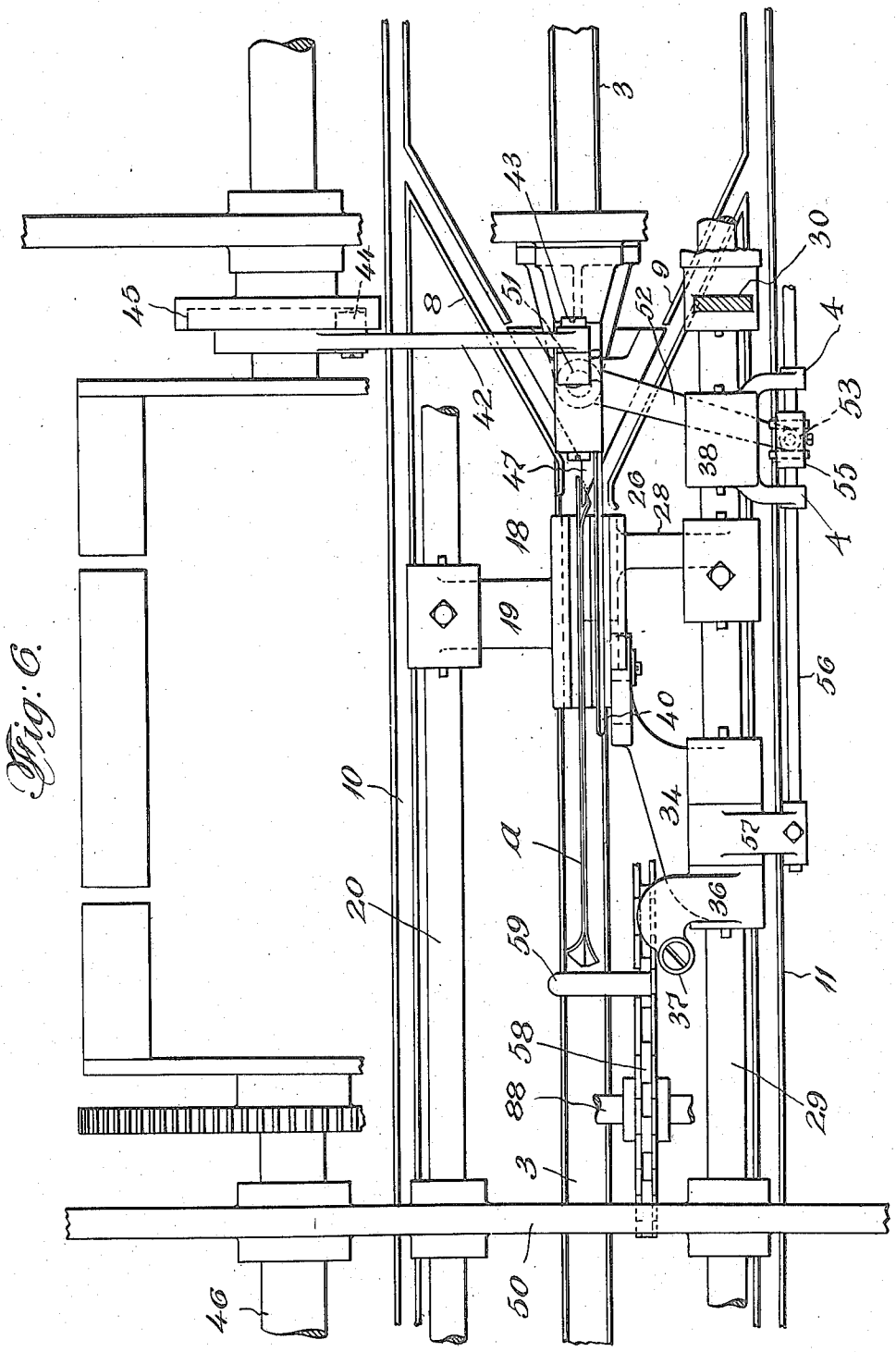


Fig. 6.

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6 SHEETS—SHEET 5.

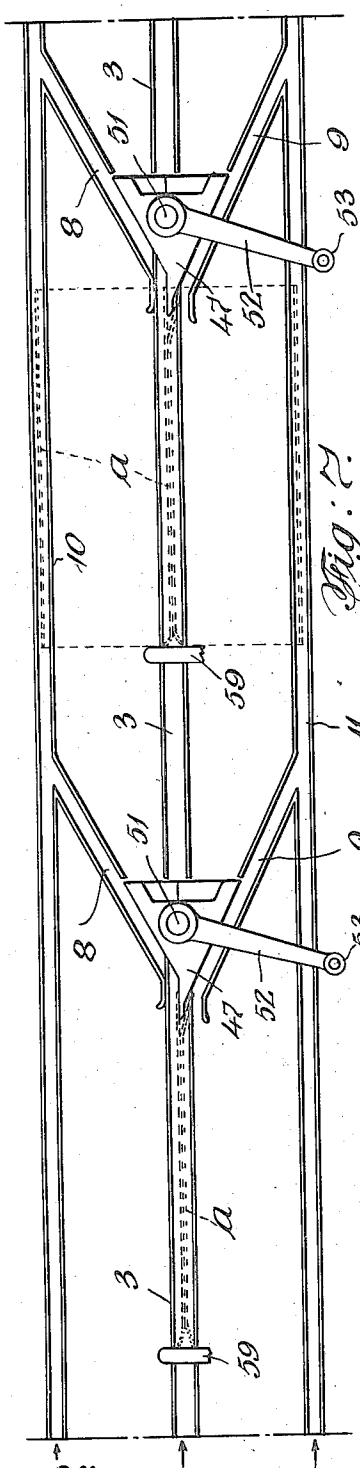


Fig. 7.

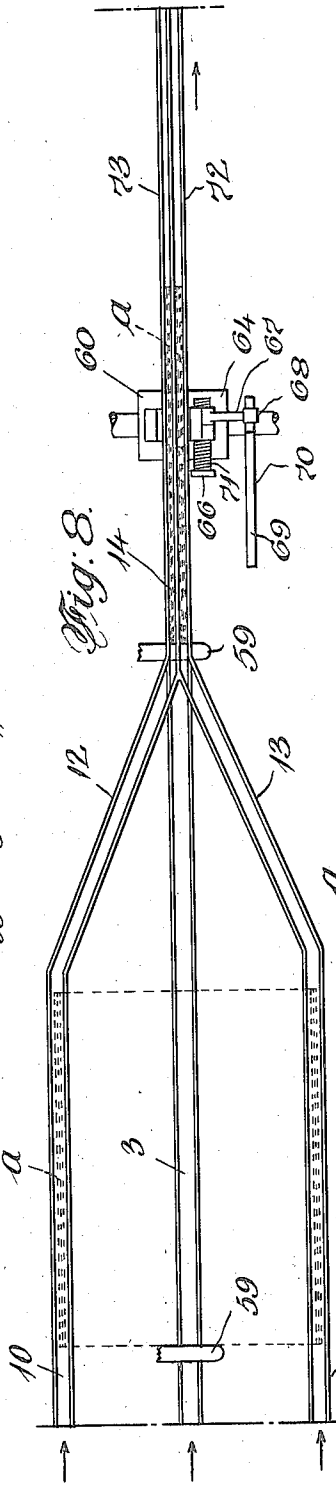


Fig. 8.

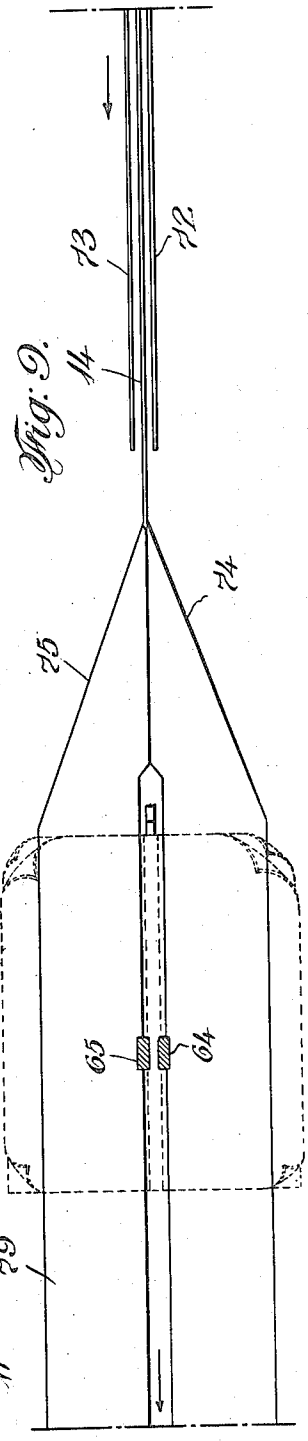


Fig. 9.

Witnesses:

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APPLICATION FILED MAY 27, 1914.

1,202,809.

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6 SHEETS—SHEET 6.

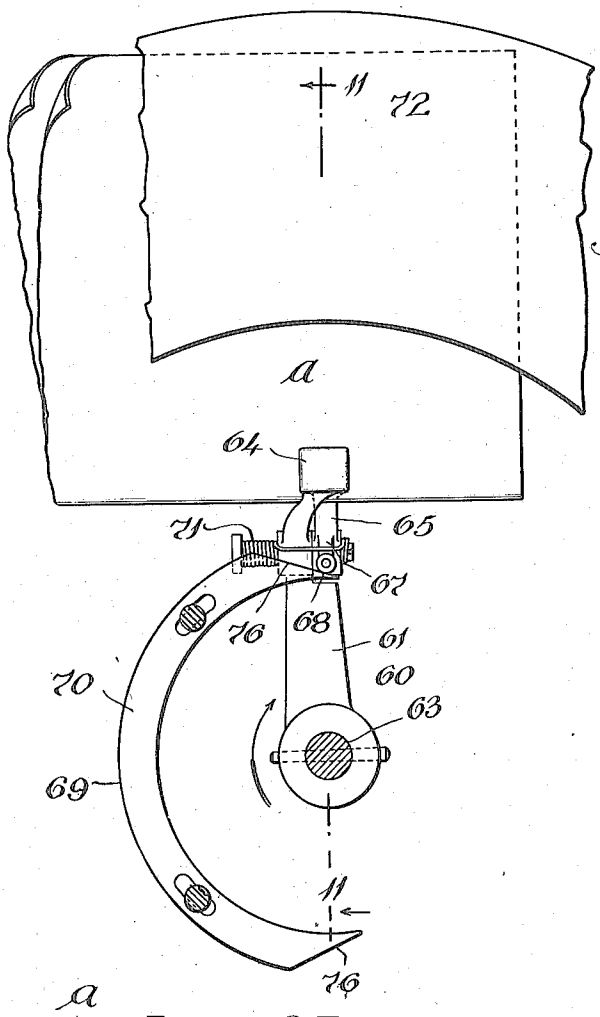


Fig: 10.

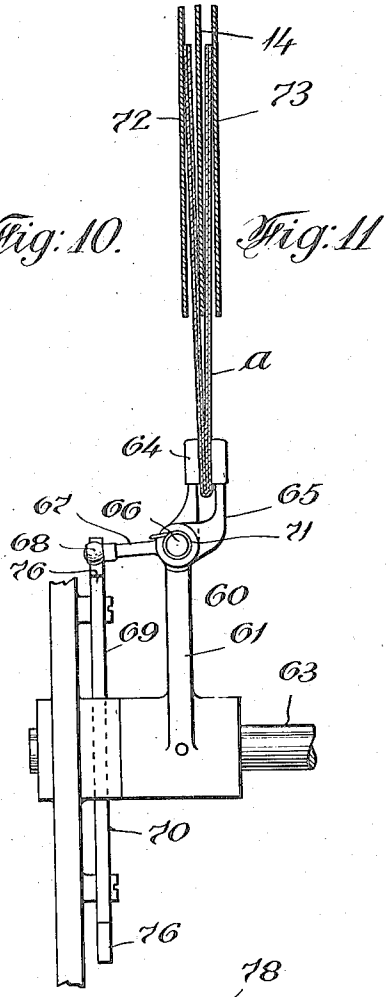


Fig: 11.

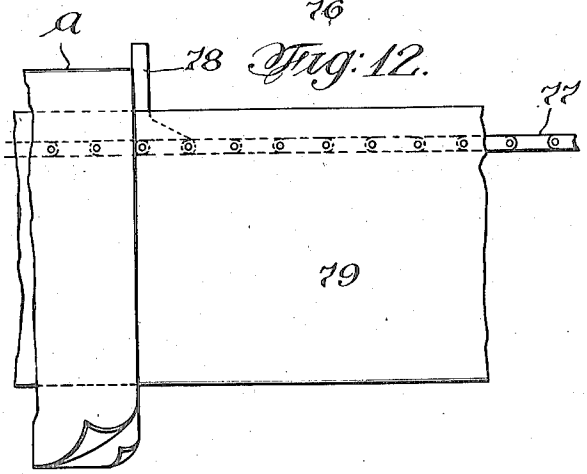


Fig: 12.

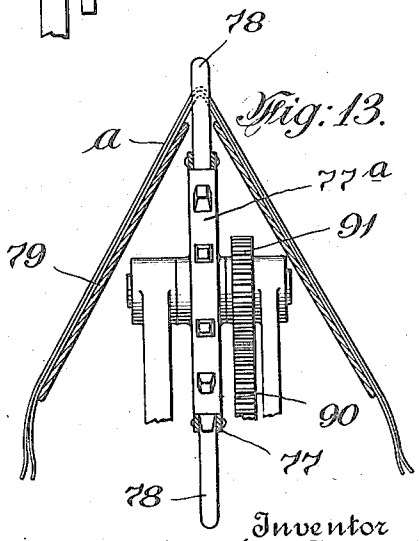


Fig: 13.

Witnesses:
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Claud D. Curry
By his Attorney
Arl V. Beeken

UNITED STATES PATENT OFFICE.

CLAUD D. CURRY, OF MASSILLON, OHIO, ASSIGNOR TO AMERICAN ASSEMBLING MACHINE COMPANY, A CORPORATION OF DELAWARE.

SIGNATURE-INSETTING MACHINE.

1,202,809. Specification of Letters Patent. Patented Oct. 31, 1916.

Application filed May 27, 1914. Serial No. 841,238.

To all whom it may concern:

Be it known that I, CLAUD D. CURRY, a citizen of the United States, and a resident of Massillon, in the county of Stark and State of Ohio, have invented certain new and useful Improvements in Signature-Insetting Machines, of which the following is a specification.

The present invention relates to signature handling machines, and has for its main object the production of a machine for associating signatures, one within the other, and for feeding said associated signatures to a stitching saddle with their open plies straddling the saddle.

The invention consists of the features of construction, combination of parts and arrangement of elements hereinafter fully described and pointed out in the claims.

In the accompanying drawings the invention is described in a concrete and preferred form, but changes of construction may be made without departing from the legitimate and intended scope of the invention as expressed in the appended claims.

In the said drawings: Figure 1 is a side elevation of a machine embodying the invention. Fig. 2 is a sectional view of a portion of the buckling device taken on a line 2—2 of Fig. 5. Fig. 3 is a view of a portion of the buckling members taken on a line 3—3 of Fig. 5. Fig. 4 is a transverse sectional view on the line 4—4 of Figs. 1 and 5 showing the arrangement for feeding signatures to the associating elements. Fig. 5 is an enlarged detail in side elevation of the buckling device and adjacent elements with parts broken away. Fig. 6 is a top plan view of a portion of the parts shown in Fig. 5. Fig. 7 is a top plan detail of some of the guideways for opening and associating the signatures. Fig. 8 forms a continuation of Fig. 7 and is a top plan detail of the means for closing the associated signatures preparatory to inverting the same, and a portion of the inverting gripping device. Fig. 9 is a top plan detail of a signature spread over a stitching saddle, the spreading means therefor, and the guideways and dividing plate leading to the spreading means. Fig. 10 is a side view of the gripping and inverting means, with a portion of the inverting guideways. Fig. 11 is an end view of the gripping and inverting means, with a transverse sectional view, taken on the line 11—11 of Fig. 10, of the inverting guideways and dividing plate. Fig. 12 is a side view of a portion of the stitching saddle with a section of the feeding means therefor, and Fig. 13 is a transverse sectional view of the stitching and feeding means thereof. Fig. 14 is a perspective view of a signature and of the buckling device acting thereon.

Similar characters of reference indicate corresponding parts in the several views.

1 indicates a hopper, of which there are a number arranged lengthwise of the machine, said hopper containing superimposed signatures.

3 is a support, extending longitudinally of the machine, here shown as a V-shaped trough in cross section.

21 indicates inner guides loosely carried by shafts 22 above the support 3. There are as many sets of inner guides as there are hoppers, and these guides 21 extend interruptedly longitudinally of the machine to form a plurality of sets of guides. Signatures *a* are delivered with their folded edge lowermost through said inner guides to the support 3, said signatures being fed by the tape path 2 adjacent to each hopper, the tape path receiving the signatures from the hopper by means of suitable separating and transferring devices in a manner to be described at another point of the specification. The support 3 and inner guides 21 thus serve to support the signature in an upright position with its fold lowermost.

Arranged in a plane above the support 3 are outer guides 10 and 11 suitably supported by the upright braces 24. These outer guides extend uninterruptedly longitudinally of the machine, and, as here shown, are upwardly and outwardly inclined in cross section so as to form a flaring continuation of the V-shaped support 3. For the purpose of holding the inner guides 21 more securely the lower ends 23 thereof may be connected to the braces 24. The braces 24 are carried on the framework 50 in any suitable manner.

8 and 9 indicate a set of obliquely arranged opening guides, one set of which connect each set of inner guides 21 with the outer guides 10 and 11, so that when

the separated plies of the signature are fed therethrough, they will be opened completely by passing into the outer guides.

18 and 26 indicate two buckling members constituting a buckling device. One of these buckling devices is located adjacent to the forward end of each set of inner guides 21, above the support 3, and between the inner and outer guides 21 and 10 and 11. The buckling member 18 is rigidly mounted by means of the arm 19 carried by the bar 20. The buckling member 26 consists of a supporting member 28 mounted on the rock shaft 29 and having at its free end an arc-shaped guide 27. The inner faces of the buckling members are provided with longitudinally extending strips 17 and 25 which frictionally engage with the sides of a paper section or signature, when the buckling members are operated, to facilitate the buckling of the signatures. Slidingly mounted on this guide 27 is the buckling finger 26 which has arc-shaped grooves as shown fitting over the guide 27. Connected to the stud 35 of the buckling finger is a slotted member 34 slidingly mounted on the shaft 29. It is evident that the reciprocation of this sliding member 34 on shaft 29 causes the buckling finger 25 to oscillate in an arc of a circle parallel to the plane of the buckling member 18 in a backward and downward direction.

The member 34 is reciprocated on shaft 29 by means of the cam 39 on the shaft 33 with which engages the roller 37 mounted on the arm 36 connected to the member 34. The shaft 29 is rocked by means of a cam 32, also on the shaft 33, by means of the roller 31 and arm 30.

Located at the point of junction of the opening guides 8 and 9 and at the end of each set of inner guides 21 is a switch 47 substantially triangular in horizontal cross section. This switch 47 is carried by a sleeve 48 mounted fast on the upright 51. Connected to this upright 51 is a link 52 provided with a roller 53 which extends into the bifurcated member 55 carried by the rod 56 which latter is reciprocated by means of the arm 57 carried by the member 34 and which is slidingly supported in the arms 4 of the bushing 38 supported on the shaft 29. The reciprocation of the member 56 causes the switch 47 to oscillate transversely of the signature.

58 indicate chains having fingers 59 for intermittently advancing a signature over the support 3 and through the guides. There are a plurality of such chains one for each section of the machine, and each chain extends only from one section to the next, so that after a signature has been advanced the length of a section of the machine it comes to a state of rest sufficiently long to permit another signature to be dropped inside the first signature and to permit the buckling device to operate to buckle one ply, of the signature so dropped, away from the other. When this has been accomplished the finger 59 on the next chain acts on the signature and advances it another step.

The operation of the devices thus far described is as follows: A signature is fed with its folded edge lowermost through the inner guides 21. The buckling finger 25 now moves toward the signature to engage one upper free corner thereof and then moves longitudinally and downwardly in a plane parallel to the signature or parallel to the buckling member 18 and at an angle to its rocking motion, thereby buckling one ply of the signature. Or, to state it differently, one upper free corner of one ply is buckled obliquely. The switch 47 now moves transversely of the signature from a point outside the buckled ply to a point against the unbuckled ply. When the buckled ply is released by the buckling member 26, the switch 47 will be between the plies of the signature. In case there should be a tendency on the part of the buckling finger 25 to adhere to the paper, a stripper finger 40 may be employed. This finger is mounted at 41 and extends between the inner guides 21 but is normally out of the path of the paper. By means of the cam 45, roller 44 and arm 42 this finger, at the proper moment in the cycle of operations, moves over toward the signature and away from the buckling finger 25 thereby disengaging the signature and buckling finger 25. The chain 58 now carries the signature forward, the folded edge traveling over the support 3 while the plies are opened by passing through the opening guides 8 and 9 into the outer guides 10 and 11. The movement of the chain carries the signature to a point beneath the next set of inner guides 21, but with its plies in the outer guides. The signature now comes to a state of rest. Another signature is now dropped through the second set of inner guides 21 and on the bottom fold of the first signature. This second signature is now buckled in the same manner as the first one and a switch 47 inserted between its plies. The next chain 58 will now act on the two signatures both of which travel on the support 3. The open plies of the first signature will travel in the outer, see Figs. 4 and 5, guides 10 and 11, and the plies of the inner signature will be directed through the set of opening guides 8 and 9 adjacent to that section and thus into the outer guides 10 and 11 where the opened plies of both signatures are thus associated. As many signatures as there are sections of the machine may thus be opened and associated.

At the end of the outer guides 10 and 11 are two obliquely arranged closing guides 12

and 13 which connect the said outer guides with central guides 72 and 73, said central guides having an intermediate dividing plate 14.

79 is another support located below the support 3 and is in the form of a saddle for supporting the signatures between their plies with the folded edge uppermost. The intermediate plate 14 extends in a curvilinear path from the support 3 and tapering closing guides 12 and 13 to the flaring guides 74, 75 and saddle 79.

Moving in a curvilinear path parallel to the guides 72 and 73 and plate 14 is a gripper 60. The action of the last chain 58 brings the plies of the associated signatures into the closing guides 12 and 13 and thence between the central guides 72 and 73 with the plies on opposite sides of the dividing plate 14. The support 3 terminates somewhat in rear of the leading end of the signature when the latter has been brought to this position. It will be observed that the plies of the signature are now partially closed but still separated. The gripper 60 now seizes the lower folded edge of the signatures and feeds them through the guides 72 and 73 and over the plate 14, thence over the flaring guides 74, 75 to the saddle 79, thereby inverting the signatures from one upright position to the other.

A chain 77 passing over the sprockets 77^a runs underneath the saddle 79. This chain 77 has fingers 78 which project up through the top of the saddle and push the signatures under a stiching device (not shown).

The gripper 60 may be constructed in any suitable manner. Preferably an arm 61 is mounted on a rotating shaft 63 and carries at its upper end a fixed jaw 64 and a movable jaw 65. The movable jaw 65 is mounted on the center 66 and is normally held in a closed position by means of the spring 71. Carried by the jaw 65 is further an arm 67 provided with a cam roll 68 which engages the segmental cam 70. So long as the roller 68 is in engagement with the cam 70 the jaws are held open. The portions 76 of the cam serve to permit a gradual opening or closing of the jaws.

Any suitable gearing may be employed for operating the various parts of the machine. In the present instance the following construction is employed: Mounted in the frame 50 of the machine is a driving shaft 81 which through suitable gearing 82 actuates the shaft 46 which carries the cam 45. The shaft 46, by means of spur gears 83, 84 and 84^a, drives the shaft 33 having mounted thereon the cams 39 and 32. Mounted on the shaft 81 is a gear 81^a meshing with a gear 85 actuating a sprocket chain 58. Said sprocket chain passes over sprocket 86 on shaft 88 from which shaft extends another sprocket chain 58. A chain 89 is driven from the shaft 88 and drives gear 90 which in turn meshes with gear 91 driving the chain 77. The shaft 63 is driven from the second chain 58 by means of gears 100, 101 and 102.

The signature individualizing means in this instance are constructed as follows: An oscillating arm *c* is pivoted upon the shaft *d* and oscillated by means of the cam roller *e* playing in the cam slot *f*. An arm *g* reciprocates within the arm *c* and is actuated by means of the cam roller *h* playing in the cam slot *i*. This reciprocating arm *g* has pivotal connection *j* with the rocker arm *k* which in turn is pivotally mounted at *w*. This rocker arm *k* has a pin *m* on its outer end which plays within the slot *n* in one end of the bell-crank lever *o* pivoted on the arm *c*. The opposite end of the lever *o* carries the needle box *p*. Upon the actuation of the bell-crank lever *o* through the medium of the rocker arm, reciprocating arm and cam roller, a signature is gripped and moved down. The projection 5 on the shaft 46 then reverses the leading edge and presents it to the friction roller *t* and thence to tapes 2 of the ordinary construction.

What is claimed, is:

1. A signature handling machine comprising: two supporting means for supporting a folded signature in an upright position, one for supporting the signature with the fold lowermost, and the other for supporting the signature between its plies with its fold uppermost, and means for inverting the signature from one upright position to the other and for carrying it from one supporting means to the other.

2. A signature handling machine comprising: means for supporting a folded signature in an upright position with its folded edge lowermost, means for separating the plies of said folded signature, another supporting means for supporting the signature between the plies thereof with its folded edge uppermost, and means for inverting the signature from one upright position to the other and for carrying it from one supporting means to the other.

3. A signature handling machine comprising: two supporting means, arranged one above the other, for supporting a signature in two different upright positions, and means for inverting the signature from one upright position to the other and for carrying it from one supporting means to the other.

4. A signature handling machine comprising: means for associating a plurality of folded signatures one within the other in an upright position, a supporting means for supporting the signatures in an upright but inverted position, and means for inverting the signatures from one upright position to the other, and for carrying them from the associating means to the supporting means.

5. A signature handling machine comprising: means for associating a plurality of folded signatures one within the other with their plies separated and in an upright position, a supporting means for supporting the signatures in an upright but inverted position with their plies separated, and means for inverting the signatures from one upright position to the other, and for carrying them from the associating means to the supporting means with their plies separated.

6. A signature handling machine comprising: means for associating a plurality of folded signatures one within the other in an upright position with their folded edge lowermost, a supporting means for supporting the associated signatures in an upright position with their folded edge uppermost, and means for inverting the signatures from one upright position to the other and for carrying them from the associating means to the supporting means.

7. A signature handling machine comprising: means for associating a plurality of folded signatures one within the other with their plies separated and in an upright position with the folded edge lowermost, a supporting means for supporting the signatures in an upright position with their plies separated and with the folded edge uppermost, and means for inverting the signatures from one upright position to the other and for carrying them from the associating means to the supporting means with their plies separated.

8. A signature handling machine comprising: means for supporting a folded signature in an upright position, means for separating the plies thereof, means for partially closing the plies, means keeping them separated, another support for supporting the signatures in an upright but inverted position, and means for inverting the signature from one upright position to the other and for carrying the signature from one support to the other.

9. A signature handling machine comprising: means for supporting a folded signature in an upright position with its folded edge lowermost, means for separating the plies thereof, means for partially closing the plies, means keeping them separated, another support for supporting the signature in an upright position between its plies with its folded edge uppermost, means for inverting the signature from one upright position to the other and for carrying the signature from one support to the other, and means for opening the plies of the signature from their partially closed position when said signature reaches the second supporting means.

10. In a signature handling machine, a support adapted to receive the folded edge of a folded signature held in an upright position with its fold lowermost, inner guides above said support for supporting the closed plies of a signature, means located adjacent said support and inner guides for separating the plies of a signature, outer guides above the plane of said support for supporting the open plies of the signature, obliquely arranged opening guides above said support extending from the inner to the outer guides, central guides and an intermediate dividing plate above said support for supporting the plies of the partially closed signature with the dividing plate between the plies, obliquely arranged closing guides above said support connecting the outer guides with the central guides, and means for feeding a signature along said support and through said guides.

11. In a signature handling machine, a central support extending longitudinally of the machine adapted to receive the folded edge of a folded signature held in an upright position with its fold lowermost, outer guides extending uninterruptedly longitudinally of the machine, above the plane of the support, for supporting the open plies of a signature on the support, a plurality of sets of inner guides above the support for supporting the closed plies of a signature on the support, means for separating the plies of a signature located adjacent to each set of inner guides, a plurality of sets of opening guides above said support each set obliquely connecting a set of inner guides with the uninterrupted outer guides, central guides and an intermediate dividing plate above said support and at the end of the sets of inner guides for supporting the plies of a partially closed signature with the dividing plate between the plies, a set of obliquely arranged closing guides above said support extending from the outer guides to the central guides, and means for feeding signatures along said support their plies passing from the inner guides through the opening guides to the outer guides, and thence through the closing guides to the central guides.

12. In a signature handling machine, a support adapted to receive the folded edge of a folded signature held in an upright position with its fold lowermost, inner guides above said support for supporting the closed plies of a signature, outer guides above the plane of said support for supporting the open plies of the signature, obliquely arranged opening guides above said support extending from the inner to the outer guides, means located intermediate the inner and outer guides for separating the plies of the signature, a switch located at the point of junction of the opening guides with the inner guides, and means for feeding the signature along said support and through said guides.

13. In a signature handling machine,

means for supporting a folded signature held in an upright position with its fold lowermost, means for buckling one ply of the signature, a switch, and means for moving said switch transversely with respect to the signature toward the unbuckled ply, so as to be between the plies when the buckled ply is released, means extending from said switch for opening the separated plies, and means for moving the signature on the supporting means.

14. In a signature handling machine, a support adapted to receive the folded edge of a folded signature held in an upright position with its fold lowermost, inner guides above said support for supporting the closed plies of a signature, outer guides above the plane of said support for supporting the open plies of the signature, obliquely arranged opening guides above said support extending from the inner to the outer guides, means located intermediate the inner and outer guides for buckling one ply of the signature, a switch located at the point of junction of the opening guides with the inner guides, means for moving said switch transversely with respect to the signature toward the unbuckled ply so as to be between the plies when the buckled ply is released, and means for feeding the signature along said support and through said guides.

15. In a signature handling machine, a support adapted to receive the folded edge of a folded signature held in an upright position with its fold lowermost, inner guides above said support for supporting the closed plies of a signature, outer guides above the plane of said support for supporting the open plies of the signature, obliquely arranged opening guides above said support extending from the inner to the outer guides, means located intermediate the inner and outer guides for separating the plies of the signature, a switch located at the point of junction of the opening guides with the inner guides, means for oscillating said switch transversely to the signature so as to place it between the plies thereof, and means for feeding the signature along said support and through said guides.

16. In a signature handling machine, means for supporting a folded signature held in an upright position with its fold lowermost, means for buckling one ply, a switch, means for oscillating said switch transversely with respect to the signature toward the unbuckled ply so as to be between the plies when the buckled ply is released, means extending from said switch for opening the separated plies, and means for moving the signature on the supporting means.

17. In a signature handling machine, a support adapted to receive the folded edge of a folded signature held in an upright position with its fold lowermost, inner guides above said support for supporting the closed plies of a signature, outer guides above the plane of said support for supporting the open plies of the signature, obliquely arranged opening guides above said support extending from the inner to the outer guides, means located intermediate the inner and outer guides for buckling one ply of the signature, a switch located at the point of junction of the opening guides with the inner guides, means for oscillating said switch transversely to the signature so as to place it between the plies thereof when the buckled ply is released, and means for feeding the signature along said support and through said guides.

18. In a signature handling machine, means for supporting a folded signature in an upright position with its fold lowermost, and means for buckling one of the plies of the signature at one free corner thereof longitudinally and downwardly of the signature while the latter is in an upright position.

19. In a signature handling machine, means for supporting a folded signature in an upright position with its fold lowermost, buckling means adjacent to said supporting means, comprising two members, one on each side of the signature, and means for moving one of said members toward the signature and longitudinally and downwardly of the signature from one free corner thereof so as to buckle one ply.

20. In a signature handling machine, means for supporting a folded signature in an upright position with its folded edge lowermost, buckling means adjacent to said supporting means comprising two members one on each side of the signature, and means for moving one of said members toward the signature and in a downwardly and longitudinally curved path with respect to the signature from one free corner thereof so as to buckle one ply.

21. In a signature handing machine, a back member and a buckling member, means for moving the buckling member toward the back member and longitudinally thereof, means for feeding a folded signature vertically between said members, and a support below said members for supporting the signature in an upright position.

22. In a signature handling machine, a back member and a buckling member, means for moving said buckling member toward the back member and longitudinally and downwardly thereof, means for feeding a folded signature vertically between said members, and a support below said members for supporting a signature in an upright position.

23. In a signature handling machine, a back member and a buckling member,

means for moving said buckling member toward the back member and longitudinally in a downwardly curved path, means for feeding a folded signature vertically between said members, and a support below said members for supporting a signature in an upright position.

24. A buckling member comprising: a supporting member, means for rocking the supporting member, a buckling finger slidingly mounted on the supporting member, and means for causing said buckling finger to slide on said supporting member.

25. A buckling member comprising: a supporting member, means for rocking the supporting member, a buckling finger slidingly mounted on the supporting member in a plane at right angles to the rocking movement of the supporting member, and means for causing said buckling finger to slide on said supporting member.

26. A buckling member comprising: a supporting member, means for rocking the supporting member, a buckling finger mounted to slide in an arc of a circle on said supporting member, and means for causing said buckling finger to slide on said supporting member.

27. A buckling member comprising: a supporting member, means for rocking said supporting member, a buckling finger mounted on the supporting member to slide in an arc of a circle in a plane at right angles to the rocking movement of the supporting member, and means for causing said buckling finger to slide on said supporting member.

28. A buckling member comprising a shaft, a supporting member carried by said shaft, means for rocking said supporting member on said shaft, a buckling finger slidingly mounted on said supporting member, sliding means mounted on said shaft and connected to the buckling finger, and means for sliding said sliding means on said shaft.

29. A buckling member comprising: a shaft, a supporting member carried by said shaft, means for rocking said supporting member on said shaft, a buckling finger slidingly mounted on the supporting member in a plane at right angles to the rocking movement of the supporting member, sliding means mounted on said shaft and connected to said buckling finger, and means for sliding said sliding means on said shaft.

30. A buckling member comprising: a shaft, a supporting member, carried by said shaft, means for rocking said supporting member on said shaft, a buckling finger mounted to slide in an arc of a circle on said supporting member, sliding means mounted on said shaft and connected to said buckling finger, and means for sliding said sliding means on said shaft.

31. A buckling member comprising: a shaft, a supporting member carried by said shaft, means for rocking said supporting member on said shaft, a buckling finger mounted on the supporting member to slide in an arc of a circle in a plane at right angles to the rocking movement of the supporting member, sliding means mounted on said shaft and connected to the buckling finger, and means for sliding said sliding means on said shaft.

32. A signature handling machine comprising: means for supporting a folded signature in an upright position with its fold lowermost, and means for buckling an upper free corner of one ply obliquely of the signature while the signature is supported in an upright position.

33. In a signature handling machine, means for supporting a folded signature in an upright position, a back member, and a buckling member, a switch, means for moving said switch between the plies of the signature to keep them separated, a stripper finger for disengaging the signature from one of said buckling members after the switch has entered between the plies of the signature, means for actuating said stripper finger, and means for feeding the signature over the support.

34. In a signature handling machine, means for supporting a folded signature in an upright position, means for separating the plies of the signature, a switch, means for moving said switch between the plies of the signature to keep them separated, a stripper finger for disengaging the signature from said separating means after the switch has entered between the plies of the signature, means for actuating said stripper finger, and means for feeding the signature over the support.

35. A signature handling machine comprising: means for supporting a folded signature in an upright position extending longitudinally of the machine, a set of inner guides above said support, means for feeding a signature through said inner guides to said support, a second set of inner guides above said support at another point longitudinally thereof, means for feeding the signature over said support from the first set of inner guides to a point below the second set of inner guides, means for separating the plies of the signature so as to bring them outside the second set of inner guides, and means for feeding a signature through the second set of inner guides into the open signature on the supporting means below the same.

36. A signature handling machine comprising: means for supporting a folded signature in an upright position extending longitudinally of the machine, means for intermittently advancing a signature over

said support, means located at different points longitudinally of said support for feeding signatures to said support at a plurality of points thereof, and means for opening a signature received at one point so that it will receive between its plies a signature fed at the next point along the support.

37. In a signature handling machine, curvilinearly extending guides and an intermediate dividing plate, means for feeding a folded signature in an upright position between said guides and with its plies on opposite sides of said dividing plate, and means moving in a curvilinear path for feeding said signature through said guides and over said dividing plate.

38. In a signature handling machine, means for feeding a folded signature in an upright position with its plies partially closed but separated, a gripper adapted to grip the signature on opposite sides and moving in a curvilinear path, means for opening and closing the gripper, a curvilinearly extending intermediate dividing plate adjacent to said gripper for keeping the plies of the signature separated as it is conveyed by the gripper, and means for conveying the signature away from the gripper.

39. In a signature handling machine, means for feeding a folded signature in an upright position with its plies partially closed but separated, a gripper adapted to grip the signature on opposite sides and moving in a curvilinear path, means for opening and closing the gripper, a curvilinearly extending intermediate dividing plate adjacent to said gripper for keeping the plies of the signature separated as it is conveyed by the gripper, means for conveying the signature away from the gripper, and guides adjacent to the plate for keeping the plies of the signature partially closed as it travels over the plate.

40. In a signature handling machine, a curvilinearly extending intermediate dividing plate, guides tapering toward the said plate connected thereto at one end, guides flaring away from said plate connected thereto at its other end, curvilinearly extending guides in spaced relation on opposite sides of the plate, and means for feeding a folded signature through said guides and over said plate.

41. In a signature handling machine, a gripper, the jaws of which clasp the folded edge of the signature, means for feeding the folded signature to the gripper in an upright position with its plies supported, means for opening and closing said gripper jaws, means for moving said gripper in a curvilinear path, guide means outside and between the open plies of the signature extending in a path parallel to the path of the gripper, and means for conveying the signature away from the gripper at the end of its movement.

42. A signature handling machine comprising: means for supporting a folded signature in an upright position with its folded edge lowermost, another supporting means for supporting the signature in an upright position with its folded edge uppermost, a rotating gripper for inverting the signature from one upright position to the other and for moving the same from one support to the other, said gripper having a normally closed movable jaw, a cam member disposed at a point in the path of rotation of said jaw and adapted to engage with the same whereby said jaw is opened to release and receive signatures.

43. A signature insetting machine comprising: a plurality of feeding mechanisms, longitudinally arranged, for feeding folded signatures with their folded edge lowermost, a longitudinal support, adjacent the first of said feeding mechanisms, engaging the lower fold of a signature to support it in an upright position, a second longitudinal support, adjacent the second feeding mechanism and forming substantially a continuation of the first support, engaging the lower fold of a signature with its plies open to receive an insert from said second feeding mechanism, means for advancing the signature along said first and second supports, and signature opening means adjacent said first support.

44. A signature insetting machine comprising: a longitudinally extending support for engaging the lower fold of folded signatures to support them in an upright position, means for feeding folded signatures with their fold lowermost to said support at a plurality of points thereof, and means for opening and advancing the signature, fed at one point of the support, along said support to the next point at which a folded signature is fed to the support.

Signed at Massillon, in the county of Stark and State of Ohio, this 22nd day of May, A. D. 1914.

CLAUD D. CURRY.

Witnesses:
J. K. MERWIN,
A. E. PHELAN.