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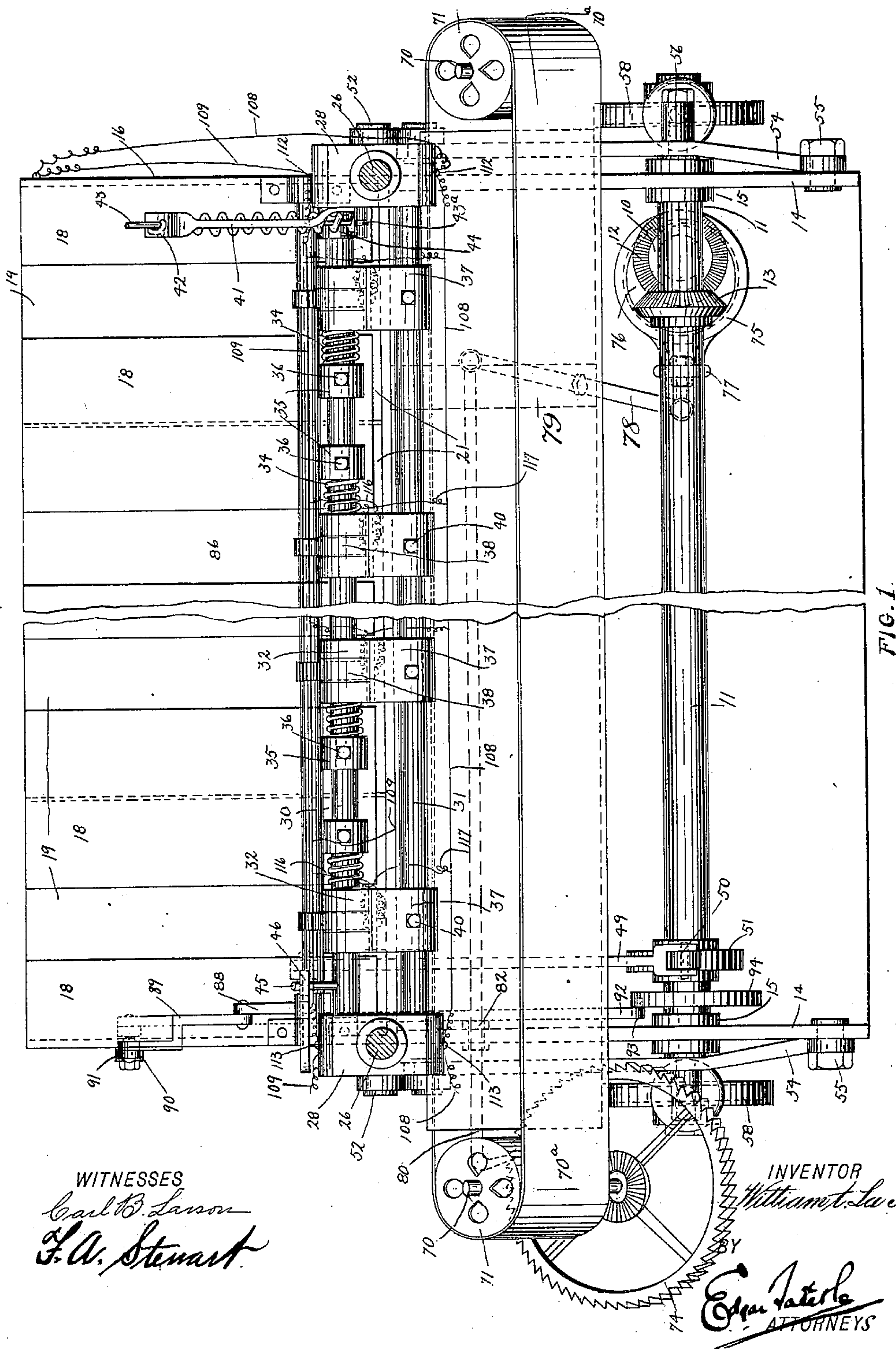
Patented Jan. 8, 1901.

W. A. LA SOR.
BOOK SIGNATURE GATHERER.

(Application filed Nov. 24, 1899.)

(No Model.)

5 Sheets—Sheet 1.



WITNESSES

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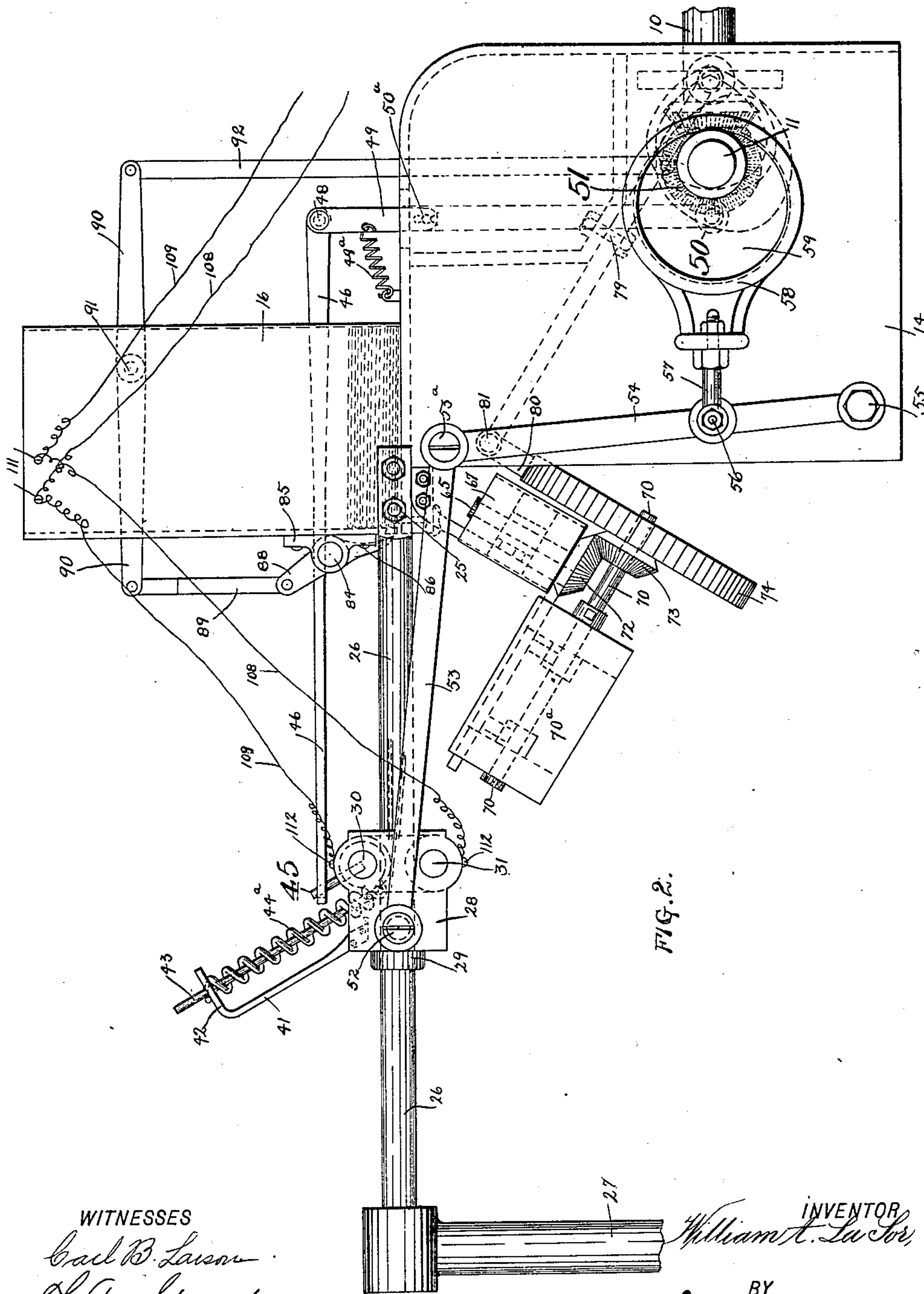
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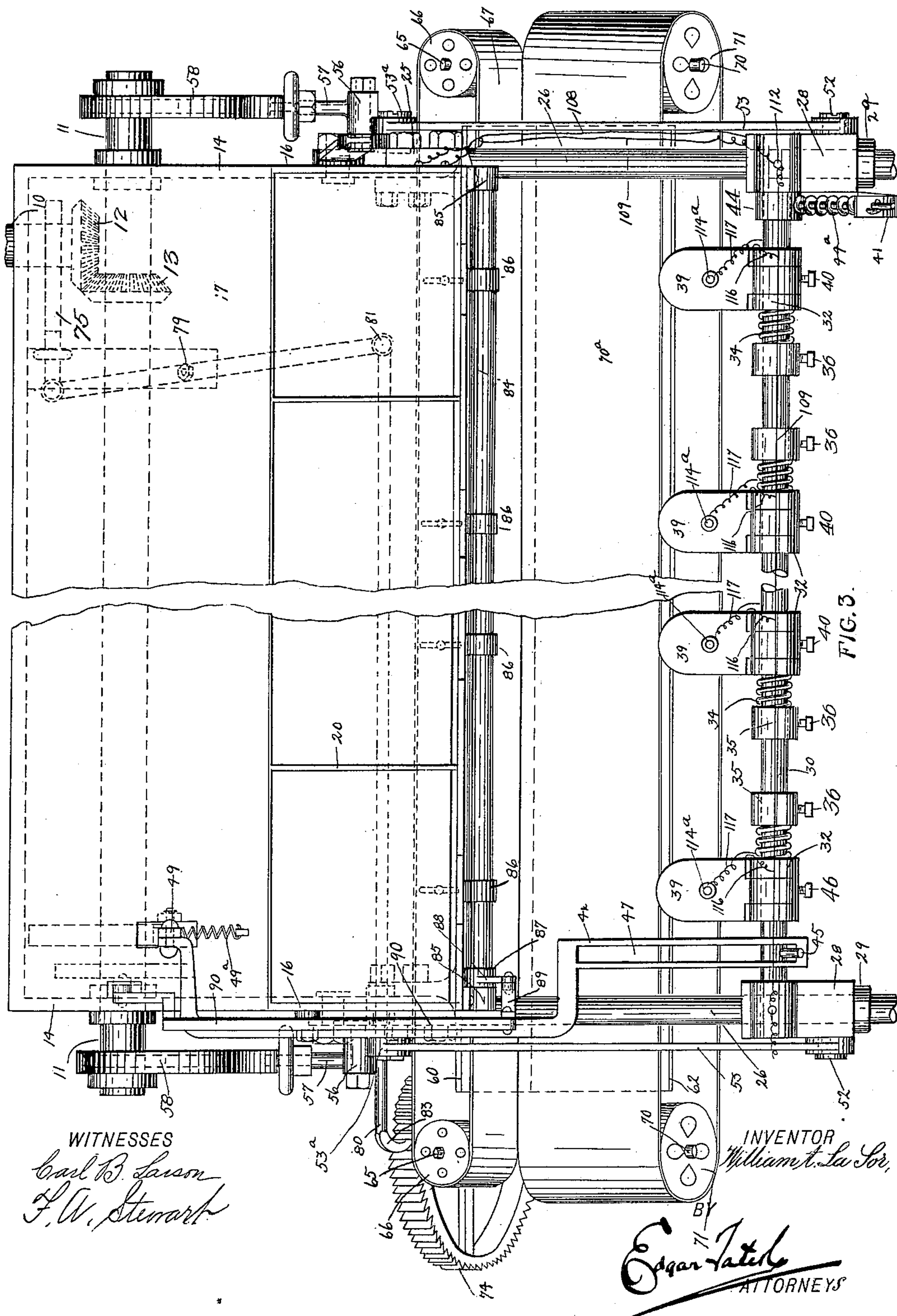
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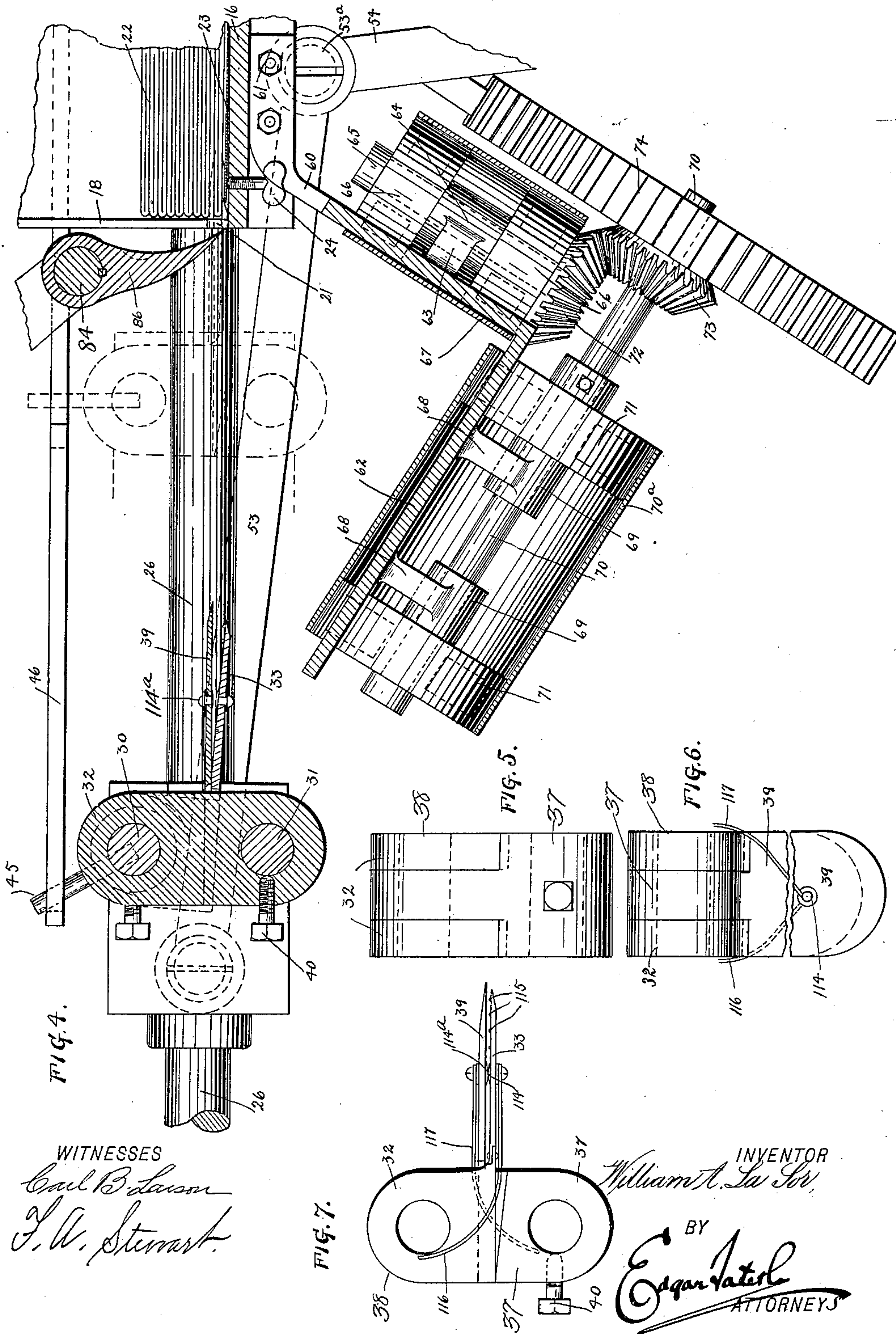
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5 Sheets—Sheet 4.



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5 Sheets—Sheet 5.

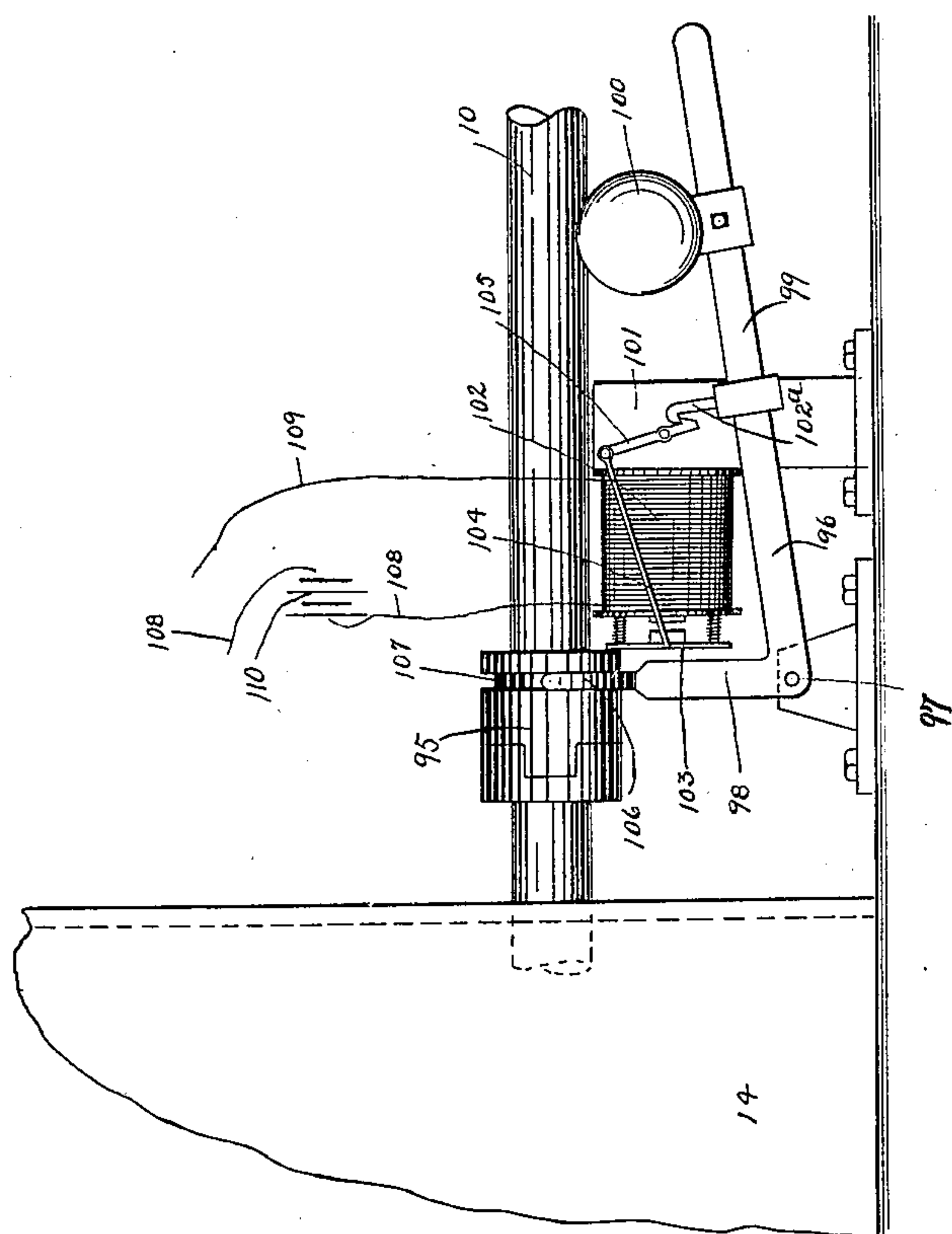


FIG. 8.

WITNESSES

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UNITED STATES PATENT OFFICE.

WILLIAM ALLEN LA SOR, OF RAHWAY, NEW JERSEY.

BOOK-SIGNATURE GATHERER.

SPECIFICATION forming part of Letters Patent No. 665,789, dated January 8, 1901.

Application filed November 24, 1899. Serial No. 738,139. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM ALLEN LA SOR, a citizen of the United States, residing at Rahway, in the county of Union and State of New Jersey, have invented certain new and useful Improvements in Book-Signature Gatherers, of which the following is a full and complete specification, such as will enable those skilled in the art to which it ap-
10 pertains to make and use the same.

This invention relates to book-signature gatherers whereby the signatures or sections of books are gathered previous to binding the same. At present this work is generally per-
15 formed manually, the several sections of the book being taken from different piles or lots, and it often occurs that the assembling is inaccurately performed and the resultant book is either abridged or parts thereof are dupli-
20 cated. I am aware that machines of this class have been heretofore constructed; but I am not aware that such machines operate with the required accuracy and efficiency.

My invention consists in the construction
25 and arrangement of parts hereinafter specified, and comprises a positively, accurately, and speedily operating machine by which signatures may be accurately gathered.

My invention consists in the construction
30 and arrangement of parts hereinafter specified.

In the accompanying drawings, forming part of this specification, in which like reference characters denote like parts in the several views, Figure 1 is a front elevation of an assembling-machine constructed according to my invention and cut away trans-
35 versely; Fig. 2, a side elevation thereof; Fig. 3, a plan view thereof; Fig. 4, an enlarged view of a portion of Fig. 2, partly in section; Fig. 5, a rear view of the grippers shown in the other views and upon an enlarged scale; Fig. 6, a plan view thereof cut away; Fig. 7,
40 a side view thereof, and Fig. 8 a side view of an improved clutch-operating device connected with the power-shaft of the machine.

In the practice of my invention I provide a power-shaft 10, which is suitably journaled and driven and which extends rearwardly of
50 the machine and is operatively connected with a main shaft 11 by bevel-gears 12 and 13, and the main shaft 11 extends longitudi-

nally of the machine, which is provided with end supports 14, in which the main shaft is journaled at 15 15.

Mounted upon the end supports 14 is a lon-
55 gitudinally-arranged casing 16, and a longitudinal frame member 17 connects the tops of the end supports 14, as shown in Fig. 3. The casing 16 is rectangular in form, open at the
60 top, and provided at the front with vertical spaced walls 18, whereby alternate vertical openings 19 are formed, and the openings provide communication with compartments
65 in the casing 16, formed by vertical transverse partitions 20. (Shown in full lines in Fig. 3 and in dotted lines in Fig. 1.) The front walls 18 are cut away at the bottom at
70 21, Fig. 1.

In the compartments formed in the casing
75 16 by the partitions 20 are stacked the parts to be assembled, in the present instance book-sections 22. The sections 22 are omitted from the showing in Fig. 1 for the sake of clear-
80 ness.

As shown in Fig. 4, within and at the bot-
85 tom of each of the compartments of the casing 16 is secured a forwardly-projecting spring-plate 23, in connection with the forward end of which operates an adjusting-screw 24, 80
passed through the bottom of said casing.

Bolted to the ends of the casing 16 at each
end of the machine at 25 is a forwardly-pro-
90 jecting track-bar 26, each of which is supported at its forward end by a standard 27. 85
Sleeved upon each of the track-bars is a carriage 28, provided with a bearing 29. Jour-
naled at either end in the carriages 28 is a
rock-shaft 30, and fixed in said carriages is a
parallel shaft 31.

Loosely mounted upon the shaft 30 are a
plurality of bifurcated gripper-heads 32, pro-
vided with rearwardly-projecting gripper-
jaws 33, and the heads 32 are tensionally
keyed to the shaft 30 by means of coiled
95 springs 34, one end of each of which is connected with one of said heads and the other
end of which is connected with one of a plu-
rality of collars 35, fixed to said shaft by set-
100 screws 36.

Mounted upon the shaft 30 are a plurality
of gripper-heads 37, provided with members
38, which are mounted upon the shaft 31, fit-
ting the bifurcated heads 32 and provided

with gripper-jaws 39, which, as clearly shown in Figs. 5, 6, and 7, project above the gripper-jaws 33. The heads 37 are fixed to the fixed shaft 31 by set-screws 40. A bracket 41 is connected with one of the carriages 28 and projects forwardly and upwardly therefrom and is provided with an upper slotted deflected end portion 42, through which is slidably passed an arm 43, pivoted at 43^a in Fig. 1 to a collar 44, which is fixed to the shaft 30, and a contractile spring 44^a is passed upon the arm 43, being connected at its lower end with the collar 44 and at its upper end with the deflected end of the bracket 41. The spring 44^a normally maintains the shaft 30 in such rotative position that the gripper-jaws 33 are slightly spaced from the gripper-jaws 39, as shown in Fig. 2 in dotted lines. The shaft 30 is provided adjacent the end thereof with which the collar 44 is connected with a projecting stud 45, and a thrust-arm 46, provided with an elongated slot 47, in which the stud 45 operates, extends rearwardly of the machine and is pivotally connected at 48 with a downwardly-directed arm 49, which, as shown in Fig. 2, is pivoted at 50^a in brackets connected with the frame member. The arm 49 is provided at its lower end with a roller 50, which operatively engages a cam 51, (shown in full lines in Fig. 1 and in dotted lines in Fig. 2,) and the cam 51 operates to reciprocate the thrust-arm 46. The arm 49 is provided with a contractile spring 49^a, connected therewith and with the frame member 17 and which normally holds said arm in the position shown in the drawings.

Connected pivotally at 52 with each of the carriages 28 is a rearwardly-directed connecting-rod 53, which engages pivotally at 53^a with an oscillating arm 54, pivoted to the next adjacent upright 14 at 55. The oscillating arm 54 is operatively connected at 56 with an adjustable link-pin 57, which is connected with an eccentric-strap 58, which operates in connection with an eccentric 59 upon the next adjacent end of the shaft 11, and the operation of the eccentrics 59 reciprocates the carriages 28. The eccentrics 59 are set similarly upon the shaft 11.

A downwardly and forwardly directed bracket 60 is connected with the under side of the casing 16, adjacent either end of said casing, at 61 and is provided with a forwardly and rectangularly directed extension 62, and the bracket 60 and extension 62 extend longitudinally of the machine and are each of plane formation and relatively broad and of slight transverse dimension. The bracket 60 is provided adjacent each end with a curved hanger 63, provided with a bearing 64, in which is journaled a shaft 65, to which at either side of said bearing is fixed a pulley 66, and a broad belt 67 is passed operatively about the pulleys 66 and so as to inclose the bracket 60 within the area inclosed by its path of motion, said bracket lying parallel

with and closely adjacent the forward portion of said belt. The extension 62 is similarly provided adjacent each end with a pair of curved hangers 68, provided with bearings 69, in which is journaled a shaft 70, to which are fixed a pair of pulleys 71. A broad belt 70^a is passed operatively about the pulleys 71 and travels exteriorly of the bracket extension 62. That shaft 65 which is next adjacent the left-hand end of the machine is provided at its lower end with a bevel-gear 72, which meshes with a similar gear 73 upon the next adjacent shaft 70, and the latter shaft is provided at its lower and rearmost end with a fixed ratchet-wheel 74, which is preferably of several times the diameter of the bevel-gear 73, and the gears 73 and 72 are of the same diameter.

An eccentric-strap 75 is operatively mounted upon an eccentric 76 upon the power-shaft 10 adjacent the gear 12, as shown in Figs. 1 and 2, and operatively and adjustably connected therewith at 77 is a lever-arm 78, which is pivoted to a bracket (shown in dotted lines at 79 in Figs. 1, 2, and 3) and is operatively connected with a pawl-arm 80 by means of a ball-and-socket joint 81. (Shown in dotted lines in Figs. 1, 2, and 3.) The pawl-arm 80 passes through a loose bearing 82 in one of the end supports 14, said bearing being shown in dotted lines in Fig. 1, and said pawl-arm 80 is provided at its outer end with a hook-shaped pawl 83, which operates in connection with the ratchet-wheel 74. The operation of the eccentric 76 actuates said ratchet-wheel at predetermined intervals to revolve the shafts 65 and 70 and move the belts 67 and 70^a.

A rock-shaft 84 is journaled in brackets 85, secured to the front portion and at the ends of the casing, and fixed thereto in alinement with each of the vertical spaces 19 between the spaced front casing-walls 18 is a depending rearwardly-curved finger 86, and the shaft 84 is provided at the left-hand end, as shown in the drawings, with a collar 87, which carries an arm 88, which projects normally forwardly at an angle of less than ninety degrees with the fingers 86.

Pivoted to the arm 88 is an upwardly-directed link-rod 89, which at its upper end is operatively connected with a lever 90, centrally pivoted at 91 to the adjacent side of the casing 16. The beam-lever 90 is laterally deflected at its rearward end, as shown in Fig. 3, and is operatively connected with a depending connecting-rod 92, which passes through an opening in the frame member 17, and is provided at its lower end with a boss 93, (shown in dotted lines in Figs. 1 and 2,) which operates in connection with an ordinary laterally-grooved cam-disk 94, fixed to the main shaft 11. The operation of the cam 94 serves to intermittently project the fingers 86 through the front openings 19 in the casing 16 and to pass under and slightly raise the forward end of the next to the lowermost

of the book-sections 22 therein, as shown in Figs. 2 and 4.

As shown in Fig. 8, the power-shaft is provided with an ordinary sliding clutch 95, so installed that its operation will operatively disconnect all the operative parts of the machine with said power-shaft. A crank-lever 96 is pivoted beneath the power-shaft at 97, the shorter arm 98 thereof operatively engaging one member of the clutch and the longer arm 99 being provided with an adjustable weight 100. A standard 101 is arranged adjacent the shaft 10 and carries an electromagnet 102, provided with a spring-projected armature 103, with which is connected an arm 104, pivotally connected with a trigger-dog 105, pivoted to the standard 101. The lever-arm 99 is provided with a catch-head 102^a, in connection with which said trigger-arm 105 operates to normally maintain said arm 99 and weight 100 in elevated position to maintain the clutch 95 in operative position, as shown in the drawings. The connection of the arm 98 with the sliding member of the clutch 95 consists of a yoke 106, which operates in an annular groove 107 and may slide vertically therein. It is manifest that if the trigger-dog 105 be detached from the catch-head 102^a the arm 99 will fall, operatively disconnecting the clutch members and stopping the motion of all parts of the machine.

The terminals of the winding of the electromagnet 102 are connected with insulated line-wires 108 and 109, the former of which is divided to receive in circuit a battery or other source of electrical supply 110. The said line-wires are extended upwardly and supported by the upper portion of the casing 16 by binding-screws 111, whence they are dropped to and connected with the next adjacent carriage 28 by binding-screws 112, and are then strung from said last-mentioned carriage longitudinally of the machine to and connected with the other carriage 28, with which they are connected by binding-screws 113, and the extreme free ends of the line-wires are left unconnected. As shown most clearly in Fig. 7, the gripper-jaws 33 and 39 are provided with contact-buttons 114 and 114^a, respectively, which are passed therethrough and fixed therein, and said contact-buttons are arranged to coengage when said jaws are swung together. The gripper-jaws 33 are also provided with serrations or teeth 115 upon their upper surfaces. The line-wire 109 is provided with a plurality of branch wires 116, each of which is electrically connected with one of the contact-buttons 114 of one of the gripper-jaws 33, and the line-wire 108 is provided with a plurality of branch wires 117, each of which is electrically connected with one of the contact-buttons 114^a of the gripper-jaws 39. It is manifest that if two of the contact-buttons 114 of two connected gripper-jaws 33 and 39 be brought into contact a closed electrical circuit will be established through the connected branch wires

116 and 117, through the line-wires 108 and 109, and through the electromagnet 102, causing the armature 103 of the latter to be actuated and the lever-arm 99 to fall, whereby the clutch 95 is operated to disconnect the power-shaft 10 and the operative parts of the machine.

The operation of my improved assembling-machine will be evident from the foregoing description when taken in connection with the accompanying drawings.

With the parts in the relative positions shown in the drawings and the power-shaft 10 continuously revolving, the eccentrics 59 in connection with the eccentric-straps 58 swing the connecting-rods 53 and move rearwardly the carriages 28 upon the track-rods 26 and the shafts 30 and 31, and the gripper-heads and gripper-jaws are moved rearwardly therewith. Meanwhile the rock-shaft 84 is operated by the lever 90, connecting-rod 92, and cam 94 and connected parts, and the fingers 86 are swung inwardly to engage and raise the forward edge portion of the book-sections 22, engaging directly with the next to the lowermost of each thereof in each of the compartments of the casing 16, and the screws 24 are at the beginning adjusted to raise the forward edge portions of the spring-plates 23 in said compartments. Consequently as the gripper-jaws 33 and 39 are projected through the openings 19 at the bottom thereof and into said compartments the gripper-jaw 33, which enters each compartment, engages with and slides over the forward edge of the respective spring-plate 23 and under the book-section directly next thereabove, and the corresponding gripper-jaw 39 passes beneath the finger 86, which operates within said compartment, and passes above the book-section beneath which the corresponding gripper-jaw 33 passes. At this phase of the operation of the machine the thrust-arm 46 is moved forwardly by the arm 49 and cam 51, and the stud 45, which operates in the elongated slot 47, is moved by said thrust-arm 46 to slightly rock the shaft 30, turning the collars 35, and by the connected spring elements 34 tensionally turning the gripper-heads 32 and raising the gripper-jaws 33, tightly gripping the book-sections between the fixed gripper-jaws 39 and said jaws 33, the teeth 115 slightly impinging upon the said book-sections. Immediately subsequently, the actuating means of the carriages 28 commence to forwardly move the same, the gripper-jaws and connected parts, and the book-sections clamped by the gripper-jaws. The fingers 86 are then withdrawn by the cam 94 from their engagement with the book-sections raised thereby, and these book-sections fall, becoming in turn the bottom sections of the respective compartments. As the carriages 28 and the withdrawing book-sections move forwardly the thrust-arm 46 continues its forward movement, operating the stud 45 to maintain the

shaft 30 in rocked position, whereby the gripper-jaws 33 are caused to tightly clamp said book-sections, and this clamping of the latter continues until they are brought directly over the belt 70^a, when the cam 51 allows the thrust-arm 46 to come to rest, and the spring 44^a causes the shaft 30 to rock, so as to depress the gripper-jaws 33 and allow the book-sections clamped thereby to fall in separate positions upon the belt 70^a and the inner edges of said sections to rest against the belt 67. The belts 67 and 70^a are so relatively arranged as to form a trough-shaped receptacle for the book-sections, and the bracket 60 and extension 62 form tables upon which the belts may move when weighted down. A book-section will now rest upon the belts in front of each compartment, and we will presume, for the sake of exposition, that there are four such compartments in the casing 16, although the drawings show but two complete compartments, the machine being broken apart transversely. It is therefore to be deduced that four book-sections will complete the book. The hooked pawl 83 and pawl-arm 80 are now retracted by the eccentric 76 and connected parts, and the ratchet-wheel 74 is turned, rotating the shaft 70, shaft 65, pulleys 71 and 66, and belts 70^a and 67 to such an extent and in such direction that each book-section on the belts is moved one stage to the right or into a position directly in front of the next compartment of the casing 16 to the right, and when the gripper-jaws next deposit a book-section upon the belts in front of each compartment each of said sections will fall upon another moved into position to receive it, as above described, with the exception of the section which is deposited upon the extreme left-hand portion of the belt. Upon the first movement of the belts a single section will be deposited from the right hand of the belts and incomplete books will subsequently be formed embodying the sections first dropped from all but the left-hand compartment. To avoid this error, in starting the machine a complete book is placed upon the extreme right-hand portion of the belts, a three-sectioned book upon the belts in front of the second compartment, and a two-sectioned book upon the belts in front of the third compartment. The machine will then operate continuously and correctly, delivering complete four-sectioned books from the right-hand ends of the belts, and the complete books may be received and collected by an attendant or a receptacle or conveyer of any suitable form.

To provide against the assembling of an incomplete book, the clutch-operating devices above described are provided. Should any pair of the gripper-jaws 33 and 39 fail to grip a book-section in one of the compartments, the contact-buttons 114 and 114^a thereof will coengage, closing an electrical circuit through the respective branch wires 116 and 117, the circuit-wires 108 and 109 and the electromag-

net 102 causing the armature 103 thereof to free the trigger-dog 105 from the catch-head 102^a and lowering the arm 99, which operates the clutch 95 to operatively disconnect the operative parts of the machine from the power-shaft 10.

I do not limit myself to the specific construction and arrangement of parts as herein specified, but reserve the right to vary the same within the scope of my invention.

By means of the machine herein described the assembling of sections or parts of books and other articles may be readily, quickly, and accurately performed and manual handling thereof avoided.

Having fully described my invention, I claim as new and desire to secure by Letters Patent—

1. In a machine of the class described, a movable support having a relatively movable element, a gripper carried by said support and arranged to engage the signatures, and means for moving said support and said gripper, said gripper being provided with a loosely-mounted member which is carried by said movable element, a tensional element by means of which said loosely-mounted member is connected with said movable element, said loosely-mounted member being operated through the medium of said tensional element, substantially as shown and described.

2. In a machine of the class described, a reciprocating carriage, a pair of shafts mounted therein and one of which is turnable, a gripper consisting of two members, one of which is tensionally keyed to said turnable shaft, and the other of which is fixed to the other shaft, said turnable shaft being tensionally connected with said carriage, and means for turning said turnable shaft whereby said members are caused to engage with the signatures, substantially as shown and described.

3. In a machine of the class described, a carriage, a pair of shafts mounted therein and one of which is turnable, a gripper supported by said shafts and comprising two members one of which is tensionally keyed to said turnable shaft, and the other of which is fixed to the other of said shafts, each of said members being provided with a jaw, which jaws coöperate to engage and grip the signatures, and means for operating said turnable shaft, substantially as shown and described.

4. A machine of the class described, comprising a container in which the signatures are stored in upright file, said container being provided with a false adjustable bottom whereby the signatures may be raised therein, and with an opening in one wall, a movable support, a gripper carried thereby and comprising two members, one of which is movable, devices for partially raising all of said signatures but the one to be gripped and withdrawn, and consisting of a pivoted finger arranged to operate through said opening, means for operating said loosely-mounted gripper member,

means for operating said support, a movable conveyer arranged adjacent said container, and means for operating said conveyer, substantially as shown and described.

5 5. In a machine of the class described, a conveyer comprising a pair of continuous belts, a bracket provided with hangers carrying pulleys upon which one of said belts travels, said bracket being provided with an angularly-directed extension provided with hangers carrying pulleys upon which the other of said belts travels, whereby a trough-shaped conveyer is provided, said bracket and extension being extended to form supports above 10 which said belts pass in the uppermost phase of their movements, substantially as shown and described.

6. In a machine of the class described, means for supplying power, a gripper device 20 comprising two members which engage and withdraw the signatures, and one of which is movable with relation to the other, said means for supplying the power being provided with power-transmission devices whereby the same 25 may be operatively disconnected from the machine, electromagnetic devices connected with said power-transmission devices, and electrically connected with said members of said gripper device, which latter members 30 embody contact devices arranged to mutually engage, whereby said power-transmission devices will be operated, substantially as shown and described.

7. In a machine of the class described,

means for supplying power, a grip device 35 comprising two members which engage and withdraw the signatures, and one of which is movable with relation to the other, said means for supplying the power being provided with power-transmission devices whereby the same 40 may be operatively disconnected from the machine, said power-transmission devices comprising a clutch, a bell-crank lever one arm of which is operatively connected with said clutch and the other arm of which is 45 provided with a weight, and with a catch-head, an electromagnet provided with a spring-projected armature, and a pivoted trigger-dog which operates in connection with said catch-head upon said lever-arm, and 50 which is operatively connected with said spring-projected armature, said electromagnet being electrically connected with a source of electricity and with said gripper members, which gripper members embody contact de- 55 vices, whereby said trigger-dog is disengaged from said catch-head upon coengagement of said gripper members, substantially as shown and described.

In testimony that I claim the foregoing as 60 my invention I have signed my name, in presence of the subscribing witnesses, this 22d day of November, 1899.

WILLIAM ALLEN LA SOR.

Witnesses:

RAYMOND I. BLAKESLEE,
V. M. VOSLER.