

No. 870,333.

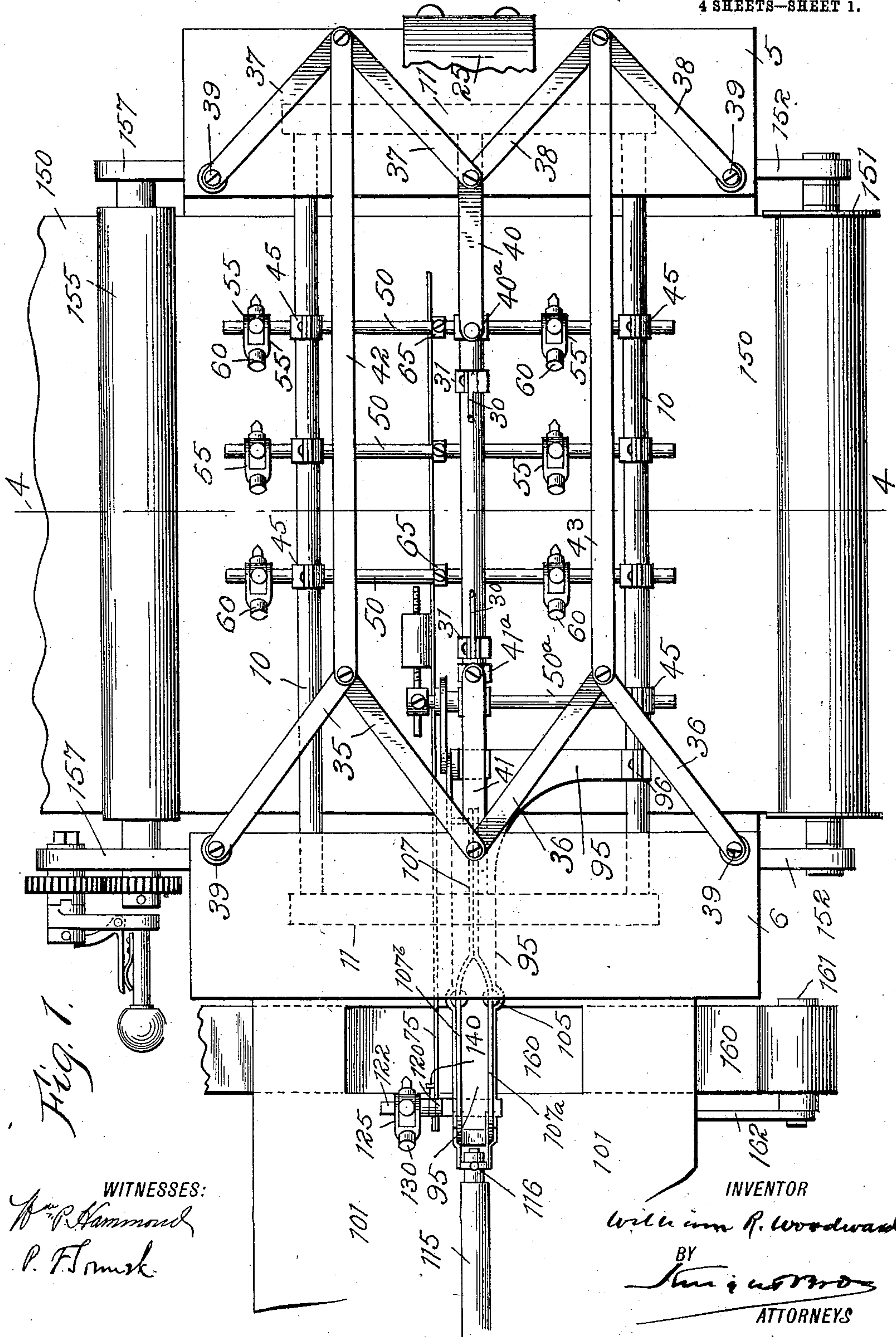
PATENTED NOV. 5, 1907.

W. R. WOODWARD.

MEANS FOR SIMULTANEOUSLY WRITING A PLURALITY OF SIGNATURES
OR INSCRIPTIONS.

APPLICATION FILED NOV. 3, 1906.

4 SHEETS—SHEET 1.



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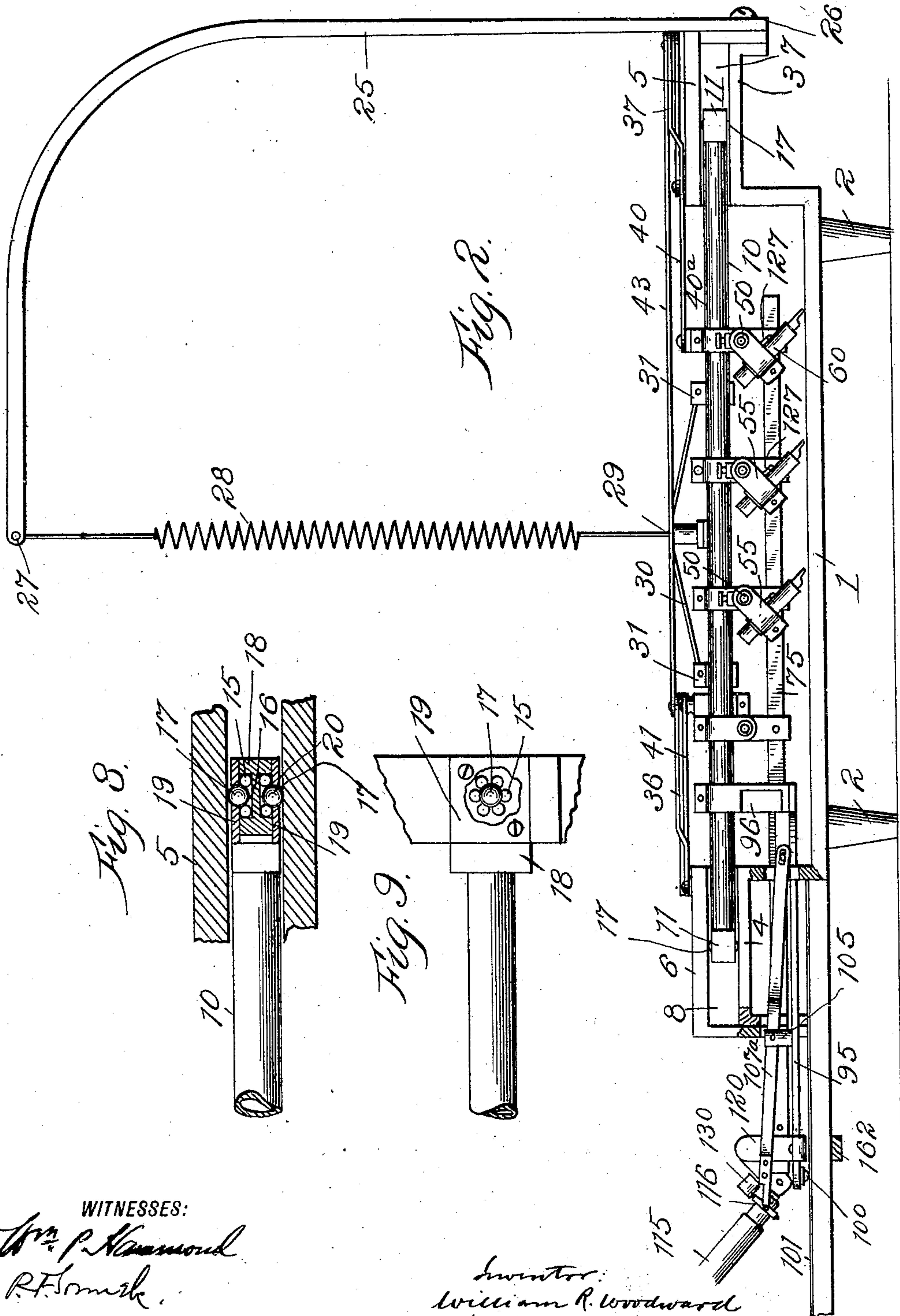
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4 SHEETS—SHEET 2.



WITNESSES:

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R. F. Smith

Inventor:
William R. Woodward
by *Wm. P. Hammond*

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No. 870,333.

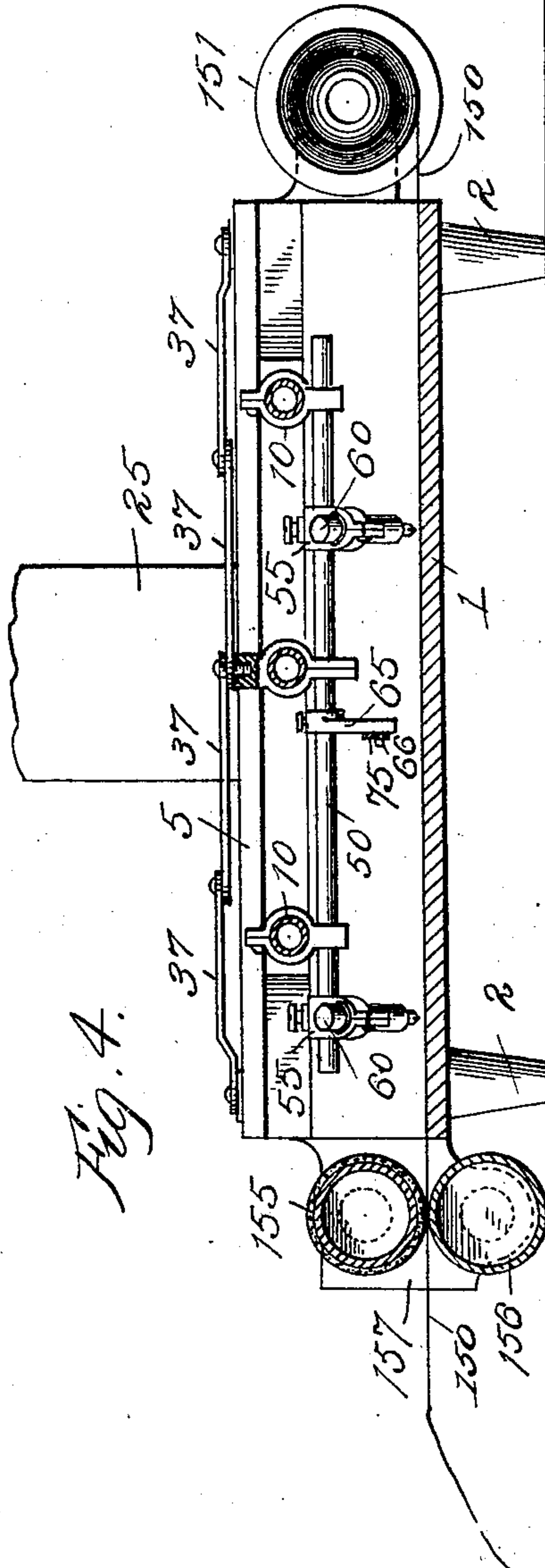
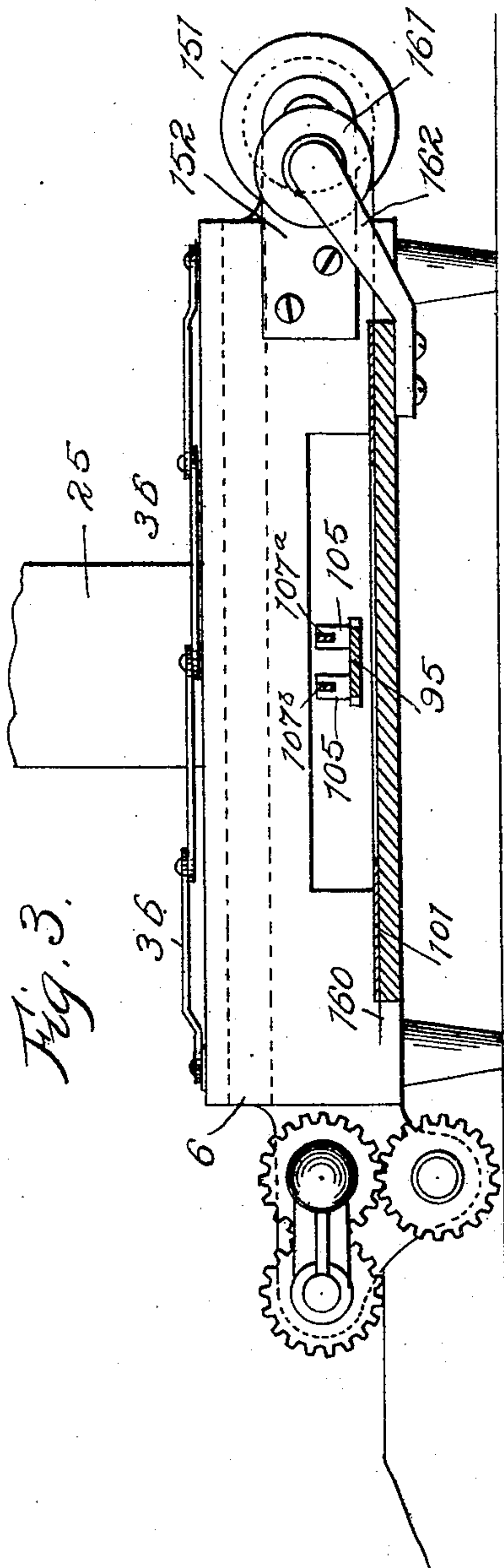
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4 SHEETS—SHEET 3.



WITNESSES:

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No. 870,333.

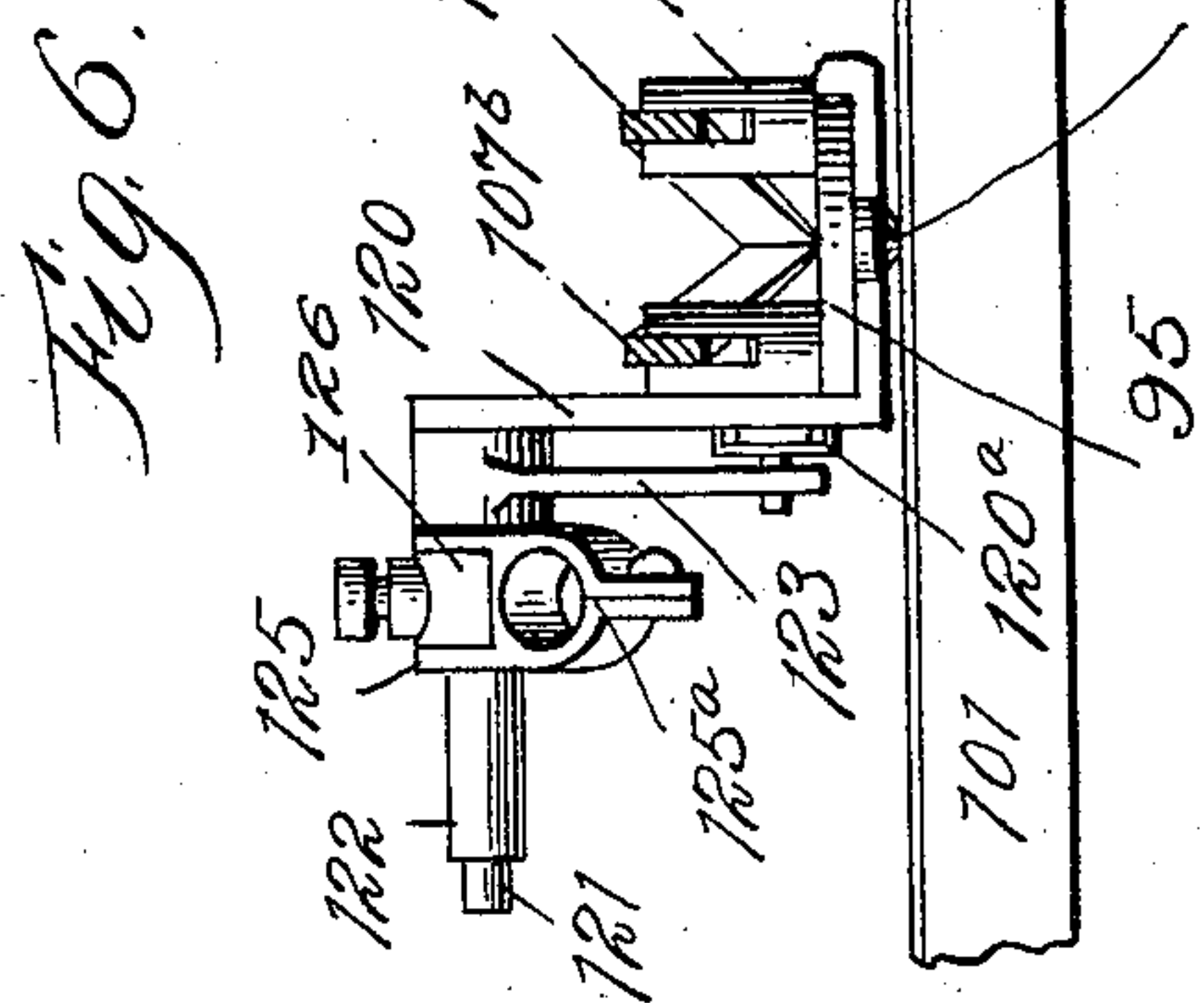
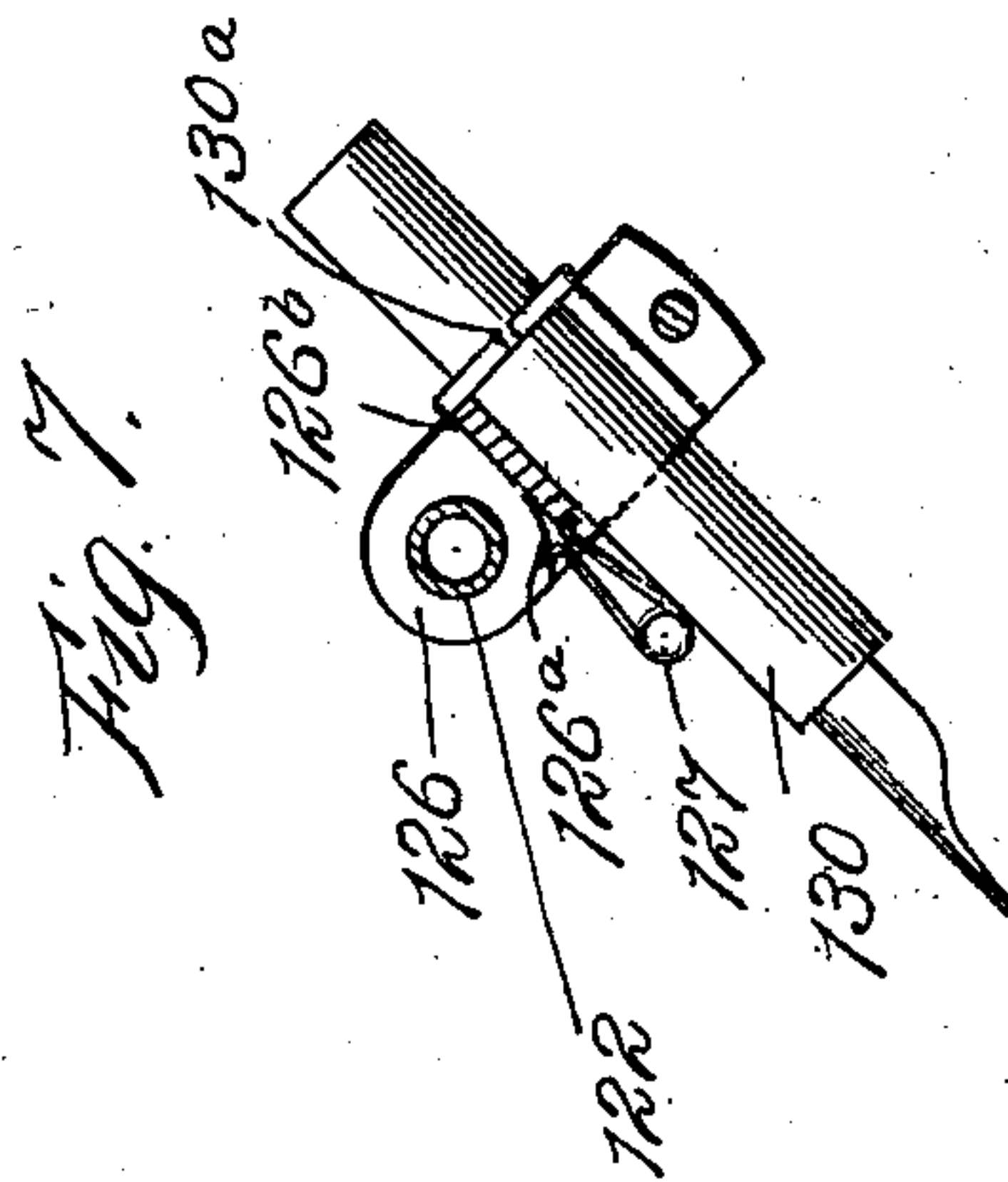
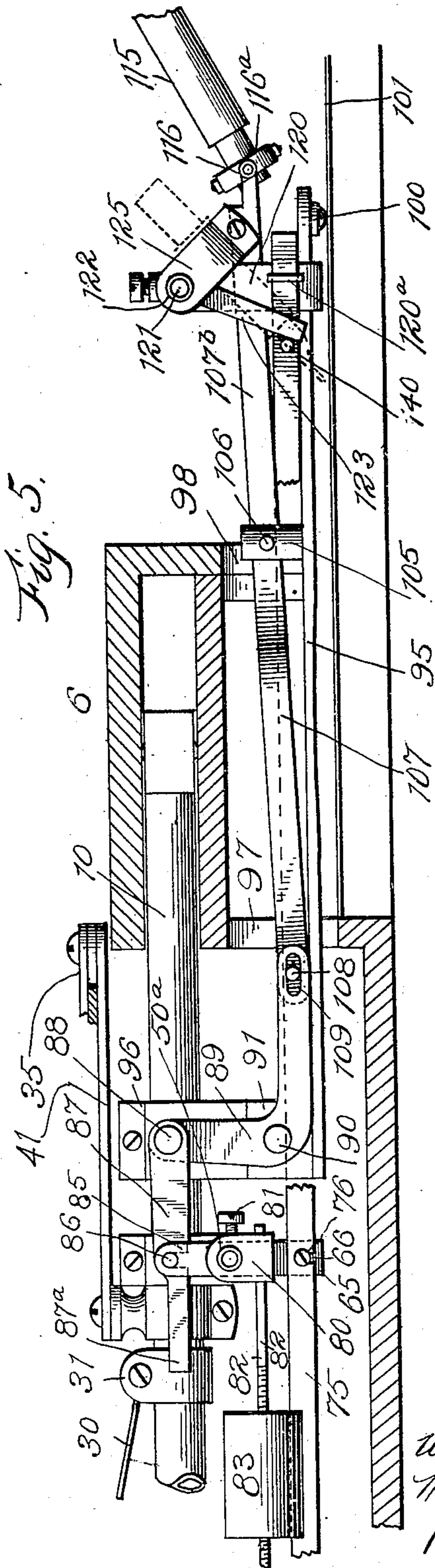
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4 SHEETS—SHEET 4.



UNITED STATES PATENT OFFICE.

WILLIAM R. WOODWARD, OF NEW YORK, N. Y.

MEANS FOR SIMULTANEOUSLY WRITING A PLURALITY OF SIGNATURES OR INSCRIPTIONS.

No. 870,333.

Specification of Letters Patent.

Patented Nov. 5, 1907.

Application filed November 3, 1906. Serial No. 341,927.

To all whom it may concern:

Be it known that I, WILLIAM R. WOODWARD, a citizen of the United States, and a resident of the borough of Brooklyn, in the city and State of New York, have invented certain new and useful Improvements in Means for Simultaneously Writing a Plurality of Signatures or Inscriptions, of which the following is a specification.

My present invention relates to improvements upon the mechanism set forth in an application for patent filed by me July 31st, 1905, Serial No. 271,886, and the object of my present invention is to simplify and improve the general construction and operation of the machine of said application.

My present invention includes, in common with the machine of my above named application, a bed-plate or table for the reception of the certificates, checks or other papers to be inscribed, a carriage having pantographic link connections with the bed-plate or table, and anti-friction bearings for supporting its weight, and a plurality of manually controlled rock shafts mounted upon the carriage and adjustable relatively to each other, each shaft carrying a plurality of individually adjustable writing members.

The improvements in the machine of my present application all relate to the perfection in construction of the details of a mechanism of the character referred to, with a view to improving the operation and accuracy of the machine, and adapting it to be more easily manipulated by the operator so as to produce a plurality of perfectly natural signatures or inscriptions which will have all of the characteristics of the operator's hand-writing.

The first feature of importance in my new machine has reference to the mounting and supporting of the movable carriage upon the bed-plate to reduce to a minimum the friction so as to relieve the operator as much as possible from the exertion of operating the mechanism. In accomplishing this result, I provide the carriage with an improved form of ball bearings upon which the carriage moves upon the bed-plate or table. I also arrange an over-hanging bracket from which is suspended a spring which is suitably connected with the carriage to partly relieve the bearings of the weight of the carriage and connected parts. By providing the mechanism with these two features, I have reduced the friction to a minimum so that the mechanism can be operated with but slight effort.

A second feature of importance comprises the structure of the controlling mechanism for simultaneously operating the rock shafts which carry the plurality of writing members. These rock shafts are operated by a common controlling bar as in my above named application, but the means for manually actuating and controlling this controlling bar has been materially improved

in the new machine with a view to rendering the mechanism more delicate in action so as to more accurately reproduce the personal characteristics of the operator's handwriting. This is accomplished through the medium of properly proportioned links and levers and a counter-balancing device, a monitor handle being connected with the main controlling lever by a universal joint to enable the operator to hold the handle in the most convenient and natural position for writing. With this arrangement the plurality of writing members are moved into and out of writing engagement with the certificates or other papers by depressing and elevating the monitor handle in a manner very similar to the action of moving an ordinary pen into and out of writing position upon the sheet of paper.

A further important feature is the provision of a monitor pen which is arranged directly in front of the operator and is so mounted that it will be under the control of the common controlling bar in substantially the same manner as all of the other writing members are controlled.

There are in addition to the above mentioned main features of improvement, many other minor features of construction, all of which will first be described with reference to the accompanying drawings, and afterwards pointed out more particularly in the annexed claims.

In said drawings, Figure 1 is a plan view of my improved mechanism for simultaneously writing a plurality of inscriptions, parts of the mechanism being broken away in the interest of clearness. Fig. 2 is a side elevation of the same mechanism, including the features that are omitted from Fig. 1, but having certain parts of Fig. 1 omitted to better show the structure. Fig. 3 is a front end view of the same, in which the monitor pen and handle and the carriage supporting spring are omitted and the monitor table is shown in section. Fig. 4 is a vertical transverse sectional view of the same, taken on line 4, 4, of Fig. 1. Fig. 5 is a detail longitudinal sectional view showing on a larger scale the manually actuated controlling mechanism of the machine. Fig. 6 is a detail transverse sectional view showing parts of the manual controlling lever and the mounting for the monitor pen. Fig. 7 is a detail sectional view of one of the writing members, all of which, including the monitor pen, are of substantially the same construction. Figs. 8 and 9 are detail views illustrating the improved antifriction ball bearings upon which the carriage is mounted.

1 is the bed-plate or table mounted upon the legs 2 and formed with the angular extensions 3, 4 at front and back. These extensions 3 and 4 are capped with the plates 5 and 6 to form horizontal guide-ways 7 and 8 into which the ends of the carriage project.

The carriage consists of a skeleton frame made up

of a plurality of longitudinal hollow bars 10 (of which three are shown, but any number of which may be employed, depending upon the size of the machine), which are braced at their ends by the plates 11, (indicated in dotted lines) in Fig. 1, which rigidly secure them together.

At each of the four corners of the carriage I provide suitable antifriction ball bearings which are shown in detail in Figs. 8 and 9. These ball bearings as preferably arranged, include a plurality of small balls 15 arranged in a circular recess 16 and supporting upon and between them a large or main ball bearing 17. It will be observed from Figs. 8 and 9 of the drawings, that the hollow carriage bar 10 has mounted upon its end a rectangular block 18 into the upper and lower faces of which the circular recesses 16 are cut. The transverse plates 11, which rigidly connect the bars 10 to form the skeleton frame of the carriage; are fastened to the rectangular blocks 18 in any suitable manner. The recesses 16 are covered by the movable plates 19 which are formed with central circular openings 20 to fit over the main balls 7 and allow said balls to project sufficiently beyond the covered plates 19 to engage the four surfaces of the plates 3, 4, 5 and 6. From this description of the ball bearings it will be observed that the carriage is supported at its four corners by four antifriction balls and operating upon the plates 3 and 4, and that it is accurately held against vertical displacement by the engagement of four similarly mounted balls which engage the under surfaces of the plates 5 and 6. To further relieve the carriage from friction, I prefer to arrange a spring to counterbalance or partly counterbalance its weight. This may be accomplished by arranging the curved mast or bracket 25 secured to the rear end of the base frame at 26; and having its upper end 27 projecting over to a point directly above the center of the machine. Attached to the end 27 of the bracket 25 is a long spiral spring 28 having its lower end secured at 29 to a yoke wire 30, whose ends are fastened to the clamp collars 31, which embrace and are rigidly secured to the central carriage bar 10. The strength and adjustment of spring 28 are such that the weight of the carriage and connected parts is almost balanced so that the antifriction bearings are relieved of the weight, and the carriage will, therefore, be more sensitive to the control of the operator.

The carriage is connected with the main frame or bed-plate by the coupled pantographic links 35, 36, 37 and 38, one of each pair of said links being pivotally connected at 39 to the plates 5 and 6 of the main frame, and to the central longitudinal bar of the carriage through links 40 and 41. The link 40 connects the adjacent ends of links 37 and 38 with the block 40^a which is secured to the central carriage bar; and the link 41 similarly connects the adjacent ends of links 35 and 36 with the block 41^a, which is also clamped to the central longitudinal bar of the carriage. The pairs of links are further coupled by the long longitudinal links 42 and 43. The pantographic link connections between the main frame and carriage are practically the same as in the machine covered by my above named application.

Each of the outside longitudinal carriage bars 10 has adjustably mounted thereon a plurality of hangers 45 65 which have means for clamping them in the desired

positions upon the carriage bars. These hangers 45 project beneath the longitudinal bars of the carriage, and have journaled in suitable bearings therein the transverse rock shafts 50, any desired number of which may be employed. By adjusting the hangers 45 upon the longitudinal bars of the carriage, it will be observed that the rock shafts 50 can be adjusted longitudinally of the carriage toward and away from each other, the hangers always maintaining the rock shafts in parallelism.

Each rock shaft 50 carries a plurality of pen grips 55, in which are mounted the fountain pens or other writing members 60. The pen grips are individually adjustable upon the rock shafts 50 so as to enable them to be adjusted to a position closer together or farther apart. Any desired number of writing members may be mounted upon each rock shaft, depending upon the number of inscriptions to be made at a single operation. The detail construction of the adjustable pen grips will be hereinafter explained in connection with the description of the monitor writing member, the pen grip being of the same construction for all of the writing members.

Depending from each transverse rock shaft 50 is an adjustable rock arm 65 carrying in its lower end a laterally projecting pin or stud 66 (preferably in the form of a screw stud), which is adapted to engage one of the notches 76 cut into the lower edge of the longitudinally movable controlling bar 75. The several rock arms 65 are placed in the same longitudinal plane and the controlling bar 75 is supported by the engagement of its notches with studs 66.

At the forward end of the machine there is a short rock shaft 50^a mounted in hangers 45 adjustably secured to the central carriage bar and one of the outside carriage bars. This short rock shaft 50^a carries at its inner end a depending rock arm 65 with a lateral stud 66 the same as the main rock shafts 50 above referred to, the controlling bar 75 having one of its notches 76 also engage the stud of rock arm 55 which projects from the shaft 50^a.

A collar 80 is secured to the short rock shaft 50^a by means of a set screw 81, and projecting from this collar 80 is a threaded pin 82 upon which is adjustably mounted a counterbalance weight 83 for the purpose which will presently appear.

Projecting up from the short rock shaft 50^a is a rock arm 85 having a laterally projecting stud 86 with which engages the notched link 87 pivoted at 88 on the upper end of a bell crank lever 89 which is pivoted at 90 upon the ear 91 of the auxiliary extension of the carriage frame hereinafter referred to. This notched link 87 has a projecting finger 87^a by which it can be conveniently manipulated for connecting and disconnecting the bell crank lever 89 and rock arm 85. It is sometimes more convenient to disconnect these parts when adjusting the rock shafts and writing members to suit a new piece of work to be performed.

95 is an auxiliary plate projecting forwardly from the carriage. This plate 95 is secured to the forward ends of two of the longitudinal carriage bars by suitable clamping collars as shown at 96, and projects through the openings 97 and 98 of the main frame beneath the plate 4. The forward end of this extension plate 95 of the carriage is provided with a ball bearing 100 which

operates upon the monitor table 101 supported upon suitable forwardly projecting bars of the main frame.

Projecting up from the auxiliary plate 95 are two vertically slotted posts 105 in which are pivoted at 106 the branches 107^a and 107^b of a controlling lever 107. This controlling lever 107 carries in its rear or inner end a laterally projecting stud 108, which operates in the longitudinal slot 109 formed in the forwardly projecting arm of the bell crank lever 89, above referred to. 115 is the monitor handle which the operator grasps as an ordinary pen-holder for operating the machine. This monitor handle 115 has an ordinary gimbal-joint connection 116 with the two arms 107^a and 107^b of the controlling lever 107, the handle turning freely within the socket member 116^a of the joint.

120 is a bracket secured to and projecting up from the auxiliary plate 95. This bracket carries a laterally projecting pin 121 upon which is journaled a sleeve 122 carrying at its inner end a depending rock arm 123. The pen grip for the monitor pen is adjustably mounted upon the sleeve 122 in the manner clearly shown in Figs. 6 and 7 of the drawings. The grip comprises a yoke 125 which is freely journaled upon the sleeve 122 and is formed with a split socket extension 125^a, in which socket the monitor pen 130 is adjustably clamped. Adjustably secured to the sleeve 122 between the two arms of the yoke shaped pen grip 125 is a cam shaped block 126 having a rounded or cut-away portion 126^a and an approximately rectangular shoulder 126^b. The rear wall of the pen receiving socket rests normally against the squared shoulder 126^b of the block 126. A delicate spring 127 is arranged between the cut-away portion 126^a of block 126 and the wall of the pen grip so as to tend to normally hold the pen grip up against the shoulder 126^b referred to. This spring 127 will yield slightly when the pen is pressed against the paper for writing and by yielding will enable the pen to successfully pass any slight obstructions or uneven places in the surface of the paper. It will be observed from Fig. 7 that the pen 130 is provided with a wire ring or collar 130^a. This collar may be made of spring wire and should be fitted to the pen holder so as to be capable of adjustment longitudinally thereon, it being clear that the purpose of the collar is to position the pen holder vertically in the pen grip when the pen holders are mounted.

As stated above, the structure of all of the writing members including the monitor pen and all the grips for mounting the writing members upon their supports are the same. From this it will of course be understood that in comparing the structure of the monitor pen and its mounting as shown in Fig. 6 and 7, with the mounting of the other writing members the sleeve 122 performs the same function as the rock shafts 50.

The controlling bar 75 extends forwardly above the monitor table 101 parallel with the extension plate 95, where its forward end is guided in a loop guide 120^a secured to the face of the vertical bracket 120. This controlling bar carries a stud or pin 140 which engages the downwardly projecting rock arm 123 of the sleeve 122 which supports the monitor pen so as to cause the monitor pen to be depressed and elevated simultaneously with and by the same means as the plurality of writing members above referred to.

The papers to be signed may be fed to the machine by any suitable means. They may be positioned upon the bed-plate by hand and secured in the desired relative position under the pens by any suitable means, or they may be properly secured in place upon a supplemental plate by any suitable means and fed into the machine by hand or automatically. The means for feeding the documents or other papers to be signed forms no part of my present invention, since this may be accomplished in so many ways.

To illustrate a complete machine I have shown the form of feeding mechanism illustrated in my above named application, in which the papers to be signed are either printed in the form of a roll, as will be the case with checks and their stubs, or they may be fastened in some way upon a continuous web of paper illustrated at 150, which may be unwound from a roller 151 shown journaled in suitable bracket arms 152 secured to the main frame or bed-plate, the web of paper being passed from roller 151 over the bed plate to the discharge side of the machine where it is engaged by the two feed rollers 155 and 156 journaled in suitable brackets at 157 secured to the machine frame. Suitable mechanism such as shown may be provided for operating the feed rollers 155 and 156 for drawing the web of paper across the bed of the machine.

In addition to the means for supplying the papers or documents to the main bed of the machine into position for the operation of the plurality of writing members, I provide a monitor strip or tape of paper shown at 160. This strip of paper 160 is mounted upon a roller 161 journaled in a bracket arm 162 projecting from the right hand side of the monitor table 101, the tape 160 passing under guide portions of the table and over a section on which the monitor pen operates to provide an exposed surface which the operator can watch while he inscribes his signature or other writing which he desires to reproduce upon the documents upon the main bed plate. It will be clear that as the signature or other inscription is completed upon the monitor tape, the tape can be pulled through to expose a fresh portion of its surface in readiness for a repetition of the operation.

In the machine shown in the drawings I have illustrated a carriage supporting three pen carrying rock shafts on each of which are mounted two pens or writing members. It will, of course, be understood that the number of rock shafts and writing members may be increased or decreased without departing from the spirit of my invention. In the machine which I have constructed embodying the invention of this present application, I have arranged twenty writing members for simultaneous operation, but have limited the illustration to the number of pens above referred to to simplify the drawings as much as possible.

The operation of my improved writing machine will be clear with but a few words of explanation. The papers or other documents to be signed being properly positioned upon the main bed plate of the machine, the operator grasps the controlling handle 115 as he would take hold of an ordinary pen holder, and slightly depresses the same similar to the operation of placing an ordinary pen upon a paper preparatory to writing. This operation of depressing the jointed end of the handle will rock the lever 107 upon its pivots which

in turn rocks bell crank lever 89, causing link 87 to rock the shaft 50^a, which through the rock arm 65 and pin 66, moves the controlling bar 75 forwardly or toward the operator. This longitudinal movement of the controlling bar 75 simultaneously shifts the monitor pen and all of the duplicate writing members into writing contact with the papers which are to be inscribed, the springs 127 of the writing members allowing a sufficiently yielding contact to produce the proper writing strokes. The springs 127 also allow the pens to yield sufficiently to pass any uneven places on the surfaces of the papers being inscribed. The operator having by the action just described moved all of the pens into engagement with the papers, proceeds to write the signature or other inscription desired exactly as would be done with an ordinary pen, his eye following the monitor pen to guide him in his movements. By the writing strokes of the monitor handle the whole carriage with the extension carrying the monitor pen, is moved to and fro over the bed plate, causing each pen to exactly reproduce every movement of the operator. It will, of course, be understood that the writing movements are transmitted to the carriage through the lever 107, while the lever is held in its shifted position with the pens in engagement with the documents.

I prefer to arrange the writing members in rows and columns as shown, each row being supported by one of the rock shafts, and the column arrangement being effected by properly positioning the individual pen grips upon the shafts. By the mechanism shown and described I arrange for the adjustment of the pens in rows and in columns, the row adjustment being effected by the adjustment of the rock shafts, while the column adjustment is effected by means of the individual adjustment of the pen grips upon the shafts.

In replacing the writing members after removal for adjustment or for refilling, as in the case of the use of fountain pens, the pens can be easily and quickly replaced to the former adjustment by the aid of the spring grip collars 130^a above described, these collars engaging the upper edges of the sockets of the pen grips when the pen holders are inserted, to support the pens at the desired height while the grips are being tightened.

The provision of the small springs between the two parts of the pen grip mounting are of great importance in allowing independent automatic adjustment of the pens to the surfaces upon which they are operated.

It will, of course, be understood that the controlling bar 75 should be provided with a sufficient number of notches in its lower edge to allow for the necessary adjustment of the rock shafts toward and away from each other longitudinally upon the carriage.

The purpose of the counterbalance 83 is to offset the weight of the writing members and connected parts so as to facilitate the action of the operator in moving the pens into and out of writing position. This weight should be so adjusted as to hold these parts of the mechanism almost balanced, whereby the operator will be required to give but a slight downward pressure to the monitor handle to move the pens into contact with the documents to be inscribed.

It will be observed that the spring 28 counterbalancing the weight of the carriage and parts supported thereon, tends to raise the carriage. The upper ball bear-

ings which engage the under surfaces of plates 5 and 6 resist any upward tendency of the carriage without materially increasing the friction in the movements of the carriage over the bed plate.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. A multiple writing device comprising a suitable bed plate, a carriage supported above and movable in all directions parallel with the bed plate, a plurality of writing members mounted upon the carriage and movable toward and away from said bed plate, a monitor handle, and a compound lever supported upon the carriage and connecting the monitor handle and the writing members.

2. A multiple writing device comprising a suitable bed plate, a carriage supported above and movable in all directions parallel with the bed plate, a plurality of writing members mounted upon the carriage and movable with the carriage, parallel with the bed plate and up and down upon the carriage with relation to said bed plate, a monitor handle, and a compound lever pivoted upon the carriage and movable in a vertical plane thereon and connecting the monitor handle and the writing members, whereby the up and down movements of the monitor handle will cause corresponding movements of the writing members.

3. A multiple writing device comprising a suitable bed plate, a carriage supported above and movable in all directions parallel with the bed plate, a plurality of writing members mounted upon the carriage and movable with the carriage parallel with the bed plate and up and down upon the carriage toward and away from said bed plate, a monitor handle controlling all of the movements of the carriage and writing members, levers upon the carriage connecting the monitor handle and the writing members, and a universal joint between the monitor handle and levers.

4. In a multiple writing device, the combination of a bed plate, a carriage supported above and movable in all directions parallel with the bed plate, means restricting the carriage to motion of translation, a plurality of writing members mounted upon the carriage and movable thereon toward and away from the bed plate and movable with the carriage parallel with the bed plate, a lever mounted upon the carriage and connected with the writing members, and a monitor handle connected with said lever.

5. In a multiple writing device, the combination of a bed plate, a carriage movably mounted above the bed plate, means restricting the carriage to motion of translation, a plurality of writing members yieldingly mounted upon the carriage and movable thereon toward and away from the bed plate, and movable with the carriage parallel with the bed plate, a lever pivotally mounted upon the carriage and connected with the writing members, and a monitor handle having universal joint connection with said lever.

6. In a multiple writing device, the combination of a bed plate, a carriage movable over the bed plate, means restricting the carriage to motion of translation, a plurality of writing members mounted upon the carriage and movable thereon toward and away from the bed plate, and a vertically movable lever mechanism including a monitor handle pivotally mounted upon the carriage and connected with the writing members in such manner that the up and down movements of the monitor handle will cause corresponding movements of the writing members, and the horizontal movements of said handle will cause the same movements of the carriage and writing members over the bed plate.

7. In a multiple writing device, the combination of a bed plate, with a carriage movable over the bed plate, means restricting the carriage to motion of translation, a plurality of writing members mounted upon the carriage and movable thereon toward and away from the bed plate, an independent yielding connection between each writing member and the carriage, and a monitor controlling device mounted upon the carriage and suitably connected with the writing members.

8. In a multiple writing device, the combination of a bed plate, with a carriage movable over the bed plate,

means restricting the carriage to motion of translation, a plurality of writing members mounted upon the carriage and movable toward and away from the bed plate, a compound lever mounted upon the carriage and connected with the writing members, a gimbal-joint connected with the compound lever, and a monitor handle rotatably connected with the gimbal-joint.

9. In a multiple writing device, the combination of a bed plate, a carriage supported above and movable parallel with said bed plate, means for restricting said carriage to motion of translation, a plurality of rock shafts journaled upon the carriage, a plurality of writing members mounted upon said rock shafts, a vertically movable controlling lever pivoted upon said carriage, and means connecting said controlling lever with said rock shafts to cause the writing members to be raised and lowered in unison.

10. In a multiple writing device, the combination of a bed plate, a carriage supported above and movable parallel with said bed plate, means for restricting said carriage to motion of translation, a plurality of rock shafts journaled upon the carriage, a plurality of writing members mounted upon said rock shafts, an independent yielding connection between each writing member and its rock shaft, a vertically movable controlling lever pivoted upon said carriage, and means connecting said controlling lever with said rock shafts to cause the writing members to be raised and lowered in unison.

11. In a multiple writing device, the combination of a bed plate, a carriage supported above and movable parallel with said bed plate, means for restricting said carriage to motion of translation, a plurality of rock shafts journaled upon the carriage, a plurality of writing members mounted upon said rock shafts, a controlling lever pivotally mounted upon said carriage and suitably connected with said rock shafts, a gimbal-joint connected with said lever, and a monitor handle rotatably connected with said gimbal-joint, as set forth.

12. In a multiple writing device, the combination of a bed plate, a carriage movable over the bed plate, means for restricting said carriage to motion of translation, a plurality of main writing members mounted upon the carriage and movable toward and away from the bed plate, a monitor writing member independently mounted upon the carriage, a controlling bar connecting the main writing members with the monitor writing member for causing the latter to be moved simultaneously with the former, and a monitor handle suitably connected with the controlling bar for operating all of the writing members.

13. In a multiple writing device, the combination of a bed plate, a monitor table, a carriage movable over the bed plate and monitor table, means for restricting said carriage to motion of translation, a plurality of main writing members upon the carriage and movable toward and away from the bed plate, a monitor writing member mounted upon the carriage and movable toward and away from the monitor table, a controlling bar connecting the main writing members and the monitor writing member for causing all of the writing members to move simultaneously up and down upon the carriage, and a monitor handle suitably connected with the carriage and the controlling bar.

14. In a multiple writing device, the combination of a bed plate, a carriage movable over the bed plate, a plurality of rock shafts mounted upon the carriage, writing members carried by said rock shafts, a monitor writing member mounted upon one of said rock shafts, rock arms projecting from said rock shafts, a controlling bar connecting said rock arms to cause the shafts to rock a controlling lever connected with the controlling bar, and a monitor handle suitably connected with the controlling lever for operating the carriage and writing members.

15. In a multiple writing device, the combination of a bed plate, a carriage movable over the bed plate, a plurality of rock shafts journaled upon the carriage, a plurality of writing members mounted upon said rock shafts, means for operating the carriage and rock shafts, and a counterbalance weight connected with said rock shafts for the purpose set forth.

16. In a multiple writing device, the combination of a bed plate, a carriage movable over the bed plate, a plu-

ality of rock shafts journaled upon the carriage, a plurality of writing members mounted upon said rock shafts, means connecting said rock shafts to cause them to move in unison, a monitor handle suitably connected with said rock shafts for controlling them, and an adjustable counterbalance weight connected with said rock shafts for the purpose set forth.

17. In a multiple writing device, the combination of a bed plate, a carriage movable over the bed plate, a plurality of rock shafts journaled upon the carriage, a plurality of writing members mounted upon said rock shafts, means connecting said rock shafts, a monitor handle suitably connected with said rock shafts for controlling them, a rock arm projecting from one of said rock shafts, and an adjustable counterbalance weight mounted upon said rock arm for the purpose set forth.

18. In a multiple writing device, the combination of a suitable bed plate, with a carriage movable over the bed plate, means for restricting the carriage to motion of translation, bearings above and below parts of the carriage for confining it in a horizontal plane, a plurality of writing members mounted upon the carriage, means for operating the carriage and for controlling the writing members, and a spring device arranged to sustain the weight of the carriage and connected parts.

19. In a multiple writing device, the combination of a suitable frame including a bed plate and an overhanging bracket, with a carriage movable over the bed plate, means for restricting the carriage to motion of translation, bearings above and below parts of the carriage for confining it in a horizontal plane, a plurality of writing members mounted upon the carriage, means for operating the carriage and for controlling the writing members, and a suspension spring secured to said bracket and connected with the carriage to counterbalance the weight of the carriage and connected parts.

20. In a multiple writing device, the combination of a suitable bed plate, with a carriage mounted above the bed plate, means for restricting the carriage to motion of translation, bearings above and below parts of the carriage for confining it in a horizontal plane, a plurality of writing members mounted upon the carriage, a bracket secured to the bed plate and extending over the carriage, and a suspension spring connecting said bracket and yoke and yieldingly supporting the weight of the carriage.

21. In a multiple writing device, the combination of a suitable bed plate, with a carriage movable thereover, means for restricting the carriage to motion of translation, a plurality of writing members mounted upon the carriage, ball bearings between the carriage and bed plate above and below parts of the carriage for confining the carriage in a horizontal plane, and a spring sustaining the weight of the carriage.

22. In a multiple writing device, the combination of a suitable bed plate, with a carriage movable thereover, a plurality of writing members mounted upon the carriage, ball bearings between the carriage and bed plate, a bracket secured to the bed plate and extending over the carriage, and a suspension spring connecting the carriage and bracket.

23. In a multiple writing device, the combination of a bed plate, a carriage supporting a plurality of writing members, means for restricting the carriage to motion of translation, a controlling lever suitably connected with the carriage and writing members, a monitor handle, and a gimbal-joint between the monitor handle and said controlling lever, the handle being rotatably connected with the gimbal-joint.

24. In a device of the character described, the combination of a support for a writing member including a rock shaft, a two part pen grip mounted upon the rock shaft, a spring between the two parts of the pen grip, and a writing member secured in one part of the pen grip.

25. In a device of the character described, the combination of a support for a writing member including a rock shaft, a block secured to the rock shaft, a pen grip movably mounted upon the rock shaft, a spring mounted between the block and the pen grip, and a writing member secured in the pen grip.

26. In a device of the character described, the combina-

tion of a support for a writing member including a rock shaft, a block secured on the rock shaft and formed with a shoulder and a cut away portion, a pen grip movably mounted upon the rock shaft and embracing said block, a spring mounted between the cut away portion of said block and the pen grip and yieldingly holding the pen grips against the shoulder of the block, and a writing member secured in the pen grip.

27. In a multiple writing device, the combination of a main bed plate, a monitor table supported in front of the main bed plate, a carriage movable over the main bed plate, an extension plate projecting forwardly from the carriage over the monitor table, a plurality of writing members mounted upon the carriage above the main bed plate, a monitor writing member mounted upon said extension plate above the monitor table, controlling means connecting all of said writing members, and a monitor handle for operating the controlling means.

28. In a multiple writing device, the combination of a main bed plate and a monitor table, with the carriage operating thereover and having a forwardly projecting extension plate, ball bearings between the carriage and main bed plate and between the extension plate and monitor table, a plurality of writing members mounted upon the carriage, a monitor writing member mounted upon the extension plate, and manually operating controlling means for the writing members.

29. In a multiple writing device, the combination of a main bed plate having a forwardly projecting monitor table, a carriage movable over the main bed plate and formed with a forwardly projecting extension plate, a plurality of writing members mounted in the carriage, a monitor writing member mounted upon the extension plate, a controlling bar connected with said plurality of writing members and projecting forwardly parallel with the extension plate, means of engagement between the controlling bar and monitor writing member, and manually operated means for controlling the movements of the writing members.

30. In a multiple writing device, the combination of a main bed plate, a monitor table supported in front of the main bed plate, a carriage movable over the main bed plate, an extension plate projecting forwardly from the carriage over the monitor table, a plurality of rock shafts

journale upon the carriage, a plurality of writing members mounted upon said rock shafts, a bracket mounted upon said extension plate, a rock shaft mounted upon said bracket above the monitor table, a monitor writing member mounted upon said bracket rock shaft controlling means including a bar connecting all of said rock shafts, and a monitor handle for operating the controlling means.

31. In a multiple writing device, the combination of a main bed plate, with a carriage movably mounted above the bed plate, a plurality of rock shafts journaled in the carriage, means connecting said rock shafts to cause them to move in unison, a plurality of writing members mounted upon said connected rock shafts and supported thereby in operative relation to the bed plate, a bell crank lever pivotally mounted upon the carriage and having link connection with one of said rock shafts, a controlling lever also pivotally mounted upon the carriage and engaging said bell crank lever, and a monitor handle having jointed connection with said controlling lever.

32. In a multiple writing device, the combination of a main bed plate, a carriage movably mounted above the bed plate, a plurality of writing members mounted upon the carriage, an extension plate projecting from the carriage, a bell crank lever suitably connected with the writing members, a controlling lever pivotally mounted upon the carriage extension plate and connected with said bell crank lever, and a monitor handle having jointed connection with the controlling lever.

33. In a multiple writing device, the combination of a main bed plate, a monitor table, a carriage operating over the main bed plate and formed with an extension which projects over the monitor table, a plurality of main writing members mounted upon the carriage above the main bed plate, a monitor writing member mounted upon the extension plate above the monitor table, a monitor handle controlling the movements of the carriage and the writing members, and means for supplying a strip of paper to the monitor table in a position to be inscribed by the monitor pen.

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Witnesses:

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