

No. 756,340.

PATENTED APR. 5, 1904.

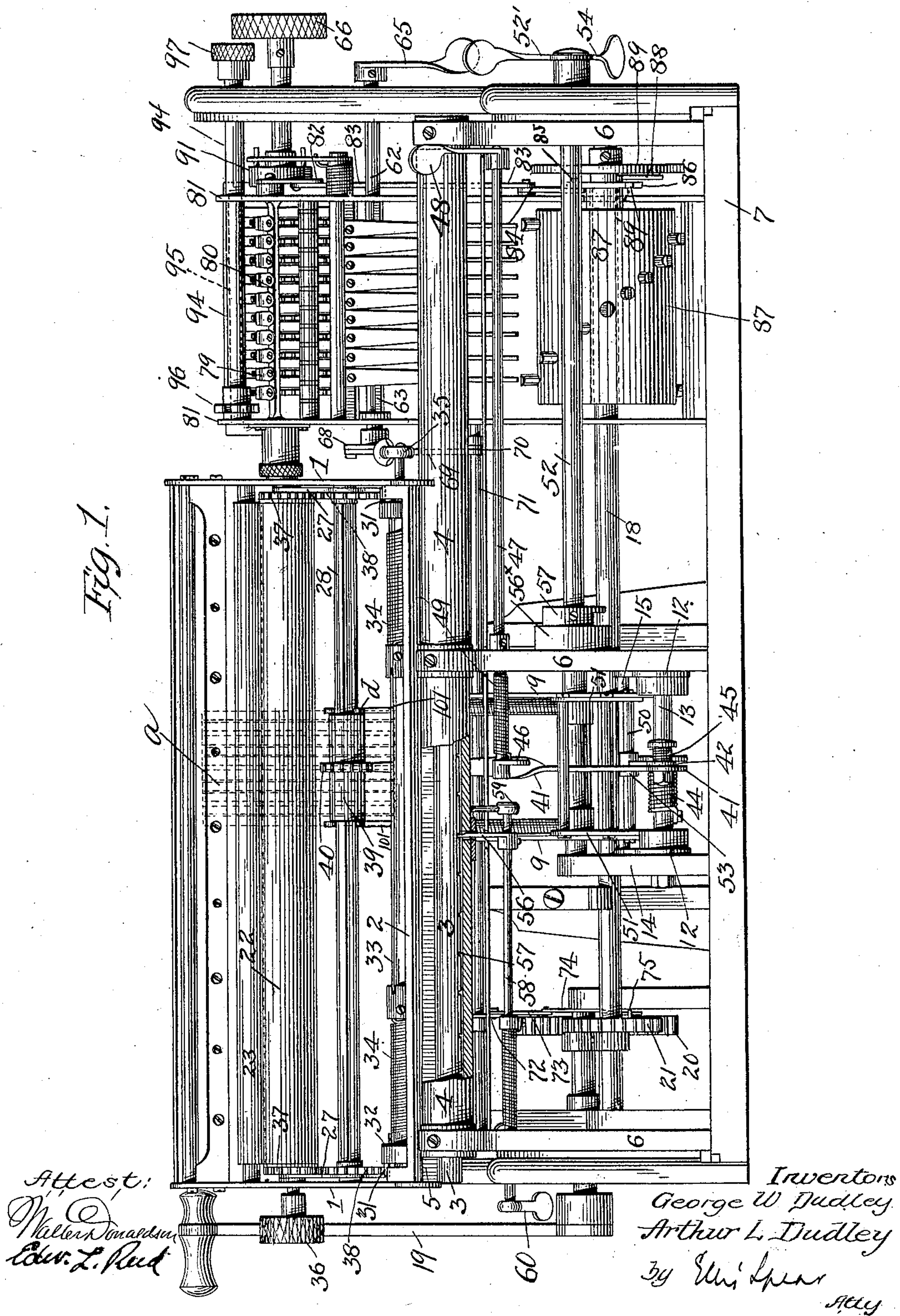
G. W. & A. L. DUDLEY.
RECORDING AND ADDING MACHINE.

APPLICATION FILED SEPT. 24, 1901.

NO MODEL.

4 SHEETS—SHEET 1.

Fig. 1.



No. 756,340.

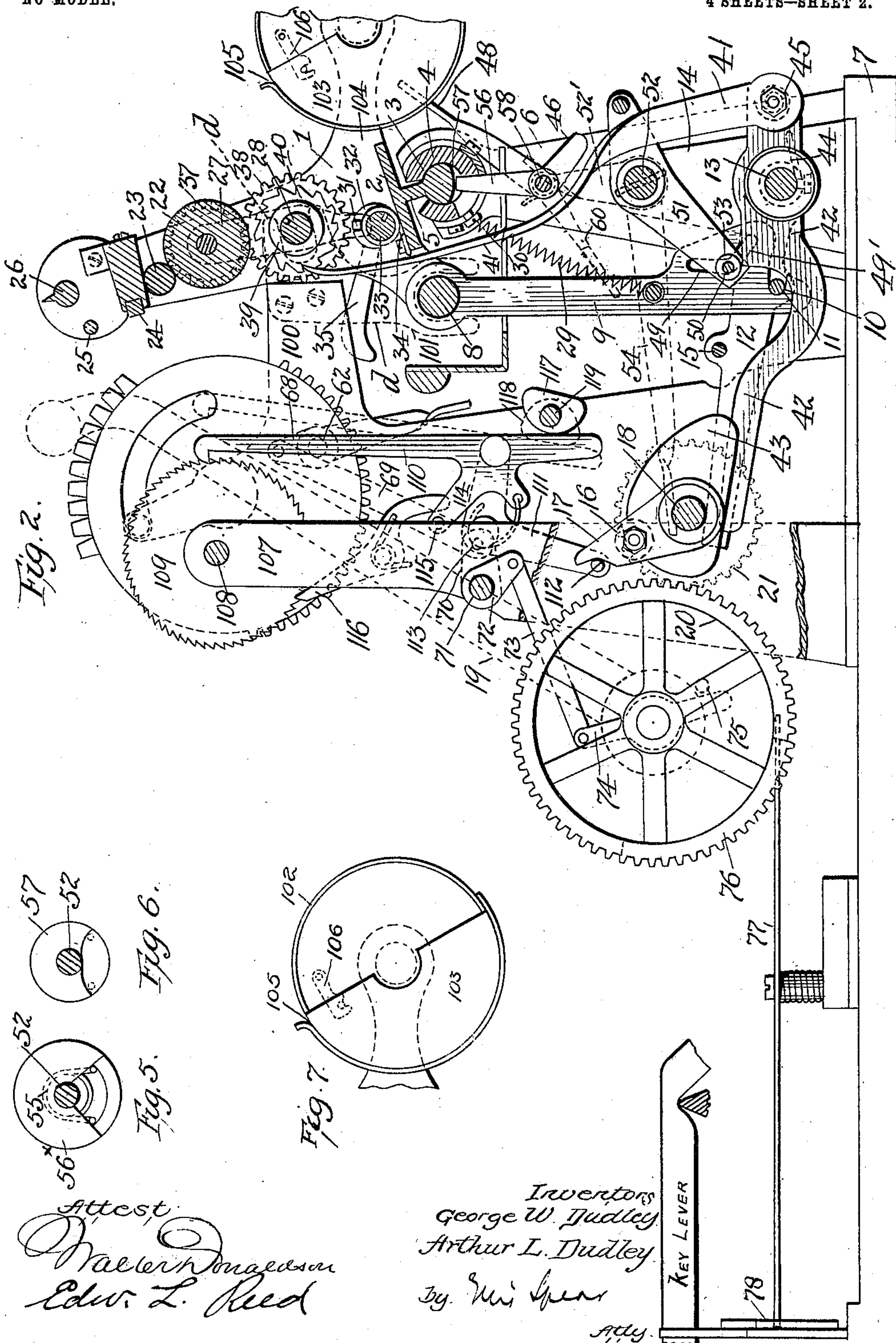
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4 SHEETS—SHEET 2.



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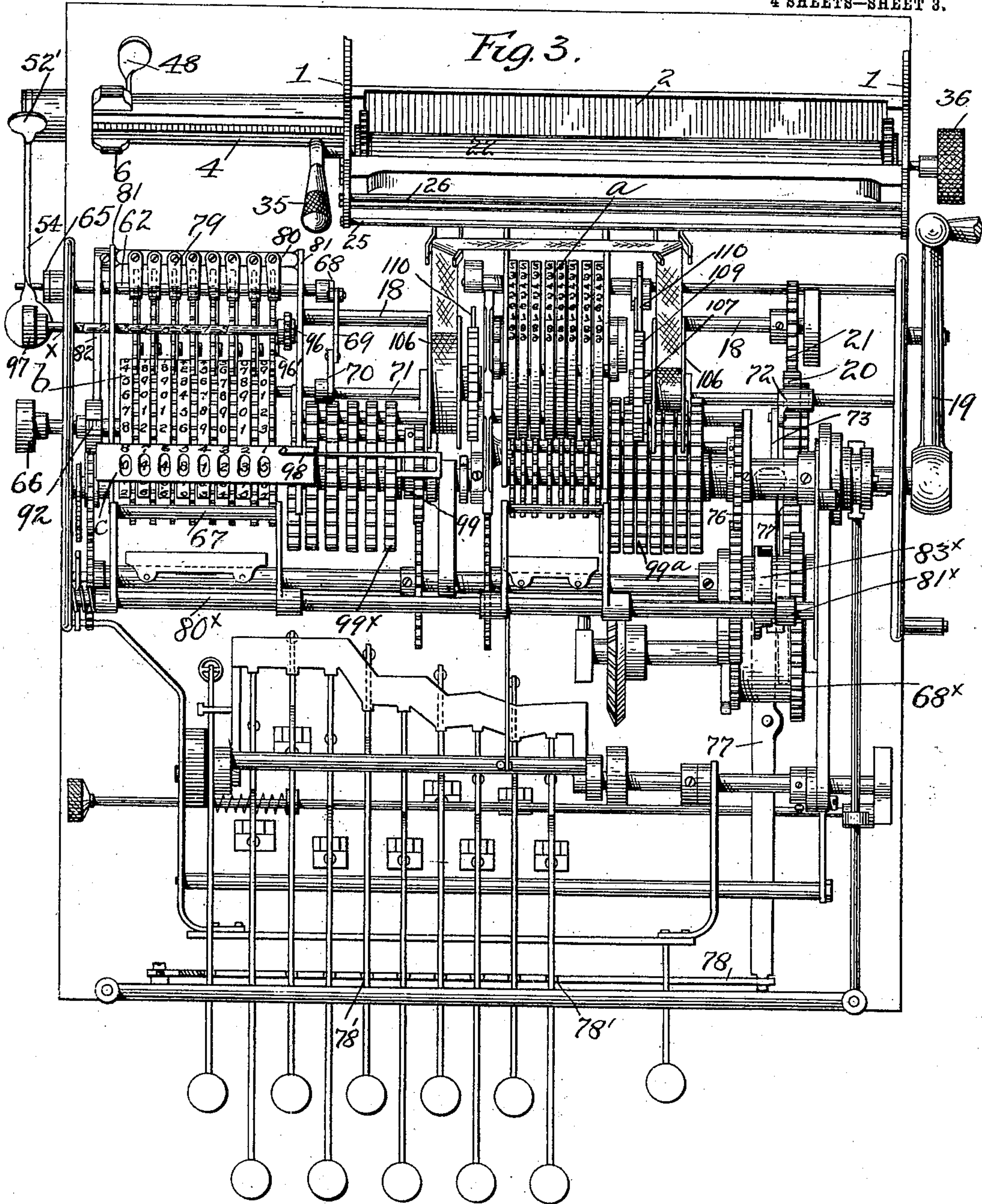
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4 SHEETS—SHEET 3.



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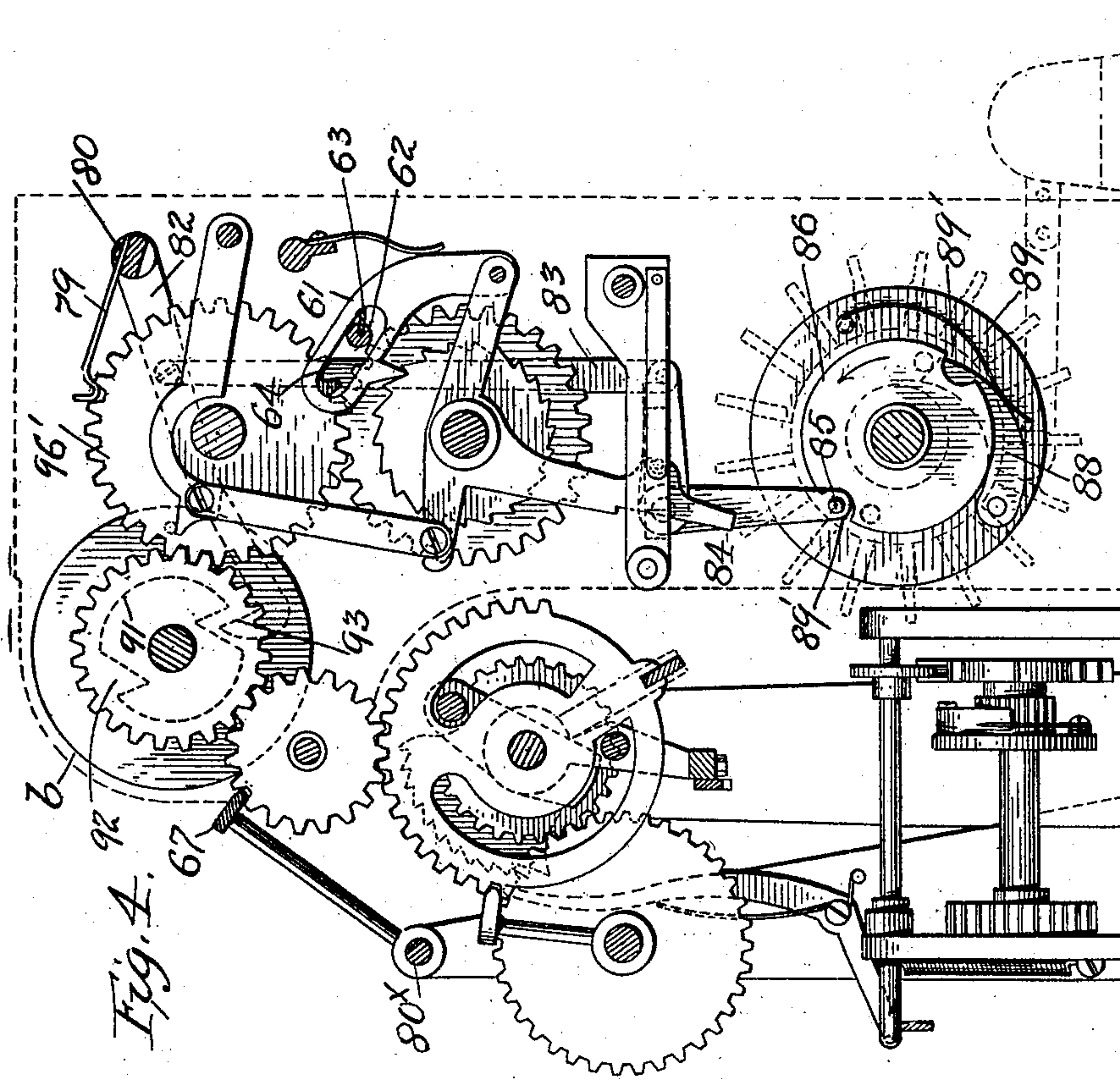
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4 SHEETS—SHEET 4.



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UNITED STATES PATENT OFFICE.

GEORGE WILSON DUDLEY AND ARTHUR LOUIS DUDLEY, OF STAUNTON, VIRGINIA, ASSIGNORS TO THE NUMEROGRAPH MANUFACTURING COMPANY, OF CHARLESTON, WEST VIRGINIA, A CORPORATION OF WEST VIRGINIA.

RECORDING AND ADDING MACHINE.

SPECIFICATION forming part of Letters Patent No. 756,340, dated April 5, 1904.

Application filed September 24, 1901. Serial No. 76,321. (No model.)

To all whom it may concern:

Be it known that we, GEORGE WILSON DUDLEY and ARTHUR LOUIS DUDLEY, citizens of the United States, residing at Staunton, Augusta county, Virginia, have invented certain new and useful Improvements in Recording and Adding Machines, of which the following is a specification.

Our invention is an improvement upon the recording and adding machine described in application for Letters Patent of the United States, filed by us March 23, 1900, Serial No. 10,105, the present improvements relating to the paper-carriage mechanism, means whereby the said mechanism may be thrown out of operation, means for resetting the adding-disks to zero, means for locking the keys during the resetting operation in order to prevent disarrangement of the trains of mechanisms, means for controlling the detents of the carrying-trains, a correcting mechanism, and other features hereinafter described, and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a rear view of our machine. Fig. 2 is a vertical sectional view of the paper-carriage with adjacent mechanism with parts in elevation. Fig. 3 is a plan view of the machine. Fig. 4 is a central vertical section of parts relating to the adding mechanism. Figs. 5 and 6 are views of details. Fig. 7 is a detail view of the paper-receptacle.

In the present specification we have confined ourselves mostly to the mechanism which is new in respect to that shown in the application referred to above, it being thought unnecessary to repeat the description contained in said application. It will be understood that the printing-disks *a* and adding-disks *b* are operated by selectors 99^a and 99^x, respectively, which are in turn set up by the operation of the keys and by connections extending from an operating-handle 19, all of said operations and connections being fully described in the application referred to. Further, the adding mechanism is provided with means for carry-

ing digits from order to order, the carrying-wheels being indicated in the present case at 96', this mechanism also being substantially the same as that described in said application, excepting as hereinafter noted.

The paper-carriage comprises end frames 1, connected by a plate 2, which has connected thereto the pivot-bar 3, adapted to both turn and slide in a track or way 4 of tubular form, which is slotted on its upper side for the passage of the web 5, connecting the said pivot-bar with the said plate 2. The track or way is rigidly supported by the fixed standards 6, extending up from the base-frame 7. The end frames of the carriage are also connected by a bar 8, which passes loosely through operating-bars 9, extending downwardly and having hooks 11 engaged by a cross-bar 10 of a pair of levers 12, which are pivoted on a bar 13, rigidly supported in the standard 14 and one of the standards 6, Fig. 1. The levers 12 are connected by a cross-rod 15, so that they, with the cross-rod, move together as one frame.

The forward ends of the levers 12 are arranged to be operated by the rollers 16, (dotted lines, Fig. 2,) carried by arms 17, fixed to the shaft 18, which is turned backward and forward as the main hand-lever 19 (dotted lines, Fig. 2) of the machine is swung forward and backward, the connection between these parts being through the master-wheel 20, on the shaft of which the hand-lever is fixed, and through the gear-wheel 21, fixed on the said shaft 18, these parts being similar to those in our previous application referred to above.

As the main hand-lever is swung forward to set up the number to the printing-point and after the printing-disks are set up the continued forward movement of the hand-lever will through the connections just described cause the depression of the levers 12, and the cross-bar 10 will draw down the hooked rods 9, and thus cause the carriage-frame to be tilted forwardly to force the paper against the type, and thus make the impression, it

being understood that the paper passes between the paper-feed roller 22 and the roller 23, carried by the carriage-frame, thence up in front of the platen 24, also carried by the carriage-frame, and then up between the cross-rod 25 of this carriage-frame and the cutting-bar 26.

When the main hand-lever is swung rearwardly to restore the printing-disks and other parts, as described in our said former application, the reverse action takes place, the arms 17 moving so as to carry the rollers 16 away from the levers 12, and thus allowing said levers to rise and the paper-carriage to swing back to normal position, this action taking place in the first part of the return movement of the main hand-lever 19 to the position shown in Fig. 2. Springs 29, one end of each of which is connected to the rod 9 and the other end to the fixed framework at 30, serve to swing the paper-carriage and the levers 12 to their normal position after the rollers 16 free the said levers 13.

The paper-feed roll 22 is carried by arms 27, Figs. 1 and 2, pivotally supported on a shaft 28, journaled in the end frames 1 of the paper-carriage frame. These arms at their lower ends have pins 31 extending into notches or slots in arms or collars 32, fixed on a shaft 33, which is journaled in the end frames of the paper-carriage. This shaft is under tension of springs 34, tending to press the paper-feed roller against the roller 23 to secure proper contact and pressure for feeding the paper. A finger-lever 35 on the end of the shaft when pressed down serves to force the feed-roll away from the roller 23 for the proper manipulation of the paper in placing it, removing, or adjusting it, and when the finger-lever is released the springs will return the feed-roll to normal position. The feed-roll may be turned by hand through the knob or finger-piece 36.

To turn the feed-roll automatically, it is provided with gear-wheels 37, Figs. 1 and 2, one at each end, meshing with gears 38, fixed on the shaft 28. This shaft is connected by a spline with a sleeve 39, carrying a ratchet-wheel 40, which is adapted to be turned one tooth at each forward movement of the main hand-lever 19 through a pawl 41, which is pivoted to a lever 42, pivoted on the cross-rod 13, the forward end of said lever being operated by a cam 43, fixed on the shaft 18, before mentioned, said shaft having its bearings in any suitable part of the framework. The lever 42 is returned to its upper normal position by a spring 44, one end of which is fixed to the rigid cross-bar 13 and the other end being secured to the lever. By this spring raising the pawl-lever the pawl is retracted for a new tooth when the hand-lever is swung rearwardly. The pawl is also pressed by a coil-spring 45 to remain in contact with the teeth of the ratchet.

To throw the pawl out of action so that the paper-feed roll may be turned in either direction by hand, we have provided a release-finger 46, carried by a shaft 47, journaled in the standards 6 and operated by a finger-lever 48. The release-finger when moved strikes the pawl and throws it out of the ratchet-teeth against the tension of the spring 45, allowing the feed-roll to be turned in either direction.

We have provided means whereby the paper-carriage may be thrown out of operation so that the adding portion of the machine may be used without causing any impression to be made by the printing mechanism. For this purpose the hook-bars 9 are thrown out of normal position, so as not to be depressed by the operation of the levers 12, which levers in the present machine are operated at each action of the hand-lever. To throw the hooked arms out, they are provided with cam-shaped slots 49, Fig. 2, through which passes a cross-bar 50, carried by arms 51, pinned to a rock-shaft 52, journaled in the standards 6. The shaft has a finger-lever 52' fixed thereto, and by moving this the arms 51 will be swung to cause the cross-bar 50 to throw the hooked arms 9 forwardly, so that their hooks will be disengaged from the cross-bar 10, and so long as the parts are held in this position the machine may be operated without causing the paper-carriage frame to be swung to make the impression, the adding mechanism alone being effective. The arms 51, with the cross-bar 50, may be used also to turn the paper-feed roll step by step by hand, for which purpose the said bar 50, which may turn in its bearings in the arms 51, is provided with an enlargement or roller 53, bearing on the upper edge of the pawl-carrying lever 42. A second finger-lever 54 is fixed to the shaft 52 to turn the same in the opposite direction from that of the releasing-lever 52', before mentioned, and through this lever and connections described the pawl-carrying lever may be depressed to turn the ratchet-wheel one step, and this action may be repeated to get the desired number of step-by-step actions of the paper-feed roll. The slots 49 of the hooked arms are extended at 49' to permit the cross-bar 50 to move in the action just described without affecting said hooked arms.

The shaft 52 is under spring tension either way it is turned, said tension restoring the shaft to normal position whichever way it is turned, said spring tension being secured by a spring 55, Fig. 5, within a case 56^x, Fig. 1, rigidly fixed to one of the standards 6, said spring having both of its ends projecting to be engaged by shoulders on a block 57, secured to the shaft 52. Whichever way the shaft is turned one of the shoulders on said block will engage one of the ends of the spring and will be returned thereby.

It will be understood that the paper-carriage besides having its swinging movement

is adapted to be moved longitudinally into different positions in relation to the printing-disks, the position of which is indicated in dotted lines in Fig. 1 at *a*. In this longitudinal movement the pivot-bar 3 simply slides in the track or way 4, it fitting snugly therein. This adjustment is to permit columns of figures to be printed side by side on the sheet.

In order to hold the carriage in any of the several positions to which it may be adjusted, we have provided a pawl 56, extending up through a slot in the fixed track to engage any one of a series of notches 57 in the pivot-bar, as shown in Fig. 1. The pawl is carried by a shaft 58, journaled in one of the standards 6 and the support 59, and it has a finger-lever 60, which when pressed will throw the pawl out of engagement with the pivot-bar, so that the paper-carriage can be shifted longitudinally. A spring 61 will return the shaft and pawl when a notch comes opposite the pawl.

Resetting adding-disks to zero.—In order to reset the adding-disks *b* to zero, we have provided means whereby the carrying-pawls 61, which act in carrying digits from one order to the next higher, may be thrown out of connection with the carrying-train, this means consisting of a shaft 62, Fig. 4, journaled in the frame of the adding mechanism and having a wing 63, Figs. 3 and 4, adapted to engage the walls of slots 64, formed in the pawls, through which slots the shaft extends. The shaft has a finger-lever 65, and when this is pressed the wing will move all of the carrying-pawls out of connection, and the adding-disks may then be reset by turning the knob 66 on the shaft of the adding-disks. This shaft may be provided with any suitable pins or devices adapted to engage parts on the adding-disks to return the same to zero position, such means being shown in the application referred to. In order to free the adding-disks, it is necessary to withdraw the detents 67, Figs. 3 and 4, from connection with the gear-train, and for this purpose we make a connection between the wing-shaft 62 and the master-wheel 20, so that when the carrying-pawls 61 are thrown out of action the same operation will throw out the detent 67, and thus free the adding-disks for the resetting action, the said detent being arranged in the same relation to the adding and printing trains as is shown in my application mentioned and operated from the master-wheel in a similar manner to that shown in said application. This connection to the master-wheel consists of an arm 68 on the shaft 62, a link 69 connecting said arm with an arm 70 on a shaft 71, journaled in the framework, said shaft having also an arm 72 connected by a link 73 with a lever 74, pivoted on the shaft of the master-wheel and arranged so that when operated it will contact with a pin 75 on the master-wheel

and turn the same, and this master-wheel 65 through its connection with the detent 67 will throw the same out of operation to free the adding-disks for the resetting action to zero. The connection mentioned consists of the gear 68^x, Fig. 3, the cam 83^x, arm 81^x, and the shaft 80^x, Fig. 3, carrying the detents, similar numerals without the exponent "x" being used to designate like parts in the application mentioned.

Key-locking means.—We have provided means whereby the key mechanism is locked when the adding-disks are to be reset to zero and the detents are withdrawn, so as to free the adding-disk trains. The object of this is to prevent the operation of the machine while the detents are thrown out of connection, and thus prevent disarrangement of the parts at this time. In order to effect this locking action, we provide the master-wheel with a cam 76 and a lever 77, pivoted to the base of the machine, which lever has its end in the path of this cam, while its opposite end engages a slide 78, guided in the framework, said slide having a series of notches 78' to normally receive the key-levers when they are depressed and having plain unnotched portions to form stops for the key-levers when the slide is shifted into locking position, which action takes place simultaneously with the release of the carrying-pawls and with the throwing out of connection of the detent. The various trains of wheels being free at this time, any intentional or accidental operation of the keys would throw the connections out of order; but the locking mechanism for the keys acting simultaneously with the release of the adding-disks will effectually prevent any disarrangement of the connections at this time, and it will be necessary to restore the detents and pawls to engaging position before the lock-bar is withdrawn to unlock the keys. In other words, the lever 19 must be returned fully to its normal rearward position to unlock the keys, and when in this position the detent 67 is in engagement, as are also the carrying-pawls 61.

In order to allow the adding-disks to move freely in the setting-up operations and at the same time to prevent overthrow of the adding-disks in the operation of carrying or resetting, a special arrangement of detent mechanism for the adding-disk trains is provided.

The spring-detents 79, Figs. 1 and 4, are fixed to a rock shaft or bar 80, journaled in the side frames 81 of the adding mechanism, there being one detent for each carrying-gear wheel. An arm 89, connected with the said shaft, is in turn connected by a link 83 with a bell-crank lever 84, pivoted to one of the side frames 81, and having a pin 85 arranged to be acted on by a cam-disk 86, which is connected with the pin-drum 87, these parts being loose on the shaft 18, before mentioned, and

adapted to be operated for the carrying operation each time the hand-lever 19 is moved rearwardly by a pawl 88, carried by a disk 89, fixed on the said shaft 18. The cam has notches or low parts 89' therein adapted to receive the pin 85 during the setting-up action, the said cam-disk remaining at rest during this time, the disk 89 alone turning and the pawl 88 moving around to engage a new pin 90 for a new action. When the pin 85 is in the notch, the detents 79 are free and rest but slightly on the toothed wheels of the carrying-train. When, however, the cam-disk is turned by the pawl 88 the pin 85, riding upon the periphery or high part of the cam, will press the detents into strong contact with the said toothed wheels, and as at this time the carrying is being done there will be no danger of overthrow of the carrying-disks. The detents are also thrown into operation when the knob 66 of the adding-disks is turned to reset the adding-disks to zero, for which purpose the arm 82 is extended and has a hooked end 93, acted on by a cam or collar 91, said collar having notches or low parts 92 to normally receive the hooked end 93 of the arm 82; but when the knob is turned to reset the disks the periphery of the cam, acting on the hooked end of the arm, will throw the detents into strong contact with the toothed wheels of the carrying mechanism and prevent the same from becoming disarranged, it being understood, as before stated, that when this resetting action takes place the carrying-pawls and the detents 67 have been thrown out of connection, and the adding-disks, with their gear-trains, are free and are liable to become disordered were some means not provided to prevent this.

Correcting device.—A correcting device is provided by which any of the adding-disks may be individually set or adjusted to correct any errors. This consists of a sleeve 94, arranged to slide upon a cross-rod 95, (dotted lines, Fig. 1,) which is supported in the frames 81 of the adding mechanism. This sleeve carries a toothed wheel 96, adapted to mesh with any of the toothed wheels of the carrying mechanisms, for which purpose the sleeve may be slid longitudinally by means of a finger-piece or button 97. The sleeve is provided with a scale marked to correspond to the different orders of the adding-disks and by making the number of the desired order register with a certain part of the frame, as at *a*, Fig. 3, which will perform the function of an index or pointer, the toothed wheel 96 will then be in mesh with the toothed carrying-wheel 96' of the order desired, and by then throwing the carrying-pawl 61 out of connection the toothed carrying-wheel and its disk may be adjusted as desired to correct any errors.

In order to indicate the last order of digits which has been operated or added, we provide a pointer 98, Fig. 3, carried by the standard

99, which shifts with the group of adding-se-lectors 99. This pointer moves over an indicating-plate *c*, having a scale composed of numbers corresponding to the different order of digits, the said plate having an opening through which the figures are exposed to view. By means of this pointer it can be ascertained at a glance which of the several orders have been operated or added last, and by means of the corrector-wheel the operator may connect with and adjust the proper toothed carrying-wheel to set the corresponding adding-disk as desired.

The sleeve carrying the ratchet-wheel of the paper-feed is held against longitudinal displacement by brackets *d*, which are secured to the standards 100, supporting the printing-disks. These brackets are slotted or forked (dotted lines, Fig. 2) to permit the swinging of the paper-carriage. The brackets have forked extensions 101, which sustain the arms or rods 9 laterally. These arms, together with the attendant mechanism, have no lateral movement, but remain fixed in relation to the longitudinal adjustment of the paper-carriage.

Paper-receptacle.—The paper-receptacle is in the form of a cylinder composed of two semi-cylindrical sections 102 103, supported upon an arm 104 of the paper-carriage. The section 102 is adapted to be turned within the section 103, so that the paper may be rolled up and placed in position, after which the said section is turned into the position shown in Fig. 2 to make the parts assume cylindrical form, and the end of the paper is then withdrawn through the slot 105 left between the sections and passed through the feed-roller. The movable section is held in open position by means of a latch 106.

Ribbon-feed.—The ribbon-spools 106 have their shafts supported in standards 107 and are slightly offset in relation to the axis of the printing-disks. The shaft 108 of each ribbon-spool is provided with a ratchet-wheel 109 to be engaged by pawls 110, carried pivotally by bell-crank levers 111, which are pivoted to any suitable part of the framework, said levers being arranged to be operated by the arms 17, before mentioned, said arms engaging pins 112 on the bell-crank levers. The pawl-levers 110 are pressed toward the ratchet-wheels normally by springs 113, carried by the bell-crank levers 111. The pawl-levers have also arms 114, provided with pins 115, arranged to operate the detents 116 of the ribbon-ratchets 109, so that when either pawl is thrown out the detent corresponding to its ratchet will be thrown out also. The arrangement is such that when one pawl is out the other is in engagement with its ratchet, as shown in Fig. 2, and for this purpose the pawls are arranged to be acted upon by cam-blocks 117 118, reversely set in relation to each other upon a shaft 119. By turning this shaft one

of the cams will engage its pawl to throw it out of operation, and at the same time the other cam-block will free its pawl, so that this under the tension of its spring 113 will engage its ratchet-wheel.

We claim as our invention—

1. In combination with keys and adding-disks, carrying mechanism including carrying-pawls, setting-up means connected with the adding-disks including selectors one for each order of digits operated from the keys, detent means for said setting-up means and means for throwing out of operation simultaneously the carrying-pawls and the detent means, substantially as described.

2. In combination with the adding-disks, setting-up mechanism therefor, carrying mechanism including carrying-pawls, detent means for the setting-up mechanism, a master-wheel connected with the setting-up mechanism and with the detent means, means for throwing the carrying-pawls out of operation and a connection between the said throwing-out means and the master-wheel whereby when the carrying-pawls are out of operation the detent means will also be out of operation, substantially as described.

3. In combination, the adding-disks, carrying mechanism therefor, setting-up means for the adding-disks including a master-wheel and a lever for operating the same, a connection from the master-wheel to the carrying mechanism, detent means for the setting-up mechanism, a connection thereto from the master-wheel, means for throwing the carrying-pawls out of operation, said means being connected with the master-wheel, substantially as described.

4. In combination, the adding-disks, setting-up mechanism therefor, detent means for the setting-up mechanism, carrying mechanism including carrying-pawls, means for throwing the pawls and detent means out of operation for the resetting action and the lock for preventing operation of the setting-up mechanism while the detent means and carrying-pawls are out of operation, substantially as described.

5. In combination, adding-disks, setting-up means therefor including a master-wheel, detent means connected with the master-wheel, carrying-pawls, means for throwing said pawls out of operation and turning the master-wheel to throw the detent means out, the keys, the key-lock and means for operating the key-

lock from the master-wheel, substantially as described.

6. In combination with the adding-disks, setting-up mechanism including a selector for each order of units, carrying mechanism, detent means for the carrying mechanism normally ineffective thereagainst when the setting-up mechanism is operated and means for throwing said detent means into action when the carrying operation is to be performed, substantially as described.

7. In combination with the adding-disks, setting-up mechanism including a selector for each order of units, detent means normally ineffective against the carrying mechanism and means for throwing said detent means into operation when the resetting of the adding-disks is to be performed, substantially as described.

8. In combination, the adding-disks, the carrying-trains therefor, the detent means for the carrying-trains normally ineffective thereupon, the pin-drum for operating the carrying-train, means for operating the drum step by step in one direction and a cam also operated by said means having connection with the detent means, substantially as described.

9. In combination with the adding-disks, a correcting device including a shifting pinion independent of the setting-up means and hand-operated means for operating the same, substantially as described.

10. In combination in a correcting device for the adding mechanism, a shifting pinion independent of the setting-up means, means for shifting and manipulating the same and a scale to indicate the position of the pinion in relation to the adding-disks, substantially as described.

11. In combination with the adding-disks, setting-up means including shifting selectors, an indicator associated with the said selectors and with the adding-disks to show the order selected, substantially as described.

12. In combination with the adding-disks, setting-up means including shifting selectors, an indicator to show the order selected and a correcting device, substantially as described.

In testimony whereof we affix our signatures in presence of two witnesses.

GEORGE WILSON DUDLEY.

ARTHUR LOUIS DUDLEY.

Witnesses:

J. L. S. KIRBY,

C. E. BERTIE.