

960,634.

5 SHEETS—SHEET 1.



J. J. McKenney

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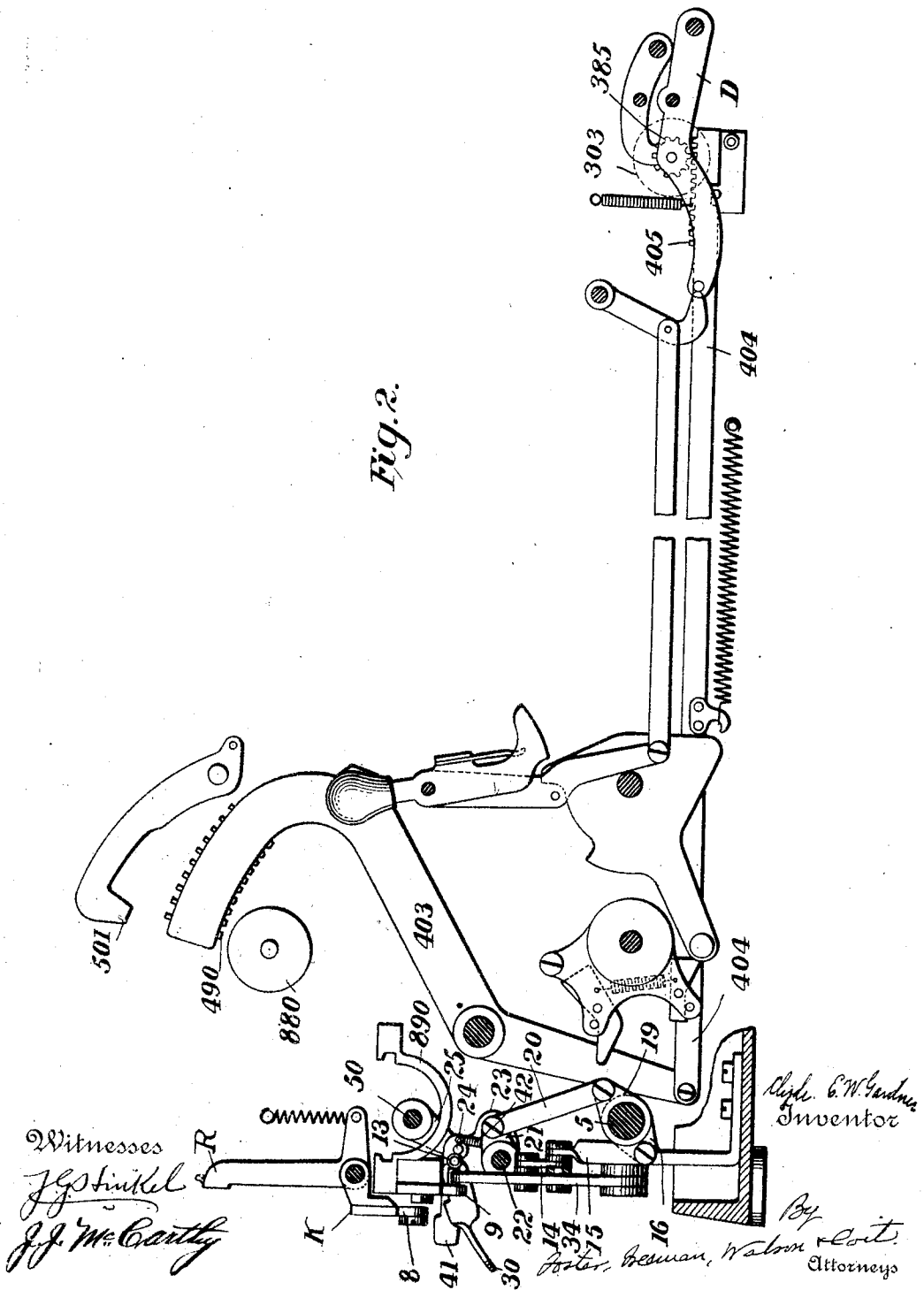
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C. E. W. GARDNER.
 PERPENDICULAR AND HORIZONTAL ADDING MACHINE.
 APPLICATION FILED MAY 16, 1908.

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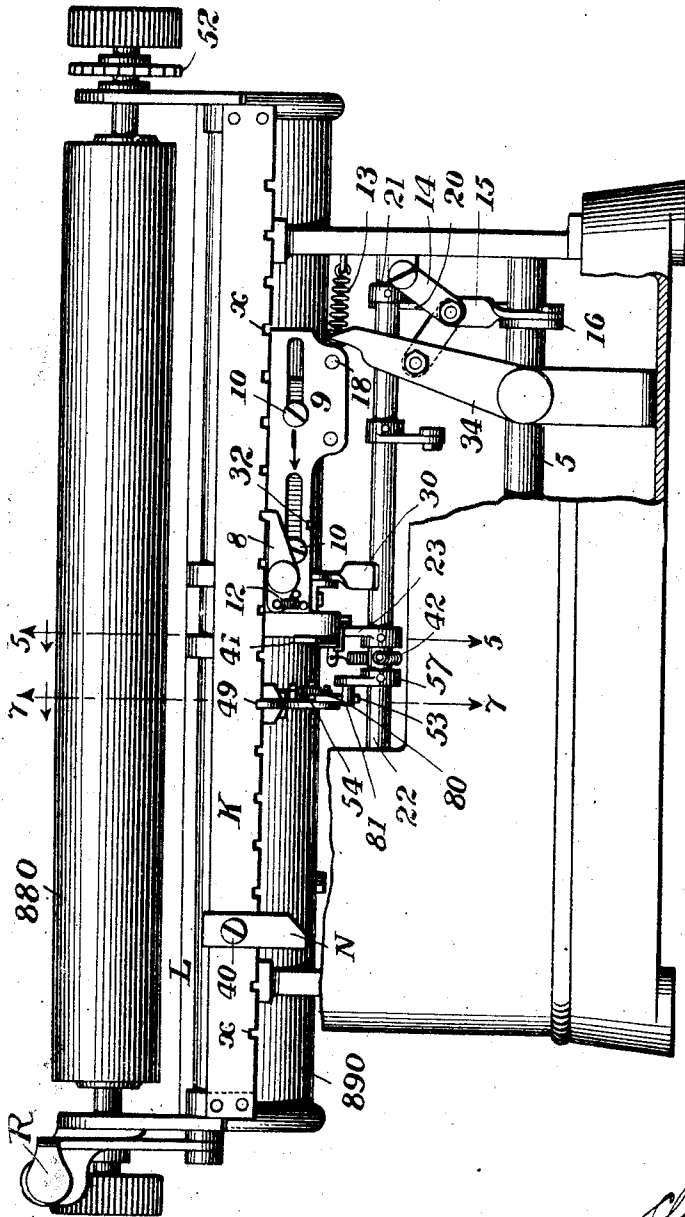


Fig. 3.

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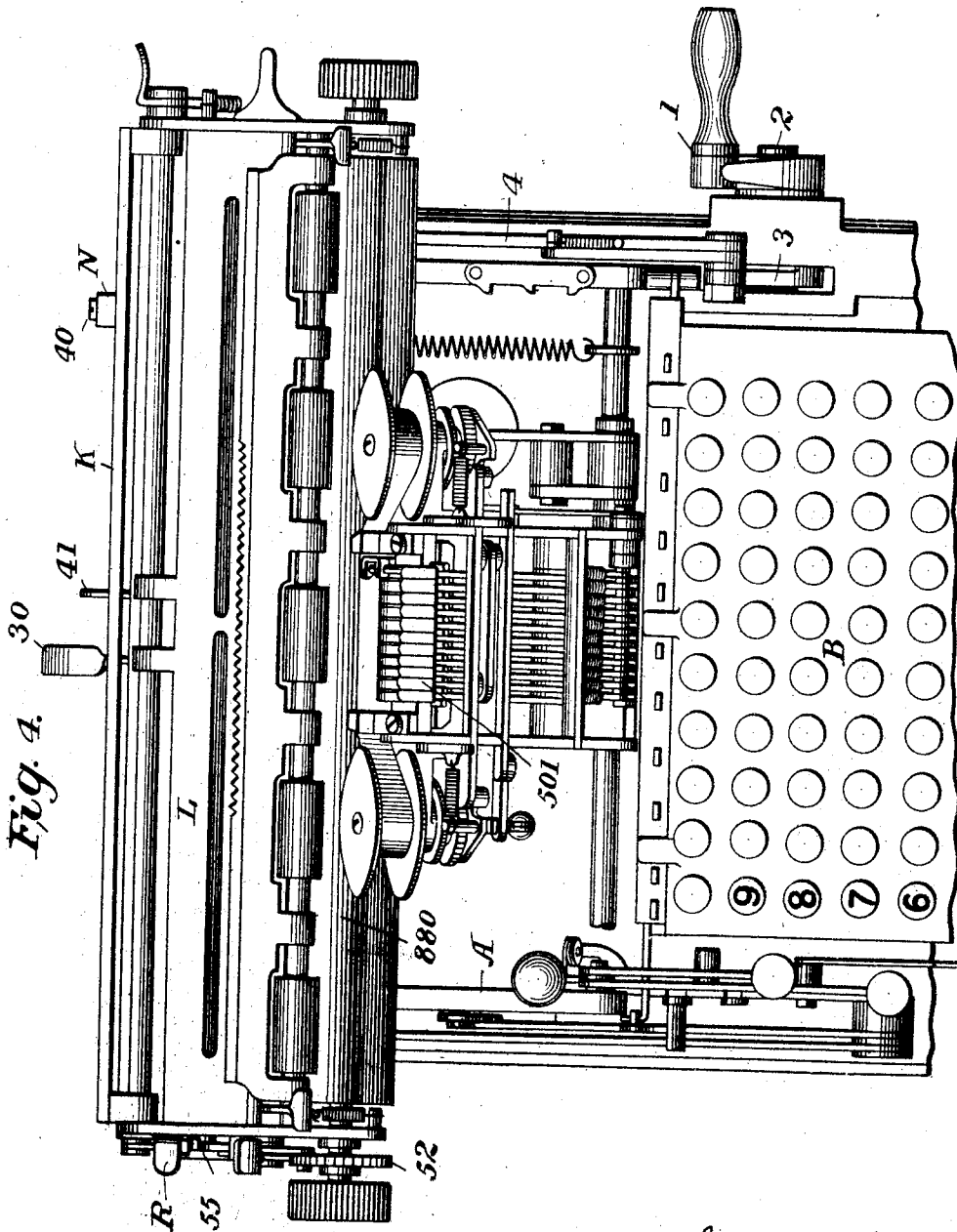


Fig. 4.

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5 SHEETS—SHEET 5.

Fig. 5.

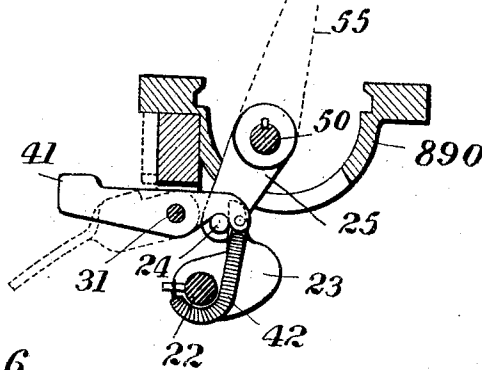


Fig. 6.

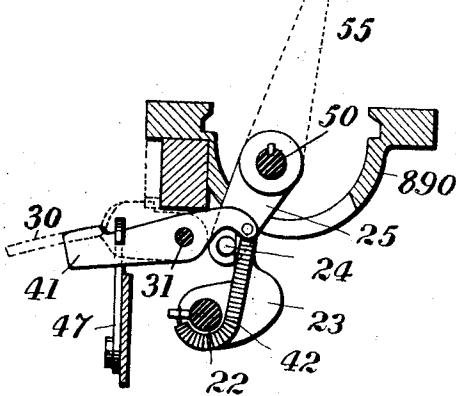


Fig. 7.

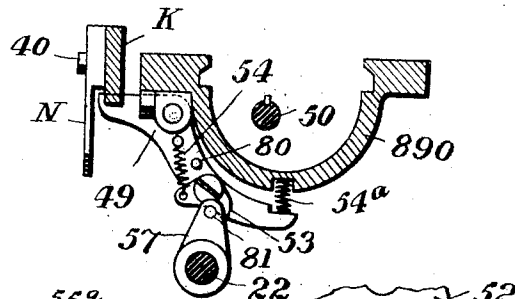


Fig. 9.

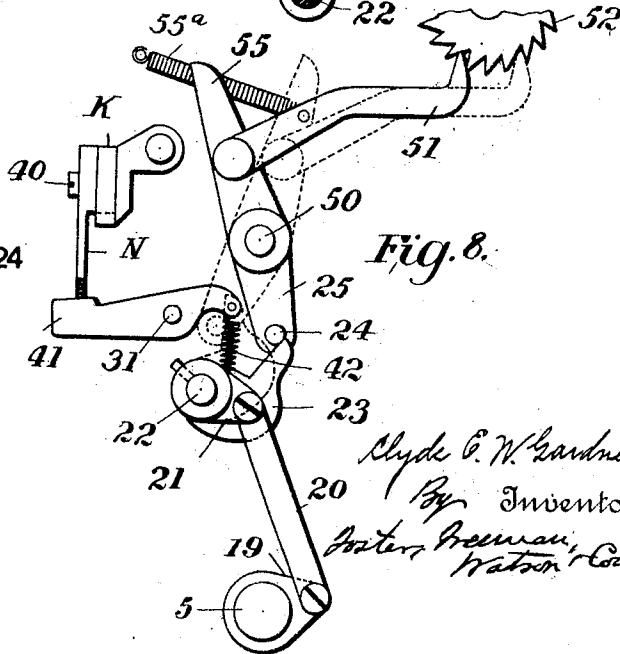


Fig. 8.

245 187 618 248 917 624
 123
 181
 629
 923

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UNITED STATES PATENT OFFICE.

CLYDE E. W. GARDNER, OF ORANGE, NEW JERSEY, ASSIGNOR TO PIKE ADDING MACHINE COMPANY, OF ORANGE, NEW JERSEY, A CORPORATION OF NEW JERSEY.

PERPENDICULAR AND HORIZONTAL ADDING MACHINE.

960,634.

Specification of Letters Patent.

Patented June 7, 1910.

Application filed May 16, 1908. Serial No. 433,295.

To all whom it may concern:

Be it known that I, CLYDE E. W. GARDNER, a citizen of the United States, and residing at Orange, New Jersey, have invented certain new and useful Improvements in Perpendicular and Horizontal Adding Machines, of which the following is a specification.

My invention relates to adding machines, and particularly to a platen and its adjuncts, where such platen is capable of longitudinal and rotative step-by-step movements, and my invention consists in means whereby to impart either of said movements at will to the platen, and to turn it one step automatically at the end of each longitudinal traverse of the platen, as fully set forth hereinafter and as illustrated in the accompanying drawings, in which:

Figure 1 is a side elevation of a Pike adding machine provided with my improvement; Fig. 1^a is a detached view of one of the connections; Fig. 2 is a longitudinal section showing part of the devices of said machine which more immediately coact with those of my improvement; Fig. 3 is a rear elevation part of the frame being broken away; Fig. 4 is a plan view of Fig. 3; Fig. 5 is a transverse section on the line 5, Fig. 3; Fig. 6 is a similar section showing the parts in a different position; Fig. 7 is a transverse section on the line 7, Fig. 3; Fig. 8 a view illustrating parts which operate in connection with the rotation of the platen; Fig. 9 is a diagrammatic view illustrating the effect of the two different movements of the platen.

While my invention is applicable to adding and recording machines of different constructions, for illustration I have shown it in connection with an adding and recording apparatus of the general character of the apparatus illustrated in Letters Patent granted to W. H. Pike, Jr., Numbers 763,692 and 767,596, except that the apparatus now illustrated is one in which the parts are operated, in adding, by means of a hand-manipulated handle 1, instead of being power driven as in said Letters Patent.

The said apparatus is generally characterized by a frame A supporting a keyboard B upon which are series of ten numeral keys nine of which are indicated by the numerals "1" to "9" and the other a restoring key, and the depression of the said

nine keys define the reciprocating movements of the blades 404, which in turn determine the position of the recording devices which are capable of printing items consisting each of a plurality of figures, that is extent of oscillation of type carriers 403 carrying numeral types 490, and the type or series of type in printing position is driven against the paper upon the platen 880 by means of hammers 501, and the extent of movement of the blades and type carriers in setting the latter to printing position determines the extent of rotation of adder wheels 303, each of which carries a pinion 385 that may gear with a rack 405 carried by the adjacent blade 404. The pinions and adder wheels are carried by a frame D which may at proper intervals be swung up and down to bring the pinions into and out of gear to record a total or sub-total, or to carry the wheels to zero in a manner which it is unnecessary to describe in detail as such details constitute no part of the present invention.

The frame A has a channel guide 890 in which slides a carriage I supporting the platen 880, and the longitudinal movement of this carriage with the platen, step-by-step to a uniform extent after printing each item, as the impressions are made by the type, serves to record said impressions across the paper while the step-by-step rotation of the platen when it occurs constitutes the means of making the record in successive parallel lines or in columns.

In order that either of these movements of the platen may be effected at will, I operate the platen automatically both longitudinally and rotatably from some moving member of the apparatus as, for instance, from a shaft 5 which is rocked from the handle 1 through the medium of an arm 3 upon a shaft 2, to which handle is connected, a connecting rod 4, and a lever 6 (dotted lines Fig. 1) secured to the shaft 5 and to which the rear end of the connecting rod 4 is pivoted at y.

The longitudinal movement of the platen.—This movement is effected from the shaft 5 as follows: The carriage supports at the rear a bar K having a series of notches α (uniformly spaced according to the greatest number of figures which may be required in any one item) and with these notches may engage the beveled end of a dog 8 pivoted

to a reciprocating slide 9, sliding upon pins 10 extending into the frame, a spring 12 tending to carry the end of the dog into engagement with the bar, but the bevel of the lip upon the dog causing the latter to swing downward out of the notch when the slide 9 moves in the direction of its arrow Fig. 3. The slide is drawn in a contrary direction by a spring 13, but is carried in the direction of its arrow by a swinging arm 34 which is reciprocated from the shaft 5 through the medium of toggles 14 centrally connected to a link 15 which is pivoted to an arm 16 extending from the shaft 5. Therefore as the shaft 5 rocks in one direction the toggles 14 are brought into line, the arm 34 is swung toward a pin 18 on the slide 9, and the latter is moved in the direction of its arrow, the pawl 8 swinging downward.

When the shaft 5 rocks in the opposite direction the toggle is broken and the spring 13 carries the slide 9 to the right of Fig. 3, and the lip of the dog which has entered one of the notches of the bar K so engages the latter that the carriage L is carried with the slide.

It will be understood that in the class of machines described all of the plurality of figures that are contained in any one item. at one operation and the distance between the notches x should therefore be uniform and as great as the greatest number of figures that are contained in any one item. This is a matter of proportion which is determined in the construction of the machine according to its requirements in this respect. The feed therefore secured by the above described means is sufficient to carry the platen at each operation to a position to permit the printing of a new item of the desired number of figures, in line with that already printed, and generally with an intervening space, Fig. 9 illustrating in horizontal line a series of items of such a character where there are three figures in each item.

It will be seen that this feeding action takes place at each movement of the handle 1 and of the operating shaft to which the handle is connected, and it will of course be understood that this operating shaft may be actuated from a motor where required.

Column-printing means.—In many instances it is desired to print the items successively one above the other in columns, and in order to effect the necessary operation of the platen in such cases when it is moved rotatably step-by-step, and is not moved longitudinally, I combine with the platen means operated from some moving part of the machine to automatically impart the necessary feed to the platen. Thus, as shown in Fig. 1, the platen carries a ratchet 52 with which engages a pawl 51 carried toward the ratchet by a spring and pivoted

to an arm 55 on a shaft 50 carried by the carriage. This shaft 50, as shown in Figs. 5 and 8, carries an arm 25 which is splined to slide on and rock with the shaft and has a lateral pin 24 which is held against an arm 23 on the rock shaft 22 by means of a spring 55^a connected with the arm 55, see Fig. 8. The shaft 22 also carries an arm 21, Figs. 2, 3 and 8, connected by a link 20 to an arm 19 on the shaft 5. As a result of this connection the rocking of the shaft 5 oscillates shaft 22 and the arm 23 and, through the arm 25, the shaft 50, its arm 55 and pawl 51, moving the ratchet 52 rotatably one step at each return operation of the operating shaft, thereby carrying the paper backward instead of laterally, such a distance that the items printed thereon appear in column one above the other instead of in line laterally, as shown in Fig. 9.

When the recording of items in column is required the platen should of course be at rest as regards longitudinal movement and I therefore make use of suitable means for holding the carriage in such case. Such means consists of a detent 30, Figs. 3 and 6, which is pivoted to a cross-shaft 31 upon the frame and which may be carried by hand up into a notch 32 of the slide 9 after the latter is carried away from the side frame so as to distend the spring 13, and thereafter no movement can be imparted to the slide by the swinging of the arm 34, and the carriage will remain at rest.

During each forward movement of the handle a latch 49, pivoted to the frame, locks the carriage, the nose of the latch entering one of the notches in the bar K, under the action of a heavy spring 54^a. Upon the shaft 22 is an arm 57 from which extends a pin 80, and when the shaft is rocked forward this pin contacts with one arm on the bell crank 53 until it escapes therefrom, when a spring 54 will swing the bell crank until its other arm makes contact with the pin 81. On the back swing of the shaft 22 the pin 81, making contact with the pendent arm of the bell crank, acts with a camming effect upon the latter and lifts the tail of the latch 49 to carry its nose out of the notch and release the bar K, permitting the movement of the carriage by its spring 13.

Rotating the platen automatically.—In some cases the lines of items printed successively on the longitudinal movement of the platen are of uniform length and it is therefore of advantage, after the last item is printed in any line, to rotate the platen automatically one step prior to being carried or as it is carried into position to start another line. This may be effected, in connection with the means before described, by a stop N which is secured, preferably adjustably, by a screw 40, to the bar K in the position shown in Fig. 3. An arm 41 piv-

oted to the frame has a notch at the inner end which normally receives the pin 24, Fig. 5, and which then prevents any swinging of the shaft 50 and its attachment. It is therefore necessary in printing in columns to lift the forward end of this arm 41 and hold it up while such printing takes place, this being effected by depressing the outer end by hand and then carrying a catch 47 pivoted to the back of the frame Fig. 1 into the position shown in Fig. 6 to hold the said outer end down. When however in printing line-by-line across the whole width of the paper, the arm 41 is released from the detent or catch 47 and the vertical feed of the paper is then and thus arrested. After the last item is printed on any one line, the lower beveled edge of the stop N, on the return movement of the carrier making contact with the projecting end of the cross-arm 41, depresses the latter and releases the pin 24 and thereafter when the machine is operated to swing the arm 23 the latter will bear upon the pin 24 and rock the shaft 50, thus turning the platen rotatively one step. As the carriage then goes back the stop N moves away from the cross-arm 41 and the latter swings to the position shown in Fig. 5, preventing any further rocking of the shaft 50 or rotation of the platen.

Whenever it is required to shift the carriage by hand a lever R connected with the rocking plate K can be drawn forward when the said plate will be swung back away from its detents and the carriage can be shifted to any position required.

Without limiting myself to the use of the particular appliances set forth, I claim as my invention:

1. In an adding machine the combination of a series of type carriers arranged to print items consisting of a plurality of figures, a platen, means for automatically carrying the platen longitudinally one step after printing each item, and means whereby the platen is rotated one step as an incident to the carriage reaching a defined position in its longitudinal travel.

2. In an adding machine the combination with movable type carriers arranged to print items consisting of a plurality of figures, and with a sliding carriage and rotating

platen carried thereby, of means for feeding the carriage longitudinally one step after printing each item, and means whereby the platen is rotated one step as an incident to the carriage reaching a defined position in its longitudinal travel.

3. The combination in an adding machine of a carriage supported to slide transversely, a notched bar connected with the carriage, a reciprocating slide, a dog pivoted thereto to engage the notches of the bar, and means for reciprocating the slide and devices whereby the slide may be locked in an inoperative position.

4. The combination with the frame, sliding carriage and platen of an adding machine, means for imparting a step-by-step longitudinal motion to the carriage, means for imparting a step-by-step rotation to the platen, and a stop connected adjustably with the carriage and operative to cause the platen rotating means to act after the termination of each complete longitudinal movement of the carriage.

5. The combination with the recording devices of an adding machine, including a handle, and means for moving the carriage on said platen, of an operating shaft, a detent holding the carriage, means for shifting the detent on the return movement of the handle, and means for moving the carriage on shifting the detent.

6. The combination, in an adding machine, of a series of type carriers, means for adjusting the carriers into position to print items each consisting of a plurality of figures, a platen, a carriage therefor, means for automatically carrying the platen longitudinally uniform distances, whereby a series of items may be printed in a horizontal line, means for rotating the platen to permit an item to be recorded below one previously listed, and means for automatically rotating the platen for such purpose at the completion of each longitudinal traverse of the carriage.

In testimony whereof I affix my signature in presence of two witnesses.

CLYDE E. W. GARDNER.

Witnesses:

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EDMUND G. LANGHORNE.