

W. W. HOPKINS.
 FULL STROKE MECHANISM FOR CALCULATING MACHINES, &c.
 APPLICATION FILED JUNE 21, 1909.

977,190.

Patented Nov. 29, 1910.

FIG. 1.

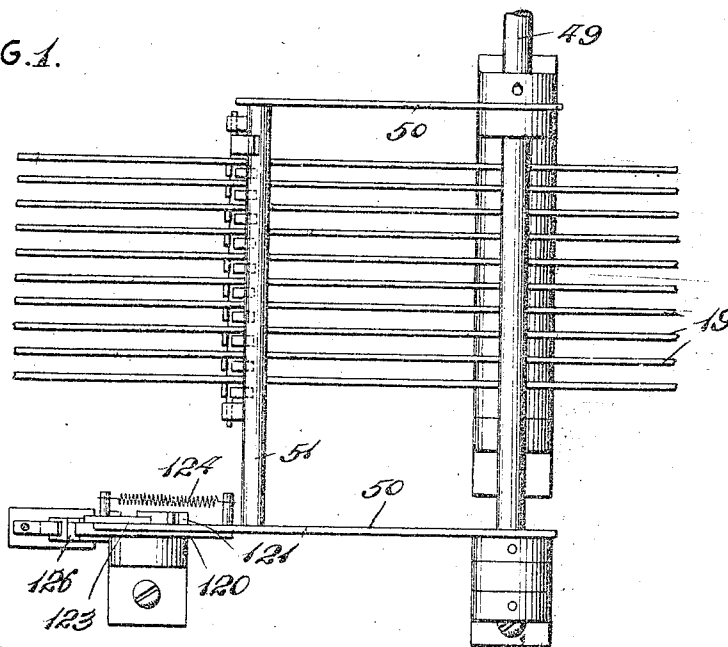


FIG. 2.

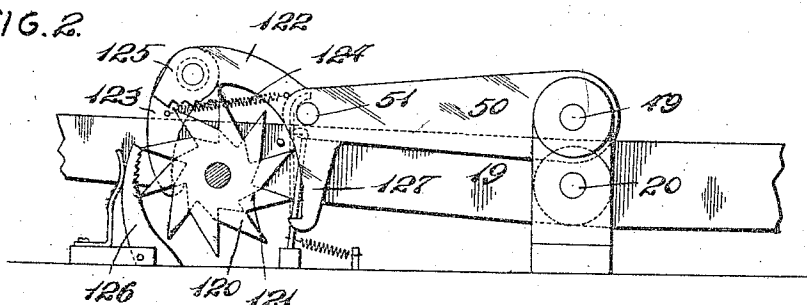
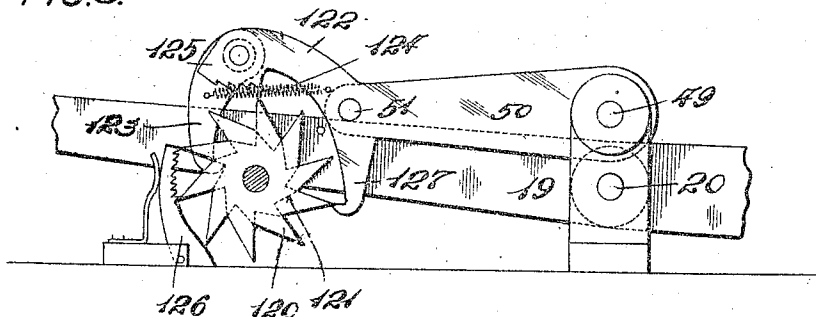


FIG. 3.



WITNESSES

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By *J. P. Cornwall* ATT'Y.

UNITED STATES PATENT OFFICE.

WILLIAM W. HOPKINS, OF ST. LOUIS, MISSOURI, ASSIGNOR TO MOON-HOPKINS BILLING MACHINE COMPANY, OF ST. LOUIS, MISSOURI, A CORPORATION OF MISSOURI.

FULL-STROKE MECHANISM FOR CALCULATING-MACHINES, &c.

977,190.

Specification of Letters Patent.

Patented Nov. 29, 1910.

Original application filed April 9, 1909, Serial No. 488,883. Divided and this application filed June 21, 1909, Serial No 503,394.

To all whom it may concern:

Be it known that I, WILLIAM W. HOPKINS, a citizen of the United States, residing at St. Louis, Missouri, have invented a certain new and useful Improvement in Full-Stroke Mechanism for Calculating-Machines, &c., of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a top plan view illustrating portions of key bars of a calculating machine to which my improved full stroke mechanism has been applied. Fig. 2 is a side elevational view of the full stroke mechanism. Fig. 3 is a similar view showing the parts in a changed position.

This invention relates to a new and useful improvement in full stroke mechanism for use in connection with the key bars of calculating machines, cash registers, and the like, or for compelling a full stroke of the operating handle employed in connection with such devices.

The object of my present invention is to compel the controlled part, such as the key bar handle, or the like, to be given a full stroke. If the controlled part is given a partial stroke and released, it will be locked in its midway position, calling the operator's attention to the fact that further movement is required, which further movement when given will release the controlled part and permit its restoration to normal position.

This present invention is a division of an application filed by me April 9th, 1909, Serial No. 488,883.

In the drawings, 19 indicates the part to be controlled, in this instance, the key bars of a calculating machine, which key bars are pivoted at 20 to an appropriate base.

50 are the side pieces of a frame pivotally mounted on a shaft 49, and carrying a bar 51 arranged above the key bars 19 or other part to be controlled, which key bars 19 will raise the bar 51, when any of them is operated, and coincidentally raise the side frame pieces 50. One of the side pieces or arms 50, which may be termed an escapement fork or lever, is provided with an overhang 122 on which is pivotally mounted a hooked

pawl 123, constituting an impulse ratchet, for coöperating with the ratchet wheel 121. A spring 124 holds the pawl in engagement with its ratchet wheel. Teeth 125 are formed on the underside of the overhang for coöperating with the teeth of wheel 120. A spring-pressed notched restraining pawl 126, mounted on the base plate 1, also coöperates with the teeth of wheel 120.

127 is a hooked extension constituting a stop pallet, on arm 50 which coöperates with the teeth of wheel 120 opposite the impulse pawl 123.

The operation of this full stroke mechanism is as follows: The normal position of the parts is shown in Fig. 2. When a key is depressed, the bar 51 is raised and the arm 50 is lifted, with the result that the pawl 123 rotates the ratchet wheels 120—121. The tooth of wheel 121, lying immediately above the stop pallet 127, will pass therebelow; the tooth which lies under the teeth 125, and the tooth at the bottom of the series of notches in pawl 126, will ride over said notches in its upward travel, until, as shown in Fig. 3, the tooth above the one first mentioned will engage in the stop pallet, 127, thus arresting the downward movement of the digit key and insuring an even stroke with respect to all of the keys: the second mentioned tooth will have passed under the teeth 125, and the last mentioned tooth will lie above the pawl 126. The "drag" of pawl 123 cannot, therefore, reversely rotate the wheels 120—121, and disarrange the relation of the teeth thereof to the other parts with which they coöperate. Should the key be released before a full stroke is made, the teeth 125 will engage the tooth of wheel 121 in operative relation thereto, and prevent the disarrangement of the relation between the pawl 123 and the tooth of wheel 120 with which it is in engagement, and the notches in pawl 126 will prevent backward rotation of wheel 121, hence the key will be locked mid-stroke, and it is necessary to complete the stroke before the star-wheel and its associate parts will be placed in position to permit the key to rise.

I am aware that minor changes in the construction, arrangement and combination of the several parts of my device can be made and substituted for those herein shown and described, without in the least departing

from the nature and principle of my invention.

I claim:

1. In a device of the character described, the combination of the controlled part and means for compelling a full stroke thereof, said means comprising a rotatable star wheel and an escapement fork or lever cooperating therewith.

2. In a device of the character described, the combination of the controlled part and means for compelling a full stroke thereof, said means comprising an escapement wheel and a fork or lever which is operated by said controlled part and which is provided with an impulse pallet and a stop pallet.

3. In a device of the character described, the combination of the controlled part and means for compelling a full stroke thereof, said means comprising a star wheel and a conjoined ratchet, an escapement fork operated by said controlled part, said fork having an impulse pallet cooperating with the conjoined ratchet and a stop pallet cooperating with said star wheel, and means on said fork to prevent the impulse pallet from engaging another tooth before the completion of a stroke.

4. In a device of the character described, the combination of the controlled part and means for compelling a full stroke thereof, said means comprising a star wheel and a conjoined ratchet, an escapement fork operated by said controlled part, said fork having an impulse pallet cooperating with the conjoined ratchet and a stop pallet cooperating with said star wheel, and means on said fork to prevent the impulse pallet

from engaging another tooth before the completion of a stroke, said means also preventing retrograde movement of said star wheel.

5. In a device of the character described, the combination of the controlled part and means for compelling a full stroke thereof, said means comprising a star wheel and a conjoined ratchet, an escapement fork operated by said controlled part, said fork having an impulse pallet cooperating with the conjoined ratchet and a stop pallet cooperating with said star wheel, means on said fork to prevent the impulse pallet from engaging another tooth before the completion of a stroke, and a notched restraining pawl cooperating with said star wheel.

6. In a device of the character described, the combination of the controlled part and means for compelling a full stroke thereof, said means comprising a star wheel and a conjoined ratchet, an escapement fork operated by said controlled part, said fork having an impulse pallet cooperating with the conjoined ratchet and a stop pallet cooperating with said star wheel, means on said fork to prevent the impulse pallet from engaging another tooth before the completion of a stroke, said means also preventing retrograde movement of said star wheel, and a notched restraining pawl cooperating with said star wheel.

In testimony whereof I hereunto affix my signature in the presence of two witnesses, this 19th day of June 1909.

WILLIAM W. HOPKINS.

Witnesses:

M. P. SMITH;
LENORE CLARK.