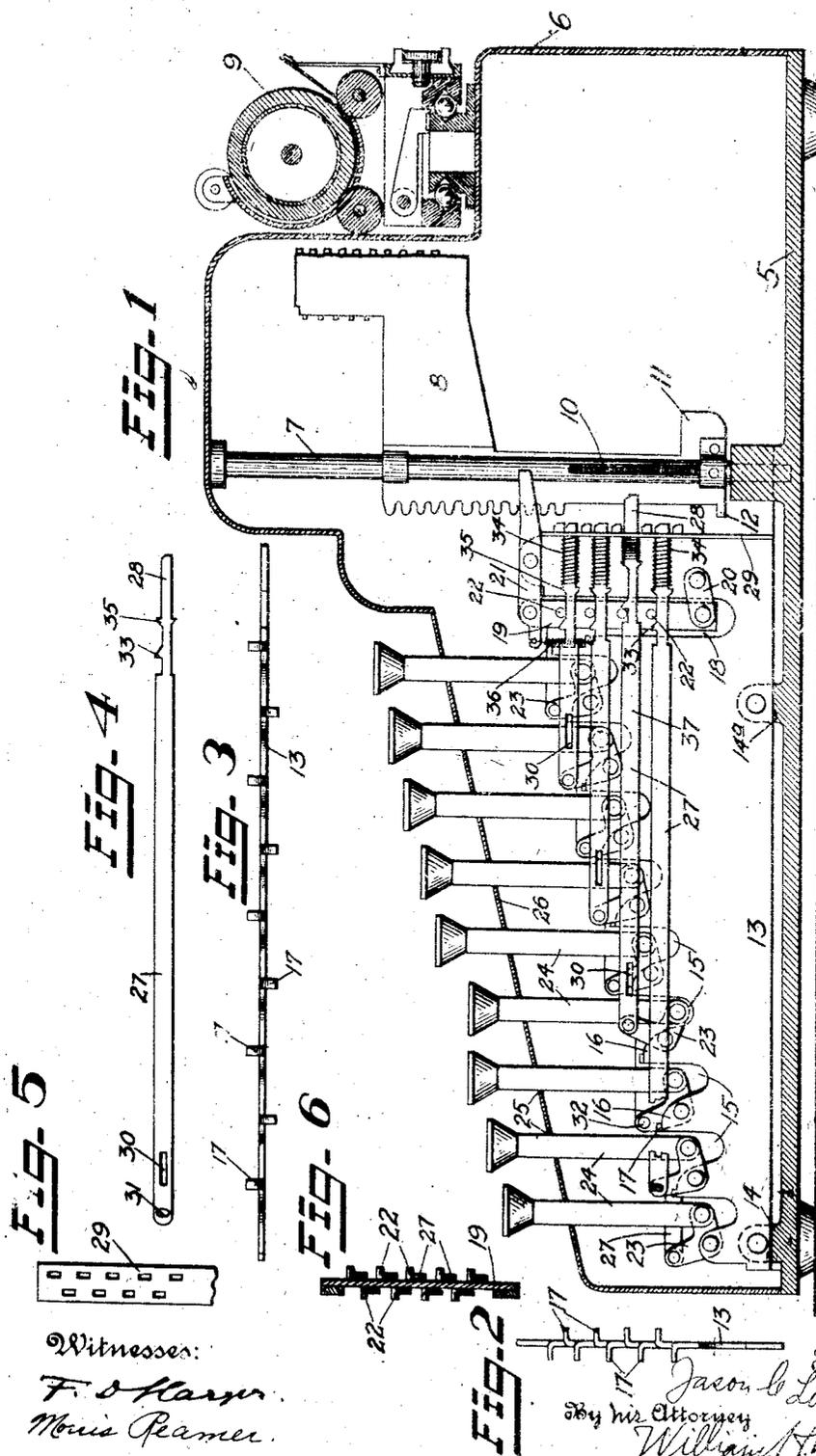


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 KEYBOARD FOR CALCULATORS.
 APPLICATION FILED OCT. 27, 1914.

1,167,086.

Patented Jan. 4, 1916.



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KEYBOARD FOR CALCULATORS.

1,167,882

Specification of Letters Patent.

Patented Jan. 4, 1916.

Application filed October 27, 1914. Serial No. 868,815.

To all whom it may concern:

Be it known that I, JASON C. LEETTERHAND, a citizen of the United States, and a resident of New York city, in the county of New York and State of New York, have invented certain new and useful Improvements in Keyboards for Calculators, of which the following is a specification.

The object of the present invention is to provide improved means for guiding the stop bars used in a calculating machine or similar apparatus, that will insure the bars moving back and forth in a rectilinear path.

A further object of the invention is to provide a form of such guiding means that will also act as a stop to limit the movement of the stop bars in one direction.

In the accompanying drawing illustrating one embodiment of my invention, Figure 1 shows in vertical section certain parts of a calculating machine, and shows one column of keys and their connected parts. Fig. 2 is an end elevation, and Fig. 3 a plan view, of one of the supporting plates; Fig. 4 shows separately one of the stop bars; Fig. 5 shows the rear guide plate for the stop bars; and Fig. 6 is a vertical section through the latch bar.

In the drawing are shown certain parts of a calculator, that has a base 5 and a casing 6. An upright post 7 is suitably supported, and serves to guide a rack and type plate 8. This member has a rack at its forward portion to cooperate with suitable adding mechanism not shown, and carries type on its rear portion, that by suitable printing means, not shown, serve to make an impression on a sheet carried by a carriage, denoted generally by 9. These parts just described form no part of the present invention, but are shown to give a better understanding of the novel features.

In this art it is usual to cause the rack and type plate to be elevated by a spring, such as a coil spring 10, when allowed to move upward by a universal bar, not shown, that may cooperate with a foot 11 at the rear of the rack and type plate. The universal bar will permit the rack and type plate to rise until a lug 12 at the bottom of the rack and type plate engages one of a set of nine different stop devices: which is the usual method in this art. Such stop devices are actuated through keys, and according to which one of the nine keys are depressed, the

rack and type bar will move upward a corresponding distance. It is understood that in this art there are a set of these rack and type bars, one for each column of keys, corresponding to each digit of the number that is printed and added in the capacity of the machine. For each of the rack and type plates there will be a set of operating keys, comprising nine keys numbered from 1 to 9.

For each of the rack and type plates I provide a set of key members, but one of which plates is illustrated, and it will be understood that any number of these can be arranged across the machine. I provide a supporting plate 13, that may be suitably supported as by racks 14 and 15 on the base. This plate 13 is mounted vertically and has its upper edge inclined upward toward the rear, and provided with a series of recesses 15 extending down from the upper edge, thereby forming a series of projections 16 separated by these recesses. At the top of each projection is a bent ear or lug 17 extending laterally, and for convenience these lugs project alternately on opposite sides as indicated in Figs. 2 and 3. At the rear portion this supporting plate 13 is shown provided with a vertical slot 18, in which is shown mounted a latch bar 19, carried by links 20 and 21, pivoted on the supporting plate 13. The latch bar 19 carries pins 22 that engage the stop bars. Since there are usually nine keys and nine stop bars, the latch bar is provided with nine of these pins 22, and as shown four of these pins are on one side of the latch bar, and five arranged on the opposite side, as indicated in Fig. 5.

On each of the extensions 16 is pivotally mounted a bent lever 23, and to one arm of each of these levers is pivoted a key stem 24, that all extend upward through suitable slots 25 in the inclined portion 26 of the casing 6. These bent levers 23, it will be seen, are pivoted alternately on opposite sides of the extensions 16 of the supporting plate, but by mounting the key stems 24 on opposite sides alternately of the bent levers, the key stems operate all vertically.

With each of the bent levers 23 is connected a stop bar, the front lever 23 being pivoted to a stop bar 27, shown separately in Fig. 4. This stop bar has its rear end portion 28 guided by suitable means for horizontal movement, such as a slotted plate 29. For the purpose of causing these stop bars,

that are identical except in length, to move in a rectilinear path, each of the stop bars is provided with a slot 30 in its forward end, into which projects one of the lugs 17 that extend laterally from the supporting plate 13. It will be seen that the rear ends of the stop bars are normally in vertical alinement, but since the forward ends of the stop bars are pivoted to the individual bent levers, their lengths will decrease upwardly as shown, each stop bar being shorter in length than the lower one by the distance apart of the adjacent key stems, and the slots 30, are similarly arranged to engage the successive lugs 17. The connection between the forward end of the stop bar and the bent lever 23 is arranged to give a certain amount of movement because the bent lever will swing through the path of an arc while the stop bar moves in a rectilinear path. As shown a vertical slot 31 is provided in the end of the stop bar, in which the pivot pin 32 has a certain amount of vertical movement.

It will be understood that the vertical reciprocation of the key stem will cause a corresponding horizontal movement of the stop bar. It will be further seen that these stop bars 27 are arranged alternately on opposite sides of the plate 13, corresponding with the similar arrangement of the bent levers 23. The plate 29 is similarly slotted to accommodate the four stop bars on one side of the plate 13 that are in vertical alinement, and also the five stop bars on the opposite side of the plate 13, that also aline.

The stop bars 27 on their rear ends usually cooperate with the rack and type plate, and as indicated will engage the foot 12 when the member 8 is elevated to arrest its movement, the stop bar 32 being shown advanced rearward, and the others in their normal forward position, that will not interfere with the passage of the foot 12.

The stop bars are provided with any suitable means for cooperating with the latch bars 19. As shown a lug 33 is provided on each of the stop bars, having its forward edge vertical, and its rear edge inclined. The pins 22 on the latch bar as shown normally rest on or near the edge of the stop bar to the rear of the lug 33, and suitable means is provided for moving the stop bars forward after they have been advanced to normal position. A coil spring 34 on each of the stop bars engages a lug 35 thereon by one end and the plate 29 by its other end, to move the stop bar forward when released, and it will be seen that this spring will advance the stop bar along the lug 17 at its forward slotted end, until the end of this slotted portion engages the lug and thus arrests the forward movement, and holds the stop bar and connected key stem in normal position. When any key is depressed, it will rock the bent lever 23 and move the connected stop bar

rearward. The inclined face of the lug 33 will engage the pin 22 to raise the latch bar 19 until the lug passes beneath the pin, whereupon the latch bar will fall behind the lug 33 assisted by a spring 36, and the pin will now engage the vertical edge of the lug 33, as indicated by the stop bar 32 in Fig. 1. The spring 34 is, however, tensioned by this movement, but the straight side of the lug 33 will be pressed against the pin 22 and prevent return of the stop bar and key, so that the stop bar will be locked in the set position, and will arrest the foot 12, when the rack and type plate is elevated. Upon raising the latch bar 19 by any means, the pin 22 will be free from the lug, and the spring 34 will drive the stop bar forward to its former position and elevate the key stem.

It will be further observed that if the key stem 24 is moved down, its end will strike the bottom of the recesses 15, that acts as a stop to limit the depression of the key, and also the rearward movement of the stop bar connected therewith. The set key and stop bar do not show the key stem engaging the bottom of recesses 15, because the spring has returned the stop bar a short distance until the lug 33 engages the pin 22.

It will be also understood that when one of the keys of the set is depressed, if any other key is pushed down, the latch bar 19 will be raised by the engagement of the lug 33, and this raising of the latch bar will serve to release any other stop bar that may have been locked in the advanced position. It will thus be seen that I have provided a simple and compact arrangement whereby the stop plate 13 serves to support the bent levers, and also by its integral lugs forms a guide for the stop bars at their forward ends, and which lugs also serve to limit the return movement of the stop bars. These lugs and the slotted stop bars cooperating therewith, serve to produce a rectilinear reciprocation of the stop bars in connection with suitable guides for the rear end of the stop bars. It will also be seen that the plate 13 forms a limit or stop at the bottom of the recesses 15, for the key stems when depressed.

Having thus described my invention, what I claim is:—

1. In a calculator, the combination of a supporting plate, a set of key stems, a set of stop bars, means connecting the key stems with the stop bars respectively to advance the stop bars, the supporting plate and the stop bars being provided with laterally projecting lugs in one of such members to engage the other of said members whereby to guide the stop bars by the plates.

2. In a calculator, the combination of a supporting plate, a set of key stems, a set of stop bars, means connecting the key stems with the stop bars respectively to advance

the stop bars, the supporting plate and the stop bars being provided with laterally projecting lugs in one of such members and the other of said members being provided with longitudinal slots into which said lugs project to guide the stop bars by the plates.

3. In a calculator, the combination of a supporting plate, a set of key stems, a set of stop bars, means connecting the key stems with the stop bars, and guiding means at the end of the stop bar adjacent the key connection to cause rectilinear reciprocation of the stop bar.

4. In a calculator, the combination of a supporting plate, a set of key stems, a set of stop bars, means connecting the key stems with the stop bars respectively to advance the stop bars, the supporting plate and the stop bars being provided with laterally projecting lugs in one of such members and the other of said members being provided with longitudinal slots into which said lugs project to guide the stop bars by the plates, each said lug engaging the end of its slot in the bar to limit the movement of the bar in one direction.

5. In a calculator, the combination of a supporting plate provided with a set of laterally projecting lugs, a set of stop bars each having a longitudinal slot and engaging the lugs respectively at the slotted por-

tions, a set of key stems, means connecting the key stems with the stop bars respectively to advance the stop bars, and means for returning the stop bars and key stems when advanced, each said lug engaging the end of its slot in the bar to limit the return movement of such bar.

6. In a calculator, a supporting plate containing a series of recesses, a set of bell cranks pivoted to said plate between the recesses respectively, a set of key stems one pivoted to each of said bell cranks and operating in said recesses respectively, a set of stop bars each pivoted to one of said bell cranks, each stop bar having a longitudinal slot near the pivot end, each of the plate extensions between the recesses having a lateral bent lug projecting into one of said stop bar slots to guide the stop bar for rectilinear movement at such portion, and means for returning each stop bar and key stem to normal position with the lug engaging the end of the bar slot to limit such movement, said lugs and bar slots being arranged to permit the key stems when depressed to be arrested by the bottoms of said recesses in the plate.

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