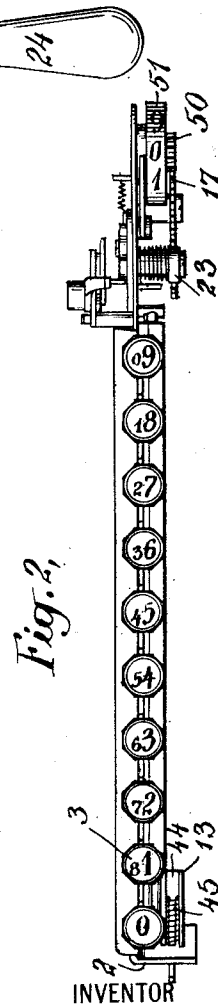
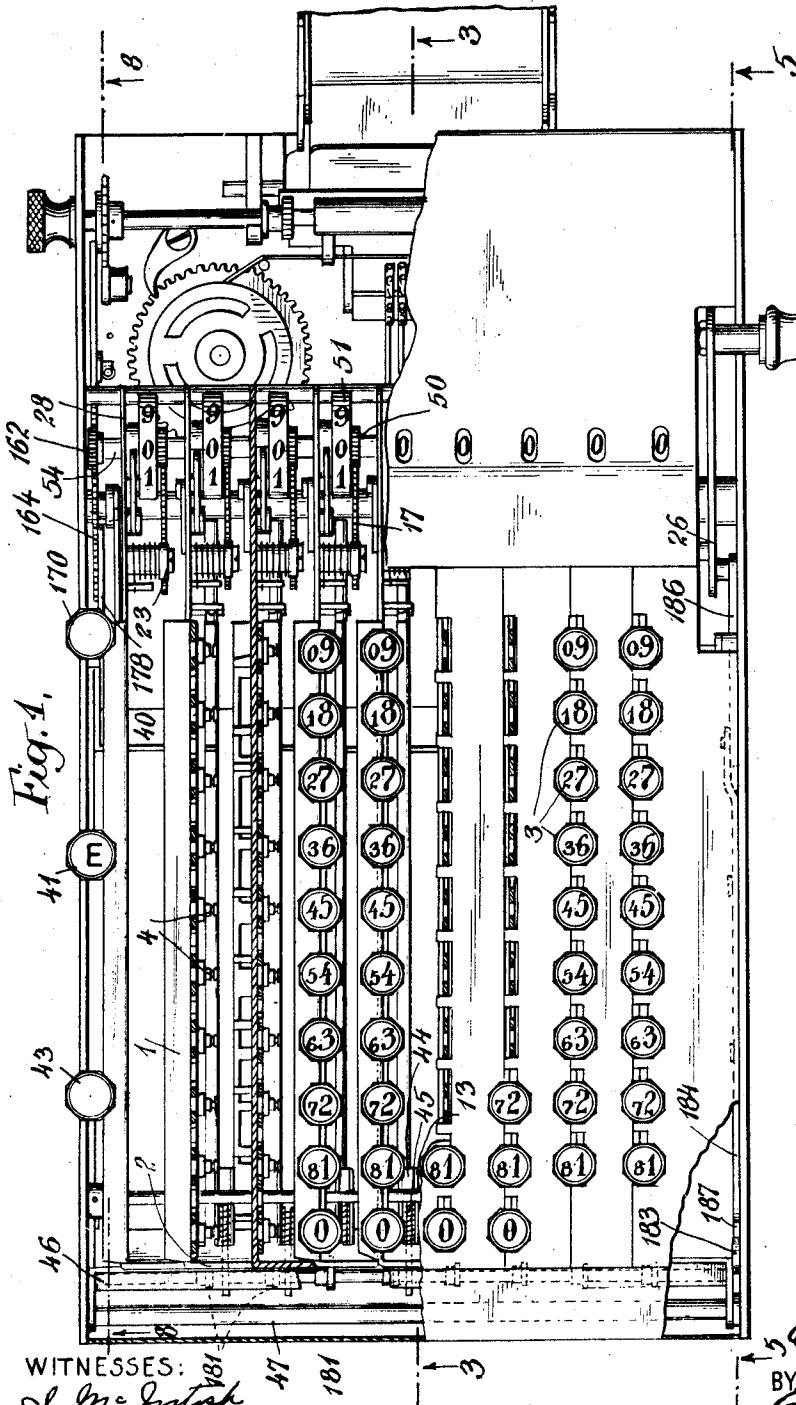


E. J. BRASSEUR.
 CALCULATING MACHINE.
 APPLICATION FILED JULY 27, 1911.

1,010,849.

Patented Dec. 5, 1911.

4 SHEETS—SHEET 1.



WITNESSES:
 L. M. Smith
 J. F. Collins

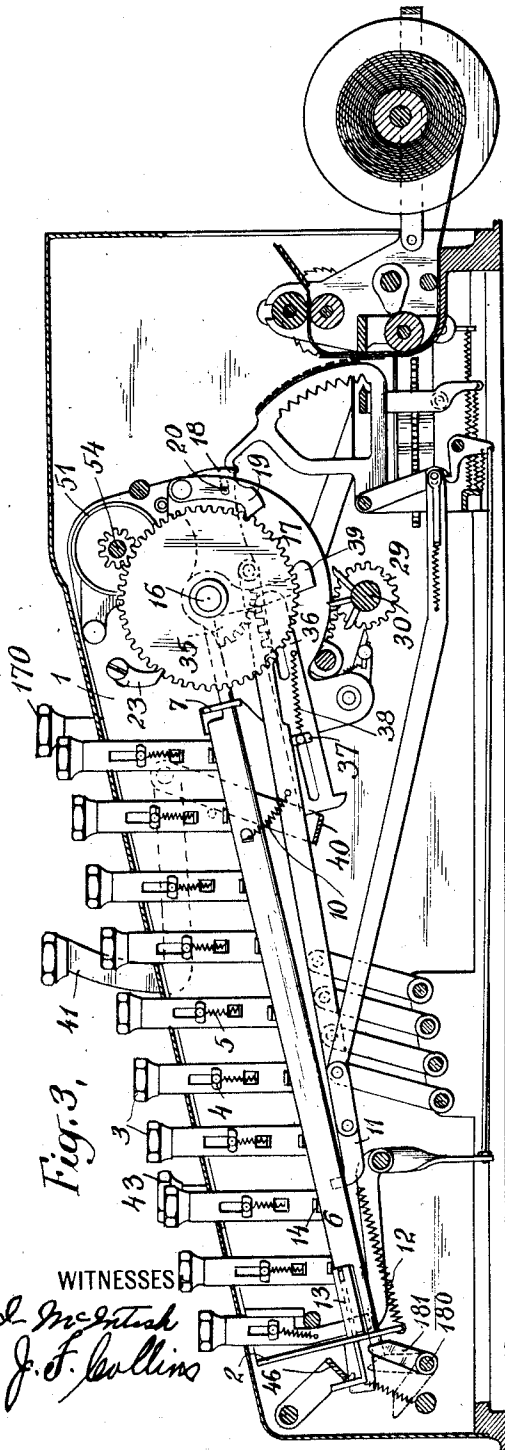
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4 SHEETS—SHEET 2.

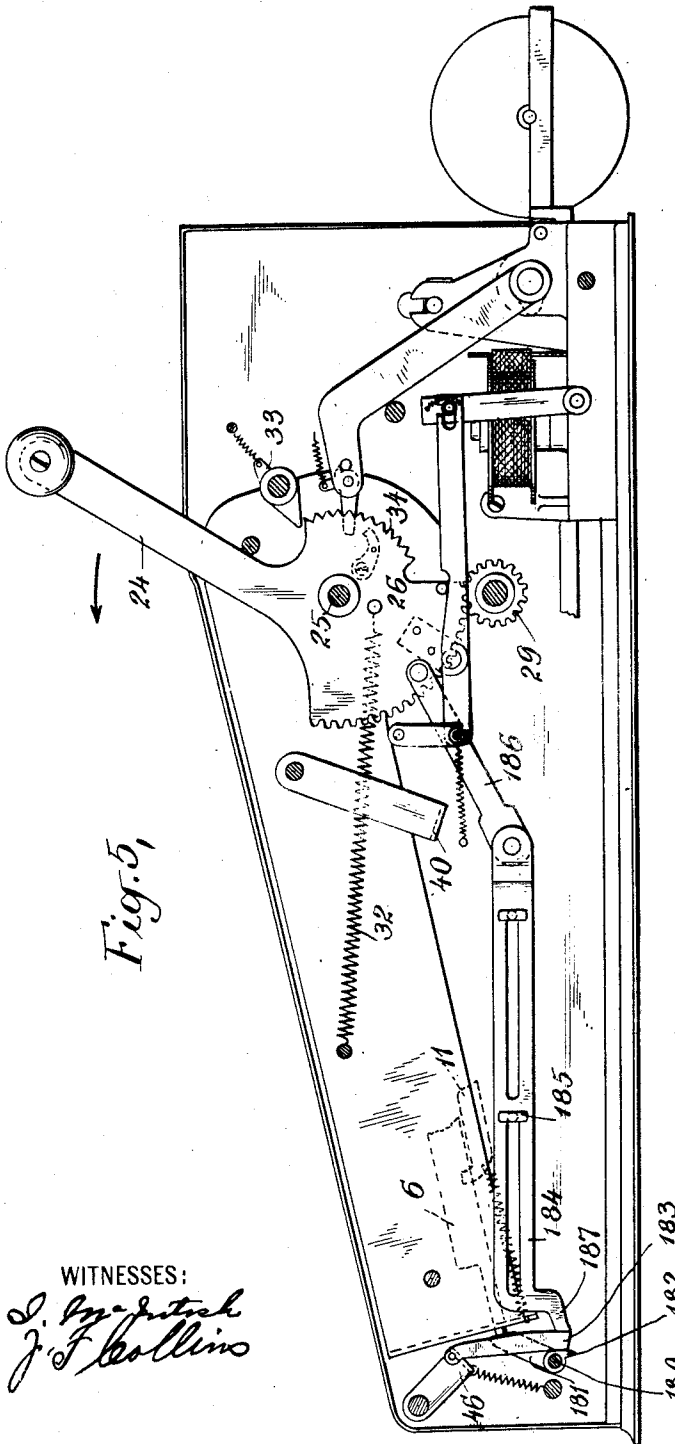


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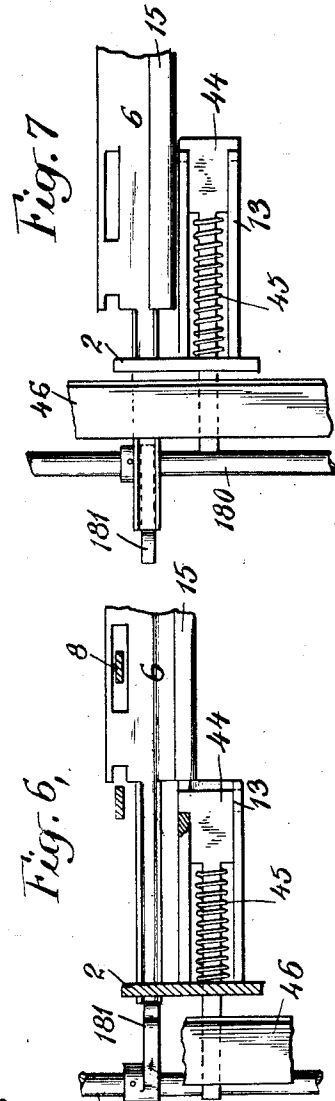
1,010,849.

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4 SHEETS—SHEET 3.



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4 SHEETS—SHEET 4.

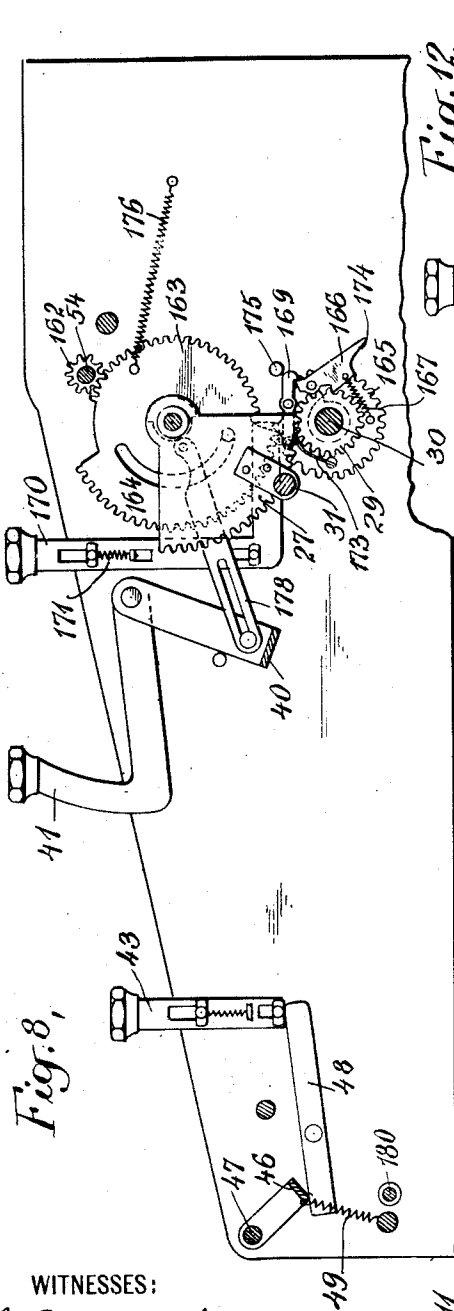


Fig. 8,

Fig. 12,

Fig. 11,

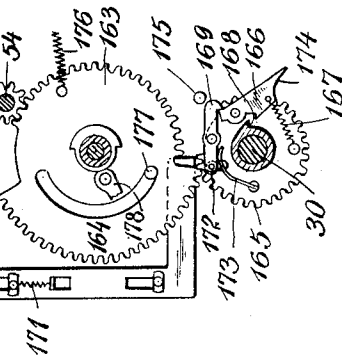
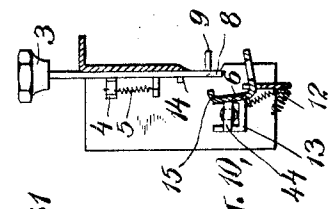


Fig. 9,



UNITED STATES PATENT OFFICE.

ERNEST J. BRASSEUR, OF CHICAGO, ILLINOIS, ASSIGNOR TO A. B. DICK COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

CALCULATING-MACHINE.

1,010,849.

Specification of Letters Patent.

Patented Dec. 5, 1911.

Application filed July 27, 1911. Serial No. 640,753.

To all whom it may concern:

Be it known that I, ERNEST J. BRASSEUR, a subject of the King of Belgium, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Calculating-Machines, of which the following is a specification.

This invention relates to calculating machines, and particularly to machines for this use of the type known as "key-set machines".

The invention is directed to the provision of certain improvements in machines of this character with respect particularly to the clearing mechanism whereby the number-wheels are returned to the zero position, the repeating mechanism for use in multiplying, and mechanism which may be termed a "shock-absorber" for controlling the movement of the slide-bars so that the noise incident to the operation of the machine is reduced and the action of the keys is much lighter.

The invention is susceptible of use in calculating machines of various types, but is adapted particularly for use in connection with machines of the type illustrated and described in an application for patent filed by me March 27, 1911, and serially numbered 617,010.

The preferred embodiment of the invention is illustrated in the accompanying drawings, in which—

Figure 1 is a top view of the machine, broken away and sectioned in part; Fig. 2 is a top view of one of the denominational units; Fig. 3 is a central section of the machine on line 3—3 of Fig. 1; Fig. 4 is an elevation of one of the units; Fig. 5 is a section of the machine on line 5—5 of Fig. 1; Figs. 6 and 7 are detail views of a portion of the mechanism employed in multiplying; Fig. 8 is a section of the machine on line 8—8 of Fig. 1; Fig. 9 is a detail view of one end of one of the units, certain of the parts being shown in section; Fig. 10 is a transverse section of one of the units; Fig. 11 is a detail view of one of the number-wheels; and Fig. 12 is a sectional detail view of the clearing mechanism.

The calculating machine shown in the drawings is of the character known as a "key-set" machine, wherein the depression of keys positions certain of the operating

parts of the machine in accordance with the value of the keys depressed, and thereafter an operating device is moved manually or otherwise to cause the number-wheels of the machine to be actuated an amount depending upon the extent of movement of the parts positioned by the depression of the keys. A plurality of rows of keys are provided, as many rows as the number of numerical orders in which it is desired to operate, each row comprising nine keys numbered from 1 to 9, or ten keys, in which latter case a zero key would be included. One key in each row may be depressed for each operation, and when that key is depressed it is locked in its depressed position and the other keys are locked against depression. When a key in a row is depressed, it permits a slide-bar corresponding to that row to move in the direction of its length a distance corresponding to the value of the key depressed, and as this slide-bar moves thus it carries a pawl around upon a differential member or gear-wheel with which that pawl coacts, the movement of the pawl being commensurate with the movement of the slide-bar. Then, upon actuation of the operating device, all the pawls which have been moved thus are turned to their initial positions, moving their gear-wheels with them, and the gear-wheels cause corresponding rotation of the number-wheels, which either indicate the result of the operation or are positioned for printing the result upon a suitable paper strip. In combination with these parts, a carrying mechanism is employed, whereby any one of the mechanisms can cause the mechanism of the next higher order to advance one unit.

In the preferred embodiment of the machine, each row of keys, the slide-bar connected therewith, the number-wheel actuated on the return of the slide-bar to its initial position, and the carrying mechanism corresponding to that number-wheel, are all mounted on a single support, so that all of these parts for one numerical order may be assembled on the support and thereafter a suitable number of these units may be secured together in the casing of the machine. Fig. 1 shows a machine having eight of these units, the units being constructed as illustrated in Figs. 2, 4 and 10. Each unit consists of a support 1 of sheet-metal having one end 2 bent to form a

spacer for separating adjacent units the required distance. Each unit has a row of ten keys, 3, mounted thereon for vertical reciprocatory movement, these keys being numbered respectively from 0 to 9. Each key has a slot formed in its stem, through which extends a stud 4 on the support 1. A spring 5 is secured at one end to the key and at the other to the stud for holding the key normally in the upper position. A swiveling slide-bar 6 is mounted for lengthwise movement in the projection 2 and a similar projection 7 on the support 1, this bar being adapted to move lengthwise and also to turn in the openings in the parts 2 and 7. The slide-bar has openings therein of progressively increasing length, and the lower end 8 of each key from 2 to 8 is adapted to be projected through one of these openings when the key is depressed. Also, when any one of the keys except the zero key is depressed, a lateral projection 9 at the lower end thereof is adapted to engage the slide-bar 6 and rock that bar in its bearings against the tension of a spring 10. Secured to the slide-bar, is a rod 11, which is connected by a spring 12 to the projection 2, and on the projection 2 is a stud 13. When the slide-bar is in its normal position, as shown in Figs. 4 and 10, its end is in engagement with the end of stud 13 and the slide-bar is held against lengthwise movement actuated by spring 12; but when, on the depression of a key, the slide-bar is rocked by a projection 9 on the key, the slide-bar is released from engagement with the end of stud 13 and is then moved in the direction of its length by the spring 12. In the case of the depression of any key from 2 to 8, this lengthwise movement of the bar is arrested by the engagement of the lower end 8 of the key with the end of the opening in the slide-bar through which that key is projected. The key number 9 has no projection 8 on its lower end (Fig. 4), but is provided with a lateral projection 9 for turning the slide-bar 6, and when this key is depressed the slide-bar moves in the direction of its length under the influence of spring 12 until the wall of the slide-bar, which normally engages the end of stud 13, comes into engagement with the projection 2. No opening in the slide-bar is provided for the key number 1, but the projection 8 at the lower end of this key is adapted to arrest lengthwise movement of the slide-bar by engaging with the end of the lower wall of the slide-bar. On each key is a projection 14 extending laterally in a direction opposite from the projection 9. The slide-bar is provided with a flange 15 at its upper edge. The lower wall of the slide-bar is engaged by the lateral projection 9 of a key after the lateral projection 14 has passed below the flange 15, and when the slide-bar is rocked in its bearings by the projection 9 of a key the flange 15 will be carried over the projection 14 of that key so as to hold the key in a depressed position until the slide-bar has been rocked back to normal position. Also, when the slide-bar is rocked by the depression of a key, the flange 15 is carried under the projections 14 on all the other keys of the row, so that it will serve to preclude depression of any one of such keys. The spring 10 for rocking the slide-bar in its bearings is connected at one end to a tang on the slide-bar and at the other to the rod 11. On the support 1 is a stud 16 of a length corresponding to the lateral projection 2 and serving as a spacer for separating the unit from the next adjacent one the required distance. This stud forms a pivot for a gear 17, and also for a pawl-carrying lever 18 on which a pawl 19 is pivotally mounted. The pawl has a pin 20 thereon, passing through a slot in the lever 18, and a spring 21 connects this pin to a stud on the lever 18, so that the spring tends to turn the pawl on its pivot in a direction to carry the tooth of the pawl into engagement with the teeth of the gear 17. The tooth of the pawl is so shaped that the pawl will slide over the teeth of gear 17 when turning about stud 16 in a clockwise direction, but when the pawl is moving in the opposite direction it will carry gear 17 with it. The pawl-carrying lever 18 is pivotally connected at 22 to the end of bar 11, so that when a key is depressed and the slide-bar, together with the bar 11, is moved in the direction of its length, the pawl 18 will be carried around gear 17 a distance commensurate with the value of the key depressed, but during such movement the gear 17 will not be actuated, as such movement of the gear is obstructed by a detent 23 pivotally mounted upon the support 1 and pressed into engagement with the gear by a suitable spring. A suitable number of units thus constructed are assembled side by side in a casing, as shown in Fig. 1, the several units being secured together by tie-bars passing through openings in the supports 1. In Fig. 1, eight such units are shown, the two at the right being for units and tens of cents, and the six units at the left being for dollars.

The setting of the parts for an operation consists in depressing a key in one or more of the rows and thereby moving the pawls corresponding to those keys about the gears 17, with which the pawls coact, distances dependent upon the values of the depressed keys. Thereafter the operating device of the machine is actuated to return all of the pawls 19 to their initial position, in which position the pawl in Fig. 4 is shown, thereby actuating the gears 17 amounts commensurate with the values of the depressed

keys in the rows corresponding respectively to the several gear-wheels.

The operating device of the machine consists of a handle 24 (Figs. 1 and 5), which is pivotally mounted upon a stud 25 in axial alinement with the several studs 16 of the units. The lower end of the operating handle is extended to form a sector-gear 26. At the opposite side of the machine, a similar sector-gear 27 (Fig. 8) is pivotally mounted in axial alinement with handle 24 on a stud extending between the side-frame of the machine and an adjacent plate 28 (Fig. 1). These two sector-gears mesh with pinions 29 carried by a shaft 30, which is rotatable in bearings formed in the side-frames of the machine. The two sector-gears 26 and 27 have brackets secured thereto, which carry an operating rod 31. This rod extends across the machine and is adapted to engage all of the pawl-carrying arms 18, so as to move those arms from the positions to which they were moved in setting up a number back to their normal positions as indicated in Fig. 4. The normal position of rod 31 is shown in Figs. 3 and 8. When the operating handle 24 is moved, rod 31 is carried around in a counter-clockwise direction, as seen in Fig. 8, and in so moving it engages all of the pawl-carrying arms 18 which have been moved in setting up a number, so as to move those arms with it, but just before engaging any one of the pawl-carrying arms 18 the rod moves over the pawl 19 carried by that arm, so as to hold the pawl in engagement with its corresponding gear-wheel 17. By reason of the gear connections between the two sectors 26 and 27 through the shaft 30, the two ends of rod 31 are compelled to move in unison. The direction of the forward stroke of the operating lever is indicated by the arrow in Fig. 5, and this movement of the lever is effected against the tension of a spring 32 connected at one end to arm 24 and at the other end to the adjacent side-frame. When lever 24 has completed its stroke in this direction, it is returned to its initial position by spring 32. A full stroke of the operating arm in both directions is insured by a pivoted spring-actuated lever 33 (Fig. 5) coacting with teeth 34 on lever 24.

If a mistake be made in setting up a number, correction can be made as follows:—Pivotally mounted on each stud 16, is a plate 35 (Figs. 4 and 9) having a sector-gear formed thereon, the teeth of which are adapted to be engaged by teeth on a slide 36 provided with slots through which pins 37 on the support 1 pass. A spring 38 normally holds the slide 36 in the position in which it is shown in Fig. 9. Secured to the plate 35 is an arm 39, the upper end

of which is beveled and is adapted to engage the pin 20 on the pawl 19. A bail 40 is pivotally mounted upon the side-frames of the machine, and at one end is provided with an operating handle, whereby it may be turned on its pivots. By depressing the handle or key 41, the bail 40 is moved so as to engage the ends of all of the slides 36 and move those slides against the tension of their springs 38. When the slides so move, the teeth thereon engage the teeth of the sectors 35 and thus carry the ends of arms 39 into engagement with the pins 20 on pawls 19. The inclined ends of arms 39 act upon the pins 20 so as to turn the pawls 19 on their pivots sufficient to carry the teeth of the pawls out of engagement with the gears 17, and when such turning movement of the pawls is arrested by the pins 20 engaging the ends of the slots through which they pass further movement of arms 39 about the studs 16 carries the pawl-carrying arms 18 and the pawls carried thereby back to their initial positions. When such positions are reached, the springs 10 acting upon the slide-bars rock the slide-bars so that they will be held against the tension of their springs 12, as before described. On releasing the key 41, the several slides 36 and the bail 40 are returned to their initial positions by the springs 38.

A repeat-key is provided for use in multiplying, as shown at 43 in Fig. 8. Referring to Figs. 6 and 7, each of the studs 13 for holding the slide-bars against lengthwise movement, has a plunger 44 therein actuated by a spring 45 to carry its end beyond the end of stud 13. The plungers 44 are normally held with their ends flush with the ends of studs 13 by a bail 46 pivotally mounted at 47 upon the side-frames of the machine. A spring 49 is connected at one end to the bail 46 and at the other to a stud on the side-frame, and normally holds the parts in the positions in which they are shown in Figs. 3 and 6, with the plungers 44 in the retracted position. By depressing the repeat-key 43, a lever 48 pivoted on the side-frame is rocked, so as to turn bail 46 on its pivots 47 against the tension of spring 49, and the plungers 44 are then moved forwardly to the position indicated in Fig. 7, in which their ends project beyond the ends of the studs 13. When the plungers 44 do so project, the operating handle may be operated any desired number of times without causing the slide-bars to be retained in their initial position when they are moved forward to those positions, as the effective length of the studs 13 is increased by the plungers 44 and the walls of the slide-bars which normally engage the ends of studs 13 will not be carried far enough to pass the ends of the plungers 44. Therefore, during

the return movement of the operating handle, the slide-bars will return to the positions to which they were moved in setting up the number, in which positions they will be arrested by the depressed keys, the keys depressed being retained in their depressed positions by the flanges 15 on the slide-bars coacting with the lateral projections 14 on the keys.

Each gear-wheel 17 meshes with a pinion 50, to which is secured a number-wheel 51, the periphery of which is provided with numbers from zero to 9 inclusive, which numbers are adapted to be exhibited through openings in the casing of the machine, as shown in Fig. 1. All of the pinions 50 with their number-wheels are loosely mounted upon a shaft 54, which extends across the machine and to which the number-wheels may be locked when necessary to reset the number-wheels at the zero position. On the side of each number-wheel is pivotally mounted a lever 160 (Figs. 4 and 11), and a spring 161 is connected at one end to the free end of this lever and at the other to a stud on the number-wheel. Shaft 54 has a plurality of notches therein, one for each number-wheel, each of which notches has one radial wall, as shown in Fig. 11. Each lever 160 has a tooth thereon which is adapted to be received in the corresponding notch in the shaft 54. On the end of shaft 54, is secured a pinion 162, meshing with a sector-gear 163. This gear is also provided with teeth 164, which mesh with the teeth of a gear 165 loosely mounted upon the shaft 30. This gear 165 has a pawl 166 pivotally mounted thereon and acted upon by a spring 167 to carry its tooth into engagement with a tooth 168 secured upon the shaft 30. A latch 169 is also pivotally mounted upon gear 165 and normally holds the pawl 166 out of the path of movement of the tooth 168 against the tension of spring 167. The latch 169 is acted upon by a spring 173 to hold it normally in the position in which it is shown in Fig. 12. A clearing-key 170 is mounted for vertical reciprocating movement upon the side-frame of the machine, it being held normally in a raised position by a spring 171. The lower end of the stem of this key is adapted to engage one end of a pin 172 formed on the end of latch 169 and projecting through a slot in the gear 165. On the depression of the clearing-key 170, the latch 169 is rocked so as to release the pawl 166 and the latter is drawn by its spring to a position in which its tooth lies in the path of movement of the tooth 168. If the operating handle 24 be now actuated through its normal forward and reverse movement, the forward movement of the handle will cause rotation of shaft 30 and the tooth 168 will engage the tooth on pawl 166 and thus cause gear 165 to rotate with shaft 30. Such rotation of gear 165 will cause rotation of the double gear 163—164 through approximately one-third of a revolution, thus driving shaft 54 through the pinion 162 so that the shaft will make one complete revolution. In the course of this revolution of shaft 54, the tooth on each one of the levers 160 will drop into its notch in shaft 54, so as to clutch the number-wheel 51 to shaft 54 and carry the number-wheel with the shaft so that the zero on the wheel is displayed through the opening in the casing. Just as the zeros on the number-wheels come under the openings in the casing, the inclined edge 174 of a projection on the pawl 166 engages a stud 175 on the side-frame, so that pawl 166 is withdrawn from coaction with the projection 168. As the gear 163 is rotated as above described, it strains a coil-spring 176 secured at one end to the gear and at the other to a stud on the casing. Therefore, when pawl 166 is withdrawn from coaction with projection 168, spring 176 turns gear 163 back to its original position, the gear 165 with the parts mounted thereon, the pinion 162 and the shaft 54 turning with gear 163 when the latter is actuated thus. This return movement of gear 163 under the influence of spring 176 is arrested by a stud 177-projecting through an arc-shaped slot in the gear. A link 178 is connected at one end to gear 163 and at the other to the bail 40, so that when the clearing mechanism is operated as above set forth the bail 40 will be actuated to positively return the slide-bars to their initial positions.

It will be seen that the clearing mechanism is operated by the depression of the clearing-key 170, and then the forward and reverse movement of the operating handle. The depression of the clearing-key operates a clutch consisting of the pawl 166 and the projection 168, so as to connect the operating handle of the machine to the clearing mechanism. When this clutch has been operated, the movement of the operating lever turns the shaft of the number-wheels through substantially one revolution, and in the course of that revolution the shaft picks up all of the number-wheels which have been moved from the zero position and carries those wheels around with it until the zeros thereon are displayed through the openings in the casing. When this has been done, the clutch is automatically released by the engagement of the projection 174 with the stud 175, and the parts of the clearing mechanism are then returned to their initial positions by spring 176.

The slide-bars are shown in their normal positions in Figs. 3 and 5. Directly below their forward ends, is a shaft 180 extending across the machine. On this shaft are a plurality of upwardly extending fingers 181,

one for each slide-bar. The upper end of each finger 181 engages the forward end of its corresponding slide-bar, as shown in full lines in Fig. 5. Secured on the shaft 180, adjacent to one end thereof, is a cam 182 (Fig 5). This cam normally engages the edge of a link 183, which is pivotally suspended from the bail 46, which is operated for multiplying. A slide 184 is mounted upon a side-frame of the machine by studs 185 extending through slots in the slide, so that the slide may reciprocate in the direction of the length of the machine. The rear end of this slide is pivotally connected to one end of a link 186, whose opposite end is pivotally connected to the head of the operating lever 24. A projection 187 at the forward end of slide 184 normally engages the end of link 183 at the edge of the link opposite that which engages the cam 182.

With the parts in the position shown in Fig. 5, if a key be depressed, the slide-bar corresponding thereto can move forwardly a distance sufficient to cause locking of that key in the depressed position and locking of the remaining keys in the row in their normal position; but the slide-bar does not move the full amount appropriate for the value of the depressed key, except in the case of the number 1 key, or it may be both the number 1 and the number 2 keys. Instead, the forward lengthwise movement of the slide-bar is checked at an intermediate point by the finger 181. When the slide-bar moves forwardly thus, its end engages the end of the finger 181 and moves that finger with it a slight amount, at the end of which the movement of the slide-bar and the finger 181 is checked by the cam 182 engaging the link 183, movement of this link being then precluded by the projection 187 of slide 184. This position of the fingers 181 is shown by the dotted lines in Fig. 3. If the operating handle 24 be then moved forwardly, the first portion of this forward movement will cause the slide 184 to be moved rearwardly, and in the initial portion of this movement of the slide the link 183 will move with it and this will allow the cam 182 to turn. This turning movement of the cam is accompanied by rocking movement of shaft 180 in its bearings, together with movement of the fingers 181 and the slide-bars 6. This position of the fingers 181 is shown by the dot-and-dash lines in Fig. 3. As above stated, the second step of the movement of fingers 181 and slide-bars 6 takes place during the initial portion of the forward movement of handle 24, and it is completed before the rod or bail 31, moved by the operating handle, engages any one of the pawl-carrying arms 18, even though the keys depressed be keys of high value, as, for instance, the number 9 keys.

It will be seen that by this construction,

the forward movement of a slide-bar 6, when one of the corresponding keys is depressed, is made in two steps, the first step taking place immediately upon the depression of the key and the second step taking place when the operating handle 24 is first moved forwardly. In other words, the forward movement of a slide-bar 6, when a key corresponding thereto is depressed, is checked at an intermediate point, the slide-bar being held at this point in its movement until the operating handle 24 is moved. This checking of the normal movement of the slide-bars at an intermediate point is effected by the fingers 181, which hold the slide-bars temporarily from making their full movement until the handle 24 is moved. As a result of this construction, the jar and noise incident to arresting the movement of the slide-bars at the end of their full range of movement, when the slide-bars are allowed to make that movement unobstructedly, is avoided, and also the action of the keys of the keyboard is much lighter and more uniform. On the depression of a key, the corresponding slide-bar moves only far enough to effect the necessary locking of the keys. The remainder of the movement of the slide-bars is effected as the projection 187 of slide 184 moves rearwardly. This movement of the slide-bars is effected by the springs 12, but these springs are not permitted to move the slide-bars quickly with a consequent jar at the end of the movement, as the slide-bars can move only in proportion to the rearward movement of the projection 187.

As above stated, the link 183 is suspended from the bail 46, which is employed in multiplying. As a result of this, when the multiplying key 43 is depressed, the link 183 is raised a distance sufficient to carry its end out of coaction with the projection 187 and the cam 182. When this has been done, the forward movement of the operating handle 24 carries the pawl-carrying arms and slide-bars back to initial position, but the slide-bars are not then locked in that position. Instead, on the return movement of the operating handle, the pawl-carrying arms and slide-bars move forwardly with the bail or rod 31 until the slide-bars are arrested by the depressed keys. Since the pawl-carrying arms and slide-bars move with the bail 31, there is no jar incident to the completion of the movement of the slide-bars. If the link 183 were not raised at this time, the return movement of the operating handle would carry the slide 184 into coaction with link 183 and force the latter into engagement with cam 182, as a result of which the fingers 181 might be moved rearwardly and might prevent the slide-bars from assuming their proper positions or might move the slide-bars rearwardly from those positions. While

the slide-bars, after having their forward movement arrested by the depressed keys, are on the next forward movement of the operating handle returned to initial position by the bail 31, it would be undesirable to have those slide-bars moved forwardly by the fingers 181 actuated by the slide 184, for such operation might give the slide-bars an extra movement such that inaccurate registration would result.

Having now described my invention, what I claim as new therein and desire to secure by Letters Patent is as follows:—

1. A calculating machine comprising the combination of a keyboard, number-wheels, key-set devices controlled by the keys of the keyboard, differential members actuated under the control of the key-set devices to operate the number-wheels in accordance with the values of the depressed keys, an operating device for actuating said differential members and thereby driving the number-wheels, and means for connecting the operating device in driving relation to the number-wheels independently of the differential members to reset the number-wheels at zero, substantially as set forth.

2. A calculating machine comprising the combination of a keyboard, a shaft, number-wheels mounted thereon and adapted to be connected thereto, key-set devices controlled by the keys of the keyboard, an operating device for actuating the number-wheels in accordance with the values of the keys depressed, and a clutch for connecting the operating device to the shaft of the number-wheels for resetting the number-wheels at zero by the operating device, substantially as set forth.

3. A calculating machine comprising the combination of a keyboard, a shaft, number-wheels loosely mounted thereon, means for automatically connecting the number-wheels to the shaft when the shaft is rotated, key-set devices controlled by the keys of the keyboard, an operating device for actuating the number-wheels in accordance with the values of the keys depressed, a clutch for connecting the operating device to the shaft of the number-wheels, a clearing-key, and means operated by said key for actuating said clutch, substantially as set forth.

4. A calculating machine comprising the combination of a plurality of rows of keys, a slide-bar for each row movable lengthwise under the control of the keys, number-wheels connected to the slide-bars so as to be actuated thereby, an operating device for actuating the number-wheels and slide-bars, means actuated by the operating device for resetting the number-wheels at zero, and connections from said means to the slide-bars for insuring the return of the slide-bars to normal position when the number-wheels are reset, substantially as set forth.

5. A calculating machine comprising the combination of a plurality of rows of keys, a slide-bar for each row movable lengthwise under the control of the keys, a shaft, number-wheels loosely mounted thereon, means for automatically connecting the number-wheels to the shaft when the shaft is rotated, an operating device for actuating the number-wheels and slide-bars; a clutch for connecting the operating device to the shaft of the number-wheels, a clearing-key for operating said clutch, and means actuated by the operating device when said clutch has been operated for insuring the return of the slide-bars to normal position, substantially as set forth.

6. A calculating machine comprising the combination of a keyboard, a shaft, number-wheels mounted thereon and adapted to be connected thereto, key-set devices controlled by the keys of the keyboard, an operating device for actuating the number-wheels in accordance with the values of the keys depressed, a clutch, a key for operating the clutch to connect the operating device to the shaft of the number-wheels, and means for automatically disconnecting the clutch, substantially as set forth.

7. A calculating machine comprising the combination of a plurality of rows of keys, a slide bar for each row movable lengthwise under the control of the keys, a shaft, number-wheels loosely mounted thereon, means for automatically connecting the number-wheels to the shaft when the shaft is rotated, an operating device for actuating the number wheels and slide bars, a clutch for connecting the operating device to the shaft of the number-wheels, a clearing-key for operating said clutch, and means actuated by the operating device when said clutch has been operated for automatically releasing said clutch, substantially as set forth.

8. A calculating machine comprising the combination of a keyboard, a shaft, number-wheels mounted thereon and adapted to be connected thereto, key-set devices controlled by the keys of the keyboard, an operating device for actuating the number-wheels in accordance with the values of the keys depressed, a resetting mechanism connected to said shaft, a clutch, a key for operating the clutch to connect the operating device to the resetting mechanism, means actuated by the operating device when said clutch has been operated for automatically releasing the clutch, and a spring for returning the resetting mechanism to normal position when the clutch is released, substantially as set forth.

9. A calculating machine comprising the combination of a plurality of rows of keys, a slide-bar for each row, means for moving the slide-bars lengthwise when a key corresponding thereto is depressed, means for

checking the movement of a slide-bar at an intermediate point in its movement, and means for returning the slide-bars to initial position, substantially as set forth.

5 10. A calculating machine comprising the combination of a plurality of rows of keys, a slide-bar for each row, means for moving the slide-bars lengthwise when a key corresponding thereto is depressed, an operating
10 device for returning the slide-bars to initial position, and means for arresting the movement of the slide-bars actuated by said means and for permitting a continuance of said movement when the operating device is
15 operated, substantially as set forth.

11. A calculating machine comprising the combination of a plurality of rows of keys, a slide-bar for each row, means for moving the slide-bars lengthwise when a key corresponding thereto is depressed, means for
20 easing the movement of the slide-bars actuated by said means, and an operating device for returning the slide-bars to initial position, substantially as set forth.

25 12. A calculating machine comprising the combination of a plurality of rows of keys, a slide-bar for each row, means for moving the slide-bars lengthwise when a key corresponding thereto is depressed, a movable
30 shock-absorbing device for easing the movement of the slide-bars actuated by said means, and means for returning the slide-bars to initial position, substantially as set forth.

35 13. A calculating machine comprising the combination of a plurality of rows of keys, a slide-bar for each row, means for moving the slide-bars lengthwise when a key corresponding thereto is depressed, means for
40 causing said movement to be made in two steps, and means for returning the slide-bars to initial position, substantially as set forth.

45 14. A calculating machine comprising the combination of a plurality of rows of keys, a slide-bar for each row, means for moving the slide-bars lengthwise when a key corresponding thereto is depressed, an operating
50 device, means for causing said movement to be made in two steps, one dependent upon and the other independent of the movement of said operating device, and means actuated by the operating device for returning the slide-bars to initial position, substantially as set forth.

55 15. A calculating machine comprising the combination of a plurality of rows of keys, a slide-bar for each row, means for moving the slide-bars lengthwise when a key corresponding thereto is depressed a distance
60 dependent upon the value of the key depressed, means for checking the movements of the slide-bars actuated by said means after the bars have moved a predetermined distance,

and means for returning the bars to initial position, substantially as set forth. 65

16. A calculating machine comprising the combination of a plurality of rows of keys, a slide-bar for each row, means for moving the slide-bars lengthwise when a key corresponding thereto is depressed, stops for
70 arresting movement of the slide-bars, an operating device, means actuated by movement of the operating device for withdrawing said stops to permit continued movement of the slide-bars, and means actuated by the
75 operating device for returning the bars to initial position, substantially as set forth.

17. A calculating machine comprising the combination of a plurality of rows of keys, a slide-bar for each row, means for moving
80 the slide-bars lengthwise when a key corresponding thereto is depressed, a shaft, fingers thereon engaging the ends of the slide-bars, an operating device, means actuated thereby for returning the slide-bars
85 to initial position, and means actuated by said operating device for controlling the movement of said shaft, substantially as set forth.

18. A calculating machine comprising the
90 combination of a plurality of rows of keys, a slide-bar for each row, means for moving the slide-bars lengthwise when a key corresponding thereto is depressed, a shaft, fingers thereon engaging the ends of the
95 slide-bars, an operating device, means actuated thereby for returning the slide-bars to initial position, a cam on said shaft, and a slide moving with said operating device and coacting with said cam, substantially
100 as set forth.

19. A calculating machine comprising the combination of a plurality of rows of keys, a slide-bar for each row, means for moving the slide-bars lengthwise when a key corresponding thereto is depressed, means for
105 checking the movement of a slide-bar at an intermediate point in its movement, means for returning the slide-bars to initial position, a repeat-key, and means operated by the repeat-key for rendering said checking
110 means inoperative, substantially as set forth.

20. A calculating machine comprising the combination of a plurality of rows of keys, a slide-bar for each row, means for moving
115 the slide-bars lengthwise when a key corresponding thereto is depressed, an operating device for returning the slide-bars to initial position, means for arresting the movement of the slide-bars actuated by said means
120 and for permitting a continuance of said movement when the operating device is operated, a repeat-key, and means operated by the repeat-key for rendering said arresting means inoperative, substantially as
125 set forth.

21. A calculating machine comprising the combination of a plurality of rows of keys, a slide-bar for each row, means for moving the slide-bars lengthwise when a key corresponding thereto is depressed, a movable shock-absorbing device for easing the movement of the slide-bars actuated by said means, means for returning the slide-bars to initial position, a repeat-key, and means operated thereby for disabling said shock-absorbing device, substantially as set forth.
22. A calculating machine comprising the combination of a plurality of rows of keys, a slide-bar for each row, means for moving the slide-bars lengthwise when a key corresponding thereto is depressed, a shaft, fingers thereon engaging the ends of the slide-bars, an operating device, means actuated thereby for returning the slide-bars to initial position, a cam on said shaft, a slide moving with said operating device, a repeat-key, and a member operated by the repeat-key and lying between said cam and said slide, substantially as set forth.
23. A calculating machine comprising the combination of a row of keys, a slide-bar movable lengthwise under the control of the keys, means actuated by movement of the

slide-bar for locking a depressed key in depressed position and the other keys of the row in normal position, and means for checking the movement of the slide-bar when the latter has effected the locking of the keys and thereafter permitting completion of the movement of the slide-bar, substantially as set forth.

24. A calculating machine comprising the combination of a row of keys, a slide-bar movable lengthwise under the control of the keys, means actuated by movement of the slide-bar for locking a depressed key in depressed position and the other keys of the row in normal position, means for checking the movement of the slide-bar after the latter has effected the locking of the keys, an operating device, and means actuated by movement thereof for permitting the slide-bar to complete its movement, substantially as set forth.

This specification signed and witnessed this 25th day of July, 1911.

ERNEST J. BRASSEUR.

Witnesses:

M. H. BURKART,
R. R. HARRINGTON.