C. B. CORELL.

COMBINED TYPEWRITING AND COMPUTING MACHINE.

APPLICATION FILED APR. 7, 1919.

1,359,231.

Patented Nov. 16, 1920.

2 SHEETS—SHEET 1.

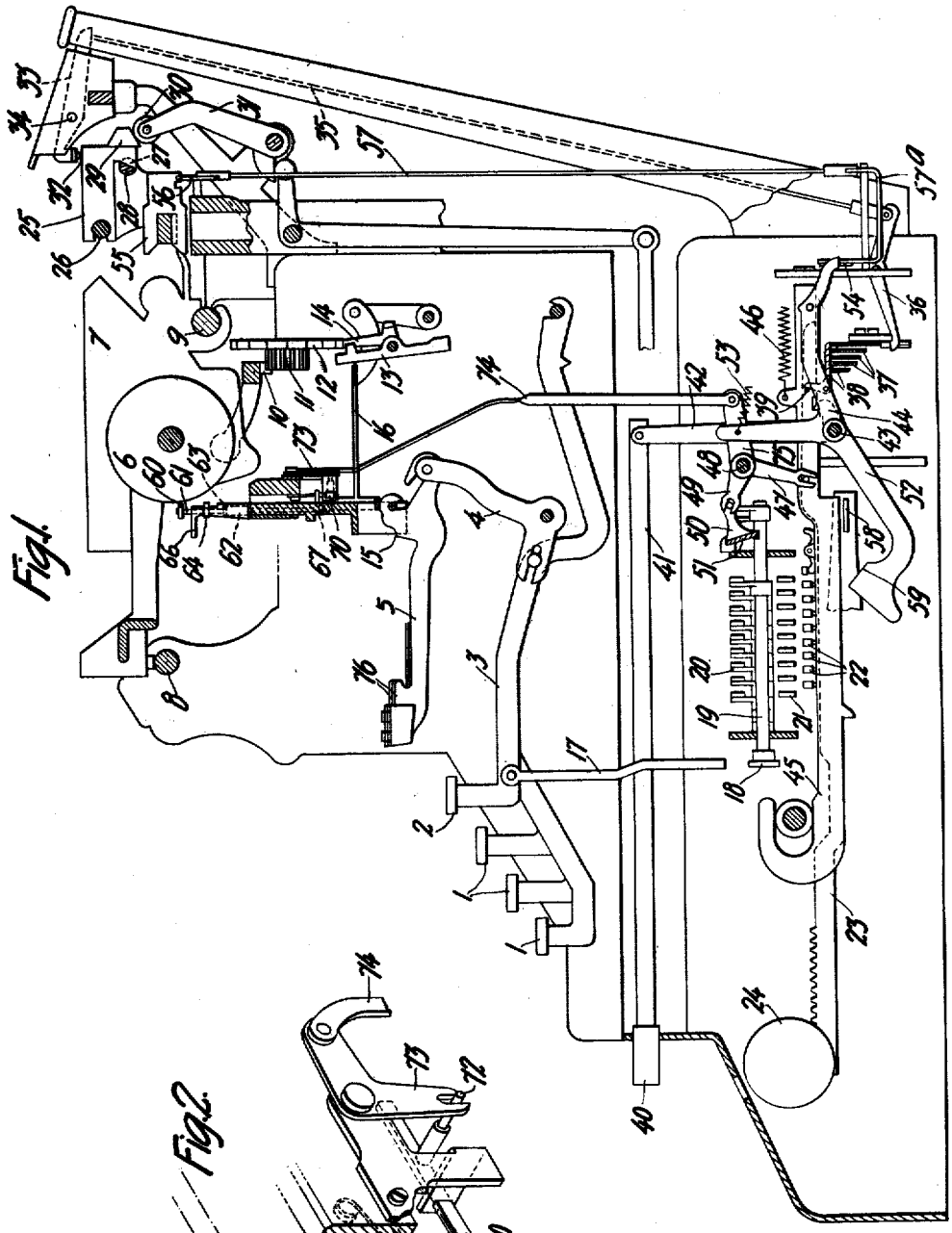


Fig. 1.

Fig. 2.

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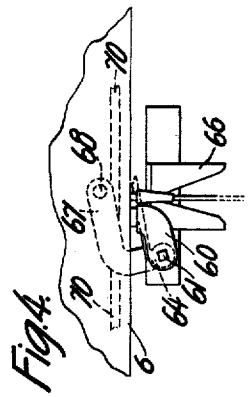


Fig. 4.

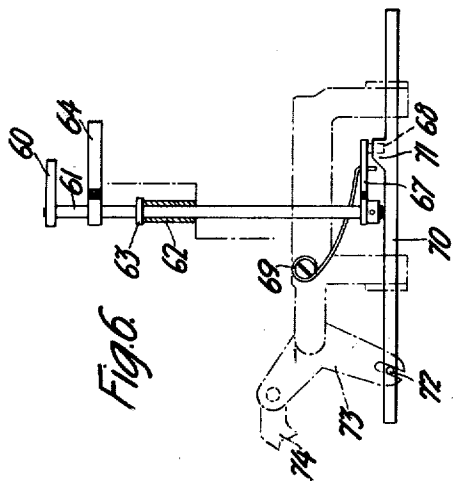


Fig. 6.

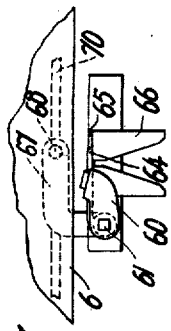


Fig. 3.

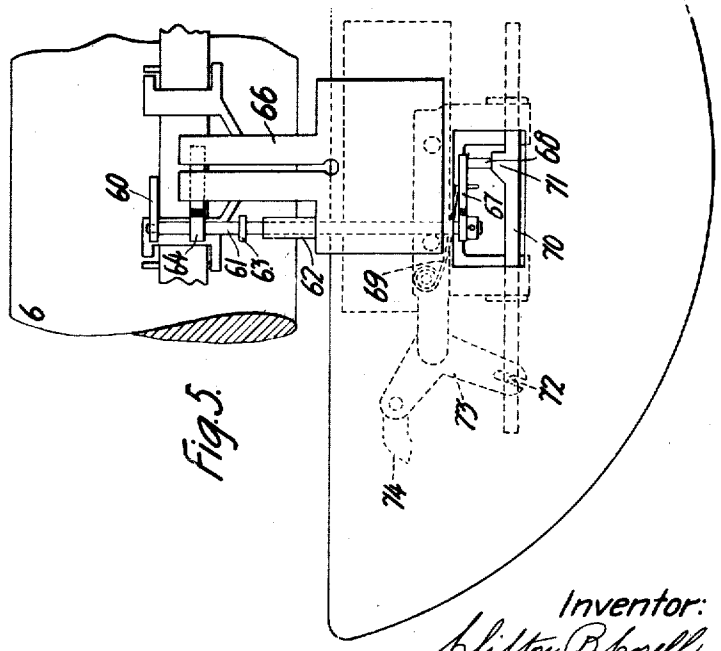


Fig. 5.

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UNITED STATES PATENT OFFICE.

CLIFTON B. CORELL, OF NEW YORK, N. Y., ASSIGNOR TO UNDERWOOD COMPUTING MACHINE COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

COMBINED TYPEWRITING AND COMPUTING MACHINE.

1,359,231. Specification of Letters Patent. Patented Nov. 16, 1920.

Application filed April 7, 1919. Serial No. 288,212.

To all whom it may concern:

Be it known that I, CLIFTON B. CORELL, a citizen of the United States, residing in New York city, in the county of New York and State of New York, have invented certain new and useful Improvements in Combined Typewriting and Computing Machines, of which the following is a specification.

This invention relates to combined typewriting and computing machines, and is herein illustrated as applied to a machine of the Underwood-Hanson type.

Heretofore, in combined typewriting and computing machines adapted to be set for addition or subtraction, provision has been made of ribbon-controlling means, whereby numbers to be added are printed in one color, and numbers to be subtracted in another color. Obviously, all numbers on the carbon copies are of the same color, and it is desirable to provide means whereby the numbers added and those subtracted may be readily distinguished on the carbon copies.

An object of my invention is to provide an improved means whereby printing of a symbol may be effected, to enable determination, upon inspection of the work-sheet or carbon copies, of the state for which the machine was set at the time the number was printed.

In the embodiment of the invention herein disclosed, provision is made of a special type-bar, having thereon a type adapted to print a minus sign. This special type-bar is fixed on a longitudinally-slidable shaft, and, under the control of said shaft, is moved to and from a position to enable printing of a minus sign, just to the left of the printing point of the key-actuated type-bars. When said shaft is positioned to enable printing of the minus sign at the proper point, any of the key-actuated type-bars, when actuated to print, will strike an arm fixed on said shaft and effect a concomitant movement of said special type-bar. Change from a setting for addition to one for subtraction will cause the actuation of a positioning device adapted to move said shaft to operative position, and to release the same when actuated by a key-actuated type-bar. It will be seen that said positioning device will continue in ineffective condition until the computing mechanism has been set for addition and then reset for subtraction.

Other features and advantages will hereinafter appear.

In the accompanying drawings,

Figure 1 is a diagrammatic, side elevation, partly in section, showing the invention applied to a combined typewriting and computing machine of the Underwood-Hanson type.

Fig. 2 is a fragmentary, perspective view, showing some of the parts in dot-and-dash lines.

Fig. 3 is a plan view of the subtraction type-bar and other parts associated therewith, showing the subtraction type-bar in its normal position.

Fig. 4 is a plan view, showing the subtraction type-bar in the position assumed at the end of its actuation by a key-actuated type-bar.

Fig. 5 is a front elevation of certain parts, in position to enable actuation of the special type-bar by a key-actuated type-bar.

Fig. 6 is a front elevation, showing certain parts in the position assumed after actuation by the key-actuated type-bar and before the setting slide has been restored to normal position.

Alphabet keys 1 and numeral keys 2, when actuated, will act, through their key-levers 3, to move bell-cranks 4, and thereby swing type-bars 5 upwardly and rearwardly against platen 6, mounted on carriage 7. Said carriage is supported for sliding movement on rods 8 and 9, and is normally urged in one direction by a spring drum and strap (not shown). Movement of the carriage is controlled by means of the usual escapement mechanism, comprising a rack 10, pivotally mounted on the carriage, engaging a pinion 11 having the usual one-way connection with escapement wheel 12, the movement of which is controlled by the usual fast and loose dogs 13 and 14. Upon actuation of any type-bar 5, a heel 15 thereon will strike a universal frame 16, when the type-bar is near the end of its stroke, and actuate the fast and loose dogs in the usual manner.

To enable control of the computing mechanism by means of the numeral keys 2, said keys are provided with pendent links 17. Upon depression of any of said numeral keys, the corresponding link 17 will strike a lever 18, mounted on one of a set of shafts

19, and rock an arm 20 secured to said shaft, thereby actuating a linkage 21, to effect a pin-setting action. The settable pins 22, mounted in rack bars 23, are, as shown, normally out of position to be actuated by linkages 21, and are moved to suitable position by denomination-selecting means, to be described hereinafter. By depression of pins 22, a number to be computed will be set up on said pins, and subsequently the number so set up is run into the register by means of the pin-carrying bars 23, which have suitable operating connections with dial wheels 24.

The denomination-selecting means comprises bars 25, mounted for pivotal movement on a rod 26, fixed on the carriage, and adjusted along said rod 26 by means of teeth 27 on said bars 25 engaging in suitable notches in a rod 28. It will be seen that bars 25 are capable of swinging to a position below that shown in Fig. 1, and that the bar 25 is held in raised position by means of a roller 30 engaging a roller 29. The roller 30 is of the usual type, with conical ends, adapted to raise the bar 25 into active position when the carriage is passing through a computing zone, and said roller 30 is mounted on arms 31. As the carriage passes through a computing zone, tappets 32 on one of said bars 25 will exert a camming action on jacks 33, pivoted at 34, and this motion will be transmitted by means of links 35, levers 36 and transposition linkages 37 to bell-cranks 38. Said bell-cranks 38 engage with pins 39 on rack bars 23, and enable said rack bars to be advanced sufficiently to enable pin-setting by linkages 21.

Provision is made for setting the indexing mechanism for subtraction, and such setting may be obtained by means of a subtraction-key 40, which, when depressed, will act through a link 41, and an arm 42, mounted on shaft 43, to withdraw a hooked latch 44 from a notch in the subtraction-bar 45, and permit said bar 45 to be drawn to the rear of the machine by means of a spring 46, connected at one end to a lug on said bar 45, and at the other end to a fixed portion of the frame. Such rearward movement of the subtraction bar 45 will serve to swing an arm 47, connected thereto by a pin-and-slot connection, and thereby rock shaft 48, which, in turn, is connected by arms 49 and 50, having a pin-and-slot connection therebetween, to a setting plate 51, pivoted near its upper edge, and engaging at its lower edge in notches formed in shafts 19. The movement of said plate 51 will be effective to move said shafts 19 toward the front of the machine and change the connection between arms 20 and linkages 21 in a well-known manner.

Subtraction-setting may also be obtained by means controlled by the carriage. For this purpose, a three-armed lever 52 is mounted on shaft 43, so that clockwise movement of lever 52 about shaft 43 will serve to rock said shaft, and thereby release the subtraction bar, and so that clockwise rocking of said shaft 43 may be effected without movement of said three-armed lever 52. A spring 53, connected to the upright arm of said lever 52 and to a fixed part of the frame, tends to give said lever a movement in a clockwise direction. Such movement, however, is normally prevented by means of a latch 54, normally underlying the rearwardly-extending arm of said three-armed lever 52. The means for controlling said latch 54 comprises stops 55, suitably positioned on a rack bar on the typewriter carriage, a lever 56, actuated by certain of said stops, and a link 57, through which motion of lever 56 will be transmitted to a bail 57ª, to which said latch 54 is connected.

The mechanism thus far disclosed is of the same general form as that shown in the patent to Minton, No. 1,280,065, dated September 24, 1918.

The embodiment of the invention herein disclosed comprises a special type bar 60, fixed at the upper end of a shaft 61, slidably mounted in a sleeve 62 and provided with a collar 63, which, in connection with said sleeve 62, limits the downward movement of the shaft. Said shaft is also provided with an arm 64, fixed thereon, and normally lying in a recess 65, formed in the rear of type-bar guide 66. As shown in Fig. 5, arm 64 lies between the ribbon guide and the type-bar guide, and the recess in the latter enables the arm to be held normally in such a position as not to interfere with the action of the ribbon guide. An arm 67 is also fixed on said shaft 61, at its lower end, and is provided with a downwardly-extending pin 68, through which the vertical position of the shaft is controlled. A spring 69, secured to a fixed portion of the frame, engages arm 67 and urges the same downwardly, and in a direction to maintain arm 64 in contact with the face of the recess 65 in the type-bar guide.

Said pin 68 normally rests on a slide 70, having a cam projection 71 thereon. Said slide 70 is also provided with a pin 72, engaging in a slot in one arm of a bell-crank lever 73, connected at its other end with link 74, pivoted to an arm 75, secured to shaft 48.

Upon setting for subtraction, either by manual operation or automatically, link 74 will be thrust upwardly and slide 70 drawn to the right, as seen in Fig. 2. Such movement of the slide will bring cam projection 71 under pin 68 and raise shaft 61, and consequently arm 64 to a position to be struck by a blade portion 76, near the head of an actuated type-bar. Striking of arm 64 by a

blade 76 will cause the special type-bar to be swung against the platen, and pin 68 to be thrown to the rear of slide 70, as shown in Fig. 6, thus permitting pin 68 to drop back of slide 70. It will be seen that the special type-bar actuating means becomes ineffective after the actuation of the first key-actuated type-bar. This ineffective condition will be maintained until the computing mechanism is set for addition and slide 70 moved to the left, as seen in Fig. 2, to enable pin 68 to be again drawn forward above the upper surface of slide 70.

Variations may be resorted to within the scope of the invention, and portions of the improvements may be used without others.

Having thus described my invention, I claim:

1. In a combined typewriting and computing machine, the combination with numeral keys and numeral-key-actuated type-bars, of computing mechanism settable for different states, a special type-bar to indicate a setting for one of said states, and numeral-key-actuated means for actuating said special type-bar, rendered effective by a change to the state indicated by said special typ-bar, and rendered ineffective upon actuation by the first numeral key actuated.

2. In a combined typewriting and computing machine, the combination with numeral keys and numeral-key-actuated type-bars, of computing mechanism normally set for addition, means for setting the same for subtraction, a special type-bar to indicate a subtraction-setting, and actuating means rendered effective by setting for subtraction, whereby actuation of a numeral key will effect actuation of said special type-bar, and release said actuating means from said subtraction-setting means.

3. In a combined typewriting and computing machine, the combination with numeral keys and numeral-key-actuated type-bars, of computing mechanism normally set for addition, means for setting the same for subtraction, a special type-bar to indicate a subtraction setting, actuating means rendered effective by the setting for subtraction, whereby actuation of a numeral key will effect actuation of said special type-bar, and release said actuating means from said subtraction-setting means, and means whereby said computing mechanism may be restored to a setting for addition, and said actuating means concomitantly restored to the control of said subtraction-setting means.

4. The combination with a platen, keys including numeral keys and numeral-key-actuated type-bars, of a special type-bar, a slidably-mounted shaft to which said special type-bar is fixed, an actuating arm mounted on said shaft, means urging said shaft in the direction of its length, and in a direction about its axis to hold its actuating arm in forward position, means to limit the movement of said shaft due to such urging, and means to move said shaft longitudinally, to bring said special type-bar to the vicinity of its printing point, and said actuating arm into position to be struck and actuated by any of said numeral-key-actuated type-bars when actuated.

5. In a combined typewriting and computing machine, the combination with numeral keys, numeral-key-actuated type-bars and a type-bar guide, of computing mechanism normally set for addition, subtraction-setting means, a special type-bar to indicate a subtraction-setting, a vertically slidable shaft on which said special type-bar is secured, and actuating arm fixed on said shaft, so that its forward position is limited by said type-bar-guide, a controlling arm fixed on the lower end of said shaft, and having a downward projection, means to limit the downward movement of said shaft, spring means tending to move said shaft downwardly and to turn the same to a position with said actuating arm in engagement with said type-bar-guide, a slide on which said downward projection normally rests, having an upwardly extending cam projection, and means actuated by said subtraction-setting means to move said slide sufficiently to bring said cam projection under said downward projection, and thereby raise said shaft sufficiently to bring said actuating arm into position to be actuated by a numeral-key-actuated type-bar, such actuation causing said downward projection to ride off and engage behind said cam projection.

6. The combination with typewriting mechanism including a traveling carriage, keys and key-actuated type-bars, of computing mechanism, carriage-actuated means for determining computing zones, carriage-actuated means for setting said computing mechanism for subtraction upon entering a computing zone, a device normally ineffective for printing a subtraction-symbol, and means rendered effective upon subtraction-setting, to enable actuation of said printing device by one of said keys, and rendered ineffective upon actuation of said printing device by the first of said keys actuated after a subtraction-setting.

7. The combination with a platen, of keys, key-actuated type-bars, a special type-bar, means for actuating said special type-bar including an actuating member constantly urged to a normal ineffective position, and positioning means for said member including an arm and a cam for engaging said arm and moving said member to effective position, whereby an actuated type-bar will actuate said member and thereby the special type-bar, and carry said arm off said cam and permit said member to move to ineffective position.

8. The combination with a platen, of keys, key-actuated type-bars, a special type-bar, a shaft on which said special type-bar is mounted and by which it is actuated, an actuating arm mounted on said shaft, a controlling arm also mounted on said shaft, means urging said actuating arm forwardly and downwardly to a limiting normal position, and positioning means for said actuating arm including a cam for engaging said controlling arm and thereby raising said actuating arm to position to be struck by an actuated type-bar, whereby the special type-bar will be actuated and the controlling arm moved off said cam and permitted to move to an ineffective position.

9. The combination with a platen, of keys, key-actuated type-bars, a special type-bar, a shaft on which said special type-bar is mounted and by which it is actuated, an actuating arm mounted on said shaft, means urging said arm forwardly and downwardly to a limiting normal position, a controlling arm mounted on said shaft, positioning means for said actuating arm including a cam for engaging said controlling arm and thereby raising said actuating arm to position to be struck by an actuated type-bar whereby the special type-bar will be actuated and the controlling arm moved off said cam and permitted to move to an ineffective position with a part thereof behind said cam, and restoring means for actuating said positioning means to restore said cam to normal position and permit said controlling arm to return to normal position.

10. The combination with a platen, of keys, key-actuated type-bars, a special type-bar, means for actuating said special type-bar including an actuating member constantly urged to a normal ineffective position, and positioning means for said member including an arm and a positioning member for engaging said arm and thereby moving said actuating member to a position whereby an actuated type-bar will strike the same and thereby actuate the special type-bar and carry said actuating member off the positioning member and permit said actuating member to move to an ineffective position.

11. The combination with a platen, of keys, key-actuated type-bars, a special type-bar, means for actuating said special type-bar including an actuating member constantly urged to normal ineffective position and positioning means for said member including a controlling member and a positioning member for engaging said controlling member and moving said actuating member to effective position, said controlling member and said positioning member having cooperating means thereon whereby movement of said positioning member will effect operative positioning of said actuating member, and actuation of said actuating member by a type-bar will enable a movement of said actuating member to an ineffective position.

12. In a combined typewriting and computing machine, the combination with a traveling carriage, keys, including numeral keys, and key-actuated means for effecting a step-by-step traveling movement of said carriage, of numeral key-controlled computing mechanism normally set for addition, but settable for subtraction, means to set said mechanism for subtraction, and numeral-key-actuated means, ineffective when said computing mechanism is set for addition, but rendered effective upon setting for subtraction for printing a mark indicative of subtraction, said numeral-key-actuated means being again rendered ineffective upon the first actuation thereof.

13. In a combined typewriting and computing machine, the combination with a platen, of mechanism for printing one character at a time, comprising numeral keys and numeral-key-actuated type-bars, normally ineffective means for printing a mark indicative of subtraction, computing mechanism normally effective for addition, subtraction-setting means, and controlling means rendered effective by said subtraction-setting means to enable actuation of said subtraction-mark printing means by the first numeral key actuated, to print a digit and cause said controlling means to become ineffective for actuation by numeral keys operated to print other digits of the same number.

14. The combination with a platen, of keys, key-actuated type-bars mounted to have a single printing point, a special type-bar, a member operatively connected to said special type-bar, and a device for positioning said member to be struck by a key-actuated type-bar and to be actuated to cause a printing movement of said special type-bar, and for permitting said member to move to ineffective position upon completion of such actuation.

15. In a combined typewriting and computing machine, the combination with means, including a traveling carriage, for determining computing zones, of a platen, numeral keys, numeral-key-actuated type-bars, numeral-key-controlled computing mechanism, a device adapted to be actuated by an actuated type-bar to cause a subtraction mark to be printed, but normally out of the paths of the type-bars, cam mechanism for moving said device into position to be actuated by the type-bars and for permitting movement of the same to ineffective position at the end of such actuation by the type-bar printing the first digit of the number, and carriage-actuated means for controlling said cam mechanism.

16. The combination with a platen, keys

and key-actuated type-bars, of a special type-bar, a member operatively connected with said special type-bar, means whereby said member is normally held out of the paths of the key-actuated type-bars, and means for positioning said member to be struck and actuated by an operated type-bar, said positioning means being rendered ineffective by the key-actuated type-bar first actuated.

17. The combination with typewriting mechanism, including a traveling carriage, keys, including numeral keys, and key-actuated type-bars, of computing mechanism, comprising indexing mechanism, carriage-actuated means for determining computing zones, and rendering said keys effective to index a number in said indexing mechanism, means to set said indexing mechanism for complementary subtraction, a special type-bar provided with a subtraction-indicating type, and means rendered effective by said subtraction-setting means, to enable actuation of said special type-bar by any of said key-actuated type-bars, but rendered ineffective by the first of said key-actuated type-bars to be actuated.

18. In a combined typewriting and computing machine, the combination with a platen, keys, including numeral keys, and key-actuated type-bars to coöperate with said platen, of a type-bar carrying a type-indicating subtraction, numeral-key-controlled computing mechanism normally set for addition, means to set said computing mechanism for subtraction, and controlling means rendered effective by said subtraction-setting means to enable any of said key-actuated type-bars to actuate said subtraction-indicating type-bar and render said controlling means ineffective.

19. In a combined typewriting and computing machine, the combination with a platen, numeral keys, and numeral-key-actuated type-bars, of a special type-bar carrying a subtraction-indicating type, numeral-key-actuated computing mechanism, subtraction-setting means, and controlling means rendered effective by said subtraction-setting means, whereby, after actuation of said subtraction-setting means, operation of a numeral key will effect movement of its type-bar to operative position and concomitant movement of the subtraction-indicating type to operative position, and subsequent actuation of a numeral key will be ineffective to effect movement of said subtraction-indicating type until the computing mechanism has been set for addition and set a second time for subtraction.

20. In a combined typewriting and computing machine, the combination with a traveling carriage, numeral keys and numeral-key-actuated type-bars, of computing mechanism settable for different states, a special type-bar to indicate a setting for one of said states, carriage-controlled means for setting said computing mechanism to the state indicated by said special type-bar, and numeral-key-actuated means for actuating said special type-bar, rendered effective by said carriage-controlled means, and rendered ineffective by the first numeral key actuated.

21. The combination with a platen, keys and key-actuated type-bars, of a special type-bar, means including a shaft for actuating said special type-bar, means including an actuating member for actuating said shaft, and means for positioning said member to be struck and actuated by the first type-bar actuated.

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Witnesses:
EDITH B. LIBBEY,
JENNIE P. THORNE.