

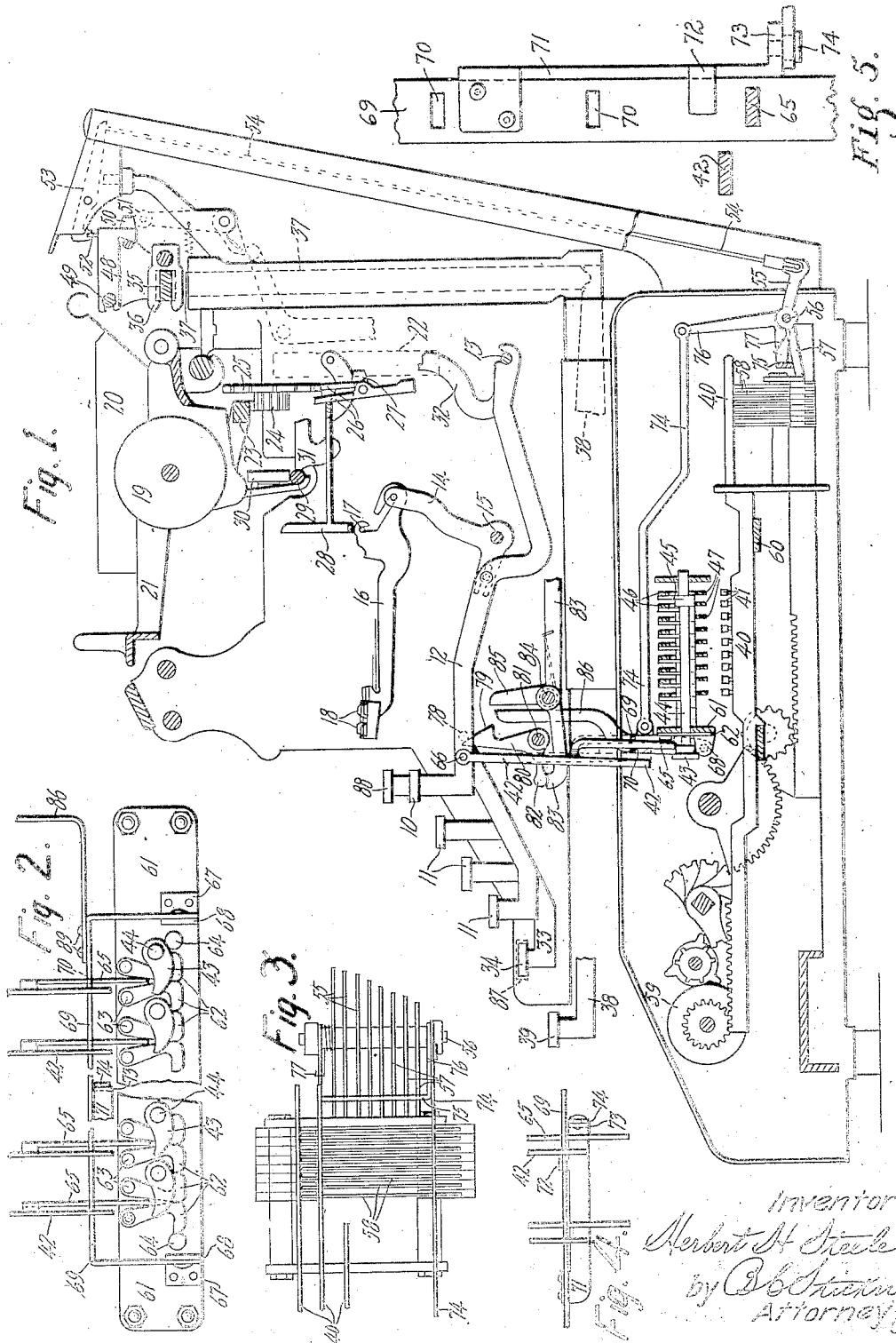
May 20, 1930.

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1,759,329

COMBINED TYPEWRITING AND COMPUTING MACHINE

Filed June 17, 1926



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COMBINED TYPEWRITING AND COMPUTING MACHINE

Application filed June 17, 1926. Serial No. 116,555.

This invention relates to typewriting machines that include a computing mechanism operable, at will, to type or jointly type and compute numerals, and may be regarded in the nature of an improvement on the patent to Hart, No. 1,270,411, dated June 25, 1918.

The patent to Hart and the well-known Underwood-Hanson combined typewriting and computing machine include many protective features devised to prevent the actuation of the computing mechanism, except at such times or during such periods as computations are desirable, and thus prevent the abuse of the mechanism through carelessness or errors. These devices usually have taken the form of interlocks to prevent the depression of any numeral-key and thus prevent the actuation of the computing mechanism. Hart shows pendent cams that have a free longitudinal movement, as a series, sufficient to allow the passage of a stem or pendant from one numeral-key-lever and in thus taking up the lost motion between the cams prevents the subsequent entrance of another stem until the first stem has been fully withdrawn at the end of the return key movement, and thus prevents the joint actuation of two numeral-keys to register dissimilar digits. To this mechanism a wedge is added that operates to close up the stem space between the cams so as to prevent the depression of any numeral-key while the wedge is held interlocked with the cams by machine conditions or manipulations. As for example, means have been provided to lock the numeral-keys when a case-shift key is depressed to prevent the typing of an upper-case character, and simultaneously compute the numeral. Other connections have been made to actuate the wedge during the interval a denominational tabulating key is depressed, to prevent the actuation of the computing mechanism within a computing zone until the key is fully released, and the carriage finally arrested. Still other connections are made to the wedge that operate during the actuation of the automatic power-driven carriage-return mechanism. These special mechanisms in the aggregate indicate a complicated

addition to a naturally complicated computing mechanism.

As already stated, these devices protect the computing mechanism against carelessness or errors in operation, and while the effect is also to prevent the typing of numerals as well as to prevent a computation, the special non-typing features are due to existing mechanical conditions and not to a sought-for result, that has no particular utility in typewriting machines. If an operator registers a mistake in the computing mechanism it is sometimes a serious matter to correct it, but if a mistake is made in typing an erasure easily corrects the error. In the Hart patent, the stems pendent from each numeral-key are at all times in position to actuate certain parts of the computing mechanism, and hence the numeral-keys, whether the manipulation is to type or to type and compute, perform the same function of vibrating the pin-setting linkages, and hence the numeral-keys are always connected to the computing mechanism, of which the linkages are a part.

One feature of this invention is to normally isolate the numeral-keys of the typewriter from the computing mechanism so that the keys are operative at all times to type a numeral, and may be rendered operative to actuate the computing mechanism only during the interval the typing position is passing through the computing zone predetermined by means adjustably secured to a part of the carriage to travel therewith. Thus mechanically removing the human element from the control of the computing mechanism, except for the depression of the numeral-keys to type and compute within a predetermined computing zone, eliminates many complicated connections and interlocking mechanisms heretofore employed to permit computing within a computing zone, and to prevent computing anywhere else along the line of print.

To this end, provision is made to swing the pendants from a pivot on the numeral-keys, between two positions, one position where the pendant is normally inoperative to actuate the computing devices, but is idly depressed

with the numeral-key, and another position where the pendant may be directed to engage with the computing mechanisms through connections under the control of the denominational selectors actuated by the traveling carriage. As these selectors or jacks are only operative during the interval of their engagement with the tappet on the traveling carriage it is obvious that the pendants on the numeral-keys are only shifted to operative computing positions during the passage of the printing point on the platen through the computing zone, and at all other positions along the line of print, the said pendants are ineffective to actuate any part of the computing mechanism.

The pendants from the numeral-keys usually have two stems of an inverted hair-pin formation, one stem thereof operatively engaging a crank-arm, to rock a shaft, to actuate the pin-setting linkage, and the other stem to spread the cams and prevent the joint depression of two numeral-keys.

To obtain the maximum speed from the carriage-feeding mechanism, the carriage-feed "let-off" of the Underwood typewriting machine takes place at a point very close to the printing position of the types, and when the numeral-keys are burdened with pendants to actuate the computing mechanism, and the computing devices are protected by cams interlocking with the pendants, and while the "let-off" takes place at the same point for the numeral-keys as for the alphabet-keys, the speed of typing with the numeral-keys is greatly reduced, because it is necessary for one pendant stem to release the cams before the next succeeding stem can pass them, and the returning type-bar naturally swings close to the basket position, before the next succeeding bar can be raised from the basket to type. It will be remembered that heretofore the typing of numerals outside the computing zone vibrated the linkages uselessly and required that the operator employ a normal touch for the alphabet-keys and a far different touch for the slower operating numeral-keys, which is objectionable and greatly interferes with the speed of manipulation. By normally directing the pendants of the numeral-keys for inoperative movements, the typing touch of the numeral-keys is restored to normal and the operation of the keyboard of the machine is restored to its maximum efficiency for speed of manipulation when computing is not desirable.

Another feature provides for a special key to shift at will the numeral-key pendants to permit of re-typing a number within a computing zone without computing, as when a numeral has been lightly typed.

When the carriage is being fed through the computing zone, should the shift-key be erroneously depressed, it is obvious that an upper-case character would be typed and a

numerical value; that has no connection with the character typed, would be run into the computing mechanism and result in confusion. Another feature of this invention includes means operative by the case-shift-key when shifting the platen to upper-case position, to simultaneously shift the numeral-key pendants to positions inoperative to compute, and hence the only error to be corrected is the erasure of the character typed.

It is obvious that the special key before mentioned may be employed to manually shift the pendants to inoperative computing positions during the passage of the carriage through a predetermined computing zone, to enable the operator, while holding said key depressed or mechanically locked, to type the total read from the totalizer within the computing zone without running the amount so typed into the computing mechanism, as where it is essential to continue a series of disconnected operations for a final or grand total in certain kinds of invoice work.

This simple method of accomplishing these results is in strong contrast to the complicated mechanisms and modes of operation heretofore employed.

Other features and advantages will hereinafter appear.

In the accompanying drawings,

Figure 1 is a central longitudinal vertical section through a combined Underwood typewriting and computing machine, with only such mechanisms shown as relate to the subject-matter of the present invention.

Figure 2 is an enlarged end view of the casing that encloses the linkage units, showing the pendants from the numeral-keys in operative positions to actuate the computing linkages while under the control of a bail hinged to the frame.

Figure 3 is an enlarged fragmentary plan view of the transposition mechanism of the computing mechanism.

Figure 4 is an enlarged front view of the resilient connection between the bail and the link actuated by the denominational selecting devices.

Figure 5 is an enlarged plan view of Figure 4.

Numeral-keys 10 and alphabet-keys 11 depress key-levers 12 about a fulcrum 13 to vibrate bell-cranks 14 about a fulcrum wire 15, and cause type-bars 16 to swing upwardly and rearwardly about a fulcrum 17 to effect the impact of types 18 against the front face of a rotatable platen 19.

The platen 19 is supported within a frame 20 movable to case-shift positions within a carriage 21 urged from right to left, by the usual spring motor 22, connected to the carriage and controlled by the usual step-by-step carriage-feeding movement of a rack 23 upon the carriage, engaging a pinion 24 on the frame to rotate an escapement-wheel 25 en-

gageable with a pair of feed-dogs 26 mounted upon a dog-rocker 27 vibrated by a universal bar 28 that is actuated by each type-bar in moving to the printing position. Each type-bar has both upper and lower case types, and, as said bars are hung from a stationary segment, the platen is shiftable from a normal lower-case typing position to an upper-case typing position by a shift-rod 29 supporting the platen-frame by a center roller 30 traveling along the rod. Said rod is suspended from the free ends of a pair of arms 31 fulcrumed to the frame and is engageable with a crank-arm 32 forming a part of the shift-lever 33 operated by a case-shift-key 34 at the keyboard, in the well-known Underwood manner.

The carriage 21 is provided with the usual rack-tooth-bar 35 spaced off at letter-space intervals to receive column-stops 36 that engage with the usual denominational stops 37 that are raised into the traveling path of the stops 36 by denominational-tabulating levers 38 extending forwardly under the machine where the free ends are provided with keys 39 at the front of the keyboard.

The computing mechanism includes a set of pin-carrying bars 40 which are raised one at a time to pin-setting positions while the carriage is passing through a computing zone. When a numeral-key 10 is depressed while one of the bars 40 is in its raised position, an index-pin 41 corresponding in value to the number of the depressed numeral-key 10 will be set therein. Each numeral-key-lever 12 has a stem 42 pendent therefrom to engage with a crank-arm 43 secured to a rock-shaft 44 that carries an arm 45 connectible by links 46 to convey a downward parallel movement to a bar 47 to depress the associated index-pins 41.

To selectively raise the pin-bars 40 to a pin-setting position where the bars 47 may depress the pins, the carriage 21 is provided with selectors 48 adjustably mounted upon a cross-rod 49, there being one selector for each computing zone. When the carriage reaches a computing zone, as by the use of a denominational-tabulator-key 39, a roller 50 of the selector 48 rides over a roller 51 central of the machine to raise a tappet 52 into co-operative relation with a series of jacks 53 pivoted to the frame. As the carriage moves through the computing zone, the tappet 52 engages and vibrates the jacks, one at a time, beginning with the highest denominational order, to move or push a rod 54 downwardly and rock a lever 55 about a fulcrum 56 to lift the forward end 57 of the lever to actuate the usual transposition devices 58 that are operative to lift the rear ends of the associated pin-bars 40 in a well-known manner.

The index-pins 41 determine the extent of movement of pin-carrying bars 40 and the extent of rotary movement for suitable dial-

wheels 59, when the pin-bars 40 are operatively thrown forward by a general operator 60 engaging such pins 41 as may have been depressed through the pin-bars.

As shown at Figure 2, the sides 61 of the frame that encloses the pin-setting units has a series of cams 62 that hang pendent from pivots 63 and are disposed relatively to each other and to fixed studs 64, to permit the passage of one stem 65 of the pendant 42 that is pivoted at 66 to each numeral-key-lever 12.

In order to release the numeral-keys from all interference with the computing devices when it is desirable to type numerals and not compute them, the pendants 42 from the numeral-keys, instead of having a fixed up-and-down movement to always vibrate the computing linkages, are to be guided between two positions, one normal position where the two stems 42 and 65 pass downwardly free of any of the computing connections, and another position where the stems perform their separate functions as heretofore.

To this end, brackets 67 are secured to the sides 61 of the frame and have ears 68 to pivotally support the two ends of an inverted U-shaped bail 69, having suitable holes 70 formed longitudinally thereof, one hole for each stem 65 and through which said stems may slide freely with the up-and-down movement of the numeral-key. It will be noted that the bail 69 is vertically disposed or in equipoise, and requires very little force to vibrate it, and that the stems 65 pass down through the bail with their free ends normally in positions inoperative to actuate the computing mechanism, but when said bail is vibrated rearwardly the pendent stems assume the dotted position of Figure 1, where one stem 65 will engage a cam 62 and the other stem 42 will rock the crank-arm 43 and the associated linkages.

To vibrate the bail 69, between the two control positions of the pendants 42, a flat spring 71 is secured to the bail in such a manner that a stop-tongue 72 thereon will bear against the edge of the bail under tension and the free end is bent at right angles to form an ear 73, to which may be pivoted one end of a link 74 to provide for a resilient connection between said link and the bail for purposes hereinafter to appear. It will be remembered that the levers 55 are fulcrumed at 56, and that the arms 57 thereof are raised one at a time through the action of the jacks 53. This lifting movement of the arms 57 is utilized to actuate a universal bar 75 fulcrumed also at 56 and formed with an upright arm 76 at one end thereof which is pivotally connected to the rear end of the link 74. To maintain the universal bar 75 in pressing engagement against the arms 57 and normally hold the bail 69 and the pendants 42 in the full-line position shown at Figure 1, a suitable spring

77 may be coiled about the fulcrum 56 to engage with the universal bar 75, as shown.

It will be noted that when the tappet 52 is brought into a computing zone it will engage the jacks 53, and each jack when vibrated by the tappet will depress its rod 54 to vibrate a lever 55 to raise the associated pin-bar 40, and simultaneously the universal bar 75 will be vibrated to pull the link 74 rearwardly to vibrate the bail 69 and shift the whole series of pendants 42 from the inoperative full-line position to the dotted position, where the two stems 42 and 65 are in position to actuate the computing mechanism when a numeral-key is depressed. The tappet 52, as is well known, raises a jack at each letter-space position within the computing zone, and holds a pin-bar raised until a numeral-key has been depressed to type and set a corresponding index-pin on the pin-bar, when the carriage-feed shifts the tappet to release one jack and engage the next adjoining jack. This letter-spacing movement of the tappet is practically instantaneous, and the rise and fall of the jacks will take place with very little, if any, vibration of the universal bar 75.

It is obvious were the connections between the universal bar 75 and the bail 69 of positive nature the numeral-keys would be positively connected to actuate the computing mechanism at all positions of the tappet 52 within the computing zone, and under such conditions should the case-shift-key be actuated, accidentally or otherwise, an upper-case character will be typed and a numeral registered. To prevent such errors it will be remembered that the link 74 is connected to the flat spring 71, and hence while the tappet 52 is in the computing zone and the stems 42 are in operative position to actuate the computing mechanism the bail 69 may be swung forwardly to shift the stems to the full-line inoperative position through the flexibility of said spring 71 secured to the link 74; and, when so positioned, the tappet will effect the lifting of the pin-bar, but as the stems 42 are inoperative, the effect of depressing a numeral-key will be to type and not compute, and if this shifting of the bail 69 is accomplished by a part of the case-shifting mechanism, it will be impossible for a numeral-key to actuate the computing mechanism while the platen is in upper-case shift position.

To this end, the shift-key 34 may be placed at one or both sides of the keyboard and provided with a stud 78 operative when depressed with the key to engage a cam-face 79 of a bell-crank 80 to vibrate the latter, to rock a shaft 81, the bell-crank having an arm 82 to engage the end of a lever 83 fulcrumed at 84 to then pass rearwardly to effect a locking of the platen shift in the well-known Underwood manner, or as shown in the patent to

Helmond, No. 1,399,481, dated December 6, 1921.

For the purposes of the present invention, the lever 83 is formed with an upright arm 85 arranged to wipe against an arm 86 passing downwardly and then inwardly where the end is secured at 89 to the top face of the bail 69. When the case-shift-key 34 is depressed to case-shift the platen, the camming of the bell-crank 80 vibrates the arm 85 to wipe against the arm 86 and vibrates the bail 69 to the full-line position of Figure 1, where the two stems 42 and 65 are directed to ineffective paths relative to the computing connections, and any depressed numeral-key operates to type, but does not actuate the computing mechanism.

While the connections just described are co-operative with the shift-key 34, it will be understood that a special key as 87 may be employed to actuate a bell-crank 80, and thus enable the operator, at will, to silence the computing mechanism within the computing zone, and permit the typing or retyping of numerals within the computing column of the work-sheet. This is especially advantageous where footings are typed within the same column, and it is desirable to type the total read from the totalizer without clearing the totalizer and without registering a computation.

Sometimes the operator in typing a series of digits will type one digit much lighter than the others. By back-spacing the carriage to the lightly typed numeral, depressing the key 87, to rock the bail against the tension of the spring 71 to draw the stems 42 and 65 forwardly to the full-line position, and while said key is held depressed, the numeral can be retyped without actuating the computing mechanism, and the bail will be restored immediately upon release of the key.

As such a back-spacing operation takes place within the computing zone, the accidental depression of a numeral-key during the back-spacing operation would actuate the computing mechanism, because the stems 42 are in dotted or computing positions during this operation of back-spacing. To prevent errors of this nature from being run into the computing mechanism, a back-space key 88 may also have a stud 78 to operate another crank-arm 80 to rock the shaft 81 and effect the swinging of the bail 69 to render the stems 42 inoperative to compute should any numeral-key be accidentally depressed before the back-space-key is restored and the backward movement of the carriage is completed. The back-spacing mechanism operated by the key 88 may be that of the Underwood typewriting machine shown and described in detail in the patent to Helmond, No. 930,962, dated August 10, 1909. It will be understood that the rock-shaft 81 has one bell-crank 80 at one end thereof to actuate the lever 83 and the arm 85, and that other crank-arms sim-

ilar to 80 with the arm 82 removed may be distributed along the rock-shaft 81 to engage with other studs 78 placed upon other key-levers when it is desirable that any key-lever be operative to jointly type and silence the computing mechanism.

Some computing machines are provided with automatic total-printing mechanisms, where the total carried by the register-wheels at the end of a series of computing operations is automatically typed digit by digit beginning at the highest denomination thereof to the limit of the computing zone. As these automatic printers actuate the numeral-key-levers to type the numerals, and as the denominational jacks are raised one by one by the movement of the tappet to predetermine which registering element shall become active, the jacks raise the pin-bars, and the power-driven connection to the numeral-keys will depress the corresponding pins of each pin-bar that later are picked up by the general operator to carry the digits typed additively or subtractively into the register-wheels. The usual practice is to change the computing mechanism to a subtractive state, so that the total is automatically typed and the register-wheels are subsequently cleared by the general operator. Should occasion arise where the total is to be automatically typed without a register-wheel-clearing movement, it is obvious that the depression of the special key 87 during the automatic printing operation will render the pendent stems of the numeral-keys inoperative to actuate the pin-setting devices, and the register devices after the typing operation will be restored to their previous state and the total restored to the register-wheels.

Attention is particularly drawn to the very few parts employed in the present invention in contrast with the complicated mechanism heretofore in use to perform similar functions; that there is no change in the existing computing mechanisms; and that the new parts are employed to convey motion from the pin-bar-selecting mechanism to the pendants of the numeral-keys and thereby mechanically prevent the actuation of any part of the computing mechanism by a numeral-key, except within a computing zone, which zone is predetermined automatically by mechanical means.

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 typewriting and computing machine, having a computing mechanism rendered operable by the letter-spacing movement of the typewriter-carriage in typing, and operated by numeral-typing keys having connections normally disconnected from the computing mechanism; mechanism for shift-

ing said key-connections as a series by each letter-space movement of said carriage, to render the keys operative to compute.

2. In a typewriting and computing machine, the combination with a traveling carriage having a platen, a computing mechanism having denominational selecting devices rendered operable by the travel of the carriage, and numeral-keys normally operative to type and normally inoperative to compute, of a shift device operable by the actuation of the selecting devices during the course of typing, to connect the numeral-keys to the computing mechanism.

3. In a typewriting and computing machine, the combination with a carriage having a platen, numeral-keys normally operative to type numerals and normally inoperative to compute, tabulating mechanism to predetermine a computing zone, and a denominational selecting mechanism operative within said zone, of shiftable mechanism connectible to the numeral-keys and to the denominational selecting mechanism, and automatically operable during the travel of the carriage through the computing zone to render the keys operative to type and compute a numeral at each denominational position of the carriage within the computing zone.

4. In a typewriting and computing machine, the combination with a traveling carriage having key-actuated case-shifting mechanism, a computing mechanism having denominational selecting devices rendered operable by the travel of the carriage to a computing zone, and numeral-keys normally operative to type and normally ineffective to compute, of a shift device connectible to be individually actuated by the carriage-driven denominational selecting devices to establish connections between the numeral-keys and the computing mechanism, and mechanism connectible to said shift device and actuated by the case-shift key to temporarily render the numeral-keys operative to type and inoperative to compute within the computing zone.

5. In a typewriting and computing machine having a carriage feedable letter-space distances, a platen thereon, a computing mechanism including denominational selecting devices, and numeral-keys operative to type numerals; a normally inoperative interponent swingable between each numeral-key and the computing mechanism, and mechanism operated automatically by said selecting devices during the course of typing, to effect the shifting of the interponents and render the numeral-keys operative to type and compute.

6. In a typewriting and computing machine having a carriage feedable letter-space distances, a platen thereon, a computing mechanism including denominational selecting devices, and numeral-keys operative to type numerals; a normally inoperative inter-

ponent swingable between each numeral-key and the computing mechanism, and mechanism actuated by each selecting device in typing to shift the interponents as a series and render the numeral-keys operative to actuate the computing mechanism.

7. In a typewriting and computing machine having a carriage feedable letter-space distances, a platen thereon, a computing mechanism including denominational selecting devices, and numeral-keys operative to type numerals; normally inoperative means carried by each numeral-key and rendered operative during the step-by-step selection of the denominational devices in letter-spacing to actuate the computing mechanism.

8. In a typewriting and computing machine having a traveling carriage, a platen thereon, a computing mechanism including a series of pin-bars, pin-bar selectors actuated by the traveling carriage, and numeral-keys operable to type; a normally inoperative computing connection depressible with each numeral-key, and mechanism operated by each pin-bar selector and effective to render each numeral-key connection operative to compute.

9. In a typewriting and computing machine having a traveling carriage, a platen thereon, a computing mechanism including a series of pin-bars, pin-bar selectors actuated by the traveling carriage, and numeral-keys operable to type; a normally inoperative computing connection depressible with each numeral-key, and a universal bar operated by each pin-bar selector in conditioning a pin-bar, and connectible to render each numeral-key connection operative to compute.

10. In a typewriting and computing machine having a traveling carriage, a platen thereon, a computing mechanism including a series of pin-bars, pin-bar selectors actuated by the traveling carriage, and numeral-keys operable to type; a normally inoperative computing connection depressible with each numeral-key, a bail swingable to direct the movement of said depressible connections to the computing mechanism, and a universal bar operated by each pin-bar selector and connectible to swing the bail.

11. In a typewriting and computing machine having a traveling carriage, a platen thereon, a computing mechanism including a series of pin-bars, pin-bar selectors actuated by the traveling carriage, and numeral-keys operable to type; a normally inoperative computing connection depressible with each numeral-key, a bail swingable to direct the movement of said connections in two directions, a spring to actuate the bail and direct the inoperative movement of the connections; and a universal bar operated by each pin-bar selector to direct the connections into

operative relation with the computing mechanism to type and compute.

12. In a typewriting and computing machine having a traveling carriage, a platen thereon, a computing mechanism including a series of pin-bars, pin-bar selectors actuated seriatim during the travel of the carriage, and numeral-keys operable to type; a normally inoperative computing connection pendent from each numeral-key, and a bail swingable by each carriage-actuated pin-bar selector and operative to direct the movement of the pendants into operative relation with the computing mechanism.

13. In a typewriting and computing machine having a traveling carriage, a platen thereon, a computing mechanism including a series of pin-bars, pin-bar selectors actuated seriatim during the travel of the carriage in a computing zone, and numeral-keys operable to type; a computing connection pendent from each numeral-key, a bail swingable by each carriage-actuated pin-bar selector and operative to direct the movement of the pendants into operative relation with the computing mechanism within the computing zone, and key-actuated means connectible to vibrate the bail and render the pendants, at will, inoperative to compute within the computing zone.

14. In a typewriting and computing machine having a traveling carriage, a platen thereon, a computing mechanism including a series of pin-bars, pin-bar selectors actuated seriatim during the travel of the carriage in a computing zone, and numeral-keys operable to type; a computing connection pendent from each numeral-key, a bail swingable to direct the movement of the pendants into and out of operative relation with the computing mechanism, and means actuated by each pin-bar selector and connectible to the bail.

15. In a typewriting and computing machine having a traveling carriage, a platen thereon, a computing mechanism including a series of pin-bars, pin-bar selectors actuated seriatim during the travel of the carriage in a computing zone, and numeral-keys operable to type; a computing connection pendent from each numeral-key, a bail swingable to direct the movement of the pendants into and out of operative relation with the computing mechanism, and a universal bar vibrated by each pin-bar selector and connectible to vibrate the bail.

16. In a typewriting and computing machine having a traveling carriage, a platen thereon, a computing mechanism including a series of pin-bars, pin-bar selectors actuated seriatim during the travel of the carriage in a computing zone, and numeral-keys operable to type; a computing connection pendent from each numeral-key, a bail swingable to direct the movement of the pendants into and out of operative relation with the computing mechanism to type and compute.

ing mechanism, a universal bar actuated by each pin-bar selector to vibrate and set the bail for a computing interval, and key-actuated connections with the bail operable to vibrate the bail during the computing interval to render the pendants inoperative to compute.

17. In a typewriting and computing machine having a carriage, a platen thereon, a computing mechanism including a series of pin-bars rendered operative by selector-mechanisms actuated seriatim during the travel of the carriage, and key-actuated numeral-typing elements; a normally inoperative computing connection pendent from and depressible with each numeral-key, a bail having perforations to receive the free ends of all of said pendants to determine the direction of their key-depressed movements, and means controlled by each selector-mechanism in conditioning a pin-bar and connectible to said bail to direct the pendants into positions to effect the actuation of the computing mechanism to compute the numeral typed by the keys.

18. In a typewriting and computing machine having a carriage, a platen thereon, a computing mechanism, numeral-keys operable to type and compute, cams operable to prevent the joint depression of two keys to compute, and an interponent pending from each numeral-key, having two stems, one stem to interlock with the cams and the other stem to actuate the computing mechanism; a mechanism operable to swing both stems of each interponent to inoperative positions, to normally disconnect the numeral-keys from the locking cams and from the computing mechanism in typing.

19. In a typewriting and computing machine having a traveling carriage, a platen thereon, a computing mechanism including a series of denomination-selecting jacks rendered operative seriatim by the travel of the carriage, and numeral-keys normally operative to type and normally inoperative to compute; a mechanism rendered operative by the carriage-actuation of each denominational jack to render the numeral-keys operable to type and compute.

20. In a typewriting and computing machine having a traveling carriage, a platen thereon, a computing mechanism including a series of denomination-selecting jacks rendered operative seriatim by the travel of the carriage through a computing zone, and numeral-keys normally operative to type and normally ineffective to compute; a shift-device operatively connected to be actuated by each carriage-driven denomination-selecting jack to establish temporary connections between the numeral-keys and the computing mechanism at each denominational position in the zone.

21. In a typewriting and computing ma-

chine having a carriage, a platen thereon, a computing mechanism, numeral-keys operable to type and compute, cams operable to prevent the joint depression of two keys to compute, and an interponent pending from each numeral-key, having two stems, one stem to interlock with the cams and the other stem to actuate the computing mechanism; a mechanism operable to swing both stems of each interponent to inoperative positions, to normally disconnect the numeral-keys from the locking cams and from the computing mechanism in typing, and a carriage-controlled mechanism effective to automatically swing said interponents into operative positions to type and compute.

22. In a typewriting and computing machine having a traveling carriage, a platen thereon, a case-shiftable mechanism for the platen, a computing mechanism including denomination-selecting devices operable by the travel of the carriage, and numeral-keys normally operative to type numerals and normally inoperative to compute; a shift-device operable by the actuation of the selecting devices during the course of typing numerals to connect the numeral-keys with the computing mechanism to compute, and means rendered operable by the case-shifting of the carriage for typing any character other than a numeral, to restore said selector-shifted shift-device and disconnect the numeral-keys from the computing mechanism to prevent a computation by any numeral-key in typing a non-numeral character.

23. In a typewriting and computing machine having a carriage feedable letter-space distances into and out of a computing zone, numeral-keys, and types operable by said keys at all points in the run of the carriage, the combination of a computing mechanism including denomination-selecting devices effective only in said computing zone, said computing mechanism being normally disconnected from said keys, and mechanism actuated by said denomination-selecting devices for connecting the numeral-keys to said computing mechanism automatically at each letter-space movement of the carriage, but only while the latter is in said computing zone, to enable said typing keys to compute in said zone only.

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