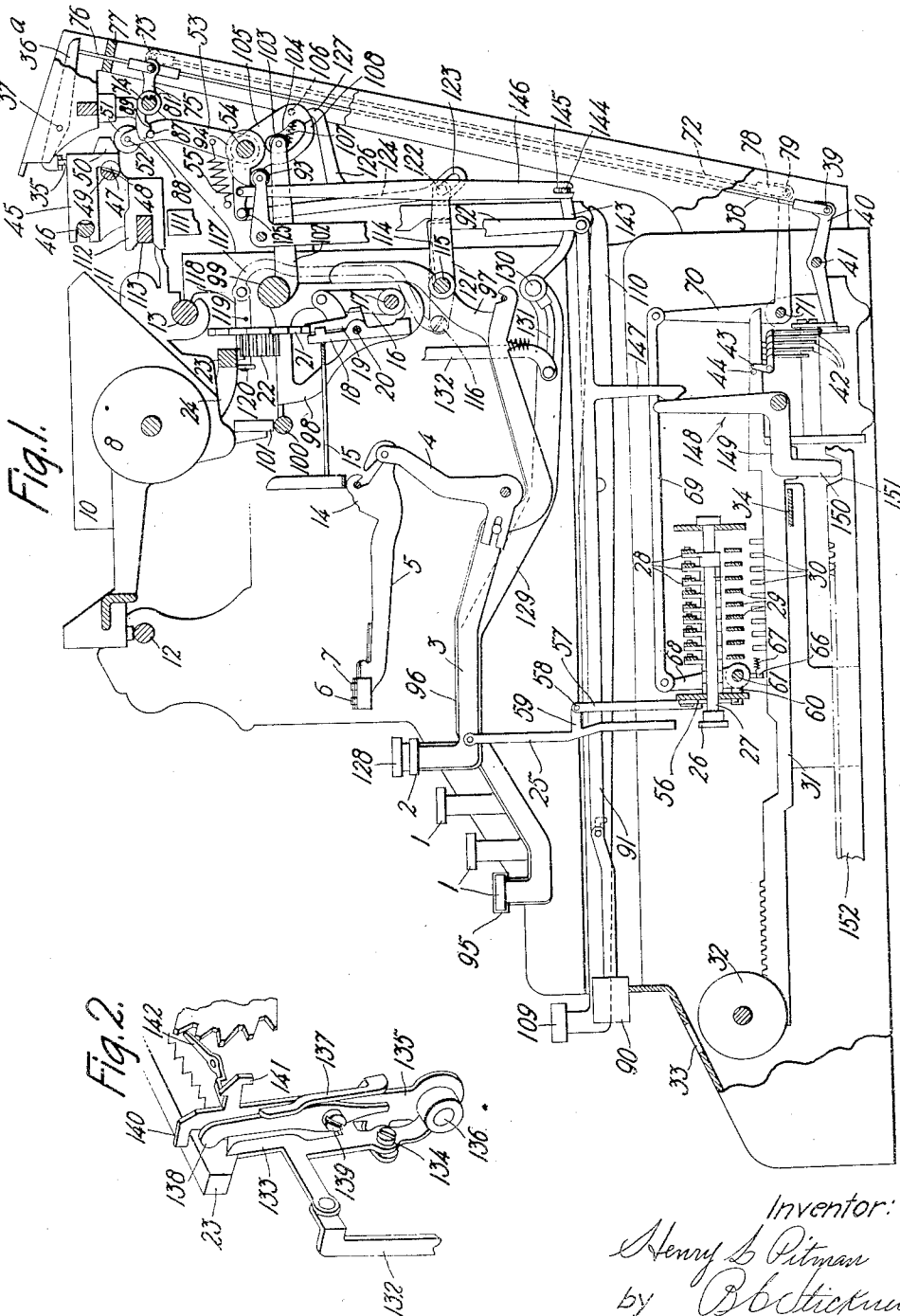


H. L. PITMAN.
 COMBINED TYPEWRITING AND COMPUTING MACHINE.
 APPLICATION FILED JAN. 31, 1919.

1,357,184.

Patented Oct. 26, 1920.

2 SHEETS—SHEET 1.

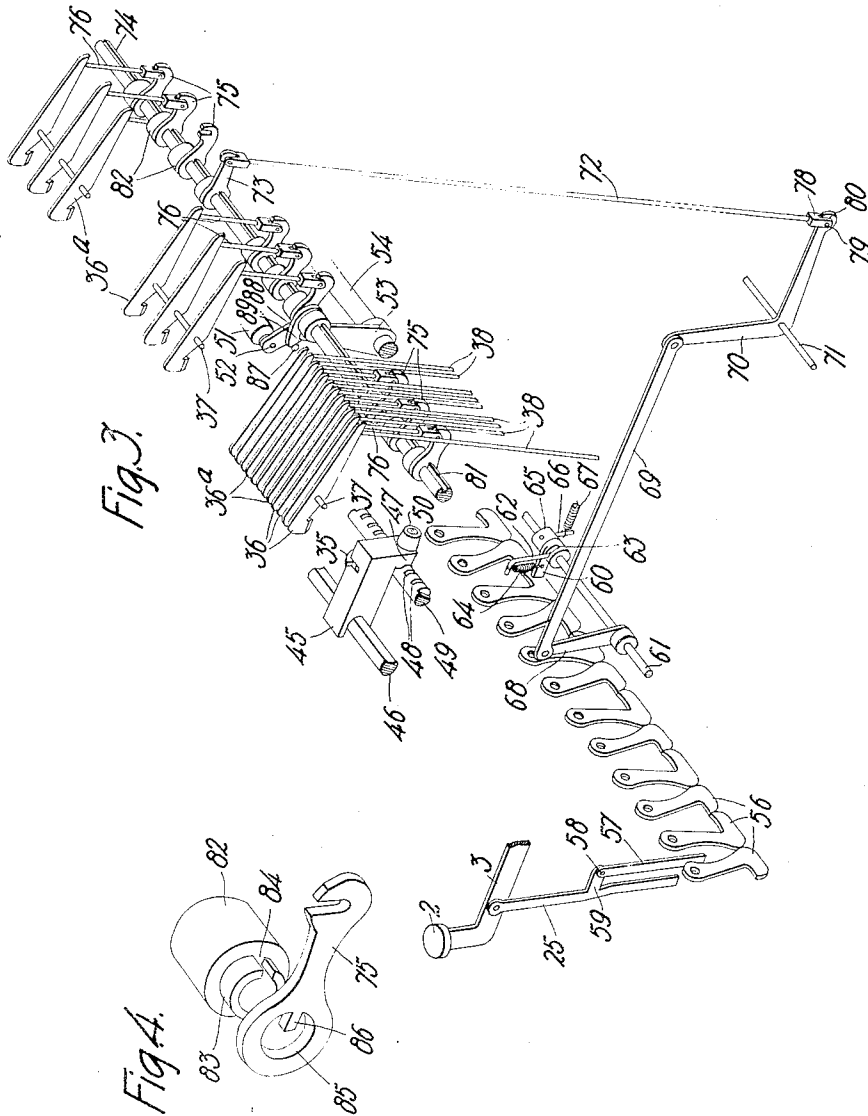


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 by *Robert Pitman*
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UNITED STATES PATENT OFFICE.

HENRY L. PITMAN, OF ELIZABETH, NEW JERSEY, ASSIGNOR TO UNDERWOOD
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COMBINED TYPEWRITING AND COMPUTING MACHINE.

1,357,184.

Specification of Letters Patent. Patented Oct. 26, 1920.

Application filed January 31, 1919. Serial No. 274,167.

To all whom it may concern:

Be it known that I, HENRY L. PITMAN, a citizen of the United States, residing in Elizabeth, in the county of Union and State of New Jersey, 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 shown as applied to a machine of the Underwood-Hanson type.

In machines of the type referred to, numbers are indexed by numeral-key-actuated devices, which set pins in accordance with the numeral keys depressed, on denominational rack bars selected by mechanism actuated by the typewriter carriage. Upon completion of the indexing operation, a general operator is actuated and acts to advance the rack bars in accordance with the pins set thereon, and to run the number, so indexed, into the register or registers. Upon return of the general operator to normal, idle position, the rack bars and the pins thereon are restored to normal position. The selection of the denominational bars is effected, in the mechanism associated with each register, by means of a dog or dogs mounted on the typewriter carriage, so as to engage a series of jacks *seriatim* as the carriage travels through a computing zone. Certain of these jacks act through suitable transposition mechanism to position the denominational bars, so that pins may be set by the numeral-key-actuated devices provided for that purpose. Other jacks are, however, utilized to cause locking of the numeral keys at selected points in the travel of the typewriter carriage. The object of this locking operation is to guard against writing numerals on the work-sheet where commas and periods may be used in punctuating the numbers. The device, by which this result is accomplished, is commonly known as a comma lock or a punctuation lock, and usually comprises devices through which the punctuation jacks act to prevent the depression of any of the numeral keys by controlling the locking device, of which the usual function is to prevent the simultaneous depression of two or more numeral keys.

The main object of my invention is to provide simple and effective means for rendering a numeral-key-locking device effective upon actuation of one or more punctuation jacks, said means having simple and effective connections with a disabling device for rendering the computing means ineffective, whereby, upon actuation of said disabling device, said numeral-key-locking device may be controlled as desired, depending upon the means whereby actuation of said disabling device is effected.

According to my invention, provision is made of a shaft extending transversely of the machine, below and in proximity to the denominational and punctuation jacks. Rocking of said shaft is effected through arms thereon positioned under the punctuation jacks and actuated therefrom by means of short links interposed between said punctuation jacks and said arms. This shaft and the arms thereon may be considered to constitute a device universal to said punctuation jacks. Operative connections between the intruding dog, which renders the numeral-key-lock effective, and said shaft, is obtained by a single line of connections comprising an arm on the shaft carrying the intruding dog, a rearwardly-extending link, a bell-crank in the lower rear part of the machine, and a relatively long upwardly-extending link connected to an arm on the shaft forming a part of said universal device.

Heretofore, there has been at least one arm on the intruding dog shaft for each register or for each computing unit, an equal number of rearwardly-extending links, an equal number of bell-cranks in the lower rear part of the machine, and an equal number of links extending to the upper rear part of the machine. It will be evident that the connections between the upper rear part of the machine and the numeral-key-locking device have been very much simplified. Such simplification is of especial value, because it results in a decrease in the number of parts in the lower and least accessible portion of the machine.

The number of parts in the upper rear part of the machine is greater than in the machines heretofore used, but this condition is more than offset by the facility with which the present construction lends itself

to control by the various devices through which the computing devices are disabled or rendered ineffective.

The usual zone-controlling rollers are carried on arms fixed against rotation relative to a rock shaft on which said arms are mounted. One of these arms is provided with a pin which coöperates with a cam surface on an arm mounted on the shaft of the universal device, so that a certain movement of the zone-controlling rollers to ineffective position will cause the numeral-key-locking device to become effective, and further movement of said zone-controlling roller will cause the release of said locking device. In the machines heretofore used, there is a separate line of connections from the pin on one of the roller-carrying arms to the shaft on which the intruding dog is mounted. It will be seen that the present construction eliminates the last-mentioned line of connections.

The position of the shaft, on which the zone-controlling rollers are mounted, is controlled by various devices heretofore in use.

An advantage of the present arrangement resides in the arrangement of most of the parts, through which the punctuation jacks control the numeral-key-lock, in the upper rear portion of the machine where they are readily accessible and interfere least with the other parts.

Other features and advantages will hereinafter appear.

In the accompanying drawings,

Figure 1 is a vertical section taken from front to rear, with parts broken away to show the underlying structure and with parts omitted for the sake of simplicity.

Fig. 2 is a view showing details of the back-space mechanism.

Fig. 3 is a broken perspective view, showing the connections between the punctuation jacks and the numeral-key-locking means.

Fig. 4 is a view showing details of construction of one of the arms mounted on the shaft through which motion is transmitted from the punctuation jacks to the numeral-key-locking mechanism.

Upon depression of alphabet keys 1 or numeral keys 2, key levers 3 will act through bell-cranks 4, to swing type-bars 5 upwardly and rearwardly to bring upper-case types 6 or lower-case types 7 into printing engagement with a work-sheet supported on platen 8. It will be understood that the upper or lower-case types will be effective in accordance with the position of platen 8. Said platen 8 is rotatably mounted in a platen frame 10, which is supported on carriage 11 in such a manner as to permit shifting movement from lower to upper-case positions. Said carriage 11 is mounted for sliding movement, transverse of the machine, on rods 12 and 13, and is urged to-

ward the left by the usual spring barrel and strap, not shown.

The travel of said carriage 11 is controlled by the usual escapement mechanism. Upon the approach of any type-bar 5 to its printing position, the heel 14 thereon will strike and actuate the usual frame 15 carried by arms 16 mounted on shaft 17, and actuate the usual fixed and loose dogs 18 and 19, respectively, about pivot 20 to permit movement of escapement wheel 21. Connections between escapement wheel 21 and carriage 11 is obtained by means of a pinion 22, connected with escapement wheel 21 and rack 23, usually meshing with pinion 22, but mounted so as to permit withdrawal therefrom by means of arms 24 pivoted on said carriage 11.

In addition to actuating the typewriting mechanism, the numeral keys also serve to control the computing mechanism. To this end, provision is made of pendants or links 25, which, upon depression of the numeral keys, strike arms 26 mounted on rock shafts 27, said rock shafts 27 being nine in number. The movement of said rock shafts 27 is transmitted through arms 28 fixed thereto to pin-depressing links 29, which serve to depress or set suitable pins 30 carried by the usual denominational or rack bars 31, through which the dial wheels 32 of the usual register are actuated. There may be a plurality of registers, and a sight-opening 33 is provided for each of said registers. It will be understood that for each register there will be as many rack bars 31 as there are dial wheels, and that there will be as many sets of rack bars 31 as there are registers. The settable pins 30 are normally positioned slightly to the rear of the corresponding pin-depressing linkages 29, and these linkages are effective only upon pins carried by selected rack bars 31, that is to say, certain rack bars which have been advanced by mechanism to be described hereinafter. It will also be understood that pin-depressing linkages 29 serve to set pins 30 on all of said sets of rack bars.

After the pin-setting operation has been completed, actuation of the usual general operator will cause the cross-bar 34 thereon to engage the lower ends of the depressed pins and effect a corresponding movement of the denominational bars 31 and the associated dial wheels 32. To effect the denominational-selecting action, or that which advances the said rack bars 31 to enable depression of pins 30 thereon, provision is made of dogs or tappets 35, which travel with said carriage and engage *seriatim* the series of jacks, associated with each register, comprising denominational jacks 36 of the denomination-selecting means and punctuation jacks 36^a. Said jacks 36 are pivoted at 37, and, upon movement by said dogs 35, 130

act through links 38, pivoted at 39 to levers 40, which in turn are pivoted at 41 on the frame to actuate the usual transposition linkages 42. From said transposition linkages, motion is transmitted to rack bars 31 by means of small bell-cranks 43 engaging pins 44 on said rack bars 31. It will be seen that in view of the arrangement of linkages 42, the bell-cranks 43 will be spaced not only transversely on the machine, but from front to back. This form of transposition mechanism is more fully described in the patent to Hart 1,287,301, dated December 10, 1918. It will be understood that there is a denominational selecting means of this form for each register.

Said dogs or tappets 35 are mounted in blocks or carriers 45 which are mounted for swinging movement and sliding movement on a rod 46 fixed on the carriage, and are held against movement along said carriage by teeth 47 thereon engaging notches 48 in a notched bar 49, also fixed on said carriage. Said blocks or carriers 45 are provided with the usual slots extending to their ends from the openings through which rod 46 passes, and said rod 46 is provided with the usual flattened surface to permit removal of said blocks 45 therefrom.

While not in computing zones, blocks 45 are usually in depressed position, so as to render dogs or tappets 35 ineffective with respect to jacks 36. Upon entering computing zones, however, frusto-conical rollers 50, carried by said blocks 45, engage rollers 51 having ends of a general conical shape, and said blocks 45 and dogs 35 thereon are lifted into effective position and so held throughout the computing zones. Said rollers 51 are pivotally supported at 52 on arms 53 fixed to a rock shaft 54, and said arms are normally held in position to maintain said rollers 51 in effective position by means of a spring or springs 55 connected to said arms 53 and to a fixed portion of the frame. It will be seen, however, that as the arms 53 are swung to the rear, blocks 45 will be permitted to drop and render dogs or tappets 35 ineffective.

The machine is also provided with a numeral-key-locking device or numeral-key-lock, which comprises pivoted dogs 56 having suitable means to limit their movement and pendants 57 pivotally supported at 58 on brackets 59 carried by said pendants or links 25. It will be understood that intrusion of any one of said pendants 57 between said dogs 56 will prevent intrusion of any other of said pendants and thereby prevent depression of any other numeral keys.

Provision is also made of a punctuation lock which acts in connection with the numeral key lock just described. To this end an intruding member or arm 60 is mounted

on shaft 61, so as to permit relative movement therebetween, and its position on said shaft is controlled by a pin 62, engaging in a slot 63 in a sleeve forming part of said arm 60, and by a spring 64 connecting the upper part of said pin 62 to said arm 60. This connection permits yielding of said arm when said dogs are locked at the time shaft 61 is rocked. To normally position shaft 61, so as to hold arm 60 in depressed position, a collar 65 is fixed to said shaft 61, and a pin 66, extending downwardly from said collar 65, is connected by spring 67 with a fixed part of the frame. To effect a rocking movement of shaft 61, an arm 68 is fixed thereon, and said arm is connected by means of a rearwardly-extending link 69 to a bell-crank 70, carried on a pivot 71 in the lower rear portion of the machine, and a long link 72 to an arm 73 in the upper part of the machine.

Said arm 73 is fixed on a shaft 74, which is located below and in proximity to said punctuation jacks 36^a, and is provided with arms 75, which support short links 76 guided for longitudinal movement in a guide plate 77.

Said link 72 is provided at its lower end with a yoke 78 carrying a pin 79, which engages in a slot 80 in a rearwardly-extending arm of said bell-crank 70, and said link 72 has a corresponding connection with the arm 73 at the upper end thereof. Said short links 76 have similar connections with arms 75.

Preferably, arms 75 are constructed as shown in Fig. 4, and cooperate with said shaft 74 to prevent rotation thereon in the following manner. The shaft 74 is provided with a slot 81 extending longitudinally thereof, thus adapting it for use with an arm having a tongue extending into said groove. In its preferred form, each of said arms 75 is provided with a collar 82 suitably fitted on said shaft 74, and said collar is provided with a reduced portion 83 of a suitable size to fit into an opening 85 in the main part of said arm 75, which is so shaped that it can be readily stamped out of sheet-metal, as shown. The stamped-out portion of arm 75 is so shaped as to provide a tongue, which is placed in a notch 84 in said reduced portion 83, and in placing said arm 75 on said shaft 74, the tongue 86 is placed in groove 81 and the arm is thus held against rotation on the shaft, and longitudinal movement on said shaft is permitted. It will be understood that the construction of arm 73 is substantially the same as that of arms 75. The two parts of arm 75, shown in Fig. 4, may be secured together in any desired manner, and, if desired, collar 82 may be secured to shaft 74 to prevent movement along said shaft. The construction of said

shaft 74 and the arms thereon is such as to facilitate adjustment in accordance with different requirements for punctuation.

The computing mechanism may be silenced or rendered ineffective by withdrawing zone-controlling rollers 51 from the positions in which they render tappets 35 effective, such withdrawal being effected by rocking shaft 54, by means described hereinafter, and thereby swinging arms 53 to the rear. Such swinging movement of arms 53 is utilized to control the punctuation lock. To this end, provision is made of a pin 87 on one of said arms 53 normally in engagement with the under side of an arm 88 carried by the shaft 74 and fixed against rotation relative thereto. It will be seen that movement of pin 87 to a position under the cam projection or hump 89 on arm 88 will serve to rock said shaft 54 and effect locking of the numeral keys, and that further movement of pin 87 will render said punctuation lock ineffective. It will also be seen that spring 67 tends to hold the various parts of the punctuation-locking means in normal position. Other springs may be provided.

When it is desired to render tappets or dogs 35 ineffective in passing through a computing zone, use is made of a non-compute key 90, which, upon depression, acts through a link 91, bell-crank 92 and a roller 93 on said bell-crank to move an arm 94 fixed on rock-shaft 54, and thereby effect swinging movement of arms 53 sufficient to disable the computing mechanism and to carry pin 87 under and past said hump or projection 89. It will be evident that during the movement of pin 87 from one position to the other, the keys will be locked, but at the end of such movement, the keys will be released, thus permitting actuation of said keys when the computing mechanism is disabled by means of the non-compute key. Any suitable means may be utilized to retain said non-compute key in depressed position. Also, there may be a link 91 and a bell-crank 92 at each side of the machine.

To effect case-shift action, use is made of a shift key 95, which, when depressed, acts through key lever 96 and an upright arm 97 on said key lever to swing a case-shift frame 98 about a shaft 99, thereby lifting shift rail 100 and the platen frame 10, by means of the roller 101 pivotally connected to said platen frame and resting on said shift rail 100. Extending rearwardly from shaft 99 is an arm 102, carrying a roller 103, normally in engagement with a hump or projection 104 on an arm 105 loosely mounted on shaft 54. A pin 106 on said arm 105 is connected by spring 107 to an arm 108 fixed on said shaft 54. Said arm 108 has a concave edge opposite said hump 104, and the two arms 105 and 108 provide what is in effect a cam slot therebetween. It will be

seen that movement of the shift frame to carry the platen to upper-case position will cause said roller 103 to act on the concave surface of arm 108 and rock said shaft 54 sufficiently to carry pin 87 to the right of hump 89, as the parts are shown in Fig. 1. Upon return of the platen to lower-case position, roller 103 will act upon the hump or projection 104 and tend to restore shaft 54 to normal position, thus acting so as to assist spring 55.

To provide for rapid movement of said typewriter carriage 11 from one position to another, provision is made of tabulating mechanism including a tabulating key 109, which, upon depression, acts through key lever 110 to lift the plunger 111 in position to cooperate with a tabulator stop 112 mounted on a rack bar 113 secured to said carriage 11. The lifting of any of said plungers 111 will, however, act through a universal arm 114 to rock shaft 115, and such rocking movement of shaft 115 effects, through arm 116 and link 117, a rocking of lever 118 pivoted at 119, said lever 118 carrying at its lower end a roller 120 underlying rack 23, which is supported for swinging movement on the typewriter carriage 11. It will be seen that such movement of lever 118 will cause roller 120 to lift rack 23 out of engagement with pinion 22, thus releasing the carriage from the control by the escapement mechanism. Fixed on shaft 115 is a rearwardly-extending arm 121 carrying at its extremity a pin 122, which projects into an inclined slot 123 of a link 124 pivoted to an arm 125, which is integral with said arm 108 fixed on said shaft 54. It will be understood that the movement of said arm 125, due to the tabulating mechanism, is sufficient merely to place pin 87 under the projection or hump 89 on arm 88, therefore, effecting locking of the punctuation lock during the depression of any tabulator key.

The link 124 is provided with a rearwardly-extending stop arm 126 having a lug 127 at its extremity, said lug being moved under certain conditions to a position to engage pin 106 on arm 105 to prevent forward movement of said arm when the case-shift mechanism is operated. When the non-compute key is operated, link 124 is lifted until the lower end of slot 123 embraces pin 122, which has not been moved, thus throwing the lower end of link 124 to the left (Fig. 1), and the combined movements of link 124 are such as to place lug 127 in position to engage pin 106, and thereby prevent movement of arm 105 when arm 102 is swung downwardly, due to actuation of the case-shift mechanism.

The back-spacing movement of the typewriter carriage is effected by means of a back-space key 128, which, upon depression, acts through a key lever 129, shaft 130 and

arm 131, fixed on said shaft to move a link 132, said link 132 being connected to a pawl 133 pivoted at 134 on an arm 135, mounted on a fixed pivot 136. Said pawl 133 is provided with a portion extending around arm 135 to limit the movement in one direction of said pawl 133, and furnishes a spring 137, which acts on a lever 138 pivoted at 139 on arm 135 to normally swing pawl 133 and the associated parts out of effective engagement with said rack 23, which co-operates with the escapement mechanism. Said link 132 is normally held in elevated position by spring means, not shown, and depression of said link 132 will act first to swing arm 135 toward rack 23 to bring pawl 133 into engagement with a tooth of said rack, and then to swing said pawl 133 about pivot 134 to give the desired movement to the typewriter carriage. The arm 135 is also provided with a lug 140 to overlie rack 23 during the operation of the back spacer to prevent lifting of said rack 23. When arm 135 is swung toward rack 23, a projection 141 thereon serves to shift a lever 142 into position to prevent backward movement of the usual escapement wheel 21.

Said shaft 130 also has fixed thereto a rearwardly-extending arm 143 carrying a pin 144 engaging in slot 145 of a link 146, connected to said arm 125 at a point intermediate of its ends. It will be understood that the pin-and-slot connection, at the lower end of said link 146, enables link 146 to be lifted without interfering with the back-space mechanism, and also enables a provision for lost movement to prevent too great actuation of arm 125. The extent of movement of pin 87, due to the back-space mechanism, is insufficient to carry pin 87 farther than the position under said projection or hump 89, and it is evident, therefore, that the punctuation lock will be effective from the beginning of the depression of the back-space key until its return to normal position.

The various means, just described, for actuating shaft 54, are, in general, the same as those disclosed in the patent to Gumprecht, No. 1,268,565, dated June 4, 1918.

Provision is also made of a device to rock shaft 54 to disable the computing mechanism and to render the punctuation lock effective during the operation of the general operator. This mechanism is, in general, the same as that disclosed in the patent to Gumprecht, No. 1,237,895, dated August 21, 1917.

A link 91 is provided with a downwardly-extending arm 147, which is positioned to be engaged by a bell-crank 148 pivoted on a fixed part of the frame. The horizontal arm 149 of said bell-crank 148 is provided with a downward projection 150, which extends into a notch 151 on a rack bar 152,

forming part of the general operator. Upon actuation of the general operator, the downward projection 150 of bell-crank 148 will ride out of notch 151, and act through the various connections to disable the computing mechanism and to move pin 87 under projection 89 on arm 88, thus effecting a locking of the punctuation lock. It will be seen that this condition will be maintained until the completion of the return stroke of a general operator.

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 computing machine, the combination with numeral keys, a traveling carriage, and a selector-dog secured thereto, of a series of denominational jacks, punctuation-jacks positioned in certain intervals between denominational jacks, the free ends of jacks of both sets lying in the path of said selector-dog, a transverse shaft adjacent to said jacks, arms fixed on said shaft, thrust links interposed between said arms and said punctuation-jacks, a guide for the upper ends of said thrust links, an additional arm mounted on said shaft, a numeral-key lock, and connections between said additional arm and said lock, whereby movement of said additional arm from its normal position will render said lock effective.

2. In a computing machine, the combination with numeral keys, a traveling carriage, and selector-dogs secured thereto, of a plurality of groups of jacks positioned in the paths of said dogs, each of said groups comprising denominational jacks and punctuation-jacks, a shaft adjacent to said jacks and operatively connected with said punctuation-jacks, a single controlling member on said shaft, a numeral-key lock, and connections between said controlling member and said lock, whereby said lock will be rendered effective upon rocking of said shaft by any of said punctuation-jacks.

3. In a computing machine, the combination with numeral keys, a traveling carriage, and selector-dogs mounted on said carriage to travel therewith, but to permit movement to and from an operative position, of a set of jacks with their forward ends in position to be engaged by said dogs when in operative position, certain of said jacks being punctuation-jacks, a shaft mounted adjacent said set of jacks, arms fixed on said shaft under the rearward ends of said punctuation-jacks, thrust links interposed between said punctuation-jacks and the corresponding arms on said shaft, a numeral-key lock, means to make said lock effective upon rocking of said shaft by said punctuation-jacks, a support to maintain said selector-dogs in operative position, and means to move said support to

ineffective position and concomitantly rock said shaft and render said lock effective.

4. In a computing machine, the combination with numeral keys, a traveling carriage
5 and selector-dogs mounted to travel therewith but normally in ineffective position, of a set of jacks including punctuation-jacks in the path of said dogs when the dogs are in effective position, a rockable device to render
10 said dogs effective in computing zones, a device universal to said punctuation-jacks, including a shaft mounted immediately beneath said jacks, a numeral-key lock, actuating means therefor, including a bell crank,
15 mounted in the lower part of the machine at its rear, a short arm on said shaft, and a link connecting said short arm and said bell crank.

5. In a computing machine, the combination with numeral keys, a traveling carriage
20 and selector-dogs mounted to travel therewith but normally in ineffective position, of a set of jacks including punctuation-jacks in the path of said dogs when the dogs are in effective position, a rockable device to render
25 said dogs effective in computing zones, a device universal to said punctuation-jacks, including a shaft mounted immediately beneath said jacks, a numeral-key lock, actuating means therefor, including a bell crank,
30 mounted in the lower part of the machine at its rear, a short arm on said shaft, a link connecting said short arm and said bell crank, and operative connections between said rock-
35 able device and said shaft, whereby a movement of said rockable device to render said dogs ineffective in the computing zones will rock said shaft and operate said lock, and further movement will release said shaft and
40 render said lock ineffective.

6. In a combined typewriting and computing machine, the combination with numeral keys, a traveling carriage mounted on the upper part of the machine, and selector-
45 dogs mounted on said carriage to travel therewith, of a series of denominational jacks and punctuation-jacks, transportation devices including denominational levers mounted in the lower part of the machine, a
50 numeral-key-locking device including a controlling lever mounted in the lower part of the machine, a shaft adjacent said jacks, arms on said shaft corresponding to said punctuation-jacks, short links connecting
55 said punctuation-jacks with the corresponding arms, an additional arm on said shaft, a long link connecting said additional arm with said controlling lever, and long links connecting said denominational jacks with
60 the respective denominational levers.

7. In a combined typewriting and computing machine, the combination with numeral keys, a traveling carriage and a numeral-key-controlled feeding means for said
65 carriage, of pendent links connected to said

numeral keys, a series of movable members below said links, means to so limit the movement of said movable members that intrusion of one of said links due to depression of a numeral key will crowd said
70 members together and lock the remaining numeral keys against depression, an additional intruding member to act on said members to lock all of said numeral keys, a single line of connections for controlling
75 said additional intruding member, including a link extending substantially from the bottom to the top of the machine, a transverse shaft in the upper part of the machine to which said last-mentioned link is
80 connected by means of a short arm fixed on said shaft, a selector-dog on said carriage, punctuation-jacks, and connections whereby actuation of any of said punctuation-jacks will effect rocking of said shaft and
85 thereby actuate said single line of connections to effect locking of said numeral keys.

8. In a combined typewriting and computing machine, the combination with numeral keys, locking dogs connected to said
90 keys, and a lock made effective by the intrusion of one of said locking dogs, due to depression of the corresponding key, to lock the other numeral keys, of an intruding member to render said lock effective to prevent
95 depression of any of said numeral keys, a lever mounted in the lower part of the machine at the rear and connected to said intruding member, a series of punctuation-jacks, a device universal to said
100 punctuation-jacks mounted in the upper part of the machine, and a single link connecting said lever with said universal device.

9. In a computing machine, the combination with numeral keys and a numeral-key
105 lock, of denominational jacks and punctuation-jacks arranged in order in the upper part of the machine, means to actuate said jacks *seriatim*, a device universal to said
110 punctuation-jacks arranged in the upper part of the machine, a lever in the lower part of the machine connected to said lock to render the same effective, and a link forming the sole connection between said
115 universal device and said lever.

10. In a computing machine, the combination with numeral keys and a numeral-key
120 lock, of denominational jacks and punctuation-jacks arranged in order in the upper part of the machine, means to actuate said jacks *seriatim*, a device universal to said punctuation-jacks arranged in the upper part of the machine, a lever in the
125 lower part of the machine connected to said lock to render the same effective, a link forming the sole connection between said universal device and said lever, a disabling device for said jack-actuating means, and
130 connections between said disabling device

and said universal device, whereby a certain movement of said disabling device will render said jack-actuating means ineffective and actuate said universal device to render said numeral-key lock effective by means of said link.

11. In a computing machine, the combination with numeral keys and a numeral-key lock, of denominational jacks and punctuation-jacks arranged in order in the upper part of the machine, means to actuate said jacks *seriatim*, a device universal to said punctuation-jacks arranged in the upper part of the machine, a lever in the lower part of the machine connected to said lock to render the same effective, a link forming the sole connection between said universal device and said lever, and means to disable said jack-actuating means and actuate said link to render said lock effective.

12. In a computing machine, the combination with numeral keys and a numeral-key lock, of denominational jacks and punctuation-jacks arranged in order in the upper part of the machine, means to actuate said jacks *seriatim*, a device universal to said punctuation-jacks arranged in the upper part of the machine, a lever in the lower part of the machine connected to said lock to render the same effective, a link forming the sole connection between said universal device and said lever, and tabulator-key-actuated means to disable said jack-actuating means and actuate said link to render said lock effective.

13. In a computing machine, the combination with numeral keys and a numeral-key lock, of denominational jacks and punctuation-jacks arranged in order in the upper part of the machine, means to actuate said jacks *seriatim*, a device universal to said punctuation-jacks arranged in the upper part of the machine, a lever in the lower part of the machine connected to said lock to render the same effective, a link forming the sole connection between said universal device and said lever, and back-spacer-actuated means to disable said jack-actuating means and render said lock effective by means of said link.

14. In a computing machine, the combination with numeral keys and a numeral-key lock, of denominational jacks and punctuation-jacks arranged in order in the upper part of the machine, means to actuate said jacks *seriatim*, a device universal to said punctuation-jacks arranged in the upper part of the machine, a lever in the lower part of the machine connected to said lock to render the same effective, a link forming the sole connection between said universal device and said lever, and case-shift-actuated devices to disable said jack-

actuating means and concomitantly effect a locking and an unlocking of said numeral-key lock.

15. In a computing machine, the combination with numeral keys and a numeral-key lock, of denominational jacks and punctuation-jacks arranged in order in the upper part of the machine, means to actuate said jacks *seriatim*, a device universal to said punctuation-jacks arranged in the upper part of the machine, a lever in the lower part of the machine connected to said lock to render the same effective, a link forming the sole connection between said universal device and said lever, and general-operator-actuated devices to disable said jack-actuating means and concomitantly effect a locking of said numeral-key lock.

16. In a combined typewriting and computing machine, the combination with numeral keys, a traveling carriage, a selecting dog traveling with said carriage, denominational jacks, and punctuation-jacks positioned between said denominational jacks at selected positions, all of said jacks being positioned to be engaged *seriatim* by said dog, of a transverse shaft adjacent said jacks, arms corresponding to said punctuation-jacks fixed against rotation on said shaft, plungers interposed between said arms and the corresponding punctuation-jacks, an additional arm fixed to said shaft, a bell-crank pivoted in the lower part of the machine, a link pivotally connected to said additional arm and one arm of said bell-crank, a locking dog having connections with the other arm of said bell-crank, and a numeral-key lock adapted to be made effective by said locking dog.

17. In a combined typewriting and computing machine, the combination with numeral keys and a traveling carriage, of numeral-key-controlled computing mechanism comprising a carriage-actuated denomination-selecting and punctuation-locking means, including a selector dog traveling with said carriage, and a series of denominational and punctuation-members positioned to be engaged by said dog *seriatim*, a device universal to said punctuation-members and in proximity thereto, a numeral-key lock including an intruding member to render it effective, and a single line of transmission from said universal device to said intruding member.

18. In a computing machine, the combination with numeral keys and a numeral-key lock in the lower part of the machine, of denominational jacks and punctuation-jacks arranged in order in the upper part of the machine, means to actuate said jacks *seriatim*, a device universal to said punctuation-jacks positioned in the upper part of the machine, and a single line of transmission

whereby movement of said universal device by said punctuation-jacks will render said lock effective.

19. In a computing machine, the combination with numeral keys and a numeral-key lock, below said keys, of denominational jacks and punctuation-jacks arranged in order in the upper part of the machine, means to actuate said jacks *seriatim*, a device universal to said punctuation-jacks to be actuated thereby, situated in proximity to said jacks, a member cooperating with said lock to render it effective, and a single line of transmission whereby actuation of said universal device will actuate said member to render said lock effective.

20. The combination with typewriting mechanism comprising a traveling carriage and keys, including numeral keys, of a numeral-key lock, a plurality of punctuation-jacks arranged in accordance with the punctuation desired in typewriting certain columns, a jack-actuating dog, controlling means to render said dog effective while typewriting in said columns, a device universal to said punctuation-jacks to be actuated thereby, a single line of transmission between said universal device and said lock whereby the latter may be rendered effective by the former, disabling means to render said controlling means ineffective, and connections between said controlling means and said universal device whereby said disabling means may determine the effectiveness of said lock.

21. The combination with typewriting mechanism including numeral keys and a traveling carriage, of punctuation-jacks mounted adjacent to the carriage, a dog mounted to move with said carriage and actuate said punctuation jacks, a member parallel and in proximity to the path of said dog, means whereby actuation of any of said jacks will actuate said member, a numeral-key lock, and a single line of connections between said member and said numeral-key lock, whereby actuation of the former will render the latter effective.

22. In a combined typewriting and computing machine, the combination with a traveling carriage and numeral keys, of denominational jacks, punctuation-jacks, a selecting dog connected with said carriage to travel therewith and engage said jacks *seriatim*, a shaft, arms on said shaft corresponding to said punctuation-jacks, the connections between said shaft and said arms being such as to cause said shaft and said arms to rotate together, but to permit said arms to be moved along said shaft, means whereby actuation of any of said punctuation-jacks will cause actuation of the corresponding arm, a numeral-key lock, and a single train of connections whereby actuation of said shaft will render said numeral-key lock effective,

HENRY L. PITMAN.

Witnesses:

EDITH B. LIBBEY,
JENNIE P. THORNE.