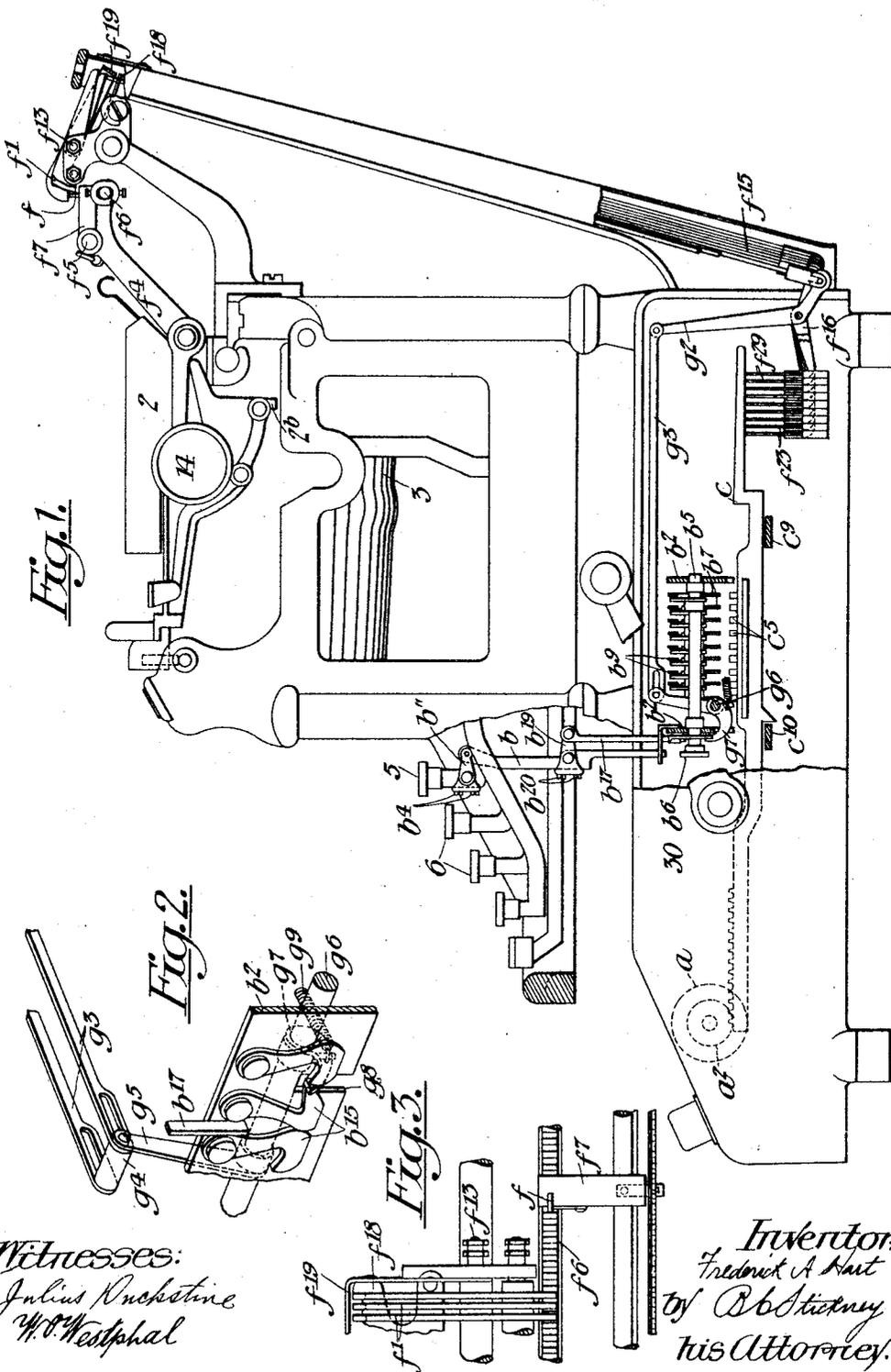


F. A. HART.  
 COMBINED TYPE WRITING AND COMPUTING MACHINE.  
 APPLICATION FILED APR. 28, 1914.

1,188,933.

Patented June 27, 1916.  
 3 SHEETS—SHEET 1.



Witnesses:  
 Julius Ruckstine  
 W. Westphal

Inventor:  
 Fredrick A Hart  
 by Ab Steiny  
 his Attorney.

1,188,933.

Patented June 27, 1916.

3 SHEETS—SHEET 2.

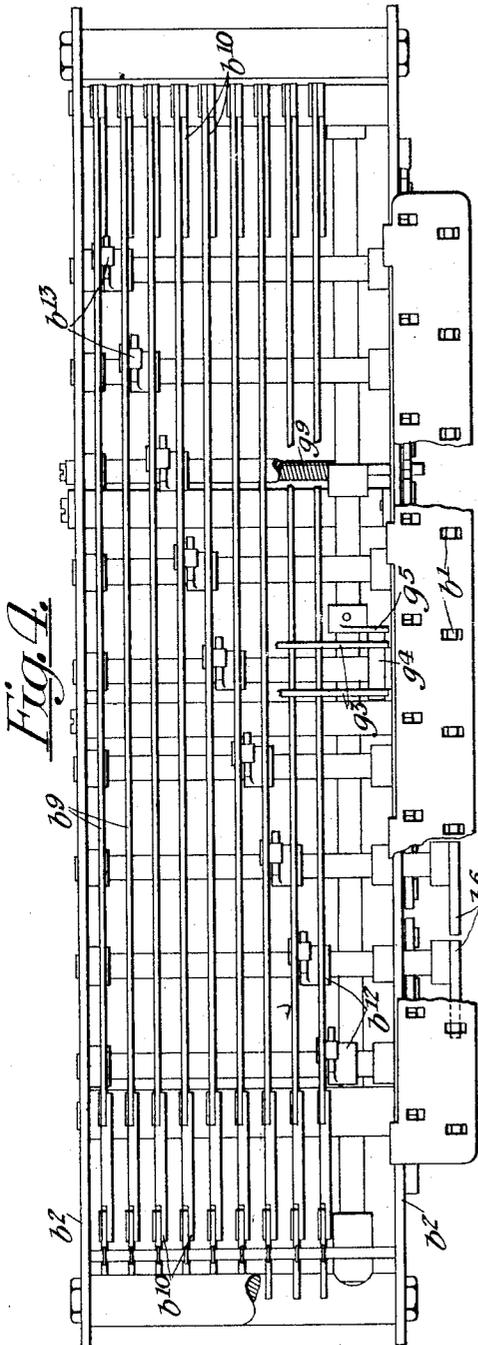


Fig. 4.

Witnesses:-  
 Julius Ruckelshaus  
 W. S. Westphal

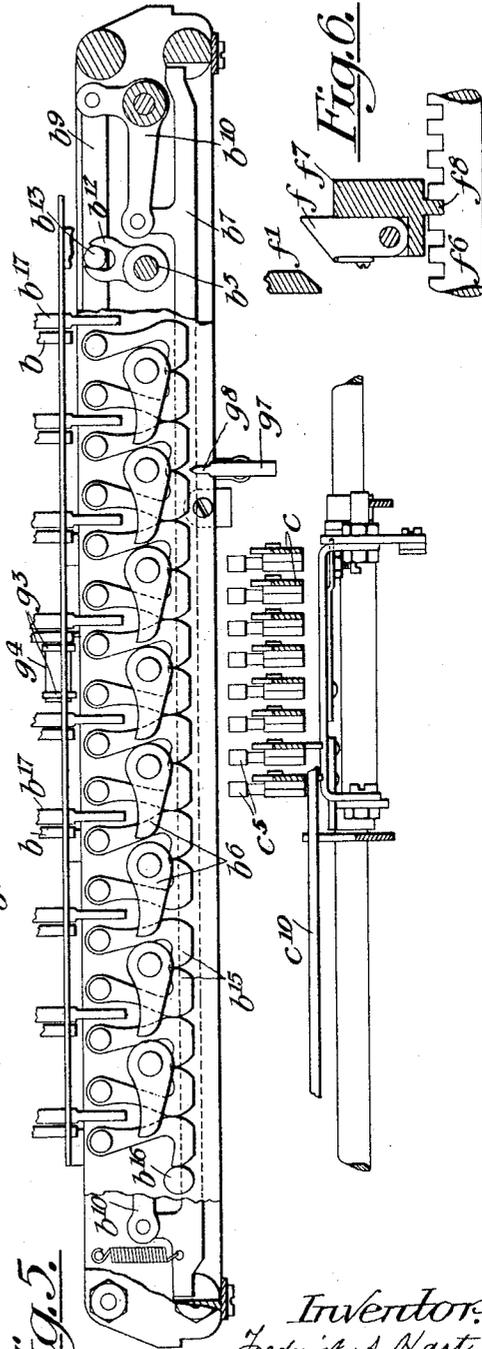


Fig. 5.

Inventor:  
 Frederick A. Hart  
 by O. B. Beckwith  
 his Attorney

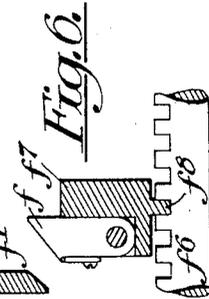


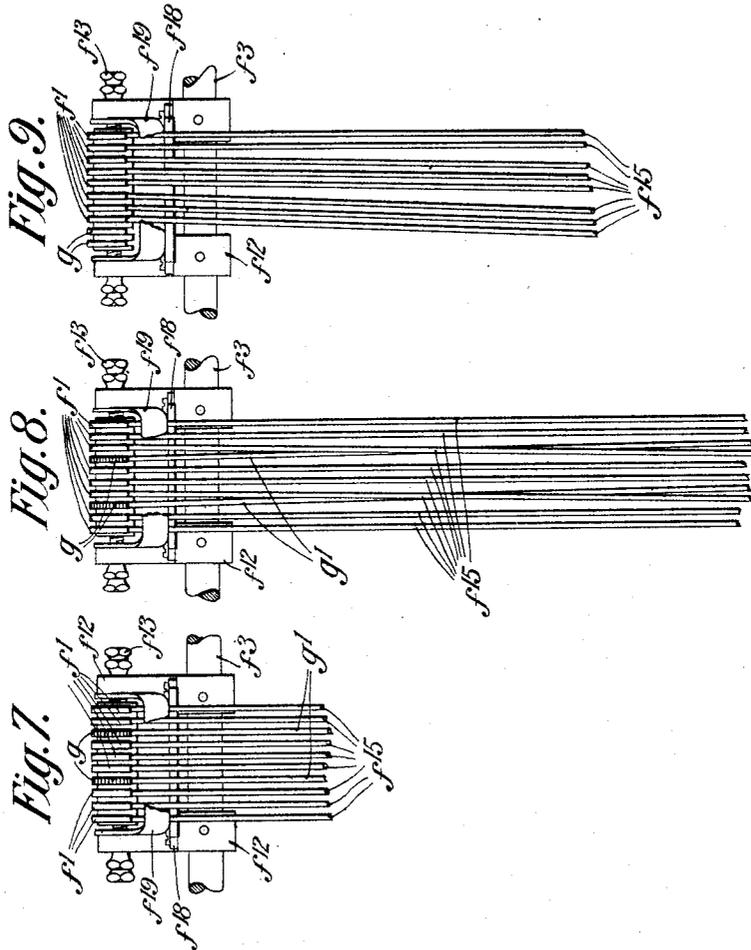
Fig. 6.

F. A. HART.  
COMBINED TYPE WRITING AND COMPUTING MACHINE.  
APPLICATION FILED APR. 28, 1914.

1,188,933.

Patented June 27, 1916.

3 SHEETS—SHEET 3.



WITNESSES:

*Arthur A. Johnson*  
*Julius Ruckstein*

INVENTOR:

*Frederick A. Hart*

BY

*B. B. Stickney*

ATTORNEY.

# UNITED STATES PATENT OFFICE.

FREDERICK A. HART, OF NEWARK, NEW JERSEY, ASSIGNOR, BY MESNE ASSIGNMENTS, TO UNDERWOOD COMPUTING MACHINE COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

## COMBINED TYPE-WRITING AND COMPUTING MACHINE.

1,188,933.

Specification of Letters Patent. Patented June 27, 1916.

Original application filed December 10, 1908, Serial No. 466,836. Divided and this application filed April 28, 1914. Serial No. 834,880.

*To all whom it may concern:*

Be it known that I, FREDERICK A. HART, a citizen of the United States, residing in Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Combined Type-Writing and Computing Machines, of which the following is a specification.

My invention relates to computing machines, and is herein described as applied to a combined typewriting and computing machine of the type disclosed and broadly claimed in the United States patent to Hans Hanson, No. 816,319, dated March 27, 1906; wherein is shown a typewriter of the usual platen carriage form, in which the numeral keys are adapted to set up pins on computation or rack bars, the pins set up corresponding to the digits written, and when a number is completely written, the pins thus set up are caused to drive the rack bars, thereby turning the computing wheels each to an extent depending on the pin set up on its bar.

According to my invention, the rack bars, as in the Hanson patent aforesaid, normally stand in a position where they hold their pins clear of pin-setting bars operated by the numeral keys of the typewriter. As the typewriter carriage travels along, it moves said pins or bars, one at a time, within the range of the pin-setting bars, such motion being effected by a dog which is settable along the typewriter carriage. For accomplishing this, the dog is arranged to pass under a series of jacks which it lifts, one at a time, and said jacks are connected by suitable levers to bring the pin bars with their pins within range of the pin-setting bars as above described. Certain of these jacks and their connected links, according to my invention, may be utilized for locking the numeral keys of the typewriter against operation at selected points in the travel of the typewriter carriage. This locking operation usually takes place when pointing off either with commas or with a period, to show the decimal place or to point off thousands, etc., and the device by means of which it is accomplished is commonly known as a comma lock. For thus

locking the numeral keys, I may utilize a device which is also effective to prevent a simultaneous depression of two or more keys. Such prevention of simultaneous depression is usually accomplished by providing a series of members having a limited throw, between which members each numeral key may thrust a dog attached thereto. Any dog when between said members will take up all the lost motion between said members due to the limited throw which they have, and thus close the path against every other dog. I find it convenient to provide my machine with a similar dog which is operated by one or more of said jacks, with the result that when said jack-operated dog is effective, no numeral key can enter its dog between the aforesaid members, and therefore, every one of such keys is locked against operation.

This application is a division of my application, No. 466,836, filed December 10, 1908.

Other features and advantages will hereinafter appear.

In the accompanying drawings, Figure 1 is a side view partly in section of a combined Underwood-Hanson typewriting machine of the kind referred to above. Fig. 2 is a fragmentary perspective view showing the comma locking dog and some adjacent parts. Fig. 3 is a plan view showing certain of the jacks, the dog for operating them, and some adjacent parts. Fig. 4 is a plan view of the pin-setting linkages. Fig. 5 is a front view of the pin-setting linkage frame showing the key-locking members, pin bars, and some other associated parts. Fig. 6 is a sectional front view showing a denomination dog and a jack. Figs. 7, 8 and 9 are details in rear elevation, showing parts of the decimal order selecting mechanism and of the punctuation-space key-locking mechanism, and illustrating the different adjustments of the latter.

In the Underwood typewriting machine, numeral keys 5 and alphabet keys 6 depress their key levers to cause type-bars 3 to swing upwardly and rearwardly against the platen 14, rotatably mounted on the usual traveling carriage 2. Said carriage is fed

along by the usual escapement devices at each key stroke, said devices including the rack bar 2<sup>b</sup>. As the typewriter carriage travels along, it carries a dog  $f$  mounted thereon, beneath a series of jacks  $f^1$  so that it raises said jacks one at a time, and when in the computing zone, said dog always holds one of said jacks elevated when the carriage is at rest. The dog  $f$  is pivotally mounted on a carrier or block  $f^7$ , which block is pivotally mounted on a bar or rod  $f^5$ , and when thrown down to effective position, rests on a rack bar  $f^6$ . A tooth  $f^8$  on the block engages between the teeth of said rack bar and holds the dog against sliding as the typewriter carriage travels along. The dog  $f$  as seen in Fig. 6 is cam faced to cooperate with cam faces on the jacks  $f^1$  to lift them. The dog is normally held in effective position by a spring, and may swing on its pivot beneath the jacks on the return of the carriage to begin a new line. The bars  $f^5$  and  $f^6$  are carried on suitable brackets  $f^4$  fast on the typewriter carriage. When the dog  $f$  lifts any one of the jacks  $f^1$ , it, through connections described below, shifts or displaces the computation member  $c$  forming part of the computing mechanism, so as to bring settable pins  $c^5$  thereon, within the range of cooperative pin-setting linkages  $b^7$ . These linkages normally stand clear of the pins  $c^5$  on the computation bars  $c$  even when said bars are shifted or displaced. When, however, any numeral key 5 is depressed, said key, through connections hereinafter described, thrusts down a pin-setting bar  $b^7$  which is connected thereto, and causes the corresponding pin  $c^5$  on the shifted or displaced computation member  $c$  to be depressed.

As will be observed, there are nine pins on each of the computation bars  $c$ , each pin corresponding to one of the numeral keys representing the digit printed by that key. As the numeral keys are depressed in succession in writing a number in the adding zone, the computation members  $c$  are displaced one after another, so that on each one a pin is set corresponding to the numeral key operated at the moment. Each member  $c$  represents, therefore, a decimal order, and the dog  $f$  is a denomination or decimal order selector. When a number has been completely written, the numbers represented by the pins set are carried into register or computing wheels  $a$  forming a register at the front of the computing case 30, there being one computing wheel for each computation member  $c$ , and the depressed pins  $c^5$  determining how far the computing wheels are turned. The pins and their bars, therefore, form an indexing device for the computing wheels. For thus turning the computing wheels, the mechanism is provided with a computing operat-

ing carriage or general operator, which after a number has been completely set up, is caused to move forward, and carry the cross bar  $c^9$  forming part of the general operator against the depressed pins  $c^5$ , with the result that each computation member  $c$  is driven to an extent determined by the pins depressed thereon. As the computation members  $c$  are thus driven forward, they turn the computing or adding wheels  $a$  by means of rack-bars formed on the forward ends of said computation members, said rack bars engaging pinions  $a^2$  connected to the computing wheels  $a$ . When the wheels have been turned to the full extent, the general operator is moved backwardly, and a cross bar  $c^{10}$  forming part of said general operator carries the computation members  $c$  back to their normal position, without however, turning the adding wheels  $a$  because of pawl and ratchet connections not shown, between the pinions  $a^2$  and the computing wheels  $a$ . The computing mechanism also includes the usual carry-over devices shown in the Hanson patent aforesaid; but which are omitted from the present application for the sake of clearness. The connections between the jacks  $f^1$  and the computation bars  $c$  include a series of links or rods  $f^{15}$  on which the rear ends of jacks  $f^1$  normally rest; said links extending to the computing case at the bottom of the machine where their split open ends are equipped with pins, which rest in notches in the rear ends of levers  $f^{16}$ . These levers are of varying lengths, so that each one may operate a single transposition linkage  $f^{23}$ , there being one of said linkages for each of the levers  $f^{16}$ , as best shown in Fig. 1. Each linkage includes a lug  $f^{29}$  lying under its computation bar  $c$ , and the arrangement of levers, linkages and lugs is such that when any rod  $f^{15}$  is depressed the front end of its lever  $f^{16}$  will move the corresponding linkage  $f^{23}$ , so that the lug  $f^{29}$  thereon will displace the corresponding computation member  $c$  in an upward direction. The rods  $f^{15}$  are held at their tops between a comb  $f^{18}$  having notches, one for each of the rods  $f^{15}$ , and a bail  $f^{19}$ , which is pivoted on the rod  $f^{13}$  on which the jacks themselves are pivoted. This connection permits the bail  $f^{19}$  to normally hold the rods  $f^{15}$  in place in the notches in the comb, but enables it to be swung upward clear of the rods  $f^{15}$ , so that said rods can be interchanged if desired. One particular advantage of this interchange is that it enables my comma-locking device to be easily altered for different kinds of computation. The construction of said comma-lock will be described later on.

Whenever a numeral key is depressed to operate its pin-setting bar  $b^7$ , it operates said bar by means of a stem or push-bar  $b$ ,

which works through a slot  $b^1$  in a forwardly projecting flange of the transversely extending elongated rectangular frame  $b^2$ , which supports the pin-setting bars  $b^7$ , and is itself supported in the computation casing 30. As the key descends its stem  $b$  strikes an arm  $b^c$  fast on a rock shaft  $b^5$ , causing said rock shaft to vibrate a linkage of which its pin-setting bar  $b^7$  forms a part. To accomplish this, each rock shaft has thereon a rock arm  $b^{12}$ , which embraces a wrist  $b^{13}$  on a cross bar  $b^9$  supported on the short arm of a bell-crank  $b^{10}$ , the long arm of which has a nearly vertical motion and carries the pin-setting bar  $b^7$ . The result therefore, of depressing a key is to cause the corresponding rock shaft  $b^5$  to thrust the pin-setting bar  $b^7$  nearly vertically downward and set the corresponding pin on any displaced or elevated pin bar or computation member  $c$ . The stems  $b$  are carried on pivoted brackets  $b''$ , and said brackets may be adjusted to vary the height of the stem  $b$  by means of set screws  $b^4$ , which swing it around its pivot, thereby raising or lowering the stem  $b$ .

For preventing simultaneous depression of two numeral keys, each key stem is provided with an extension or stem or blade  $b^{17}$ , which forms part of a key-locking device. Whenever a key is depressed it carries its extension  $b^{17}$  down between two pivoted dogs  $b^{15}$ , there being two such dogs for every stem  $b^{17}$ , and the throw of said dogs is limited by fixed stops  $b^{16}$ , there being one stop  $b^{16}$  at each end of the array of dogs. The lost motion between the array of dogs is just sufficient to allow one stem  $b^{17}$  to descend freely; but whenever one stem lies between two dogs  $b^{15}$  it closes all the other dogs together, with the result that no other key can be depressed, because its stem  $b^{17}$  cannot descend. Each stem  $b^{17}$  is held to the main stem  $b$  of the corresponding key by a bracket  $b^{19}$ , which is pivotally adjustable by set screws  $b^{20}$ . The stems are guided in openings or slots adjacent the slots  $b^1$ . The system of dogs  $b^{15}$  is also used according to my invention as part of a comma-locking device. For this purpose there is provided a comma-locking dog  $g^7$ , which includes an extension or blade  $g^8$  adapted to enter between the dogs  $b^{15}$  to take up the lost motion between them, thereby preventing the depression of any numeral key. Said dog  $g^7$  is connected to one or more of the jacks  $f^1$  or  $g$  to be operated thereby at any selected letter space in the travel of the typewriter carriage. For this purpose there is provided between certain of the levers  $f^{16}$  one or more levers  $g^2$  having upwardly extending forward ends, the rear ends of these levers  $g^2$  being, however, precisely like the levers  $f^{16}$ . The levers  $g^2$

may be connected by rods or links  $g^1$  to the jacks  $g$  or  $f^1$  as will be later explained. These levers  $g^2$  are connected to operate the comma-locking dog  $g^7$  by forwardly extending links  $g^3$ , each having a pin-and-slot connection with a wrist  $g^4$  on the upper end of a rock arm  $g^5$  fixed on the shaft  $g^6$  carrying the comma-locking dog  $g^7$ . The result of these connections permits any link  $g^3$  to operate said comma-locking dog without disturbing any other link  $g^3$ . The comma-locking dog is formed as an elbow lever and is normally held in ineffective position by a spring  $g^9$ .

Owing to the length and consequent springiness of the rods  $f^{15}$  and  $g^1$ , it is possible to cross the rods from top and bottom to a considerable extent, thereby enabling any ordinary grouping of the levers  $g^2$  among the levers  $f^{16}$  to serve for any order in which it is desired to have the jacks operate the comma-lock. The crossing of the rods  $f^{15}$  and  $g^1$  can be easily accomplished by any ordinary operator, if the bail  $f^{19}$  is thrown upward to release the upper ends of rods  $f^{15}$ . It will also be noted that since the dog  $f$  is settable at any letter space within the travel of the typewriter carriage, comma-locking between different computing wheels can be had in any combination at any column in the travel of the typewriter carriage.

With the arrangement of jacks  $f^1$  and the punctuation jacks  $g$  described, it is a very easy matter to vary the kind of punctuation that will be done. It should be remembered that jacks  $f^1$ , and punctuation jacks  $g$ , are identical in construction, and so are the rods  $f^{15}$  and  $g^1$ , and that the lower levers  $f^{16}$  and bell cranks  $g^2$ , are for two different purposes, viz., to lift the register bars, and lock the numeral keys when the punctuation space is opposite the printing point. Such being the case, it follows that the action of selecting dog  $f$  on jacks  $f^1$  and  $g$ , and transmitted to levers  $f^{16}$  and bell cranks  $g^2$ , can be made variable on the latter, according to the location of the jacks  $g$ , and that such location is determined solely by connecting bell cranks  $g^2$ , through rods  $g^1$  to some of the jacks  $f^1$ , in which case such jacks  $f^1$  become jacks  $g$ , or eliminating such connection altogether by removing rods  $g^1$  from the machine, which is easily done, by turning the free end of bail  $f^{19}$  upward, which releases the rods so they can be removed from the bell cranks by simply lifting them upward from the open seats in the rearwardly extending arms of bell cranks  $g^2$ . From this description, it is also easy to understand that jacks  $f^1$  and  $g$  are thus designated for the purpose of explaining their functions only, and that, in case the punctuation is to be changed from denoting dollars and cents to

denoting hundreds, thousands and hundreds of thousands, said jacks  $f^1$  and  $g$  will change functions, although remaining in their respective places, depending on the order in which rods  $g^1$  are connected to said jacks. For instance, with rods  $g^1$ , arranged as the fourth and eighth members from the left, as shown in Fig. 7, and connected to corresponding members or jacks, marked  $g$ , the punctuation will be like this:

645,387.29

With the said rods  $g^1$  arranged at their upper end as the third and seventh members from the left, as shown in Fig. 8, which arrangement is accomplished by crossing rods  $g^1$  with rods  $f^{15}$ , as shown, the lower ends of all the rods remaining in their normal positions, indicated in Fig. 7, making said rods  $g^1$  subject to corresponding third and seventh jacks from the left, in Fig. 8, thereby causing the punctuation-space key-locking mechanism to be actuated one step in advance of that shown in Fig. 7, hence the punctuation in this case will be like this:

64,538.729

With the rods  $g^1$  removed, as indicated in Fig. 9, and rods  $f^{15}$  arranged as shown, jacks  $f^1$ , act in succession on said rods, and jacks  $g$ , shown as now being at the left hand side, have no connections with bell cranks  $g^2$ , hence the punctuation-space key-locking mechanism is not actuated, which permits the figures to be printed solid, like this:

64538729

The notched guide plate  $f^{15}$  and bail  $f^{19}$ , make the various adjustments of the upper ends of the rods, and their ready connection with or disconnection from any of the jacks, a very easy matter.

It will be remembered that the punctuation-space key-locking mechanism operates only when the punctuation space on the paper is opposite the printing point, from which it follows, that while a numeral cannot be printed in the punctuation space, that the desired mark, such as a comma or period, may, nevertheless, by striking the proper character key, be printed in such space, or this punctuation space on the sheet may be left blank, if desired, by simply striking the space bar.

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 a computing device, of a blade individual to each numeral key for operation thereby, means in which said

blades move so that when one blade is operated, no other numeral key can be operated, and a blade controlled by the typewriter carriage for preventing the operation of any other blade at a predetermined point in the travel of the said carriage.

2. In a combined typewriting and computing machine, the combination with numeral keys and a computing device, of a blade, a traveling carriage, and means moved by said carriage to cause the blade to prevent the operation of any numeral key.

3. In a combined typewriting and computing machine, the combination with numeral printing keys and a traveling carriage, of a computing device, a tappet on said carriage, a set of members moved one after another by said tappet during the travel of the carriage, means operated by certain of said members to connect said keys to said computing device, and means operated by another of said members to prevent said keys from printing at a selected letter-space in the travel of the carriage.

4. In a combined typewriting and computing machine, the combination with numeral keys having extensions connected thereto and a traveling carriage, of a denomination selector associated with said carriage, a set of devices having a limited throw, said extensions being adapted to enter between said devices and having a width sufficient to substantially take up said limited throw, and a dog of a width substantially equal to an extension adapted to be moved between said members by said selector to substantially prevent said limited motion and thereby lock the keys against operation.

5. In a combined typewriting and computing machine, the combination with numeral keys and a traveling carriage, of pendants connected to said numeral keys, a digit selector operated by said pendants, a set of members having a limited throw, extensions on said pendants adapted to enter between said members to take up such throw, a denomination selector on said carriage, and a dog movable by said denomination selector to a position between said members to take up said throw and thereby prevent entry of an extension, so as to lock said keys.

6. In a combined typewriting and computing machine, the combination with numeral keys and a traveling carriage, of a denomination selector on said carriage, a series of denomination members operable by said selector, denominational computation members operable by said members, a key locking dog also operable by certain of said members, and means normally holding said dog in ineffective position.

7. In a combined typewriting and computing machine, the combination with nu-

meral keys and a traveling carriage, of a denomination selector on said carriage, a series of denomination levers operable by said selector, denominational computation members connectible to said levers, a key locking dog, and a plurality of lost motion devices for connecting said levers to said dog.

8. In a combined typewriting and computing machine, the combination with numeral keys and a traveling carriage, of a denomination selector on said carriage, a series of denomination levers operable by said selector, denominational computation members connectible to said levers, a series of members adapted to prevent simultaneous operation of two numeral keys, a key locking dog cooperating with said members, and means for connecting said dog with any of a plurality of said levers.

9. In a combined typewriting and computing machine, the combination with numeral keys and a traveling carriage, of a denomination selector, a series of denomination members operable by said selector, a key locking dog, and connections between said key locking dog and certain of said levers.

10. In a combined typewriting and computing machine, the combination with numeral keys and a traveling carriage, of a series of denomination members, a denomination selector on said carriage for operating said members, a key locking dog connectible to certain of said members so that said dog will be operated at a predetermined point in the denomination selecting relative to said members, a series of denominational computing wheels and means connectible to the other members to effect denominational selection of said wheels.

11. In a combined typewriting and computing machine, the combination with computing wheels and a traveling carriage, of a denomination selector on said carriage, denominational jacks moved by said selector, denominational computation members associated with said wheels, a key locking dog, and means whereby said denominational computation members and said dog are interchangeably connected to said denominational jacks.

12. In a combined typewriting and computing machine, the combination of numeral keys, computing wheels, a traveling carriage, a key locking dog, a decimal order selecting mechanism comprising a series of denomination members, a denomination selector on the carriage for selecting said members, decimal order devices controlled by said members and interchangeable links interposed between said key locking dog and said decimal order devices, and said denominational members.

13. In a combined typewriting and com-

puting machine, the combination with numeral keys, computing wheels and a traveling carriage, of a denomination selector on said carriage, a series of denomination members moved by said selector, a key locking dog, a series of levers, some connected to said wheels, and some to said dog, and a series of identical interchangeable links connecting said two sets of levers, and adapted to variably connect them.

14. In a combined typewriting and computing machine, the combination with numeral printing keys, computing means and means for preventing printing by a numeral key, of means settable to determine in what column said keys shall be effective to compute, and means controlled by said settable means for operating said preventing means in a definite part of said column.

15. In a computing machine, the combination with a set of numeral printing keys, of a traveling carriage controlled by said keys as to step-by-step movement, an array of key-interfering devices each associated with a numeral printing key for preventing two or more of said keys being operated at a time, and a key interfering device called into action by said carriage a plurality of times during the carriage run, cooperating with said first-named devices for preventing operation of any numeral key.

16. The combination with a typewriter carriage, of printing keys, computing devices controlled by said keys, and a dog on said carriage to connect said keys to said computing devices and to make said keys inoperable at predetermined points in the run of said carriage.

17. The combination with a typewriter carriage and printing keys, of devices for said keys to prevent the simultaneous operation of two or more keys at any point in the run of the carriage, computing devices, a cam for connecting said keys to said computing devices, and a device under the control of said cam, and acting through the medium of said first-mentioned devices, to prevent any operation of said keys at selected points in the carriage run.

18. In a recording computing machine, the combination with a register having wheels mounted equi-distant, of numeral printing devices, keys controlling the same, and variably adjustable devices preventing printing by said keys, at points where a space is desired between groups of figures in the printed numbers for punctuation or other purposes, substantially as described.

19. In a recording computing machine, the combination with a register, of numeral printing devices, keys controlling the same, and means for preventing printing by said numeral printing devices at punctuation spaces, and which means is adjustable to

vary the location of such punctuation spaces, between figures of printed numbers.

20. In a recording computing machine, the combination with a register having decimal orders, of a decimal order selector, devices co-acting with said decimal order selector for selecting the decimal orders of said register, printing devices for printing numerals and other characters, and a device operated by said decimal order selector, for preventing the printing of numerals in punctuation spaces.

21. In a recording computing machine, the combination with a register having decimal orders, of a decimal order selector, printing devices adapted to print numerals and other characters, at will, in column formation, with punctuation spaces, in which punctuation marks may be printed, if desired, and means controlled by said selector for preventing the printing of numerals in said punctuation spaces, and which means is adjustable to vary the location of such punctuation spaces.

22. In a recording computing machine, the combination with a register, of numeral keys, connections for preventing the simultaneous operation of two numeral keys, and key-locking devices effective through said preventing connections for preventing the operation of numeral keys at space provided for punctuation between groups of figures in the printed numbers.

23. In a recording computing machine, the combination with a register having decimal orders, of numeral printing devices, keys controlling the same, a decimal order selector, and devices operated by said decimal order selector, for preventing the printing of numerals in punctuation spaces.

24. In combination, a register, preliminary representation devices, keys with connections for setting said preliminary representation devices, a decimal order selecting mechanism, comprising a selecting dog and a multiplicity of selecting levers subject to said dog, and having connections for preventing the decimal orders of said preliminary representation devices to said setting connections, in succession, and a key-locking lever, interposed between certain of said selecting levers, and also subject to said selecting dog, and having a connection for locking said keys so that a numeral cannot be printed in the punctuation space.

25. In a combined typewriter and computing machine, the combination with typewriting mechanism including a key controlled traveling carriage; of a register; register bars; unit pins on each bar constituting preliminary representation devices; key actuated unit bars for setting said unit pins; a decimal order selecting mechanism, comprising a selecting dog on said key con-

trolled carriage; a multiplicity of selecting levers arranged to be moved, in succession, from the right toward the left, by said selecting dog; a group of transposing bars, subject to said selecting levers and operative on said register bars, successively from left toward the right; and a key-locking lever interposed between certain of said selecting levers and also subject to said selecting dog and having connections for locking said keys so that a numeral cannot be printed in the punctuation space.

26. In a combined typewriter and computing machine, the combination with printing devices and computing devices, of keys adapted to compute in said computing devices and to print both numerals and other characters, a denomination selector for making said keys effective on said computing devices, means for preventing printing by said keys by said selector in inoperative positions at punctuation spaces, and means for rendering said selector inoperative with respect to said keys, at will, in individually selected denominations.

27. The combination with a carriage, of keys, imprinting and computing devices operable by said keys, and a carriage controlled mechanism for interrupting the operation of the key-operated devices, said carriage controlled mechanism including a member movable at will at any point in the carriage run into inoperative position thereby to make said mechanism ineffective at any one of said plurality of points in said carriage run.

28. The combination with a typewriter carriage, of dial wheels denominational members controlling them, said denominational members arranged in separated groups, a set of keys including numeral keys, locks controllable by said numeral keys to prevent two numeral keys from operating simultaneously, an additional lock to cooperate with said locks, and means controlled by the typewriter carriage for calling into action said additional lock at the spaces between the groups of denominational members.

29. The combination with numeral keys, a carriage, computing devices controlled by said keys, and mutually-associated locking devices for said keys, of an additional locking device controlled by said carriage to cooperate with said locking devices to lock the keys.

30. The combination with a computing mechanism, of a series of keys for controlling the action of said computing mechanism, a member connected to control the action of said keys on said computing mechanism, said member having a cam head, and means engaging said cam head to actuate said member, said means and said member having a relative traveling movement.

31. The combination with a traveling carriage, of keys, imprinting mechanism and indexing mechanism both controlled by said keys to effect a combined typewriting and indexing operation, a lock for preventing the action of said imprinting and indexing mechanisms, a tappet carried by said carriage and traveling therewith, and a plurality of members arranged at spaced intervals in the path of said tappet so as to be actuated thereby to operate and bring into play said lock so as to prevent actions of said imprinting and indexing mechanisms at predetermined intervals in the travel of said carriage.
32. The combination with a combined typewriting and computing mechanism, of a single set of numeral keys for actuating both the typewriting and computing parts of said mechanism, a lock for said keys, a traveling carriage, a plurality of trippers common to said lock and each connected to bring the same into play, and a member carried by said carriage coming during the travel of said carriage successively into engagement with said trippers, so as to momentarily actuate the same and thus operate said lock to bring the same into play at a plurality of points in the carriage travel.
33. The combination with a combined typewriting and computing mechanism, of a single set of numeral keys for actuating both the typewriting and computing parts of said mechanism, a lock for said keys, a traveling carriage, a plurality of trippers common to said lock and each connected to bring the same into play, and a member carried by said carriage coming during the travel of said carriage successively into engagement with said trippers so as to momentarily actuate the same and thus operate said lock to bring the same into play, said trippers being spaced apart distances corresponding to the spaces of punctuation marks desired in the numbers to be typewritten and computed.
34. The combination with computing mechanism for setting up a computation, of typewriting mechanism for printing the digits of the number computed, locking mechanism common to said typewriting and computing mechanisms for preventing the writing and computing of more than one digit at a time, and a lock moving at punctuation spaces to cooperate with said locking mechanism to prevent operation of said computing and typewriting mechanisms at spaces corresponding to punctuation spaces in the writing and computing of the digits of a number.
35. The combination with a carriage, of a computing head including a series of computing wheels, controlling mechanism for said computing wheels, locking mechanism for preventing operation of said controlling mechanism at punctuation spaces, and means for bringing said locking mechanism into play, said means being adjustable along said carriage so as to vary the instant of coming into play of said locking mechanism with respect to the travel of said carriage.
36. In a computing machine, the combination with a series of numeral keys, of a dog for each key moved whenever the key is depressed, a traveling carriage, and means for locking said keys against operation at a certain point in the travel of said carriage by locking said dogs against movement.
37. In a combined typewriting and computing machine, the combination of numeral and other character keys and a key-arresting device for said numeral keys only, of a typewriter carriage and a member on said carriage movable with relation thereto to control the operativeness of said key-arresting device whereby said member when in operative position controls the locking of the numeral keys only whereby the other character keys may be used anywhere on the work sheet, said member when in inoperative position permitting both numerals and characters to be written anywhere on the work sheet notwithstanding the carriage position.
38. In a combined typewriting and computing machine, the combination with numeral keys and computation members, of a dog for blocking the action of said keys, a series of denominational jacks, a denomination selector associated with said carriage and effective on said jacks, and interchangeable connections extending from certain of said levers to said computation members and from certain others of said levers to said locking dog.
39. In a combined typewriting and computing machine, the combination with numeral keys and computation members, of a dog for blocking the action of said keys, a denomination selector for said members and controlling said dog, and means whereby said selector may be made ineffective on said dog at a predetermined variable number of denominations.
40. The combination, with type-operating numeral printing keys, and a traveling typewriter carriage; of a jack for preventing printing by said keys; a tappet on said carriage for operating said jack, adjustable to enable the printing preventing operation to take place at any desired point in the travel of the carriage; computing mechanism; and a series of denomination-selecting jacks for connecting said keys with said computing mechanism, said tappet being designed to operate said selecting jacks as well as said printing preventing jack, whereby a single adjustment of said tappet relatively to said

carriage will concurrently determine the locations of both the printing-preventing operation and the denomination-selecting operation with respect to the travel of the carriage.

41. The combination, with type-operating numeral keys, and a traveling typewriter carriage; of a device for preventing printing by said keys; a tappet on said carriage for operating said preventing device, adjustable to enable such operation to take place at any desired point in the travel of the carriage; computing mechanism; and a series of denomination-selecting jacks for connecting said keys with said computing mechanism, said tappet being designed to operate said selecting jacks as well as said preventing device, whereby a single adjustment of said tappet relatively to said carriage will concurrently determine the locations of both the printing-preventing operation and the denomination-selecting operation with respect to the travel of the carriage.

42. The combination, with type-operating numeral keys, and a traveling typewriter carriage; of a device for preventing printing by said keys; a tappet on said carriage for operating said preventing device, adjustable to enable such operation to take place at any desired point in the travel of the carriage; computing mechanism; and a series of denomination-selecting jacks for connecting said keys with said computing mechanism, divided into groups corresponding with decimal-order grouping and having said preventing device disposed between such groups, said tappet being designed to operate said selecting jacks as well as said preventing device, whereby a single adjustment of said tappet relatively to said carriage will concurrently determine the locations of both the printing-preventing operation and the denomination-selecting operation with respect to the travel of the carriage.

43. The combination, with type-operating numeral keys, and a traveling typewriter carriage; of a device for silencing said keys; a tappet on said carriage for bringing said silencing device into action, adjustable to enable such action to take place at any desired point in the travel of the carriage; computing mechanism; and a series of denomination-selecting jacks for connecting said keys with said computing mechanism, said tappet being designed to operate said selecting jacks as well as said silencing device, whereby a single adjustment of said tappet relatively to said carriage will concurrently determine the locations of both the silencing operation and the denomination-selecting operation with respect to the travel of the carriage.

44. In a combined typewriting and computing machine, the combination, with nu-

meral keys, and a traveling typewriter carriage; of a zone selector on said carriage; means for preventing printing by said keys; and means controlled by said zone selector for automatically operating said preventing means, said selector being adjustable along said carriage to determine at one and the same time, with respect to the travel of the carriage, both the location of the zone and the precise point at which said automatic operation shall be controlled.

45. The combination with type-operating numeral and other character keys and a traveling carriage, of means for preventing printing by said numeral keys only, at punctuation spaces in a number written by said numeral keys, and a tappet for automatically operating said preventing means adjustable along the carriage run to enable such automatic operation to take place at the punctuation spaces in a number written anywhere on the work sheet, whereby spaces may be left between the groups of denominations of said number or punctuation marks inserted.

46. The combination with type-operating numeral and other character keys and a traveling carriage, of means for preventing printing by said numeral keys only, at punctuation spaces in a number written by said numeral keys, and a tappet for automatically operating said preventing means a plurality of times in the carriage traverse and adjustable along the carriage run to enable such automatic operation to take place at the punctuation spaces in a number written anywhere on the work sheet, whereby spaces may be left between the groups of denominations of said number or punctuation marks inserted.

47. The combination with a typewriting mechanism, of a computing mechanism operable from said typewriting mechanism, said computing mechanism including a series of members setttable to represent a computation, setting means operated by said typewriting mechanism to set said members, a single locking elements for preventing actuation of all of the parts of said setting mechanism, and means operable from said typewriting mechanism for actuating said locking element solely at all points corresponding to commas and decimal points between digit columns in a computing zone.

48. The combination with a computing mechanism, of a series of denominational selectors for said computing mechanism, certain of said selectors corresponding to the spaces between groups of figures, such as between hundreds and thousands, thousands and millions, etc., and a single locking element for said computing mechanism common to all of said space denominational selectors, so as to be actuated thereby to

65  
70  
75  
80  
85  
90  
95  
100  
105  
110  
115  
120  
125

lock said computing mechanism when in spaces corresponding to the spaces between the groups of figures.

49. The combination with a computing mechanism, of a series of denominational selectors for said computing mechanism, a plurality of selectors corresponding to the spaces between the groups of figures, such as millions and thousands, thousands and hundreds, etc., a lock for preventing the actuation of said computing mechanism when in spaces between the groups of figures, and a universal bar connected to actuate said lock, and in turn common to and actuated by any or all of said denominational selectors corresponding to the spaces between groups of figures.

50. In a combined typewriting and computing machine, the combination with numeral and alphabet keys and a traveling carriage, of devices in which numbers are registered as written by said numeral keys, a denomination selector for selecting said devices, a lock operated by said denomination selector for preventing the operation of a numeral key where another key should be operated, and means for adjusting said selector to ineffective position, to thereby permit the use of said alphabet keys at any point in the carriage run.

51. In a combined typewriting and computing machine, the combination with numeral keys, and a lock for preventing the simultaneous operation of two of said keys, of a traveling carriage, a denomination tappet on said carriage, and means connected to said lock and operated by said tappet for preventing the operation of a numeral key at a comma or period space.

52. In a combined typewriting and computing machine, the combination with numeral printing keys and a traveling carriage, of computing mechanism, comprising equally-spaced members, connections arranged in groups leading from said computing members for controlling denominational selection thereof by said carriage, and means acted on by the carriage at the spaces between said groups for rendering said keys inoperative to print a numeral, whereby spaces may be left between portions of the printed number or punctuation marks inserted.

53. In a combined typewriting and computing machine, the combination with numeral printing keys and a traveling carriage, of computing mechanism, comprising equally-spaced members, connections arranged in groups leading from said computing members for controlling denominational selection thereof by said carriage, and means acted on by the carriage at the spaces between said groups for rendering said keys inoperative to print a numeral, said connec-

tions being variable, so that the denominational selection and the rendering inoperative of printing may be varied, whereby spaces may be left between different portions of the printed number enabling punctuation marks to be inserted, or the number printed solid at will.

54. In a combined typewriting and computing machine, the combination with numeral keys and a traveling carriage, of a denominational selector carried by said carriage, computing mechanism, a series of denominational members operable by said selector and controlling said computing mechanism, a numeral-key-locking means, and connections between said key-locking means and said members, said connections being variable, so that said key-locking means may be connected to different ones of said members as desired.

55. In a combined typewriting and computing machine, the combination with computing mechanism, a traveling carriage and numeral printing keys, of means for locking the numeral keys, connections extending from a point adjacent the carriage to said locking means and to said computing mechanism and means on the carriage for operating said connections during the traversing movement of the carriage, to control both selection of the computing mechanism and said locking means.

56. In a combined typewriting and computing machine, the combination with computing mechanism and numeral keys, of a series of jacks controlling the denominational selection of said computing mechanism, special jacks arranged along with said first-mentioned jacks, locking means for said numeral keys under control of said special jacks, and means for varying the action of said jacks at will so that certain ones may control either denomination selection or locking.

57. In a combined typewriting and computing machine, the combination with computing mechanism and numeral keys, of means for locking said numeral keys, a series of jacks for controlling the denomination selection of said computing mechanism and the locking of said keys, a series of links, one for each jack, some of said links connected to the key-locking means, other of said links being connected to said denomination-selecting jacks, and means for varying the action of said jacks by connecting different links with different jacks, whereby different spacing of the numerals printed may be had.

58. In a typewriting machine, the combination with numeral and alphabet keys, of a traveling carriage, means controlled by said carriage for preventing printing by said numeral keys at different letter-spaces during said carriage movement, whereby

numbers written may be divided into groups, and means for varying the action of said first-mentioned means whereby different groupings of numerals may be had.

5 59. The combination with a series of numeral printing keys, of a locking device for said keys, a series of members spaced apart at predetermined intervals, operative connections between said members and said

locking device, and a traveling element for 10 controlling the successive locking of the keys by said locking device, said traveling element acting through the medium of said series of spaced members.

FREDERICK A. HART.

Witnesses:

JULIUS DUCKSTINE,  
F. E. ALEXANDER.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."