

COMBINED TYPE WRITING AND COMPUTING MACHINE.

Patented Sept. 24, 1918.

1,279,862.



WITNESSES:
Julius Rudstine
F. E. Alexander

Hans Hanson

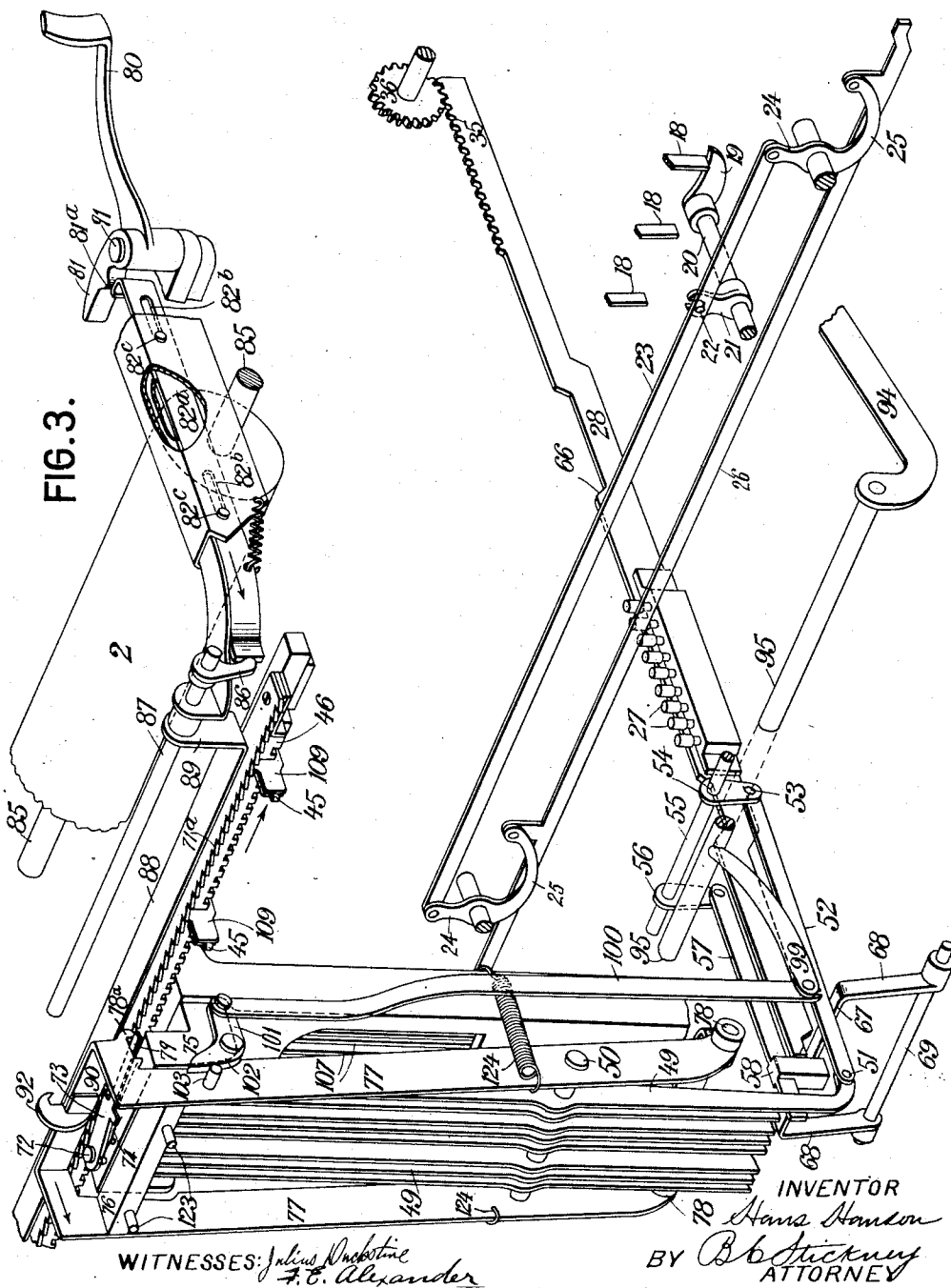
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H. HANSON.
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5 SHEETS—SHEET 2.



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 5 SHEETS—SHEET 3.

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FIG. 6.

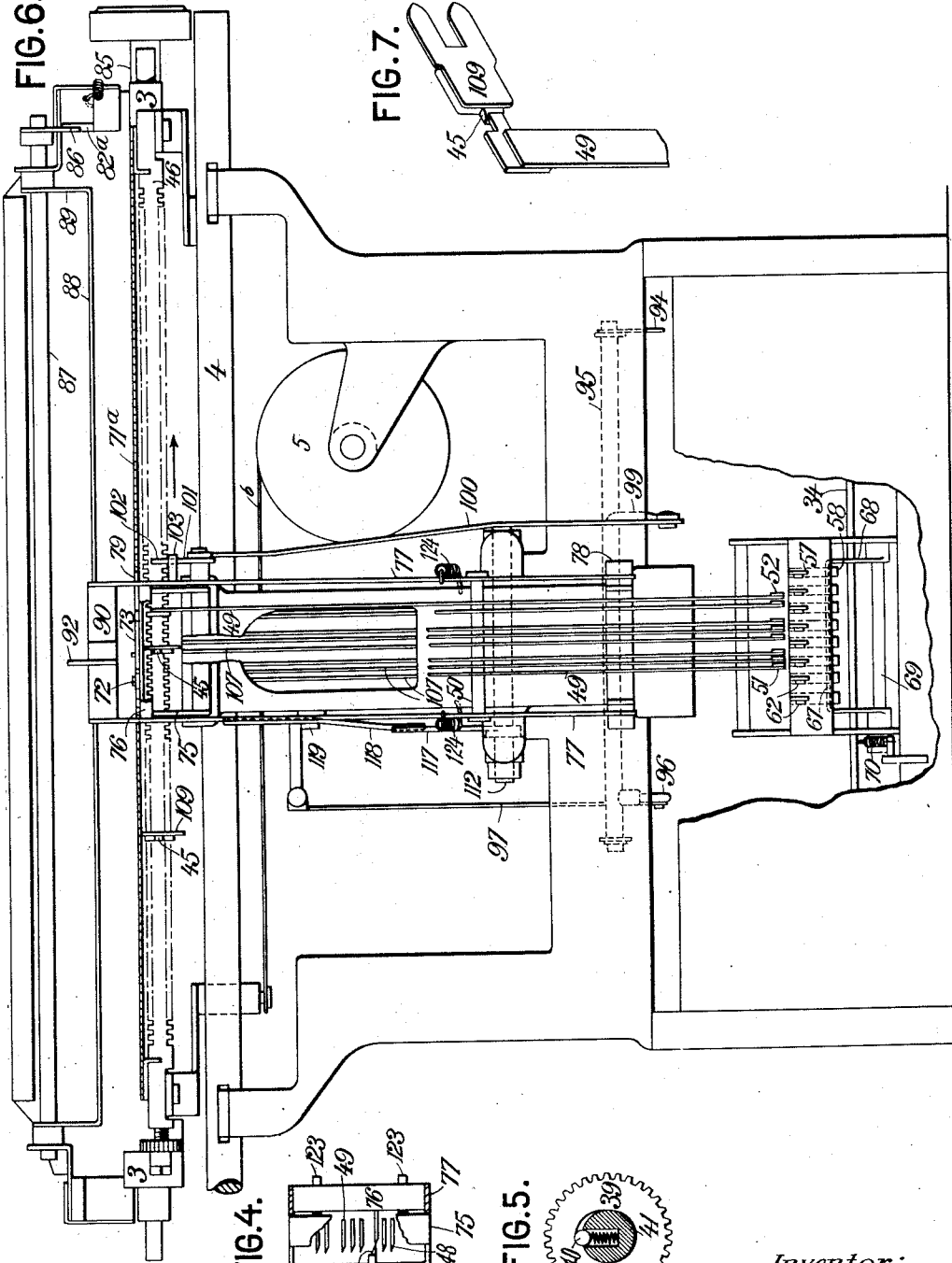


FIG. 7.

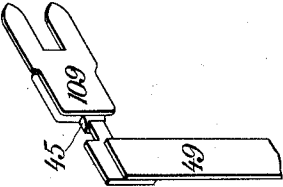


FIG. 4.

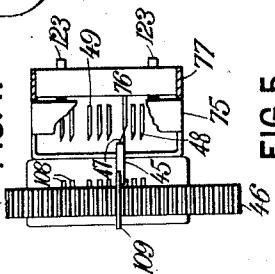
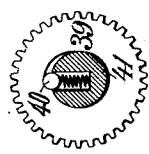


FIG. 5.



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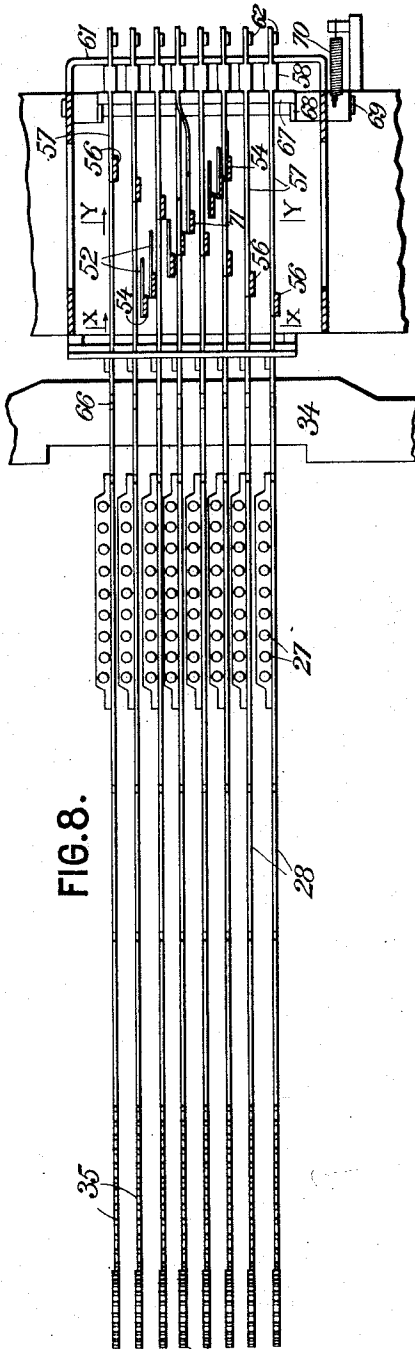


FIG. 8.

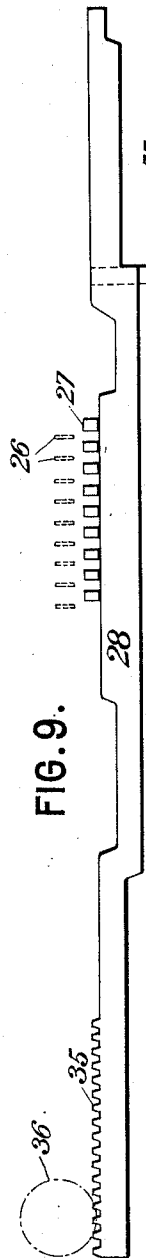


FIG. 9.

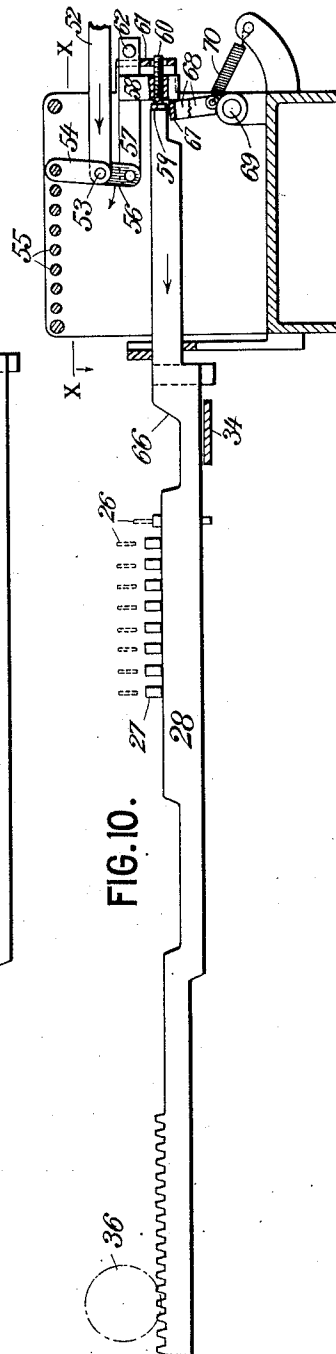


FIG. 10.

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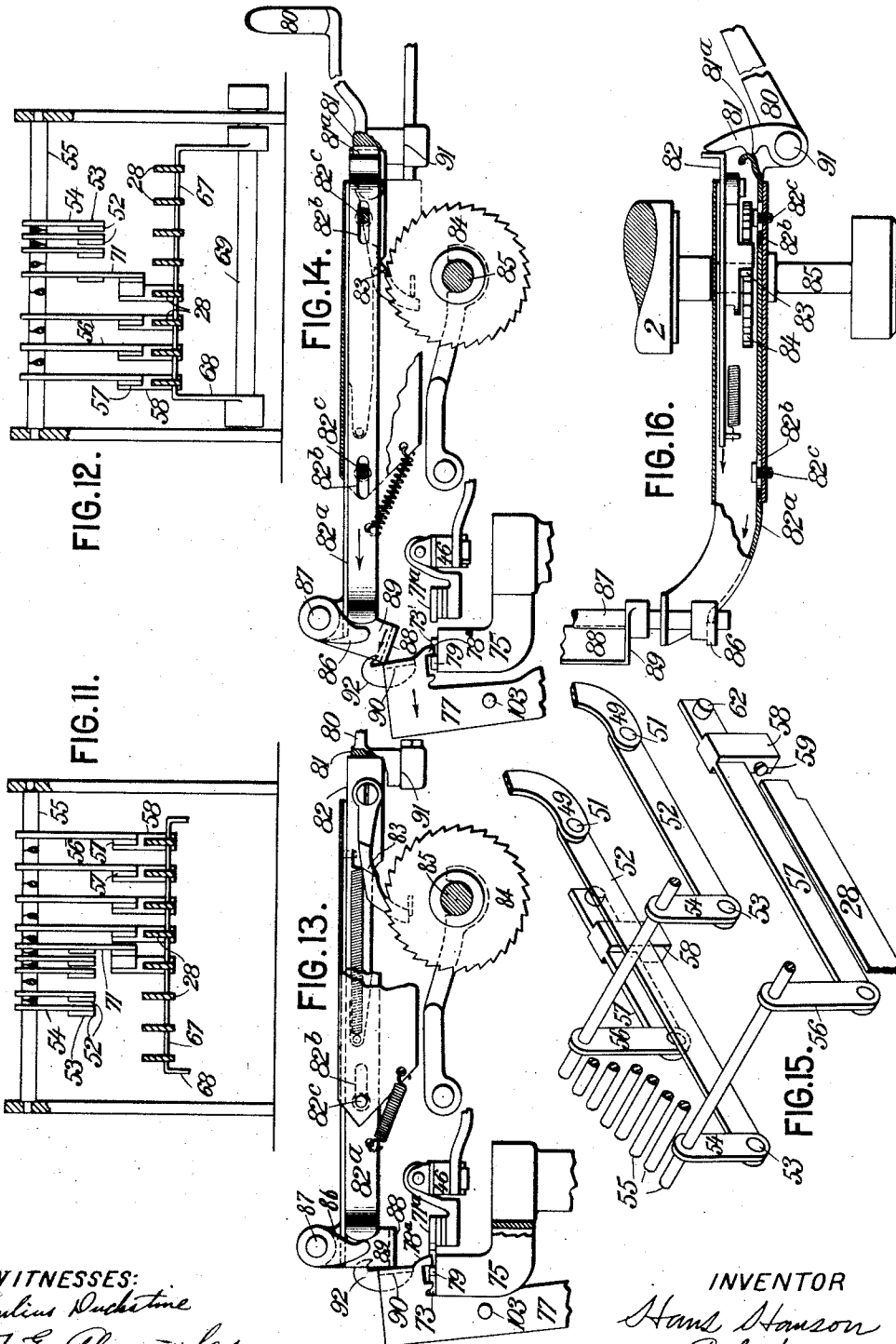
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5 SHEETS—SHEET 5.



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UNITED STATES PATENT OFFICE.

HANS HANSON, OF HARTFORD, CONNECTICUT, 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.

1,279,862.

Specification of Letters Patent. Patented Sept. 24, 1918.

Application filed June 5, 1913. Serial No. 771,783.

To all whom it may concern:

Be it known that I, HANS HANSON, a citizen of the United States, residing in Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Combined Type-Writing and Computing Machines, of which the following is a specification.

This invention relates to combined type-writing and computing machines.

A machine of this general class is illustrated in my Patent No. 905,422 of December 1, 1908. In this type of machine, the numeral keys of the typewriter effect the setting of certain index-pins during the writing of a number; and thereafter the number wheels are operated simultaneously, according to the pins which have been set.

These index-pins are mounted one row on each of several denomination bars, and one of the objects of the present invention is to provide improved means for displacing the index-pin bars consecutively from normal positions during the progress of the typewriter carriage, so that one pin on each bar may be set at the writing of a figure in the corresponding denominational position on the work sheet.

These index-pin bars are normally in such positions, that the key-operated setting links or bars cannot strike the pins; and at the movement of the typewriter carriage, one index-pin bar after another is displaced to bring the pins thereon into reach of the key-operated setting bars to be settable thereby. One of the features of the present improvement is to simplify and improve the carriage-controlled mechanism whereby the index-pin bars are displaced for this purpose. There are provided upstanding levers of the first order engageable one after another by a cooperating member mounted on the typewriter carriage, whereby the levers may be swung one at a time; and by mechanism placed between the levers and the bars, the latter are displaced preferably endwise from normal positions.

This intervening mechanism is in the nature of a transposition device, inasmuch as in a machine of this class the denomination of the lever at one side of the system corresponds to the denomination of the index-pin bar at the opposite side of the system;

this being due to the fact that the number-wheels arranged on the machine-frame are read from left to right, while the denomination jacks or levers are engaged in order from right to left by the dog on the typewriter carriage; the index-pin bars being usually connected directly to the number-wheels, and occupying the same denominational positions as the latter.

It will be understood, however, that the aforesaid improvements, including said levers and also including certain features of the transposition device, may be employed in connection with machines in which the index-pin bars are otherwise displaced from normal positions.

Another feature of the improvements relates to the simplification of the aforesaid carriage-dog, and to securing greater efficiency and adaptability thereof and of the mechanism that cooperates therewith. The levers above referred to correspond to the dog-controlled denomination jacks now in use on the well known Underwood-Hanson machine; these levers or jacks being placed at letter-space intervals, and being consequently thin, so that it is found difficult in practice, when the typewriter carriage is set back one step at a time, for the carriage dog to properly reengage and displace the preceding jack or lever; the carriage-dog having been heretofore swiveled to permit the carriage to be stepped back (by means of the usual back-spacing key, and this swiveling of the dog making it difficult or impracticable for the dog to recover its normal position until the carriage has been pushed clear of the whole series of jacks.

In overcoming these difficulties, I preferably swivel neither the dog nor the jacks. The dog or tappet cams the jacks or levers backwardly during the progress of the carriage in letter-feeding direction, and in order to permit the dog to pass the jacks on the return step-by-step movement of the carriage, the jacks or levers are bodily withdrawn from the path of the dog.

The back-space key is therefore provided with a device which automatically withdraws the jacks or levers, to permit the dog to be set back one step with the carriage; and upon releasing the back space key, the proper jack or lever will be found to be

displaced by the dog, without the necessity, as heretofore, of first turning the dog back clear of several or all the jacks, and then feeding the carriage forward again to the
5 desired position.

From the foregoing, it will be perceived that the jacks are obstructions in the path of the dog during the return movement of the carriage, and in order to permit the
10 carriage to be returned to begin a new line, there is connected to the usual carriage-returning and line-spacing lever, a device which withdraws the jacks or levers and permits the free return run of the carriage.
15 Another object of the present invention is to avoid liability of injury or undue wear which would be likely to occur at the tabulating operation, owing to the impact of the carriage-dog upon the jacks or levers
20 in quick succession during the jumping movement of the typewriter carriage; and to this end I connect the tabulating mechanism to the means for withdrawing the jacks bodily from the path of the dog, so
25 that there is no impediment to the movement of the carriage, nor liability of wear or injury upon the dog or levers.

The dog is preferably thin, and made adjustable along a rack on the carriage, the
30 rack having notches at letter-space intervals, thus conducing to convenience in adjusting the dog to any point required. This rack may be the usual column-stop rack used on the typewriting machine, and the dog
35 may in some cases be formed directly upon a column-stop, so as to be part thereof, so that the operator, by simply adjusting said stop, not only determines the point at which the carriage shall be arrested for writing
40 in a column, but also positions the dog for displacing the index-pin bars correspondingly. There may be several such dogs or combined column-stops and dogs, in use at the same time on the machine for cross-
45 adding.

In order to avoid liability of injury by reason of an attempted rapid return movement of the carriage otherwise than by the devices above mentioned, there is provided
50 upon the carriage a rack, and there is provided upon the machine-frame a pawl to engage said rack, to prevent the carriage from being returned. The back spacer and the carriage-returning handle are arranged
55 to disconnect said pawl at the same time that the jacks are thrown out of the path of the carriage-dog or tappet.

Other features and advantages will hereinafter appear.

60 In the accompanying drawings,

Figure 1 is a detail of a transposition device for connecting the selector bars to the rack bars.

65 Fig. 2 is a sectional side view of an Underwood-Hanson combined typewriter and

computing machine, showing my invention as applied thereto.

Fig. 3 is a skeleton perspective showing many of the principal parts of my invention as seen in Fig. 2.

Fig. 4 is a detail showing the relation between a tappet and the selector bars.

Fig. 5 is a detail of a clutch for operating the carry-over mechanism.

Fig. 6 is a rear view of the machine seen
75 in Fig. 2.

Fig. 7 is a skeleton perspective showing part of Fig. 4.

Fig. 8 is a plan view, with parts in section on the line $x-x$ of Fig. 10, of the rack bars
80 and of their immediate connections.

Fig. 9 is a side view of a rack bar in its normal position.

Fig. 10 is a similar view, showing such a bar when moved by its selector bar.
85

Fig. 11 is a sectional rear view on the line $x-x$ of Fig. 8.

Fig. 12 is a similar view on the line $y-y$ of Fig. 8.

Fig. 13 is an end view showing some of
90 the connections between the line-space lever and computing devices.

Fig. 14 is a view similar to Fig. 13 showing the line-space lever in operation.

Fig. 15 is a skeleton perspective of part
95 of Fig. 1.

Fig. 16 is a plan view of Fig. 14.

In the Underwood-Hanson combined typewriting and adding machine types 1 strike rearwardly against a platen 2, which
100 is mounted on a carriage 3 running on rails, one of which is seen at 4, and driven by a spring barrel 5 connected by a strap 6 to the carriage. The types are mounted on type bars 7 which are operated by bell
105 cranks 8 and levers 9, the latter carrying alphabet keys 10 and figure keys 11. Heels 12 on the type bars strike a universal bar 13, and the latter vibrates dogs 14 to control an escapement wheel 15 which is con-
110 nected to a pinion 16 engaging a rack 17 on the carriage, whereby the letter-feeding movements of the carriage are controlled.

From the numeral keys 11 depend stems 18 to engage and depress rock arms 19
115 mounted on rock shafts 20 and forming part of the computing mechanism. There is one of these rock shafts 20 for each numeral key, and each shaft carries an upstanding arm 21 to engage a pin 22 to drive
120 endwise a horizontal link 23, forming part of an index pin-setting linkage (Fig. 3). The linkage also comprises bell cranks 24 connected by said link 23, said bell cranks having arms 25 connected by a link or bar
125 26 which, at the operation of the key, is driven down to depress an underlying index pin 27. There is an array of bars 28 in which these pins are mounted, there being one bar for each denomination; each bar
130

carrying nine pins, one for each numeral key.

By means of mechanism, presently to be described, the index pin bars 28 are to be displaced one after another as the paper carriage 3 travels step-by-step through the computation zone; and the depression of any numeral key at such time will cause the connected bar 26 to depress the corresponding pin on whichever index pin bar 28 happens to be displaced at the time.

After the number has been written on the work-sheet and the corresponding index pins 27 have been depressed, the user of the machine draws forward a handle 29 (Fig. 2). This movement of the handle effects the rotation of the adding wheels by means of the depressed index pins. For this purpose, the handle 29 is mounted on a shaft 30, which extends across the machine and has at its ends segments 31 to mesh with idle pinions 32, the latter meshing with racks 33 at opposite sides of the machine, said racks forming part of a carriage; a rigid transverse horizontal bar 34 forming another part of said carriage. This bar 34 is placed just beneath the index pin bars 28 and in position to engage such pins as have been depressed, and thereby drive forwardly the bars 28, and by means of racks 35 on their forward ends rotate pinions 36 accordingly; said pinions being connected to number wheels 37 by the usual one-way pawl-and-ratchet devices (not shown).

The tens-carrying mechanism is of the style usual in the Underwood-Hanson machine operating on the return stroke of the general operator 33, 34, effected by the handle 29 or otherwise, and comprises a pinion 38 meshing with the rack 33 and driving a pinion 39 (Figs. 2 and 5), which has a clutch connection 40 with a shaft 41, so as to operate the same only during the return stroke of the general operator; said shaft carrying spurs 42 to drive the usual tens-carrying trains 43 in the usual manner. During the conclusion of the return stroke of the general operator, a plate 44 (Fig. 2) rises and restores to normal positions the depressed index pins 27.

For displacing the index pin bars 28 preparatory to setting the pins thereon, there are provided upon the typewriter carriage one or more dogs 45 (Figs. 2, 3, 4, 6, and 7). These dogs are adjustable along a rack 46 which is fixed to the typewriter carriage 3, and which is preferably the usual column stop rack of the typewriter tabulating mechanism. Each dog has a beveled or cam face 47 to engage beveled edges 48 on the upper ends of levers 49 to cam the latter backwardly at the movement of the typewriter carriage, as illustrated at Fig. 4, at which figure it will be understood the carriage has completed its letter-feeding movement so

that the lever 49 is held back while the carriage remains in such position, to receive the type impression.

These levers 49 extend down behind the machine and are fulcrumed between their ends upon a rod 50, and at their lower ends are pivoted at 51 to the rear ends of links 52 which operate a transposition device (Figs. 1, 2, 3, 6, 11, 12 and 15). At their forward ends the links are pivoted at 53 to depending arms 54 mounted upon horizontal transverse rock shafts 55. The order or denominational arrangement of the levers 49 is inverse of the order of the index pin bars 28, and accordingly the rock shafts 55 are employed to make cross connections; the extreme left-hand lever being connected to the extreme right-hand index pin bar, and so on; each lever being connected to the index pin bar of corresponding denomination. It will be seen that each rock shaft 55 carries a second depending arm 56; and that the arms 56 are connected to the forward ends of hooks 57, teeth or lugs 58 whereof are in positions to engage the rear ends of the index pin bars 28 and to displace the latter forwardly from the position at Fig. 9 where the index pins 27 are out of the paths of the pin-depressing bars 26, to the position at Fig. 10, whereby said pins 27 have stopped directly under their respective bars to be depressible thereby, as in the case of the rear pin at Fig. 10; each bar 28 being held in the Fig. 10 position until the carriage 3 starts to make its next feeding movement.

For convenience in assembling, the rock shafts 55 are placed one behind another and the hooks 57 are of corresponding lengths; their teeth or lugs 58 standing in a transverse row. The arms 54 may be shorter than the arms 56 to permit the links 52 to overlie the links 57. At Fig. 8 it will be seen that the arms 54 occupy considerably less space across the machine than do the hook-carrying arms 56, the former being placed at intervals to agree with the letter-feeding movements of the carriage or with the spaces of the levers 49; and the latter being placed at wider intervals to agree with the spacing of the index pin bars 28 and their number wheels 37. At Fig. 8 the row of arms 54 is seen crossing the other row 56 to effect the required denominational transposition. At the point where these rows cross, a single arm 71 answers for both arms 54 and 56; the links 52 being pivoted on arm 71 at a point above the pivotal connection of link 57 to arm 71.

In order to compensate for inaccuracies arising in manufacture or use of the machine, each tooth or lug 58 may have an adjustable head 59 (Fig. 10) to abut against the rear end of its index pin bar 28; said head 59 being formed on the end of a screw 60 threaded through the lug 58 from front

to rear. The hooks or links 57 may be guided in a comb 61 and may have stops 62 in rear of said comb to prevent accidental excessive forward movements of the parts 57.

- 5 Each index pin bar 28 may be provided with a return means in the form of a pawl or arm 63 (Fig. 2) pivoted at 64 and having a return spring 65 which causes the pawl to bear against a shoulder 66 on the bar 28, said shoulder inclining to the rear and formed to permit the pawl 63 to ride idly upon the top edge of the rear portion of the bar 28 during the number wheel driving forward movement of the latter; these pawls 10 63 serving, however, to return the bars 28 promptly from the position at Fig. 10 to the normal Fig. 9 position.

- A short universal bar 67, mounted upon arms 68 rising from a rock shaft 69 and pulled rearward by a spring 70, may bear 20 against all the lugs 58 to return them to normal positions after actuation, together with the transposition linkages and the levers 49.

- 25 There is also shown herein mechanism for preventing the denominational selecting dogs 45 from clashing with the denominational levers 49 during the return movement of the carriage 3; but this clashing preventing mechanism can be used in connection 30 with other denominational dogs and other devices for displacing the index pin bars. These devices, however, are especially valuable in connection with one or more denominational selecting dogs, such as are shown adjustable along the ordinary rack 46. One of the advantages of the dog 45 is that it is rigidly mounted, and hence when the carriage stands at any printing position within 40 the adding zone, there must be a displaced lever and an index pin bar of corresponding denomination, thus avoiding one of the difficulties to which a usually pivoted selecting dog might, in some cases, be subject.

- 45 The clashing between the denominational selecting dogs 45 and the levers 49, during the return stroke of the carriage, is prevented by the following means. In order to prevent the carriage from being pressed back by the operator applying his hand thereto in the usual manner, there is provided upon the carriage a rack 71^a which may be connected to said column stop rack 46 (Figs. 3 and 6); and upon the machine 50 there is pivoted at 72 a pawl 73 pressed into engagement with said rack by a spring 74. The carriage can be released from this locking device only when there is effected a concomitant disconnection or relative displacement between the dogs 45 and the levers 49.

- 60 The pawl 73 is pivoted upon a mount 75 which is fixed upon the machine frame. A bar 76 is fixed to a pair of upstanding rock arms 77 forming a frame which rocks upon 65 pivots 78 at the lower part of the machine;

and at Figs. 2 and 3, it will be seen that the rod 50, which connects the denominational levers 49, is mounted upon the arms 77, so that a backward movement of said frame may swing the upper ends of the levers 49 rearwardly out of the path of the denominational selecting dogs 45; the levers at this time swinging about the pivots 51, which are themselves restrained from backward movement by reason of the engagement of 75 the connected lugs 58 with the guide comb 61.

On the upper end of one of the arms 77 is an ear or projection 78^a to catch an extension 79 formed on the pawl 73. It follows that at any time the frame 76, 77, is pushed back, to effect the release of the carriage locking pawl 73, the denominational levers 49 must also be swung rearwardly to clear the dogs 45. 80 85

At Figs. 3, 13, 14 and 16 is shown mechanism whereby at the operation of the usual line-spacing carriage-returning handle 80, the pawl-and-lever retracting frame 76, 77 is automatically swung backwardly. Said lever on the Underwood machine usually has an arm 81 to press backwardly a sliding bar 82 to which is pivoted a pawl 83 to engage a line-spacing ratchet wheel 84 connected to the axle 85 of the platen 2. Said arm 81, in this instance, comprises a lug 81^a which presses backwardly a sliding bar 82^a simultaneously with the bar 82, said bar 82^a including slots 82^b in which ride guide pins 82^c and said bar engages an arm 86 depending from a rock shaft 87 mounted on the carriage and extending therealong, and carrying a bail comprising a long bar 88 and short arms 89; said bar 88 arranged to engage a cross bar 90 which joins the arms 77 at their upper ends, to swing the frame 76, 77 rearwardly. 90 95 100 105

The line-space handle 80 is swung about its pivot 91 to effect the line-spacing, to release the carriage lock 73, and to vibrate the levers 49; continued pressure upon said handle effecting the return movement of the carriage to begin a new line of writing. 110

There may be provided upon the bar 90 a guard hook 92 to prevent the bar 88 from swinging too high, or the frame 76, 77 from swinging too far to the rear. 115

At Fig. 2, 93 is a back-spacing key; and the back-spacing mechanism shown at this figure agrees substantially with that shown in Fig. 4 of the Helmond Patent No. 930,962 of August 10, 1909; the key 93 being mounted on a lever 94 extending forwardly from a rock shaft 95; said rock shaft carrying an arm 96 which, by means of a link 97, operates the back-spacing dog 98, the latter corresponding to the part 20 of said Helmond patent. 120 125

The present improvement may be used with any kind of back spacing mechanism; 130

but the usual Underwood mechanism is illustrated for convenience. This back spacing key 93 automatically unlocks the carriage preparatory to the back spacing movement thereof. For this purpose an arm 99 is secured to the rock shaft 95 and extends rearwardly therefrom. A link 100 extends upwardly from said arm 99 (Fig. 3) to connect it to a bell crank or dog 101 having an arm 102 to engage a pin 103 projecting from one of the rocking frame arms 77. Depression of the key lever 94 rocks the shaft 95, lifts the free end of arm 99 and link 100 and rocks the arm 102 backwardly to force back the frame 76, 77, to release the carriage locking pawl 73 and retire the denominational levers 49. Thus the carriage is released at the first part of the stroke of the back spacing key 93 to unlock the carriage, and during the completion of said stroke the carriage is spaced backwardly in the manner described at length in said Helmond patent.

Besides the above described provision for withdrawing the denominational levers 49, to permit the paper carriage 3 to be returned, there is also provision made for withdrawing said levers, so that the dogs 45 will not strike them when the carriage 3 is running rapidly in letter-feeding direction during a tabulating operation. The decimal tabulator keys are seen at 104 (Fig. 2) being mounted upon levers 105 fulcrumed at 106, and at their rear ends swinging up to lift rods 107, whose upper portions terminate in decimal stops 108, which project upwardly to intercept column stops 109.

The releasing of the paper carriage 3 in the tabulating operation is effected by a small universal bar 110 lifted by shoulders 111 on said upright rods 107. This universal bar is mounted on a rock shaft 112 having an arm 113 connected by a link 114 to a lever 115 which is pivoted between its ends and carries on its forward end a roll 116, which takes under the rack 17 to lift the same from the pinion 16, to permit the carriage to be driven freely by its spring 5 until arrested by the engagement of the nearest column stop 109 with the projected decimal stop 108. As far as described, the tabulating mechanism is in common use on said Underwood-Hanson machine. Extending upwardly from said rock shaft 112 is an arm 117 which engages a lever 118 pivoted at 119 on the framework, and arranged at its upper end to bear against one of the upstanding arms 77, to swing back the frame 76, 77, together with the levers 49, which are hence withdrawn from the path of said dogs 45 whenever any tabulator key 104 is depressed.

At Figs. 6 and 7 it will be seen that the dog 45 is secured upon the column stop 109. Hence when any column stop 109 is inserted

at the desired position in rack 46, the dog 45 is adjusted to position therewith, so that when the carriage is arrested at the point to write a figure of any selected denomination, the dog 45 will hold back a lever 49 of the same denomination, and hence when a numeral key is operated at such place, not only will the types strike in the right place, but there will also be a depression of a corresponding index pin 27 upon the bar 28 of a corresponding denomination. Of course there may be used at the same time column stops 109 not having the dogs 45, if desired.

The combined dog and column stop structure is very simple and compact; also the provision made for withdrawing the denominational levers or jacks 49 from the path of the dog avoids liability of injury; while at the operation of the back space key 93, the dog 45, when assuming its new position, is sure to displace the right lever or jack 49.

The rock arms 77, as has been described, form part of a frame pivoted at 78, said frame also including the cross bar 76 at the top. This frame is normally held by springs 124 in such a position that the selector bars or levers 49 therein will properly cooperate with the dogs or tappets 45. The point at which said frame is so held may be accurately adjusted by means of set screws 123, one at each side of said frame, which screws strike against the top of the mount 75 which is fixed upon the machine frame. The springs 124 must be strong enough to hold the frame with its selector bars 49 in effective position when said selector bars are being operated against the tension of spring 65.

Variation 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 computing wheels, of a traveling carriage, a denomination-selecting device, means controlled by the numeral keys for determining the extent of rotation of the computing wheels, a rotatable platen in said traveling carriage, a line-spacing lever for rotating said platen and returning said carriage, and means connected to said line-spacing lever for making said denomination-selecting device ineffective.

2. In a combined typewriting and computing machine, the combination with numeral keys and computing wheels, of a traveling carriage, a denomination-selecting device settable on said traveling carriage, means controlled by the numeral keys for determining the extent of rotation of the computing wheels, a rotatable platen in said traveling carriage, a line-spacing lever for rotating said platen and returning said car-

riage, means connected to said line-spacing lever for making said denomination-selecting device ineffective, a pawl cooperating with said denomination-selecting device and
 5 normally effective to hold said carriage against return movement, and means for moving said pawl to ineffective position by the operation of said line-spacing lever.

3. In a combined typewriting and computing machine, the combination with numeral keys and computing wheels, of a traveling carriage, a denomination-selecting device setttable on said traveling carriage, means controlled by the numeral keys for
 10 determining the extent of rotation of the computing wheels, a rotatable platen in said traveling carriage, a device for returning said carriage, means connected to said returning device for making said denomination-selecting device ineffective, a pawl co-
 20 operating with said denomination-selecting device and normally effective to hold said carriage against return movement, and means for moving said pawl to ineffective
 25 position by the operation of said returning device.

4. In a combined typewriting and computing machine, in combination, a computing mechanism, a traveling platen carriage,
 30 a platen movably mounted in said carriage, means, including parts normally caused to be brought into engagement and to be operated on movement of said carriage in one direction, to effect denominational selections of
 35 parts of said computing mechanism, means normally effective to prevent a return movement of said carriage, a device for imparting a return movement to said carriage and a line-spacing movement to said platen,
 40 means operated by said carriage-returning and line-spacing device, when actuated, for varying the relative positions of parts of said denomination-selecting means so as to prevent engagement on movement of said
 45 carriage, and for rendering said carriage-return-preventing means ineffective, a carriage-returning device independent of said line-spacing means, and means operated by said independent carriage-returning device,
 50 when actuated, for effecting a like variation of the relative positions of the parts of said denomination-selecting means and for also rendering said carriage-return-preventing means ineffective.

5. In a combined typewriting and computing machine, in combination, a computing mechanism, a traveling platen carriage, a platen movably mounted in said carriage, means, including parts normally caused to be
 60 brought into engagement and to be operated on movement of said carriage in one direction, to effect denominational selections of parts of said computing mechanism, means normally effective to prevent a return move-
 65 ment of said carriage, a device for impart-

ing a return movement to said carriage and a line-spacing movement to said platen, means operated by said carriage-returning and line-spacing device, when actuated, for
 70 varying the relative positions of parts of said denomination-selecting means so as to prevent engagement on movement of said carriage, and for rendering said carriage-return-preventing means ineffective, a back-spacing device for imparting a step-by-step
 75 return movement to said carriage, and means operated by said back-spacing device, when actuated, for effecting a like variation of the relative positions of the parts of said denomination-selecting means and for also render-
 80 ing said carriage-return-preventing means ineffective.

6. In a combined typewriting and computing machine, the combination with numeral keys and computing wheels, of a traveling carriage, a denomination-selecting device, means controlled by the numeral keys for determining the extent of rotation of the
 85 computing wheels, a rotatable platen in said traveling carriage, a line-spacing lever for rotating said platen and returning said carriage, means connected to said line-spacing lever for making said denomination-selecting device ineffective, a pawl normally effective
 90 to hold said carriage against return movement, and means for making both said pawl and said selecting device ineffective by the operation of said line-space lever.

7. In a combined typewriting and computing machine, in combination, a computing mechanism, a traveling carriage, means, including parts normally caused to be brought into engagement and to be operated
 100 on movement of said carriage in one direction, to effect denominational selections of parts of said computing mechanism, means normally tending to engage and prevent a return movement of said carriage, a manually operative device, and means operated
 105 by said device, when actuated, for varying the relative positions of parts of said denomination-selecting and carriage-return-preventing means so as to prevent the engagement of the parts of either during a movement of said carriage.
 115

8. In a combined typewriting and computing machine, the combination with numeral keys, computing wheels and a traveling carriage, of a tappet setttable on said carriage, selector bars movable by said tap-
 120 pet, a movable frame in which said selector bars are pivoted, means for swinging said movable frame to carry said selector bars into and out of the path of said tappet, a pawl on the frame of the typewriting machine normally effective to prevent the return
 125 of said carriage, and means for swinging said pawl to ineffective position by movement of said frame.

9. In a combined typewriting and com- 130

puting machine, the combination with numeral keys, computing wheels and a traveling carriage, of a tappet settable on said carriage, selector bars adapted to cooperate with said tappet, a movable frame in which said selector bars are mounted, means for moving said selector bars by swinging said frame so that said tappet is ineffective thereon, a bar extending along said traveling carriage, a line-spacing lever for returning said traveling carriage, and means connecting said lever to said bar to move said frame to move the parts controlled thereby to ineffective positions.

10. In a combined typewriting and computing machine, the combination with a traveling carriage, of a gang of computing wheels, a rack bar for each computing wheel having settable index pins thereon, the rack bars being normally out of pin-setting position, selector bars adapted to be moved by said carriage, and means including a hook capable of being operated by each selector bar, the nose of each hook being adapted to cooperate with its rack bar to move said rack bar in the direction of its length to bring its pins into settable positions.

11. In a combined typewriting and computing machine, the combination with a traveling carriage, of a gang of computing wheels, a rack bar for each computing wheel having settable index pins thereon, the rack bar normally out of pin-setting position, selector bars adapted to be moved by said carriage, a hook for each selector bar, the nose of each hook being adapted to cooperate with its rack bar to move said rack bar to bring its pins into settable positions, a rock shaft intermediate each selector bar and its hook, and two rock arms on each shaft, one attached to the hook and the other adapted to operate the selector bar; said rock arms being placed on intersecting lines.

12. In a combined typewriting and computing machine, the combination with numeral keys and a traveling carriage, of a gang of computing wheels, a rack bar for each computing wheel having pins thereon normally in an ineffective position, selector bars adapted to be moved by said carriage, a frame in which said selector bars are pivoted, a hook for each selector bar to be moved thereby, the nose of each hook being adapted to cooperate with its rack bar to move said rack bar to bring its pins into positions in which they are subject to the action of the numeral keys, and means for swinging said frame to carry said selector bars clear of the carriage without disturbing said hooks.

13. In a combined typewriting and computing machine, the combination with numeral keys and a traveling carriage, of rack bars comprising devices settable by said keys, selector bars operated *seriatim* by said

carriage to move said rack bars *seriatim* to positions in which the settable devices thereon are subject to the action of the numeral keys, a hook for each selector bar for moving the corresponding rack bar, a series of rock shafts, one for each selector bar, a rock arm on each shaft joined to the corresponding selector bar, and a rock arm on each shaft connected to the corresponding hook.

14. In a combined typewriting and computing machine, the combination with numeral keys and a traveling carriage, of rack bars comprising devices settable by said keys, selector bars operated *seriatim* by said carriage to move said rack bars *seriatim* to positions in which the settable devices thereon are subject to the action of the numeral keys, a hook for each selector bar for moving the corresponding rack bar, a series of rock shafts, one for each selector bar, a rock arm on each shaft joined to the corresponding selector bar, and a rock arm on each shaft connected to the corresponding hook; said sets of rock arms being so arranged that when the selector bars are operated *seriatim* in one direction, the rack bars are moved to effective position *seriatim* in the opposite direction.

15. In a combined typewriting and computing machine, the combination, with a traveling carriage; of computation members in which numbers are temporarily registered; selector bars for selecting said computation members *seriatim*; a swinging frame in which said selector bars are mounted to swing about a pivotal axis, said selector bars also mounted to swing about a second pivotal axis which is separate from the first-named axis; and means for swinging said frame, so as to swing said bars about the second-named pivotal axis and thereby carry them into ineffective position.

16. In a combined typewriting and computing machine, the combination, with a traveling carriage; of computation members in which numbers are temporarily registered; selector bars for selecting said computation members *seriatim*; a swinging frame in which said selector bars are mounted to swing about a pivotal axis, said selector bars also mounted to swing about a second pivotal axis which is separate from the first-named axis; means for swinging said frame so as to swing said bars about the second-named pivotal axis and thereby carry them into ineffective position; and a spring acting to normally hold said frame in a position in which said bars are effective.

17. In a combined typewriting and computing machine, the combination, with a traveling carriage; of computation members in which numbers are temporarily registered; selector bars for selecting said computation members *seriatim*; a swinging frame in which said selector bars are mount-

ed to swing about a pivotal axis, said selector bars also mounted to swing about a second pivotal axis which is separate from the first-named axis; means for swinging said frame so as to swing said bars about the second-named pivotal axis and thereby carry them into ineffective position; a spring acting to normally hold said frame in a position in which said bars are effective; and means for adjusting the normal position in which said frame is held by said spring.

18. In a combined typewriting and computing machine, in combination, a computing mechanism, a traveling carriage, means, including parts normally caused to be brought into engagement and to be operated on movement of said carriage in one direction, to effect denominational selections of parts of said computing mechanism, means normally effective to prevent a movement of said carriage in the opposite direction whenever said parts of said denomination-selecting means are in such relative positions as to be brought into engagement, the relative positions of parts of said denomination-selecting means being capable of being varied at will, so as not to be brought into engagement on movement of said carriage, and an operative connection between parts of said denomination-selecting means and said carriage-movement-preventing means effective to render said carriage-movement-preventing means ineffective when the relative positions of parts of said denomination-selecting means are so varied.

19. In a combined typewriting and computing machine, in combination, a computing mechanism, a traveling carriage, means, including parts normally caused to be brought into engagement and to be operated on movement of said carriage in one direction, to effect denominational selections of parts of said computing mechanism, and means for varying the relative positions of parts of said denomination-selecting means, so as to prevent engagement on movement of said carriage, said denomination-selecting means and said position-varying means including parts brought into mutual engagement on operation of said position-varying means so as to prevent the overthrow of either of said means beyond a predetermined extent of actuation.

20. In a combined typewriting and computing machine, in combination, a computing mechanism, a traveling carriage, means, including parts normally caused to be brought into engagement and to be operated on movement of said carriage in one direction, to effect denominational selections of parts of said computing mechanism, means normally effective at any position of said carriage to prevent a return movement of said carriage, a back-spacing mechanism

for effecting a step-by-step return movement of said carriage, and means operated by said back-spacing mechanism, when actuated, for changing the relative positions of parts of said denomination-selecting means, so as to prevent engagement on return movement of said carriage, and for rendering said carriage-return-preventing means ineffective.

21. In a combined typewriting and computing machine, in combination, a computing mechanism, a traveling carriage, means, including parts normally caused to be brought into engagement and to be operated on movement of said carriage in one direction, to effect denominational selections of parts of said computing mechanism, means including parts normally tending to engage and prevent return movement of said carriage, a tabulating mechanism for said carriage, and means operated by said tabulating mechanism, when actuated, to change the relative positions of parts of said denomination-selecting means, so as to prevent their engagement on movement of said carriage, and for maintaining the parts of said carriage-return-preventing means disengaged during a tabulating movement of said carriage.

22. In a combined typewriting and computing machine, in combination, a computing mechanism, a traveling carriage, means, including parts normally caused to be brought into engagement and to be operated on movement of said carriage in one direction, to effect denominational selections of parts of said computing mechanism, means, including parts normally tending to engage and prevent return movement of said carriage, a back-spacing mechanism for effecting a step-by-step return movement of said carriage, means operated by said back-spacing mechanism, when actuated, for varying the relative positions of parts of said denomination-selecting means, to prevent engagement on movement of said carriage, and for maintaining the parts of said carriage-return-preventing means in disengaged relation, a tabulating mechanism for said carriage, and means operated by said tabulating mechanism, when actuated, for effecting a like variation of the relative positions of parts of said denomination-selecting means, and for likewise maintaining the parts of said carriage-return-preventing means in disengaged relation.

23. In a combined typewriting and computing machine, the combination with a traveling carriage, of selector bars operated thereby, pivots on which the selector bars are turned when so operated, an item register, pivots connecting said selector bars to said item register, and means for moving said selector bars to ineffective position by

moving said first-named pivots so as to swing said selector bars around said second-named pivots.

24. In a combined typewriting and computing machine, the combination with numeral keys and a traveling carriage, of computing wheels, a selecting device for determining at each position of said carriage on which wheel a numeral key shall be effective, a pawl pivoted on the frame of the typewriter for preventing backward movement of said carriage, and a movable frame in which said selecting device is mounted, and by which it is carried to ineffective position, said frame having an extension for moving said pawl to ineffective position when said selecting device is carried to ineffective position.

25. In a computing machine, the combination, with a set of denominational computing members; of a set of selectors, one for each computing member; a rocking frame wherein said selectors are pivotally mounted; means for rocking said selectors individually about their pivots and relatively to said frame; a set of linkages connecting said selectors with their respective computing members, to transmit the individual rocking movements of the former to the latter, each linkage having the corresponding selector pivoted to it; and means for rocking said frame and said selectors as a unit, to carry the selectors to ineffective position with relation to the first-named rocking means, said selectors rocking at such time about their pivotal connections with said linkages.

26. In a computing machine, the combination, with a set of denominational computing members, a traveling carriage, and a tappet on said carriage; of a set of selectors, one for each computing member; a rocking frame wherein said selectors are pivoted, and relatively to which they are rocked individually about their pivots by said tappet; a set of linkages connecting said selectors with their respective computing members, to transmit the individual rocking movements of the former to the latter, each linkage having the corresponding selector pivoted to it; and means for rocking said frame and said selectors as a unit, to carry the selectors to ineffective position with relation to said tappet, said selectors rocking at such time about their pivotal connections with said linkages.

27. In a combined typewriting and computing machine, the combination with a traveling carriage and means for feeding the carriage in one direction, of means for preventing the return of said carriage, a denomination selector, denomination members on which said selector is effective in a manner determined by said carriage, means

for effecting separation between said selector and said denomination members, and a connection whereby said carriage-return-preventing means is rendered ineffective whenever said separation takes place.

28. In a combined typewriting and computing machine, the combination with a traveling carriage and means for feeding the carriage in one direction, of means for preventing the return of said carriage, a denomination selector, denomination members on which said selector is effective in a manner determined by said carriage, means for effecting separation between said selector and said denomination members, a connection whereby said carriage-return-preventing means is rendered ineffective whenever said separation takes place, and a line-space device for returning said carriage and operating said connection.

29. In a combined typewriting and computing machine, the combination with a traveling carriage and means for feeding the carriage in one direction, of means for preventing the return of said carriage, a denomination selector, denomination members on which said selector is effective in a manner determined by said carriage, means for effecting separation between said selector and said denomination members, a connection whereby said carriage-return-preventing means is rendered ineffective whenever said separation takes place, a back-space key for returning said carriage, and means connected to be operated by said back-space key and in turn operating said connection so as to make said return-preventing means ineffective.

30. In a combined typewriting and computing machine, the combination with a traveling carriage and means for feeding the carriage in one direction, of means for preventing the return of said carriage, a denomination selector, denomination members on which said selector is effective in a manner determined by said carriage, means for effecting separation between said selector and said denomination members, a connection whereby said carriage-return-preventing means is rendered ineffective whenever said separation takes place, a tabulating device for positioning said carriage, and means connected to be operated by said tabulating device to operate said connection and thus render said return-preventing means ineffective.

31. In a combined typewriting and computing machine, the combination with rack-bars forming an item register, of a separate spring for each rack-bar normally holding it, means for moving each rack-bar against the tension of its spring, a digit-determining means effective on said rack-bar when so moved, said spring adapted to return the

bar from digit-determining position, denomination members for selecting said rack-bar, and a single universal bar normally holding all of said denomination members ineffective on said rack-bars.

32. In a combined typewriting and computing machine, the combination with the frame of the machine, of a denominational frame, a traveling carriage, denomination members in said denominational frame on which said carriage is effective, a bar pivoted to the frame of the machine having one end adjacent said denominational frame, a tabulating device for positioning said carriage, and a universal bar forming part of said tabulating device and effective on the other end of said pivoted bar to make the denomination members ineffective.

33. In a combined typewriting and computing machine, the combination with a denominational frame and the frame of the machine on which said denominational frame is supported, of a pawl on the machine frame, a typewriter carriage, a rack on said carriage on which said pawl is effective, and a bail on the typewriter carriage effective on said denominational frame to make the pawl ineffective.

34. In a computing machine, the combination with rack-bars settable to effective position, of a spring for each rack-bar holding it normally ineffective, a lug for each rack-bar to move it to effective position, a denomination member connected to said lug, a traveling carriage effective on the denomination members, a universal bar normally holding said lugs in an ineffective position, and a single spring for said universal bar.

35. In a computing machine, the combination with rack-bars settable to effective position, of a spring for each rack-bar for holding it normally ineffective, a hook for each rack-bar, a transposition device comprising a rock shaft for each hook, a denomination member connected to each rock shaft, a traveling carriage effective on the denomination members, a universal bar normally holding said hooks in an ineffective position, and a single spring for said universal bar.

36. In a combined typewriting and computing machine, the combination with numeral keys and a traveling carriage, of a tabulating device for positioning said carriage, said tabulating device comprising a rack bar on said carriage and stops below said rack bar and movable thereto to be effective, a denomination-determining frame extending above said rack bar, and means connected with said carriage for controlling the position of said frame.

37. The combination with a typewriting mechanism including a traveling carriage, of a computing mechanism, a series of denomination members extending between said typewriting mechanism and said computing

mechanism, and forming a means to effect denominational selection of said computing mechanism, said members being operative by said carriage during the travel thereof, means for shifting said members bodily in a direction transverse to the direction of length thereof, so as to govern their control by said carriage, and a lock for said carriage movable with said members to an ineffective position so as to admit of a movement of said carriage when said members are in their ineffective position.

38. In a combined typewriting and computing machine, in combination, a computing mechanism, a traveling carriage, means, including parts normally caused to be brought into engagement and to be operated on movement of said carriage in one direction, to effect denominational selections of parts of said computing mechanism, the parts of said denomination-selecting means being subject to injury if permitted to engage on a return movement of said carriage, the relative positions of parts of said denomination-selecting means being capable of being varied at will, so as not to be brought into engagement on movement of said carriage, and means normally tending to prevent a return movement of said carriage whenever the parts of said denomination-selecting means are relatively positioned for effecting an engagement.

39. The combination with a typewriting mechanism, of a series of selector bars operable by said typewriting mechanism, a transposition device including a series of members pivoted to said selector bars so as to be operated thereby, and shifting means for swinging said selector bars about the pivotal connection between said selector bars and said members so as to govern the control of said selector bars by said typewriting mechanism, while leaving said transposition device undisturbed.

40. In a combined typewriting and computing machine, the combination with numeral keys, computing wheels, and a traveling carriage; of a tappet settable on said carriage; selector bars adapted to be rocked by said tappet; a movable frame in which said selector bars are pivoted to permit such rocking movement; and means for rocking said movable frame and said selector bars about a pivotal axis different from that about which said selector bars move during their first-named rocking movement, so as to carry said selector bars into and out of the path of said tappet.

41. In a combined typewriting and computing machine, the combination, with numeral keys and computing wheels; of a traveling carriage; a denomination-selecting device; means controlled by the numeral keys for determining the extent of rotation of the computing wheels; a platen in said

carriage; a device for returning said carriage; a detent normally effective to hold said carriage against return movement; and means connected to said returning device for rendering both said detent and said selecting device ineffective.

42. In a combined typewriting and computing machine, the combination, with numeral keys and computing wheels; of a traveling carriage; denomination-selecting mechanism, including a member settable on said carriage; means controlled by the numeral keys for determining the extent of rotation of the computing wheels; a platen in said carriage; a device for returning said carriage; a detent normally effective to hold said carriage against return movement; and means connected to said returning device for rendering both said selecting device and said detent ineffective.

43. In a combined typewriting and computing machine, in combination, a computing mechanism, a traveling platen carriage, a platen movably mounted in said carriage, means, including parts normally caused to be brought into engagement and to be operated on movement of said carriage in one direction, to effect denominational selections of parts of said computing mechanism, a device including a movably mounted finger-piece affording means for manually imparting a return movement to said carriage, said device also including means operated on movement of said finger-piece relatively to said carriage, when used to return the same, for effecting a line-spacing movement of said platen, and means operated by said carriage-returning and line-spacing device, when so actuated, for varying the relative positions of the parts of said denomination-selecting means so as to prevent engagement thereof.

44. In a combined typewriting and computing machine, in combination, a computing mechanism, a traveling platen carriage, a platen movably mounted in said carriage, means, including parts normally caused to be brought into engagement and to be operated on movement of said carriage in one direction, to effect denominational selections of parts of said computing mechanism, means normally effective to prevent a return movement of said carriage, a device including a movably mounted finger-piece affording means for manually imparting a return movement to said carriage, said device also including means operated on movement of said finger-piece relatively to said carriage, when used to return the same, for effecting a line-spacing movement of said platen, and means operated by said carriage-returning and line-spacing device, when so actuated, for rendering said carriage-return-preventing means ineffective, and for varying the relative positions of the parts of said de-

nomination-selecting means, so as to prevent engagement thereof.

45. In a combined typewriting and computing machine, in combination, a computing mechanism, a traveling platen carriage, a platen movably mounted in said carriage, means, including parts normally caused to be brought into engagement and to be operated on movement of said carriage, to effect denominational selections of parts of said computing mechanism, means for varying the relative positions of the parts of said denomination-selecting means so as to prevent engagement on movement of said carriage, a device for imparting a return movement to said carriage and a line-spacing movement to said platen, a tabulating device for said carriage, and connections from both said devices to said position-varying means, effective on operation of either of said devices, when actuated, to cause the relative positions of the parts of said denomination-selecting means to be varied, so as to prevent engagement on movement of said carriage.

46. In a combined typewriting and computing machine, in combination, a computing mechanism, a traveling platen carriage, a platen movably mounted in said carriage, means, including parts normally caused to be brought into engagement and to be operated on movement of said carriage in one direction, to effect denominational selections of parts of said computing mechanism, means for varying the relative positions of parts of said denomination-selecting means so as to prevent engagement on movement of said carriage, a device for imparting a return movement to said carriage and a line-spacing movement to said platen, a back-spacing device for imparting a step-by-step return movement to said carriage, and connections from both said devices to said position-varying means, effective on operation of either of said devices, when actuated, to cause the relative positions of the parts of said denomination-selecting means to be varied, so as to prevent engagement on movement of said carriage.

47. In a combined typewriting and computing machine, in combination, a computing mechanism, a traveling platen carriage, a platen movably mounted in said carriage, means, including parts normally caused to be brought into engagement and to be operated on movement of said carriage, to effect denominational selections of parts of said computing mechanism, means, including parts normally tending to engage, for preventing a return movement of said carriage, means for varying the relative positions of the parts of said denomination-selecting and carriage-return-preventing means, so as to render said carriage-return-preventing means ineffective, and so as to prevent engagement of the parts of said denomina-

tion-selecting means on movement of said carriage, a device for imparting a return movement to said carriage and a line-spacing movement to said platen, a tabulating device for said carriage, and connections from both said devices to said position-varying means, so that on operation of either device said carriage-return-preventing means will be rendered ineffective, and the engagement of the parts of said denomination-selecting means prevented.

48. In a combined typewriting and computing machine, in combination, a computing mechanism, a traveling platen carriage, a platen movably mounted in said carriage, means, including parts normally caused to be brought into engagement and to be operated on movement of said carriage, to effect denominational selections of parts of said computing mechanism, means for varying the relative positions of the parts of said denomination-selecting means so as to prevent engagement on movement of said carriage, a device for imparting a return movement to said carriage and a line-spacing movement to said platen, a tabulating device for said carriage, a back-spacing device for imparting a step-by-step return movement to said carriage, and connections from each of said devices to said position-varying means, so that on operation of any one of said devices the engagement of the parts of said denomination-selecting means will be prevented.

49. In a combined typewriting and computing machine, in combination, a computing mechanism, a traveling platen carriage, a platen movably mounted in said carriage, means, including parts normally caused to be brought into engagement and to be operated on movement of said carriage, to effect denominational selections of parts of said computing mechanism, means, including parts normally tending to engage, for preventing a return movement of said carriage, means for varying the relative positions of the parts of said denomination-selecting and carriage-return-preventing means, so as to render said carriage-return-preventing means ineffective, and so as to prevent engagement of the parts of said denomination-selecting means on movement of said carriage, a device for imparting a return movement to said carriage and a line-spacing movement to said platen, a tabulating device for said carriage, a back-spacing device for imparting a step-by-step return movement to said carriage, and operating connections from each of said devices to said position-varying means, so that on operation of any one of said devices said carriage-return-preventing means will be rendered ineffective and the engagement of the parts of said denomination-selecting means prevented.

HANS HANSON.

Witnesses:

ROBT. B. CONE,
MARION L. CHAPMAN.