

**LEARNING
THE BURROUGHS
COMPUTING-BILLING
MACHINES**

Manual of Basic Operations



key functions,
controls and features of
Styles M 231 and M 235

LEARNING THE BURROUGHS COMPUTING-BILLING MACHINES

Manual of Basic Operations



Burroughs

ADDING, ACCOUNTING, CALCULATING, BILLING AND STATISTICAL MACHINES
AND CASH REGISTERS • MICROFILM EQUIPMENT • MACHINE METHODS
SERVICE AND MECHANICAL SERVICE • SUPPLIES FOR BUSINESS MACHINES

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Detroit, Michigan

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Introduction

Figures comprise the most important part of billing and accounting. The computing mechanism of the Burroughs Computing-Billing Machine is constructed to handle figures in the most convenient and efficient way possible. In fact, it is the only

machine that performs all the operations of **invoicing**—typing, adding, subtracting, multiplying, accumulating several totals at one time, handling fractions, figuring discounts and extending the net amounts.

ANY MANUFACTURER OR WHOLESALER				
Customers Order No. & Date 2465 12/19	Invoice Date DEC 30 5-	1	Refer to Invoice Number	
Requisition No.	Vendor's Nos. 2365		FOR CUSTOMER'S USE ONLY	
Contract No.			Register No.	Voucher No.
• A I CUSTOMER • ANYWHERE			F. O. B. Checked	
			Terms Approved	Price Approved
			Calculations Checked	
			Transportation	
			Freight Bill No.	Amount
			Material Received	
			Date	Signature
			Satisfactory and Approved	
			Adjustments	
			Accounting Distribution	
			Audited	Final Approval
Shipped to & Destination SAME	Date Shipped 12/21	From ANYPOINT		
Car Initials & No. NP 235767	How Shipped and Route GT-CB&Q-NP	F. O. B. ANYWHERE		
Terms: 2% 10 DAYS		Prepaid or Collect PREPAID		
		Salesman		

QUANTITY	DESCRIPTION	PRICE	AMOUNT	NET
6	DZ ARTICLES ← 2	4 25	25 50	
10	DZ ARTICLES	12 50	125 00	
29	DZ ARTICLES	9 87	286 23	
10 ³ / ₄	DZ ARTICLES	3 12 ¹ / ₂	33 59	
1/2	DZ ARTICLES	2 25	1 13	
			471 45	
	LESS 60-10-5% ← 6			
72	ONLY	1 12 C NT		161 24
	LESS FRT 608 LBS AT ← 12	26 ¹ / ₂ CWT		81
				162 05
				1 61
				160 44

The arrows point to some of the remarkable results obtainable with the Burroughs Computing-Billing Machine. These promote speed, accuracy and simplicity in billing.

1. Date is typed from one key depression.
2. Billing typewriter combined with a compact computing keyboard.
3. Automatic alignment of dollars under dollars and cents under cents—**no decimal tabulating keys to select and depress.**
4. Extensions are computed by **direct multiplication—not repeated addition.**
5. Fractions are added or multiplied as easily as whole numbers.
6. Error key is used for correction of amounts before printing and computing, and also for restoring control keys incorrectly depressed.

7. Full cent feature takes advantage of half cent or over.

8. The long line above the total is printed by a single key depression—saves seven operations.

9. Totals are accumulated automatically and printed by the operation of the total key—not copied, figure by figure, from dials.

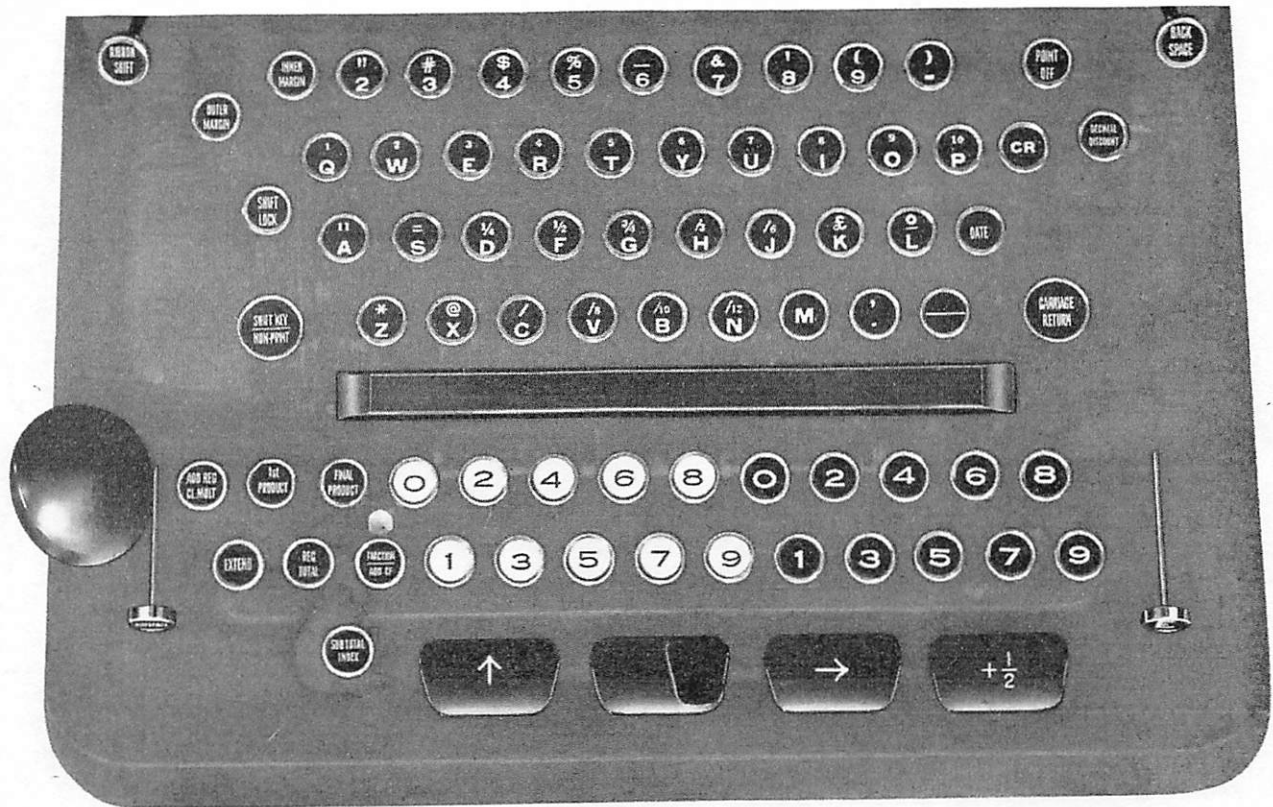
10. Discounts are quickly and easily computed.

11. By the touch of a key or motor bar, the carriage is electrically returned to the starting point and the paper is automatically spaced up for the next line of writing.

12. Freight or other allowances are computed and either added or subtracted.

13. Net amount is accumulated automatically and is printed by the operation of the total key—not copied, figure by figure, from dials.

The Typewriter



The typing unit of the machine is equipped with standard billing type, with fraction numerals and commercial signs in the shift position. (See The Shift Lock.) Since the type is all capital letters, it should be remembered that the letters I and O are used, respectively, for the large numerals, one and zero.

The Shift Lock—Depression of this key shifts and locks the carriage. It is used for typing fraction numerals and commercial signs which are in the shift position of the typewriter keys. It also prevents printing from the computing mechanism.

The Shift Non-print Key—Depression of this key releases the Shift Lock and restores the carriage to original position. Holding this key depressed permits the typing of single, shift-position fraction numerals and commercial signs. It also prevents printing from the computing mechanism.

Carriage Return Key—Depressing this key returns the carriage to the left-hand margin.

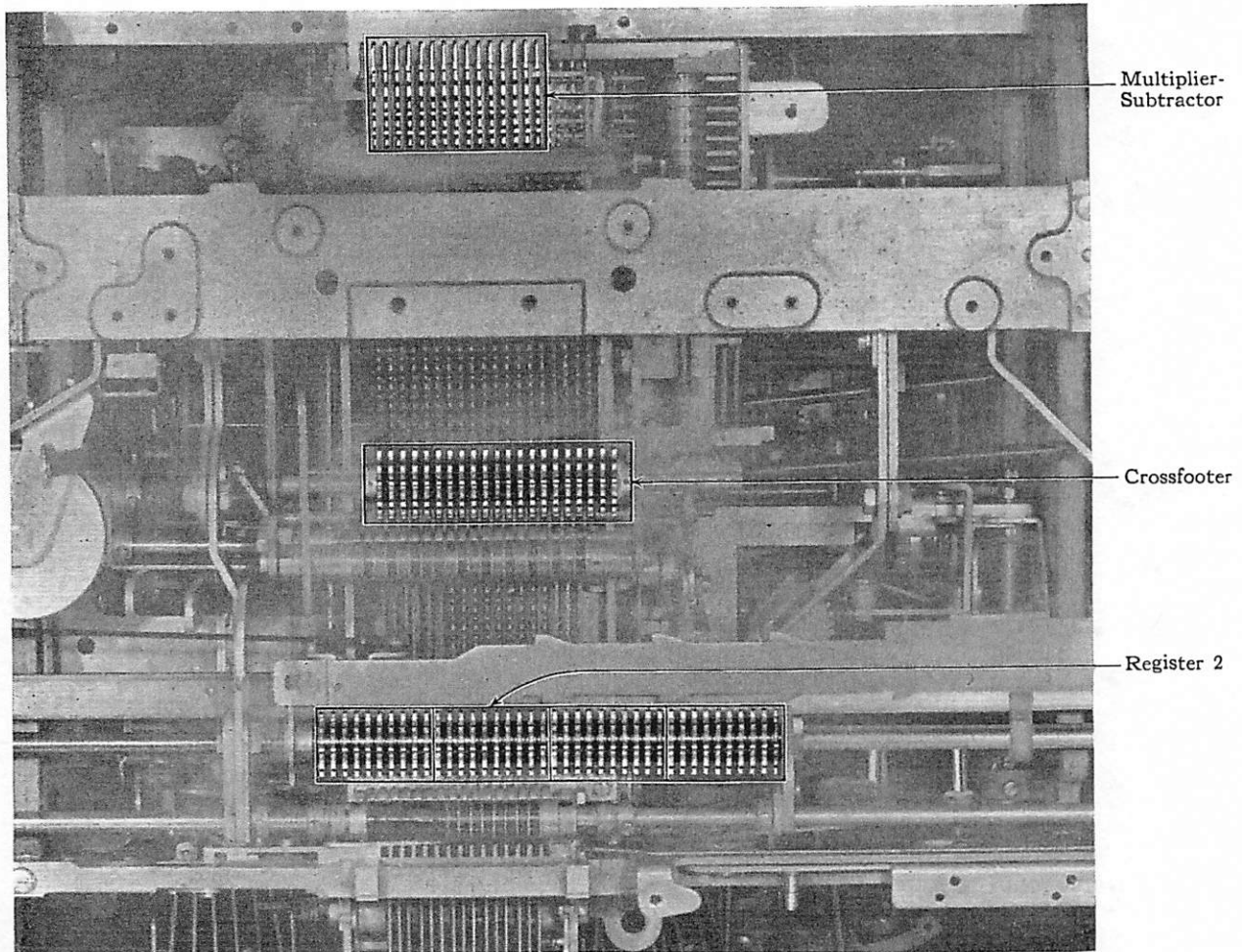
Fingering—It is desirable that the typewriter be operated by touch method. When the hands are in the home position, the little finger of the right hand should rest on the date key.

Date Key—The complete date (month, day and year) may be printed by striking the Date key. The dating mechanism is usually changed to the correct date at the beginning of each day's work and requires no further attention.

To change the dating mechanism:

1. Raise the carriage and push the ribbon back with a stylus.
2. Raise dating mechanism by depressing the Date key and hold the Date Latch lever located at the upper left-hand corner of the front panel.
3. With a stylus, move the Date Lock at the right of the dating mechanism to the right and turn the dials to the desired position. Relock the date and straighten the ribbon.

The Computing Unit



The computing unit includes three important sections: (1) the crossfooter, (2) the registers, and (3) the multiplier-subtractor.

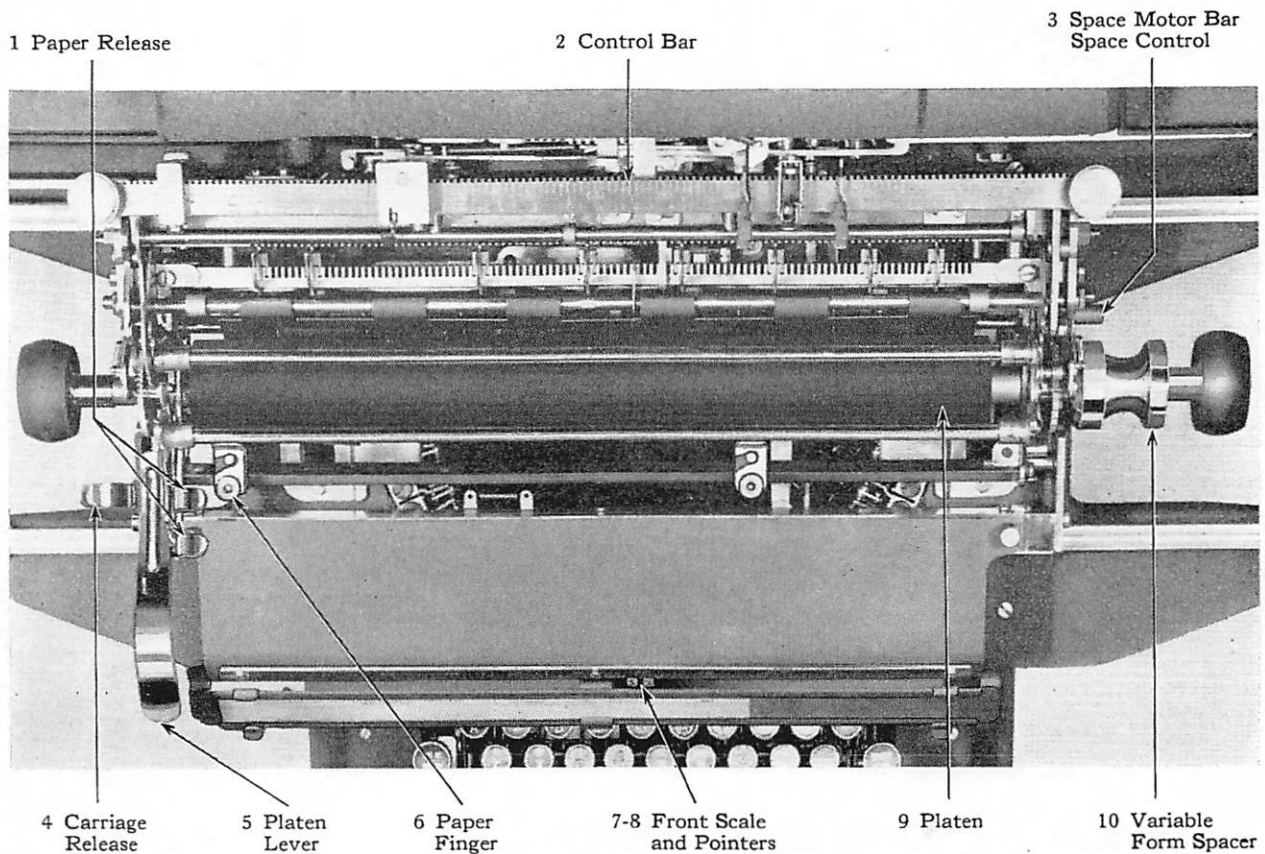
Crossfooter—This section of the computing unit is an adding machine that is in active position at all times. The word crossfooter means to add across. Therefore, the crossfooter is used for each line of an invoice that is computed and is cleared at the end of each line. The results of all multiplications, also direct subtractions, are developed in the crossfooter.

Registers—These are equivalent to separate adding machines which are used to accumulate

amounts entered in different columns. In this machine, there are four registers, but certain models may have more than four. Only one register may be in active position at any time. The registers can be shifted so that any desired register may be brought into position, either automatically by a Register Trip or Return control as the carriage moves from column to column, or manually by use of the Register Trip key or the Register Return key (See page 22).

Multiplier-Subtractor—In this section is introduced one of the factors of a multiplication or an amount that is to be subtracted. It is not an adding or accumulating register.

The Carriage



1. **Paper Release**—Depressing the rear Paper Release lever releases the pressure rolls so that the paper can be adjusted. The front lever, depressed alone, locks the Paper Release mechanism in released position. To unlock, the rear lever is pressed.

2. **Control Bar**—On this bar are located the Margin Controls, the Register Tripping Controls, the Register Return Control, and other automatic controls. These features are described in detail on pages 21, 22, 25, 26 and 27.

3. **Space Adjustment for Space Motor Bar**—The position of this control, determines whether the paper spaces up one or two spaces when the Space Motor Bar is operated. If it is pushed in, as in the illustration, the paper turns up one space. When it is pulled out, the paper turns up two spaces.

4. **Carriage Release**—Depressing this lever permits free movement of the carriage by hand.

5. **Platen Lever**—This is used for raising or lowering the platen.

6. **Paper Fingers**—These fingers hold the paper smoothly against the platen. They are movable for different widths of paper. Small pointers on the sides of the paper fingers indicate the position of the writing line.

7-8. **Front Scale and Pointers**—This scale corresponds to a scale under the platen (not illustrated) and with the scale on the Tabulator Stop Bar. The right-hand Pointer (8) indicates the typewriter printing position; the left-hand Pointer indicates the printing position of the units of cents of the computing mechanism.

9. **Platen**—This provides a writing surface.

10. **Variable Form Spacer**—By pulling out the Variable Form Spacer, the paper may be turned up a fraction of a regular space.

The Adding Keys and the Multiplying Keys

The adding keys are used to set up amounts to be added, subtracted or multiplied.

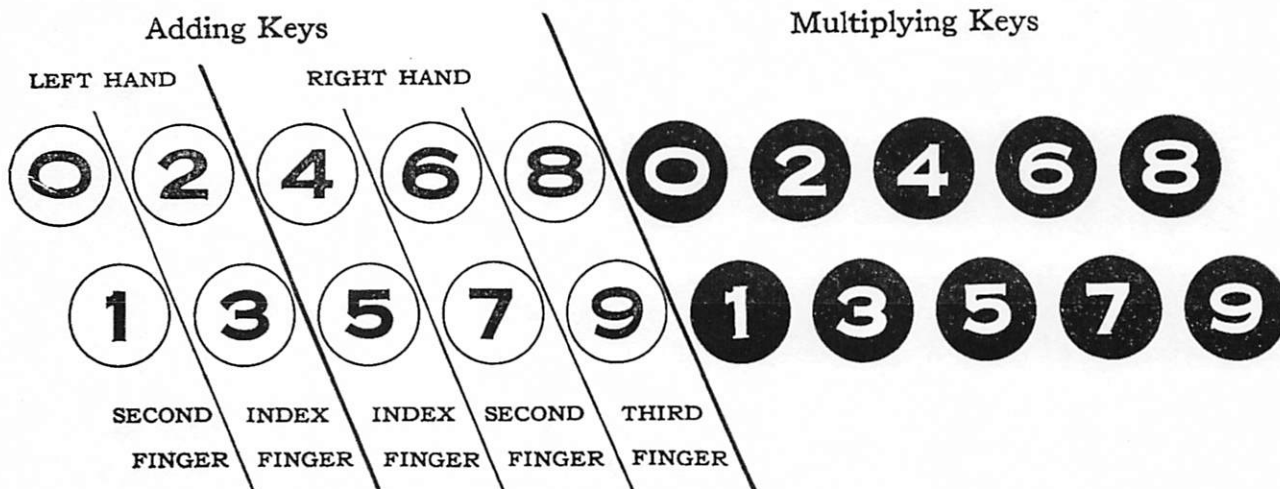
The multiplying keys are used for entering the multiplying factor.

The Error Key—Depressing this key eliminates the amount entered on the adding keys before it is printed or added and restores the Extend key, the Fraction/Add Crossfooter key, or the Subtotal Index key when depressed in error.

Two-hand Fingering

Where practical, both hands should be used in operating the adding keys. (Two-hand fingering is not used on the multiplying keys.) The index and

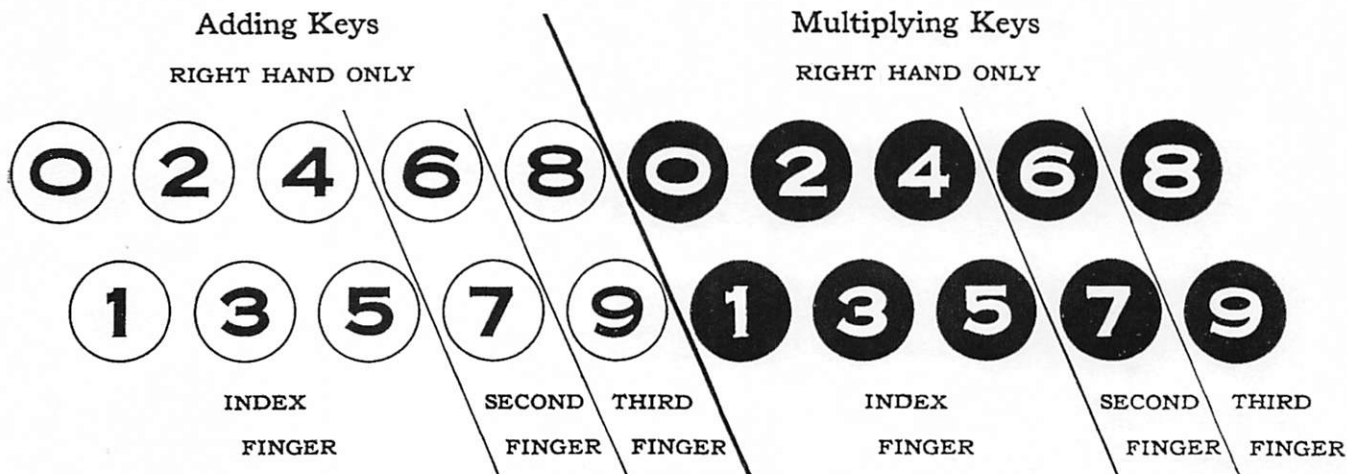
second fingers of the left hand and the index, second, and third fingers of the right hand are used as illustrated.



One-hand Fingering

The right hand is always used for operating the multiplying keys and is used in setting up amounts on the adding keys when the left hand is needed for

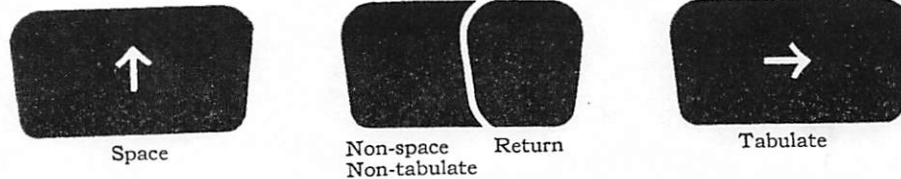
turning media or handling other forms. The index, second, and third fingers of the right hand are used as illustrated.



Fingering of Result and Control Keys

Result and control keys are depressed with the index or second finger of the left hand.

The Motor Bars



The Space Motor Bar—operates the computing mechanism and spaces the paper but does not tabulate the carriage. This is commonly used for listing figures in a column.

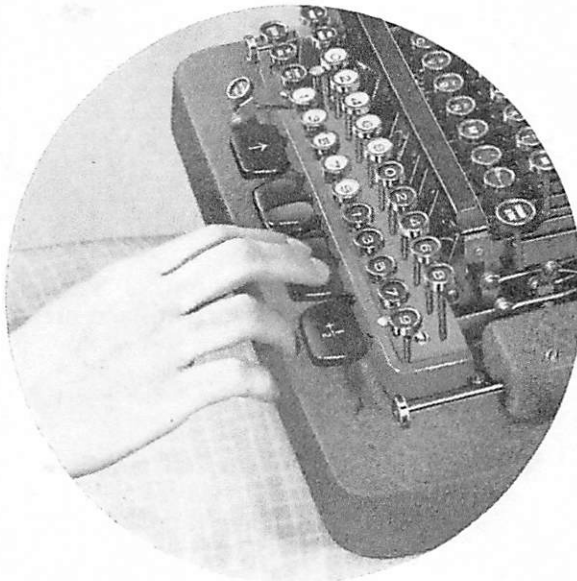
The Non-space Non-tabulate Motor Bar—operates the computing mechanism but does not tabulate the carriage nor space the paper. This is most commonly used when it is desired to print an amount and then type close to the right of it.

The Return Motor Bar—operates the computing mechanism and returns the carriage to the left-hand margin. Form spacing is obtained as explained on page 23.

The Tabulate Motor Bar—operates the computing mechanism and causes the carriage to tabulate to the next position. It does not space the paper.

Fingering—All motor bars are operated with the first two fingers as the hand is dropped naturally from the adding keys, as illustrated at the left.

Space Adjustment for Space Motor Bar—This control, located just behind the right-hand platen twirler, regulates the number of spaces the paper will move up when the Space motor bar is operated. If the control is pushed in, the paper moves up one space; when it is pulled out, the paper moves up two spaces.



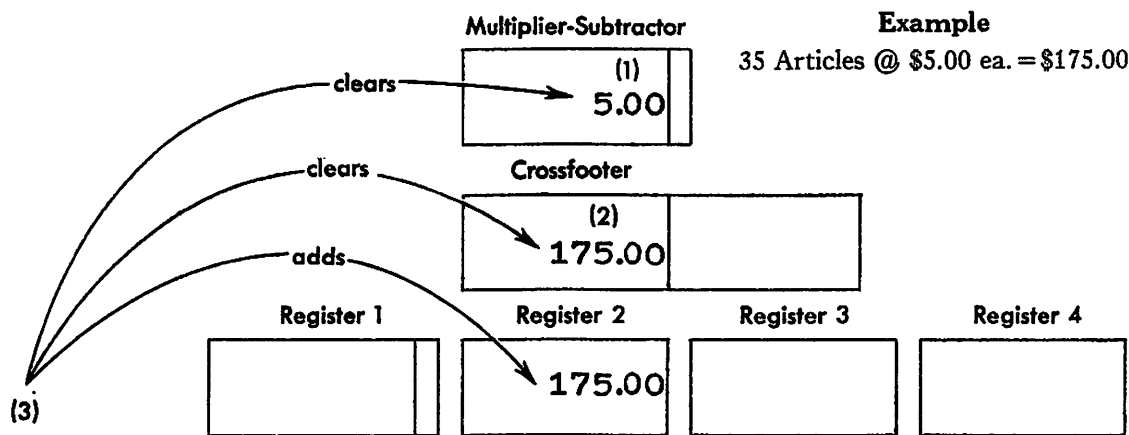
The Palm Tabulator

The Palm tabulator tabulates the carriage to the next position without operating the computing mechanism. It is most commonly used following the typing of a description, or to tabulate the carriage through inactive positions.

The Palm tabulator is operated with the palm of the left hand.

Multiplication

(See also, multiplication on machine with Printing Multiplier feature, page 10.)



To multiply:

1. Set up the price (\$5.00) on the adding keys; then depress the Extend key and operate a Motor bar. This introduces the price in the multiplier-subtractor.

2. Operate the multiplying keys for the quantity (35). As the multiplying keys operate the computing mechanism, the result of the multiplication is developed in the crossfooter immediately.

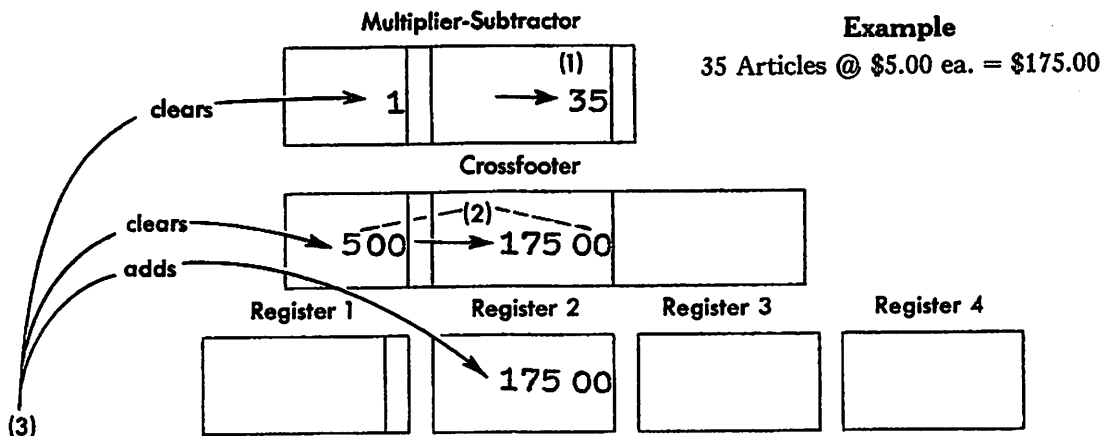
3. Operate the Final Product key to print and clear the result of the multiplication (\$175.00) from the crossfooter. This key also adds the amount in the active register and clears the multiplier-subtractor.

Maximum is Seven Key Operations—Each time a multiplying key is operated, the crossfooter moves one digit to the left. **The limit of this shifting to the left is seven digits; hence seven is the maximum number of multiplying keys that can be used in one multiplication.** The crossfooter is restored to its starting position when the result is printed and cleared.

Keep in Continuous Operation—To develop speed in multiplying, the operator should strive to keep the multiplying mechanism in continuous operation. This can be done with a little practice. Immediately after operating the first multiplying key, place the finger on the next key with a slight pressure so that it operates as soon as the previous key has functioned. In this manner the operator soon becomes accustomed to the rhythm of the machine and to the fact that the multiplying keys "0" and "1" require slightly less time to operate than the other multiplying keys.

Multiply and Tabulate Simultaneously—To save time the operator should also practice operating the multiplying keys while the carriage is being tabulated with the Palm tabulator. Frequently the multiplication can be completed before reaching the result column.

Multiplication on Machine With Printing Multiplier Feature



On this machine the factor that is entered on the multiplying keys can be printed automatically with the result of the multiplication when the Printing Multiplier Control is used. (See Printing Multiplier Control, page 27.)

To multiply:

1. Set up the quantity (35) on the adding keys; then depress the Extend key and operate a Motor bar. This introduces the quantity in the right-hand side of the multiplier-subtractor. The digit 1 is automatically introduced in the left-hand side by the Printing Multiplier Control on the Control bar.

2. Operate the multiplying keys for the price (5.00). As the multiplying keys operate the computing mechanism, both results (price and amount) are developed in the two separate sections of the crossfooter simultaneously.

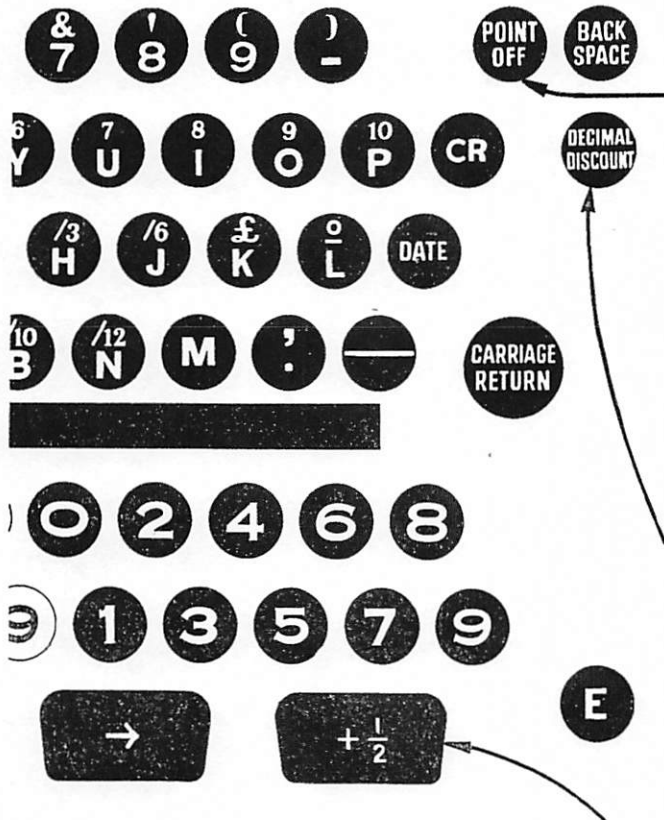
3. Operate the Final Product key to print and clear the results of the multiplication (\$5.00 and \$175.00) from the crossfooter. This key also adds the amount that was in the right-hand side of the crossfooter in the active register (the price in the left-hand side of the crossfooter does not add in a register), and clears the multiplier-subtractor.

This type of multiplication speeds billing because it eliminates typing the price and it provides a visual check on the accuracy of multiplication since both factors (quantity and price) are printed with the computing mechanism of the machine.

Maximum is Seven Key Operations—Each time a multiplying key is operated, the crossfooter moves one digit to the left. The limit of this shifting to the left is seven digits. **However, when the Printing Multiplier Feature is used, the multiplying factor is limited to six digits; hence, six is the maximum number of multiplying keys that can be used in one multiplication.** The crossfooter is restored to its normal position when the result is printed and cleared.

Keep in Continuous Operation—To develop speed in multiplying, the operator should strive to keep the multiplying mechanism in continuous operation. This can be done with a little practice. Immediately after operating the first multiplying key, place the finger on the next key with a slight pressure so that it operates as soon as the previous key has functioned. In this manner the operator soon becomes accustomed to the rhythm of the machine and to the fact that the multiplying keys "0" and "1" require slightly less time to operate than the other multiplying keys.

Multiply and Tabulate Simultaneously—To save time the operator should also practice operating the multiplying keys while the carriage is being tabulated with the Palm tabulator. Frequently the multiplication can be completed before reaching the result column.



The Point Off Key

Each depression of the Point Off key moves the decimal point one place to the left in the result of a multiplication (which is in the crossfooter). The maximum number of places that can be pointed off is the same as the number of multiplying keys that have been operated. The Point Off key is used after a multiplication when either or both of the factors contain a decimal except no point off is required for dollars and cents contained in one of the factors nor for tenth fractions introduced in the Multiplier-Subtractor.

The Decimal Discount Key

One depression of the Decimal Discount key points off as many places in a result of multiplication as there were multiplying keys operated. It is always used to point off after multiplying by a discount or a decimal which is not preceded by a whole number.

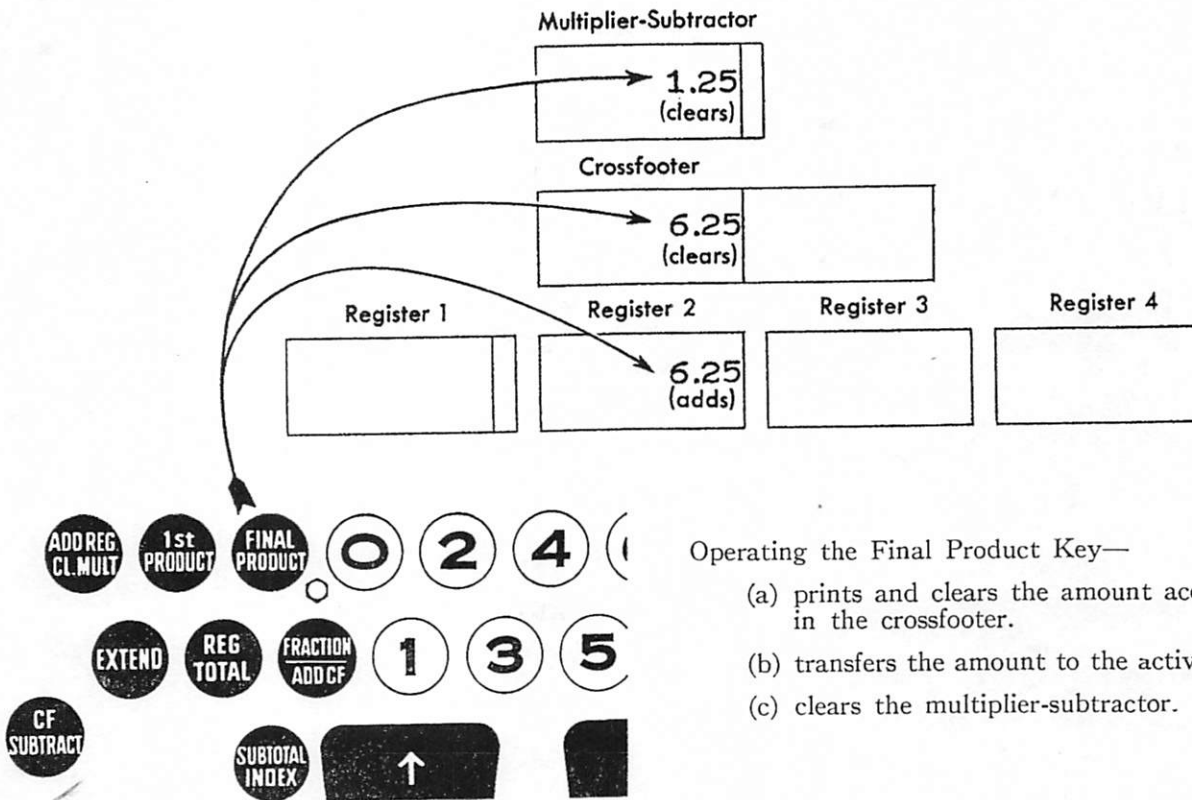
The Full Cent Bar

Operating the Full Cent bar adds .005 ($\frac{1}{2}$ cent) in the crossfooter. It should be used when there is a fraction or decimal in either factor of a multiplication or whenever the Point Off or Decimal Discount key is used. This will automatically adjust the answer to the nearest full cent. The Full Cent bar

should be operated just before the result of the multiplication is printed.

The Full Cent bar should never be used when the result is to be printed with Register 1 active.

The Final Product Key



Operating the Final Product Key—

- prints and clears the amount accumulated in the crossfooter.
- transfers the amount to the active register.
- clears the multiplier-subtractor.

Effect of Other Keys and Controls used with the Final Product Key

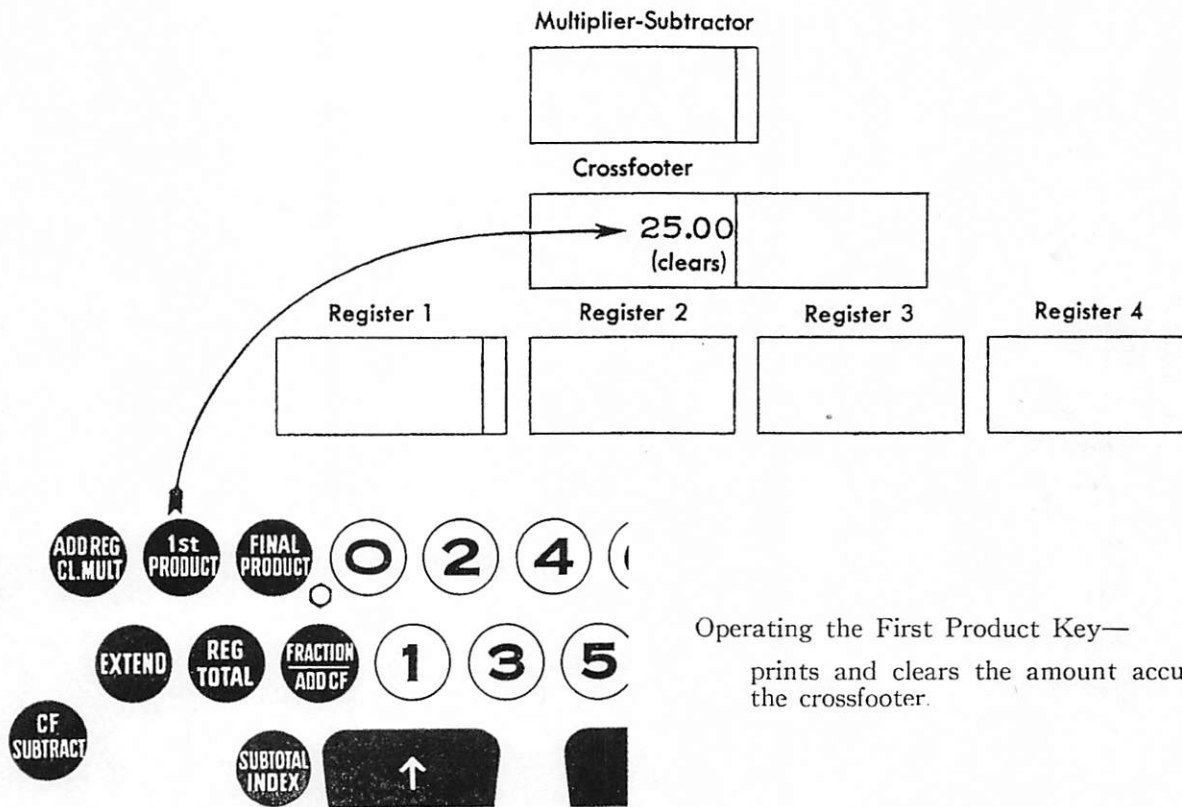
Subtotal Index Key—depressing this key before operating the Final Product key prints and retains the amount accumulated in the crossfooter, adds the amount in the active register and clears the multiplier-subtractor. This is called a sub-transfer total of the crossfooter.

Fraction/Add Crossfooter Key—Holding down this key with the small steel key behind it while operating the Final Product key prevents the amount that clears from the crossfooter from adding in the active register. The multiplier-subtractor is cleared.

Non-add or Add Crossfooter Control—Either of these controls active in a carriage position where the Final Product key is operated, prevents the amount that clears from the crossfooter from adding in the active register. The multiplier-subtractor is cleared. If in such a case it is desired to add the amount in the active register, operate the Add Register/Clear Multiplier key and the Final Product key together.

Add Register Control—has no effect upon the function of the Final Product key.

The First Product Key



Operating the First Product Key—

prints and clears the amount accumulated in the crossfooter.

Effect of Other Keys and Controls used with the First Product Key

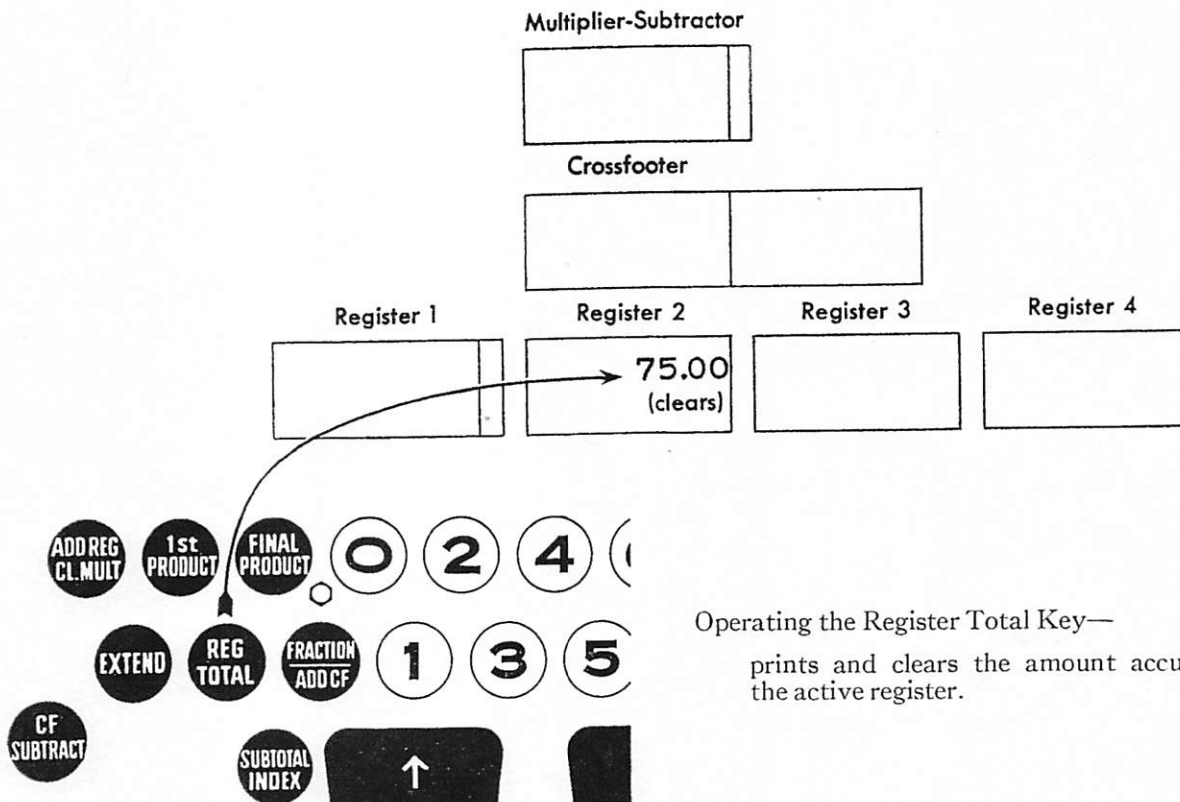
Subtotal Index Key—Depressing this key before operating the First Product key, prints and retains the amount accumulated in the crossfooter. This is called a subtotal of the crossfooter.

Add Register/Clear Multiplier Key—Operating this key and the First Product key together, prints and clears the amount accumulated in the crossfooter and clears the multiplier-subtractor.

Extend Key—Depressing this key before operating the First Product key, prints and clears the amount accumulated in the crossfooter, and introduces the amount in the multiplier-subtractor.

The Add Crossfooter, Non-add and Add Register Controls—These controls have no effect upon the function of the First Product key.

The Register Total Key



Operating the Register Total Key—

prints and clears the amount accumulated in the active register.

Effect of Other Keys and Controls used with the Register Total Key

Subtotal Index Key—Depressing this key before operating the Register Total key prints and retains the amount accumulated in the active register. This is called a subtotal of the register.

Fraction/Add Crossfooter Key—Depressing this key before operating the Register Total key, prints and clears the amount accumulated in the active register, and adds it in the crossfooter.

Extend Key—Depressing this key before operating the Register Total key, prints and clears the amount accumulated in the active register and introduces the amount in the multiplier-subtractor.

Extend Key and Fraction/Add Crossfooter Key—Depressing these keys before operating the Register Total key, prints and clears the amount accumulated in the active register, introduces the amount in the multiplier-subtractor, and adds the amount in the crossfooter.

Add Register/Clear Multiplier Key—Operating this key and the Register Total key together,

prints and clears the amount accumulated in the active register and clears the multiplier-subtractor.

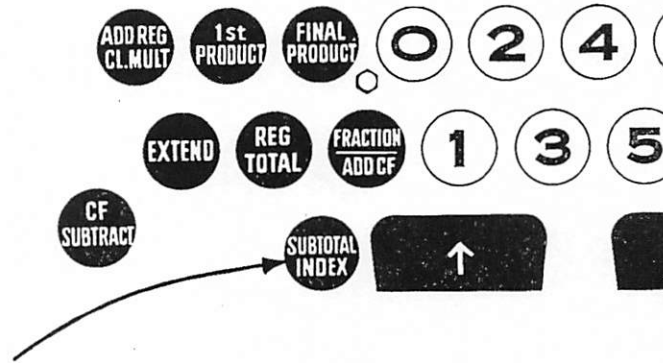
Add Crossfooter Control—This control active in a carriage position where the Register Total key is operated causes the amount that prints and clears from the active register to add in the crossfooter.

Holding down the Fraction/Add Crossfooter key and the small steel key behind it while operating the Register Total key in a carriage position where the Add Crossfooter control is active, prevents the amount that prints and clears from the active register from adding in the crossfooter.

Non-add or Add Register Control—have no effect upon the function of the Register Total key.

Depressing the Add Crossfooter key and then operating the Register Total key in a carriage position where a Non-add or Add Register control is active, prints and clears the amount accumulated in the active register and adds the amount in the crossfooter.

The Subtotal Index Key



Depressing this key before operating the Final Product, First Product, or Register total keys prevents the result that is printed with these keys from clearing.

With the Final Product Key—Depressing the Subtotal Index key before operating the Final Product key, prints and retains the amount accumulated in the crossfooter, adds the amount in the active register, and clears the multiplier-subtractor.

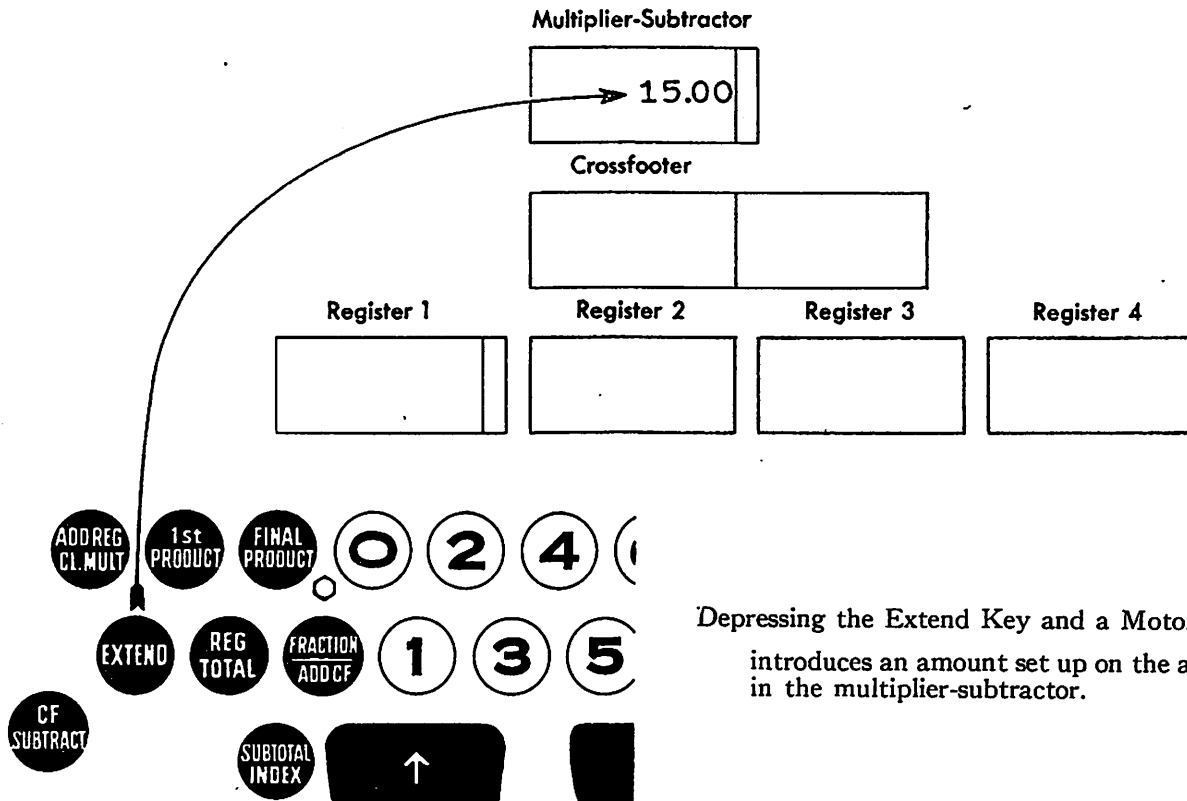
With the First Product Key—Depressing the

Subtotal Index key before operating the First Product key, prints and retains the amount accumulated in the crossfooter.

With the Register Total Key—Depressing the Subtotal Index key before operating the Register Total key, prints and retains the amount accumulated in the active register.

Note: For the function of these keys and the effect of other keys and controls used with these result keys, see pages 12, 13 and 14.

The Extend Key



Depressing the Extend Key and a Motor Bar—introduces an amount set up on the adding keys in the multiplier-subtractor.

After an amount has been introduced in the multiplier-subtractor, the Extend key is locked against depression. Therefore, a second amount cannot be introduced until the first has been cleared, either with the Final Product key or

the Add Register/Clear Multiplier key.

The Extend key should never be held down. If held down during an operation, the amount will not be introduced in the multiplier-subtractor.

Effect of Other Keys and Controls used with the Extend Key

Extend Control Button (located at the upper left-hand corner of front panel)—With this button set at NON-ADD EXT, depressing the Extend key and a motor bar introduces an amount set up on the adding keys in the multiplier-subtractor. With this button set at ADD EXT, depressing the Extend key and a motor bar introduces an amount set up on the adding keys in the multiplier-subtractor and also adds the amount in the active register. If, in such a case, it is desired to prevent addition in the active register, set up the amount on the adding keys, depress the Extend key and hold down the Fraction/Add Crossfooter key and the steel key behind it while operating a motor bar.

Fraction/Add Crossfooter Key—Depressing this key with the Extend key and a motor bar, introduces an amount set up on the adding keys in the multiplier-subtractor and also adds the amount in the crossfooter.

First Product Key—Operating this key after depressing the Extend key prints and clears the amount accumulated in the crossfooter and introduces the amount in the multiplier-subtractor.

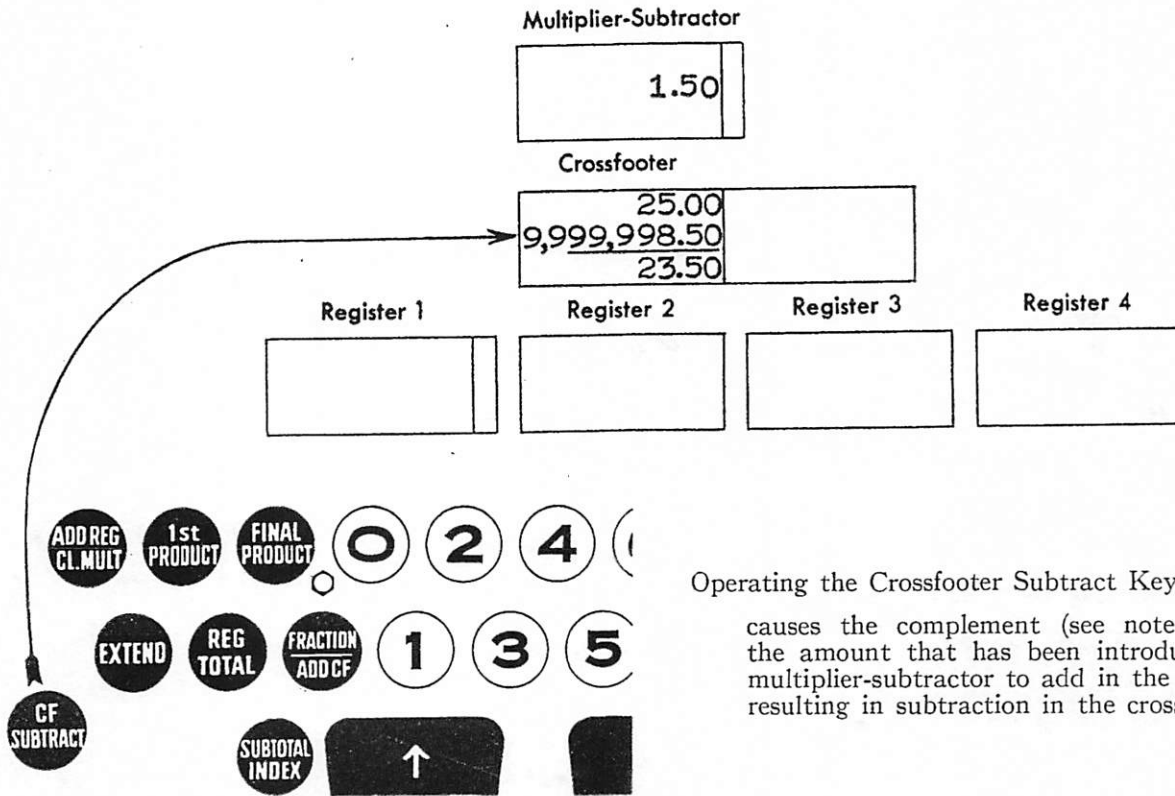
Register Total Key—Operating this key after depressing the Extend key prints and clears the amount accumulated in the active register and introduces the amount in the multiplier-subtractor.

Non-add Control—When an amount is set up on the adding keys, the Extend key depressed and a motor bar operated in a position where this control is active and the control button is set at ADD EXT, the amount introduced in the multiplier-subtractor will not add in the active register.

Add Crossfooter Control—When an amount is set up on the adding keys, the Extend key depressed and a motor bar operated in a position where this control is active, the amount that is introduced in the multiplier-subtractor will not add in the crossfooter, neither will it add in the active register even though the control button is set at ADD EXT.

Add Register Control—has no effect upon the function of the Extend key regardless of whether the control button is set at ADD EXT or at NON-ADD EXT.

The Crossfooter Subtract Key



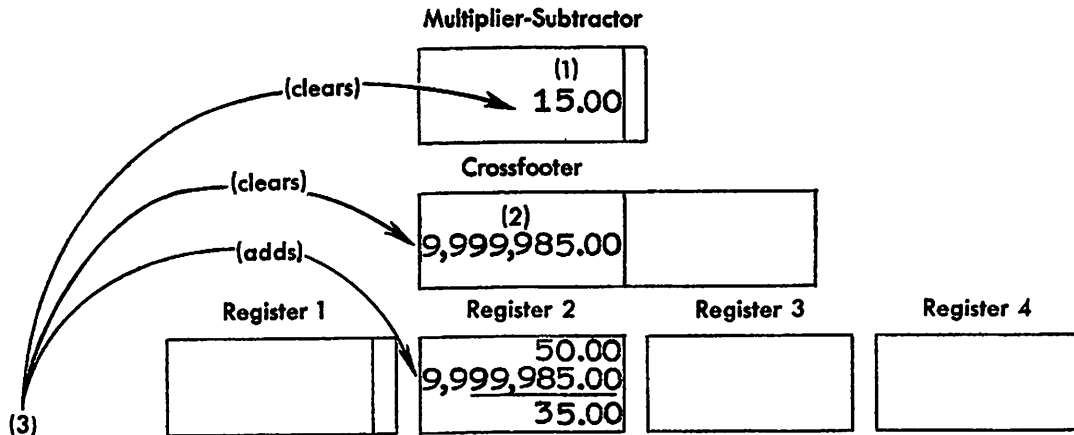
Operating the Crossfooter Subtract Key—

causes the complement (see note below) of the amount that has been introduced in the multiplier-subtractor to add in the crossfooter, resulting in subtraction in the crossfooter.

Note—The complement of a number is the difference between the number and the next higher power of 10. Examples: The complement of 7 is 3; the complement of 25 is 75; the complement of 150 is 850.

With the machine, the Crossfooter Subtract key computes the complement and automatically prefixes 9's through the capacity of the crossfooter to carry the 1 completely out of the answer.

Register Subtraction



The register in which the subtraction is to be made must be in active position and the crossfooter must be clear because it is used in making the subtraction.

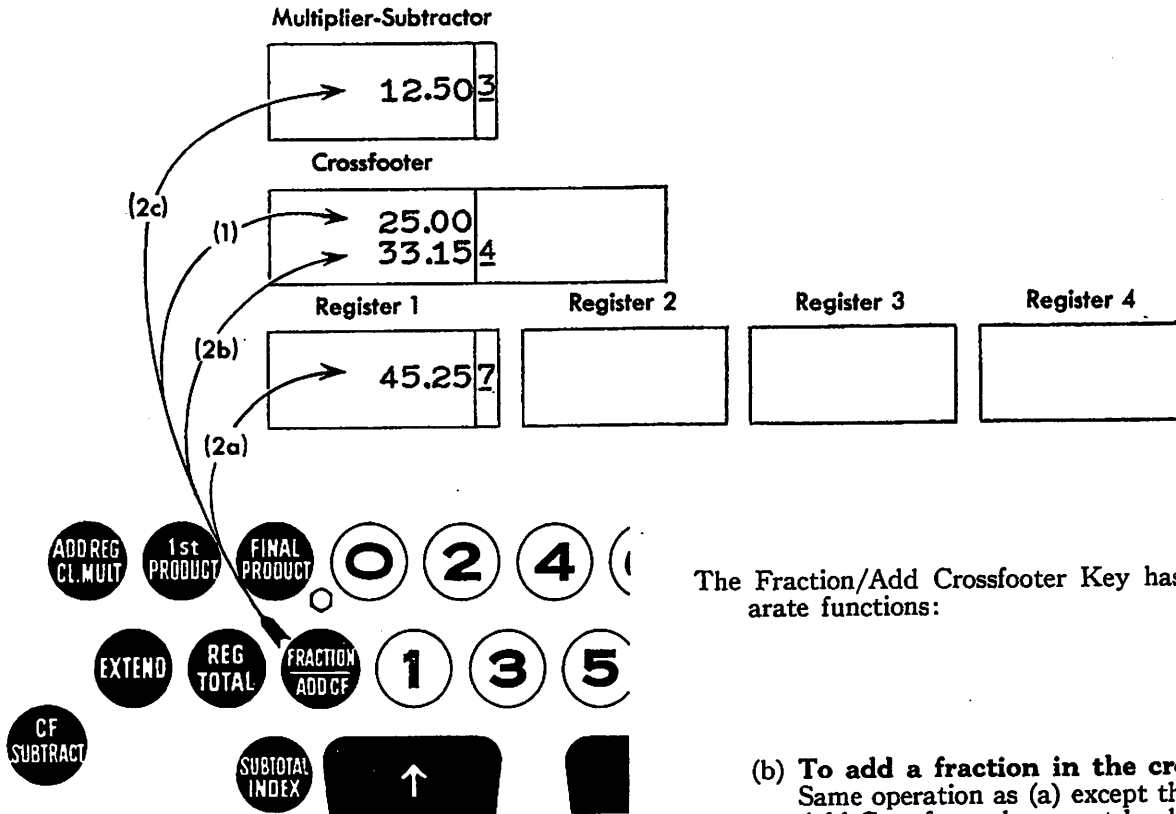
To subtract in a register:

1. Set up the amount to be subtracted (\$15.00) on the adding keys, depress the Extend key and then operate a motor bar. This introduces the amount in the multiplier-subtractor.

2. Operate the Crossfooter Subtract key to cause the complement (see note, page 17) of the amount that has been introduced in the multiplier-subtractor to add in the crossfooter.

3. Hold down the Non-print key (to non-print the complement) and at the same time operate the Final Product key. The Final Product key clears the complement from the crossfooter, adds the complement in the active register resulting in subtraction in that register, and clears the multiplier-subtractor.

The Fraction/Add Crossfooter Key



The Fraction/Add Crossfooter Key has three separate functions:

1. To add an amount in the crossfooter—Set up the amount on the adding keys, depress the Add Crossfooter key, and operate a motor bar.

2. To set up fractions—This machine is equipped to handle tenth fractions. The adding keys 1 through 9 are used for the respective tenth fractions for which underscored numerators are printed. (Some machines print $\frac{1}{2}$ for $\underline{5}$.) To print the fractions, register 1 must be in active position.

- (a) To add a fraction in register 1—(Fractions will not add in any other register.) Hold down the Fraction/Add Crossfooter key and the steel key behind it, while depressing an adding key representing the fraction, release the Fraction/Add Crossfooter key and operate a motor bar.

- (b) To add a fraction in the crossfooter—Same operation as (a) except the Fraction/Add Crossfooter key must be depressed before the motor bar is operated.
- (c) To introduce a fraction in the multiplier-subtractor—Same operation as (a) except the Extend key must be depressed before the motor bar is operated.
- (d) To non-add a fraction—Same operation as (a) except the Fraction/Add Crossfooter key and the steel key behind it must be held down while the motor bar is operated.

3. To non-add an amount—Set up the amount on the adding keys and then hold down the Fraction/Add Crossfooter key and the steel key behind it while a motor bar is operated. The amount will print but will not add in either the register or the crossfooter. When used in this manner it is commonly called the Non-add Key.

Effect of Other Keys and Controls used with the Fraction/Add Crossfooter Key

Register Total Key—Operating this key after depressing the Fraction/Add Crossfooter key, prints and clears the amount accumulated in the active register, and adds the amount in the crossfooter.

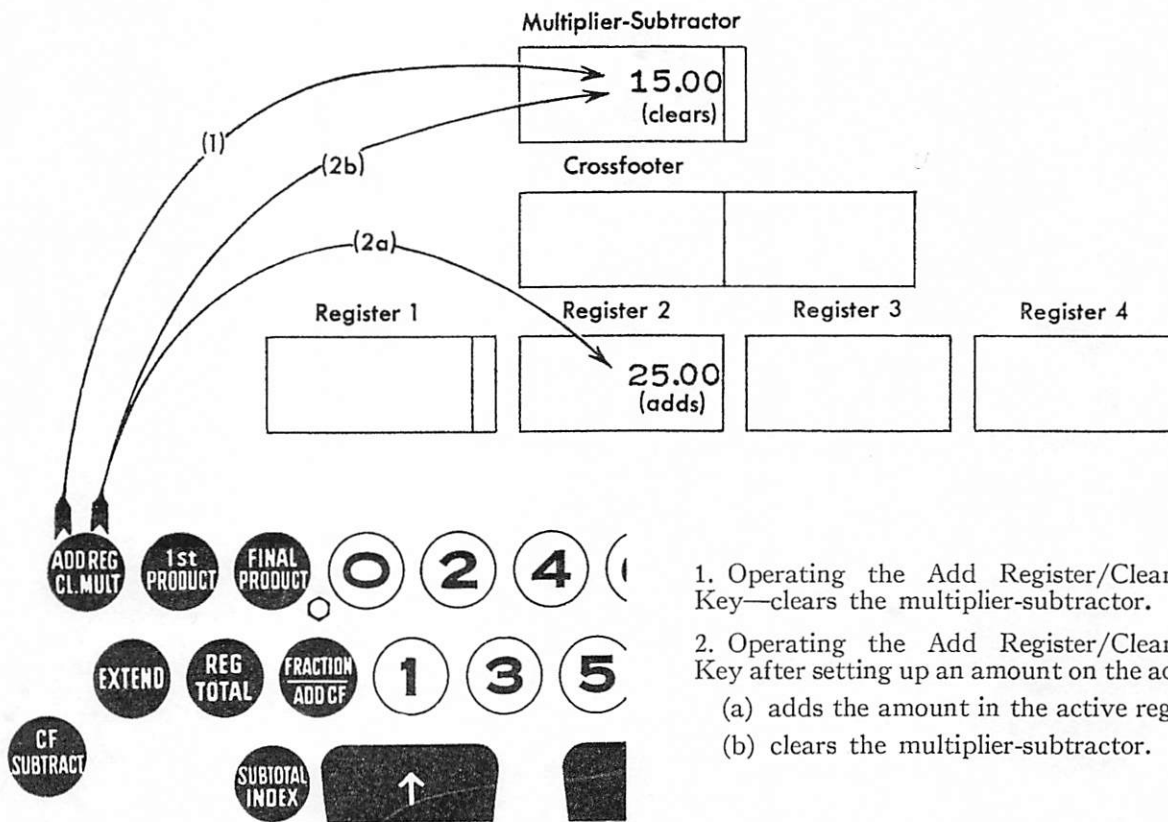
Extend Key—Depressing this key and the Fraction/Add Crossfooter key together and operating a motor bar causes an amount set up on the adding keys to add in the crossfooter and also introduces the amount in the multiplier-subtractor. If these two keys are depressed before operating the Register Total key, the amount will be cleared

from the active register, introduced in the multiplier-subtractor and added in the crossfooter.

Final Product Key—Holding down the Fraction/Add Crossfooter key and the steel key behind it while the Final Product key is operated, prints and clears the crossfooter and clears the multiplier-subtractor. The amount that clears from the crossfooter will not add in the active register.

Add Crossfooter, Non-add or Add Register Controls—These controls have no effect upon the functions of the Fraction/Add Crossfooter key.

The Add Register/Clear Multiplier Key



1. Operating the Add Register/Clear Multiplier Key—clears the multiplier-subtractor.

2. Operating the Add Register/Clear Multiplier Key after setting up an amount on the adding keys—

(a) adds the amount in the active register.

(b) clears the multiplier-subtractor.

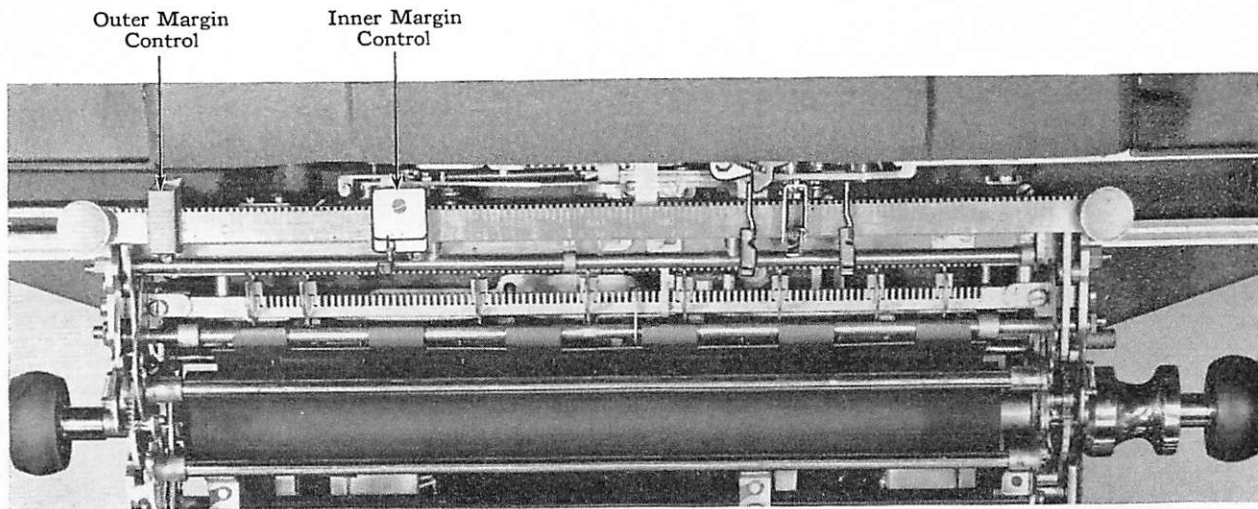
Effect of Other Keys and Controls used with the Add Register/Clear Multiplier Key

First Product Key—Depressing this key together with the Add Register/Clear Multiplier key, prints and clears the amount accumulated in the crossfooter, and clears the multiplier-subtractor.

Register Total Key—Depressing this key together with the Add Register/Clear Multiplier key, prints and clears the amount accumulated in the active register and clears the multiplier-subtractor.

Add Crossfooter and Non-add Controls—have no effect upon the function of the Add Register/Clear Multiplier key. A Non-add or Add Crossfooter control active where the Add Register/Clear Multiplier and Final Product keys are operated together—prints and clears the amount accumulated in the crossfooter, adds the amount in the active register and clears the multiplier-subtractor.

The Margin Controls



The Inner and Outer Margin controls located on the control bar are used to stop the return of the carriage at the left-hand margin.

The Outer Margin Control—To set the Outer Margin control to stop the carriage at the left-hand margin, press the release button on the front of the control and move it along the control bar until the right-hand edge of the control is even with the desired number on the scale. A simple way to do this is to position the carriage at the desired left-hand position and move the Outer Margin control to the right as far as it will go.

The Inner Margin Control—To set the Inner

Margin control to stop the carriage at an intermediate position, press the release button on the front of the control and move it along the control bar until the right-hand edge of the control is even with the scale number four places to the right of the desired position for the carriage to stop. For example, to have the carriage stop at 25, the right-hand edge of the control is set at 29 on the control bar scale. To make the Inner Margin control operative, raise the latch on the front of the control. A simple way to do this is to position the carriage at the intermediate position, release the latch on the front of the control, depress the Inner Margin key and slide the control to the right as far as it will go. See the Margin Keys below.

The Margin Keys

When the Inner Margin control is operative, the Margin keys (located at the upper, left-hand side of the typewriter keyboard) control stopping the carriage upon return at the Outer or Inner Margin. When the Outer Margin key is depressed the carriage will stop at the Outer Margin control,

or when the Inner Margin key is depressed it will stop at the Inner Margin control.

If the Inner Margin control is inoperative (lever on front of control latched down) when the carriage is returned it will stop at the Outer Margin control regardless of which Margin key is depressed.

Tabulation

Tabulator stops are set on the stop bar to provide column-to-column tabulation of the carriage when the Palm Tabulator or the Tabulate Motor bar is operated. The stop position number on the stop bar scale is the same as the typing position number on the front scale. For example, if the carriage is tabulated to a stop set at 30, the typewriter will print at 30, and the units of cents digit

of an amount printed with the computing mechanism will be at 27.

To remove a Tabulator stop from the stop bar, tilt it forward slightly and pull upward.

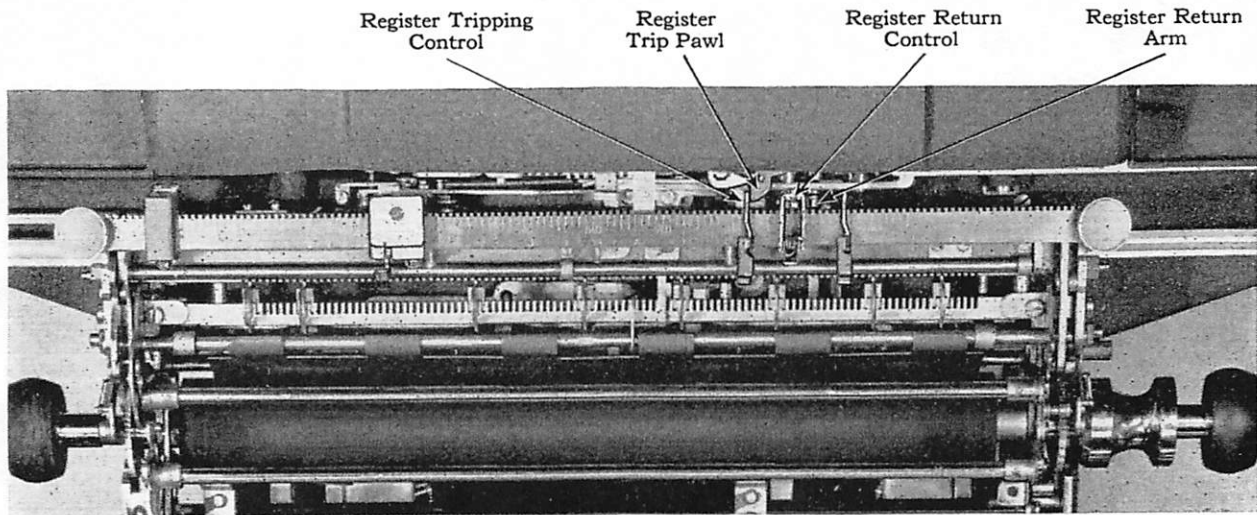
To set a Tabulator stop, tilt it forward and push down firmly into the slot on the stop bar.

Register Shifting

Register Indicator

The pointer of the Register Indicator, located at the upper right-hand corner of the front panel

indicates at all times which register is active.



Automatic Register Tripping

Register tripping means bringing the next higher-numbered register into active position.

Register Tripping Controls—To cause registers to trip automatically, Tripping controls are set on the control bar so that they pass over the Register

Trip pawl as the carriage tabulates.

To set a Register Tripping control, tabulate the carriage to the position where it is desired to shift registers. Clamp the Register Tripping control on the control bar and lock firmly in the notch about two places to the left of the Register Trip pawl.

Automatic Register Returning

Register Return Control—returns register 1 to active position when the carriage is returned to the margin.

To set a Register Return control, tabulate the carriage to the position in which register 2 is in active position. Clamp the Register Return control on the control bar just to the left of the register return arm.

Note: A similar Register Return control may be used to return register 1 to active position when the carriage is tabulated from one column to the next. This control is set to the left of the register return arm when the carriage is in the position in which register 1 is to be returned to active position.

Manual Register Shifting

Registers may also be manually tripped and returned by using the Register Trip and Register Return keys, located at the upper right-hand corner of the front panel. Manual shifting of registers is used in the operation of clearing the machine.

The Register Trip Key—When depressed, trips the next higher-numbered register into active position.

The Register Return Key—When depressed, returns register 1 to active position.

Spacing

The spacing of forms is automatic when the machine operation returns the carriage a sufficient distance for the spacing pawl to pass over the spacing cam, usually at about 50 on the scale. Thus automatic spacing may be obtained from the use of the Return motor bar or Carriage Return key. When

it is desired to return the carriage and space the forms from a position that would not provide automatic spacing, the Space bar and the Return bar may be operated simultaneously. The forms may be spaced in any carriage position by operating the Space bar.

Ribbon Adjustment

After a portion of the ribbon becomes worn, it may be adjusted to an unused portion. Thus the entire width of the ribbon may be utilized.

The position of the knurled button, located above the left-hand ribbon spool, determines the

portion of the ribbon that is in position for use. To adjust, open the panel on left-hand side of the case for access to the adjusting button, pull out the button and move it so that the mechanism shifts the ribbon to an unused position. Release the button to latch the ribbon in the position (hole) selected.

Clearing the Machine

TO CLEAR THE MACHINE:

1. Move the carriage to the extreme left by depressing the carriage release lever, and raise the platen out of printing position. Depress the Register Return key to return register 1 to active position.

2. Operate the Final Product key. This clears the crossfooter, transfers the amount from the cross-

footer, if any, to register 1 and clears the multiplier-subtractor.

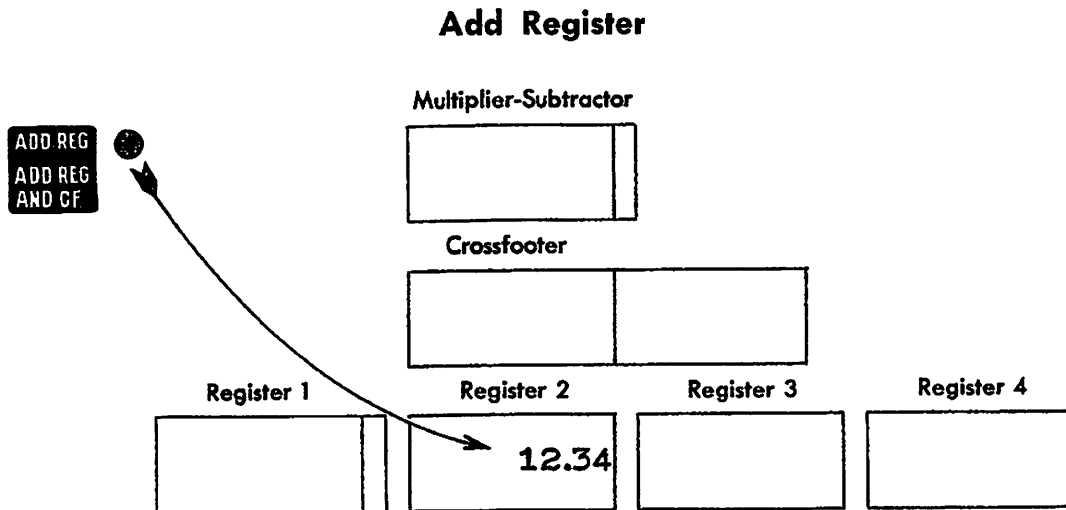
3. Operate the Register Total key. This clears register 1.

4. Depress the Register Trip key to trip the register indicator to register 2 and operate the Register Total key. This clears register 2.

5. Repeat step 4 for each of the other registers.

The Addition Control Button

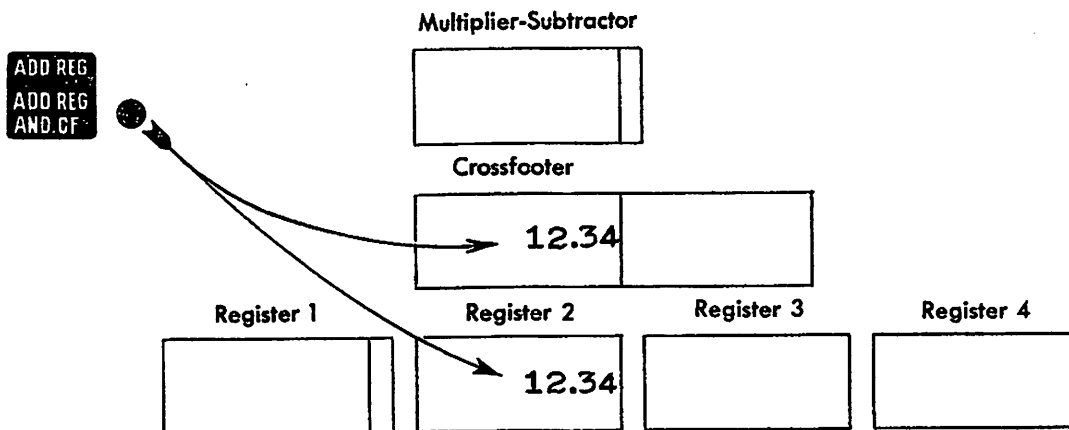
Addition in the machine is controlled by the button located on the lower, left-hand side of the front panel.



When the control button is set at ADD REG, amounts entered on the adding keys will add only in the active register when a motor bar is operated.

The control button is set at this position for practically all the billing work for which the machine is used.

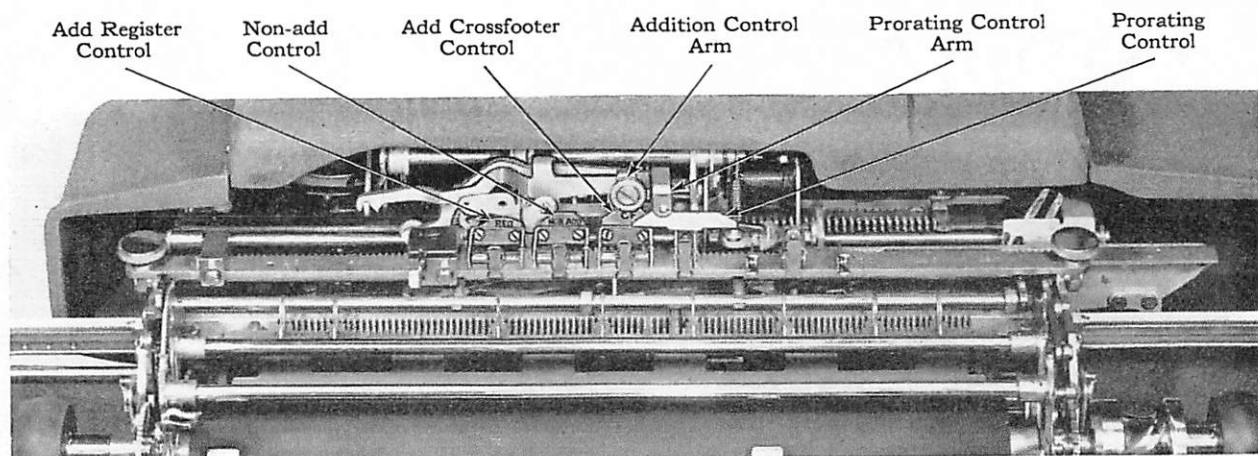
Add Register and Crossfooter



When the control button is set at ADD REG AND CF, amounts entered on the adding keys will add simultaneously in the crossfooter and in the active register when a motor bar is operated.

The Addition Control keys (see pages 19 and 20) and the Automatic Addition Controls (see pages 25 and 26) take precedence over the Addition Control Button.

The Automatic Addition and Prorating Controls



The Automatic Addition Controls

Control of addition may be accomplished automatically, in any desired position, by attaching a control on the control bar under the Addition Control arm.

To set an Addition Control—tabulate the carriage to the desired stop position and rest the control on the control bar so that the center of the control is aligned with the Addition Control arm.

Then move the carriage a short distance to the right (or left) and clamp the control on the control bar. When the carriage is tabulated to this position, the center of the control will be beneath the Addition Control arm.

To remove the control—press the lever at the front of the control and lift it from the bar.

Effect of the Addition Controls used with the Adding Keys

The Add Crossfooter Control (CF)—The highest control set under the Addition Control arm causes amounts entered on the adding keys to add in the crossfooter only.

The Non-add Control—The next to the highest control set under the Addition Control arm pre-

vents amounts entered on the adding keys from adding either in the crossfooter or the active register.

The Add Register Control (REG)—The lowest control set under the Addition Control arm causes amounts entered on the adding keys to add in the active register only.

Effect of the Addition Controls used with Result and Control Keys and Other Controls

With the Final Product Key—A Non-add or Add Crossfooter control, active where the Final Product key is operated, prevents the amount cleared from the crossfooter from adding in the active register. (The multiplier-subtractor is cleared.) The Add Register control has no effect upon the function of the Final Product key.

With the Register Total Key—The Add Crossfooter control, active where the Register Total

key is operated, will cause the amount cleared from the active register to add in the crossfooter. The Add Register or Non-add controls have no effect upon the function of the Register Total key.

With the First Product Key—An Add Crossfooter, Non-add, or Add Register control has no effect upon the function of the First Product key—the amount accumulated in the crossfooter is printed and cleared.

The Automatic Addition Controls—Continued

With the Add Register/Clear Multiplier Key—This key takes precedence over the Addition Controls:

- (a) An Add Crossfooter, Non-add or Add Register control active where the Add Register/Clear Multiplier key is operated, the multiplier-subtractor will be cleared.
- (b) If any of these controls are active where an amount is set up on the adding keys and the Add Register/Clear Multiplier key is operated the amount will add in the active register and the multiplier-subtractor will be cleared.

With the Fraction/Add Crossfooter Key—This key takes precedence over the Addition Controls:

- (a) An Add Crossfooter, Non-add or Add Register control active where the Fraction/Add Crossfooter key is depressed and a motor bar is operated, after setting up an amount on the adding keys, the amount is added in the crossfooter only.

- (b) An Add Crossfooter, Non-add or Add Register control active where the Fraction/Add Crossfooter key and the steel key behind it are held down and a motor bar is operated, after setting up an amount on the adding keys, prevents the amount from adding either in the crossfooter or in the active register.

With the Extend Key (control button set at ADD EXT)—A Non-add or Add Crossfooter control, active where the Extend key is depressed and a motor bar is operated, prevents the amount, set up on the adding keys, that is introduced in the multiplier-subtractor from adding in the active register. The Add Register control has no effect upon the function of the Extend key.

With the Extend Key (control button set at NON-ADD EXT)—An Add Crossfooter, Non-add or Add Register control, active where the Extend key is depressed and a motor bar is operated, the amount set up on the adding keys is introduced in the multiplier-subtractor only.

The Automatic Addition Controls take precedence over either position of the Addition Control button.

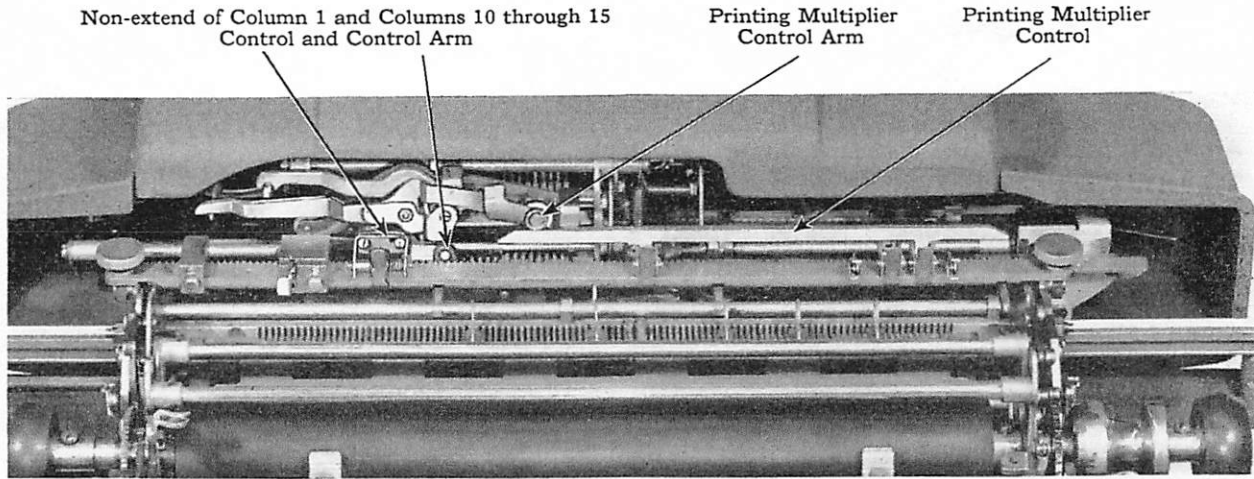
The Prorating Control

The Prorating Control set under the Prorating Control Arm in a carriage position where the crossfooter is cleared with the First Product key, causes any fractional part of a cent to be retained in the crossfooter. This control does not have any effect over any other result or control key or over amounts that are entered in the machine from the adding

keys. The fractional part of a cent can be cleared by operating the Final Product key since this key makes the control inactive.

The Prorating Control is set on the Control bar in the same manner as the Addition Controls except it must be under the Prorating Control Arm.

Additional Features and Controls of Style M 235



Printing Multiplier Control—causes one (1) to be introduced in the left-hand side of the multiplier-subtractor. With this control active in the carriage position or positions where the multiplying keys are operated, the factor depressed on the multiplying keys will enter the left-hand side of the cross-footer. This amount will print at the same time the result of the multiplication is printed.

This control is set on the control bar in the same manner as the Addition Controls except it must be set under the Printing Multiplier Control Arm.

The Printing Multiplier Control can be made inactive by pushing in the button, located in the lower left-hand side of the front panel, before the multiplying keys are operated. The button is restored by the operation of the Final Product key or by moving the release lever, located just to the left of the button, upward.

The Adjustment Lever (located on the center of the front panel)—When the Printing Multiplier control is used, this lever must be adjusted to enable the machine to handle multiplications involving unit prices, prices per ten, per hundred (C), per thousand (M), etc. The Adjustment lever must be in position 11 for a computation if the price is

per each unit, position 12 if per units of ten, position 13 if per hundred, position 14 if per thousand, and position 15 if per tens of thousands. To move the lever push it down slightly and then slide it, left or right, to the desired position and release it.

If the Adjustment lever is moved to the inactive position, the Printing Multiplier control will become inactive.

Non-extend of Column 1 and Columns 10 through 15 Control—This control, active in a carriage position where an amount is transferred from the cross-footer to the multiplier-subtractor, prevents any fractional part of a cent (column 1) and the multiplying factor (columns 10 through 15) from being introduced in the multiplier-subtractor. In such a carriage position, the result of a multiplication can be transferred directly from the cross-footer to the multiplier-subtractor, without having any fractional part of a cent and the multiplying factor transfer, by first operating the Add Register/Clear Multiplier key and then by depressing the Extend key and operating the First Product key.

This control is set on the control bar in the same manner as the Addition Controls except it must be set over the Non-extend Control arm.

Rules for Correcting Operating Errors

It is easy to correct errors made in operating the computing mechanism because they are usually detected before the incorrect amounts have been printed and consequently most of them may be corrected with the Error key.

Adding or Lock-Down Control Keys depressed in error—Depression of the Error key restores these keys. If, however, the Error key is used to restore a Lock-Down control key, remember that the Error key also eliminates the amount set up on the adding keys.

Extend Key held down—(The amount is not introduced in the multiplier-subtractor.) Without releasing the Extend key, set up the amount again and operate the motor bar. If the Extend Control button is set at ADD EXT, hold down the Non-add key while the motor bar is operated.

Extend Key locked—This indicates the multiplier-subtractor is not clear. Depress Error key and operate the Add Register/Clear Multiplier key.

Final Product Key operated instead of First Product Key—Subtract the amount from the register (See Register Subtraction, page 18). Re-introduce the multiplicand in the multiplier-subtractor, non-print.

First Product Key operated instead of Final Product Key—Multiply again and operate the Final Product key to clear the multiplier-subtractor and transfer the amount to the register.

Incorrect Amount Introduced in the multiplier-subtractor—

(a) **If no multiplying key has been depressed**—Operate the Add Register/Clear Multiplier key and then introduce the correct amount in the multiplier-subtractor.

(b) **If a multiplying key has been depressed**—Hold down the Non-print key while operating the First Product and the Add Register/Clear Multiplier keys. Introduce the correct amount in the multiplier-subtractor.

Note: If the Extend Control button is set at ADD EXT, the incorrect amount must also be subtracted from the register.

Incorrect Multiplying Key depressed—Hold down the Non-print key and then clear the cross-footer by operating the First Product key. Then, multiply again.

Incorrect result of a multiplication printed with the Final Product key—Subtract the amount from the register (See Register Subtraction, page 18). Compute line again.

Too many places pointed off—Depress the zero multiplying key once for each place pointed off in error. If in doubt as to the number of places pointed off, depress the Decimal Discount key which points off as many places as there were multiplying keys depressed, then depress the zero multiplying key once for each place by which the number of multiplying keys depressed exceed the number of places to be pointed off.