No. 709,365. Patented Sept. 16, 1902.

A. C. SCHUMAN.

CALCULATING MACHINE.

(Application filed Jan. 30, 1902.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

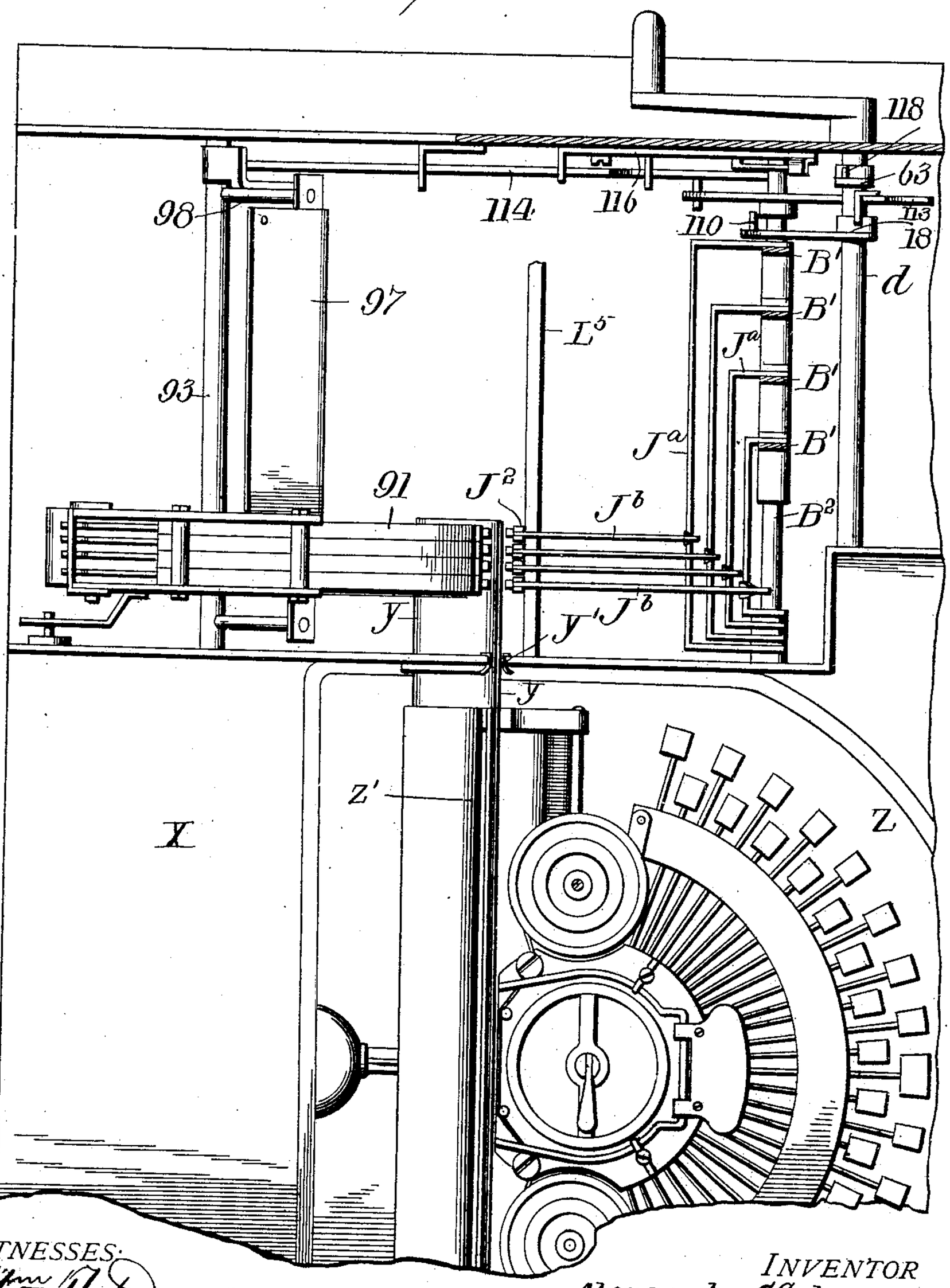

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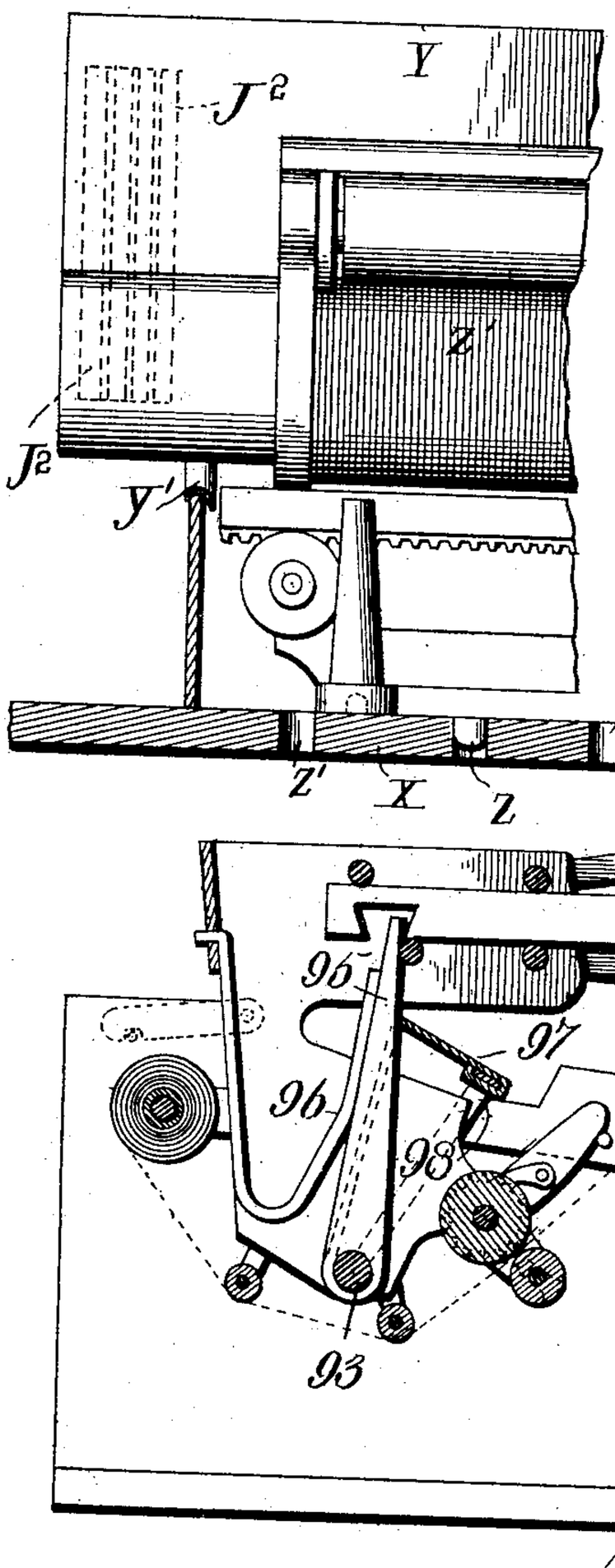
Fig. 5.



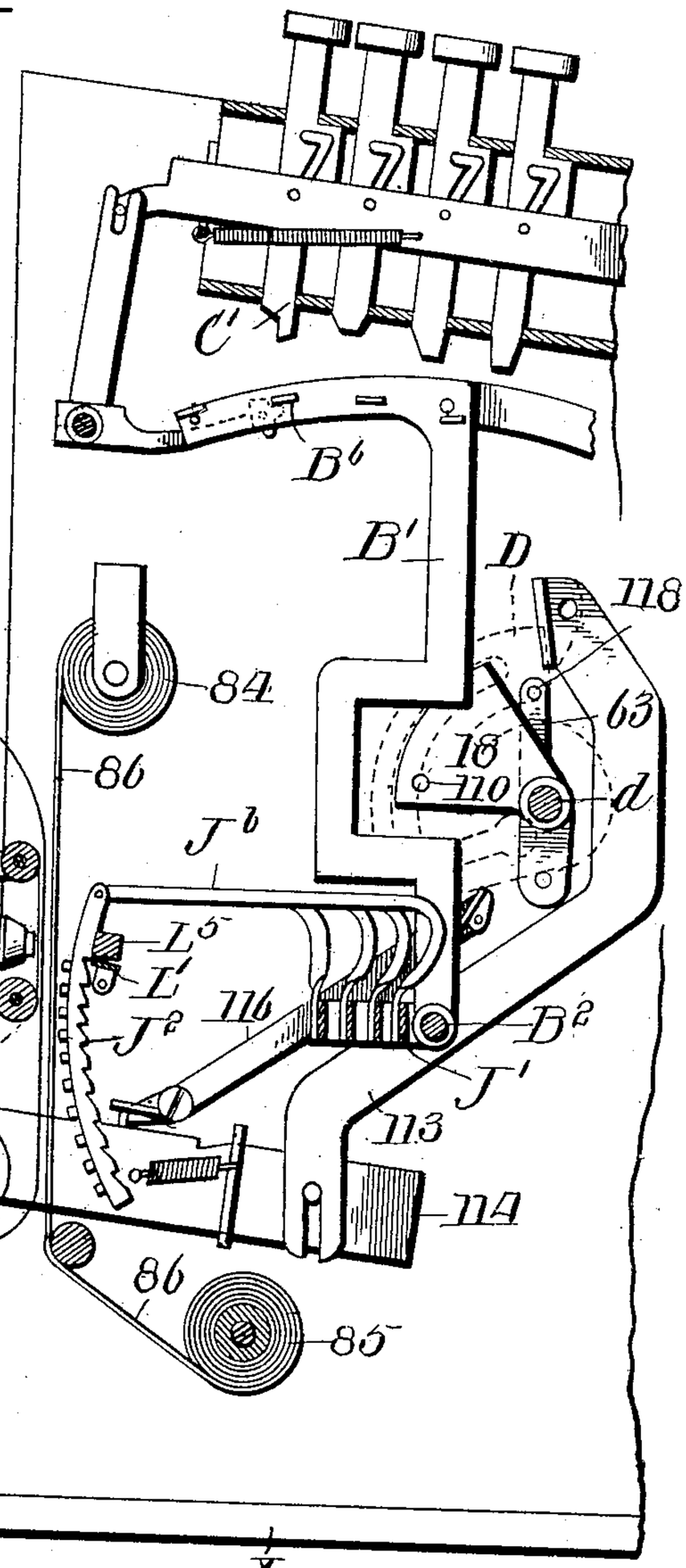


Fig. 6.

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ALEXANDER C. SCHUMAN, OF LOUISVILLE, KENTUCKY, ASSIGNOR TO SPALDING COLEMAN, OF LOUISVILLE, KENTUCKY.

CALCULATING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 709,365, dated September 16, 1902.

Application filed January 30, 1902. Serial No. 91,925. (No model)

To all whom it may concern:

Be it known that I, ALEXANDER C. SCHUMAN, of Louisville, in the county of Jefferson and State of Kentucky, have invented certain new and useful Improvements in Attachments for Calculating and Tabulating Machines; and I hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, which form part of this specification.

This invention is an improvement in calculating-machines; and the object of the invention is to enable the writing necessary in making out itemized bills, statements, &c., to be performed upon the same paper upon which the amounts are printed by the mechanism of the calculating-machine without having to change the paper and to utilize the reciprocating paper-carriage of an ordinary type-writer as the means for feeding the paper to the printing mechanism of the calculating-machine and for holding such paper in position during the operation of such printing mechanism, the writing of the nature or character and dates of the items being performed on the main body of the paper by the type-writing mechanism, while the amounts of items calculated in the calculating-machine are printed on the right-hand side of the same sheet of paper while in the type-writer paper-carriage by the mechanism of the calculating-machine, the operator simply having to shift the paper in the type-writer carriage in the usual manner and proceed by first printing the amount and then writing the desired data relative thereto, so that at the completion of the operation upon removing the paper from the type-writer a complete tabulated itemized statement is produced, and the total sum of all the items can be immediately printed on the paper at the foot of the columns without any mental calculating effort on the part of the operator or changing of paper from one machine to another. This object is attained by so constructing the adding-machine that the mechanism for printing the items is brought to the outer left-hand side of the calculating-machine and so constructed and arranged that the paper can be fed properly thereto by means of a reciprocating paper-carriage exterior to the calculating-machine and in which the paper can be readily and conveniently placed without having to open up the calculating-machine case. The paper-carriage may conveniently be the carriage of a type-writer, preferably of the "Hammond" type, in which the paper can be placed so as to project beyond the end of the platen, this projecting portion of the paper being readily introduced into the printing mechanism of the calculating-machine during the movements of the type-writer carriage or platen.

The invention consists in the novel construction and combination of parts hereinafter described and claimed, and the accompanying drawings illustrate the invention as applied to or in connection with my calculating-machine shown and described in my application for patent, Serial No. 86,514, filed December 19, 1901, and also in my application for patent, Serial No. 86,455, filed December 18, 1901.

In said drawings, Figure 1 is a partial top plan and sectional view of the printing mechanism of my calculating-machine and a type-writer coacting therewith. Fig. 2 is a detail vertical sectional elevation of the calculating-machine, illustrating the printing mechanism and the manner of feeding the paper thereto. Fig. 3 is a detail view indicating mechanisms for making a tabulated itemized statement.

Referring to the drawings, B^2 designates the shaft upon which are mounted a series of oscillating levers B′, provided with stops B^6, adapted to contact with key-stems C′ (when the latter are depressed) and arrest the forward movement of said levers. Each lever actuates a registering-wheel, as described in my application Serial No. 86,514. Said levers B′ are thrown back when released by springs and are returned to normal position by means of cam-plates D on a hand-actuated rock-shaft *d*. All these parts are constructed and operated substantially as described in my application Serial No. 86,514 aforesaid, the parts corresponding with parts in said application being similarly lettered, and more detailed explanation thereof is unnecessary. As shown in said application, an arm is attached to each lever B′ and a printing type-bar is suspended from such arm, so that the type-bar will be shifted by and with the le-

ver so as to bring the proper type into printing position, the printing mechanism being directly in rear of the shaft B^2. In the present invention this construction is varied as follows: In place of the arms shown in said application I use bars J^a, which are attached to and vibrate with levers B'; but these bars are bent laterally and extend parallel with shaft B^2 to and beyond the outer left-hand lever B', where the end of bar again embraces the shaft. These bars J^a are practically U-shaped and rock with levers B' on shaft B^2, and it will be observed that the bars J^a are "nested"—that is, they are of successively greater length and depth, so that they can vibrate independently, as will be obvious from Fig. 1. To the bars J^a, near their outer ends, are attached curved arms J^b, which extend rearwardly, and from the rear ends thereof are suspended type-bars J^2, carrying on their outer faces printing-type and adapted to vibrate past a backing-bar L^5 and be locked when shifted by a plate L', substantially as described in my aforesaid application Serial No. 86,514, until the printing is effected. In place of the vibrating hammers shown in my application Serial No. 86,514 I prefer to use the reciprocating hammers 91 shown in my application Serial No. 86,455, which hammers are operated by means of levers 95 on a rock-shaft 93, the levers being thrown forward by springs 96. All the levers 95 can be forced back to set the hammers 91 by means of a plate 97, mounted on arms 98, attached to shaft 93, when the pusher-bar 114 is moved backward by the lever 113, which is pivoted on shaft B^2, and its upper end lies in the path of a pin 110 on a cam-plate 18, secured to shaft *d*, so that when said shaft is rocked to the right (in Fig. 2) the bar 114 will be pushed backward and retract and set the hammers 91, the parts being locked in this position by a catch-lever 116, which engages a notch in the upper side of push-bar 114 and holds the same retracted until said lever 116 is disengaged from the notch by a pin 118 on an arm 63, attached to shaft *d*, when the latter is returned to normal position. The construction and operation of this hammer-actuating mechanism are fully set forth and described in my application Serial No. 86,455 aforesaid, and I would here remark that the parts thus far described marked with reference-numerals correspond to similar parts in my said application Serial No. 86,455, so that by reference thereto they can be readily understood.

Between the type-bars J^2 and hammers 91 the inking-ribbon 86 is passed, being led from a spool 85 over suitable guides to a spool 84, and for simple tabulating-work paper may be fed from a roll in rear of the hammers to and between the type-bars and hammers, as indicated in dotted lines, Fig. 2, all substantially as described in my application Serial No. 86,455.

From the foregoing description it will be observed that the printing mechanism in the improved construction is at the side of the machine instead of at the rear thereof, so that sheets of paper can be inserted between the type and hammers through an opening Y' in the side of the calculating-machine casing, and for convenience I propose to employ a paper-carriage Z', such as employed on type-writing machines, to hold and support sheets of paper upon which impressions are to be taken from the said printing mechanism. The sheets can be placed in and removed from such carriage without disturbing the calculating-machine or requiring any troublesome manipulation of parts. For convenience also I propose to utilize the carriage of a type-writing machine, as Z, which is placed at the left-hand side of the calculating-machine and is preferably of the Hammond type, in which the sheet of paper can project beyond the end of the carriage Z'. The carriage Z' of the type-writer is alined with the printing mechanism of the calculating-machine, and the printing-point of the type-writer is in exact alinement with the printing-point of the calculating-machine, so that if a piece of paper be simultaneously fed through the type-writer and printing mechanism impressions made by both mechanisms will be in alinement. I utilize the paper-carriage and feed mechanism of the type-writer as the paper-feed for the printing mechanism of the calculating-machine, as indicated in the drawings, and am enabled to make itemized tabulated statements by using both machines, as hereinafter explained.

By referring to Figs. 1 and 3 it will be seen that the sheet of paper Y is placed in the carriage Z' so that its right-hand side projects beyond the end of the carriage, and when the carriage is brought to the right preparatory to beginning to write a line thereon the projecting margin of the sheet of paper enters the printing mechanism of the calculating-machine through opening Y' between the type-hammers and type-bars in position to receive impressions therefrom, the opening Y' permitting the entrance and exit of the paper, which is of course reciprocated by and with the paper-carriage Z' of the type-writer. When the paper is properly placed and the carriage Z' moved to the right, as indicated in Fig. 1, thus bringing the right-hand margin of paper into the printing mechanism of the calculating-machine, the operator after the type-bars J^2 are in proper printing position (to which are brought, as described in my application Serial No. 86,514) rocks shaft *d*, producing an impression upon the paper from the printing mechanism, then operates the type-writer to print the date, amount, or kind of merchandise to which the item printed in the calculating-machine refers, then shifts the paper up by the ordinary manipulation of the type-writer-carriage platen, and when he draws the paper-carriage to the right the paper is again brought into position for another impression

from the printing mechanism of the calculating-machine. Thus the operator proceeds, alternately printing the amount of the item on the paper by the calculating-machine and then the data relating thereto on the same sheet by the type-writer, the type-writer feeding the paper properly to and from the printing mechanism of the calculating-machine. After completing the items the operator can obtain and print the total sum thereof without any mental effort by performing the "total" operation, as described in my applications aforesaid. Thus in a simple and expeditious manner statements can be itemized and summarized on the same sheet of paper by the combined operations of the calculating and type-writing mechanisms.

In order to accommodate different widths of paper, the type-writer Z may be laterally adjustable toward and from the calculating-machine, both machines being mounted on a common support X, which may be provided with a series of holes z', with which pins z on the bottom of type-writing machine may engage to hold the type-writing machine in any position to which it is adjusted relative to the calculating-machine.

Having thus described my invention, what I therefore claim as new, and desire to secure by Letters Patent thereon, is—

1. The combination of the vibrating levers of a calculating-machine, and means for arresting the movements of said levers, the bars connected with and oscillated by said levers and extending laterally to the side of the calculating-machine, and the type-carriers connected to the outer ends of said extended bars and actuated thereby, and means for taking an impression from the type on said bars, substantially as described.

2. The combination of the vibrating levers of a calculating-machine, and key-controlled means for varying the movements of said levers, laterally-extending bars connected with and oscillated by said levers, the arms attached to the outer ends of said bars, the type-bars pivotally attached to and suspended from said arms, a paper-carriage, and means for taking an impression from the type on said bars upon the paper held by the carriage, substantially as described.

3. In a calculating and tabulating machine, the combination of the printing mechanism located at one side of the machine; with an exterior type-writing machine beside the calculating-machine, having a longitudinally-movable paper-carriage adjacent to the printing mechanism and adapted to present the paper to the said printing mechanism, substantially as described.

4. In a printing mechanism for calculating-machines, the combination of oscillating levers, the vibrating type carriers or bars actuated thereby, a type-writing machine beside said calculating-machine having a movable paper-holding carriage adapted when moved to one position to present the margin of the paper to the printing mechanism to receive impressions therefrom, substantially as described.

5. In a printing mechanism for calculating-machines, the combination of the oscillating levers, the type-bars actuated thereby, the inking-ribbon, the impression-hammers opposite said bars, and a type-writing machine beside the calculating-machine having a movable paper-holding carriage adapted to present the margin of the paper to the printing mechanism to receive impression therefrom, substantially as described.

6. In a printing mechanism for calculating-machines, the combination of vibrating levers, keyed stops for limiting the movement of said levers, the laterally-extending bars attached to and operated by the levers, the type-bars connected with and actuated by said bars, the impression-hammers, and means for actuating said hammers; with a type-writing machine beside the calculating-machine having a laterally-movable paper-carriage adapted to present the margin of a sheet of paper between the hammers and type-bars, substantially as described.

7. In a combined calculating and type-writing machine, the combination of the vibrating levers, means for vibrating said levers, keyed stops for limiting the movement of said levers, laterally-extending U-shaped bars attached to and operated by the levers, the arms attached to the outer ends of said bars, the type-bars pivotally attached to and suspended from said arms, the impression-hammers, and means for actuating said hammers; with a type-writing machine adjacent to the type-bars having a laterally-movable paper-carriage adapted to present the margin of a sheet of paper between the hammers and type-bars, substantially as described.

8. In a printing mechanism for calculating-machines, the combination of vibrating levers, keyed stops for limiting the movement of said levers, the bars attached to and operated by the levers and extended laterally to one side of the machine, the type-bars connected with the outer ends of and actuated by said bars, the impression-hammers, and means for actuating said hammers; with a type-writing machine beside the calculating-machine having a longitudinally-reciprocating paper-feed carriage, adapted to present the paper to the printing mechanism and hold the same in position during the taking of an impression thereon by the latter, all substantially as and for the purpose described.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

ALEXANDER C. SCHUMAN.

In presence of—
T. H. ALEXANDER,
ARTHUR E. DOWELL.