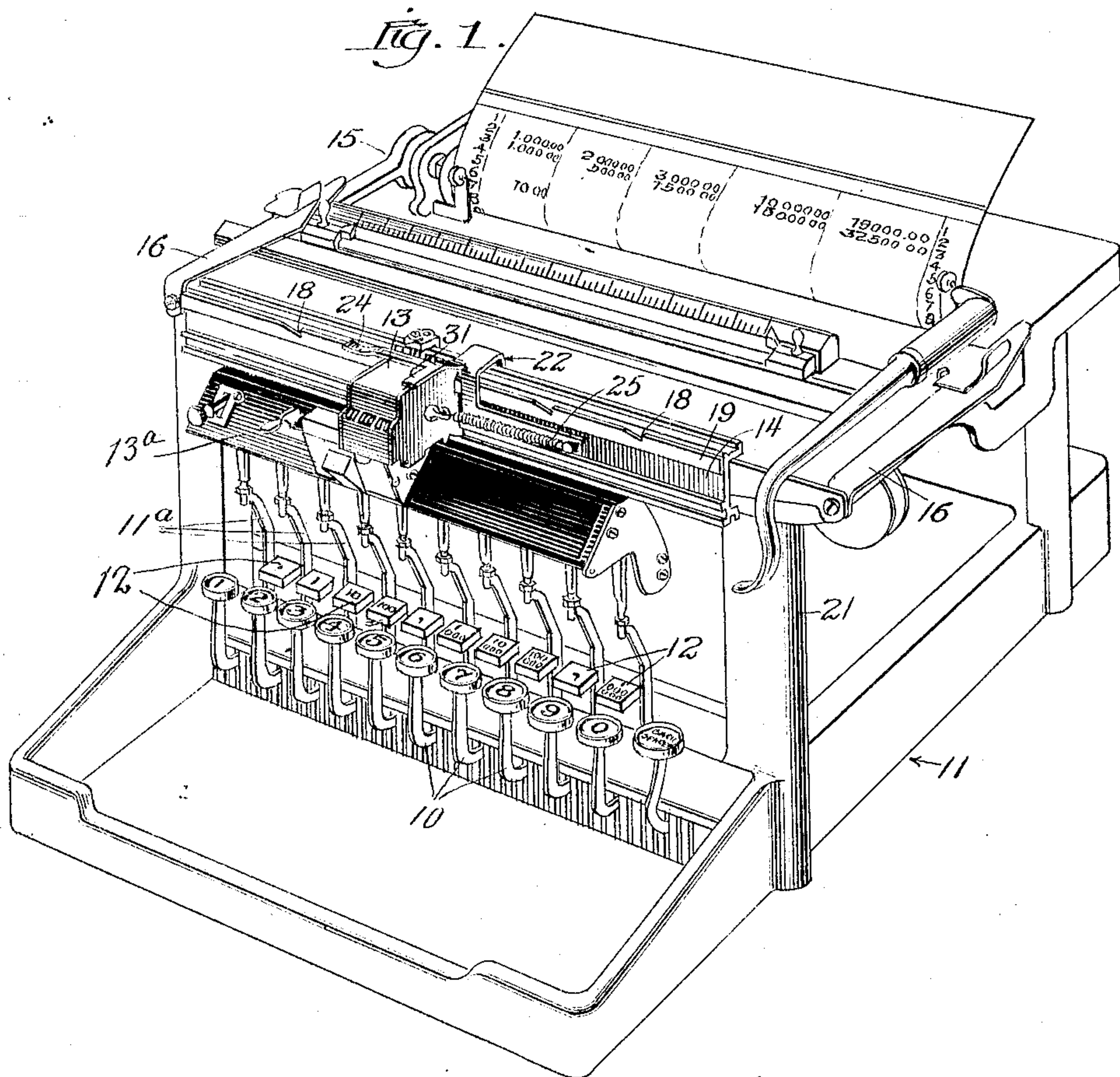


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COMPUTING MACHINE.  
APPLICATION FILED MAR. 9, 1910.

976,086.

Patented Nov. 15, 1910.

2 SHEETS—SHEET 1.



Witnesses:  
Frank Blanchard  
J. M. Daggett.

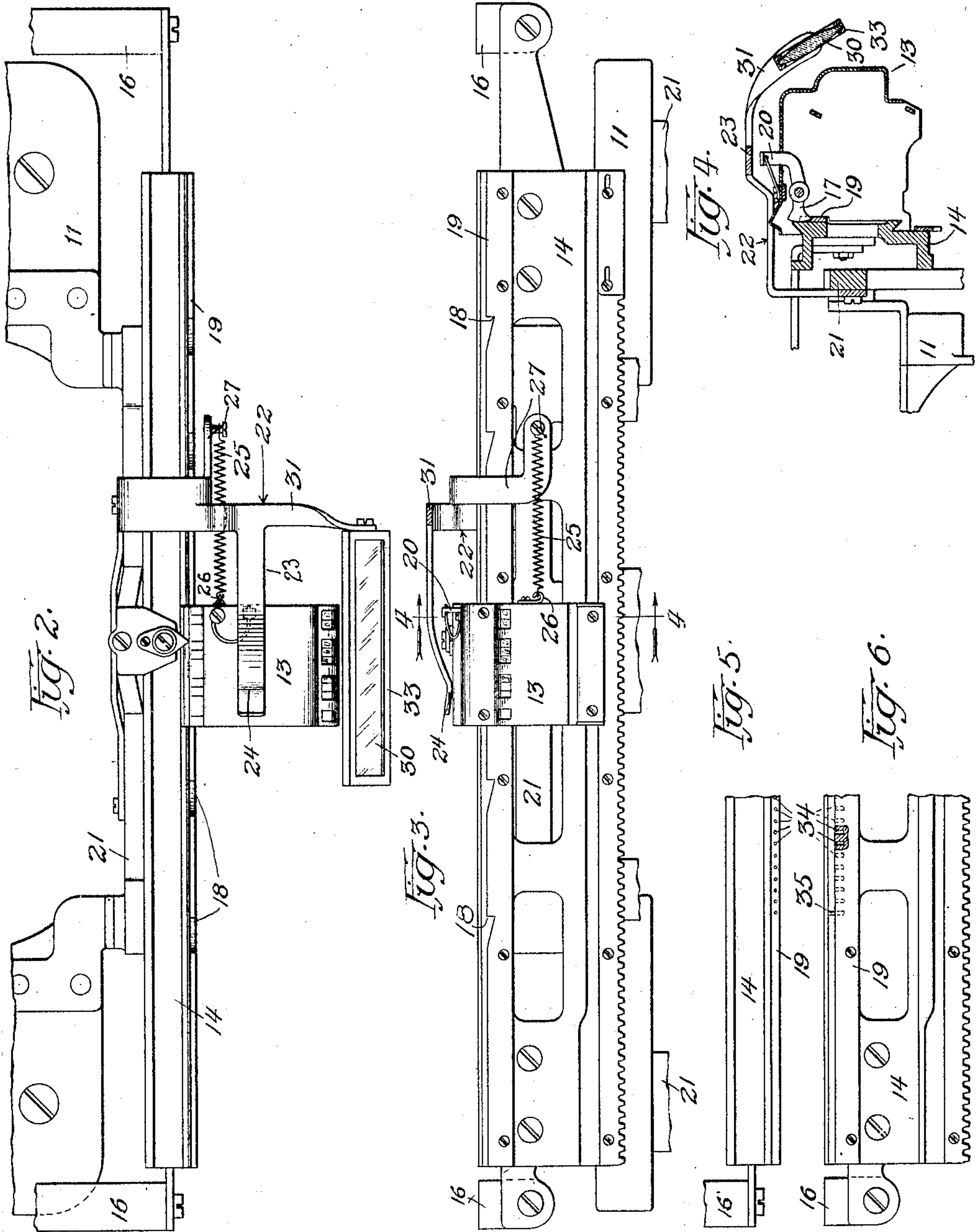
Inventor  
Fred F. Main.  
By Charles O. Shervey  
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Att'y.



# UNITED STATES PATENT OFFICE.

FRED F. MAIN, OF CHICAGO, ILLINOIS.

## COMPUTING-MACHINE.

976,086.

Specification of Letters Patent.

Patented Nov. 15, 1910.

Application filed March 9, 1910. Serial No. 548,321.

*To all whom it may concern:*

Be it known that I, FRED F. MAIN, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented new and useful Improvements in Computing-Machines, of which the following is a specification.

My invention relates to computing machines, and is designed to be used in what is called cross tabulation in which it is required to record in the counter the amounts written in each column. The usual form of this machine is an attachment to the ordinary typewriter so that explanations may be written with the typewriter in the usual way, and when it is required to add or subtract the amounts written in any given column, the counter is set to register with the actuator which in turn operates by means of the keys when the typewriter is used to write the numbers. The counter, while operating may be carried step by step past the actuator as in the construction shown, or the actuator may move forward while the counter remains stationary. In either case the counter must be moved to the new column. In the type of machine shown, the counter must be moved to the right after writing a number to place it in position to write in the following column, and the reverse relative movement of the counter for the whole length of the line takes place when the carriage is brought back to the beginning of a line. All these movements of the counter where more than one column requires the counter, must now be done by hand and in the present work shown by the sheet in the machine, the counter is used in each column in every line which necessitates the manual movement of the counter five times in each line and since the counter position must be determined exactly, the amount of time consumed by this frequent movement is a great hindrance to the work. The loss of time is not the greatest objection, since the operator often forgets to move the counter and thus fails to add or subtract the amounts, and leaves all the following amounts incorrect.

The short space traveled by the typewriter while making a single character necessitates the use of very thin wheels in the counter, and for this reason the characters on the counter wheels are so small as to be read with difficulty even in good light.

The objects of my invention are to cause the counter to act automatically in unison with the movements of the typewriter when writing the number in any column so that none of the present operations of the machine shall be interfered with, and also to eliminate entirely all manual movements of the counter so that the movement of the carriage in either direction shall automatically place the counter in position to record the number in the column at the printing position. The exact order or denomination at which the printing is to begin is determined by the decimal tabulator now used for that purpose, and which controls the position of the counter in my device just as it now controls it for the single column.

Another object is to provide means to facilitate reading the amount showing on the wheels of the counter.

Other objects and advantages will appear and to such ends this invention consists in mechanism arranged to disconnect the counter from its supporting mechanism in combination with means for automatically shifting the counter into proper position with respect to the printing point of the next column to be printed.

It further consists in the several novel features of construction, arrangement and combination of parts hereafter set forth in this specification and more particularly set out in the claims.

The invention is illustrated in the drawings furnished herewith in which—

Figure 1 is a perspective view of a computing machine embodying my invention, Fig. 2 is a plan view of a fragment of the machine, showing the counter in position upon its carrying bar with my improvement in position upon the machine, Fig. 3 is a front view of the parts seen in Fig. 2, Fig. 4 is a vertical cross section taken on the line 4—4 of Fig. 3, Fig. 5 is a plan view of a fragment of a counter carrying bar, illustrating a modified form of stop and Fig. 6 is a front view of the parts seen in Fig. 5.

Referring to the drawings, 11 represents a typewriting machine of well known construction having the usual type keys, which are pressed down to print numbers on a sheet or page, and 12 are the tabulating keys or buttons by means of which the operator can bring the printing point on the



carriage to a position of rest at any denomination in any column in which it is desired to write a set of figures.

13 is a counter or other device for recording the sum of the numbers printed in the column or the difference between the amounts of various columns, said counter being shown as carried by a bar 14, which is supported from the carriage 15, of the machine by means of forwardly projecting arms 16. Counters of the type shown in the drawing are well known and require no special description. Suffice it to say, the counter contains a set of numbered disks or wheels arranged side by side to indicate the amount printed, the sum of the amounts printed or their difference, and said counter is arranged to be operated by an actuator 13<sup>a</sup>, operated by the number keys 10, of the machine. In this type of machines, the number keys 10, are operatively connected with the actuator 13<sup>a</sup>, by means of connecting mechanism 11<sup>a</sup>, and the actuator contains a counter operating device which must register with the counter for each character printed. The counter is arranged to move with the bar 14, in its step by step movement by means of a spring pressed locking pawl 17, which is arranged to engage with stops here shown as comprising saw teeth 18, formed in a bar 19, that is attached to the supporting bar 14. The pawl 17, has a finger piece 20, by means of which it may be actuated to withdraw it from the teeth for the purpose of disconnecting the counter from its operative connection with the bar 19, and permitting the counter to be shifted to another column. The teeth 18, are so positioned upon the bar 19, with respect to the columns to be printed that when said pawl 17, is in engagement with any given tooth, the counter will be in proper position to record any number. The exact order or denomination at which the printing is to begin is determined by the decimal tabulator used for that purpose. All of the parts thus far described are old and well known, and I make no claim to them, and for this reason no further description thereof is necessary.

Secured to the stationary frame work 21, of the machine, is a pawl releasing mechanism 22, which is arranged to withdraw the pawl to release the counter from its operative connection with the bar 19, after the last digit in the column has been printed and recorded in the counter. In the form illustrated in the drawing, said releasing mechanism 22, has a finger 23, which is bent down at 24, to engage with the projecting end or finger piece 20, of the pawl 17, whereby as the counter is moved along underneath the finger, the projecting end 20, of the pawl is depressed as it reaches the bent portion, thereby withdrawing the pawl from the

tooth and freeing the counter from its operative connection with the bar 19.

Means are provided for automatically shifting the counter to its proper position with respect to the next column to be printed, and in the simple form shown, said means comprises a coiled spring 25, one end of which is attached to the counter as at 26 and the other end of which is attached to some stationary object, as for instance the arm 27, which extends from the releasing mechanism 22. It is obvious that whenever the pawl is released from its operative connection with the bar 19, the spring 25, will instantly shift the counter until the pawl strikes the shoulder of the next notch in the bar 19, unless the counter is sooner arrested by the arm 27, as the case may be.

The counting wheels or disks being very thin, the indicating numerals thereon must necessarily be very small and difficult to read, especially in poor light, and I have provided means for facilitating the reading of these numerals. This I accomplish by mounting a lens 30, in front of the exposed portion of the number wheels, and in line with the operator's vision, so that when the numerals are seen through the lens, they will be magnified in size and clearly readable. A simple arrangement for holding the lens in position comprises an arm 31, extending out from the releasing mechanism 22, to which arm is attached a lens mount 33.

In the modified form shown in Figs. 5 and 6, the position of the stops in the bar 19, may be varied. This I accomplish by providing a plurality of sockets 34, in the bar 19, said sockets being spaced the distance between the characters written. Pins 35, may be placed in the proper sockets to bring the counter into the proper position upon the bar relative to the column of figures to be written. This construction makes it possible to re-arrange the location of the various columns on the sheet which may be found advantageous.

It is to be observed that the carriage may be moved either way on the machine without interfering with the counter. When the carriage is moved from left to right the spring holds the counter against the arm 27, the saw teeth raising the locking pawl as they pass, and when the carriage is moved toward the left, the counter is moved by the stop with which its pawl is in engagement until released by the pawl releasing mechanism, whereupon the spring draws the counter back until the next stop engages with the pawl and draws the counter forward until again released by the pawl releasing mechanism.

While I have shown my improvement as applied to one of the well known typewriting machines, this has been solely for the purpose of making the application of my



invention easily understood. I do not desire to be restricted to this particular form of machine, and I realize that various alterations and modifications in the details of construction are possible without departing from the spirit of my invention, and I do not therefore desire to limit myself to the exact form of construction shown and described.

I claim as new and desire to secure by Letters Patent:

1. In a computing machine, the combination of a counter, a slidable carrier therefor provided with a plurality of spaced stops, a pawl carried by said counter and arranged to engage said stops during the movement of the carrier for locking the counter to the latter, to effect a synchronous movement of the counter with the carrier and means for automatically releasing said pawl from such engagement to unlock said counter.

2. In a computing machine the combination of a counter, a slidable carrier therefor including a supporting bar provided with a plurality of spaced stops, a pawl carried by said counter and arranged to successively engage said stops during the movement of said carrier for locking the counter to the latter, to effect a synchronous movement of said counter with said carrier and a stationary member projecting into the path of movement of said pawl for periodically releasing the same from such engagement.

3. In a computing machine the combination of a counter, a slidable carrier therefor including a supporting bar provided with a plurality of spaced stops, a pawl carried by said counter and arranged to successively engage said stops during the movement of said carrier for locking the counter to the latter, to effect a synchronous movement of said counter with said carrier, and mechanism secured to the frame of the machine for periodically releasing said pawl from such engagement, said mechanism including a stationary arm, having one end thereof bent into position to engage the adjacent end of said pawl during its movement there beneath.

4. In a computing machine the combination of a counter having a single pawl pivoted thereto, a slidable carrier for the counter including a member provided with a plurality of spaced stops adapted to be successively engaged by said pawl, a member arranged to periodically engage said pawl to release the same from the adjacent stop, and means for automatically shifting said counter after each release to engage said pawl with the succeeding stop.

5. In a computing machine the combination of a counter having a single pawl pivoted thereto, a slidable carrier for the counter including a member provided with a plurality of spaced stops adapted to be suc-

cessively engaged by said pawl, a stationary member secured to the frame of the machine and overlying said counter, said member being arranged to periodically engage said pawl to release the same from the adjacent stop, and a spring connected with said counter for automatically shifting it bodily after each release to engage said pawl with the succeeding stop.

6. In a computing machine, the combination of a counter, a slidable carrier therefor including a member provided with a plurality of stops individually adjustable with respect thereto, means carried by said counter for successively engaging said stops during the movement of the carrier for locking said counter to the latter, means for periodically releasing said locking means from said stops and means for automatically shifting said counter after each release to engage said locking means with the succeeding stops.

7. In a computing machine, the combination of a counter, a slidable carrier therefor including a member provided with a plurality of spaced sockets, a plurality of stop teeth adapted for interchangeable engagement in said sockets, means carried by said counter for successively engaging said teeth during the movement of the carrier, for locking said counter to the latter, means for periodically releasing said locking means from said teeth, and means for automatically shifting said counter after each release to engage said locking means with the succeeding tooth.

8. In a computing machine, the combination of a counter, a slidable carrier therefor including a member provided with a plurality of spaced stop teeth, means carried by said counter for successively engaging said teeth during the movement of the carrier, for locking said counter to the latter, means for periodically releasing said locking means from said teeth, and means for automatically shifting said counter after each release to engage said locking means with the succeeding tooth.

9. In a computing machine the combination of a counter, a slidable carrier therefor including a supporting bar provided with a plurality of spaced stops, a pawl carried by said counter and arranged to successively engage said stops during the movement of said carrier for locking the counter to the latter, to effect a synchronous movement of said counter with said carrier, and mechanism secured to the frame of the machine for periodically releasing said pawl from such engagement, said mechanism including a stationary arm projecting into the part of movement of said pawl.

10. In combination with a computing machine arranged to print items in a plurality of columns and having a counter which is



actuated simultaneously with the printing of the items, a sliding support for the counter arranged to bring the same to the operative position to record the amount or  
 5 amounts printed in any column and a locking pawl binding said counter to its support, of a releasing finger lying in the path of movement of said pawl and arranged to withdraw the same from its engagement with  
 10 the bar, and an elastic element arranged to shift the counter into its following position on the support for recording the amount or amounts printed in the following column.

11. In combination with a computing machine comprising a movable paper holding carriage having a step by step movement, key operated printing mechanism, tabulating mechanism for shifting the carriage to predetermined positions whereby items may  
 15 be printed in a plurality of columns, a movable counter, an actuator therefor operated by the keys, a bar moving with the carriage and arranged to bring the counter into register with the actuator and locking means for  
 20 operatively connecting the counter in a plurality of positions upon the bar coincident with any given column, of a releasing finger lying in the path of movement of said locking means and operating to unlock the counter from the bar and a spring for shifting  
 5 the counter to its next operative and locked position upon the bar.

12. The combination with a computing machine having a carriage adapted to hold  
 5 a record sheet, a counter, an element for moving the counter in a step by step movement coincident with the printing of the items on the record sheet and means for shifting the carriage to bring a plurality of individual  
 10 columns in succession into printing position, of mechanism for automatically readjusting the counter to an operative position with respect to the several columns comprising a carrier moving in unison with the carriage  
 45 and being provided with a plurality of stops corresponding in position to the positions of the several columns, means on the carrier co-acting with the stops to operatively connect the counter with the carrier at the several

stops, whereby the counter may be moved in  
 50 a step by step movement in unison with the carriage, a releasing mechanism operating to disconnect the counter from its several operative positions on the carrier and a movable element for shifting the counter  
 55 when released, to the following stop on the carrier.

13. In combination with a computing machine having a counter, registering with its actuator in the step by step movement of  
 60 printing the number computed, a slidable support for the counter having a step by step movement in unison with the printing of the numbers and arranged to bring said counter into position to record in a plurality  
 65 of columns, and a pawl carried by said counter, of a series of adjustable stops on said support co-acting with the pawl to locate the counter in its several positions upon the support corresponding to the locations of the  
 70 columns, mechanism for automatically withdrawing the pawl from the stops in succession and a movable element for retracting the counter when released, and shifting it to the following stop.  
 75

14. In combination with a computing machine, having a movable counter registering with its actuator in the step by step movement of printing the number computed, a sliding carrier for said counter arranged to  
 80 bring said counter to the operative position to record in a plurality of columns, a pawl for binding the counter to the carrier at various predetermined positions thereon, a releasing finger lying in the path of move-  
 85 ment of the pawl and operating to withdraw the same out of contact with the carrier, a spring for retracting the counter whenever released by the releasing finger and a stationary stop for limiting the retrograde move-  
 90 ment of the counter.

In witness whereof, I have hereunto subscribed my name at Chicago, Cook county, Illinois, this 5th day of March 1910.

FRED F. MAIN.

Witnesses:

CHARLES O. SHERVEY,  
 FANNIE F. RICHARDS.