

Sept. 15, 1959

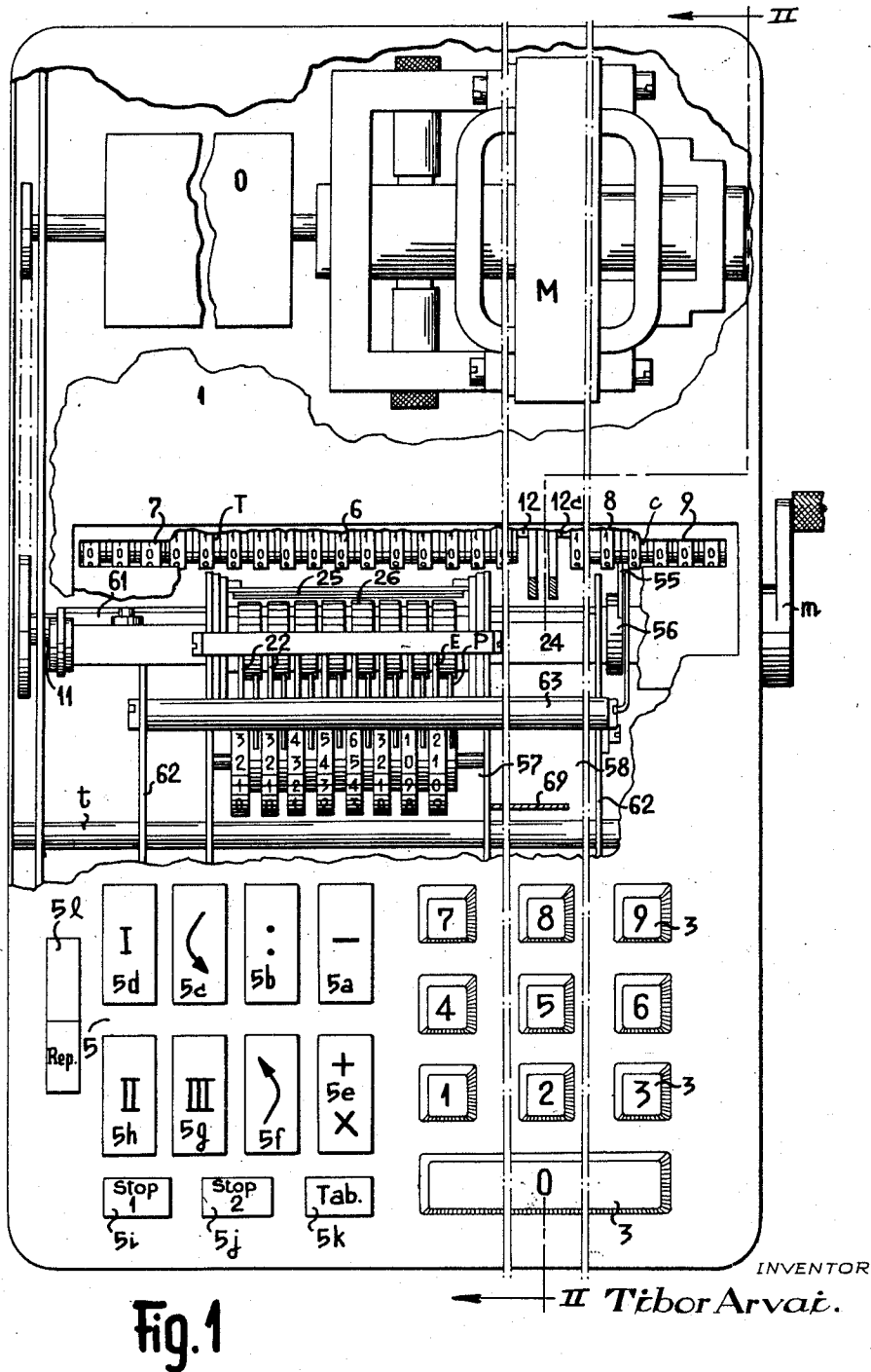
T. ARVAI

2,904,247

TENS TRANSFER MECHANISM FOR A TEN KEY MACHINE

Filed June 29, 1953

6 Sheets-Sheet 1



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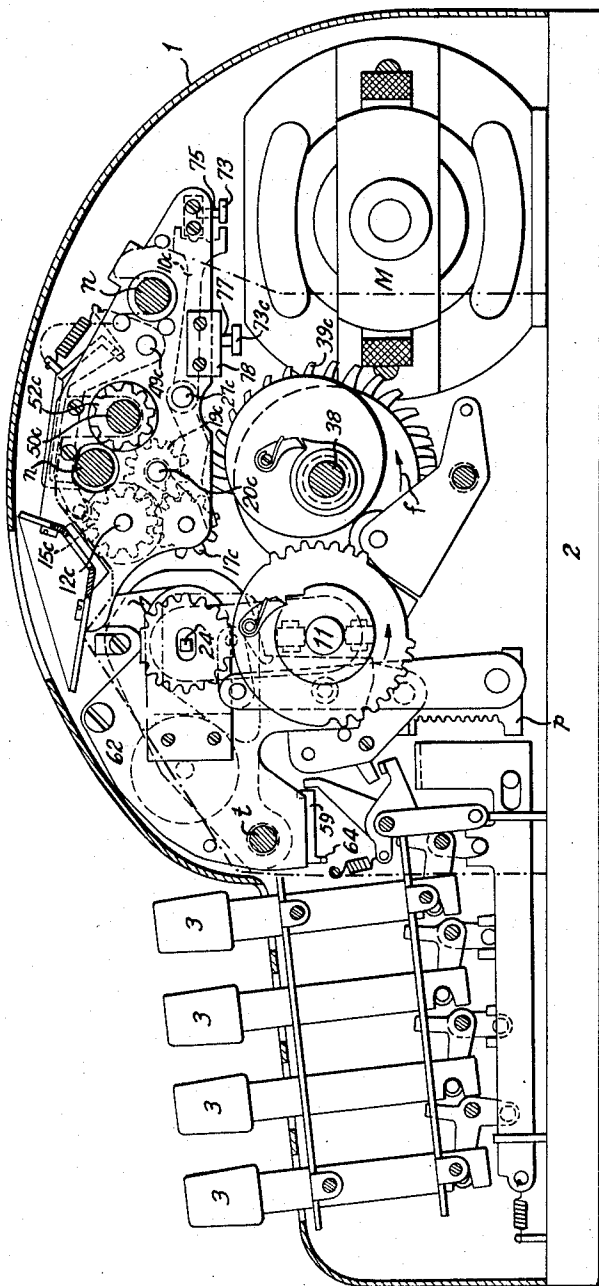
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TENS TRANSFER MECHANISM FOR A TEN KEY MACHINE

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Fig. 2



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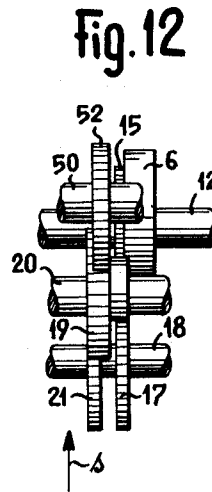
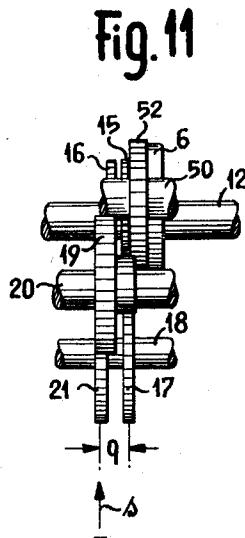
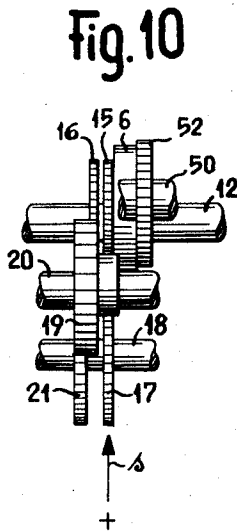
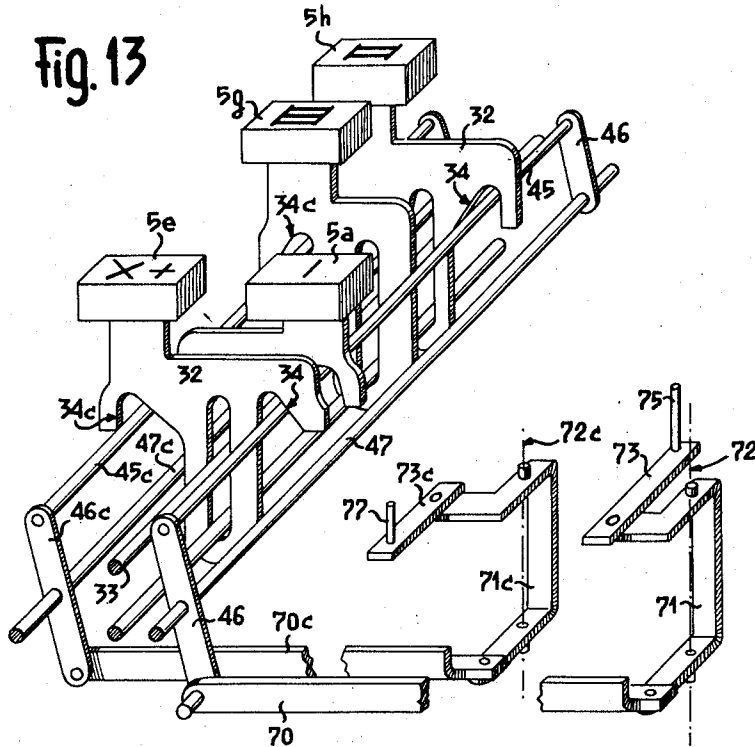
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TENS TRANSFER MECHANISM FOR A TEN KEY MACHINE

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6 Sheets-Sheet 4



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TENS TRANSFER MECHANISM FOR A TEN KEY MACHINE

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Fig. 8

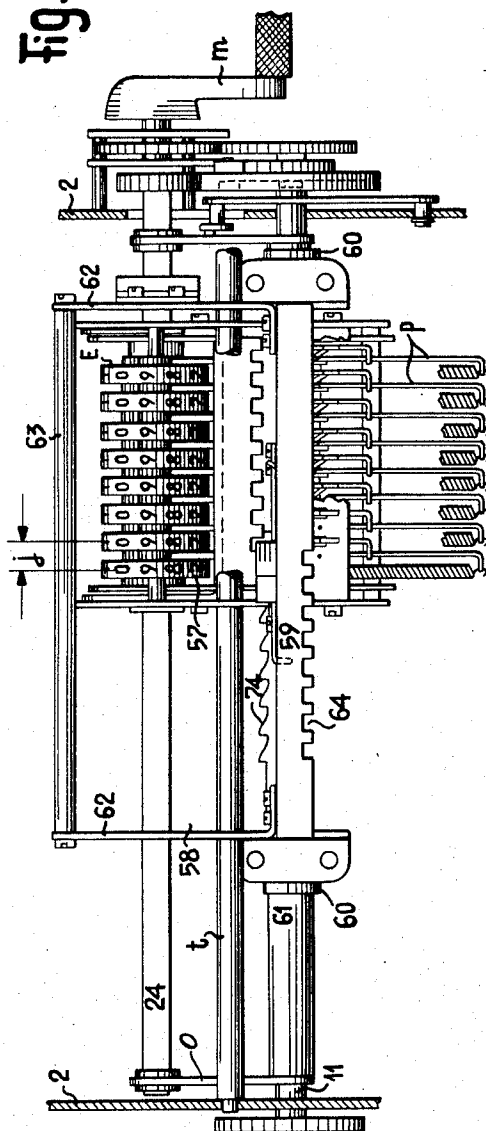
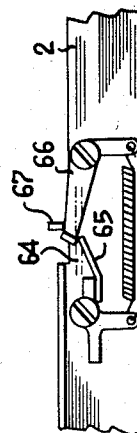


Fig. 9



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TENS TRANSFER MECHANISM FOR A TEN KEY MACHINE

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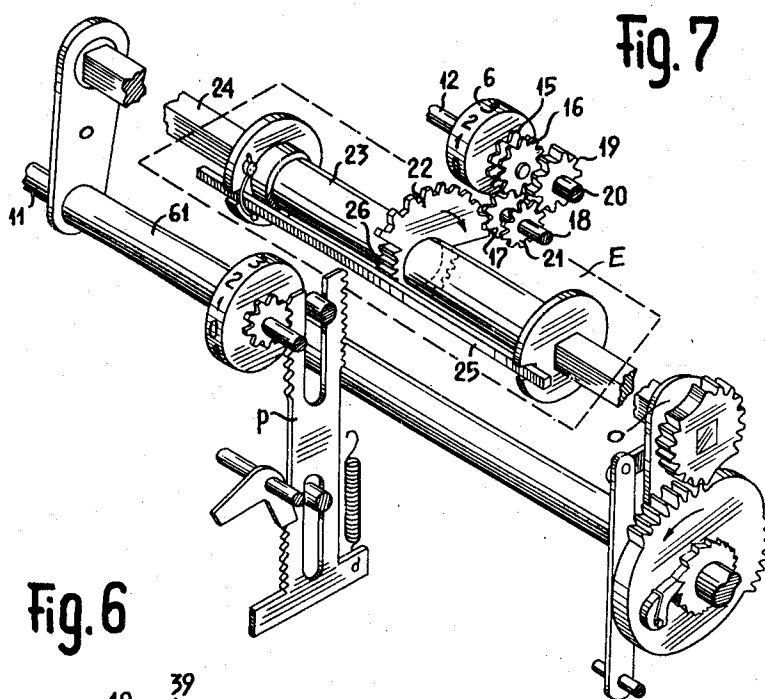


Fig. 6

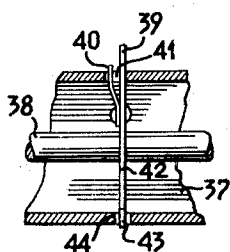
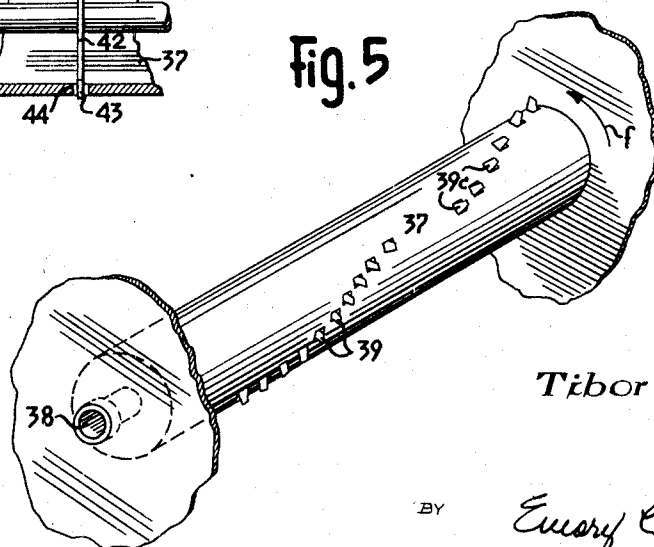


Fig. 5



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2,904,247

TENS TRANSFER MECHANISM FOR A TEN KEY MACHINE

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Application June 29, 1953, Serial No. 364,692

Claims priority, application Switzerland October 7, 1952

5 Claims. (Cl. 235—60)

The present invention relates to a calculating machine. An object is to provide a machine adapted to perform the four basic arithmetical operations.

Broadly, it comprises a keyboard for the control of the different operations, a reduced keyboard of ten keys for the manipulation of the numbers to be introduced in the machine, a registering device of the manipulated numbers, mounted on a carriage travelling step by step to the left by the manipulation of the keys, a totalizer comprising reading members indicating the result of the calculating operations, a counter comprising reading members indicating the number of elemental operations performed and reading members connected to the totalizer and to the counter.

Said machine distinguishes from known calculating machines by the fact that the carry-over devices of the totalizer and of the counter each comprise a rotative member provided with laterally displaceable teeth, disposed along a helix and each being normally maintained in such an axial position that said teeth pass on the side of driving members of the reading members, and by the fact that said carry-over devices each comprise tens carry levers formed at their free ends with guiding members movable individually into the path of one carry-over tooth by means of a nose or finger integrally formed with a pinion gear mechanically connected to a reading member of the totalizer, the zero order of which must reach the reading position, to thereby cause a lateral displacement of said carry-over tooth and the actuating by said tooth of a reading member of the totalizer of an immediately higher order to the reading member of the lower order and result in the setting or shifting to carry-over position of said guiding members of the tens carry levers.

The attached drawing shows schematically and by way of example one form of the calculating machine according to the invention.

Fig. 1 is a plan view of the machine, certain parts of the casing cut away.

Fig. 2 is a cross section view along line II—II of Fig. 1.

Fig. 3 is a view from the under side of the totalizer.

Fig. 4 is a cross section view along line IV—IV of Fig. 3.

Fig. 5 is a perspective view of the rotative drum carrying the carry-over.

Fig. 6 is a partial cross section view of said rotatable drum showing one of the said carry-over teeth.

Fig. 7 is a partial view of the registering device being in mesh with the members of the totalizer.

Fig. 8 is a front view of the registering device.

Fig. 9 is a detail view showing an escapement device controlling the step by step displacements to the left of the registering device.

Figs. 10, 11 and 12 are views from the rear of the machine illustrating the mechanical connections connecting one of the reading members of the totalizer to its different driving members.

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Fig. 13 is a partial perspective view illustrating the mechanism allowing the setting in axial position of the totalizer and of the counter.

According to the attached drawing, the calculating machine comprises a casing 1 protecting a frame 2 carrying the different members of the machine.

A driving crank *m* and a reduced keyboard of ten keys 3 extend from the casing 1. The keys 3 are for introducing a number in the machine and for registering said number on a registering device E provided with registering members comprising toothed sectors 22, see Figure 7, as described in detail in copending application Serial No. 364,691, filed June 29, 1953. These sectors drive a totalizer T mounted adjacent the device E. Also, extending from the casing 1 is a control keyboard 5 comprising keys for the control of the different operations, such keys being numbered 5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j, 5k and 5l.

A motor M is connected to the different members of the machine by a clutch and by a suitable reversing device O adapted to reverse the driving direction of the machine members.

The totalizer T comprises a set of reading members 6 located opposite a window 7 and revolving freely on an axis 12 carried by a carrier constituted by plates 13 and cross members 14, see Figures 3 and 8. The carrier is displaceable along the two guides *n*, see Figure 2.

Each reading member 6, see Figures 3, 4 and 7, is fastened to two pinions 15 and 16, the first of which meshes with a driving pinion 17, see Figure 7, whereas the second pinion 16 is in mesh with an intermediate pinion 19 meshing with a second driving pinion 21. The driving pinions 17 and 21 revolve freely on a shaft 18, while the intermediate pinions 19 revolve on a shaft 20.

The registering device E, see Figure 7, comprises a set of registering segment gear members 22, one of which only is illustrated. Normally, the members 22 revolve freely on a sleeve 23, but they may be angularly fixed with respect to a driving shaft 24 by means of a lock 25 meshing with teeth of pinions 26 each integrally formed with a registering toothed sector member 22. This lock 25 is provided to keep the segment gears 22 in their respective angular positions to actuate the totalizer T.

As described in application Serial No. 364,691, the registering device is carried by a carriage 57, see Figures 1 and 8, displaced, under the action of a spring (not shown), step by step from the right to the left by the manipulation of the keys 3. Each step of the carriage 27 is equal to the distance *i* between two registering segment members 22 next to each other, which distance *i* is equal to the distance *i* between two reading members 6, see Figure 3. The distance between two driving members 17 next to each other, is equal to the distance between two driving members 21 next to each other, which is equal to the distance *i*. It follows that, by the manipulation of the keys 3, the registering apparatus advances one step towards the left, so that the registry apparatus moves progressively and step by step in front of the totalizer T. Simultaneously, the shaft 24 is displaced in a plane parallel to its axis in order to mechanically connect the registering segment members 22 to a positioning member *p* controlled by the manipulation of the keys 3 or to the keys for the digits one, two, three, etc., according to the number of figures which comprises the registered number driving pinions 17 or 21, according to whether the totalizer T is in the adding position or in the subtracting position along the guides *n*.

The first mentioned carriage 57 is carried by a relatively larger second carriage 58 including a support 59 provided with sleeves 60 sliding along a tube 61 oscillating on the control shaft 11, said sleeve 61 connecting to

the shaft 24 by an arm O to impart movement to shaft 24 to connect the segment gears 22 to key controlled members *p*, see Figure 2. The support 59 carries plates 62, which slide along guides, such as rods *t*, extending through suitably spaced aligned apertures formed therein. These plates 62 are rigidly secured to each other by means of cross-pieces 63. The support 59 is provided with a toothed rack 64 cooperating with an escapement pawl 65 and a retaining pawl 66 articulated or pivoted on the frame 2, see Figure 9. These pawls are actuated by a finger 67 mechanically connected, for example by a cable, to a key 5f. Thus, the actuating of said key causes the step by step displacement to the left of the large second carriage 58 under the action of a spring (not shown). A step of the carriage 58 is equal to a step of the first small carriage 57. The actuating of the key 5f thus permits step by step displacement of the registering device E with respect to the totalizer T.

The support 59 is further provided with teeth 74 with which actuates a pawl, not shown, pivoted on the frame and mechanically connected to a key 5c. The actuating of key 5c, thereby causes the step by step return of the large carriage 58 and of the registering device E to the right.

The mechanical connections connecting the driving pinions 17 to the reading members 6 comprise one gear less than the mechanical connections connecting the driving pinions 21 to the said reading members 6, so that for a same direction of rotation of the registering members 22, the reading members revolve in the positive direction for addition when said registering sector members 22 are in mesh with the driving pinions 17, while said reading members 6 revolve in the negative or reverse direction for subtraction when the registering members are in mesh with the driving pinions 21.

The axial displacements of the totalizer T are controlled by keys 5e and 5a and by the intermediary of a mechanism represented on Fig. 13. Said mechanism comprises push rods 32 fastened each to a key and sliding on the one hand in guides provided in the frame (not shown), and on the other hand along guiding rods 33. Each push rod presents an incline 34 intended to cooperate with a bar 45 carried by levers 46 pivoted on an axis 47. One of said levers 46 is connected by a connecting rod 70 to a yoke 71 pivoted on the frame around an axis 72. Finally, said yoke is connected to the totalizer T by means of a connecting rod 73, see Figures 1 and 13, carrying a pin 75 engaged in an opening 76 provided in the cross members 14, see Figures 2 and 3.

When the key 5e is lowered, the totalizer is maintained in the axial position represented on Figure 10, for which the driving pinions 17 may mesh with the registering sector members 22. Thus, when they are driven by the shaft 11, see the co-pending application Serial No. 364,691, filed June 29, 1953, the reading members 6 revolve in the positive direction for addition. When the key 5a is lowered, the totalizer is shifted to the left and is maintained in the position represented on Figure 11, for which the registering members may mesh with the driving pinions 21. The reading members 6 are then driven in the negative direction for subtraction. In these Figures 10 and 11, the position of the registering sector member 22 with respect to the pinions 17 or 21, is indicated by the arrow *s*. Thus the machine performs an addition or a subtraction, the registering device E occupies always the same position along the guides *t*, while the totalizer is shifted by the lowering of one of the keys 5e or 5a and is moved along its guides *n* into two positions spaced one from the other to define a distance *q* between the pinions 17 and 21, thereby actuating a same reading member 6.

The totalizer T is provided with carry-over or a ten transfer mechanism device which comprises levers 10, Figure 4, oscillating on an axis 27, Figure 3, between two positions defined by locking devices each comprising

a ball 28 submitted to the action of a spring located in a bore 29 provided in the cross members 14. Said ball cooperates with one or the other of two sockets 31 provided in the rear face of each lever 10. Each intermediate pinion 19 is integrally formed with an actuating finger 36 cooperating with a nose 35 integrally formed on each lever 10. At each complete revolution of the intermediate pinion 19, and therefore at each complete revolution of the reading member 6 to which it is connected, see Figure 4, the finger 36 engages with the nose 35 and thereby oscillates the lever 10 out of its rest position, represented in dots and dashes lines, until the carry-over position is reached, as represented by continuous lines, and at which position the driving pinions 17 and 21 are engaged between arms 30 of said lever 10. The drum 37 is formed with the carry-over teeth 39, which teeth are disposed along a helix driven by the motor M in the direction of an arrow *f*. These carry-over teeth 39 are represented in detail in Figure 6 and the number of the teeth is equal to the number of figures which may be introduced into the registering device E. The teeth 39 are laterally displaceable against the action of a spring 40. To this effect, each carry-over tooth 39 emerging from a slot 41 machined in the drum 37 is rigidly fastened to a carrier 42 extending diametrically across said drum. The carrier 42 is formed with a guiding tail 43 engaged in a guide slot 44 in the drum 37 diametrically opposite to the tooth slot 41. The spring 40, rigidly fastened to the carrier 42, bears against one of the walls of each respective tooth slot 41 and tends to maintain the tooth 39 engaged against the opposite wall of said slot.

When the levers 10 are in the neutral or rest position, represented in dots and dashes lines in Figure 4, the carry-over teeth 39 pass to the side of the pinions 17 or 21, according to the axial position of the totalizer T, without meshing with either of said pinions. On the contrary, when a carry-over is manipulated, i.e., when one of the carry-over fingers 36 of the pinions 19 has actuated the corresponding lever 10 by means of its nose 35 said lever 10 is in the carry-over position represented in continuous lines and the corresponding carry-over tooth 39 is displaced laterally against the action of its spring 40 by means of the one or the other of two guiding faces 85 each formed by an incline provided at the extremity of each of the two arms 30 carried by each lever 10. The carry-over tooth 39 is displaced by the one or the other of said two inclines 85 according to the adding or subtraction position of the totalizer T so that said tooth 39 actuates one step further, either the pinion 17 or the pinion 21 of higher order of numeration according to whether the machine performs an addition or a subtraction.

Each reading member 6 is provided with a brake comprising an arm 48 pivoted on an axis 49 and mounting a roller 51 on one end thereof, maintained in engagement with the teeth of its pinion 15 by a spring 51a, see Figure 4. Said brakes define the exact angular positions of each of the reading members 6.

The means for resetting the totalizer T to zero comprises a shaft 50 driven by the motor M during the complete duration of a calculating operation. The shaft 50 carries toothed members 52, the teeth of which are cut down above the pitch circle as shown in Figure 4. Likewise, one tooth 53 of each intermediate pinion 19 is also cut down above the pitch circle. Finally, the carrier of the totalizer may occupy a third axial position for which the toothed members 52 are in mesh with the intermediate pinion 19. A key 5h, Figure 13, allows resetting the totalizer to move axially to its zero position, Figure 12, such axial movement being provided by the toothed member 52, which meshes with the intermediate pinion 19. The reading members 6 are driven in rotation until their respective mechanical connections with the shaft 50 are automatically disconnected when the cut

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down teeth 53 of the intermediate pinions 19 come in the plane of the shafts 20 and 50 respectively. At this moment, the zero of each reading member 6 appears in the window 7.

The reading members 8 of a counter C giving the number of the successive operations performed revolve freely on a shaft 12c and are each driven by means of gearing and of a carry-over and zero resetting device, similar to those of the totalizer T described above, and will therefore not again be described. However, in Figure 2, the equivalent members carry the same reference ciphers as those relative to the totalizer, but with the addition of the sub-index c.

With further reference to counter C, the same may be placed in three axial positions corresponding to the adding, subtracting and resetting to zero positions. However, said counter C may be positioned manually by the actuating of keys 5a and 5g, Figure 13, only in the adding and resetting to zero positions. The mechanism connecting the control keys 5a, 5e and 5g to the counter C, is in all particulars similar to that connecting the keys 5a, 5e and 5h to the totalizer T. The connecting rod 73c carries a pin 77 engaged in a slot provided in a cross member 78, shown on Figure 2 and which is similar to the cross member 14 of the totalizer T, shown in Figure 3, and disposed at the right of said totalizer T and in the same common plane.

One of the driving pinions 17c or 21c of the counter is actuated at each whole revolution of the shaft 24 carrying the registering members, by means of a finger 55 fastened to a ring 56 sliding along the shaft 24 and driven in the displacements of the large or second carriage 58. Thus, the counter totalizes the number of complete revolutions performed by the shaft 24 driving the registering members.

The counter C is always actuated in the positive direction for addition for any calculating operation performed by the machine. However, for a division, the divisor introduced on the registering device is subtracted many times one after the other from the dividend preliminarily carried over on the totalizer, until all the reading members 6 have passed over the zero. The machine has been then performed one subtraction too much. At this time, one adds once the divisor to the negative reading inscribed on the totalizer and subtracts one unit from the number appearing on the counter C by the action of the finger 55 on the driving pinion 21c connected to the right hand reading member 8 of counter C. Thus, for said latter partial operation, the counter C is actuated in the negative direction for subtraction. The setting of the counter C into the subtraction position is automatically controlled at the desired moments, during the dividing operation, by means of cams and by the intermediary of a known control device which is used in a general manner in calculating machines for the control of a subtraction on the counter of the successive operations. In this case, the passage over the zero position of the reading member 6 located at the extreme left end of the totalizer is caused by the intermediary of conventional means (not shown), but comprising for example a cam carried by the said numeral wheel and toggle means actuated by said cam, the displacement of the shafts 45 and 45c, Figure 13, which control the members 70 and 70c causing by the intermediary of the pins 77 and 75, a transverse displacement of the counter C and of the totalizer T.

In the same way as in the known calculating machines, when the dividend comprises a number of figures greater than the divisor, the dividing operation is effected by partial divisions by beginning at the left end. Therefore the large and the small carriages 27 and 58, respectively, are shifted to their extreme left-hand positions as follows: the first small carriage slides along the shaft 24 and the guide t, Figures 1, 2 and 8, comes to rest on the left end of the second larger carriage, and the large

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carriage 58 slides along the shaft 61 and the guide t and comes to rest on the extreme left end of the shaft 61. These shifting motions are caused by the action of return springs (not shown) acting on each of said carriages, upon actuation of a key 5k causing the unlocking of locks and pawls cooperating with the toothed racks of said large and small carriages as shown on Figures 8 and 9. After each partial division, the large carriage 58 is automatically returned to the right one step back, against the action of its return spring, by means of a pawl cooperating with the toothing 74.

When the calculating operation is finished, the return of the large and of the small carriages 58 and 27 up to their right end position is controlled by a key 5c. The actuating of said key causes the engagement of the two parts of a clutch (not shown) connecting the motor M to a drum (not shown) around which winds up a cable 69 fastened to the small carriage 27.

Operation

In order to perform a multiplication, the described calculating machine proceeds by successive additions, which are operated in the semi-automatic operation as illustrated with reference to Figure 1, in the following manner:

(1) The key 5m is depressed by pressing on the key bearing the letters "Rep."

(2) The multiplicand is obtained by manipulating the keys 3 of the ten keys keyboard.

(3) The key 5e which is the addition-multiplication key is depressed and said key is maintained in the depressed position during the time the machine is working by repeating the addition of the registered multiplicand in the following manner:

(a) The machine transfers the value of said multiplicand into the totalizer T.

(b) Then the machine adds to said first value of said transferred multiplicand, a same value of the multiplicand, whereby the sum substitutes in the totalizer T to the single value.

(c) The machine begins a new similar operation as long as the key 5e is maintained in its depressed position and the counter C registers the number of successive additions performed.

(4) The operator observes the counter C and interrupts the addition process by releasing said key 5e as soon as the multiplied result appears in said counter.

(5) The operator shifts the registering device E one step to the left by pushing in the key 5f.

(6) The operator again depresses the key 5e, until the figure of the tens of the multiplier registers the counter C. If the figure of the tens is zero, the operator passes to the hundredth figure by acting a second time on the key 5f.

(7) As soon as the figure of the tens appears or registers in the counter C, the operator again depresses the key 5f in order to shift the registering device E one step further to the left, and in this way the operator will, after the machine has performed the necessary number of additions, have the hundredth figure of the multiplier in said counter C.

(8) The operator continues in this way until the whole figures of the multiplier appear or register in said counter C.

In a full automatic operation of the machine, the multiplication may be performed as follows:

(1) The operator depresses the key 5m bearing the letters "Rep."

(2) He introduces in the machine the multiplicand by manipulating the ten keys keyboard.

(3) He depresses then a key "x" which is the multiplication key and registers in the machine the multiplier by manipulating the keys keyboard.

During the manipulating of said multiplier, the machine automatically effects the necessary additions, and the

lateral shifts from row to row of the registering device E, the multiplication beginning by the additions determined by the extreme left-hand figure and ending with the additions determined by the extreme right-hand figure.

On the contrary, the division operation is always automatic; however, in a semi-automatic machine the key 5b should be maintained in its depressed position during the whole time of working of the machine, whereas in a full automatic machine the key 5b may be released.

The division operation is performed by successive subtractions in the following manner:

(1) The operator depresses the key 5m bearing the letters "Rep." The depression of said key suppresses the automatic resetting to zero of the registering device E.

(2) The operator manipulates the dividend on the ten keys keyboard.

(3) He then depresses the key 5k in order to shift said registered dividend into the registering device E to the extreme left end.

(4) He depresses during a short time the key 5e of the addition in order to transfer the values registered into said registering device E into the totalizer T.

(5) He depresses the key III in order to reset to zero the registering device E as well as the counter C.

(6) He manipulates on the keyboard the figures of the divisor.

(7) He depresses the key 5k in order to shift the registering device until the extreme left-hand position is reached.

(8) He then depresses the key 5b which is the division key.

The division is then effected automatically by successive subtractions, the result appearing in the counter C and the successive rests in the totalizer T.

While certain novel features of the invention have been disclosed herein, and are pointed out in the annexed claims, it will be understood that various omissions, substitutions and changes may be made by those skilled in the art without departing from the spirit of the invention.

I claim:

1. In a calculating machine for carrying out the four basic arithmetical operations, the combination comprising, frame means, a keyboard for control of the different operations, a keyboard of ten keys to introduce a number in the machine mounted in the frame, a carriage adapted to travel in the frame to the left in a step-by-step movement in response to the setting of said keys, a set of spring driven members displaceably mounted in said carriage and responsive to said key settings, a set of registering and transfer members mounted in said carriage and driven by said key driven members, the combination of a totalizer controlled by said registering and transfer members and comprising a set of numeral wheels indicating the result of an operation, first and second actuating means connected to each of said numeral wheels, said first actuating means being connected to drive said numeral wheels in a positive direction and said second actuating means being connected to drive said numeral wheels in a negative direction, means for displacing said totalizer in front of said registering and transfer members from a first and adding position for which said registering and transfer members engage said first actuating means, to a second and subtracting position for which said registering and transfer members engage said second actuating means, a rotative member having laterally displaceable carry-over teeth disposed along a helical path, and a set of levers driven in the displacement of said totalizer from said adding position to said subtraction position, an intermediary shaft carried by said totalizer, cam means carried by said shaft and corresponding to each of said levers, said levers being movable from a rest position to a carry-over position by said cam means when a carry-over is requested, first and second arms carried by the end of each of said levers, a

first incline at the end of said first arm and a second incline at the end of said second arm, each carry-over tooth of said rotative member being resiliently maintained in such a position that said tooth will pass, according to the position assumed by said totalizer, on the side of said first or second actuating members of the numeral wheels and wherein said first or said second inclines, according to the position assumed by said totalizer, of one of said levers set in the carry-over position, displaces laterally one of said teeth to bring said tooth in engagement with said first or said second actuating means of the numeral wheel of the next higher order, whereby said carry-over tooth drives said last-mentioned numeral wheel in the positive or in the negative direction, according to the position assumed by said totalizer.

2. In a calculating machine according to claim 1, and comprising also guide means for said totalizer, said totalizer carriage being slidable along said guide means, said carriage carrying said numeral wheels, said first and said second actuating means, and said levers being operatively connected to said numeral wheels.

3. In a calculating machine for carrying out the four basic arithmetical operations, the combination comprising, frame means, a keyboard for control of the different operations, a keyboard of ten keys to introduce a number in the machine mounted in the frame, a carriage adapted to travel in the frame to the left in a step-by-step movement in response to the settings of said keys, a set of key driven numbers displaceably mounted in said carriage and responsive to said key settings, a set of registering and transfer members mounted in said carriage and driven by said key driven members, the combination of a totalizer controlled by said registering and transfer member and comprising a set of numeral wheels indicating the result of an operation, first and second actuating means connected to each of said numeral wheels, said first actuating means being connected to drive said numeral wheels in a positive direction and said second actuating means being connected to drive said numeral wheels in a negative direction, means for displacing said totalizer in front of said registering and transfer members from a first and adding position for which said registering and transfer members engage said first actuating means, to a second and subtracting position for which said registering and transfer members engage said second actuating means, and comprising also in combination with a rotative member having transversely displaceable carry-over teeth disposed along a helical path on said rotative member, first and second guiding members rigidly connected to each other and operatively connected with each numeral wheel and movable from a rest position to a carry-over position, and driven by the displacements of said totalizer and when said totalizer is in the first and adding position any one of said first guiding members set in the carry-over position transversely displaces one carry-over tooth carried by said rotative member to cause its meshing with the first actuating means of the numeral wheel of the next higher order, and when said totalizer is in the second and subtraction position the second guiding member, rigidly fastened to said first guiding member, and set in the carry-over position, displaces transversely said same carry-over tooth to cause its meshing with the second actuating means connected to said numeral wheel of the next higher order.

4. A calculating machine comprising a rotative member having lateral displaceable carry-over teeth disposed along a helical path on said rotative member, a totalizer movable to a first adding position and to a second subtracting position, first and second guiding members connected together, a lever carrying said guiding members, said totalizer including an auxiliary shaft carried thereby, cam means rotatably mounted on said auxiliary shaft, said respective cam means being capable of acting on each of a respectively adjacent one of said levers thereby moving said respectively adjacent one of said levers, thereby

moving said lever from its rest position to a carry-over position, said totalizer including a numeral wheel, a first actuating means connected with said totalizer numeral wheel, a second actuating means connected with said totalizer numeral wheel, said teeth of said rotative members each being normally maintained in one position, whereby said teeth pass to the side of the said first and second actuating means, said lever, said cam and said shaft being arranged so that when said numeral wheel passes through its zero position said cam will actuate said first guiding member to its actuated position whereby it will cam one of said carry-over teeth on said rotative member out of said one position into meshing relation with said first actuating means when said totalizer is in its first position, and further, said lever, said cam, and said shaft being arranged so that when said totalizer is in its second position and said numeral wheel passes through its zero position, said cam will actuate said second guiding member to its actuated position whereby it will cam one of said carry-over teeth on said rotative member into meshing relation with said second actuating means.

5. A calculating machine comprising a rotative member having laterally displaceable carry-over teeth disposed along a helical path on said rotative member, a totalizer movable to a first adding position and to a second subtracting position, said totalizer including a numeral wheel for each denominational order, a first actuating means connected with said numeral wheel, a second actuating means connected with said numeral wheel, guiding means, carry-over levers carried by said totalizer and carrying two of said guiding means, said totalizer including an auxiliary shaft carried by said totalizer, cam means rotatably mounted on said shaft and each acting on a corresponding carry-over lever when its associated numeral

wheel passes through its zero position in order to actuate one of said guiding means to its actuated position whereby said one guiding means is set in the path of one of said displaceable teeth in order to subsequently cam a laterally displaceable tooth of said rotative member into meshing relation with said first actuating means so that when said totalizer is in its first position and said rotative member is subsequently rotated said numeral wheel connected with said first actuating means is rotated in a positive direction, and said rotatably mounted cam means being effective to actuate the other of said guiding means to its actuated position, whereby said other guiding means is set in the path of one of said displaceable teeth in order to subsequently cam a laterally displaceable tooth of said rotative member into meshing relation with said second actuating means so that when said totalizer is in its second position and said rotative member is subsequently rotated said numeral wheel connected with said second actuating means is rotated in a negative direction.

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