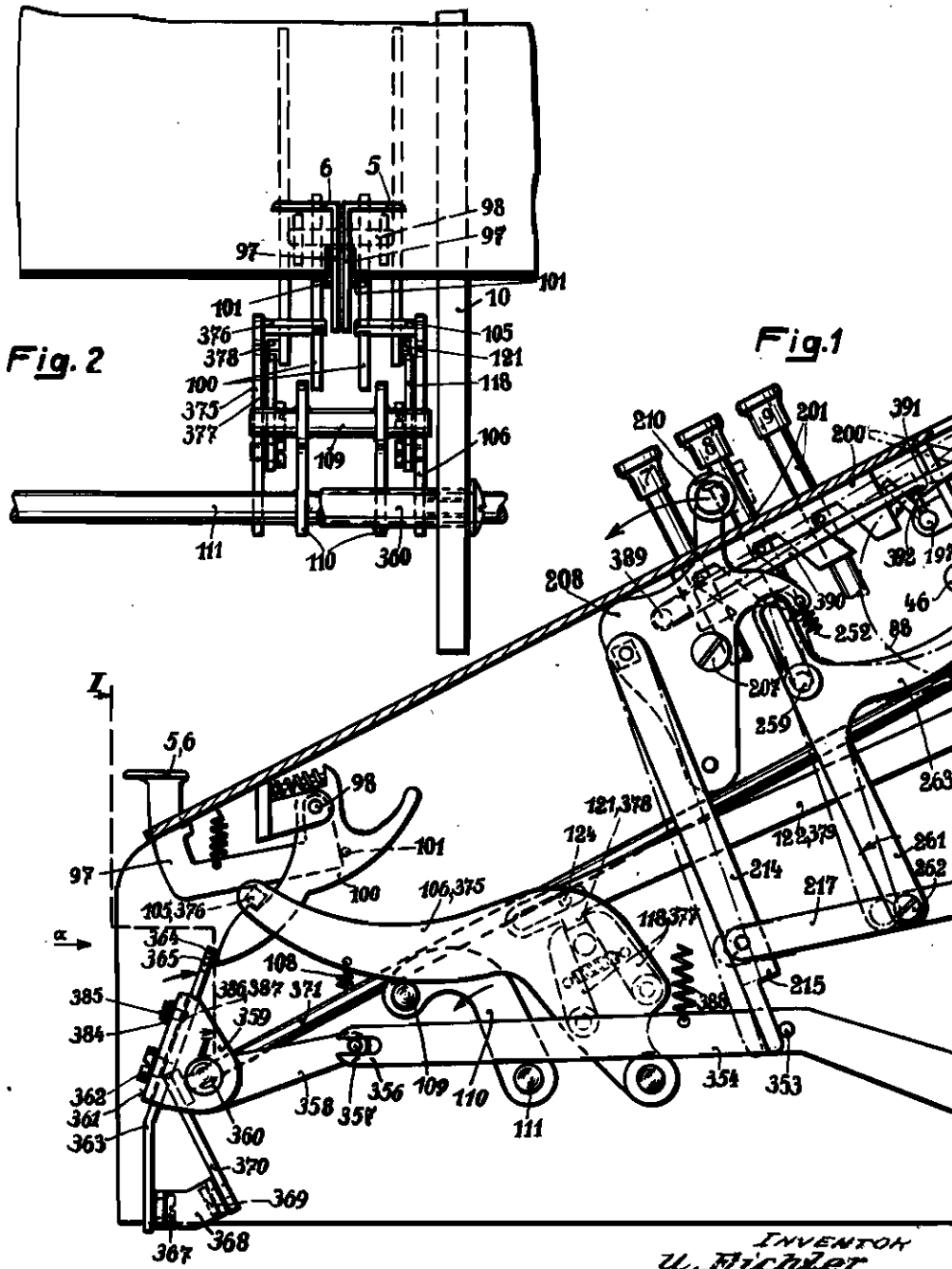


PUBLISHED  
MAY 25, 1943.  
BY A. P. C.

U. EICHLER  
CALCULATING MACHINE  
Filed Aug. 2, 1939

Serial No.  
288,057  
5 Sheets-Sheet 1



INVENTOR  
*U. Eichler*  
BY *John O. Heid*  
ATTORNEY

PUBLISHED

MAY 25, 1943.

BY A. P. C.

U. EICHLER

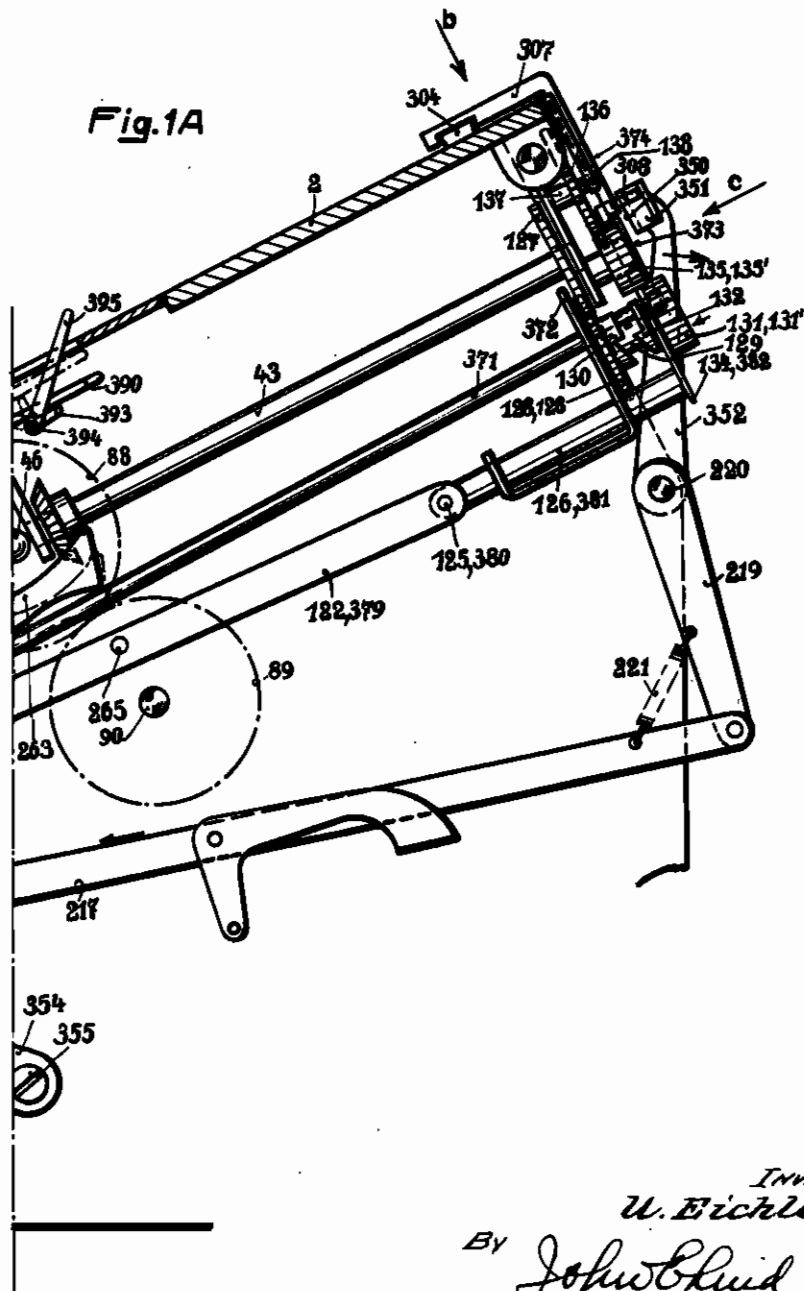
CALCULATING MACHINE

Filed Aug. 2, 1939

Serial No.

288,057

5 Sheets-Sheet 2



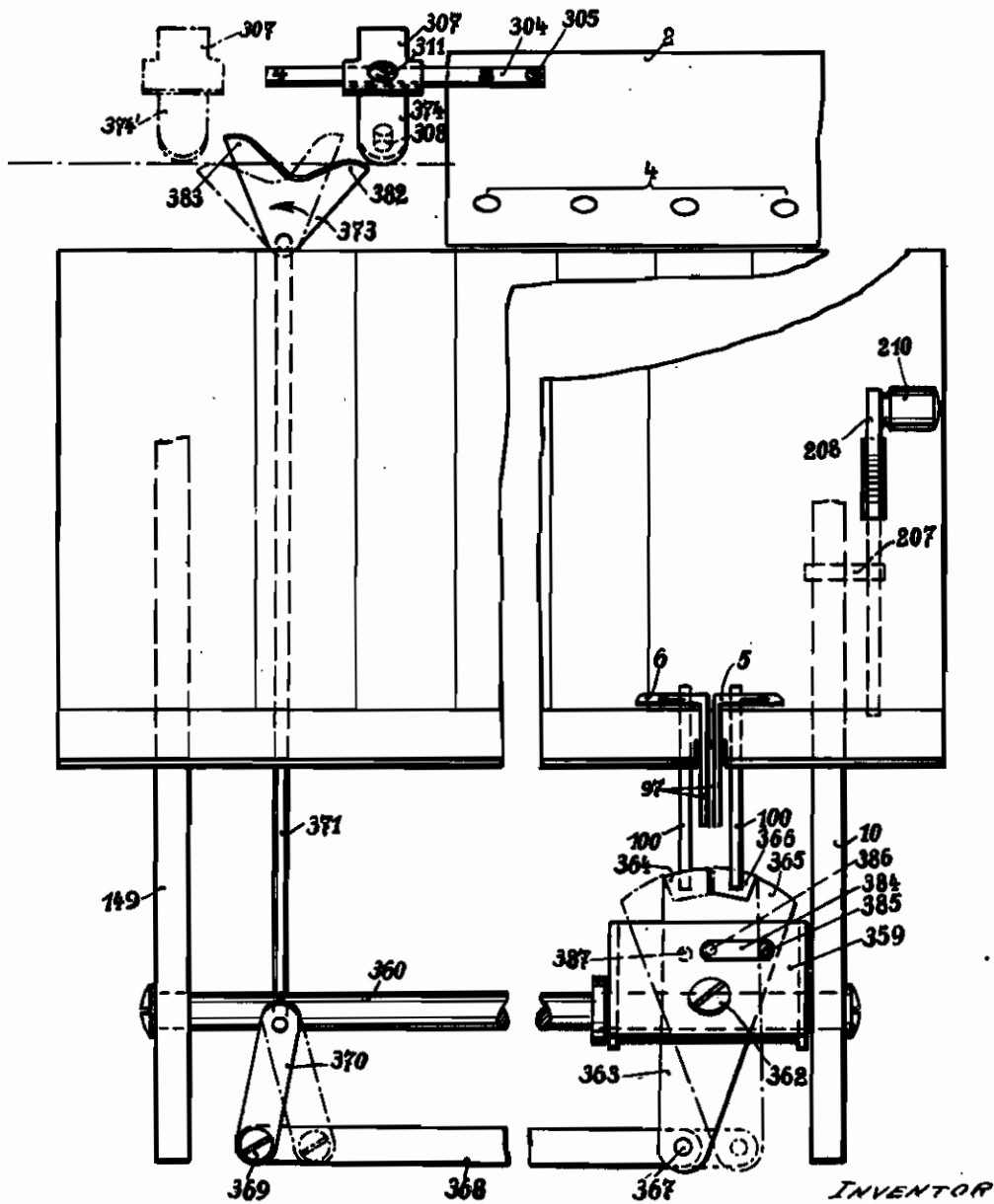
INVENTOR  
*U. Eichler*  
BY *John O. Lind*  
ATTORNEY

PUBLISHED  
MAY 25, 1943.  
BY A. P. C.

U. EICHLER  
CALCULATING MACHINE  
Filed Aug. 2, 1939

Serial No.  
**288,057**  
5 Sheets-Sheet 3

**Fig. 3**



INVENTOR  
*U. Eichler*

BY

*John E. Lind*  
ATTORNEY

PUBLISHED  
MAY 25, 1943.  
BY A. P. C.

U. EICHLER  
CALCULATING MACHINE  
Filed Aug. 2, 1939

Serial No.  
288,057  
5 Sheets-Sheet 4

Fig. 4

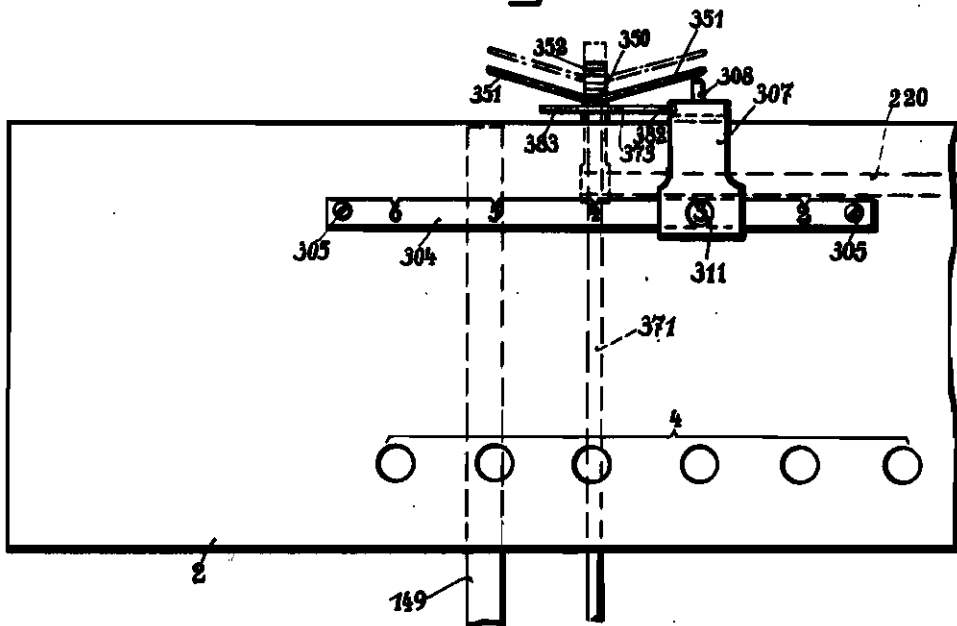
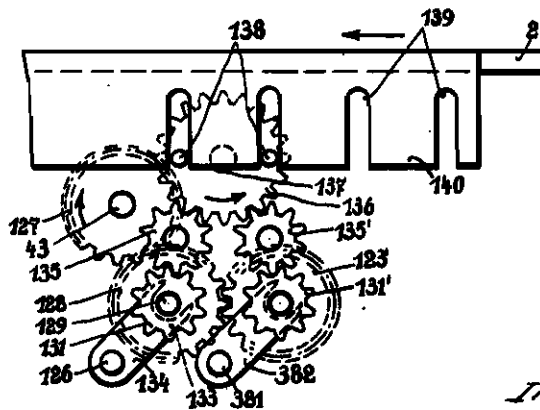


Fig. 6



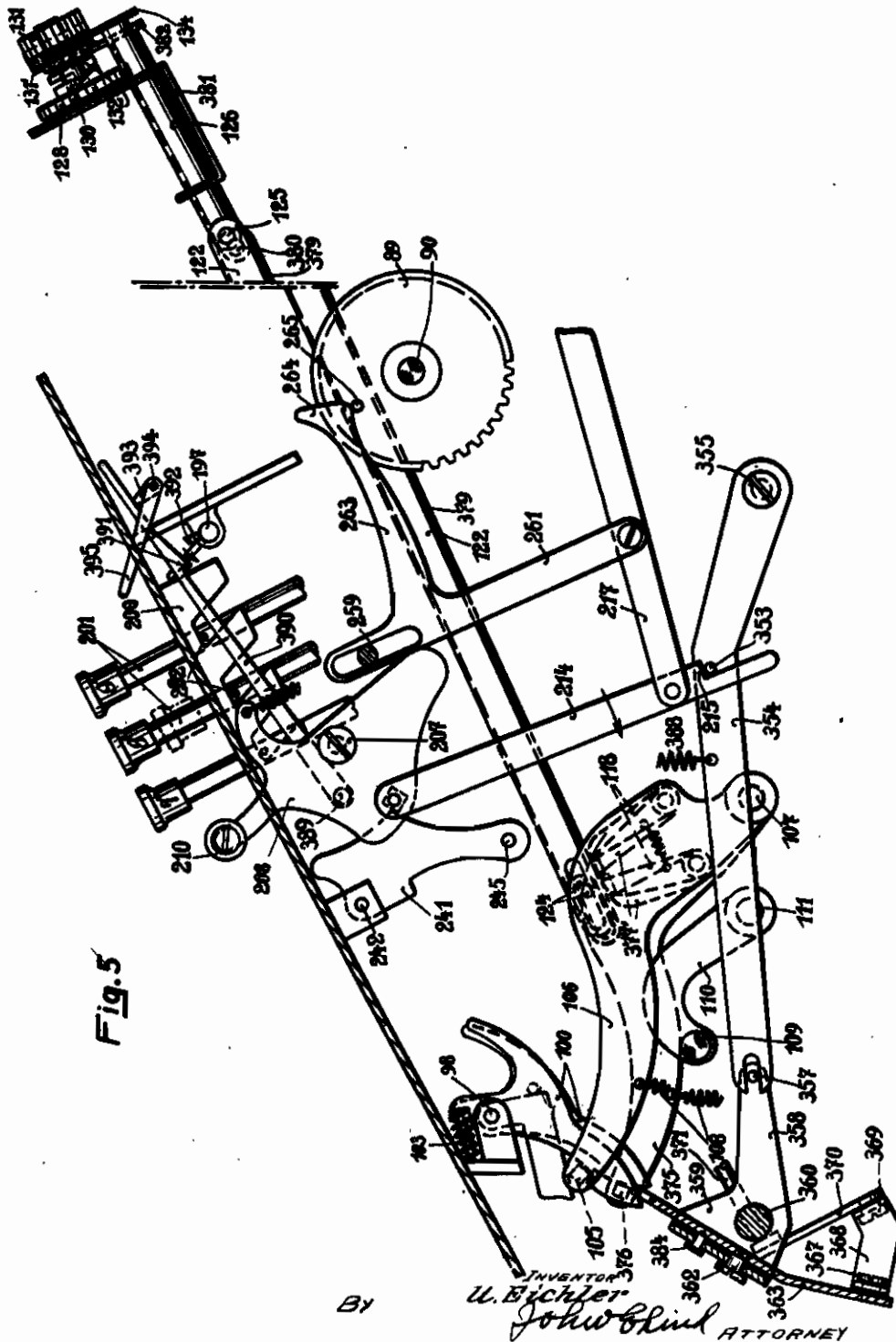
INVENTOR  
U. Eichler

BY *John Chuid*  
ATTORNEY

PUBLISHED  
MAY 25, 1943.  
BY A. P. O.

U. EICHLER  
CALCULATING MACHINE  
Filed Aug. 2, 1939

Serial No.  
288,057  
5 Sheets-Sheet 5



# ALIEN PROPERTY CUSTODIAN

## CALCULATING MACHINE

Ulrich Eichler, Glashutte in Saxony, Germany;  
vested in the Alien Property Custodian

Application filed August 2, 1939

This invention relates to calculating machines provided with a motor driven carriage shifting mechanism, in which means are provided thru which the carriage shifting mechanism is actuated, and an adjustable abutment is provided on the carriage adapted to engage with a member which controls the carriage shifting mechanism, in order to bring the carriage to a stop. Prior arrangements act only on a single direction of movement of the carriage, thus limiting the use of such older arrangements. An object of the invention, therefore, is to provide an arrangement by which it is possible to always bring the carriage into a selectively predetermined position, either to the left or to the right.

An object of the invention is to provide means whereby the shift drive, by means of a feeler, actuates the left or right shifting mechanism for the carriage according to whether an adjustable abutment provided on the carriage is at the right or left of a member controlling the carriage drive. The arrangement is thus applicable not only generally, but especially permits, for example, the adding of the items set up in a calculating machine with the decimal position observed, without any special attention.

A further object is a construction in which the carriage shift drive may be set in operation automatically at the end of a previous calculation. It is also possible to provide a special handle by means of which said shift drive may be actuated.

A still further object is to provide a feeler in the form of a V-shaped rocking lever, with which a shoulder-like projection or the like mounted on the adjustable abutment of the carriage co-operates, and which controls the shift drive by a rod arrangement.

Furthermore, since the control member sets in operation the calculating mechanism after the carriage shifting mechanism has been brought to a stop, in order to transfer the value set up in the keyboard to the totalizer, it is an object of the invention to provide means for clearing the value set up in the keyboard before the transfer rotation of the calculating shaft. In this manner it is possible, in certain calculations, to prevent the value still set up in the keyboard from being transferred to the totalizer.

With this and other objects in view, which will become apparent from the detailed description below, the invention is illustrated in the drawings which show one form of the invention, somewhat similar to that shown in my co-pend-

ing application Ser. No. 213,279, filed June 11, 1938.

Fig. 1 is a partial lateral elevation with the casing removed and parts omitted for greater clarity.

Fig. 1A is a continuation of Fig. 1 to the right. Fig. 2 is a vertical cross section on line II—II of Fig. 1.

Fig. 3 is a partial front elevation of the machine viewed in the direction of the arrow *a* on Fig. 1.

Fig. 4 is a partial plan view looking in the direction of the arrow *b* on Fig. 1.

Fig. 5 is a partial side view with parts omitted and showing the elements in a different operative position.

Fig. 6 is a partial rear elevation viewed in the direction of the arrow *c* on Fig. 1.

The construction described below is based on the arrangement forming the subject matter of application Ser. No. 213,279 above mentioned, with, however, the following modifications.

Co-operating with the pin 308 on the adjustable slide 307 is a counter-abutment 350 which has two V-shaped surfaces 351 directed toward each other. The counter-abutment 350 is carried by a lever 352 fixed on the shaft 220.

Moreover, the bar 214 acts on a pin 353 on a lever 354. Lever 354 is journaled oscillatably at 355 on the machine frame and has a forked end 356 engaging over a pin 357 on a lever arm 358, which latter is connected with a U-shaped supporting member 359, which is journaled oscillatably on the connecting bar 360 provided on the machine frame. Journaled on the plate-like front part 361 of the supporting member 359, by means of a pivot pin 362, is a lever plate 363, the form of which is shown on Fig. 3. It terminates above in two abutments 364 and 365 between which the recess 366 is provided. Engaging with the downwardly directed extension of the plate 363, at 367, is a bar 368, the other end of which is pivoted at 369 to a lever 370. The latter is fixed on a shaft 371 which is journaled on the one hand in the connecting bar 360 and on the other in the frame plate 372. A feeler plate 373, cut out V-shaped, is attached at the rear upper end of the shaft 371. Co-operating with the V-shaped feeler plate 373 is the lower end or the downwardly directed end of the extension 374 which is attached to the slide 307 and carries the pin 368.

As stated in application Ser. No. 213,279, a latch lever 100 (see Fig. 2) is coordinated with the key levers 97.

Application Ser. No. 213,279 relates in detail only to means which initiates the shift to the right of the calculating mechanism carriage. As shown on Fig. 2 there is disposed, with respect to Fig. 1, behind the lever plate 106 a corresponding lever plate 375 which carries a pin 376 corresponding to the pin 105. Pin 376 co-operates with the latch pawl lever 100 which is actuated by the shift key 97.

Co-ordinated with the lever plate 375 is a pair of levers 377, 377, corresponding to the levers 118, and which cooperate with an extension 378 corresponding to the extension 121. Extension 376 is on a bar 379 which, with respect to Fig. 1, lies behind the bar 122 and is, moreover, shaped and journalled like the bar 122. Bar 379 engages by means of a pin 390 with a slide-like bar 381 which, together with the similar bar 126, is longitudinally slidable in the machine frame (see Fig. 6). Attached to the end of bar 381 is a plate 382 which has a forked end engaging in a groove of the spur gear 131' mentioned in Ser. No. 213,279. By moving gear 131' in the direction of the arrow on Fig. 1 a clutch is connected in between the gear 131' and spur gear 126' which corresponds substantially to the clutch parts 130 and 132 between the spur gears 131 and 128.

The pin 109 on the lever arms 110 is, as shown on Fig. 2, so formed as also to engage under the lever plate 375, so that when the left shift key 6 is depressed, by the rocking of the corresponding latch lever 100, the lever plate 375 can rock downwardly through the traction of the spring 108 engaging therewith in the direction of the arrow shown on Fig. 1. The pin 109 is swung downwardly and the lever arm 110 and the shaft 111 connected therewith are swung in the direction of the arrow on Fig. 1. The motor is then supplied with current in the manner described in co-pending application Ser. No. 213,279, and the drive clutch engaged. At the same time, by means of the bar 275 described in Ser. No. 213,279, the calculating mechanism is disconnected and, by means of the rods 379 and 381, the gears 131' and 128' are set in combined rotation. The thereby resulting rotation of gear 128' shifts the calculating carriage 2 to the left (with respect to Fig. 3).

The above mentioned lever plate 363 is coordinated with the latch levers 100 so that in its two end positions it engages the lever 100 initiating the left or right shift. For example, if the lever plate 363 is in the position shown by full lines on Fig. 3 then, on a rocking movement of the support 359 in the direction of the arrow on Fig. 1, that lever 100 would be actuated which initiates the left shift, while if the plate 363 is in the position shown by dotted lines that lever 100 would be actuated which causes the right shift.

It is to be noted that when, for example, the calculating mechanism carriage is moved manually or by motor from the position of Fig. 3 to the left, the lower end of the plate 374 passes by the curved part 382 of the plate 373, but strikes against the curved part 383 and thereby rocks plate 373 in the direction of the arrow on Fig. 3, so that the lever plate 363 is carried by the elements 367-371 into the dotted line position of Fig. 3.

A leaf spring 384 is attached to the support 359 at one end by means of a screw 385, and at the other end carries a pin 386 which cooperates with two cap-shaped recesses 387 provided in the rocker plate 363 in order to hold the plate 363 releasably in its two end positions. If the slide 307 is in a position so that the plate 374 occupies,

for example, the dotted line position of Fig. 3, and if the calculating mechanism carriage 2 is shifted to the right, the lower end of the plate 374 passes by the curved part 383 (see dotted line position of Fig. 3), but contacts with the upwardly extending curved part 382 and the plate 373 is swung back into the position shown in full lines.

The operation is explained with reference to a single calculation example:

For example, in making out a statement, if the cost of 21.75 meters at 12.50 Marks per meter is to be found, with 2.75 Marks added for transportation (postage, freight or the like) and packing, the result would be as follows:

As marks and pfennigs are involved, and use is made only of two of the four decimal places after the decimal point, the slide 307 must be set on the carriage 2 so that the "3" is visible in the opening 311, that is, the slide must be set so that two decimal positions of the totalizer are moved to the right out of the range of the calculating mechanism.

Calculation is then done as follows:

First the number of meters is set up in the keyboard, the "5" in the key bank farthest to the right, then the "7" in the adjacent bank, then the "1" and finally the "2," are set up. This is then multiplied by 1250, with the carriage, in the initial position, so that the value 2 718 750 is given in the totalizer at the end of the calculation. Corresponding to the two decimal positions, in the multiplicand as well as the multiplier, the decimal point would be placed between the fifth and the fourth decimal position from the right. This would indicate that the total was 271.8250 Marks, to which should be added the postage and packing charge of 2.75 Marks, with the decimal point placed in the proper position. This is done in simple manner, according to the invention, in that the value 275 is set up in the keyboard so that the "5" and the "7" are in the first and second right key banks, for the pfennig calculation, and the "2" in the third key bank.

In order to add the supplementary charge to the result, with the proper decimal position, the calculating carriage which is first in the position in which the three extreme right decimal positions are at the right outside of the calculating mechanism, first passes to the left for a shift advance, so that the supplementary charge set up in the keyboard passes to the proper position, that is, the decimal point between the "2" and the "7" must align with the decimal point between the "1" and the "8" in the totalizer. It is then necessary only to carry the handle 210 into the position of Fig. 5, whereby the following automatically takes place. By actuating the handle 210 as described, the plate 208 carrying said handle is rocked into the position of Fig. 5, and the impact bar 214 connected thereto is first depressed. The shoulder 215 of the bar 214 then strikes the pin 353, and the lever 354 is rocked into the position of Fig. 5.

It is here to be noted that the carriage, after the above multiplication calculation, assumes a position such that the three decimal positions at the farthest right are outside the calculating mechanism, and the slide 307 is in the position shown by full lines on Fig. 3.

In said actuation of the handle 210 the rocker plate 363 is thus in the position shown in full lines, so that when the support 358 is rocked in the direction of the arrow on Fig. 1, the extension 364, through the action of the lever 354, strikes

against the latch lever 100, which sets in motion the left shift of the calculating machine. Fig. 5 shows how the corresponding lever 100 is rocked by the extension 364, so that the lever plate 375, through the traction of its engaging spring 108, can swing into the position shown in Fig. 5.

When the plate 375 passes into the position according to Fig. 5, the calculating mechanism and the drive motor are connected in by means of the pin 109 in the manner described in application Ser. No. 213,279. Furthermore, when the plate 375 passes to the position of Fig. 5, the rod 379 is actuated and the clutch for the left shift of the carriage is connected in.

In the first revolution of the main shaft 46 the carriage 2 is thus moved for one shift to the left, relative to Fig. 3, so that the slide 307 comes into position above the shaft 371. In this movement of the calculating carriage the pin 308 on slide 307 contacts with the corresponding inclined surface 351 of the counterabutment 350, whereby the latter and the lever 352 carrying it are rocked into the dotted line position of Fig. 4. By the rocking of the lever 352 in the direction of the arrow on Fig. 1A and the consequent rocking of shaft 220, the rod 217 connected therewith by means of the lever 219 is moved to the left in the direction of the arrow on Fig. 1.

Through this movement of the rod 217, the impact bar 214 is first rocked in the direction of the arrow on Fig. 5, so that the pin 353 is released from the shoulder 215. The lever 354 is thereby released, so that it can swing back under the traction of the spring 380 engaging therewith into the initial position. The support 359 is again rocked back to the initial position of Fig. 1, so that the abutment 304 releases the corresponding lever 100 whereby, as described in application Ser. No. 213,279, the lever plate 375 which was shortly before rocked back to the initial position, is retained by such co-ordinated lever 100.

This has the further result of disconnecting the carriage advance at the end of the first revolution of the main shaft. At the same time, in the movement of the rod 217, the lever 261, 263 is rocked so that the end 264, formed as an abutment, passes into the range of the pin 205 on the spur gear 89. At a given time interval the lever 261, 263 is then rocked about the pivot point 262 so that the pin 250 engaged thereby is forced to the left which, as described in application Ser. No. 213,279, results in a revolution of the calculating mechanism, through which the value set up in the keyboard is added at the proper decimal position to the previous total, so that finally, at the end of the calculation, that is, after the machine is brought to a stop, the value 274.6250 appears in the totalizer.

If, in further calculating the statement there is to be added to the price obtained from 1.75 meters  $\times$  1.25 Marks a further addition of .90 Marks for postage and packing, the procedure is as follows.

The value 1.75 is first set up in the three extreme right key banks of the keyboard. This value is multiplied by a proper operation of the corresponding calculating keys by 1.25. After this multiplication the value in the totalizer is 21875. After clearing the keyboard the supplement of .90 Marks is set up therein, which is done by pressing the "9" in the second key bank from the right. It is to be noted that at the end of the multiplication the carriage is in a position such that the two extreme right decimal positions, thus the "75", is outside the range of the

calculating mechanism. In this case the calculating machine carriage is already in the proper position, that is, the pin 308 is in front of the counter-abutment 350, which is thus in the dotted line position of Fig. 4.

If, however, the counter-abutment 350 is in this swung-out position the bar 217 is moved by levers 352 and 219 to the left so that the impact bar 214 assumes the dotted line position of Fig. 1. If the lever handle 210 is actuated, the bar 214 passes freely by the pin 353, so that lever 354 is not rocked. The carriage shifting mechanism is thus not connected in.

On the other hand, when the rod 217 is moved the abutment end 264 of the lever 201, 263 contacts the pin 265, and the lever 201, 263 is rocked in the direction of the arrow on Fig. 1 about the pin 262, and this causes a revolution of the calculating shaft, as described in application Ser. No. 213,279, and the value set up in the keyboard is added to that in the totalizer. The amount 3.0875 then appears in the totalizer.

Finally, in a further statement calculation, if it is desired to find the price of 0.75 meters at a price of 0.25 Marks per meter, to which 0.45 Marks are to be added for postage and packing, the procedure is as follows.

First, the 0.75 meters is set up in the keyboard, by depressing the "5" in the extreme right key bank, and the "7" in the adjacent row. Then, with the carriage in the initial position, that is, the carriage is in its extreme left position, the amount is first multiplied by "5," and then, after a movement of the carriage to the right, by "2." The value 1875 thereupon appears in the totalizer. Inasmuch as the carriage, in the multiplication, has moved one position to the right, the slide 307 is in the dotted line position of Fig. 3, and the plate 373 is in the dotted line position. If now, after the value 45 has been set up in the extreme right banks of the keyboard, the handle 210 is swung into the position of Fig. 5, the lever 354 is swung by the bar 214 into the position of Fig. 5.

Since, corresponding to the dotted line position of the plate 373, the rocker plate 363 also assumes the dotted line position shown in Fig. 3, when the support 359 is rocked by the lever 354 in the direction of the arrow on Fig. 1, the extension 385 strikes the lever 100 which causes a shift to the right of the calculating carriage. Then during the first revolution of the main shaft, the carriage is moved for one position to the right with respect to Fig. 3, so that the slide 307 comes above the shaft 371. The result thereof is a rocking of levers 352 and 219, and the bar 217 is moved to the left.

In this movement of the bar 217, the shoulder 215 on the impact bar 214 releases pin 353, so that the carriage shifting mechanism is disconnected in the manner described and the calculating mechanism is connected in. Through the movement of the carriage the "1" and the "8" of the value 1875 in the totalizer aligns with the "45" in the keyboard. In the following revolution of the calculating shaft the value .45 Marks is added at the proper positions, so that the value 0.6375 Marks can then be read off in the totalizer.

It is thus apparent that, by means of the present arrangement, values having a widely different number of positions after the decimal point can be added, and the decimal point placed in the proper position.

In order, on actuating the handle 210, to per-



mit the carriage to pass to the position desired through the setting thereof without the value set up in the keyboard being at the same time carried into the totalizer, there is pivoted on plate 208, at 389, a bar 390 which is provided with a shoulder-like extension 301. This latter extends in the range of a finger-like extension 392 attached to the clearing shaft 205. As described in application Ser. No. 213,279, when the shaft 205 is oscillated in the direction of the arrow on Fig. 1, the key check bars 200 are carried into the release position.

The free end of the bar 390 is engaged by a cam member 393 which is attached to a shaft 384 journalled in the machine frame, and on which there is also attached a handle 395 which extends outside the cover of the calculating machine.

If the value set up in the keyboard is to be

transferred, on the actuation of the handle 210, as was the case in the preceding calculating examples, to the totalizer, then the handle must be rocked into the position of Fig. 5, so that the shoulder 391 may pass freely by the finger 392.

On the other hand, if there is to be no transfer of the value still in the keyboard, to the totalizer, the handle must be moved into the position shown in full lines on Fig. 1. The shoulder 391 therefore moves in front of the finger 392. If the handle 210 is now actuated the clearing shaft 205 is rotated simultaneously therewith, and any value set up in the keyboard is cleared before the calculating shaft begins to revolve. It is to be noted that after the shoulder 391 has caused the clearing revolution of the shaft 205, the shoulder 391 slides off over the finger 392, so that the shaft 205 can snap back to the starting position.

ULRICH EICHLER.