Jan. 4, 1938. F. A. NIEMANN 2,104,051

CALCULATING MACHINE

Filed May 16, 1935 2 Sheets-Sheet 1

Fig. 1

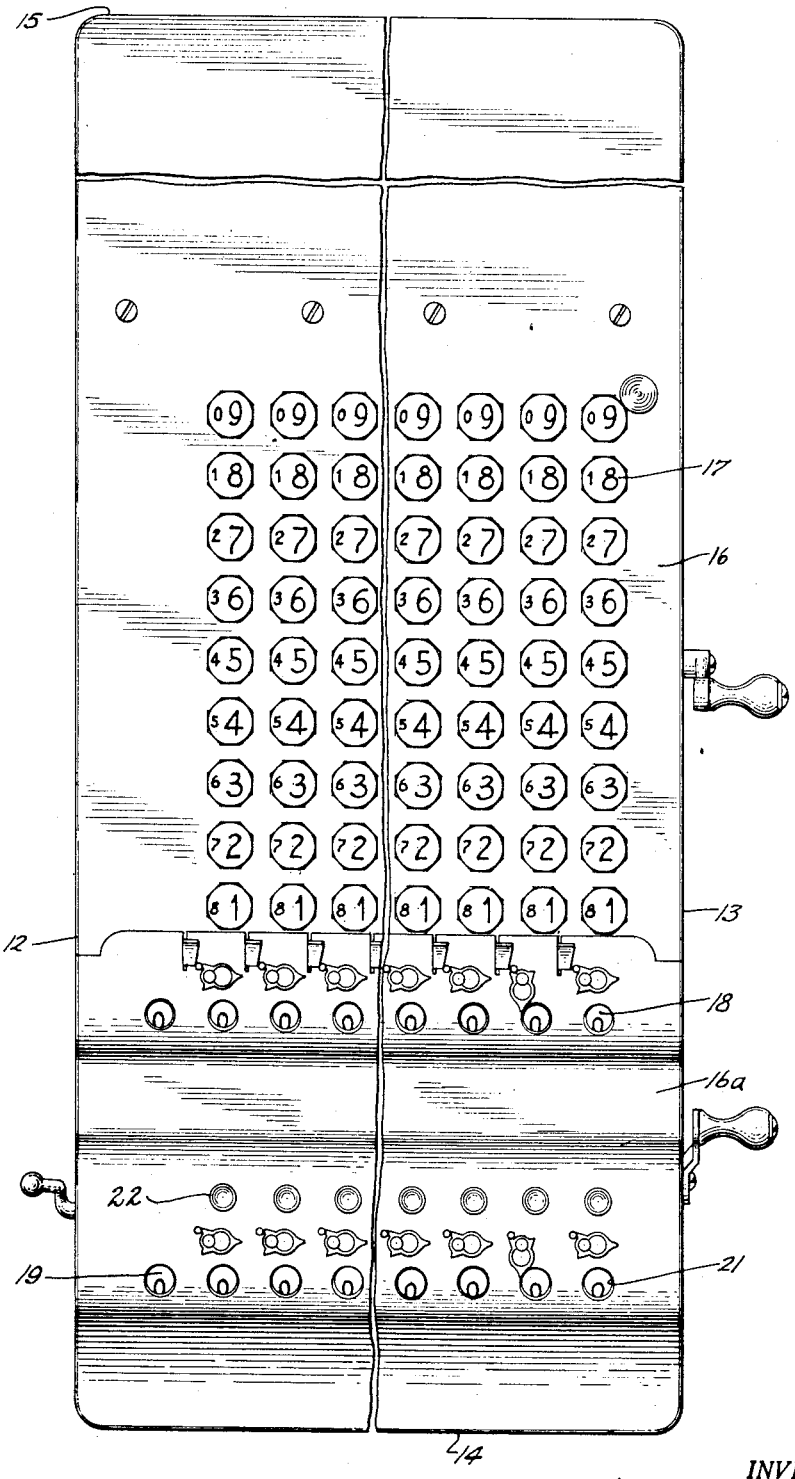

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Fig. 2

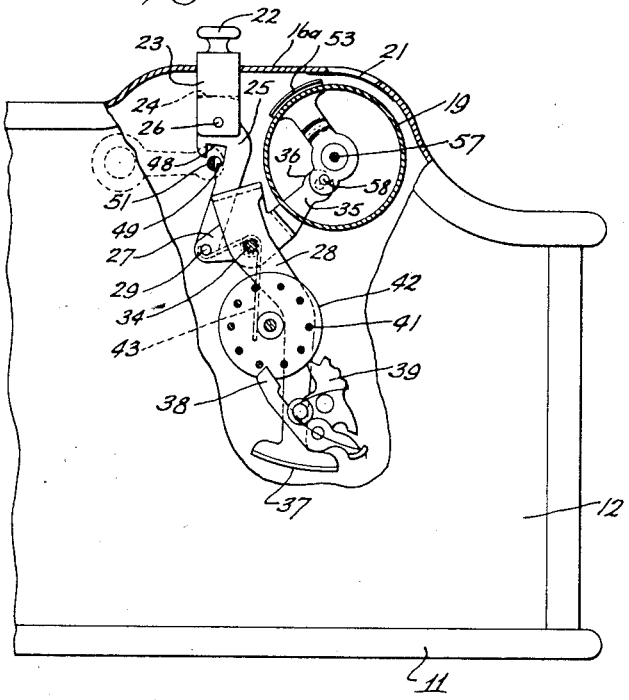


Fig. 3

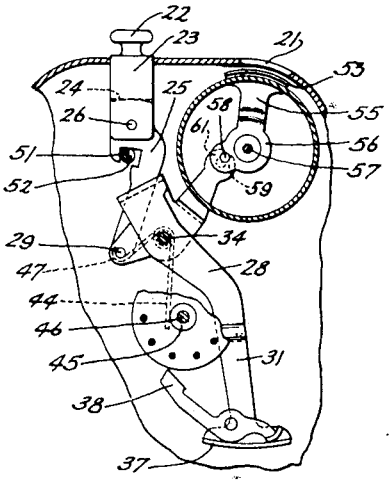


Fig. 4

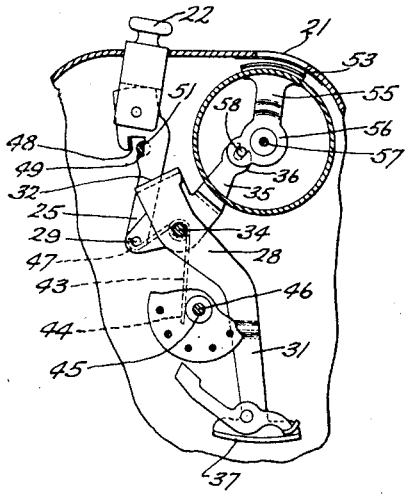
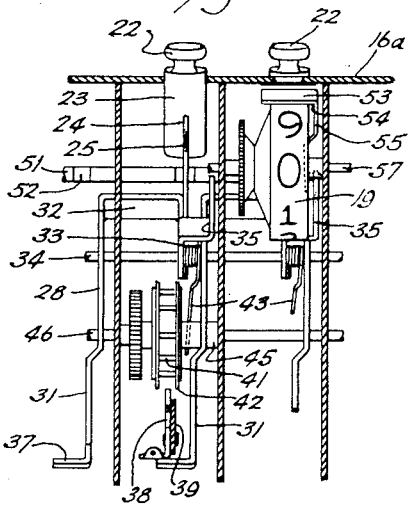


Fig. 5



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2,104,051

CALCULATING MACHINE

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Application May 16, 1935, Serial No. 21,734

5 Claims. (Cl. 235—82)

This invention relates in general to calculating machines and while it has more particular reference to calculating machines of the type disclosed in the copending application of Frederick A. Niemann and Joseph A. V. Turck, Serial No. 751,526, filed November 5, 1934, it will be apparent that certain features of the invention have other and more general valuable application.

The machine disclosed in said co-pending application is of the supertotalizer type wherein a supplemental registering mechanism is provided to receive and register the grand totals transferred from the ordinary registering mechanism shown and described in United States Letters Patent to Joseph A. V. Turck, No. 1,357,748.

A principal object of the invention is the provision of an improved mechanism for preventing errors in calculating operations, which may arise from inadvertent reading of figures which are not to be included in the total resulting from a calculating operation.

Another important object of the invention is the provision of means for concealing the items registered by a particular numeral wheel.

It is desirable in performing certain calculating operations on machines of this type, that the carry be prevented in certain of the orders of the machine, and an important object of the invention is the provision of means for locking a carry cut-out lever in operative or carry preventing position to prevent a carry in a desired order of mechanism.

Another important object of the invention is the provision in a machine of the character described of means for locking a carry cut-out lever in a desired order of mechanism in operative or carry preventing position to prevent a carry when a total is being transferred from the ordinary registering mechanism to the supplemental registering mechanism.

A further important object of the invention is the provision of means for simultaneously locking the carry cut-out lever in operative or carry preventing position and concealing the items registered by the numeral wheel of a desired order.

Numerous other objects and advantages of the invention will be apparent as it is better understood from the following description, which, taken in connection with the accompanying drawings, discloses a preferred embodiment thereof.

Referring to the drawings,

Figure 1 is a partial plan view of a calculating machine in which the present invention is embodied;

Fig. 2 is a partial side view, partly broken away to show the parts in inoperative position;

Fig. 3 is a partial vertical section taken just to the left of a numeral wheel and showing the parts in operative position;

Fig. 4 is a view, similar to Fig. 3, showing the parts locked in operative position; and

Fig. 5 is a partial end sectional view of Fig. 4 with parts broken away and parts removed.

In its present embodiment the invention is incorporated in a calculating machine of the type disclosed in the co-pending application above referred to, wherein a supplemental accumulator mechanism is provided to accumulate the totals transferred from an ordinary accumulator mechanism to indicate a grand total of the ordinary calculating operations. The details of construction of this type of machine may be readily understood from the aforementioned copending application and only such parts of the machine as may be necessary or desirable to an understanding of the present invention are herein shown and described. It will be understood, however, that the invention may be incorporated in other types of calculating machines.

For the purpose of illustrating the invention I have shown on the drawings a calculating machine in which the working parts are mounted within a casing of any preferred construction, such casing in the present instance comprising a base 11, side walls 12, 13, front and rear walls 14, 15, and top wall 16. A plurality of denominational orders of keys 17 are provided and the registrations effected by operation of the ordinary accumulator mechanism are viewed through the ordinary sight openings 18 located in the face plate 16a.

As more particularly disclosed in the beforementioned copending application, a supplemental accumulator mechanism is provided to receive the totals transferred from the ordinary accumulator mechanism and such totals are indicated on numeral wheels 19, viewed through sight openings 21 located in the forward portion of the face plate, as shown more particularly in Fig. 1.

It may be desirable, when the machine is used for extending invoices or inventory, to raise the minimum unit "one" only when the fraction or decimal value of such unit in the extension is ".5" or more. The present invention provides for eliminating the carrying of any undesired number or decimal of a number from a previous extension to the next extension or accumulation.

The mechanism employed is or may be duplicated for each denominational order of the ma-

chine and a description of a single set of such mechanism is thought to be sufficient to an understanding of the invention.

Extending through a suitable opening in the face plate 16a is a finger button or key 22 having a depending stem 23 which is centrally slotted as indicated at 24 to receive a depending lever 25 pivotally secured to the stem 23 by a pin 26 or other suitable fastening means. At its lower end the lever 25 is fastened to an arm 27 of a carry cut-out or carry preventing lever 28 by a stud 29.

The carry cut-out or carry preventing lever 28 comprises a downwardly extending offset stem portion 31 bent at its upper end to form a shoulder 32 which in turn is bent to provide a hub portion 33 pivoted on a shaft 34 extending transversely across the several orders of the machine. An upwardly extending arm 35 is provided with a bifurcated end 36 for a purpose to be later described.

The lower end of lever 28 is bent to form a laterally extending shelf or shoulder 37 which is curved slightly and is normally positioned slightly below and to the rear of a carry transfer pawl 38 pivoted to a bell crank lever 39. The carrying mechanism is constructed and arranged in the calculating machine used for illustration, as shown and described in Letters Patent No. 1,357,748, and detailed description here is not thought necessary.

As described in said Patent #1,357,748, the carrying pawl 38 is normally in position to engage the pins 41 of the lantern wheel 42 to throw the lantern wheel ratchet of the next higher or left hand accumulator one numeral space, which movement of the lantern wheel is transmitted through a suitable train of gears (not shown) to effect a carrying transfer from the accumulator mechanism of the lower order to the accumulator mechanism of the next higher order whenever the bell crank lever 39 is urged rearwardly in a carrying operation.

When it is desired to prevent or cut out a carry, the finger button or key 22 is depressed, moving the lever 25 downwardly and through arm 27 rocking the carry preventing or carry cut-out lever 28 forwardly. Forward movement of the lever 28 brings the shoulder 37 into engagement with the lower end of pawl 38 rocking it out of normal accumulator pin engaging position and preventing a carry, as shown in Fig. 3.

The keys 22 are normally held in elevated inoperative position by springs 43, one said spring being provided for each key. Each spring comprises a coiled central spring body which is pivoted on shaft 34. One end 44 is arranged to the rear of and has bearing against a bushing 45 on a shaft 46 of the lantern wheel 42 and the other end 47 is arranged below and bears upwardly against stud 29 of lever 25, normally urging lever 25 upwardly.

The invention contemplates the provision of means for locking the keys and carry preventing or carry cut-out lever in operative or carry preventing position. The lever 25 has a cut-out portion 48 forming a shoulder 49. A transverse key lock shaft 51 extending across the several orders of the machine is positioned just below the cut-out portion 48 of the lever 25 and is milled to its center at 52 adjacent each shoulder 49.

When the key 22 is in normal elevated position, the shoulder 49 extends into the milled or slotted portion 52 of the shaft, as shown in Fig. 2. Upon depression of the key 22, the lever 25 moves downward as already described against the tension of spring 43 until the upper edge of the cut-out portion 48 engages shaft 51, limiting further downward movement of the lever and limiting also further rocking of the lever 28. The front edge of the key 22 is then further depressed and slightly tilted as shown in Fig. 4, rocking the lever 25 rearwardly until it enters the milled portion or slot 52 of shaft 51 where the shaft rides on shoulder 49 and upward movement of the lever 25 and key 22 under the tension of spring 43 is restrained until the key is again tilted and the lever moved out of engagement with shaft 51.

The invention also provides means for eliminating from the operator's vision unnecessary, confusing decimal figures which otherwise might be read as part of the answer by the provision of a shutter which moves into a position to conceal the items registered by a numeral wheel immediately upon depression of the key 22 which renders the carry cut-out operative, as already described.

Shutters 53, extending transversely over the tops of the several numeral wheels 19, are bent at 54 to form a wing 55 having a hub portion 56 which is pivoted on shaft 57 of the numeral wheels 19. A stud 58, secured to the hub 56, is adapted for sliding engagement within the jaws 59 and 61 of the bifurcated end of arm 35 of the carry cut-out lever 28. On depression of a key 22, the arm 35 is rocked rearwardly, raising the stud 58 and swinging the shutter forwardly to the position shown in Fig. 3, concealing the numeral wheel from view. Release of the key 22, as earlier described, rocks arm 35 downwardly and moves the shutter away from sight opening 21 into the position shown in Fig. 2.

It is thought that the invention and many of its attendant advantages will be understood from the foregoing description, and it will be apparent that various changes may be made in the form, construction and arrangement of the parts without departing from the spirit and scope of the invention or sacrificing all of its material advantages, the form hereinbefore described being merely a preferred embodiment thereof.

I claim:

1. In a calculating machine having denominational orders of accumulator registering mechanisms including numeral wheels, sight openings through which said numeral wheels may be viewed and devices for transferring a carry from lower to higher denominational orders of accumulator registering mechanisms, means for preventing said carry transfer devices from effecting said carry transfer, means actuated by said preventing means for concealing the numeral wheels associated with said devices from view, and means for actuating said carry transfer preventing means.

2. In a calculating machine having denominational orders of accumulator registering mechanisms including numeral wheels, sight openings through which said numerals may be viewed and devices for transferring a carry from lower to higher denominational orders of accumulator registering mechanisms; means for preventing said carry transfer devices from effecting said carry transfer in selected orders, and means actuated by said preventing means for concealing the numeral wheels of said selected orders from view.

3. In a calculating machine having denominational orders of accumulator registering mechanisms including numeral wheels, sight openings

through which said numeral wheels may be viewed, and devices for transferring a carry from lower to higher denominational orders of accumulator registering mechanisms; means for preventing said carry transfer devices from effecting said carry transfer in selected orders, devices controlled by said preventing means for concealing the numeral wheels of said selected orders from view when said preventing means is actuated, and means for actuating said carry transfer preventing means.

4. In a calculating machine having denominational orders of accumulator registering mechanisms including numeral wheels, sight openings through which said numeral wheels may be viewed, and devices for transferring a carry from lower to higher denominational orders of accumulator registering mechanisms; a lever associated with each of said carry transfer devices operable to prevent the associated device from effecting a carry transfer, and a shutter controlled by each of said levers when operated for concealing the associated numeral wheel from view.

5. In a calaculating machine having denominational orders of accumulator registering mechanisms including numeral wheels, sight openings through which said numeral wheels may be viewed, and devices for transferring a carry from lower to higher denominational orders of accumulator registering mechanisms; a lever associated with each of said carry transfer devices operable to prevent the associated device from effecting a carry transfer, and a shutter connected to each of said levers for concealing the associated numeral wheel from view when the lever is in carry transfer preventing position.

FREDERICK A. NIEMANN.