July 17, 1923. 1,462,058

E. F. BRITTEN, JR

CARRY MECHANISM FOR REGISTERS

Filed April 14, 1920 3 Sheets-Sheet 1

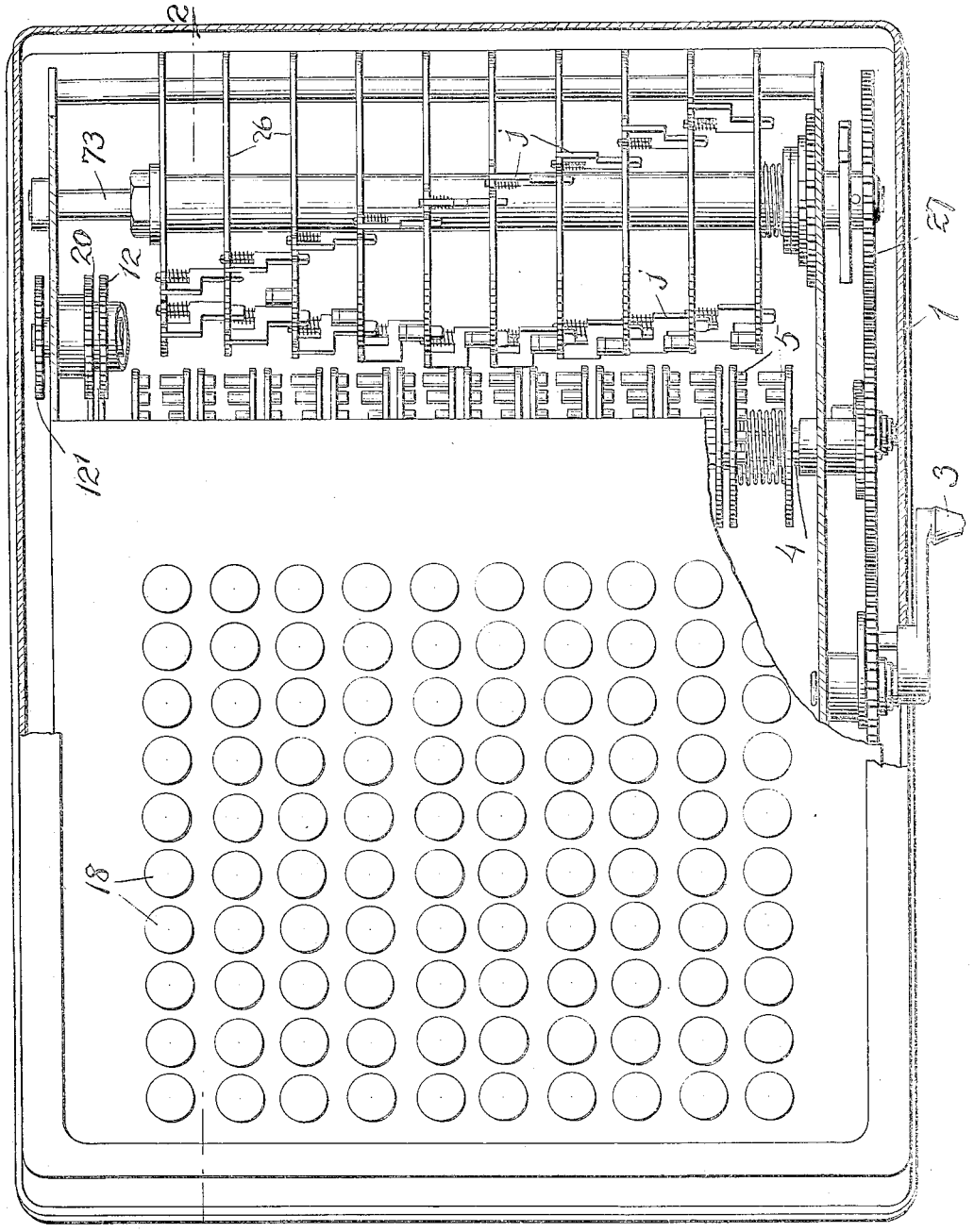

Fig. 1.

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Filed April 14, 1920 3 Sheets-Sheet 2

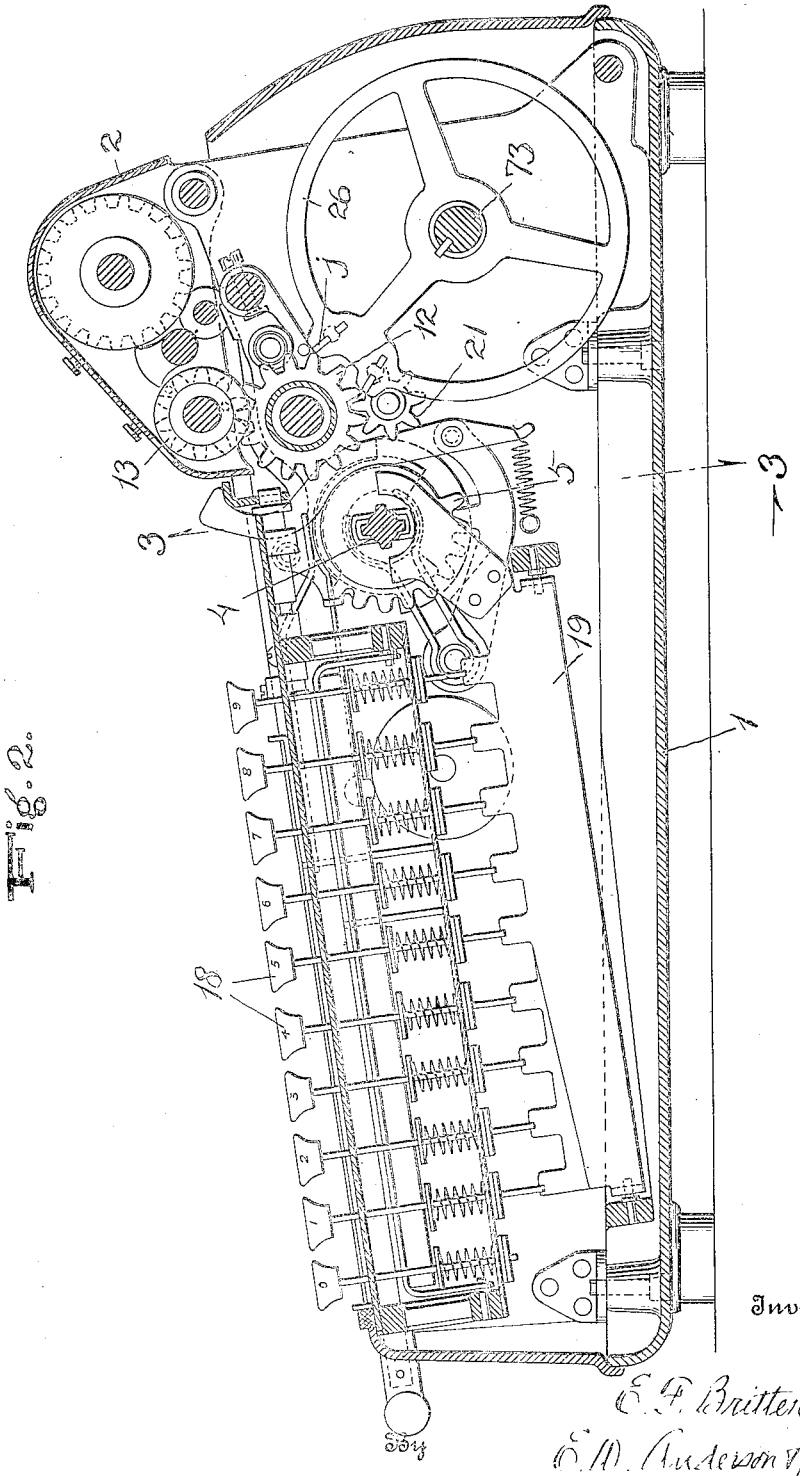

Fig. 2.

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Fig. 4.

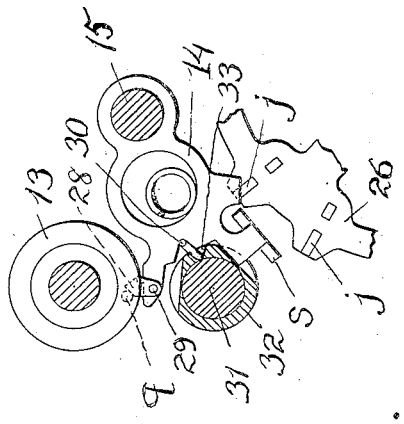


Fig. 5.

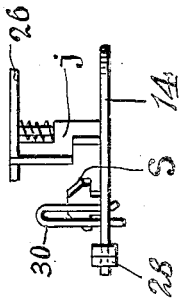
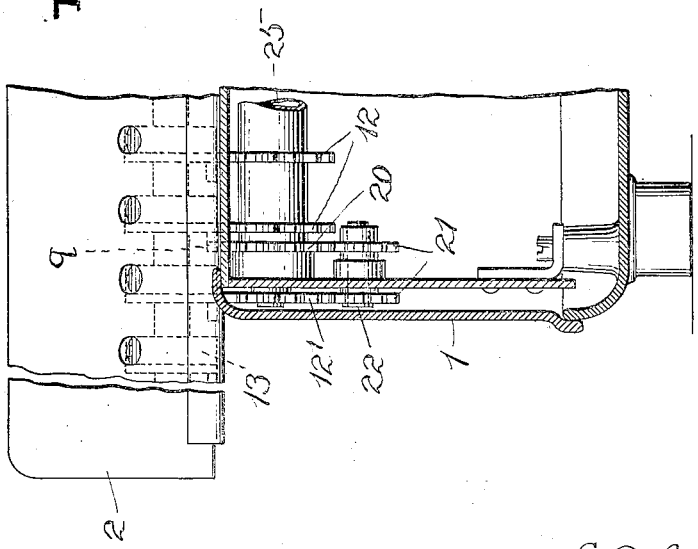


Fig. 3.



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UNITED STATES PATENT OFFICE.

EDWIN F. BRITTEN, JR., OF MAPLEWOOD, NEW JERSEY, ASSIGNOR TO MONROE CALCULATING MACHINE COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

CARRY MECHANISM FOR REGISTERS.

Application filed April 14, 1920. Serial No. 373,834.

To all whom it may concern:

Be it known that I, EDWIN F. BRITTEN, Jr., a citizen of the United States, resident of Maplewood, in the county of Essex and State of New Jersey, have made a certain new and useful invention in Carry Mechanism for Registers; and I declare the following to be a full, clear, and exact description of the same, such as will enable others skilled in the art to which it appertains to make and use the invention, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

Figure 1 is a plan view of a machine embodying the invention, with the carriage removed, and parts broken away.

Figure 2 is a section on the line 2—2 Figure 1.

Figure 3 is a section of the left hand end of the machine on the line 3—3 Figure 2.

Figure 4 is a detail side view of the pivotal member and parts adjacent thereto.

The invention has relation to calculating machines, and particularly to carry mechanism therefor, having for an object, in rotating the crank handle or operating device at a given rate of speed, to reduce the speed of operation of the carry mechanism or of the selecting mechanism, or of both carry and selecting mechanism, and to simplify the construction of the carry mechanism. Other objects and advantages will appear.

The invention consists in the novel construction and combinations of parts, as hereinafter set forth.

In the accompanying drawings, illustrating an embodiment of the invention, as applied to a machine of the type of the reissue patent to Baldwin, No. 13,841, the numeral 1 designates the framing, and 2 an endwise-shiftable carriage whereon are mounted a series of register wheels or dials 13, each having a gear fast thereto. A series of intermediate gears 12 is mounted upon shaft 25, in mesh with the gears of the register wheels 13 and operated by selecting or differential actuating wheels 5, mounted upon shaft 4, and by carry devices, including teeth *j*, slidable in seats of annular carry elements 26, mounted upon the shaft 73. A gear or gears 12′ are also mounted upon the shaft 25, at one end of and beyond the gears 12, to which they correspond in diameter and number of teeth.

The shafts 4 and 73 are rotated in either direction, according to the nature of the problem to be solved, through gear connection 27 with an operating device or crank handle 3, and transmit clockwise or counter-clockwise rotation, through the gears 12, to the register wheels.

The carriage is shiftable endwise to shift the register wheels relatively to the intermediate gears.

Denominational keys 18 are arranged in a plurality of ordinal banks or series, each series being provided with rock-bars or members 19, actuated by the key depressed to set the related selecting wheel or element 5 in accordance with the value of said key. An intermediate gear 12 is provided for each ordinal series of keys and its related selecting means and carry means, and to the left of the intermediate gears and upon the same shaft are provided one or more additional gears 12′, not directly related to any selecting element and serving to transmit the tens or to carry from the next lower order wheel 13.

In order that a carry to be transmitted through one of the gears 12 shall not merge with an actuation of said gear by its selecting element 5, means for storing or reserving the carry, and for effecting it after the operation of the element 5, are provided, said means consisting of teeth or pins *q* of the register wheels 13; plungers or settable members depressed by said pins and having lower cam faces *s*, and sliding teeth *j* actuated and held in active position relative to the gears 12 by said cam faces *s*, all as described in said patent to Baldwin. Furthermore, inasmuch as a carry may necessitate one or more additional carries, and the members or plungers must be depressed before the teeth *j* come into registering position, these teeth *j* must be arranged to operate successively upon the gears of different order, from right to left, and the successive registration of these teeth with the gears 12 therefore takes place during a considerable proportion of the stroke of the crank handle or operating device, also as disclosed in said patent.

For each gear 12′ a gear 20 is provided, upon the same shaft or concentrically thereof, said gears 20 being located in position to contact with the pins *q* of the lower order

register wheels 13; and for each gear 20 is provided a pair of gears 21, mounted upon a stud shaft 22 and transmitting rotative movement from gear 20 to the related gear 12', and thereby to the wheel 13 of higher order. As the wheel 13 related to each gear 20 passes to decimal position from 9 to 0 or from 0 to 9, its pin q will rotate gear 20 one step, and 1 will be added to or subtracted from the next higher register wheel 13.

In this way the carry is transmitted directly to the gear or gears 12', without the intervention of a carry storing means, this being possible because the gear or gears 12' are not operated by the selecting or differential actuating elements 5 but are related to an order or orders of the register higher than those provided in the keyboard; the result being that the plunger or settable member and the carry tooth j are eliminated for each gear 12', and the carry takes place simultaneously with the passing of the register wheel to decimal position, instead of being stored or reserved and operating successively, as in the patent.

Any desired number of extreme ordinal carry mechanisms, having no related selecting elements or setting-up mechanism, may be provided, the operation of the lower order mechanisms being unaffected thereby.

In the construction shown, the carry cams s, instead of being formed upon plungers p, as in the patent, are formed upon the pivotal members 14, pivoted upon frame rod 15, each member being also provided with an upper double-cam-beveled tooth 28, corresponding to the similarly formed upper tooth of the plunger p of the patent, but pivoted to said member at 29, whereby incorrect carry operation by excess movement of the numeral wheels is prevented, as explained in the patent to Phinney, No. 1,215,186. The pins q of the register wheels engage the teeth 28 and thereby depress said members.

In order to releasably retain the members 14 in raised and in depressed position, U-form springs 30 have each one arm thereof pivotally engaging a seat 31 of a collar 32 upon the intermediate gear shaft, said springs being permitted a limited pivotal movement, and at the end of this movement, in either direction, having contact with one or the other of the lateral walls of a V-form notch 33 of said collar, said springs at their outer portions having pivotal engagement with the member 14 as shown in Figure 4.

I claim:

1. In a register, an endwise-shiftable carriage, register wheels mounted thereon, means for selectively operating said wheels, and carry mechanism comprising means for effecting a delayed carry between certain of said wheels in a given position of the carriage, and means for effecting a carry to one of the last-named wheels simultaneously with the passage of the next lower order wheel to decimal position, in another position of the carriage.

2. In a register, an endwise-shiftable carriage, register wheels mounted thereon, selecting mechanism including an ordinal series of elements controlling certain of said wheels, and means for variably operating certain of the wheels in accord with the control of their respective elements, carry mechanism comprising means for effecting a delayed carry successively in successive higher orders between the wheels so controlled and means for effecting a carry to a wheel not so controlled simultaneously with the passage of the next lower order wheel to decimal position, said register wheels being adapted to cooperate indifferently with the delayed or the simultaneous carry means, according to the position of the carriage.

3. In a register, an endwise-shiftable carriage, register wheels mounted thereon, selecting mechanism including an ordinal series of selecting elements controlling certain of said wheels, and means for variably operating certain of said wheels in accord with the control of their respective selecting elements, carry mechanism comprising means for effecting a delayed carry between the wheels so controlled, and means for effecting a carry to a wheel not so controlled simultaneously with the passage of the next lower order wheel to decimal position, said delayed carry means and said simultaneous carry means both including elements upon the register wheels adapted to act indifferently with either means, according to the position of the carriage.

4. In a register, an endwise-shiftable carriage, register wheels mounted thereon, selecting mechanism including an ordinal series of elements controlling certain of said wheels, and means for variably operating certain of said wheels in accord with the control of their respective selecting elements, carry mechanism comprising means for effecting a delayed carry between the wheels so controlled, including reciprocatory elements, and means including gear elements for effecting a carry to a wheel not so controlled simultaneously with the passage of the next lower order wheel to decimal position, said delayed carry means and said simultaneous carry means both including elements upon the register wheels adapted to act indifferently upon the first-named elements of either means, according to the position of the carriage.

In testimony whereof I affix my signature, in presence of two witnesses.

EDWIN F. BRITTEN, JR.

Witnesses:
F. E. NORRIS,
P. F. HARNETT.