

Jan. 12, 1926.

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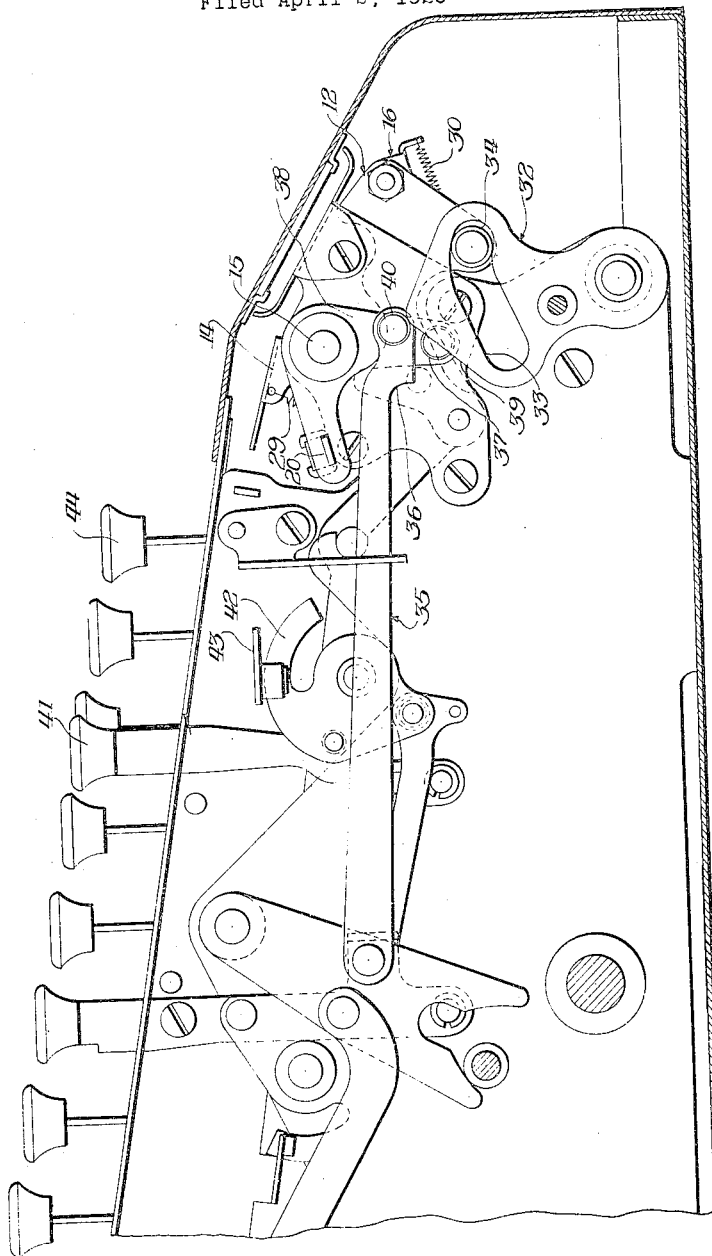
O. D. JOHANTGEN

CALCULATING MACHINE

Filed April 2, 1925

3 Sheets-Sheet 1

Fig. 1.



Witness:

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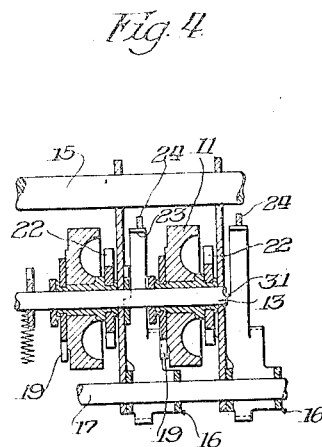
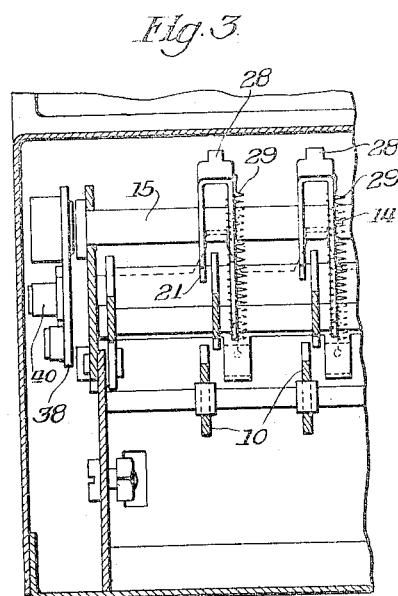
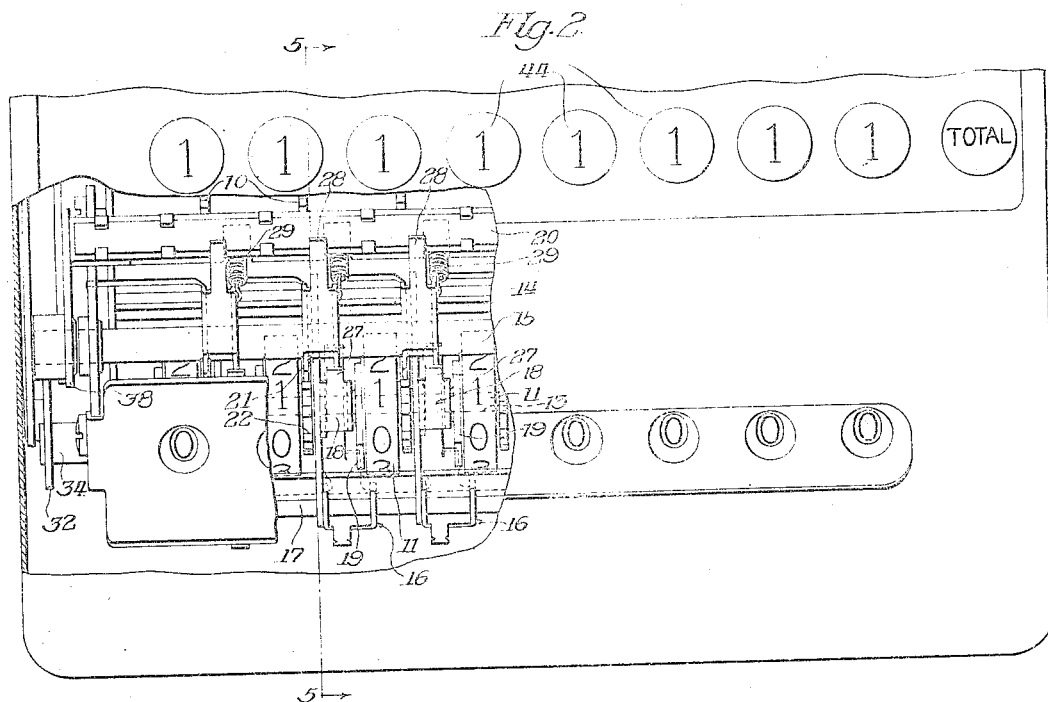
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CALCULATING MACHINE

Filed April 2, 1925

3 Sheets-Sheet 2



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CALCULATING MACHINE
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3 Sheets-Sheet 3

Fig. 6.

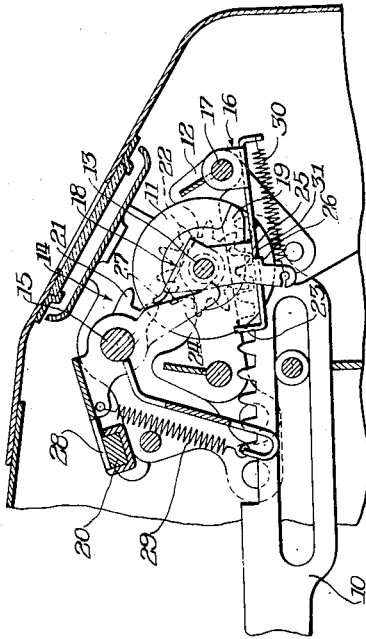


Fig. 8.

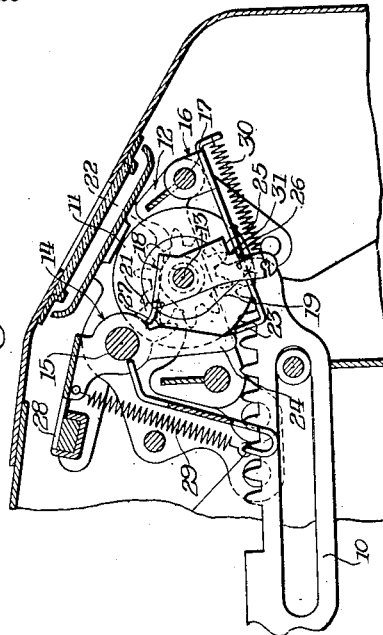


Fig. 5.

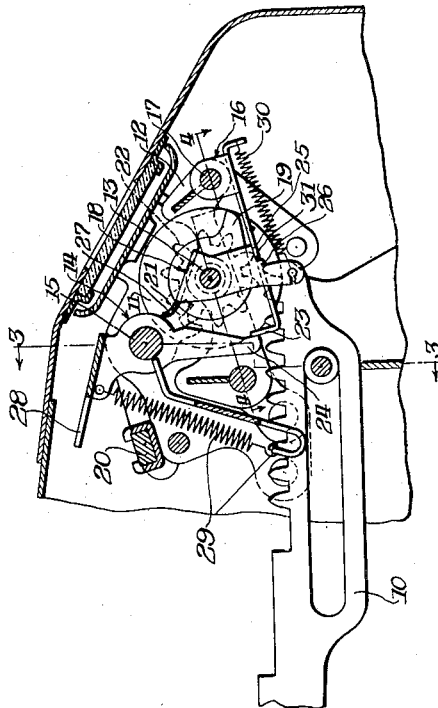
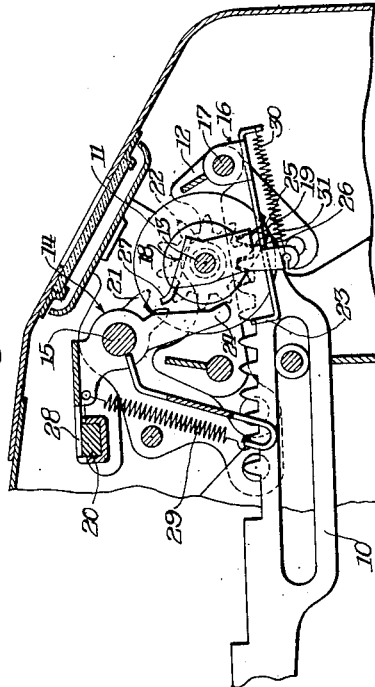


Fig. 7.



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By *James A. Huntington, Atty.* & *Richard J. Atty.*

UNITED STATES PATENT OFFICE.

OLIVER D. JOHANTGEN, OF OAK PARK, ILLINOIS, ASSIGNOR TO VICTOR ADDING MACHINE CO., OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

CALCULATING MACHINE.

Application filed April 2, 1925. Serial No. 20,090.

To all whom it may concern:

Be it known that I, OLIVER D. JOHANTGEN, a citizen of the United States, residing at Oak Park, in the county of Cook and State of Illinois, have invented new and useful Improvements in Calculating Machines, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawing, forming a part of this specification.

My invention relates to calculating machines and has special reference to the construction of the accumulator.

More specifically the invention relates to machines of that type wherein the operation of carrying is accomplished by spring actuated carry devices which are separated from the main actuating element.

The construction disclosed in this application is in the nature of an improvement or development of the construction shown in my Patent No. 1,306,112, dated June 10th, 1919.

One of the objects of the present invention is to simplify the construction and operation of the carry mechanism.

Further objects will appear from the description and claims.

In the drawings, in which my invention is illustrated

Figure 1 is a vertical sectional view showing the accumulator mechanism and the mechanism for controlling its movement;

Fig. 2 is a plan view of the front part of the machine with part of the casing broken away to show the accumulator construction;

Fig. 3 is a substantially vertical section on the line 3—3 of Fig. 5;

Fig. 4 is an inclined section on the line 4—4 of Fig. 5;

Fig. 5 is a section on the line 5—5 of Fig. 2 showing the carrying mechanism;

Fig. 6 is a section similar to Fig. 5 showing the parts in a different position;

Fig. 7 is a section similar to Figs. 5 and 6 showing a still different position; and

Fig. 8 is a similar view showing still another position of the carry mechanism.

The part of the adding machine shown comprises a plurality of key-controlled reciprocable racks or actuators 10 for actuating the register wheels 11, the register wheel frame or carriage 12 oscillatable about a fixed axis and carrying a shaft 13 on which

the register wheels are rotatably mounted, a plurality of toothed carry-dogs 14 cooperating with the register wheels and oscillatable about a fixed axis on the transversely extending shaft 15, a plurality of carry-dog lock members 16 oscillatably mounted on a transversely extending shaft 17 carried by the register wheel carriage, a plurality of detent members 18 cooperating with the lock members, respectively, and oscillatably mounted on the same shaft 13 on which the register wheels are mounted, and a plurality of lock-controlling cam members 19, one for each of the lock members, mounted to rotate with the register wheels, respectively. These lock-controlling cam members may, as is customary, also constitute the total stop members for the register wheels.

A setting or return bar 20 is provided for the carry dogs mounted to swing about the same axis as the carry dogs and operable to set or return the carry dogs when the register wheels are in driven relationship with respect to the racks. Suitable means, shown in Fig. 1 and described in detail hereinafter, are provided for controlling the movement of the register-wheel frame 12 and carry dog setting bar 20.

There are four principal elements of the carry mechanism, as follows: (1) the toothed carry-dog 14 oscillatable about the fixed axis and having a pair of teeth 21 engaged by the teeth of the register wheel pinion 22 when this pinion is in its uppermost position as shown in Figs. 5 and 8, (2) the carry dog lock 16 oscillatable on the shaft 17 and having an upwardly extending foot portion 23 for engagement with the downward extension 24 on the carry dog, as shown in Fig. 5, (3) the carry lock detent 18 oscillatably mounted on the register wheel shaft and having a pair of stepped shoulder portions 25, 26 for cooperating with the carry dog lock and also having an extension 27 for cooperation with the carry dog itself, and (4) the oscillatable carry return bar 20 which lies underneath the extensions 28 of the carry dogs and resets them at the proper time.

Each carry dog is provided with a spring which opposes the action of the carry return bar 20 and causes the carry dog to act unless prevented by the carry dog lock 16. A spring 30 is provided for controlling both the carry lock and the carry lock detent.

This spring opposes the action of the carry dog on the extension 27 of the detent and moves the detent 18 to bring the shoulder 26 above the carry dog lock when the latter is depressed by the lock-controlling cam 19. The successive steps of the carry operation are shown in Figs. 5, 6, 7 and 8.

Fig. 5 shows the position of the parts before the operation is started, the rack 10 being in its extreme rearward position, the register wheel pinions 22 being raised out of mesh with the racks, the carry dog 14 being held in set position by means of the carry dog lock 16, the carry lock detent 18 being held in the position shown because of the engagement with the shoulder 31 on the carry lock and the carry dog setting or returning bar 20 being in its lower position.

Fig. 6 shows the position of the parts shortly after the end of the forward stroke of the handle and just at the beginning of the return stroke, the rack 10 having moved forwardly to a position determined by its controlling key, the register-wheel frame 12 having been moved rearwardly to bring the register wheel pinions 22 into mesh with the forwardly moved rack, the carry dog 14 having moved to the position shown by the action of the spring 29 when released from the carry lock 16 by the downward movement of the register wheel frame 12 on which these locks are mounted.

Fig. 7 shows the position of the parts after the rack has returned far enough to rotate the register wheel pinion 22 to cause the carry-lock-controlling cam 19 to depress the carry lock 16 below the level of the shoulder 26 on the carry lock detent, so that the spring 30 of the detent has brought the shoulder 26 of the detent above the carry lock to hold it down so that it will not act to lock its respective carry dog when the register wheel frame 12 is again raised to bring the register wheel pinion into mesh with the teeth 21 of the carry dogs. The carry return or setting bar 20 is on its way to return or reset the carry dogs, the movement of this setting bar being such that the carry dogs will be completely reset when the rack has completed its return movement.

Fig. 8 shows the position of the parts just before the carry dog 14 acts to effect a carry on the register wheel which it controls. The rack 10 has returned completely to its rearward position, the register wheel frame 12 has been swung upwardly to move the pinion 22 out of mesh with the rack and into mesh with the teeth 21 of the carry dog, the carry lock 16 is still held down by the carry lock detent 18 and the carry dog setting bar 20 is just on the point of being released to allow any unlocked carry dogs to effect a carry. As soon as the carry setting bar 20 drops the unlocked carry dog 14 will move under the action of the spring 29 and will

rotate the register wheel pinion 22 one step to effect a carry. The final movement of the carry dog under the action of the spring brings the edge of the upper portion of the downward extension 24 into engagement with the extension 27 on the carry lock detent and oscillates this detent slightly, enough to release the carry lock 16 from the shoulder 26 of the detent and permit the carry lock to swing upwardly under the action of the spring 30 back to the position shown in Fig. 5 ready to lock its corresponding carry dog in the following operation.

The control mechanism for the movement of the register wheel frame and carry dog setting bar is not claimed in this application, but is disclosed and claimed in my copending application, Serial No. 9327, filed February 14, 1925. However, this control mechanism is disclosed to some extent in this application in order to make the construction and operation clear. The control mechanism shown in Fig. 1 comprises an oscillatable cam 32 having a cam slot 33 cooperating with a cam follower 34 on the oscillatable register wheel carriage 12 to control the up and down swinging movement of this carriage. This oscillatable cam 32 is moved at the proper time to effect the sequence of operations described above in connection with Figs. 5 to 8.

The oscillation of the carry dog setting bar 20 is controlled by a swinging link 35 having a hooked portion 36 which engages a pin 37 on the bell crank lever 38 which rocks the setting bar. This swinging link 35 is, in turn, controlled by the upper cam edge 39 of the oscillatable cam 32 previously referred to. On the forward movement of the handle, not shown, the swinging link 35 also moves forward, the follower 40 of the swinging link riding upon the upper cam edge 39 of the oscillatable cam. This brings the hooked portion 36 of the swinging link forward of the pin 37 on the bell crank lever but this hooked portion is prevented from engaging the pin 37 until the oscillatable cam 32 swings forward. However, this oscillatable cam does swing forward just at the beginning of the return stroke of the handle and moves the upper cam edge 39 of the cam member, on which the follower 40 of the swinging link is resting, out of the way of this follower member. The hook portion 35 then drops down and engages the pin 37 on the bell crank lever 38. Then on the return movement of the swinging link 35, the hooked portion 36 of the link by its engagement with the pin 37 on the bell crank 38 causes the carry dog setting bar 20 to be swung upwardly to raise all of the carry dogs 14.

There are certain other parts which it was almost necessary to show but which are not concerned with the invention claimed here-

in, such as the error key 41, the cam 42 and the follower 43 which it controls and the repeat key 44.

I claim:

1. In a calculating machine, a plurality of register wheels, a carry device cooperating with said register wheels and oscillatable about a fixed axis, a plurality of actuators for said register wheels respectively, said register wheels being movable back and forth from driven relationship with respect to said actuators to cooperative relationship with said carry device, and means for returning said carry device while the register wheels are being driven by said actuators.

2. In a calculating machine, in combination, a toothed register wheel, a main actuating rack and a spring actuated carry rack engageable with the teeth of the register wheel in alternation, said carry rack being oscillatable about a fixed axis, means for returning the carry rack against the action of its spring while the register wheel is being turned by the main actuating rack, a lock for holding the carry rack against movement by its spring when the carry rack is engaged with the teeth of the register wheel, another register wheel of lower denomination, and a cam carried by the last register wheel to move the lock to inoperative position.

3. In a calculating machine, in combination, a toothed register wheel, a main actuating rack, a carry rack, engageable with the teeth of the register wheel in alternation, said carry rack being oscillatable about a fixed axis, means for setting the carry rack while the register wheel is being turned by the main actuating rack, a lock for holding the carry rack against movement when the carry rack is engaged with the teeth of the register wheel, another register wheel of lower denomination, and a cam carried by the last register wheel to move the lock to inoperative position, and a detent for holding the lock in the position to which it is moved by the cam.

4. In a calculating machine, the combination with a register, a spring actuated carry member oscillatable about a fixed axis, and a lock for the carry member, of means for separating the last two mentioned parts to render each of said parts independent of the other, and means for returning the carry

member against the action of its spring while separated from the lock.

5. In a calculating machine, the combination with a register, a spring actuated carry member oscillatable about a fixed axis, and a lock for the carry member, of means for separating the last two mentioned parts to render each of said parts unaffected by the movement of the other, and means for setting the carry member and the lock while so separated.

6. In a calculating machine, the combination with a register, a carry member oscillatable about a fixed axis, and a lock for the carry member, of means for separating the last two mentioned parts to render the lock unaffected by the movement of the carry member, and means for setting the lock while separated from the carry member.

7. In a calculating machine, in combination with a register wheel, a driving member and a spring advanced carry member engageable with the register wheel in alternation, said carry member being oscillatable about a fixed axis, and means for retracting the carry member operable while the register wheel is being turned by the driving member.

8. In a calculating machine, in combination, a register wheel and a driving member, one of said two parts being movable for engagement with and disengagement from the other, a spring actuated carry device oscillatable about a fixed axis, and means for returning the carry device against the action of its spring operable upon the said carry device through the period of engagement of the register wheel with the driving member.

9. In a calculating machine, in combination, a register wheel, a frame in which said register wheel is mounted, oscillatable about a fixed axis, a driving member and a spring advanced carry member engageable with the register wheel in alternation, said carry member being oscillatable about a fixed axis, and means for retracting the carry member against the action of its spring operable while the register wheel is being turned by the driving member.

In witness whereof, I have hereunto subscribed my name.

OLIVER D. JOHANTGEN.