

C. N. McFARLAND & C. WALES.
CARRYING MECHANISM FOR ADDING MACHINES.

APPLICATION FILED SEPT. 17, 1906.

4 SHEETS—SHEET 1.

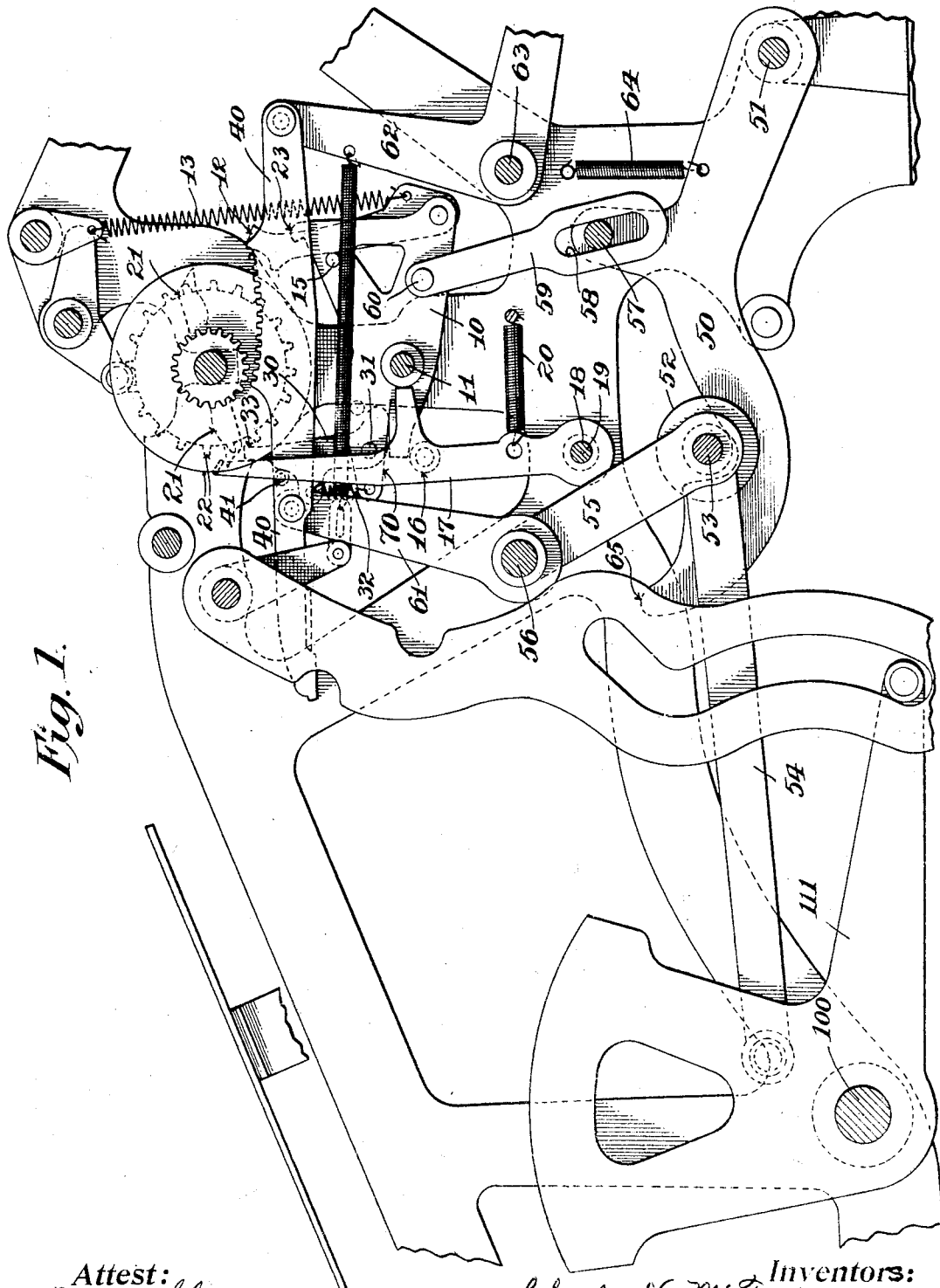


Fig. 1.

Attest:
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W. McFarland

Inventors:
Charles N. McFarland
and Charles Wales
by *William R. Bond* their Att'y.

No. 880,157.

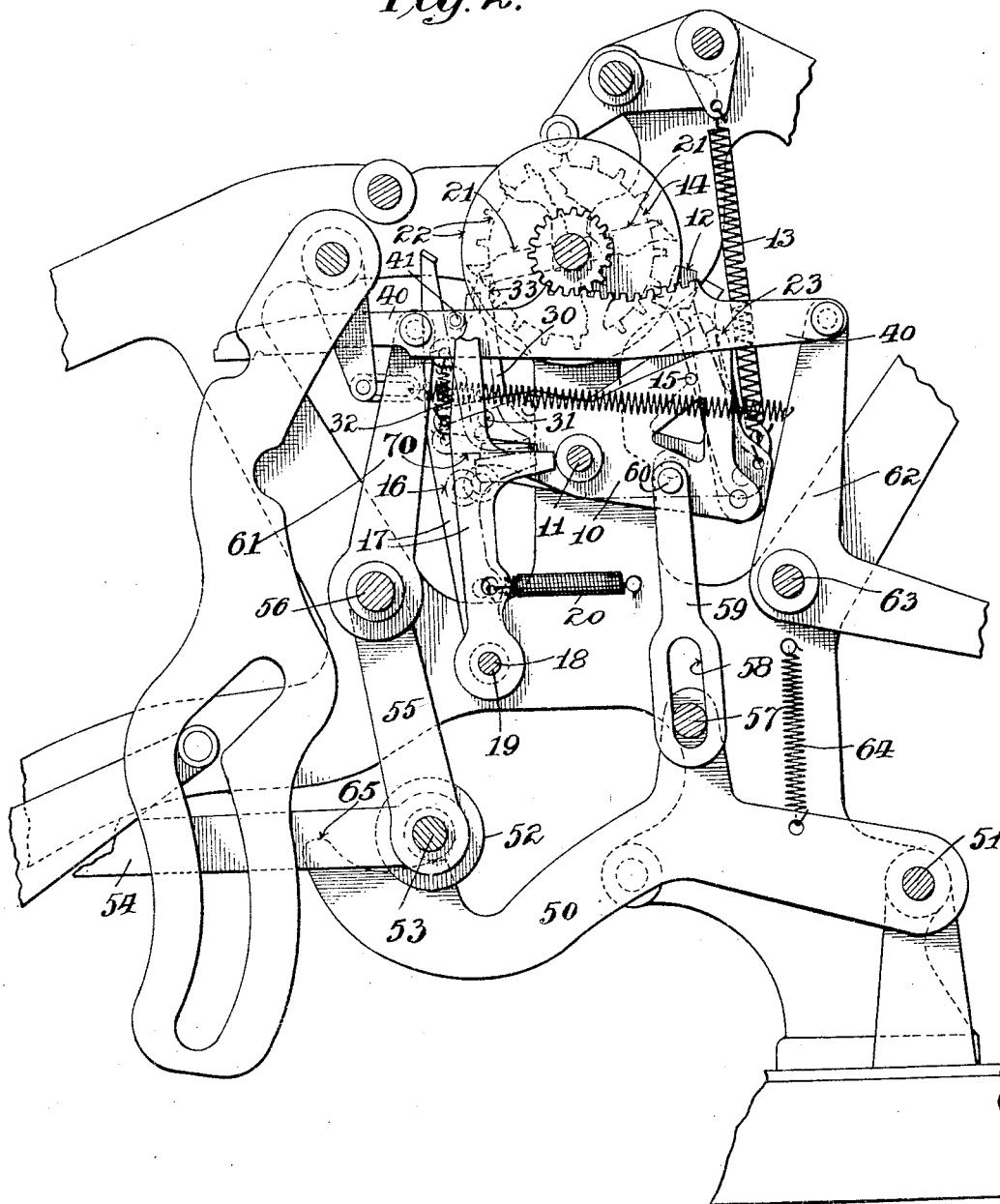
PATENTED FEB. 25, 1908.

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4 SHEETS—SHEET 2.

Fig. 2.



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4 SHEETS—SHEET 3.

Fig. 3.

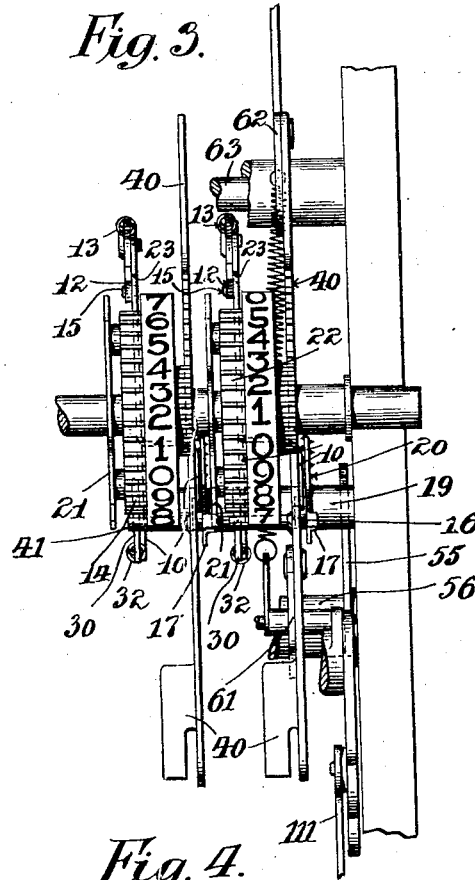
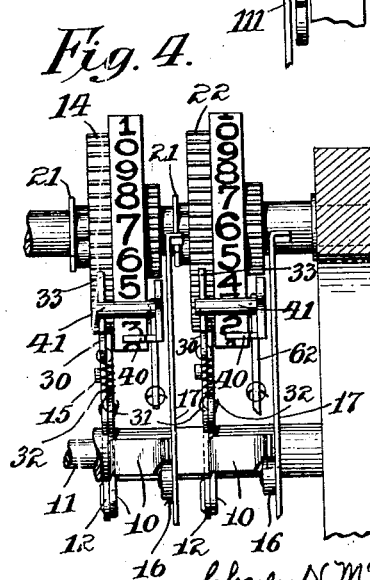


Fig. 4.



Attest:
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Charles N. McFarland Inventors:
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by William R. Baird
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No. 880,157.

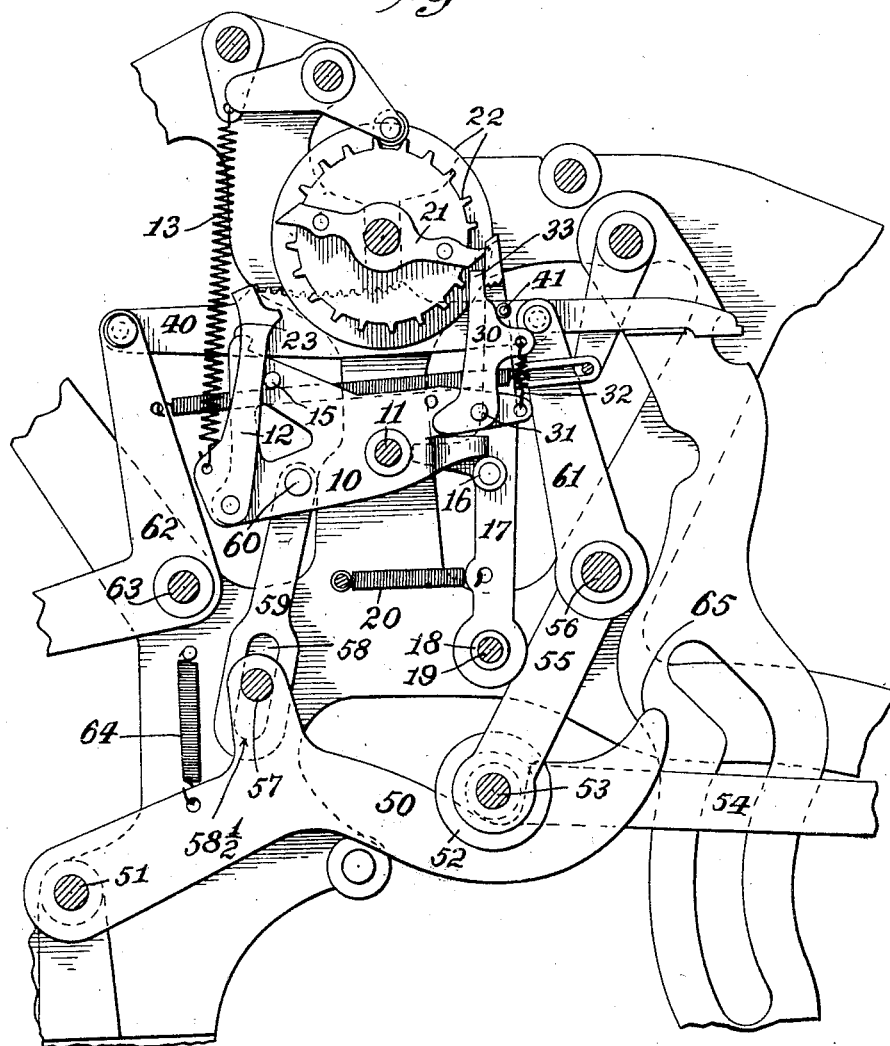
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4 SHEETS—SHEET 4.

Fig. 5.



Attest:

S. Brachear
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Inventors

Charles N. McFarland
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by *William R. Baird, their Atty.*

UNITED STATES PATENT OFFICE.

CHARLES N. McFARLAND, OF KINGSTON, PENNSYLVANIA, AND CHARLES WALES, OF CLEVELAND, OHIO, ASSIGNORS TO THE ADDER MACHINE COMPANY, OF KINGSTON, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

CARRYING MECHANISM FOR ADDING-MACHINES.

No. 880,157.

Specification of Letters Patent.

Patented Feb. 25, 1908.

Application filed September 17, 1906. Serial No. 335,026.

To all whom it may concern:

Be it known that we, CHARLES N. McFARLAND, a citizen of the United States, residing at Kingston, Luzerne county, Pennsylvania, and CHARLES WALES, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Carrying Mechanism for Adding-Machines, of which the following is a specification.

My invention relates to adding machines and more particularly to the mechanism designed to prevent over rotation of the parts under rapid operation. Machines of this class have reached a point of perfection where their accuracy is unquestioned. This having been accomplished, an increase of speed has become desirable and motors have been attached to them by means of which they are capable of being operated much faster than when a manually operated handle is connected to their actuating shaft. Under conditions of high speed, the numeral wheels are apt to be carried by their momentum beyond proper position, both when they are being rotated to register the number indicated by the proper key and during the carrying operation, and it is the purpose of my present invention to provide means whereby such over rotation is prevented and the wheels are kept in their proper relative position, when moved with relatively great rapidity.

The machine in which I have embodied my invention is of the Wales type which is described in Letters Patent of the United States No. 797,032, issued Aug. 15th, 1905, and reference is made to that patent for an understanding of the construction and general mode of operation of the parts.

In the drawings, Figure 1 is a side elevation of a portion of the machine embodying my improved mechanism; Fig. 2 is a similar view showing the parts in a different position; Fig. 3 is a top plan view of the parts shown in Figs. 1 and 2, some of the parts below the plane of the numeral wheels being omitted; Fig. 4 is a front elevation of the parts shown in Fig. 3; Fig. 5 is a side elevation of part of the machine looking in the direction opposite to that of Figs. 1 and 2.

In the drawings, I have shown two adjacent numeral wheels, and for convenience I

shall refer to the wheel of higher order as the "left hand" and the wheel of lower order as the "right-hand" wheel. A lever 10 is pivoted at a suitable point to a transverse rod 11 secured to the frame of the machine. A carrying pawl 12 is pivoted on this lever 10 and held by a spring 13 in the direction of the left hand wheel 14, its movement in that direction being limited by a stop pin 15. A roller 16 is mounted on a trigger 17 pivoted at 18 to a transverse rod 19 suitably mounted in the frame of the machine. This roller 16 supports the lever 10 in opposition to the action of the spring 13. The trigger is held in the direction of the lever by a spring 20, and is tripped by means of a radial cam 21 and the right hand wheel 22 after this wheel has left the ninth position. The cam 21 moves against the trigger 17 and pushes it away carrying the holder roller 16 with it and this movement permits the lever 10, under the tension of the spring 13, to move the pawl 12 against the teeth of the left-hand wheel 14 and thus move it forward one space or tooth. The tip or end 23 of the lever 10 moves toward the wheel 14 and engages a tooth on it lower in position than that engaged by the pawl 12 to prevent over rotation of this wheel due to the momentum of the carrying operation.

A pawl 30 pivoted at 31 to the lever 10 is held in a retracted position away from the left hand wheel 14 by a spring 32 attached to the lever 10 and which pawl prevents over rotation of the left hand wheel due to the operation of accumulation. The swing of the lever 10 during the carrying operation moves the pawl 30 downward and away from the left hand wheel 14 so that it is out of the way of this wheel when the pawl 12 is in contact therewith.

When the racks 40 are restored to their normal position a pin 41 positively moves the pawl 30 toward the wheel bringing its point or tooth 33 between two of the teeth on the wheel to prevent the further movement of the wheel as it is lifted from contact with the rack 40.

A cam lever 50 is pivoted to a transverse rod 51 mounted in the frame of the machine. It engages with a roller 52 which is moved by a shaft 53 which, in turn, is actuated from the main shaft 100 of the machine by a link 54 secured to a plate 111 mounted on the

main shaft and which link serves also to swing a link 55 pivoted on a fixed transverse shaft 56. 57 is a shaft carried by the lever 50 and which moves in a slot 58 in a link 59 pivoted at 60 to the lever 10 above referred to. The rack bars 40 are supported upon the link 61 swinging on the shaft 56 and upon a bell crank 62 pivoted at 63 to the frame of the machine and which bell crank is connected to mechanism not herein shown.

The actuation of the vibratory main shaft of the machine, either by the forward movement of the handle or otherwise, pulls upon the link 54 and swings the link 55 toward the left. This serves to bring the roll 52 against the cam lever 50 and swings it downward on its pivot 51 against the tension of a spring 64, the other end of which is secured to the frame of the machine. The shaft 57 mounted upon the levers 50, reaching the end of the slot 58 in the link 59, pulls down the latter and causes the lever 10 to be moved on its pivot 11 to allow the holder roller 16 to move against the edge of the lever 10. The further pull of the link 54 lifts the roller 52 up and onto a supplementary cam surface 65, provided on the cam lever 50 and the resulting further depression of the cam lever 50 throws the roller holder 16 safely underneath the lever 10.

The backward actuation of the main shaft 100 permits the restoration of the lever 50 to its normal position without disturbing the position of the lever 10 because the shaft 57 moves in the slot 58 and does not move the link 59, so that if any of the series of levers 10 may not have been discharged, they are free to be discharged with the shaft 57 occupying the upper portion of the slot 58.

The mode of operating the device is as follows:—It being desired to carry from the right hand to the left-hand wheel, the appropriate key on the keyboard is depressed and the main actuating shaft 100 of the machine is moved. The rack bars 40 are thus moved forward and then rearward to rotate the right hand numeral wheel 22 of the pair to an extent which is determined by the key which has been depressed and which indicates one of the digits of the item to be registered.

When the mechanism is being operated at a high speed there is a tendency for this right hand wheel 22 to rotate beyond its proper position when it is lifted and disengaged from its particular rack 40 on account of its momentum. To prevent this, the pin 41 upon the rack 40 is brought into contact with the pawl 30 on the lever 10 at the end of the rearward movement of the rack bars. This movement of the pin 41 brings the pawl 30 in the path of the teeth on the wheel 22 and the motion of this wheel in leaving the rack 40, being slight and in an upward direction, the pawl 30 effectually prevents its

over rotation. If, during the rotation of the wheel 22, its cam 21 comes into contact with the upper end of the arm 17, which only occurs when the ninth tooth has been passed, the arm is oscillated away from the wheel and the roller holder 16 is partly withdrawn from the lever 10 allowing it to drop slightly but sufficient to bring the lower end 58½ of the slot against the shaft 57 to permit the rotation of the left hand wheel 14 upon the engagement therewith of the pawl 12 mounted on the other end of the lever 10 and which moves this left hand wheel forward one tooth to accomplish the carrying operation. In the meantime, the actuating shaft of the machine has moved the link 54 and this swings the link 55 rearwardly and moves the roll 52 along the surface 65 of the arm 50, this roll being in contact with the surface during the rearward motion of the rack bar 40. This lack of movement of the arm 50 holds the shaft 57 at the bottom of the slot 58 in the link 59 and prevents any further movement of the lever 10 with respect to the roller holder 16 until such time as the racks 40 shall have completed the accumulation desired on the wheel, when the roll 52 in its rearward motion allows the spring held arm 50 to rise. This leaves the link 59 free to rise and the lever 10 is then further oscillated under the tension of the spring 13 and completely disengaged from the roller holder 16, which movement in turn permits the pawl 12 to contact with the left hand numeral wheel, moving it one tooth, as above stated. It also brings the tip 23 to contact with another tooth of the left hand wheel to prevent its further movement. The motion of the lever 10 has also swung the pawl 30 out of the path of the teeth on the same wheel.

Any movement of the actuating shaft in a forward direction will cause the roller 52 to mount to the upper cam surfaces 65 of the arm 50, which movement will pull down the link 59, oscillate the lever 10 and permit the holder roller 16 to come underneath the lever 10 and the parts are thus restored to their original position.

What we claim as new is:—

1. In an adding machine, the combination of two wheels side by side, each bearing numerals from "zero" to "9", means for rotating the right-hand wheel, means by which carrying is effected when an accumulation greater than 9 is registered on the right-hand wheel, and means adapted to prevent an over rotation of said wheel during accumulation and other means adapted to prevent an over rotation of said wheel during the carrying, and further means adapted to disengage the first means from said wheel as the second means is brought into operation.

2. In an adding machine, the combination of two wheels side by side, each bearing nu-

merals from "zero" to "9" means for rotating the right-hand wheel, means by which carrying is effected when an accumulation greater than 9 is registered on the right-hand wheel, and means adapted to prevent an over rotation of said wheel during accumulation and other means adapted to prevent an over rotation of said wheel during the carrying, further means adapted to disengage the first means from the said wheel as the second means is brought into operation, comprising a holder for the lever supporting the said first and second means and a device for disengaging said holder therefrom.

3. In an adding machine, the combination of two wheels side by side, each bearing numerals from "zero" to "9", means for rotating the right-hand wheel, means by which carrying is effected when an accumulation greater than 9 is registered on the right-hand wheel, and means adapted to prevent an over rotation of said wheel during accumulation and other means adapted to prevent an over rotation of said wheel during the carrying, and further means adapted to disengage the first means from said wheel as the second means is brought into operation, comprising a holder for the lever supporting the said first and second means and a device for disengaging said holder therefrom, said holder being mounted upon a normally spring retracted arm which is oscillated by the carrying means of the right-hand wheel.

4. In an adding machine, the combination of two wheels side by side, each bearing numerals from "zero" to "9", means for rotating the right-hand wheel, a lever, a pawl at one end thereof, means for actuating the lever to cause the pawl to move the left hand wheel one step when an accumulation greater than 9 is registered on the right-hand wheel, a pawl on the opposite end of the lever, and means for actuating the last named pawl to prevent over rotation of the right-hand wheel when it is rotatable in the operation of accumulation.

5. In an adding machine, the combination of two wheels side by side, each bearing nu-

merals from "zero" to "9", means for rotating the right-hand wheel, a lever, a pawl at one end thereof, means for actuating the lever to cause the pawl to move the left hand wheel one step when an accumulation greater than 9 is registered on the right hand wheel, a pawl on the opposite end of the lever, means for actuating the last-named pawl to prevent over rotation of the right hand wheel when it is rotated in the operation of accumulation, and means carried by the lever to prevent over-rotation of the left-hand wheel during carrying.

6. In an adding machine, the combination of the numeral wheels side by side, a rack for rotating the right-hand wheel, means for carrying from the right hand to the left hand wheel, and means for preventing over rotation of the right hand wheel brought into active position by the rack in rotating the right hand wheel.

7. In an adding machine, the combination of two numeral wheels side by side, a rack for rotating the right-hand wheel, a lever pivoted intermediate its ends, a pawl on one end to move the left-hand wheel one step in carrying, a pawl on the opposite end of the lever, and a pin on the rack adapted to engage the last named pawl during the rotation of the right hand wheel to bring said pawl into position to prevent over rotation of said right hand wheel after the rack has completed its movement.

Signed by the said CHARLES N. McFARLAND at Kingston, Pa., on the 30th day of July, 1906, and by the said CHARLES WALES at Cleveland, Ohio, on the 15th day of August, 1906, each in the presence of two witnesses.

CHARLES N. McFARLAND.
CHARLES WALES.

Witnesses as to Charles N. McFarland:

H. B. PAYNE,
CHAS. M. SNYDER.

Witnesses as to Charles Wales:

E. I. SCHNELL,
F. S. WHEELER.