No. 745,541. PATENTED DEC. 1, 1903.

C. WALES.

MULTIPLYING MECHANISM FOR ADDING MACHINES.

APPLICATION FILED SEPT. 17, 1902.

NO MODEL. 4 SHEETS—SHEET 1.

Fig. 1.

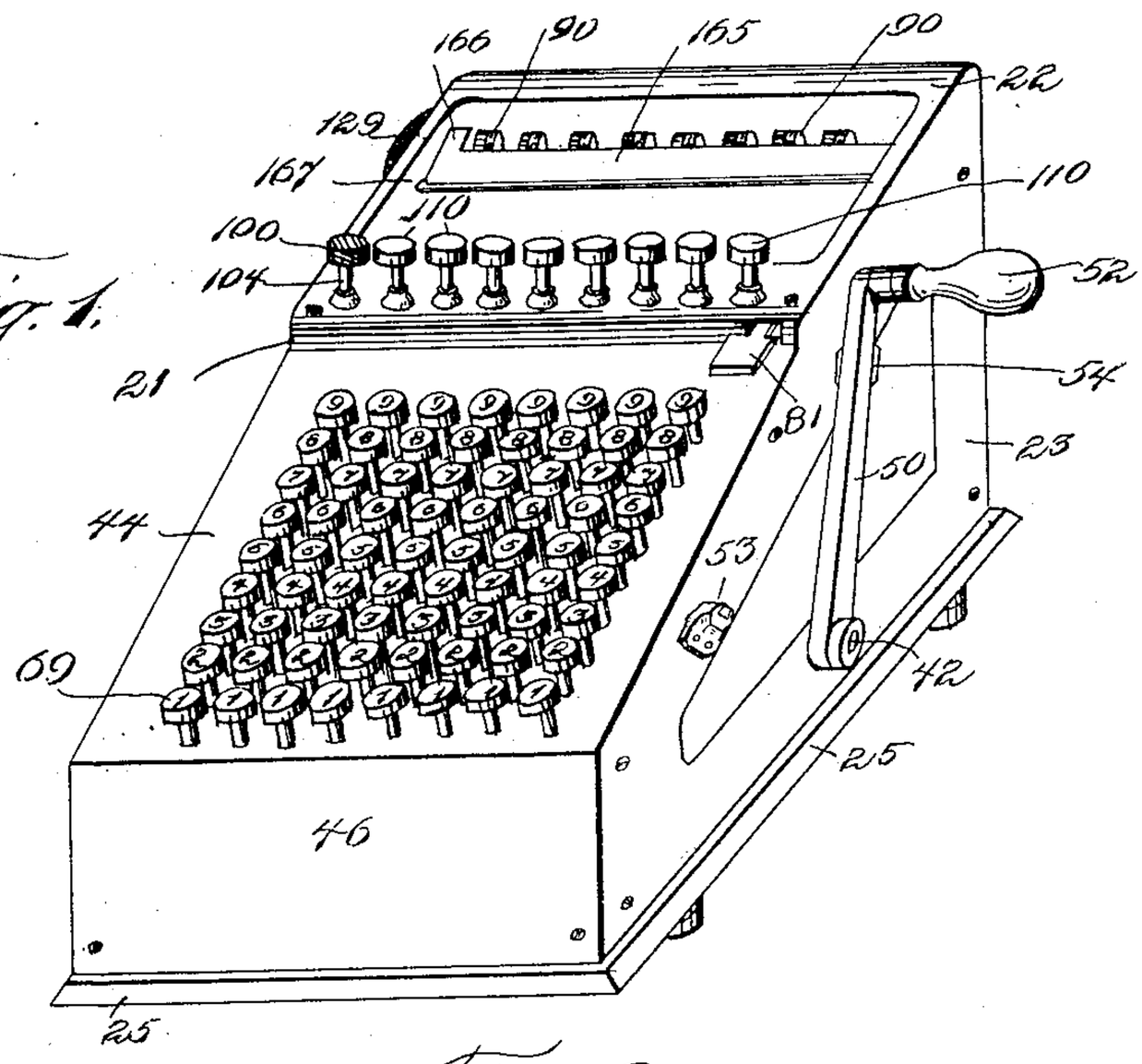
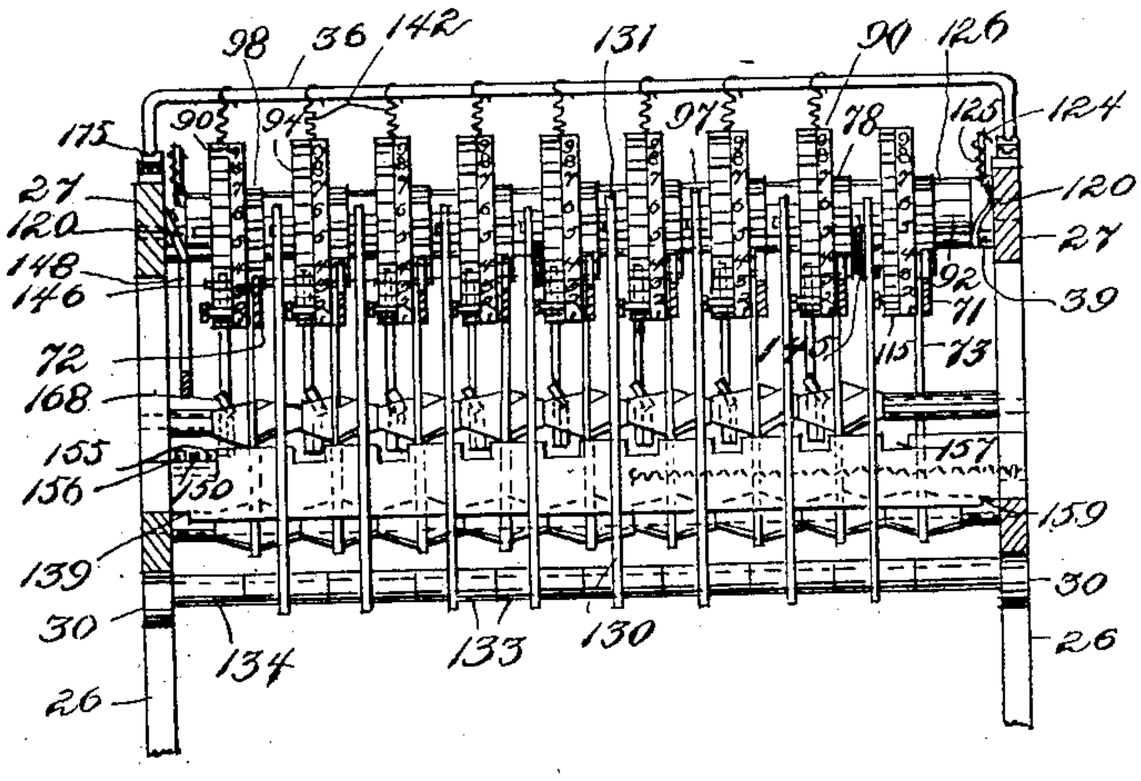


Fig. 6.



Witnesses

Chas. M. Farrell,

M. D. Foley

Inventor

Charles Wales

By D. R. Baird

Attorney

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NO MODEL. 4 SHEETS—SHEET 2.

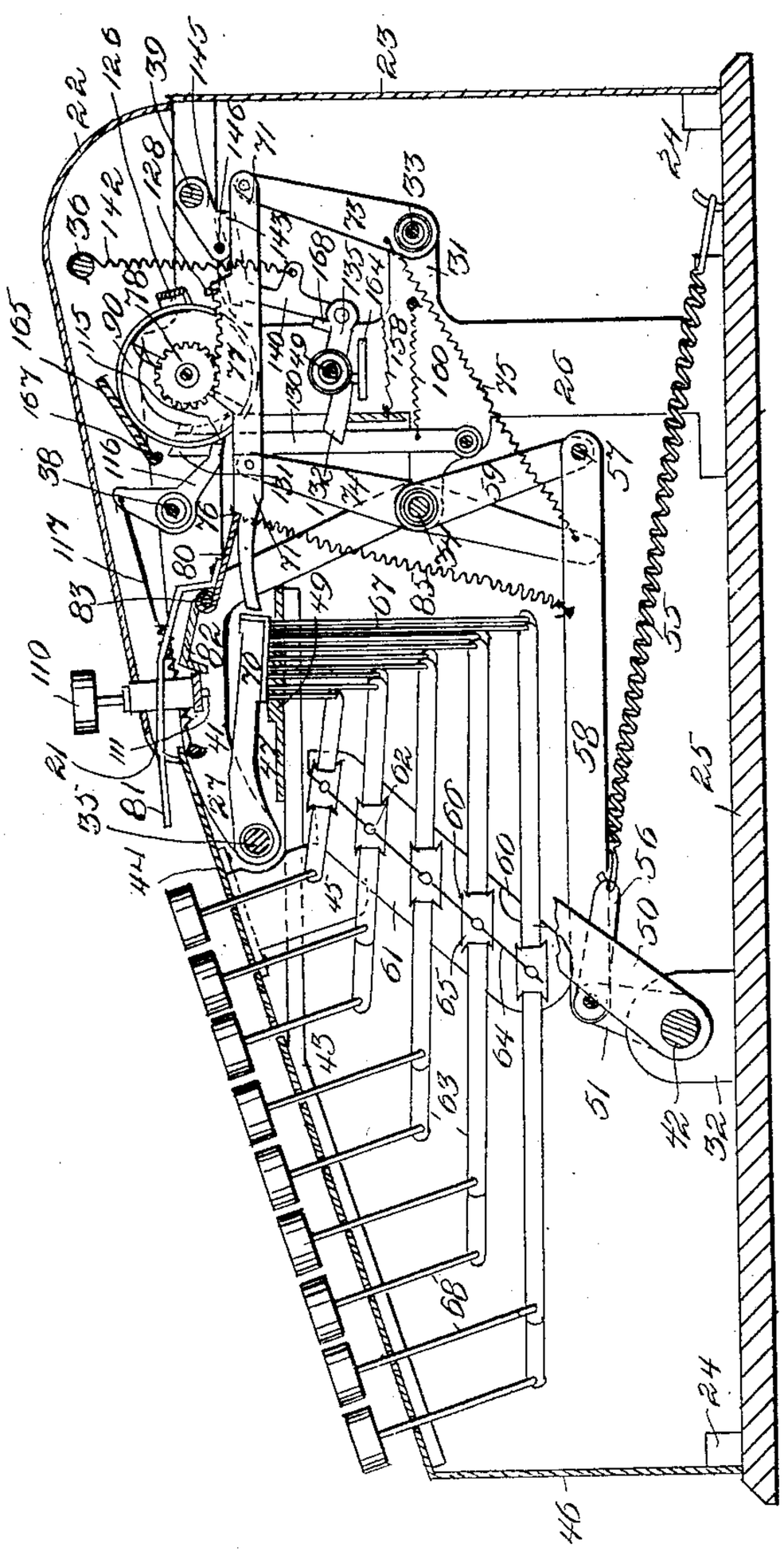

Fig. 2.

Witnesses

Chas. M. Ravell

S. I. Brashears

Inventor

Charles Wales

By William R. Baird

Attorney

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NO MODEL. 4 SHEETS—SHEET 3.

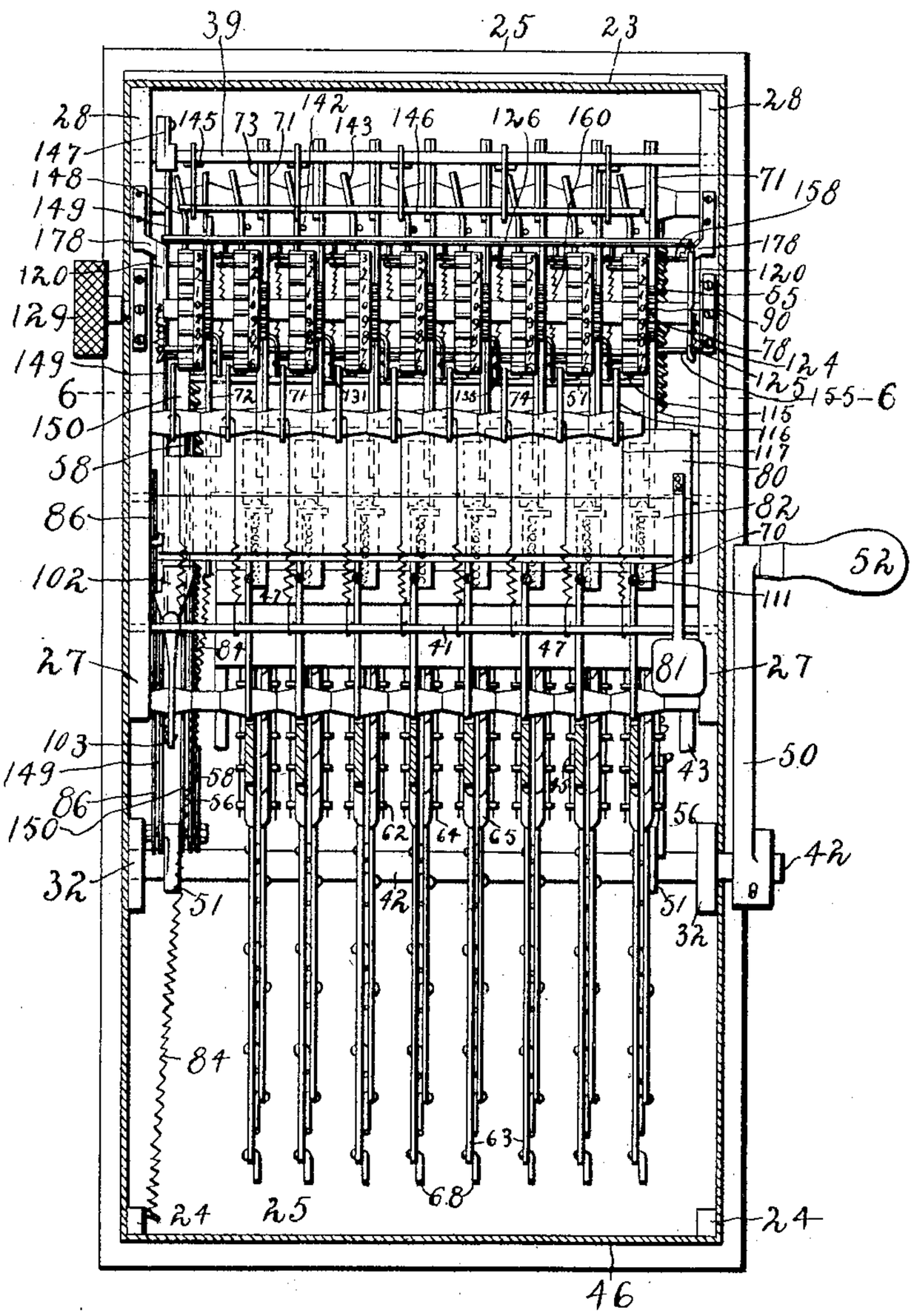

Fig. 3.

Witnesses

C. H. Walker,

M. B. Schley

Inventor

Charles Wales

By O. R. Bard

Attorney

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C. WALES.

MULTIPLYING MECHANISM FOR ADDING MACHINES.

APPLICATION FILED SEPT. 17, 1902.

NO MODEL. 4 SHEETS—SHEET 4.

Fig. 4.

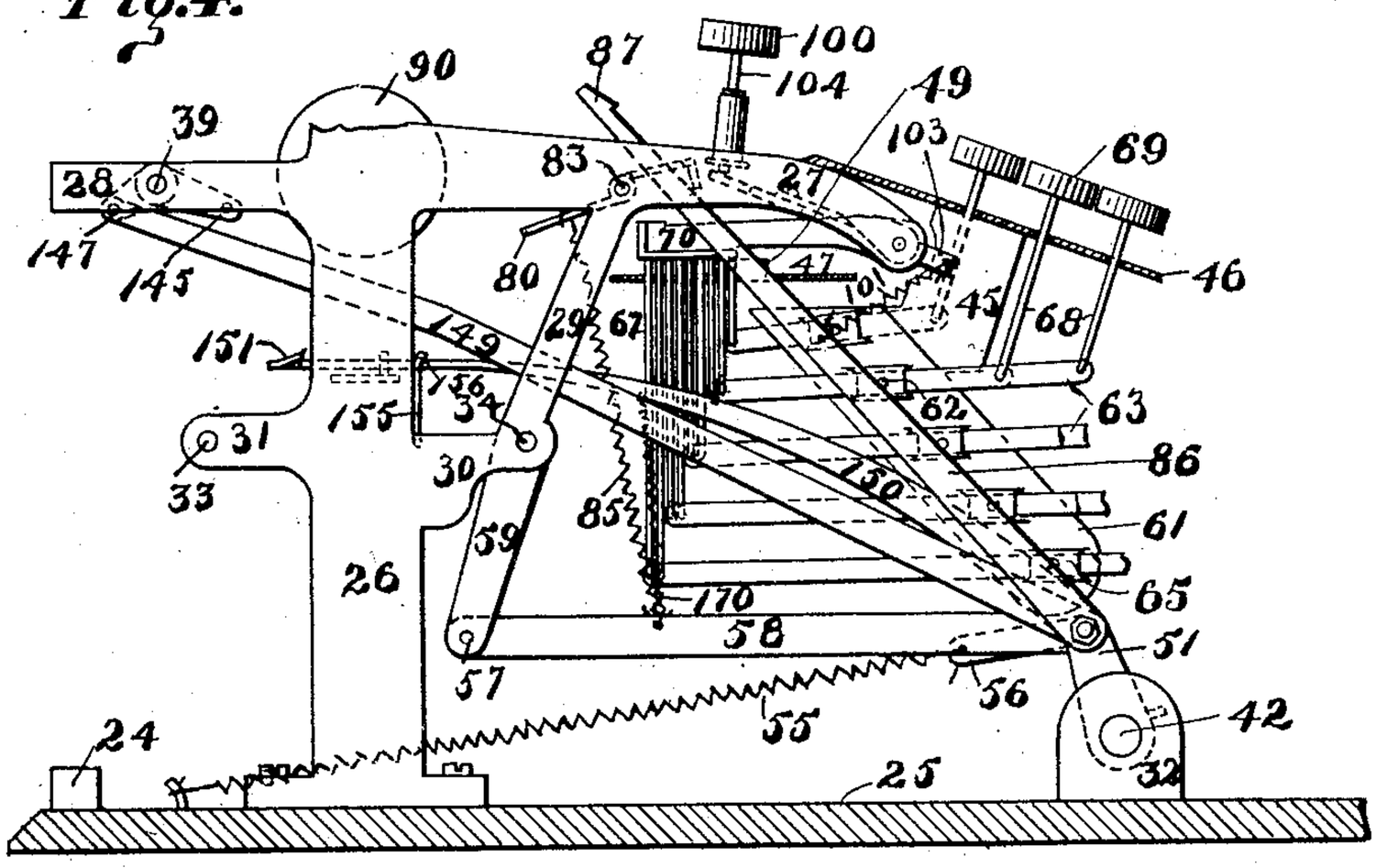


Fig. 5.

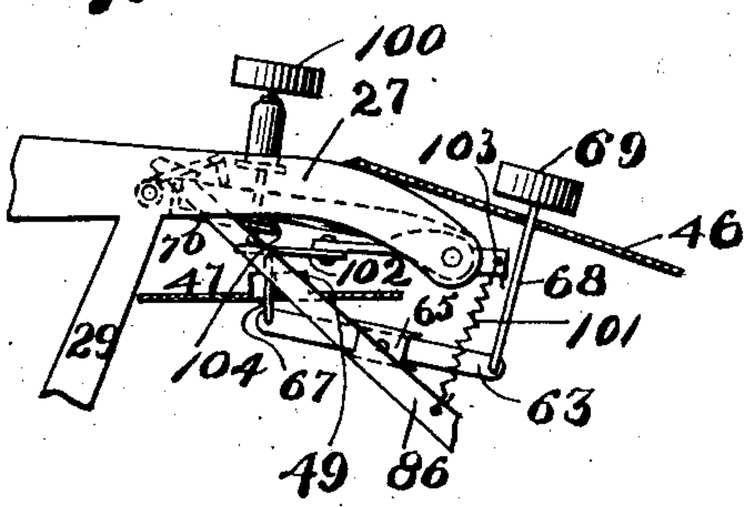
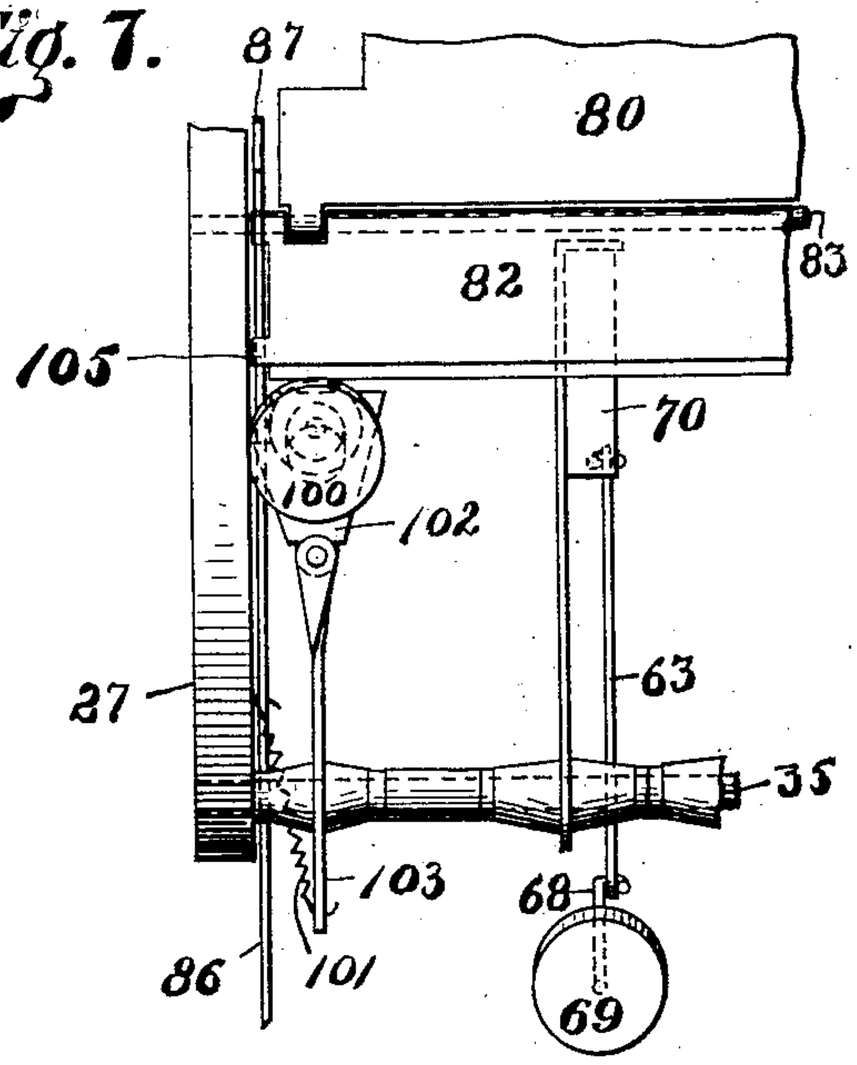


Fig. 7.



WITNESSES:

S. J. Cox

E. H. Borie.

INVENTOR

Charles Wales

BY William R Baird

His ATTORNEY

No. 745,541. Patented December 1, 1903.

UNITED STATES PATENT OFFICE.

CHARLES WALES, OF DETROIT, MICHIGAN.

MULTIPLYING MECHANISM FOR ADDING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 745,541, dated December 1, 1903.

Application filed September 17, 1902. Serial No. 123,741. (No model.)

To all whom it may concern:

Be it known that I, CHARLES WALES, a citizen of the United States, and a resident of Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Multiplying Mechanisms for Adding-Machines, of which the following is a specification.

My invention relates to adding-machines adapted to be operated by keys bearing numerals, and more particularly to that part of the mechanism designed to effect the operation of repeating the addition already made, or, in other words, multiplying any sum which has been already recorded upon the adding mechanism.

I have described and claimed the general features of my adding-machine, of which the particular mechanism described and claimed herein forms a part, in a copending application filed by me on the 12th day of September, 1902, Serial No. 123,133, and I refer to that application for a more particular description of the general mechanism.

The general mechanism comprises a keyboard and key-levers which will remain in either one of their two positions until removed therefrom by an impulse received from the operator through the keys or other parts of the machine. These levers serve to operate a series of stops and interpose them into the path of racks which by connecting mechanism determine the position of the numeral-wheels, the position of the particular stop thus interposed determining the extent of the rotation of the said wheel and consequently the particular numeral on the periphery of the wheel at the predetermined point selected either for view or for registration when such rotation is checked. The numeral on the key corresponds to the number on the wheel at the predetermined point referred to. A stop-and-release plate is employed which holds the racks until the number desired to be added has been written on the keyboard. The racks which actuate the numeral-wheels are returned to their original positions through the operation of a main lever which simultaneously rotates the numeral-wheels communicating with the racks which have been displaced. The wheels are all returned to zero by means of a device which I call a "rake", which has a rotary motion parallel to the wheels and which engages certain pins thereon, and these pins also serve to set the carrying mechanism, which when one wheel passes the numeral "9" causes the next wheel to be moved one step or number forward.

It is obvious that if it is desired to repeat the register for a number or, in other words, to multiply it that the numeral-bearing wheels should not be returned to zero after the said number has been registered.

In the drawings, Figure 1 is an exterior perspective view of the entire machine. Fig. 2 is a side elevation and partial section of the train of mechanism for one section of the machine and some of the adjacent parts. Fig. 3 is a plan view of the machine with some of the upper parts removed. Fig. 4 is an elevation from the side opposite that shown in Fig. 2 of certain portions of the machine. Fig. 5 is a similar view to Fig. 4 of some of the parts in a different position. Fig. 6 is a front view of the upper parts of the machine back of the plane of the line 6 6 in Fig. 3. Fig. 7 is a plan of the parts shown in Fig. 5.

Referring to the drawings, assuming that the keys 69 have been pushed down to move the numeral-wheels 90 to a certain predetermined number, the key-resetting mechanism is brought into operation to return each of the wheels to normal position. This mechanism comprises a rod 86, provided with a hook 87, which extends from one of two arms 51 through a plate 82. It will appear that as the arm 51 moves forward the hook 87 will engage the plate 82 by striking a lip 105, provided for that purpose, and cause the latter to press dogs 70 down upon the upper ends of the stop-rods 67 of the keys 69 until the dogs are brought into contact with the thickened portion 49 of a plate 47, hung from an upper plate 44 of the machine-casing by a bracket 43, and thus return the rods 67 to their normal positions. The plate 82 is returned to its position by a tension-spring 101, which forces the upper part of the rod 86 against it.

The multiplying device comprises a multiplying-key 100, its rod 104, a rocking plate 102, pivoted to one of the arms 27, and the spring 101, which is attached to an extension 103 of the rocking plate 102 and holds the opposite

end of said rocking plate in its upper position in contact with the key-rod 104. When the plate 102 is depressed by the key 100, it presses the rod 86 backward and causes the hook 87 on its upper end to escape the resetting-plate 82. When, therefore, this key 100 is held down, the numeral-keys 69 remain set and each movement of the operating-crank adds the original sum set to the sum already registered.

What I claim is—

1. The combination of registering-wheels, means for operating the same, setting mechanism for determining the extent of such operation, a hinged plate for returning said setting mechanism after an operation, a hooked arm for depressing said plate and a key by which the said arm may be maintained in inoperative position through successive operations.

2. The combination of registering-wheels, means for operating the same, setting mechanism for determining the extent of such operation, a hinged plate for returning said setting mechanism after an operation, a hooked arm connected with the operating mechanism and adapted to engage and depress said plate, and a pivoted plate independent of said operating mechanism for holding said arm out of engagement with said plate during successive operations.

3. The combination of registering-wheels, means for operating the same, setting mechanism for determining the extent of such operation, a hinged plate for returning said setting mechanism after an operation adapted to cause a return movement of said setting mechanism, a hooked arm adapted to engage said plate and depress it, and a key for holding said arm out of engagement with said plate during successive operations.

4. The combination of registering-wheels, means for operating the same, setting mechanism for determining the extent of such operation, independent means for returning said setting mechanism after an operation comprising a hooked arm and a plate bearing upon said setting mechanism and adapted to be engaged and depressed by said arm, and a pivoted plate normally out of contact with said arm, and a key by the movement of which said pivoted plate is brought into contact with said arm.

5. The combination of registering-wheels, means for operating the same, setting mechanism for determining the extent of such operation, independent means for returning said setting mechanism after an operation comprising a hooked arm and a plate bearing upon said setting mechanism and adapted to be engaged and depressed by said arm, and a pivoted plate normally out of contact with said arm, and a key by the movement of which said pivoted plate is brought into contact with said arm whereby the said arm may be held out of engagement with the said first-named plate through successive operations.

6. The combination of registering-wheels, means for moving the same, a setting mechanism comprising keys, and stops operated by said keys for determining the extent of said movement of the wheels, a hinged plate connected with the operating means adapted to bear upon said stops and return them to their normal positions, a hooked arm adapted to engage said plate and depress it to return said stops to their normal positions, and a pivoted plate for holding said arm out of engagement with said hinged plate through successive operations of the wheels.

Witness my hand this 28th day of August, 1902, at the city of Port Huron, in the county of St. Clair and State of Michigan.

CHARLES WALES.

Witnesses:

PETER J. ABT,

WM. L. JANUARY.