

Feb. 23, 1926.

1,574,249

R. W. HOOK

ADDING MACHINE

Filed Feb. 17, 1921

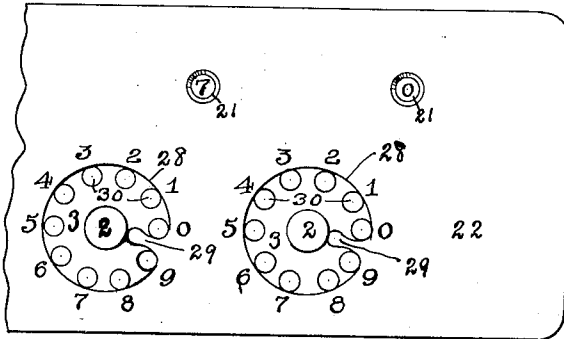


Fig. 1

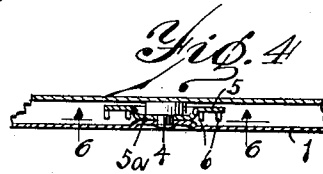


Fig. 4

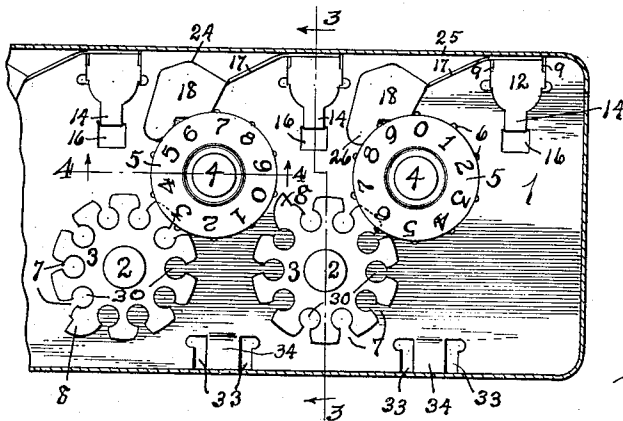


Fig. 2

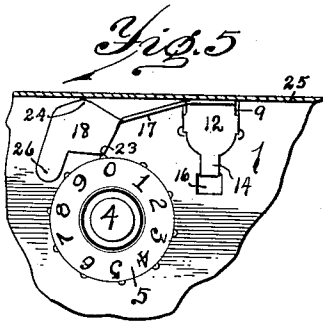


Fig. 5

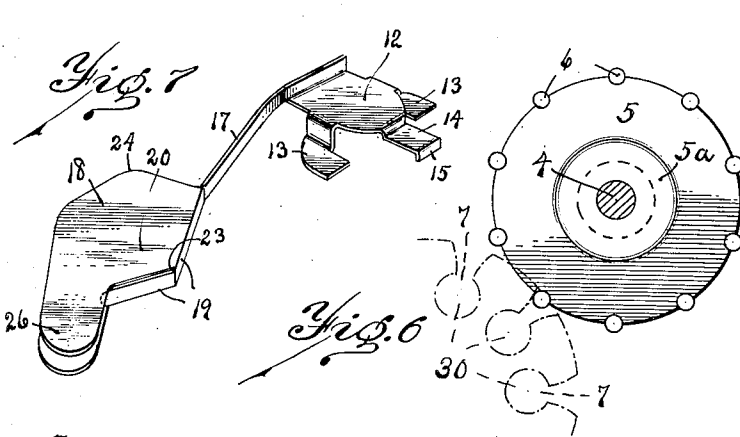


Fig. 7

Fig. 6

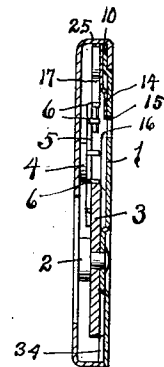


Fig. 3

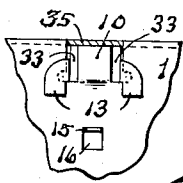


Fig. 8

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Patented Feb. 23, 1926.

# UNITED STATES PATENT OFFICE.

RUSSELL WALLACE HOOK, OF GRAND RAPIDS, MICHIGAN.

## ADDING MACHINE.

Application filed February 17, 1921. Serial No. 445,581.

*To all whom it may concern:*

Be it known that I, RUSSELL WALLACE HOOK, a citizen of the United States, and residing at Grand Rapids, in the county of Kent and State of Michigan, have invented a new and Improved Adding Machine, of which the following is a specification.

This invention relates to that type of adding machines in which the numeral-bearing wheels are mounted on parallel axes, and its object is to provide means to prevent the overthrow of these wheels when actuated in the usual operation of the machine.

In the accompanying drawing, Fig. 1 is a plan of one end of my improved adding machine. Fig. 2 is a plan thereof when the top of the case is removed. Figs. 3 and 4 are sections on the lines 3-3 and 4-4 of Fig. 2. Fig. 5 is a plan of a numeral-bearing wheel and a pawl in engagement therewith showing this pawl at the outward limit of its movement. Fig. 6 is a section on the line 6-6 of Fig. 4 on a larger scale. Fig. 7 is a perspective of a pawl on a larger scale. Fig. 8 is a bottom plan of a fragment of the upper edge of the base.

Similar reference characters refer to like parts throughout the several views.

This machine embodies a case consisting of a cover and a base 1 which is in the form of a flat plate, preferably substantially rectangular with rounded corners, and carries a series of rivets 2 which serve as shafts for the actuating wheels 3, while a second series of rivets 4 serve as shafts for the numeral wheels 5. The base is preferably bumped up at each rivet in order to reduce the areas in contact and to avoid projecting rivet heads.

As shown in Fig. 3, the numeral wheels are in a higher plane than the actuators 3, being held up by the hubs 5<sup>a</sup> and they have ten parallel downwardly extending pins 6 adapted to enter the notches 7 in the actuators. The actuators are between the numeral wheels and each is in constant engagement with the numeral wheel next to the right. Each actuator has a tooth 8 which is of such length that it may engage the pins 6 of the numeral wheel next to the left, but the form and position of this tooth is such that it extends inoperatively between the pins 6 of the wheel next to the right.

The principal feature of this invention is the pawl which engages the pins 6 of the numeral wheels. The upper longitudinal

edge of the base is formed with pairs of slots 9 and the tongues 10 between them are bumped up as shown in Fig. 3. Each pawl consists of a clip, a spring and a head integral with each other. The clip embodies a plate 12 which lies flat against the tongue 10, a pair of wings 13 which extend through the slots 9 and then lie outwardly flat against the base, and a finger 14 whose tip 15 extends down into a hole 16 therefor. As the wings engage the ends of the slots 9, they and the finger 14 position the pawl.

The spring 17 extends from the outer edge of the plate 12 to the head which comprises two plates 18 with the bearing strip 19 between them, and the angular portion 20 of this head is so proportioned that when it is in engagement with two pins 6, a numeral on the wheel registers with the reading opening 21 in the top cover 22 of the case. Furthermore, the distance from the point 23 of this angular portion to the corner 24 is such that when a pin 6 engages this point 23 the corner 24 is separated from the upper edge 25 of the case by the least practical distance, as shown in Fig. 5. The outer end 26 of the head drops in behind the next pin after the one which has raised the pawl and absolutely prevents overthrow, but these pawls do not prevent reverse movements of the several wheels so that problems in subtraction may be solved.

Forming the top 22 with down-turned edges to constitute the sides of the case is merely a matter of choice, and the positioning of a side wall 25 of the case of the machine so that it will limit the outward movements of the weighted heads 20 of the pawls is a matter of importance as it prevents undesired excessive movement of the pawls. The principal feature, however, is the extension 26 at the end of the pawl which adds weight and inertia at the most effective point and absolutely prevents overthrow of the numeral wheel.

Overthrow usually results by reason of the stop pawls being thrown out so far when the wheels are violently operated that the pawl has no time to get back into the path of the next projection before such projection crosses the path of the engaging portion of the pawl. But when the weighted outer end of the pawl moves into the path of a second projection as soon as the first projection has moved by, the inertia of the wheel is not sufficient to move the pawl out

of the path of this next projection.

The top is formed with openings 28 and stop-tongues 29 extending into these openings and the actuator wheels are formed with holes 30 to receive a stylus or other actuating instrument. The lower edge of the base 1 is also preferably formed with notches 33 and bumped up tongues 34 between them. The down-turned edges of the top engage the upper surface of the base and are formed with fingers 35 which are bent down under the tongues 10 and 34 to unite the case, the tongues 10 and 34 being shortened the thickness of the metal of the top to permit a smooth edge for the case. The top heads of the rivets preferably project above the plane of the numeral wheels so that there is little danger of the cover being bent down onto the wheels as may happen when these adding machines are sent through the mails.

The form of the case and the number and size of the several wheels may be changed by those skilled in the art without departing from the spirit of my invention as set forth in the following claims.

I claim:--

1. In an adding machine, a base and a numeral wheel pivotally mounted thereon and formed with a series of evenly spaced projections, a pawl to restrain the rotation of the wheel and consisting of a clip to at-

tach the pawl to the base, a resilient central portion and a head comprising parallel plates, a bearing strip between them, and a weight at the outer end of the pawl, said head being normally held so that the weight at its outer end extends into the path of the projections on said wheel. 35

2. In an adding machine, a base, a series of actuator wheels rotatably mounted thereon, a series of numeral wheels rotatably mounted on the base adjacent to said actuator wheels, a series of parallel shouldered pins, one for each wheel, on which said wheels are rotatably mounted, said base being formed with holes to receive the reduced ends of the pins, and a top bearing against the opposite ends of the pins and spaced thereby from the wheels. 40 45 50

3. In an adding machine, a base and a series of numeral wheels mounted thereon, each wheel being formed with a series of evenly spaced parallel pins, a pawl for each wheel comprising a spring, means to attach one end of the spring to the base, and a head at the free end of the spring embodying an angular portion adapted to enter between two adjacent pins on the wheel and a weight at the outer end of the head adapted to extend back of the second of the two pins when the pawl is in its inner position. 55 60

RUSSELL WALLACE HOOK.