Nov. 25, 1924. 1,517,125

R. C. PATTON

ADDING MACHINE

Filed June 20, 1924 2 Sheets-Sheet 1

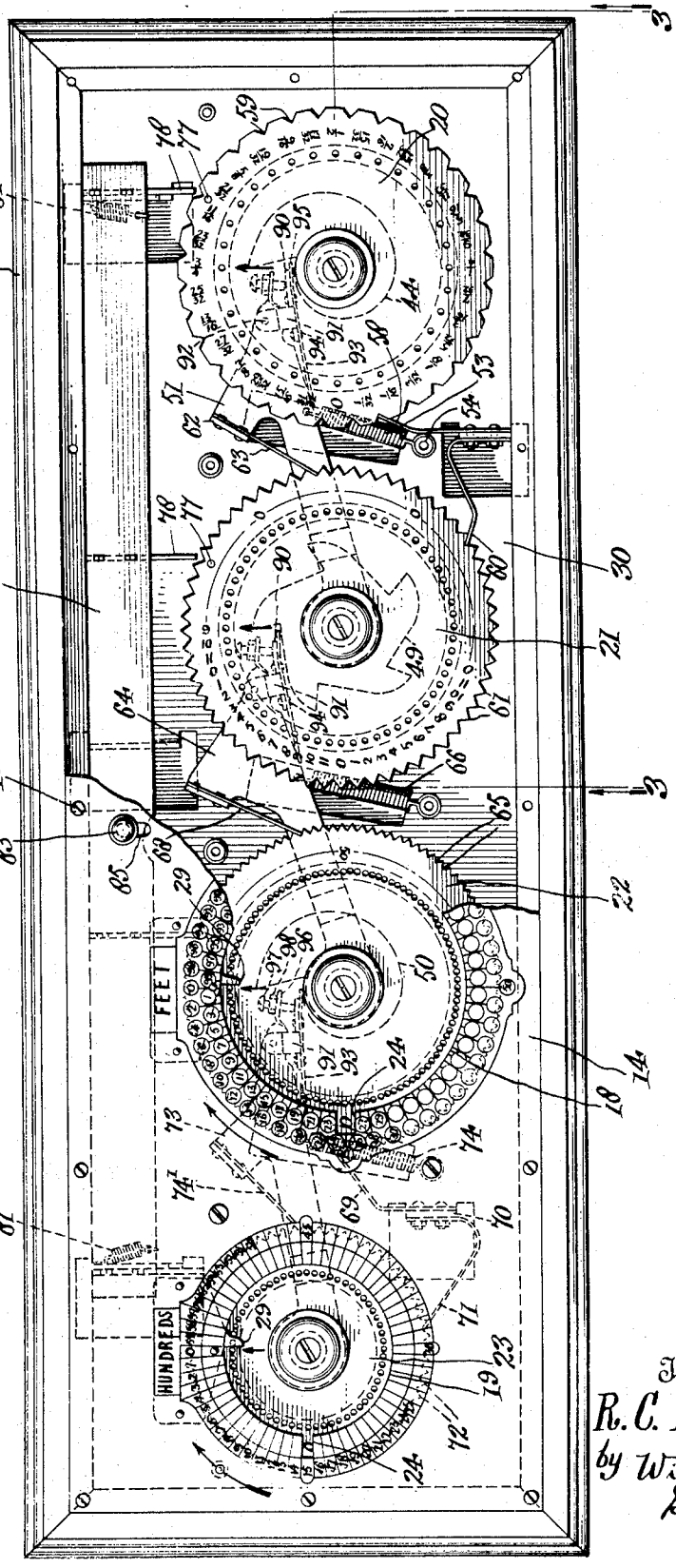

Fig. 1.

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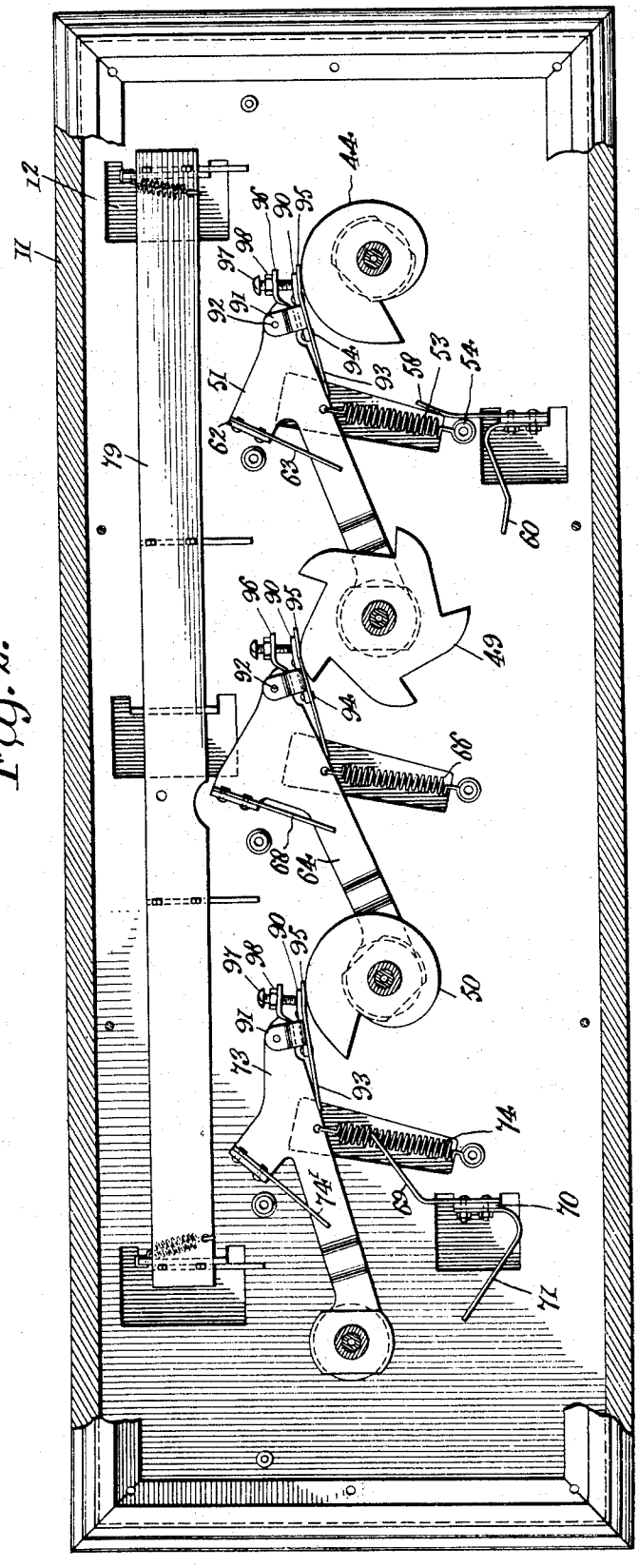

Fig. 2.

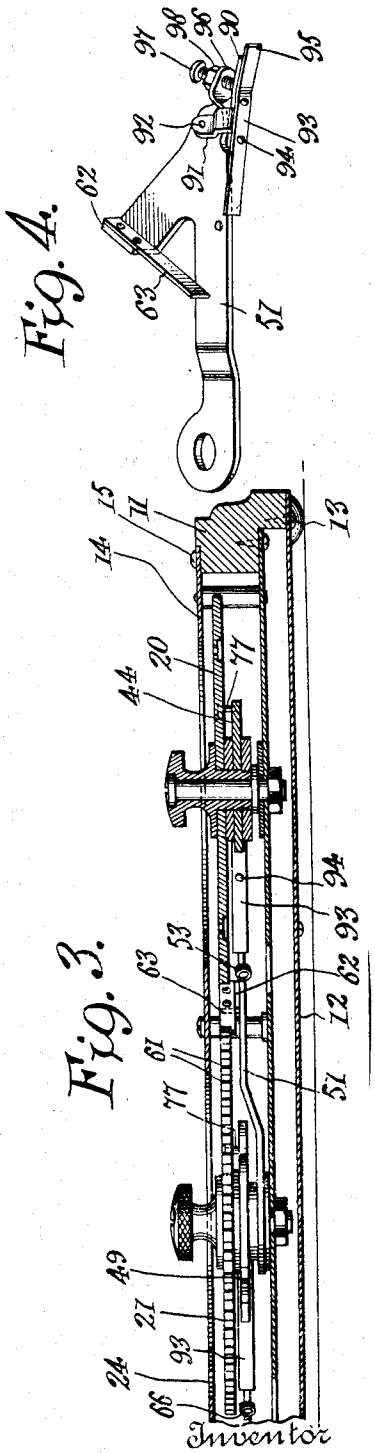

Fig. 4.

Fig. 3.

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UNITED STATES PATENT OFFICE.

RALPH CLIFTON PATTON, OF PROVIDENCE, RHODE ISLAND, ASSIGNOR TO PRECISION ADDING MACHINE COMPANY, OF CHARLOTTE, NORTH CAROLINA, A CORPORATION OF NORTH CAROLINA.

ADDING MACHINE.

Application filed June 20, 1924. Serial No. 721,320.

To all whom it may concern:

Be it known that I, RALPH CLIFTON PATTON, a citizen of the United States, residing at Providence, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Adding Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The present invention relates to improvements in adding machines and more specifically stated refers to the transfer mechanism for effecting movement from one of the numeral discs to a second disc in order.

The transfer lever is actuated by a cam moved with one disc and is provided with a pawl for engaging teeth upon the periphery of the disc of next higher denomination, a spring being used to keep the transfer lever against the edge of the cam and to draw the transfer lever in one direction when the lobe of the cam passes the lever whereby to actuate the second disc through an angular distance corresponding to one subdivision thereon.

At the present time considerable difficulty is experienced with the adjustment of the pawl relatively to the teeth of the disc and the transfer lever relatively to the cam. Of course the essential thing in a machine of this character is accuracy in the result and absolutely accurate operation at all times so that the adjustment becomes a most important item.

Previously it has been necessary to file the end of the spring pawl or to bend the pawl to secure a proper relationship of the parts and it is an object of the invention to eliminate the necessity for such make shift arrangements and to provide for the adequate and fine adjustment of these several parts.

With the foregoing and other objects in view, the invention will be more fully described hereinafter, and will be more particularly pointed out in the claims appended hereto.

In the drawings, wherein like symbols refer to like or corresponding parts throughout the several views,

Figure 1 is a plan view with parts broken away of an adding machine constructed according to the present invention.

Figure 2 is a plan view with the cover and discs removed and the casing partly broken away.

Figure 3 is a section on the line 3—3 in Figure 1, and

Figure 4 is a perspective view of the transfer lever.

Referring more particularly to the drawings 11 designates a casing closed below by a bottom plate 12 secured as by the screws 13 or other fastenings and at the top by a cover 14 held in place by the fastenings 15.

The cover 14 is provided with a number of openings indicated at 18 and 19 in Figure 1 which openings are arranged above the numeral discs 20, 21, 22 and 23. These discs are mounted for rotation and are carried by the supporting plate 30 mounted within the casing. The discs are each provided with cams 44, 49 and 50 except the last disc 23 in the series. An angular series of perforations are made in the discs inwardly of the marginal portions thereof which bear various designations or tables to agree with the tables shown surrounding the openings upon the cover 14. One of the perforations is provided opposite each subdivision on the respective disc and table about the cover opening and the cover obscures the numeral portion of the disc except at points where windows 24 are provided for showing the numeral designations. Abutments 29 on the cover project into the openings in order to arrest the movement of the stylus or other implement adapted to be inserted in the perforations in the discs for effecting the rotation of the same. Arrows are also placed upon the disc opposite certain of the perforations in order to indicate the perforation for engagement by the stylus when restoring the discs to the zero or initial position after actuation.

The cam 44 of the initial disc is engaged by the transfer lever 51 which oscillates about the axis of the second disc 21 and the head of the lever is enlarged and provided with an upturned lug 62 to which is riveted or otherwise secured a pawl 63 in position to engage the notches or teeth 61

of the disc 21. The pawl is made from spring material and is bent from the lug to engage the teeth. A coil spring 53 is connected between the lever 51 and a stud 54 on the supporting plate 30 in order to hold the lever against the cam 44. Stationary pawls 58 and 60 are provided to engage respectively the teeth 59 of the first disc 20 and the teeth 61 of the second disc 21 for avoiding casual or accidental rotation thereof.

The cam 49 of the second disc 21 is engaged by a transfer lever 64 pivoting about the axis of the third disc 22 and carrying a pawl 68 engaged with the teeth 65 of said third disc. A coil spring 66 acts to draw the lever 64 against the cam 49.

In a similar way the cam 50 of the third disc 22 is engaged by the transfer lever 73 which pivots about the axis of the fourth disc 23 and is yieldably held against the cam by the action of the coil spring 74. The transfer lever 73 carries a yieldable pawl 74′ to engage with the teeth 72 of the fourth disc 23. Fixed pawls 69 and 71 carried by the lug 70 on the supporting plate engage respectively the teeth 65 and 72 of the third and fourth discs to avoid retrograde movement thereof.

Upon the end of each transfer lever which engages its respective cam in a rocker 90 made of a flat piece of metal provided with a pair of upturned ears 91 pinned as at 92 to the outer free end portion of the transfer lever in order to give the strip 90 a pivotal movement in substantially the same plane of movement with the lever 51. A facing strip 93 is secured as by rivets 94 to the bar 90 and this facing strip is provided with a projecting outer end 95 extending beyond the end of the rocker 94 and with an elongated inner end extending to the edge of the lever remote from the rocker and being bent out of its normal plane by engagement with the lever edge whereby to put the rocker under resilient tension, the facing strip 93 being of spring metal. The extremity of the lever is twisted as indicated at 96 to receive the set screw 97 which bears against the outer portion of the rocker 90. A lock nut 98 upon the set screw is adapted to hold the same in a fixed position of adjustment.

A clearing bar 79 is slidably mounted transversely in the casing and is provided with projections 78 adapted to engage pins 77 projecting from the under sides of the various discs. The clearing bar is normally held with the projections 78 away from the pins 77 by the action of coil springs 81 and a knob 83 on the clearing bar projects through a slot 85 in the cover 14 for manipulating the bar when setting the various discs to zero position.

In operation the stylus is inserted in the perforation of the disc opposite the number on the cover and the disc is rotated in a clockwise direction until the stylus strikes the abutment 29 whereupon the number will be shown at the window 24. The next number in the addition is then added by placing the stylus in the perforation opposite such number and giving the disc another partial rotation until the stylus strikes an abutment whereupon the sum of the two numbers added will appear at the window.

After each actuation the clearing bar is brought down, the stylus inserted in the perforation of each disc opposite the arrow and rotated until stopped by the projections of the clearing bar whereupon the zero marks will be shown at the opening.

Now when setting the device, it is necessary that the pawl on the transfer levers shall properly engage the teeth of the next discs. For instance the pawl 63 must engage properly with the teeth 61 of the discs 21 in all positions of its movement. Any irregularity is at the present time corrected by filing the end of the spring pawl and by bending the spring pawl to secure the proper relationship of the parts.

In accordance with the present invention the set screw 97 is secured in or out in order to shift the rocker 90 toward or away from the cam, this movement resulting in an angular movement of the transfer lever with respect to the next disc and causing the pawl to take up a correct position with respect to the teeth. The screw 97 causes a micrometer adjustment and the adjustment is secured by the lock nut 98. The facing 93 of spring steel secures long wearing qualities where the end rubs on the cam. The spring steel face of the rocker projects as indicated at 95 quite a way beyond the rocker so that the latter shall not interfere with the overhanging point of the cam during the downward movement of the finger immediately after it has slipped off the high point of the cam.

It is obvious that various changes and modifications may be made in the details of construction and design of the above specifically described embodiment of this invention without departing from the spirit thereof, such changes and modifications being restricted only by the scope of the following claims.

What is claimed is:—

1. An adding machine comprising a casing having a cover with openings therein, discs rotatable in the casing beneath the openings, a cam movable with one disc, a transfer lever pivoting about the other disc and moved by said cam, yieldable means for holding the transfer lever against the cam, a pawl on the transfer lever engaging the second disc, and a rocker adjustably and pivotally mounted upon the end portion of said lever for engaging the cam whereby to shift the lever and pawl angularly with respect to the second disc.

2. An adding machine comprising a casing having a cover with openings therein, discs rotatable in the casing beneath the openings, a cam movable with one disc, a transfer lever pivoting about the other disc and moved by said cam, yieldable means for holding the transfer lever against the cam, a pawl on the transfer lever engaging the second disc, a rocker pivoted upon the end of the lever, a facing strip secured to the rocker and engaging the lever for placing the rocker under resilient tension, said facing strip adapted to engage the cam, and means for adjusting the rocker and facing strip substantially radially of the cam.

RALPH CLIFTON PATTON.