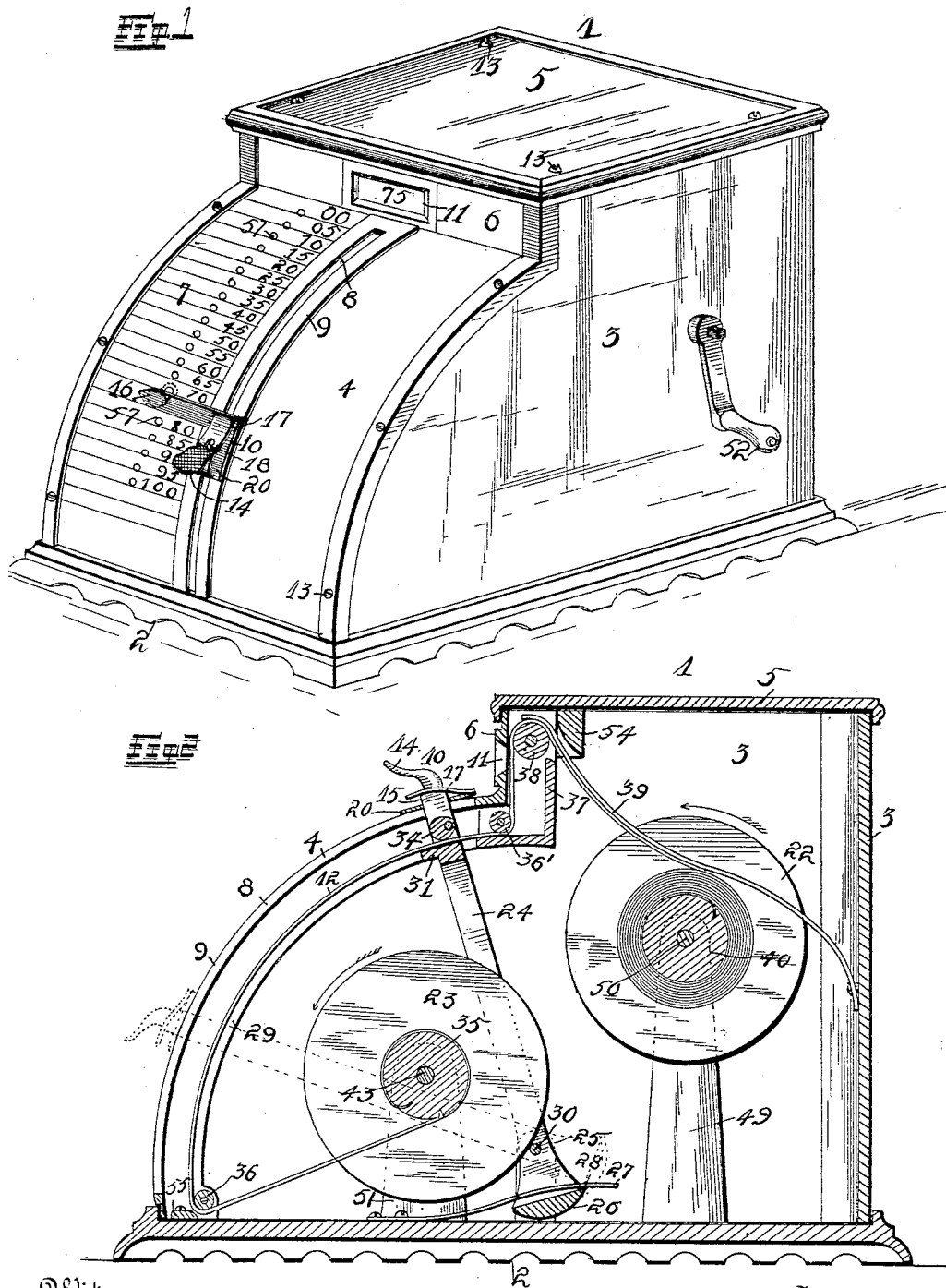


W. A. RITCHIE.  
ADDING OR REGISTERING MACHINE.

No. 493,117.

Patented Mar. 7, 1893.



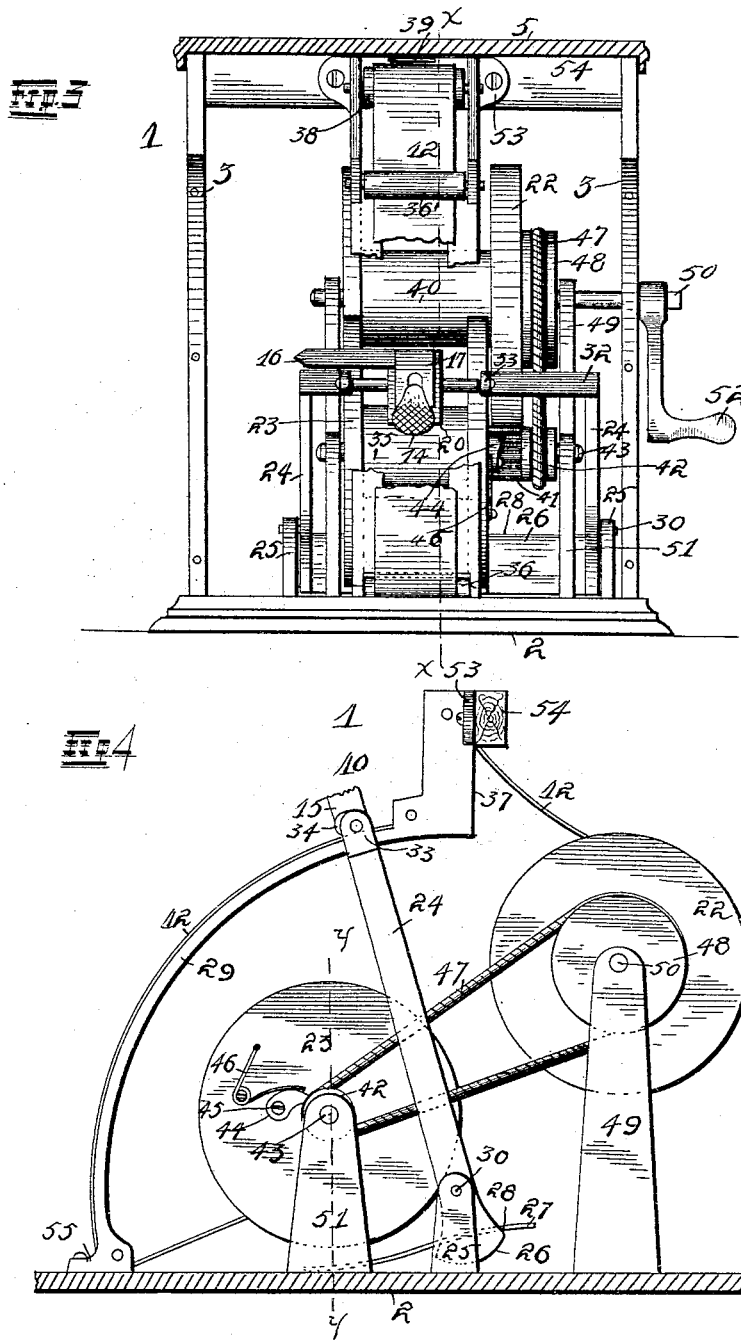
Witnesses  
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Fig. 5

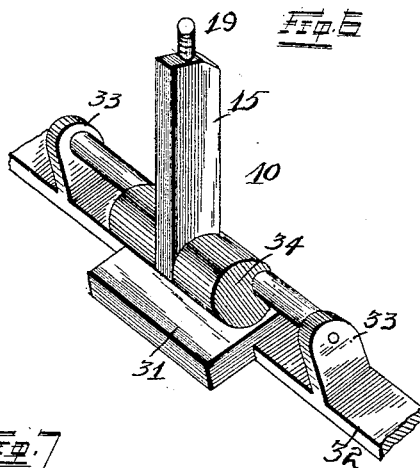


Fig. 7

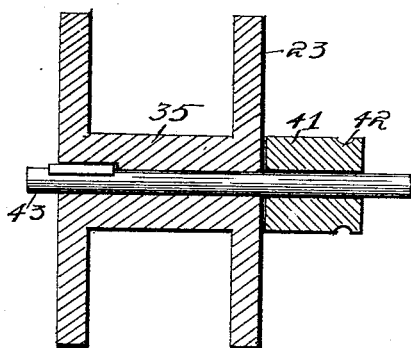


Fig. 9

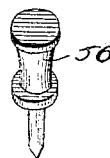


Fig. 8

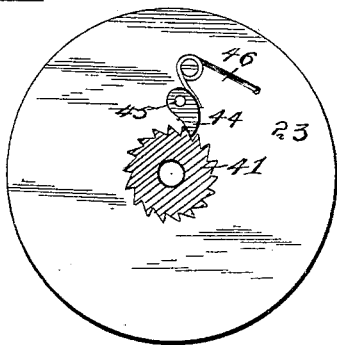
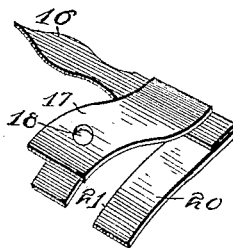


Fig. 10



210  
205  
200  
195  
190  
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140  
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By his Attorneys  
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# UNITED STATES PATENT OFFICE.

WILLIAM ADAMS RITCHIE, OF ST. LOUIS, MISSOURI, ASSIGNOR OF ONE-HALF  
TO EDWARD F. MARITZ, SR., OF SAME PLACE.

## ADDING OR REGISTERING MACHINE.

SPECIFICATION forming part of Letters Patent No. 493,117, dated March 7, 1893.

Application filed July 13, 1892. Serial No. 439,935. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM ADAMS RITCHIE, of the city of St. Louis and State of Missouri, have invented certain new and useful Improvements in Adding or Registering Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

My invention relates to improvements in an adding or registering machine, and consists in the novel arrangement and combination of parts as will be more fully hereinafter described and designated in the claims.

The object of my invention is to simplify upon the class of inventions mentioned above and at the same time to construct a machine which for accuracy, durability, &c., has not yet been designed.

In the drawings: Figure 1 is a perspective view of my invention. Fig. 2 is a vertical section taken on a line *xx* of Fig. 3. Fig. 3 is an end detail view with the front casing removed and part of the graduated-tape broken away. Fig. 4 is a side elevation of the interior part of my invention with the box-casing removed. Fig. 5 is a detail view of a portion of the graduated-tape. Fig. 6 is a perspective of the eccentric clutch. Fig. 7 is a view on a line *yy* of Fig. 4. Fig. 8 is a side elevation of the ratchet attachment governing the speed of the receiving reel. Fig. 9 is a perspective view of the stop-pin made use of in the operation of my invention. Fig. 10 is a perspective view of the indicator and spring.

Referring to the drawings: 1 indicates the complete machine consisting of a base 2, a casing 3, surrounding the two sides and back of the base 2, and forming a protection for the integral parts in the device.

The front casing 4 is in the form of a quadrant of a circle and forms what I denominate a face-plate. The round portion of this face-plate does not extend entirely to the top of the casing 3, but is connected with said casing 3 and the top 5 by a depending projection 6 which connects said top and the face-plate 4.

The casing 3 surrounding three sides of the device, the front face-plate 4, and the top 5 all fitted upon and connected with the base 2

form a protecting casing for the working parts of my invention while the face-plate 4 serves a double purpose in having the graduated scale 7 imprinted thereon. Said plate 4 is provided in its center and running vertically through its surface with a slot 8, and two flanges or projections 9 which form a track in and upon which travels the eccentric clutch 10 more fully hereinafter described. A sight opening 11 in that part of the casing which I denominated 6 allows a view of the graduated-tape 12, which forms the essential feature of my invention.

The different parts of the casing embodying the cover for the interior parts of the device are fitted together by removable screws 13.

The friction-clutch 10 has an operating handle 14 upon the end of its rocking-bar 15, the handle 14 extending and adapted to be operated outside of the casing or face-plate 4 and travel in the track 8.

In Fig. 1 I have shown the face-plate graduated by fives from naught to one dollar, beginning the graduation at the top of the face-plate, with the smallest figure. In manufacture, however, I can use decimals, fractions, numerical figures indicating dollars and cents, or successive figures for totals.

In the use of any of the above named signs, the column is started with the smallest item at the top.

The pointer or indicator 16 is held in position with the clutch 10 by means of a spring 17 provided with a perforation 18 through which the handle 12 is screwed onto the projecting portion 19 of the clutch 10. The pointer 16 is formed integrally with a flat piece of spring-metal 20 which is provided with a central slot 21 through which the projection 19 of the clutch 10 extends. Said piece of metal 20 is formed at right angles with the pointer 16 and the spring 17 is secured upon said piece of metal or guide 20, and said spring 17 holds the thumb-piece or handle 14 up and by reason of the eccentric pivoting of the clutch said clutch is held out of engagement with the graduated-strip 12.

I will now proceed with the description of the working parts of the mechanism.

The reel located in the rear part of the casing I denominate a supply-reel 22 and the

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60

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70

75

80

85

90

95

100

reel in the front portion under the face-plate 4, a receiving reel 23. I apply these terms to the reels 22 and 23 for the reason that when the machine is ready for use the graduated-tape 12 is wound upon said reel 22 and in operation the said tape gradually winds itself upon the receiving reel 23.

A vibrating frame 24 is pivotally mounted in two upright standards 25, located relatively upon both sides of the base within the casing 3, and preferably formed integral with said base 2. The lower cross-piece 26 of said frame is weighted to facilitate the vibrating motion of the frame in one direction, said motion being imparted to the frame by the downward and return movement of the handle 14 of the clutch. The downward movement is caused by the motion imparted to the handle 14 by the operator, and the return movement of said frame 24 is caused by a spring 27, secured to the base 2 at one of its ends and bearing against the outer side 28 of the base 26 of said frame 24 when the frame has reached the lowest point in its movement, and the quick return is caused by the tension of said spring against the outer edge 28 of the base 26.

A track or guide 29 in the shape of a quadrant having the pivoted point 30 of the frame 24 as the center of its radius is secured within the face-plate 4, and is the same distance from said plate 4 throughout its periphery. The track or guide 29 is provided with a slot 30 running throughout its length into which fits a projection 31 formed upon and with the frame 24 upon its upper side 32. This projection as well as the top piece of the frame is rounded to conform with the surface of the track 29, and the projection 31 is flush with the track 29 when said frame 24 is stopped at any point in the radius of its movement.

I will now describe the peculiar construction of the clutching attachment which controls the motion of the tape 12. The top cross-piece 32 of the vibrating frame 24 has two upright projections 33 which extend from said cross-piece 32 upon either side of the track 29 and act as an additional guide for the movement of the frame 24. Eccentrically pivoted in said standards 33 is a cam 34, provided with a projection or bar upon which the handle 14 is screwed. The tape 12 passes between said cam 34 and the plate 31 formed with the top-side 32 of the rocking-frame 24 and is caught and pulled down by the downward movement of the handle 14 which forces the eccentric portion of the cam 34 into adjacent contact with the tape 12 upon the plate 31. Thus in the downward movement of the clutching device 10 the pressure imparted to the handle 14 by the finger of the operator compresses the tension of the spring 17 and clamps the tape between the eccentric portion of the cam 34 and the plate 31. When the clutch is at the downward extent of its movement, such movement being regulated at the will of the operator, the finger of the operator is removed

from the handle 14 and the tension of the spring 17 against the lower portion of said handle 14 forces the handle up and consequently releases the clutching contact of the cam 34 and the spring 27 in engagement with the lower portion 26 of the rocking-frame 24 causes the vibrating-frame 24 and all of its connected parts to return to the normal positions shown in Fig. 2 of the illustrations. The downward movement of the clutch 10 and the clamping feature attendant thereon moves the tape a certain prescribed distance while in the return movement the tape being perfectly free, remains stationary.

One end of the tape 12 is secured upon the spindle 35 of the receiving-reel 23 and passes downwardly at an angle and under a roller 36 which is secured in the lower portion of the guide 29. From thence it passes upwardly over the outer periphery of the guide 29 and under a roller 36' which is pivoted in the upper portion of the guide through the projections 37 by means of which said guide 29 is secured in the device. It then passes upward over a roller 38 pivoted in said casting 37 and downward to the supply-reel 22.

A spring 39 is secured in the back casing 3 of the device and extends over the spindle 40 of said reel 22 and thence upward over the roller 38, and the tension of said spring being sufficient to prevent any slack accumulating in the tape 12 at this point.

The prevention of slack at the receiving-reel 23 is prevented by a ratchet-attachment shown in detail in Figs. 7 and 8. It consists of a ratchet 41, a portion 42 of which forms a pulley hereinafter described and is fitted upon the shaft 43 upon which the spindle 35 of the receiving-reel is keyed. Said ratchet 41 is revolubly mounted on said shaft and has a pawl 44 in contact with the teeth of said ratchet. Said pawl 44 is secured to the reel by a pivot 45, and held in contact with the teeth of said ratchet 41 by a spring 46 which is also secured upon the side of said reel 23.

When the tape 12 becomes slack at the reel 23 the engagement of the pawl 44 in the teeth of the ratchet 41 prevents the reel 23 from running any slower and in addition allows the reel to run "over" or faster thus taking up the slack in the tape 12. As the pawl 44 engages the ratchet 41 in an opposite direction from that in which the reel is adapted to turn, consequently when the tape is again taut the reel resumes its normal speed.

The connection by means of which both reels 22 and 23 are operated is made by a rope-belt 47 which passes over the pulley 42 upon the ratchet 41, and a pulley 48 upon the side of the reel 22. As it is necessary for the receiving-reel to travel faster than the supply-reel 22, the pulley 48 upon the supply-reel 22 is relatively larger than the pulley 42 forming a part of the ratchet 41.

In the illustrations the relative difference in the size of the pulleys is shown to be about three times as large, or in other words the

pulley 48 upon the reel 22 is three times as large as the pulley 42 upon the reel 23 thus increasing the revolutions of the reel 22 over the reel 23. Motion is imparted to these reels by the downward movement of the tape 12 by means of the clutch 10. The tape 12 is unwound from the supply-reel 23 and by reason of the connection between said reel 23 and the reel 22 by the belt 47, said reel 23 is also revolved at a greater speed than the reel 22 and the tape wound thereon as it comes from under the roller 36. The reel 22 is pivotally mounted in upright standards 49 and keyed upon a shaft 50 revolving in said pivotal mounting, and the reel 23 is similarly mounted in the standards 51 but lower down and at a relative distance from the reel 22 to conform with the shape of the casing.

In referring to the clutch as 10, I desire to say that that term includes the attachment by which the machine is operated, viz., the handle 14, the spring 17, the cam 34, &c.

The shaft 50 extends outwardly at one side of the machine through the casing 3 and has a crank 52 removably fitted thereon by means of which the tape 12 may be re-wound upon the supply-reel 22 when the total has been reached and a new column is to be added.

The guide 29 is secured in the casing at the upper end of said guide by a casting 37, provided with projecting lugs 53 which are secured to a cross-piece 54 removably fitted in the side-casings 3 of the machine and the lower end of the guide 29 is provided with a lug 55 by means of which it is secured to the base 2 of the device.

The numerical figures upon the tape may be numbered up to any desired amount and are printed on said tape in inverse order to the figures imprinted upon the face-plate 4. The figures on said tape are in exact alignment with the figures on the face-plate, that is to say, when the tape is in such a position that 10 shows through the sight opening 11 by pulling the pointer 16 down to 10 upon the face-plate, the figure 20 would show at the sight opening 11.

The detail operation of my machine will be more fully hereinafter described.

In the construction the base 2, top 5 and face-plate 4 are preferably made from some light and suitable metal while the sides and back casing 3 are made from wood, the combination of which adds to the general appearance and durability of my invention.

When it is desired to record a number of amounts of the same denomination a plug 56 shown in Fig. 9 can be placed in perforations 57 immediately under each line of figures upon the face-plate as shown in Fig. 1. To repeatedly record the amount the pointer is brought down to the pin and returned.

My adding machine is especially adapted for the use in stores where the check system is used. A slip of paper or check is sent by the salesman to the cashier, together with the money, and by using my machine the totals

for the day may be reached without the necessity of entering each check in a book or adding up the amounts of the checks separately.

We will premise that the amount of the check sent in is seventy five cents and being the first check that has been sent in at the beginning of the day's business, the figure upon the tape shows through the sight opening 11 as 0. The finger of the operator is placed upon the handle 14, and the spring 17 is compressed, and by the downward movement of the handle 14 the eccentric portion of the cam 34 grips the tape 12 between its surface and the upper surface of the plate 31 over which said tape travels. The tape being thus gripped, the handle 14 is pulled downwardly over the face-plate 4 and stopped at a point where the pointer 16 covers the figures 75. The tape 12 by reason of being gripped indirectly by the handle is pulled down a corresponding distance and the numerals 75 will show through the sight opening 11. If the numerals upon the face-plate 4 and the strip 12 were arranged in the same order with the reels 22 and 23 revolving in the same direction, the machine would subtract instead of add, but as the figures upon the strip 12 are in inverse order to those upon the face-plate 4 consequently addition. When the handle 14 has been brought down a desirable distance and the pointer 16 covers the figure desired, the handle 14 is allowed to fly up by means of the tension of the spring 17 against said handle 14, and the grip upon the tape 12 is released and the frame 24 actuated by the spring 27 upon the base 26 of said frame and the accompanying parts of the frame return to the normal position shown in Fig. 4. The strip 12 now shows the numerals 75 through the sight opening 11, and by each amount registered by bringing down the handle to the desired figure the total upon the strip 12 is correspondingly increased. At the end of the day's business the crank 52 is turned in a direction opposite to the continuous operation of the tape and the tape which has been wound upon the reel 23 during the day is re-wound upon the reel 22 and the machine is ready for the next day's business.

My machine may also be used as a cash register by either providing a drawer in connection with its construction or depositing the cash in some other receptacle.

In all the designs the figures upon the face-plate 4 and the strip 12 must be similar and in alignment.

The machine especially recommends itself for book-keepers' use where it is desired to reach small totals, and in fact any of the work in an office for which the machine is designed.

Having fully described my invention, what I claim is—

1. In an adding or registering machine, the combination, with a casing provided with a graduated face plate, and a graduated indicating tape movable in said casing, of an operating lever provided with a pointer, and

means carried by said lever for automatically feeding said tape when the lever is operated; substantially as and for the purpose set forth.

2. In an adding or registering machine, the combination, with a casing provided with a slotted, graduated face plate, and a graduated indicating tape movable in said casing, of an operating lever provided with a pointer, a cam journaled on said lever and provided with a handle, said cam automatically binding on the tape when the handle is depressed; substantially as and for the purpose set forth.

3. An adding or registering machine constructed with a gripping attachment, consisting of a rocking-frame 24 pivotally mounted near its lower end in standards 25, and having its lower end 26 weighted to facilitate the action of a spring 27 in contact with said lower cross-piece 26, the top cross-piece 32 of said frame 24 having an upwardly projecting plate 31 traveling in a guide 29, said plate 31 having its outer surface rounded to conform with the circular outline of the guide 29, projections 33 engaging the outsides of said guide 29, and having eccentrically pivoted therein, a cam 34 with a projection 19 onto which is screwed a handle 14, by means of which said gripping attachment is manipulated and the gripping of said tape being caused by the pressure upon the handle 14 which is imparted to the cam 34 by reason of its connection with said handle 14 and the eccentric portion of

said cam 34 clamping the tape 12 between its surface and the rounded surface of the plate 31 traveling in the guide 29, substantially as set forth.

4. An adding or registering machine constructed with a gripping attachment manipulated directly by a handle 14 having a spring 17 formed with a pointer 16 and a traveler 20 secured between the base of said handle 14 and the track 9 of the face-plate 4 and adapted to throw the handle up and consequently keep the eccentric portion of the cam 34 out of contact with the tape 12, substantially as set forth.

5. An adding or registering machine having a vibrating frame 24, with a weighted lower cross piece 26, said frame 24 pivoted in standards 25, a guide 29 of the shape of a quadrant of a circle with the pivotal point 30 of said frame 24 as the center of its radius and a plate 31 formed with the upper cross-piece 32 of said rocking frame 34 traveling in said guide 29 in the plane of its radius, and guide 29 forming a surface guide for the passing of the tape 12 over same, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM ADAMS RITCHIE.

Witnesses:

C. K. JONES,

HERBERT S. ROBINSON.