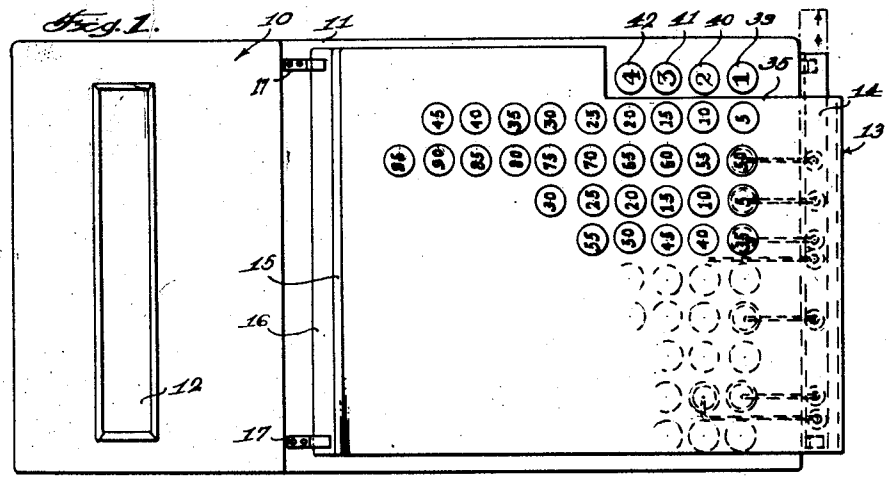
Dec. 1, 1959 J. D. CASANOVA ET AL 2,915,245

PAYROLL CHANGE CALCULATING ATTACHMENT

Filed Sept. 25, 1956 3 Sheets-Sheet 1

Fig. 1.



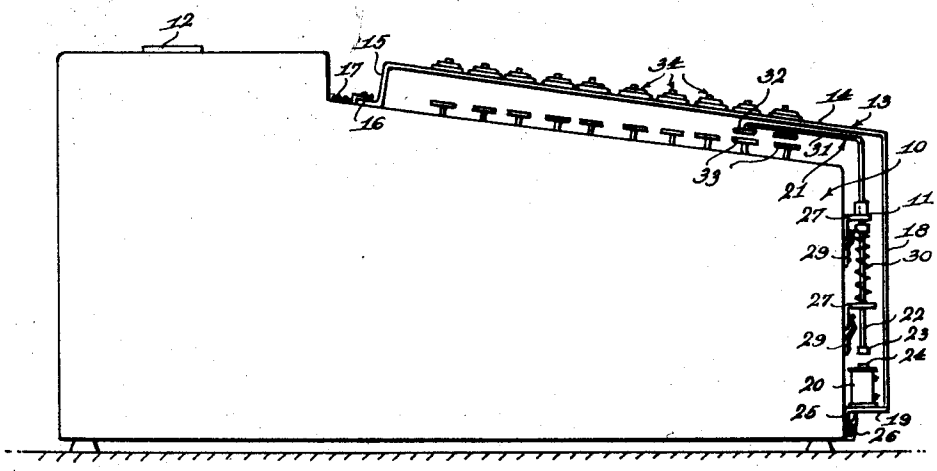


Fig. 2.

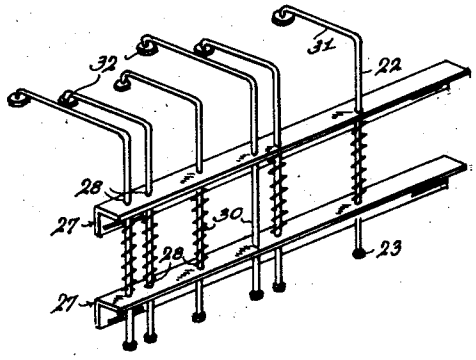


Fig. 6.

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Dec. 1, 1959 J. D. CASANOVA ET AL 2,915,245

PAYROLL CHANGE CALCULATING ATTACHMENT

Filed Sept. 25, 1956 3 Sheets-Sheet 2

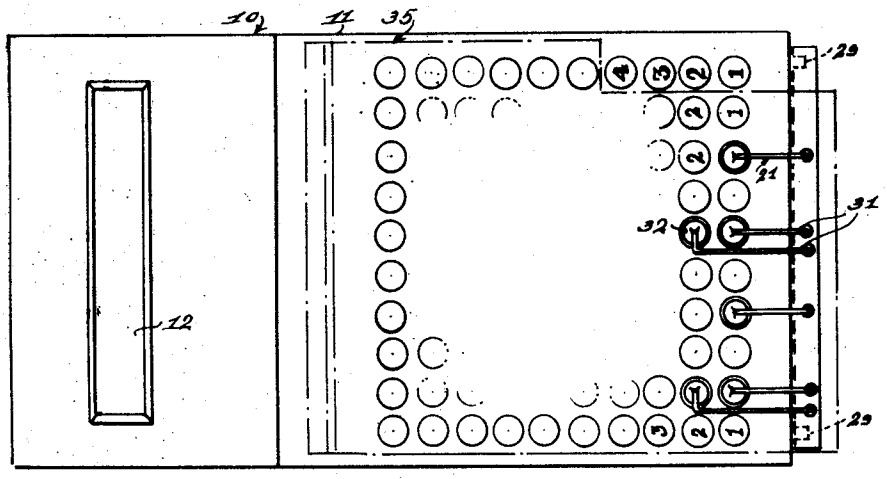


Fig. 3

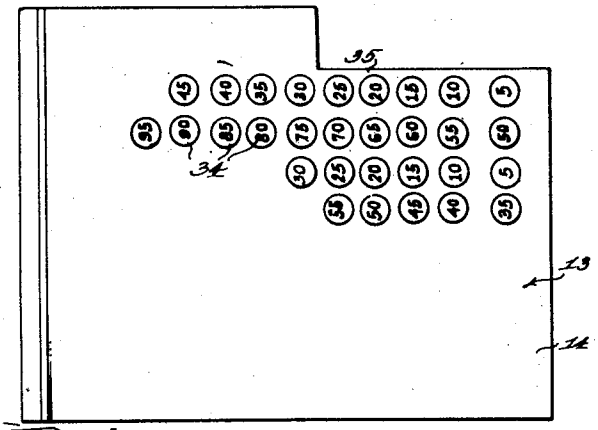
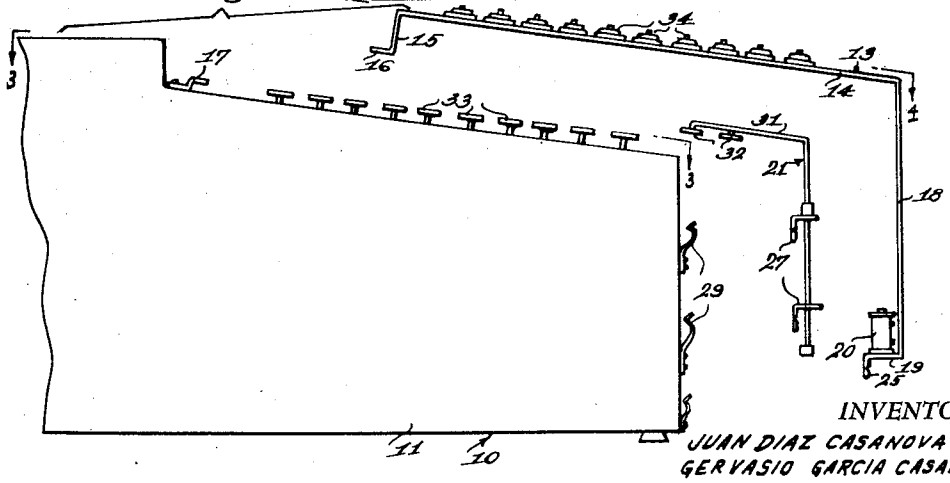


Fig. 4

Fig. 5.



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Dec. 1, 1959 J. D. CASANOVA ET AL 2,915,245

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Filed Sept. 25, 1956 3 Sheets-Sheet 3

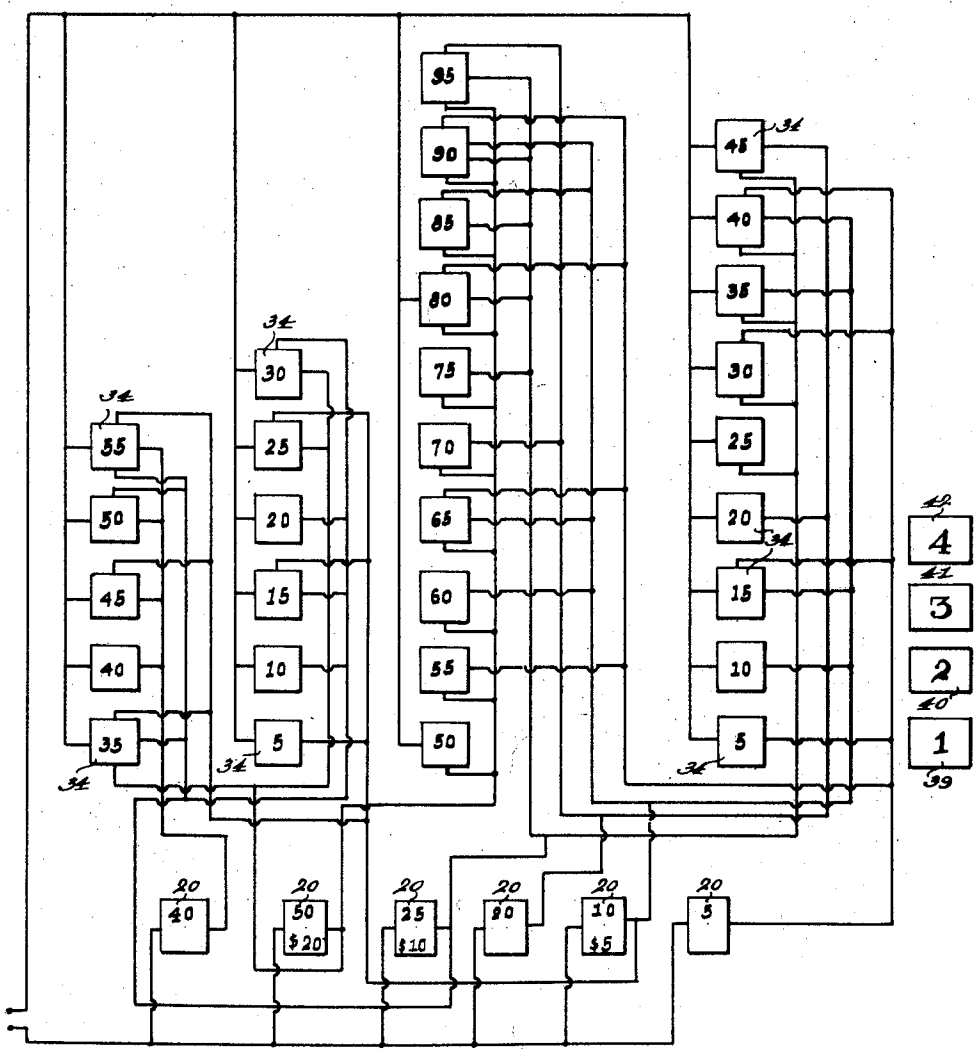


Fig. 8.

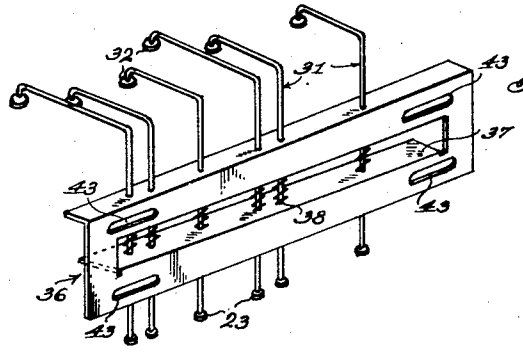


Fig. 7.

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PAYROLL CHANGE CALCULATING ATTACHMENT

Juan Diaz Casanova and Gervasio Garcia Casanova, Caguas, Puerto Rico

Application September 25, 1956, Serial No. 611,984

6 Claims. (Cl. 235—146)

This invention relates to a computing machine, and more particularly to a change listing attachment for an adding machine.

The object of the invention is to provide a change listing attachment for an adding machine which will simplify the obtaining of change for payment of pay rolls or the like.

Another object of the invention is to provide an attachment which is adapted to be detachably mounted on a conventional adding machine such as that shown in prior Patent No. 2,745,601 or 2,665,063, so that by means of such attachment a person can readily compute the exact amount of change required for a given purpose, as for example, for use in making up a pay roll.

A still further object of the invention is to provide a change listing attachment for an adding machine which is electrically operated, the attachment of the present invention including a base which carries a plurality of manually operable switches that are adapted to actuate solenoids whereby actuation of the solenoids will depress arms which will move certain of the keys on the adding machine.

A further object of the invention is to provide a change listing attachment for an adding machine which is extremely simple and inexpensive to manufacture.

Other objects and advantages will be apparent during the course of the following description.

In the accompanying drawings, forming a part of this application, and in which like numerals are used to designate like parts throughout the same.

Figure 1 is a top plan view illustrating the change listing attachment for the present invention mounted on an adding machine.

Figure 2 is a side elevational view of the device of Figure 1.

Figure 3 is a sectional view taken on the line 3—3 of Figure 5.

Figure 4 is a sectional view taken on the line 4—4 of Figure 5.

Figure 5 is a disassembled view illustrating certain constructional details of the assembly.

Figure 6 is a fragmentary perspective view illustrating the channel members and movable arms.

Figure 7 is a view similar to Figure 6 but showing a modification.

Figure 8 is a view illustrating the wiring diagram of the present invention.

Referring in detail to the drawings, the numeral **10** designates a conventional adding machine which includes the usual housing or casing **11**. The adding machine **10** is provided with the usual roll of paper **12** on which is adapted to be printed the various numerals or indicia.

The present invention is directed to a change listing attachment for use with the adding machine **10**, and the change listing attachment of the present invention includes a body member **13** which can be made of any suitable material. The body member **13** includes an inclined base **14** which has its upper end terminating in a downwardly extending lip **15**, and the lip **15** terminates in a substantially horizontal flange **16** which is adapted to be arranged in engagement with brackets **17** which are secured to the housing of the adding machine **10**.

Depending from the lower edge of the base **14** is a vertical portion **18** which has a horizontal portion or platform **19** extending therefrom, and the platform **19** provides a support for a plurality of solenoids **20**. The solenoids **20** are adapted to actuate movable arms **21**. Each of the arms **21** may include a vertical section or portion **22** which has a shoulder **23** on its lower end for coaction with the core **24** of the solenoids **20**. Vertical portions **25** depend from the horizontal portions **19**, and the vertical portions **25** of the body member **13** are adapted to engage brackets **26** on the adding machine **10** so as to retain the parts in their proper assembled position.

For supporting the movable arms **21**, there is provided a pair of channel members which are each indicated by the numeral **27**, Figure 6. The channel members **27** may have an L-shape in cross section, and the channel members **27** are provided with apertures or openings **28** for slidably receiving the vertical portions **22** of the arms **21**. Brackets **29** are provided for releasably connecting the channel members **27** to the adding machine **10**. Coil springs **30** are circumposed on the vertical portions of the arms **21**, and the coil springs **30** may be interposed between the pair of channel members **27**.

The arms **21** further include upper portions **31** which are each provided with a head **32** on the end thereof. The heads **32** are mounted for movement into and out of engagement with certain of the depressable keys **33** of the adding machine **10**. A plurality of manually operable switches **34** are carried by the base **14**, and the switches **34** are arranged in an electrical circuit as shown in Figure 8. A portion of the base **14** is cut away as at **35** for a purpose to be later described, Figures 1 and 4.

Referring to Figure 7 of the drawings, there is shown a modification which is adapted to be used in lieu of the arrangement shown in Figure 6. Thus, in Figure 7 the numeral **36** designates an L-shaped channel member which is provided with struck out portions **37** that have apertures or openings **38** therein for slidably receiving the arms **31**.

The numerals **39**, **40**, **41** and **42** designate the keys of the adding machine which are exposed through the cut-out portion **35** of the base **14**.

From the foregoing, it is apparent that there has been provided a change listing attachment for a computing machine such as an adding machine. The four keys **39**, **40**, **41** and **42** are left uncovered or exposed due to the cut away portion **35**, and these keys **39**, **40**, **41** and **42** are manually operated. The arms **21** serve to depress the keys **33**. As shown in the drawings, the base **14** is arranged above the keys **13**. The adding machine **10** is electrically operated. The switches **34** serve to actuate the solenoids **20**, and the solenoids **20** pull the shoulders **23** of the arms **21** towards the solenoids so that the heads **32** will depress the keys **33** therebelow. After the solenoids **20** have been deenergized, the coil spring **30** returns the arms **21** to the position shown in Figure 2. Figure 8 illustrates the circuits or electrical connections between the switches and solenoids. Thus, as shown in Figure 8 for example there are four connections or circuits so that for example when the change for ninety cents is required, the following keys will be depressed so as to make a mark on the paper roll **12**. Five cents, ten cents, twenty-five cents and fifty cents so that the total will be ninety cents.

Similarly, when the change for thirty cents is required, it will be seen from Figure 8 that a circuit to the twenty-five cent solenoid and to the five cent solenoid will be actuated.

In Figure 7 there is illustrated a modification wherein the numeral **36** designates a movable base which is provided with the four slots **43** which permit the base to be moved sideways and when the base **36** moves sideways, the arms **31** likewise move sideways so that when operating the machine in order to find out the change for the bills, the base **36** will be moved towards the right. For purposes of illustration, the six arms or depressors **31** are indicated by the numbers 1, 2, 3, 4, 5 and 6. Thus, when operating the machine in order to find out the change for bills, the base **36** can be moved towards the right so that the depressor or arm marked 2 will be above the key 1 of column 4 of the keyboard of the adding machine. This will permit three columns of the adding machine for recording the one dollar bills; two columns for the five dollar bills; two columns for the ten dollar bills and three columns for the twenty dollar bills. This arrangement will only be used when listing the change for the bills. When listing the change for the coins, the base **36** holding the six depressors **31** will again be moved to the left so that the depressor marked 2 will be above the key 1 of column 5 of the key board.

Due to the provision of the brackets such as the brackets **26**, **29** and **17**, the device can be readily attached to or removed from the adding machine when desired.

It is to be understood that the present invention is directed to an attachment for use with a conventional adding machine such as the adding machine **10**. The present invention is electrically operated and consists of a minimum number of parts. Also, the present invention utilizes the existing printing mechanism including the roller **12** and keys **33** of the adding machine to which the device is attached. With the present invention, different denominations for coins and bills are printed on the paper roll normally used by the adding machines. Furthermore, the present invention can be used with either adding machines which are electrically operated or hand operated. Also, the present invention gives the exact amount of all denominations.

The device or mechanism of the present invention is adapted to be used for determining the change needed for the payment of pay rolls and the attachment includes six electro magnets or solenoids **20** which are connected to the different switches **34** on the panel or base **14** that is arranged on top of the machine keyboard. The electro magnets **20** operate the six arms **21** which in turn serve to depress the keys **33** according to the different connections made to each switch.

The switch panel on top of the keyboard consists of thirty switches **34**. Eleven of these switches are for bills while nineteen of the switches are for coins. The switches for the bills will be in a progression of five from five dollars to fifty-five dollars. The coins will also be in a progression of five, from five cents to ninety-five cents. The pennies will be operated manually, for which purpose the first four keys **39** through **42** of the right hand column are not covered by the panel. For example, if it is necessary to figure out twenty-nine cents, then the operator merely depresses the switch marked twenty-five and the uncovered key forty-two which has the numeral 4 thereon.

When using a ten column adding machine, the keys will be divided into five groups. The first two keys from left to right are for the halves, the next keys for quarters, the next two keys for dimes, the next two keys for nickels, and the last two keys for pennies.

The arms or key operating depressors **21** are operated by the electromagnets **20** and are distributed from right to left as follows. For the coins, arm 1 will depress key 1 of column 3 for the nickels. Similarly, arm 2 will depress key 1 of column 5 for the ten cents. Also, arm 3 will depress key 2 of column 5 for the twenty cents. Furthermore, the arm 4 will depress key 1 of column 7 for the quarters. The arm 5 will depress key 1 of column 9 for the halves.

For the bills, arm 2 will depress key 1 of column 4 for the five dollar bills. Also, arm 4 will depress key 1 of column 6 for the ten dollar bills. Further, arm 5 will depress key 1 of column 8 for the twenty dollar bills. Similarly, arm 6 will depress key 2 of column 8 for the quantities of forty dollars.

As previously described, the pennies will be operated manually and for this purpose the keys 39 through 42 of the first column from the right will be used.

The thirty switches of the panel will be of one, two, three and four contacts as follows:

One contact switches—for the coins: 5, 10, 20, 25, 50; for the dollars: $5, $10, $20 and $40.

Two contact switches—for the coins: 15, 30, 35, 45, 55, 60, 70 and 75; for the dollars: $15, $25, $30, $45 and $50.

Three contact switches—for the coins: 40, 65, 80, 85, 95; for the dollars: $35 and $55.

Four contact switches for the coins 90.

As shown in the drawings, the change listing attachment of the present invention is mounted on top of the keyboard of the adding machine and the device is held in place by suitable fasteners such as the previously described bracket. However, other types of fastening means can be used if desired.

As an example of how the attachment is used, assuming for example that it is desired to determine the change needed for the following amounts in a pay roll, $29.40, $18.20 and $6.44. Then, it is only necessary to proceed as follows: First, the operator determines the bills required by depressing the following switches, $25 and the uncovered key No. 42 which has the numeral 4 thereon, the key 42 being part of the adding machine; the switch marked $15 and the uncovered key with the numeral 3 thereon which is indicated by the numeral **41** on the adding machine; the switch marked $5 and the uncovered key indicated by the numeral **39** and having the number 1 thereon. Then, to determine the change for the coins, it is only necessary to depress the switch **34** marked 40, then the switch **34** marked 20, then the switch marked 40 and the uncovered key with the numeral 4 thereon, the last named key being a part of the adding machine.

The attachment of the present invention can be used on a hand operated machine or on an electric operated adding machine as desired.

The following is given as a detailed description of the operation of the change listing attachment.

Referring to Figure 2 of the drawings, the body member **13** is placed on top of the keyboard of a conventional adding machine which may be electrically or manually operated and which has at least ten columns of keys. The body member **13** is held in place by suitable fasteners so as to permit easy attachment and removal thereof. When placing the body member **13** on top of the adding machine, the head **32** of the depressors will be at least ⅛ of an inch above the keys **33** and the head **32** of the first depressor (counting from right to left) will be above the first key **33** of the column 2 of the keyboard. The head **32** of the second depressor **31** will be above the first key **33** of the column 4 of the keyboard. The head **32** of the third depressor **31** will be above the second key **33** of column 4 of the keyboard. The head **32** of the fourth depressor **31** will be above the first key **33** of the column 6 of the keyboard. The head **32** of the fifth depressor **31** will be above the first key **33** of column 8 of the keyboard and finally, the head **32** of the sixth depressor **31** will be above the second key **33** of column 8 of the keyboard.

As shown in Figure 7, the six depressors **31** are mounted on a movable base **36** so as to permit the base to move either to the right or to the left. By moving the base **36** to the right so that the previously described six depressors **31** are in the position explained above,

the change listing attachment is ready to operate so as to determine first the denomination of the bills required. This is done by depressing the switches **34** which are carried by the base **14**. There are eleven switches **34** which will permit the operator of the machine to determine the change required for the bills in the denominations of $5.00, $10.00 and $20.00.

The $1.00 required is determined by manually depressing the first four keys **33** of column 1 of the keyboard, which for this purpose has been left uncovered by the base or body member **13**. As an example, assume that it is desired to determine the change in bills for the following amounts in a pay roll: $5.00, $10.00, $20.00, $15.00, $25.00, $50.00, $55.00, $65.00, and $75.00; then it is only necessary to proceed as follows. Depress switches **34** which are marked $5.00, $10.00, $20.00, $15.00, $25.00, $50.00, $55.00, and then switches $55.00 and $10.00 (for the $65.00) and the switches $55.00 and $20.00 for the $75.00. It is to be noted that after depressing each switch, it is necessary to press the operating bar of the machine so that each amount will be individually registered and printed on the paper roll of the adding machine. If the amounts in the payroll are $6.00, $16.00 and $24.00, it is only necessary to depress switch **34** which is marked $5.00 and the uncovered key **39** of the first column; the switch **34** marked $15.00 and the uncovered key **39** of the first column; and switch **34** marked $20.00 and the uncovered key **42** of the first column.

After the change for the bills of the payroll is determined as explained above, the following procedure is carried out in order to determine the change for the coins. As a general rule office personnel determines the change required for the first sheet of the payroll, next the change for the second sheet and then the change for the third sheet, etc. First, the movable base **36** is shifted to the left so that the head **32** of the first depressor **31** is above the first key **33** of the column 3 of the keyboard and the other depressors are in the position as shown in Figure 3 of the drawings. The switches **34** are now ready to operate which are carried by the base **14** and there are nineteen of these switches which are used in order to determine the change for the coins in the denominations five cents; ten cents; quarters; and half dollars. The switches are marked with numbers 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70, 75, 80, 85, 90, and 95. These switches have been arranged in two columns but it is to be understood that they can be arranged in three columns or in any other desired arrangement.

As an example, let it be assumed that the following amounts appear on a pay roll; 5 cents, 10 cents, 15 cents, and 20 cents. Then, it is only necessary to proceed as follows: Depress the switches **34** marked with the above denominations 5 cents, 10 cents, 15 cents and 20 cents. After depressing each switch individually, the operating bar of the adding machine will be depressed so as to register and print the amounts on the paper roll of the adding machine. If the amounts are 6 cents, 11 cents, 14 cents, it is only necessary to depress the switch **34** which is marked 5 cents and the uncovered key **33** marked 39; the switch **34** marked 10 cents and the uncovered key **33** marked 39; the switch **34** marked 10 cents and the uncovered key **33** marked 42.

By way of further explanation of the circuits shown in Figure 8 the following is given. The switch marked 5 is a one contact switch and when it is depressed it closes the circuit between the line and the solenoid number one (counting from right to left). This closing of the circuit energizes the solenoid **20** and this causes the solenoid to pull the shoulder **23** of the arm **21** towards the solenoid and then the head **32** pushes the key **33** downward. As soon as the pressure of the finger of the switch **34** is removed a spring in the switch will break the circuit and the solenoid **20** will be deenergized. This will permit the coil spring **30** to return the arm **21** to its original

position shown in Figure 2 of the drawings. At this moment, the operator of the adding machine presses down the operating bar of the machine and the operation is recorded on the paper roll of the adding machine. The key **33** of the adding machine in this case will be the first key of column 3. If the switch marked 10 is depressed, the solenoid actuated would be number 2 (from right to left) and key 1 of column 5 will be depressed. If the switch marked 15 is depressed, it will close the circuits for the 5¢ and 10¢ and the solenoids affected will be 1 and 2. Key 1 of columns 3 and 5 will be depressed. Since the other switches will operate as previously described, it is not believed necessary to repeat the function of each one. However, there is submitted herewith immediately following this material, information which explains in detail the number of contacts in each switch, the circuit it closes, the solenoid actuated, and the keys of the adding machine which will be depressed.

Below is a description of the eleven switches of the change listing attachment which are used in order to obtain the change required for the bills in the payroll.

Bill Denomination Switch used to determine it	Number of contacts required	Circuits affected	Arm and solenoid affected	Key affected	Column of Keyboard affected
$5.00 bill	1	$5	2	1	4.
$10.00 bill	1	$10	4	1	6.
$15.00 bill	2	$5 and $10	2 and 4	1	4 and 6.
$20.00 bill	1	$20	5	1	8.
$25.00 bill	2	$5 and $20	2 and 5	1	4 and 8.
$30.00 bill	2	$10 and $20	4 and 5	1	6 and 8.
$35.00 bill	3	$5, $10, $20	2, 4 and 5	1	4, 6 and 8.
$40.00 bill	1	$40	6	2	8.
$45.00 bill	2	$5 and $40	2 and 6	1 and 2	4 and 8.
$50.00 bill	2	$10 and $40	4 and 6	1 and 2	6 and 8.
$55.00 bill	3	$5, $10 and $40.	2, 4 and 6.	1 and 2	4, 6 and 8.

The following is a description of the nineteen switches of the change listing attachment which are used in order to determine the change required for the coins in a payroll.

Coin Switch used to determine it	Number of contacts required	Circuits affected	Arm and solenoid affected	Key affected	Column of Keyboard affected
5 cents	1	5 cents	1	1	3.
10 cents	1	10 cents	2	1	5.
15 cents	2	5 and 10	1 and 2	1	3 and 5.
20 cents	1	20	3	2	5.
25 cents	1	25	4	1	7.
30 cents	2	25 and 5	1 and 4	1	3 and 7.
35 cents	2	25 and 10	2 and 4	1	5 and 7.
40 cents	3	25, 10 and 5	1, 2, and 4	1	3, 5 and 7.
45 cents	2	25 and 20	3 and 4	2 and 1	5 and 7.
50 cents	1	50	5	1	9.
55 cents	2	5 and 50	1 and 5	1	3 and 9.
60 cents	2	10 and 50	2 and 5	1	5 and 9.
65 cents	3	5, 10 and 50	1, 2 and 5	1	3, 5 and 9.
70 cents	2	20 and 50	3 and 5	1 and 2	5 and 9.
75 cents	2	25 and 50	4 and 5	1	7 and 9.
80 cents	3	5, 25 and 50	1, 4 and 5	1	3, 7 and 9.
85 cents	3	10, 25 and 50	2, 4 and 5	1	5, 7 and 9.
90 cents	4	5, 10, 25 and 50.	1, 2, 4 and 5.	1	3, 5, 7 and 9.
95 cents	3	20, 25 and 50	3, 4 and 5	1 and 2	5, 7 and 9.

We claim:

1. In a change listing attachment for an adding machine of the type including a housing and a plurality of numbered depressable keys and a printing roll, a body member including an inclined base arranged above said keys, a lip extending downwardly from the upper edge of said inclined base and terminating in a flange connected to said housing, said inclined base being provided with a cutaway portion adjacent a side edge thereof, a vertically disposed first portion depending from the lower edge of said base and terminating in a horizontally disposed

second portion, a vertically disposed third portion arranged at right angles with respect to said second portion and connected to said housing, a plurality of electrically operated solenoids mounted on said second portion, a plurality of arms movably mounted between said housing and base and said arms including first sections and vertically disposed second sections, a head on the upper end of each of said arms for engagement with said keys, a shoulder on the lower end of each of said arms for engagement with said solenoids, a pair of spaced parallel horizontally disposed L-shaped channel members arranged contiguous to an end of said housing and detachably connected thereto, the vertical sections of said arms being slidably mounted in said channel members, and a plurality of manually operable switches mounted on said base and electrically connected to said solenoids.

2. The structure as defined in claim 1 and further including means detachably connecting said channel members to said housing.

3. The structure as defined in claim 1 and further including means detachably connecting said channel members to said housing, said means comprising brackets secured to said housing and provided with offset portions for receiving said channel members.

4. The structure as defined in claim 1 and further including resilient means arranged in engagement with said arms.

5. In a change listing attachment for an adding machine of the type including a housing and a plurality of numbered depressable keys and a printing roll, a body member including an inclined base arranged above said keys, a lip extending downwardly from the upper edge of said inclined base and terminating in a flange connected to said housing, said inclined base being provided with a cut away portion adjacent a side edge thereof, a vertically disposed first portion depending from the lower edge of said base and terminating in a horizontally disposed second portion, a vertically disposed third portion arranged at right angles with respect to said second portion and connected to said housing, a plurality of electrically operated solenoids mounted on said second portion, a plurality of arms movably mounted between said housing and base and said arms including first sections and vertically disposed second sections, a head on the upper end of each of said arms for engagement with said keys, a shoulder on the lower end of each of said arms for engagement with said solenoids, a pair of spaced parallel horizontally disposed L-shaped channel members arranged contiguous to an end of said housing and detachably connected thereto, the vertical sections of said arms being slidably mounted in said channel members, and a plurality of manually operable switches mounted on said base and electrically connected to said solenoids, means detachably connecting said channel members to said housing, said means comprising brackets secured to said housing and provided with offset portions for receiving said channel members, resilient means arranged in engagement with said arms, said resilient means comprising coil springs circumposed on said arms.

6. A change listing attachment comprising a body member embodying an inclined base, a lip extending downwardly from the upper edge of said inclined base and terminating in a flange, said inclined base having a cutaway portion adjacent a side edge thereof, a vertically disposed first portion depending from the lower edge of said base and terminating in a horizontally disposed second portion, a vertically disposed third portion arranged at right angles with respect to said second portion, a plurality of electrically operated solenoids mounted on said second portion, a plurality of arms movably mounted, said arms including first sections and vertically disposed second sections, a head on the upper end of each of said arms, a shoulder on the lower end of each of said arms for engagement with said solenoids, a pair of spaced parallel horizontally disposed L-shaped channel members, the vertical sections of said arms being slidably mounted in said channel members, and a plurality of manually operable switches mounted on said base and electrically connected to said solenoids, and brackets provided with offset portions for receiving said channel members, and resilient means comprising coil springs circumposed on said arms.

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