

Dec. 15 1925.

1,565,298

M. WADDELL ET AL

STOP CHECK ANNOUNCING DEVICE FOR ADDING MACHINES

Filed April 10, 1925

3 Sheets-Sheet 1

Fig. 1.

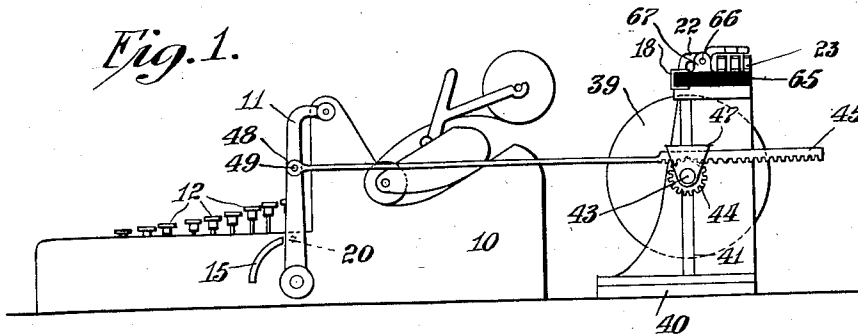


Fig. 2.

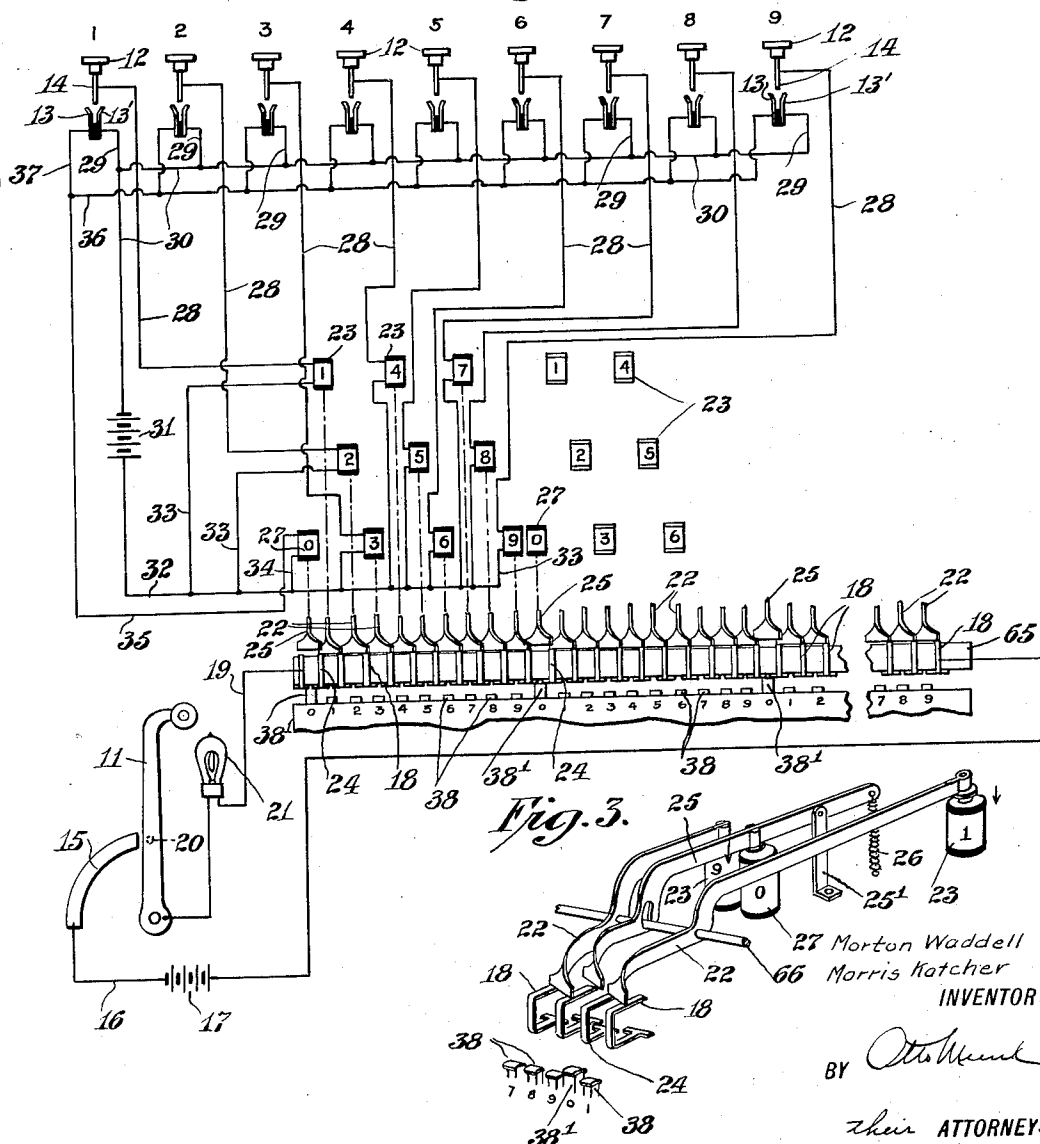
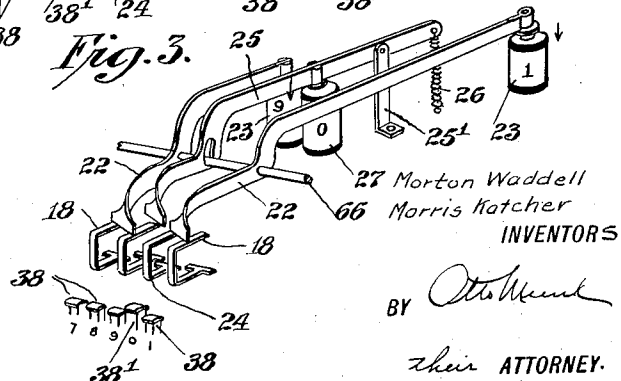


Fig. 3.



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3 Sheets-Sheet 2

Fig. 4.

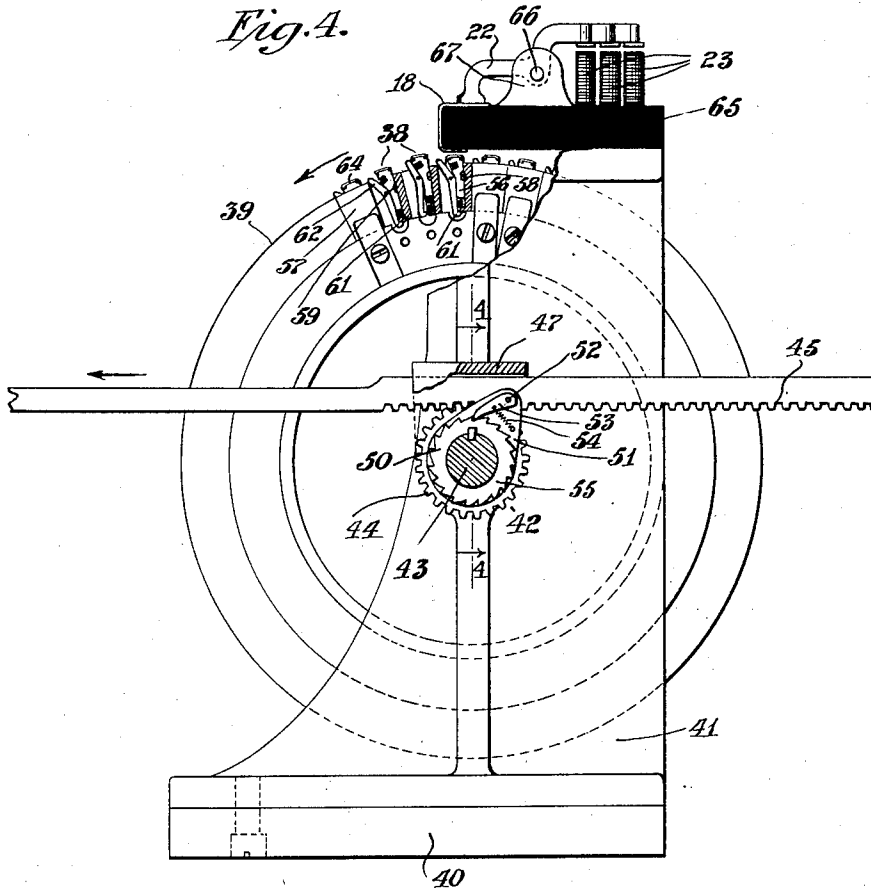
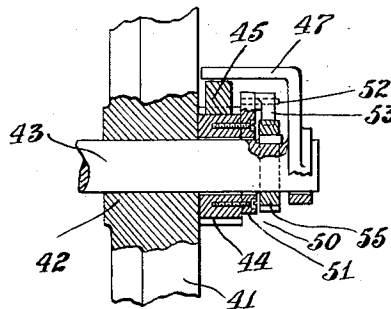


Fig. 5.



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3 Sheets-Sheet 3

Fig. 6.

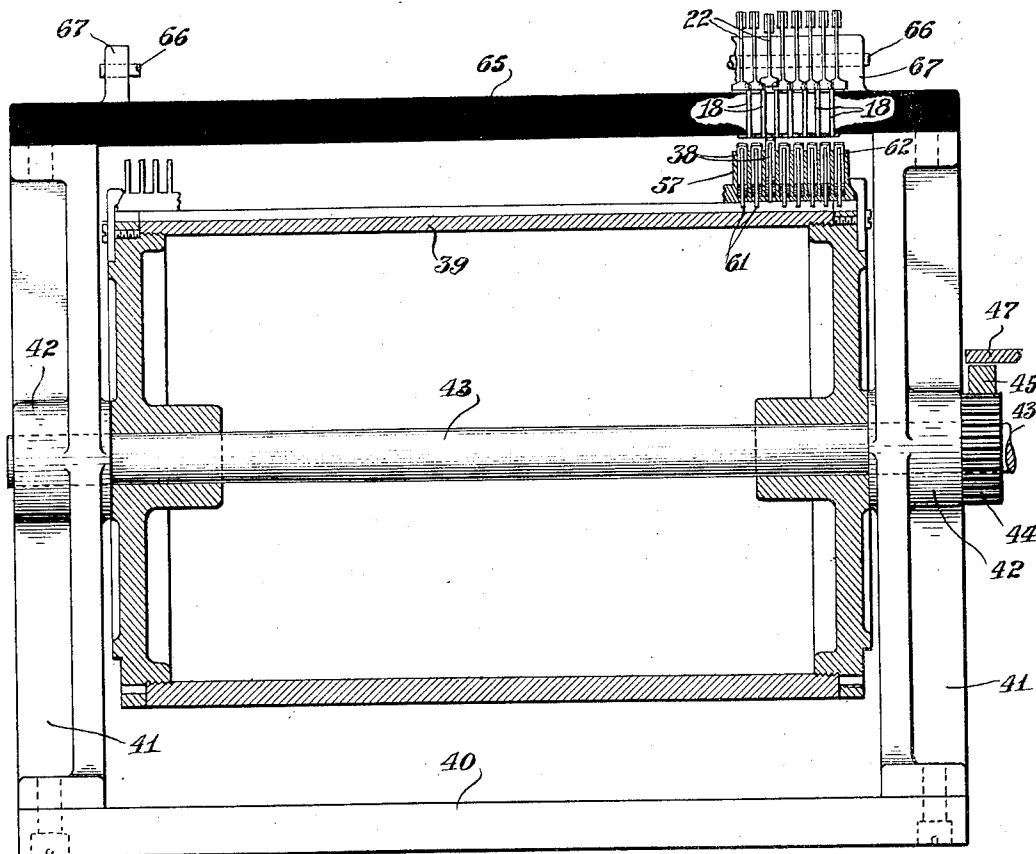


Fig. 8.

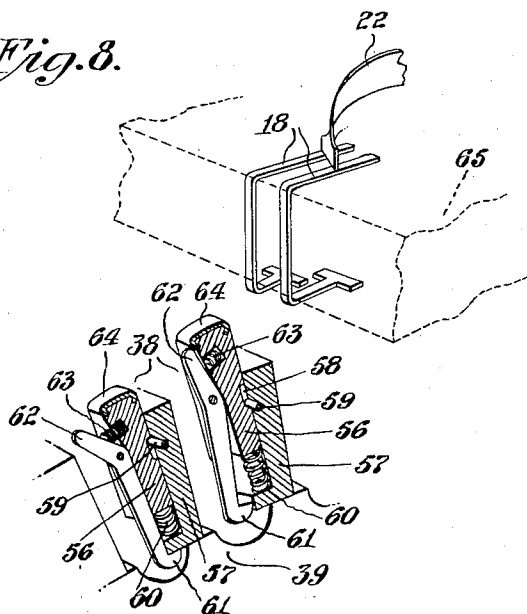
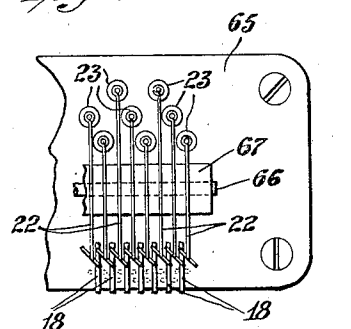


Fig. 7.



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UNITED STATES PATENT OFFICE.

MORTON WADDELL, OF NEW YORK, AND MORRIS KATCHER, OF BROOKLYN, NEW YORK.
STOP-CHECK-ANNOUNCING DEVICE FOR ADDING MACHINES.

Application filed April 10, 1925. Serial No. 22,065.

To all whom it may concern:

Be it known that we, MORTON WADDELL and MORRIS KATCHER, citizens of the United States of America, residing at city, county, and State of New York, and Brooklyn, county of Kings, and State of New York, respectively, have invented new and useful Improvements in Stop-Check-Announcing Devices for Adding Machines, of which the following is a specification.

This invention relates to an automatic stop-check announcer for use in banks and other establishments where large numbers of checks are handled and their amounts tabulated on adding machines, and where it is necessary during such tabulation to call attention of an adding machine operator to the presence of a stop-check.

The principal object of our invention is to provide a stop-check announcer of the character hereinafter described which forms a complete mechanism in itself and which may be operatively connected to substantially any standard type of adding machine.

The invention is illustratively exemplified in the accompanying drawings, in which Figure 1 is a side elevational view of an adding machine with our improved automatic stop-check announcer operatively connected thereto; Figure 2 is a diagrammatic view of the electrical connections and parts of the invention; Figure 3 is a perspective view of a section of the drum, brush contactors and selectors operatively connected thereto; Figure 4 is an end elevational view of the stop-check announcer; Figure 5 is an enlarged detail sectional view of the bearing and drive mechanism of the selecting drum; Figure 6 is a substantially longitudinal sectional view of the drum; Figure 7 is a plan view of one end of the mechanism showing a series of electrically operated selectors; and Figure 8 is an enlarged detail perspective view, partly in section showing the construction of the adjustable brush connections.

Referring to the drawings, and particularly to Figures 1 and 2, 10 designates an adding machine of the general type having a handle lever 11 and the usual tabulating keys 12 arranged in banks of nine each. Each key is provided with electrical contacting points, which comprise a pair of spaced spring fingers 13 and 13' carried by a block of insulating material beneath the key. The shank of each key is extended to

form a knife arrangement 14, movable upon depression of the key, into contact with both spring fingers 13 and 13'.

In the signal system an electrical contact segment 15 is mounted concentrically with respect to the axis of the handle lever 11 and disposed to make contact with the latter during the entire downward action thereof to operate the adding machine.

The signal circuit in addition to the segment 15 comprises a wire 16 between the segment 15 and one terminal of a battery 17, the other terminal of the latter being wired to one of a series of contact shoes 18. There is one shoe 18 for each key 12 and at opposite ends of the series a wire connection 19 is made with a contact point 20, which is disposed on the handle and arranged to contact with the segment 15, the connection 19 including a lamp 21 or any other suitable electrically operated annunciator.

The contact shoes 18 are substantially U-shaped members arranged side by side and are electrically connected in groups of ten, i. e., one shoe for each key of a bank and one extra one which represents the zero character not appearing in the adding machine key board. One parallel set of free ends of the digit shoes 18 are normally electrically connected together by a series of pivoted members 22, which operate to open the signal circuit when the corresponding keys of the adding machine are depressed, and which are controlled by electro-magnets 23. The zero shoe, designated 24, in each group normally places a gap in the signal circuit because the pivoted contact member 25 co-operating therewith is normally raised so that the connection is broken between the zero shoe 24 and the ninth digit shoe 18. The contact member 25 is yieldably supported in raised position by a spring connection and drawn downwardly to close the signal circuit by means of an electromagnet 27.

The connection between each magnet 23 and its corresponding key 12 consists of one wire 28 connecting one terminal, the magnet with the knife portion 14 of the key 12 and a second wire 29 connecting the finger 13' with a bus wire 30, which in turn is connected to one terminal of a battery 31. From the other terminal of the battery 31 a bus wire 32 connects with the other terminal of each magnet 23 through

wire connections 33. In order to close the gap in the signal circuit caused by the normally raised contact member 25, when any key of its group is depressed, the magnet 27 is connected at one terminal to the bus wire 32 by a wire connection 34 and at the other terminal by a second wire connection 35 to a bus wire 36 which is tapped by wire connections 37 to each finger 13.

The other set of free ends of the contact shoes 18 comprises T-shaped projections arranged in the path of selector segments disposed in longitudinal rows around the surface of a rotatable drum 39, making one complete revolution for each depression of the handle lever 11. The segments 38 are adjustable into and out of the path of the T-shaped projections, so that as the drum revolves the segments which are projected will close the sections of the circuit coming under their influence, as herein-after described in detail.

From the foregoing it will be clear that there are two distinct circuits in the present invention, one operating the signal device and the other connected to the pivoted members 22 and 25 to open and close gaps in the signal circuit. For each tabulation made on the adding machine 10 the corresponding member 22 will be operated so as to open the necessary number of gaps in the signal circuit. In order to avoid the possibility of false alarms, which would result if no zero places were provided, each group of digits in a bank are isolated from adjacent groups by the zero shoes 24 and raised pivoted member 25. As described, the electromagnet 27 controlling the lever contact member 25 bridging the zero gap is so connected with the digit circuits of its group that whenever a key corresponding to one of these digits is depressed, the electromagnet 27 repels the lever contact member 25 and it closes the zero gap, thereby completing the signal circuit in so far as its particular group is concerned. If, however, none of the digits in this particular group is operated, resulting in a zero on the adding machine tabulation, the zero gap remains open. Therefore, the signal circuit cannot be completed unless there is a zero on the stop check corresponding to the gap, in which case the selector segment 38 of a row on the drum 39 will be raised to close the said gap. So far the arrangement will take care of all the zero positions to the right of the first figure on the stop check.

In order to complete the circuit, it is also necessary to close the zero gaps to the left of the first digit on the stop check, and for this reason every zero position on the selector drum 39 to the left of the first digit of the stop check must be raised so as to close the corresponding zero gaps, which remain inactive because none of the digits in

the respective banks on the keyboard of the adding machine are depressed.

It will be clear that each key controls directly two magnetic circuits, one thereof being used to actuate the lever members 22 to break the signal circuit, and the other circuit cooperating with the first circuit to close the zero gap, normally open in the same signal circuit.

From the foregoing it will be clear that there are two distinct independent circuits in the present invention, one operating the signal device and the other just described, which comprises two magnetic circuits, which control the operation of the pivoted members 22 and 25 to open and close gaps in the signal circuit. For each tabulation made on the adding machine 10 the corresponding members 22 will be operated, so as to open the necessary number of gaps in the signal circuit, and simultaneous therewith the zero members 25 in the groups having depressed digit keys will be raised. The drum 39 is then rotated by operation of the adding machine handle and if the adjusted segments or selectors 38, representing the amount of the stop-check, register with the gaps in the signal circuit, the latter will be completed and the announcer operated to call the operator's attention to the presence of the stop-check. It is believed that the elements described in the foregoing will suffice to give a full understanding of the invention, it being possible of course to arrange these elements in several designs, but for the purpose of illustration we have shown only one design embodying the various features of our invention.

The automatic stop check announcer, illustrated particularly in Figures 3 to 8, inclusive, comprises a base plate 40, upright end standards 41 mounted adjacent the ends of the plate 40 and having suitable bearings 42 to receive a shaft 43 upon which the drum 39 is keyed. At one end of the machine the shaft 43 projects through its bearing and carries a pinion 44 which is constantly in mesh with the teeth of a rack 45, and which may be rotated by longitudinal movement of the latter through a guide piece 47 loosely carried on the end of the shaft 43. One end of the rack 45 is provided with an eye 48 (Figure 1) adapted to pivot about a pin 49 projecting from the hand lever 11 of the adding machine 10. In order that the drum 39 may rotate only in one direction a pawl and ratchet device 50 is carried by the pinion 44 and comprises a plate 51 attached to the face of the pinion 44 and having a projecting pin 52 upon which is mounted a pawl 53 held in effective position by means of a spring 54. The pawl 53 engages the teeth of a toothed wheel 55 which is keyed to the shaft 43 and which rotates with the latter to effect movement of

the drum in a counter clockwise direction, but which will rotate in the opposite direction without moving the drum.

As stated, the drum carries the segments 38 which are arranged in series of rows disposed axially of the drum and about the periphery thereof to operate in connection with the T-shaped ends of the contact shoes 18. Each of these rows contains a number of segments 38 corresponding to the keys on the adding machine, and in addition thereto a zero segment 38' is provided for each zero place in a group or bank. Each segment 38 and 38' comprises a radially disposed member 56 supported in a comblike bar piece 57, which is attached to the drum at opposite ends. The segment further comprises a member having an elongated slot 58 in one edge to receive a fixed pin 59 projecting from one of the teeth of the bar 57. This construction enables the member 56 to be raised or projected outwardly from the periphery of the drum. A spring seat 60 is provided for the inner end of the member 56 whereby the normal tendency is to raise the latter. The member 56 is held in depressed position by means of a pivoted latch arrangement comprising a lever having a hook 61 at the inner end to engage under the bar 57, as illustrated clearly in Figure 8. The latch is pivoted to the member 56 and above the pivot the arm portion 62 is disposed at an angle away from the adjacent edge of the member 56, so as to enable the latter to swing inwardly to release the hook 61. The normal tendency of the latch is to yieldably engage the hook under the bar 57 and for this purpose a spring 63 is carried in an opening in the segment the outer end of the spring being adapted to yieldably press outwardly the offset arm 62. When it is desired to set up the drum to signal certain combinations of numbers corresponding to the amount of the stop check it is merely necessary to press the arm 62 towards the body of the segment which will project outwardly upon release of the hook 61. In order to insure perfect electrical contact between the adjacent T-shaped ends of the shoes 18 and 24, the outer surface or end of the member 56 is provided with a shoe 64 of copper or aluminum. It will be clear of course that the number of segments to a row and the number rows may be varied depending upon the maximum amount of the checks to be stopped, i. e. if the maximum check to be stopped is \$9999.99 the number of segments will be 6×10 or 60.

The contact shoes 18 and 24 are supported above the drum upon an insulating bridge piece 65 which is attached at its opposite ends to the upper edges of the standards 41, as illustrated in Figure 6. Since these shoes 18 and 24 are electrically insulated

from each other it is necessary to induce current to flow from one to the other during operation of the machine and for this purpose the pivoted members or levers 22 are normally held in contact with two adjacent shoes 18. The circuit in this connection is not closed however because the levers 25 are not lowered to connect the zero shoe 24 with the 9th digit shoe 18 of the succeeding bank until a digit key of the same bank is operated. As stated, the levers 22 are pivoted midway of their length on a common pivot pin 66 projecting between standards 67 carried by the bridge piece 65, while the levers 25 are pivoted on standards 25' disposed rearwardly of the magnet 27 and provided with slots to receive the pin 66. It has been explained that the levers are operated by magnets 23 and 27, one thereof for each key in a bank of the adding machine and one for the zero place of each bank, so that as any key is depressed a circuit will be closed and the corresponding lever will break contact with its respective shoes 18 to form a gap and simultaneously therewith the second circuit will be closed to drop the lever 25 and close the connection. The shoes 18 in normal position form a continuous electrical circuit except the zero gaps for one gap which is bridged electrically by the movement of the adding machine handle 11 to form contact with the segment plate 15. Thus when the tabulation is made by depressing several keys, a corresponding number of gaps are opened and closed in the circuit which is thereby broken at predetermined places. Under the bridge the adjacent elements are so arranged that when one of the drum segments 25 is raised, it bridges the gap between the two shoes 18 or between a latter shoe and a zero shoe 24 and completes the circuit. It will be clear then, that when the operator pushes down certain keys, a series of gaps is produced and should it so happen that corresponding segments in the rows are raised, all the gaps would close and the circuit completed to give the signal. The number of stop-checks possible to record on a single cylinder is only limited by the number of rows of segments possible to dispose about the periphery.

Briefly stated the present invention virtually comprises a drum carrying a series of selectors which may be adjusted to give certain combinations corresponding to the total amounts of the stop checks. A second set of elements operatively associated with the first, to normally form a closed electrical circuit which may be open and closed at uniform distances by operating the keys of an adding machine. If the gaps formed by these breaks correspond with any one of the selected combinations on the drum, then as the latter moves, the set selectors comprising

the stop check combination and the necessary raised zero selectors to the left of the first digit, disposed in the path of the second set of elements, the latter will close the gaps and complete a circuit in which a signal is included.

What we claim is:—

1. The combination of an adding machine and a stop-check announcer, and means connecting the two devices to cause the announcer to respond to the key action obtained for each operation of the adding machine.

2. In combination with a key operated adding machine, a stop-check announcer, of means connecting said keys to the stop-check announcer, and means for effecting a signal in said announcer when certain combinations of keys are operated.

3. In combination with a key operated adding machine, a stop-check announcer, of electrical connecting means between said keys and the announcer, and electrical signalling means operatively associated with said announcer to respond through the latter to certain combinations of depressed keys.

4. In a stop-check announcer for adding machines, the combination of an electric signalling circuit, key operated means for making and breaking the circuit, and movable circuit closing means for closing certain breaks in the circuit caused by operation of said first means.

5. A signalling circuit for a stop-check announcer, comprising an operating open circuit, electric controlled circuit breakers disposed in said signalling circuit, and selector electric circuit closing means for closing selected breaks caused by operation of the circuit breakers.

6. In a stop-check announcer for adding machines, the combination of an electric signalling circuit, comprising spaced contact members, key operated means normally in and out of contact with said members to control the circuit between the latter members, and selector contact means movable into contact with said spaced members to close the circuit between the said member when the corresponding key operated means is operated to break the circuit between certain members.

7. In a stop-check announcer for adding machines, the combination of an electric signalling circuit, comprising spaced contact members corresponding to the keys of the adding machine, said members being connected in groups of ten for each nine keys of the adding machine, the extra member being the zero member while the other nine are the digit members, a circuit closer disposed in said signalling circuit and operatively connected with the handle of the adding machine, electrical circuit closing

members arranged to normally close the gap between said digit members and other closing members to normally open the circuit at the zero members, electric means affected by operation of the keys of said adding machine to operate the closer digit members and the closer zero members of the same group to make and break the circuit between the corresponding contact members, and a rotating member having series of digit and zero contact members in operative relation to said spaced contact members, whereby gaps in the signalling circuit caused by the closing members may be closed by the corresponding selector members to effect a signal.

8. In a stop-check announcer for adding machines, the combination of an electric signalling circuit, comprising spaced U-shaped contact members arranged in groups of ten and adapted to correspond to the nine digit keys in a group on the adding machine, means for closing and opening the circuit at a remote point when the adding machine is operated, pivoted digit circuit closing members for each adding machine key and arranged to normally contact one arm of each of two adjacent U-shaped contact members of a group, intermediate zero circuit closing members for each group normally open to break the circuit between groups of digit contact members, means for simultaneously operating a digit closing member and the zero closing member of the same group by operating a digit key of said adding machine, and means having adjustable contact brushes to engage the U-shaped contact members to close the signalling circuit.

9. In a stop-check announcer, the combination of a plurality of spaced contact members arranged in an electric signalling system, and a rotating drum having series of rows of contact adjustable selectors adapted to close the gaps between said contact members.

10. In a stop check announcer, the combination of a plurality of spaced contact members arranged in an electric signalling system, and a rotating drum having series of rows of contact selectors, each thereof comprising a resiliently supported contact shoe, capable of bridging the gap between adjacent contact members, and means carried by each shoe to lock the latter in depressed position against its resilient support.

11. In a stop check announcer for adding machines, the combination of a plurality of spaced U-shaped contact members arranged in an electric signalling system, one arm of each member being T-shaped, the cross bar thereof being disposed to overlap in the same plane the adjacent cross bar of another arm, a rocker arm having a portion to bridge and form a contact between two adjacent straight arms of U-shaped contact

members, independent electrical means operated by each key of the adding machine for moving the rocker arm and making and breaking the circuit of the signalling system, and moving selected contact shoes adapted to connect electrically certain adjacent T-shaped arms to close gaps formed by operation of corresponding keys and rocker arms to break the circuit.

12. In a stop-check announcer, the combination of a plurality of key operated alined electric make and break units for an electric signalling system, a rotating drum having series of rows of recesses disposed longitudinally of its axis, and a plurality of adjustable selector contact shoes arranged in rows in each recess and adapted to cooperate with the make and break units whereby certain gaps formed in the signalling system may be closed to effect a signal.

13. A series of selectors, a plurality of spaced elements disposed on a signal circuit and operatively associated with said selectors, and key operated means connected with said elements to break the circuit at selected stations whereby contact of certain selectors with said elements at the station will close the circuit.

14. A series of selectors, a plurality of spaced elements disposed in a signal circuit and arranged in groups of ten each, one thereof for the zero character accompanying each nine digits, said elements being operatively associated with said selectors, and key operated means associated with said elements to break the circuit at selected stations and to simultaneously operate to close the zero station in the same group with a break, whereby contact of certain selectors with said elements at the open stations will close the signal circuit.

15. In a stop-check announcer, the combination with a plurality of spaced elements

disposed in a signal circuit and arranged in groups of ten each, one thereof for the zero place accompanying nine digit places, pivoted rocker contact levers normally closing the circuit between digit elements, and a pivoted contact lever for each zero element normally not in contact with the zero element and its adjacent digit element of the same group, magnetic controlling means for operating each lever, and an electric circuit between each key and its corresponding magnetic controlling means for simultaneously operating the digit lever and zero lever in the same group.

16. In a signalling circuit of the character described, a plurality of switches, magnetic circuit controlling elements therefor, said elements being arranged in groups and comprising one element for each switch and one element extra for each group, and electrical connections between the switches and the elements to operate the extra element in each group simultaneously with the operation of any other element of the same group.

17. In a signalling circuit of the character described, a plurality of key operated switches, separate magnetic circuit controlling elements therefor, said elements being arranged in groups, and comprising one normally closed element for each switch and one normally open element for each group, and separate electrical connections between the switches and the normally closed elements and between the switches and the normally open element of each group to simultaneously operate the normally open element with the operation of any normally closed element of the same group.

In testimony whereof we affix our signatures.

MORTON WADDELL.
MORRIS KATCHER.