Aug. 13, 1957 W. B. KARKOW, JR 2,802,914

SWITCH OPERATING MECHANISM

Filed Sept. 28, 1955 2 Sheets-Sheet 1

FIG. 1.

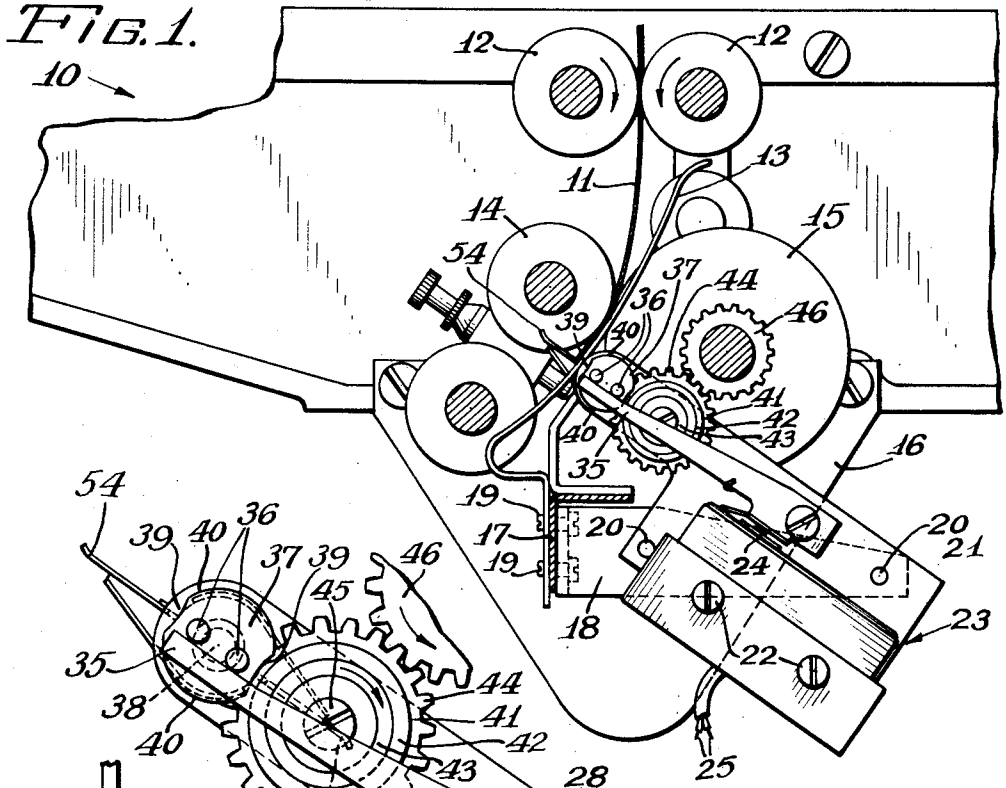
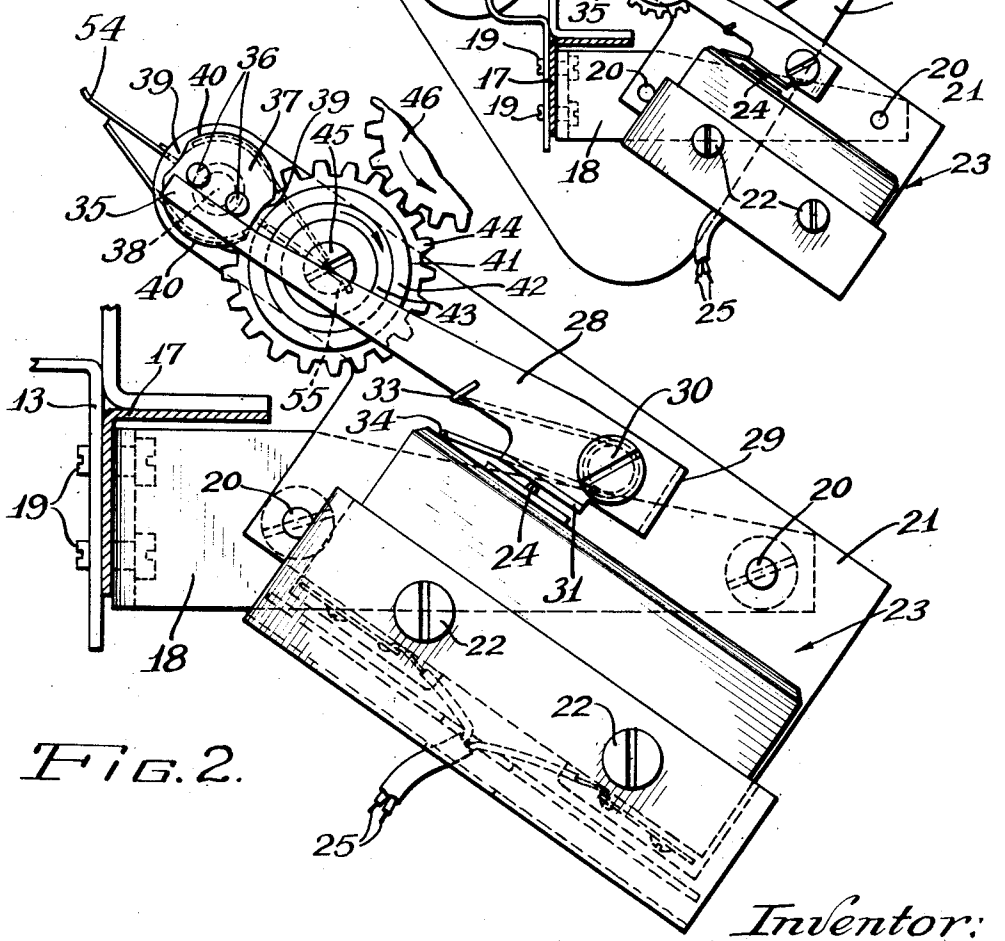


FIG. 2.



Inventor:
Waldemar B. Karkow Jr.
By Robert F. Miehle Atty.

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FIG. 3.

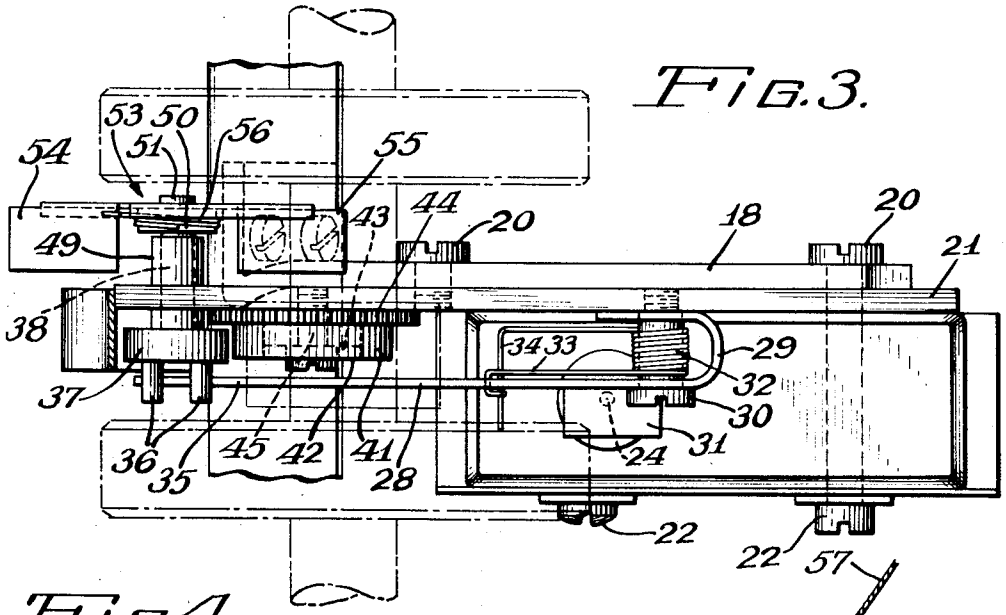


FIG. 4.

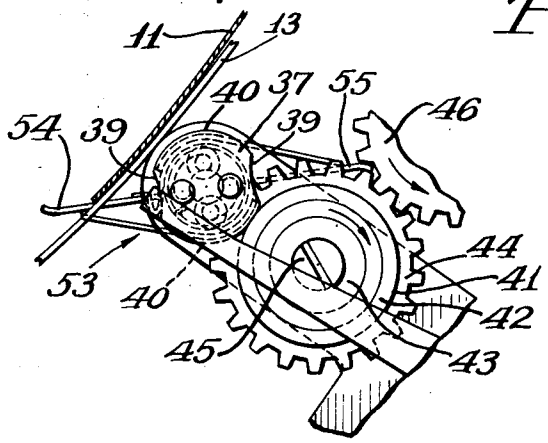


FIG. 5.

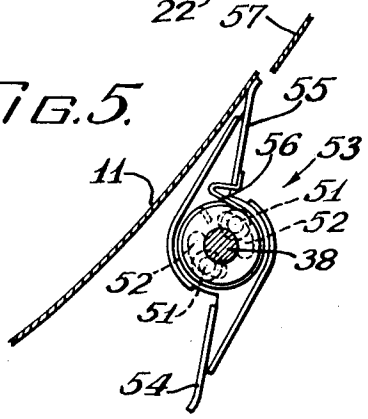


FIG. 6.

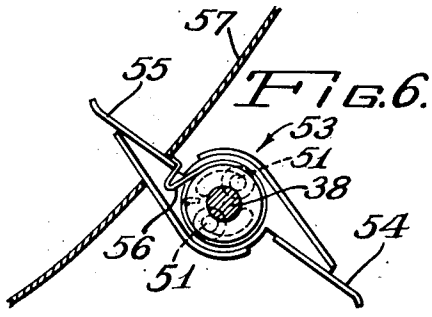
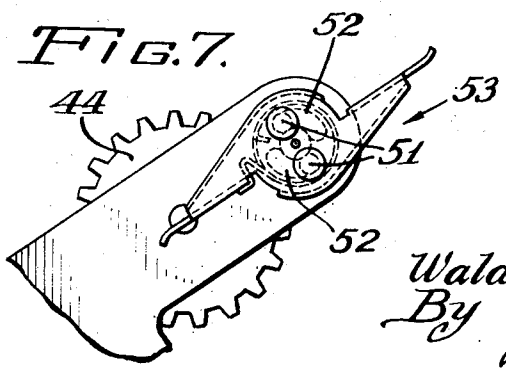


FIG. 7.



Inventor:
Waldemar B. Karkow Jr.
By
Robert F. Medler Atty.

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SWITCH OPERATING MECHANISM

Waldemar B. Karkow, Jr., Wilmette, Ill., assignor to Bell & Howell Company, Chicago, Ill., a corporation of Illinois

Application September 28, 1955, Serial No. 537,254

8 Claims. (Cl. 200—61.41)

This invention relates, generally, to switch operating mechanism and it has particular relation to mechanisms for operating switches in response to the movement of a bank check or the like along a predetermined path for controlling the operation of a check endorsing machine, such as the check endorsing machine disclosed in my copending application Serial No. 540,114 filed October 12, 1955.

Among the objects of this invention are: To provide a switch operating mechanism in which the force required for operating the switch in response to the presence of a check is supplied by means independent of the check; to employ the check merely to trigger the switch operating mechanism after which the switch is operated from a separate source of power; to provide a lost motion connection between a flipper that is engaged by the check and the switch operating mechanism in order to permit limited independent operation thereof; and to provide an eccentric connection between a switch operator and a disc that is intermittently driven by the separate source of power

Other objects of this invention will, in part, be obvious, and in part appear hereinafter.

This invention is disclosed in the embodiment thereof shown in the accompanying drawings and it comprises the features of construction, combination of elements and arrangement of parts that will be exemplified in the construction hereinafter set forth and the scope of the application of which will be indicated in the appended claims.

For a more complete understanding of the nature and the scope of this invention reference can be had to the following detailed description, taken together with the accompanying drawings, in which:

Figure 1 is a view, in side elevation, of the switch operating mechanism of the present invention shown as being embodied in a check endorsing machine of the type as shown in the application above referred to;

Figure 2 is a view, in side elevation and at an enlarged scale, of the switch operating mechanism shown in Figure 1;

Figure 3 is a top plan view of the mechanism as shown in Figure 2;

Figure 4 is a view showing the interaction between a check and the flipper after the latter has been engaged and moved from the non-operated position;

Figure 5 shows another position of the flipper where it makes a second engagement with the same check shown in Figure 4;

Figure 6 is a view, similar to Figure 5, but showing the position of the flipper where it is operated upon by the next check; and

Figure 7 is a view of the flipper from the side opposite that shown in Figure 4 in order to illustrate more clearly the details of construction.

Referring now particularly to Figures 1, 2 and 3 of the drawings, it will be observed that the reference character **10** designates a part of a frame of a check endorsing machine of the type shown in the application above referred to. The check to be endorsed is shown at **11** and it

is fed downwardly between guide rollers **12** and along a guide strip **13** between a guide roller **14** and a large diameter guide roller **15** that is driven continuously by means not shown. A support plate **16** depends from the frame **10** and it carries a transversely extending angle bracket **17** to which an L-shaped bracket **18** is secured by screws **19**. The screws **19** also carry the lower end of the guide strip **13**.

Mounted by screws **20** on the L-shaped bracket **18** is a frame plate **21** which extends generally normal to the path of the bank check **11** as it is fed downwardly between the guide rollers **14** and **15** to be imprinted by a type roller in the machine as described more fully in the copending application above referred to. Mounted on the frame plate **21** by screws **22** is a pulse switch that is indicated, generally, at **23**. The switch **23** has a switch pin **24** projecting therefrom for operating its contacts from one position to the other. Conductors **25** are provided for connecting the contacts in a suitable control circuit as will be understood readily. It is conventional practice to provide a spring within the switch **23** which urges the switch pin **24** outwardly and to hold the contacts of the switch in a predetermined non-operated position.

In order to depress the switch pin **24** and operate the contacts of the switch **23** a second class lever **28**, constituting a switch operator, is provided. The lever **28** has a U-shaped end **29**, as shown in Figure 3, that is fulcrumed on a screw **30** which is carried by the frame plate **21**. An arm **31** formed integrally with the lever **28** overlies the switch pin **24** and serves to depress the same when the lever **28** is moved downwardly or in a counterclockwise direction. In addition to any upward biasing action that may be provided by the spring within the switch **23** further biasing action can be provided by a spring **32** the central portion of which is coiled about the screw **30** with one end **33** being hooked under the lever **28** and the other end **34** bearing against the upper surface of the switch **23**.

The force for moving the lever or switch operator **28** downwardly or in a counterclockwise direction is applied to the outer end **35** by one or the other of a pair of pins **36** that project laterally from a disc **37** which is fast on one end of a shaft **38** that is journaled in the frame plate **21**. The pins **36** constitute an eccentric connection to the outer end **35** of the lever **28** and are arranged to be operated intermittently by the presence of a check **11** through the mechanism to be described presently.

In order to permit intermittent operation of the disc **37** from a constantly driven member the diametrically opposite sides **39** of the disc **37** are slabbed off preferably providing a concave surface at each side. The circular portions **40** between the slabbed off sides **39** are arranged to have driving engagement with a non-slipping peripheral surface **41** of a ring **42** of rubber or the like that is carried by a drive wheel **43** which is located, as shown in Figure 3, in substantially the same plane as the disc **37**. The drive wheel **43** is fast on a gear wheel **44** that is freely rotatable about a screw shaft **45** carried by the frame plate **21**. As shown in Figures 1 and 2 of the drawings the gear wheel **44** meshes with a gear wheel **46** that rotates with the large diameter guide roller **15** which, it will be recalled, rotates continuously.

It will be noted that the pins **36** are aligned with the slabbed off sides **39** of the disc **37** and that, as long as one or the other of these slabbed off sides is juxtaposed to the ring **42** which rotates continuously, there is no driving engagement between the ring **42** and the disc **37**. However, as soon as the disc **37** is rotated slightly in a counterclockwise direction, the circular periphery **40** engages the ring **42** so that a driving connection is established to the disc **37** and it rotates through one half a revolution. The left hand pin **36** then depresses the outer

end 35 of the lever 28 to operate the switch 23 by depressing the switch pin 24.

The initial movement of the disc 37 is effected by the check 11 in a manner to be described now. It will be noted that the shaft 38 projects through a hub 49 carried by the frame plate 21 and that there is fast on its outer end an annular flange 50. Projecting laterally from the annular flange 50 are two headed pins 51 that are located on diametrically opposite sides of the axis of rotation of the flange 50 or of the shaft 38. The pins 51 project through arcuate slots 52 in the central portion of a flipper 53 which thereby is rockably mounted on the flange 50 and has relative lost motion with respect thereto. The flipper 53 is provided with diametrically oppositely extending wings 54 and 55 which, as shown in Figure 1, are arranged at their outer ends to intersect the path of the check 11 as it moves toward the endorsing position. A spring 56 is strained between the annular flange 50 and the flipper 53 and biases the latter in the direction in which the former is rotated.

In operation, a check 11 engages the wing 54, for example, as shown in Figure 4 and rotates the flipper 53 in a counterclockwise direction. This movement is transmitted to the disc 37 which rotates slightly to place one of the circular surfaces 40 in engagement with the non-slipping peripheral surface 41 of the ring 42 of rubber. Thereafter the disc 37 is driven by the ring 42 as described previously. Because of the lost motion connection provided by the arcuate slots 52, the movement of the disc 37 and of the annular flange 50 is somewhat independent of the movement of the flipper 53, the latter being somewhat slower. As the check 11 moves to the position shown in Figure 5, the flipper 53 continues to move until the other wing 55 engages the same check 11 and lifts the edge thereof slightly above the oncoming edge of the next check 57.

As shown in Figure 6 the continued rotation of the flipper 53 to complete a half revolution places the wing 55 underneath the advancing edge of the next check 57 where the foregoing cycle of operation is repeated.

As long as checks continue to be fed into engagement with the flipper 53, it rotates one half revolution for each check and effects the operation of the switch 23 once for each check.

Since certain changes can be made in the foregoing construction and different embodiments of the invention can be made without departing from the spirit and scope thereof, it is intended that all matter shown in the accompanying drawings and described hereinbefore shall be interpreted as illustrative and not in a limiting sense.

What is claimed as new is:

1. Mechanism for operating a switch in response to the movement of a check or the like comprising, in combination, support means adapted to be mounted along the path of the check and to have a switch stationarily mounted with respect thereto, a level fulcrumed on said support means, a shaft journaled on said support means transversely to said lever having fast on one end a disc having at least one slabbed off side and fast on the other end a flipper support, means operatively interconnecting said disc and lever, a drive wheel on said support means adapted to be continuously rotated and having peripheral driving surface interfitting with and spaced from said slabbed off side of said disc, and a flipper rockably mounted on said flipper support and having a lost motion connection therewith and adapted to intersect the path of the check to rotate said disc sufficiently to cause said drive wheel to operatively engage said disc whereby said lever is rocked and the switch is operated.

2. Mechanism for operating a switch in response to the movement of a check or the like comprising, in combination, support means adapted to be mounted along the path of the check and to have a switch stationarily mounted with respect thereto, a lever fulcrumed on said support means, a shaft journaled on said support means transversely to said lever having fast on one end a disc having at least one slabbed side and fast on the other end a flipper support, means operatively interconnecting said disc and lever, a drive wheel on said support means adapted to be continuously rotated and having a peripheral surface interfitting with and spaced from said slabbed off side of said disc, a flipper rockably mounted on said flipper support and having a lost motion connection therewith, a spring strained between said flipper support and said flipper and biasing the latter relative to the former in the direction of rotation of said flipper support, and diametrically opposite wings on said flipper with the path of their ends intersecting the path of the check to rotate said disc sufficiently to cause said drive wheel to operatively engage said disc whereby said lever is rocked and the switch is operated.

3. Mechanism for operating a switch in response to the movement of a check or the like comprising, in combination, support means adapted to be mounted along the path of the check and to have a switch stationarily mounted with respect thereto, a lever fulcrumed on said support means, a shaft journaled on said support means transversely to said lever having fast on one end a disc having slabbed off diametrically opposite sides and fast on the other end a flipper support, eccentric means operatively interconnecting said disc and lever, a drive wheel on said support means adapted to be continuously rotated and having a non-slipping peripheral surface interfitting with and spaced from the adjacent one of said slabbed off sides of said disc, and a flipper rockably mounted on said flipper support and having a lost motion connection therewith and adapted to intersect the path of the check to rotate said disc sufficiently to cause said drive wheel to operatively engage said disc whereby said lever is rocked and the switch is operated.

4. Mechanism for operating a switch in response to the movement of a check or the like comprising, in combination, support means adapted to be mounted along the path of the check and to have a switch stationarily mounted with respect thereto, a lever fulcrumed on said support means to swing in a plane normal to the path of the check, a shaft journaled on said support means transversely to said lever having fast on one end a disc having slabbed off diametrically opposite sides and fast on the other end a flipper support, eccentric means operatively interconnecting said disc and lever, a drive wheel on said support means adapted to be continuously rotated and having a non-slipping peripheral surface interfitting with and spaced from the adjacent one of said slabbed off sides of said disc, a flipper rockably mounted on said flipper support and having a lost motion connection therewith, a spring strained between said flipper support and said flipper and biasing the latter relative to the former in the direction of rotation of said flipper support, and diametrically opposite wings on said flipper with the path of their ends intersecting the path of the check to rotate said disc sufficiently to cause said drive wheel to operatively engage said disc whereby said lever is rocked and the switch is operated.

5. Mechanism for operating a switch in response to the movement of a check or the like comprising, in combination, a frame plate adapted to be mounted generally normal to the path of the check and to have a switch stationarily mounted with respect thereto, a second class operating lever fulcrumed on said frame plate to move in a vertical plane downwardly to operate said switch, a shaft journaled on said frame plate transversely to said lever, a disc fast on one end of said shaft having at least one slabbed off side, means projecting from said disc on opposite sides of its axis of rotation aligned with said slabbed off side and operatively engaging said lever, a drive wheel rotatably mounted on said frame plate adjacent said shaft and adapted to be driven continuously in the plane of said disc and having a peripheral surface

interfitting with said slabbed off side of said disc and spaced therefrom and freely rotatable with respect to said disc in such position, an annular flange fast on the other end of said shaft, a flipper rockably mounted on said flange about its axis of rotation and having a lost motion connection therewith and positioned to intersect the path of the check whereby when the check engages said flipper said disc is rotated to place the same in driving engagement with the said peripheral surface of said gear wheel resulting in said means on said disc moving said lever to operate said switch, said lost motion connection permitting said flipper to move conjointly with the check independently of said flange and disc and subsequently to engage the same check and move it slightly out of the path of the next check to be engaged thereby on the opposite side.

6. Mechanism for operating a switch in response to the movement of a check or the like comprising, in combination, a frame plate adapted to be mounted generally normal to the path of the check and to have a switch stationarily mounted with respect thereto, a second class operating lever fulcrumed on said frame plate to move in a vertical plane downwardly to operate said switch, a shaft journaled on said frame plate transversely to said lever, a disc fast on one end of said shaft having at least one slabbed off side, means projecting from said disc on opposite sides of its axis of rotation aligned with said slabbed off side and operatively engaging said lever, a gear wheel rotatably mounted on said frame plate adjacent said shaft and adapted to be driven continuously, a drive wheel fast on said gear wheel rotatable in the plane of said disc and having a non-slipping peripheral surface interfitting with said slabbed off side of said disc and spaced therefrom and freely rotatable with respect to said disc in such position, an annular flange fast on the other end of said shaft, a flipper rockably mounted on said flange about its axis of rotation and having a lost motion driving connection therewith, and wings projecting diametrically from said flipper with the path of the ends thereof intersecting the path of the check whereby when one of said wings is engaged by an edge of the check as the same moves therepast said disc is rotated to place the same in driving engagement with the said non-slipping surface accomplished by further rotation caused by said gear wheel resulting in said means on said disc moving said lever to operate said switch, said lost motion connection permitting said one wing to move conjointly with the check independently of said flange and disc and subsequently the other wing to engage the same check and move it slightly out of the path of the next check to be engaged thereby on the opposite side.

7. Mechanism for operating a switch in response to the movement of a check or the like comprising, in combination, a frame plate adapted to be mounted generally normal to the path of the check and to have a switch stationarily mounted with respect thereto, an upwardly biased second class operating lever fulcrumed on said frame plate to move in a vertical plane downwardly to operate said switch, a shaft journaled on said frame plate transversely to said lever, a disc fast on one end of said shaft having diametrically opposite slabbed off sides, a pair of pins projecting from said disc on opposite sides of its axis of rotation aligned with said slabbed off sides overlying said lever and restraining its upward movement, a gear wheel rotatably mounted on said frame plate adjacent said shaft and adapted to be driven continuously, a drive wheel fast on said gear wheel rotatable in the plane of said disc and having a non-slipping peripheral surface interfitting with the adjacent one of said slabbed off sides of said disc and spaced therefrom when said lever is engaged by both of said pins and freely rotatable with respect to said disc in such position, an annular flange fast on the other end of said shaft, a pair of pins projecting from said flange on opposite sides of its axis of rotation having a pair of arcuate slots on opposite sides of the last mentioned axis through which said pins on said flanges project, a spring reacting between said flange and said flipper to bias the latter relative to the former in the direction in which said flange is rotated, and wings projecting diametrically from said flipper with the path of the ends thereof intersecting the path of the check whereby when one of said wings is engaged by an edge of the check as the same moves therepast said disc is rotated to place the same in driving engagement with the said non-slipping surface accompanied by further rotation caused by said gear wheel resulting in one of the first mentioned pins moving said lever downwardly to operate said switch, said arcuate slots permitting said one wing to move conjointly with the check independently of said flange and disc and subsequently the other wing to engage the same check and move it slightly out of the path of the next check to be engaged thereby on the opposite side.

8. Mechanism for operating a switch in response to the movement of a check or the like comprising, in combination, a frame plate adapted to be mounted generally normal to the path of the check and to have a switch stationarily mounted with respect thereto, a second class operating lever fulcrumed on said frame plate to move in a vertical plane downwardly to operate said switch, spring means biasing said lever upwardly, a shaft journaled on said frame plate transversely to said lever, a disc fast on one end of said shaft having diametrically opposite slabbed off sides providing concave surfaces, a pair of pins projecting from said disc on opposite sides of its axis of rotation aligned with said slabbed off sides overlying said lever and restraining its upward movement under the influence of said spring, a gear wheel rotatably mounted on said frame plate adjacent said shaft and adapted to be driven continuously, a drive wheel fast on said gear wheel rotatable in the plane of said disc and having a non-slipping peripheral surface interfitting with the adjacent one of said slabbed off sides of said disc and spaced therefrom when said lever is engaged by both of said pins and freely rotatable with respect to said disc in such position, an annular flange fast on the other end of said shaft, a pair of pins projecting from said flange on opposite sides of its axis of rotation, a flipper rockably mounted on said flange about its axis of rotation having a pair of arcuate slots on opposite sides of the last mentioned axis through which said pins on said flange project, a spring reacting between said flange and said flipper to bias the latter relative to the former in the direction in which said flange is rotated, and wings projecting diametrically from said flipper with the path of the ends thereof intersecting the path of the check whereby when one of said wings is engaged by an edge of the check as the same moves therepast said disc is rotated to place the same in driving engagement with the said non-slipping surface accompanied by further rotation caused by said gear wheel resulting in one of the first mentioned pins moving said lever downwardly to operate said switch, said arcuate slots permitting said one wing to move conjointly with the check independently of said flange and disc and subsequently the other wing to engage the same check and move it slightly out of the path of the next check to be engaged thereby on the opposite side.

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