

July 4, 1933.

W. K. CABOT

1,916,255

ELECTRICAL CONTROL FOR CAN MAKING MACHINERY

Filed Sept. 8, 1930

3 Sheets-Sheet 1

Fig. 1

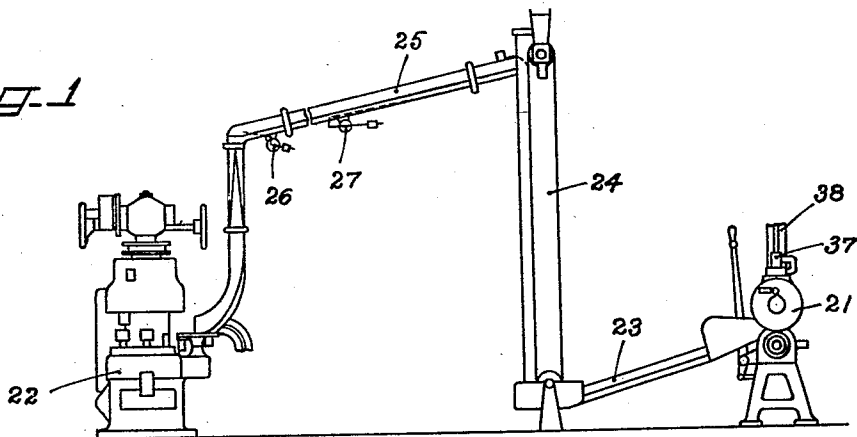


Fig. 2

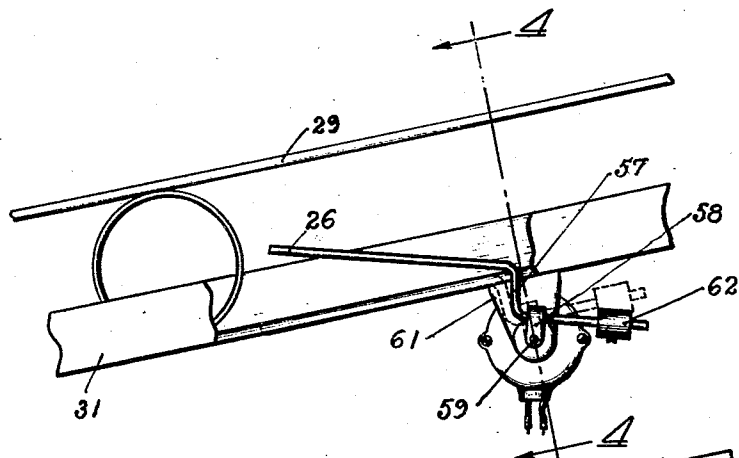
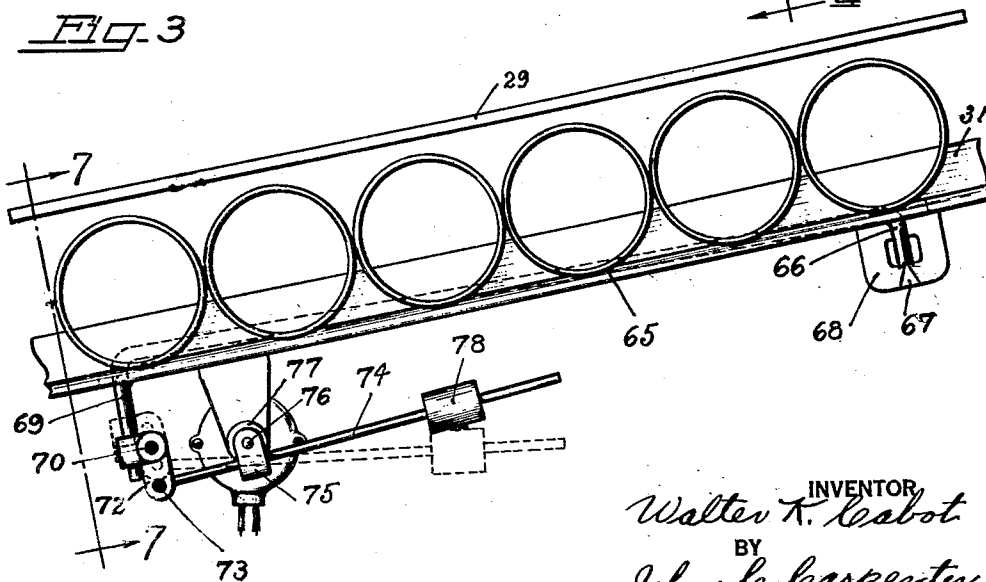


Fig. 3



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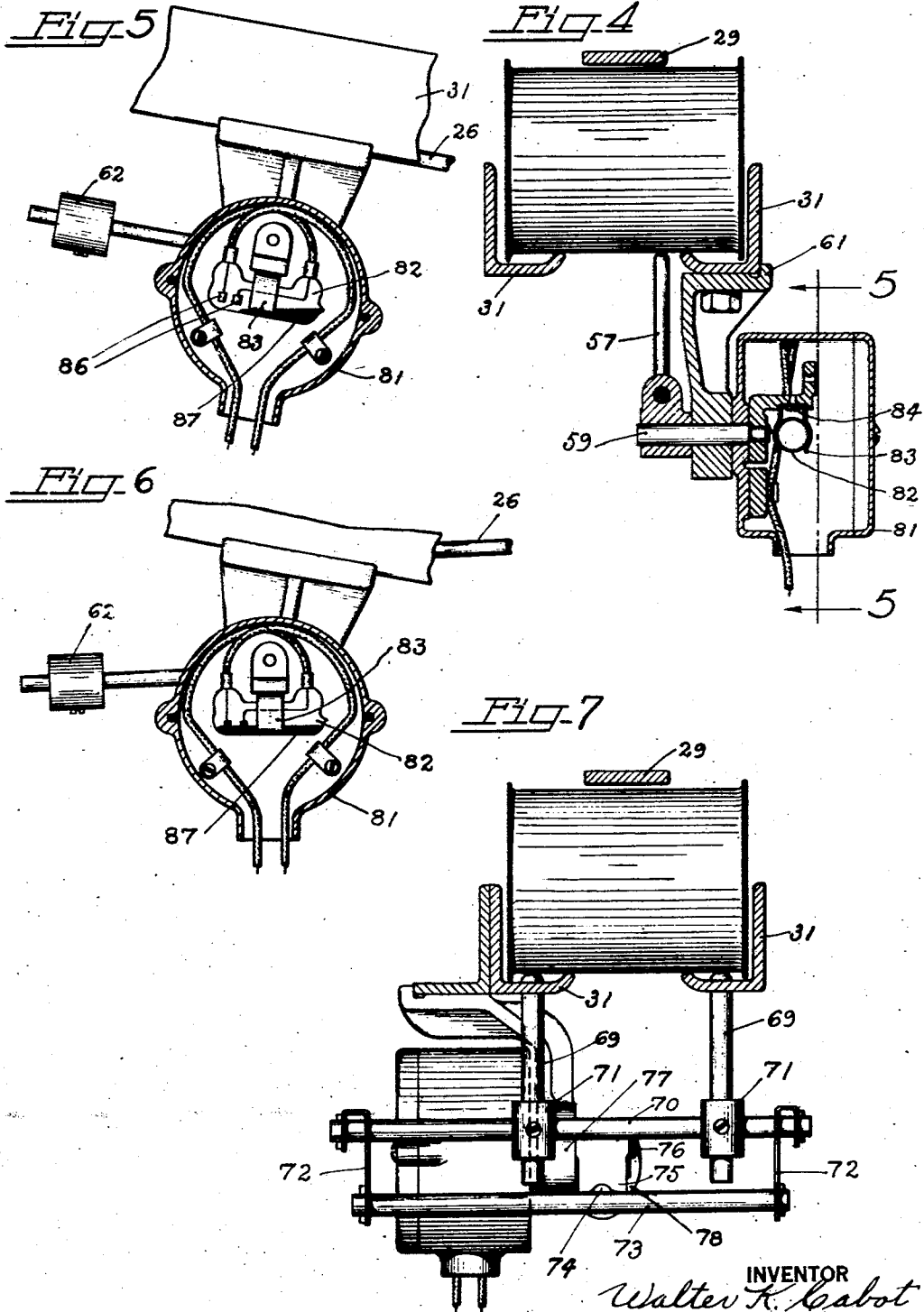
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Fig. 8

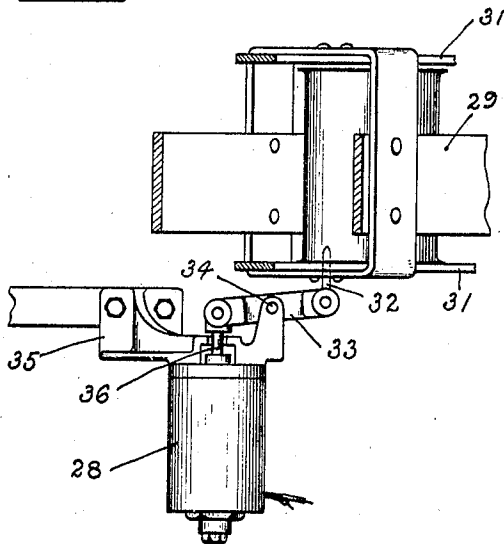


Fig. 10

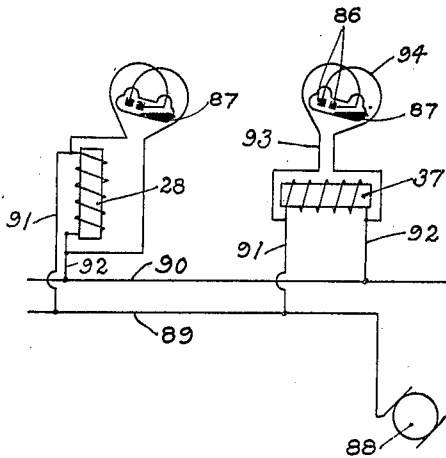
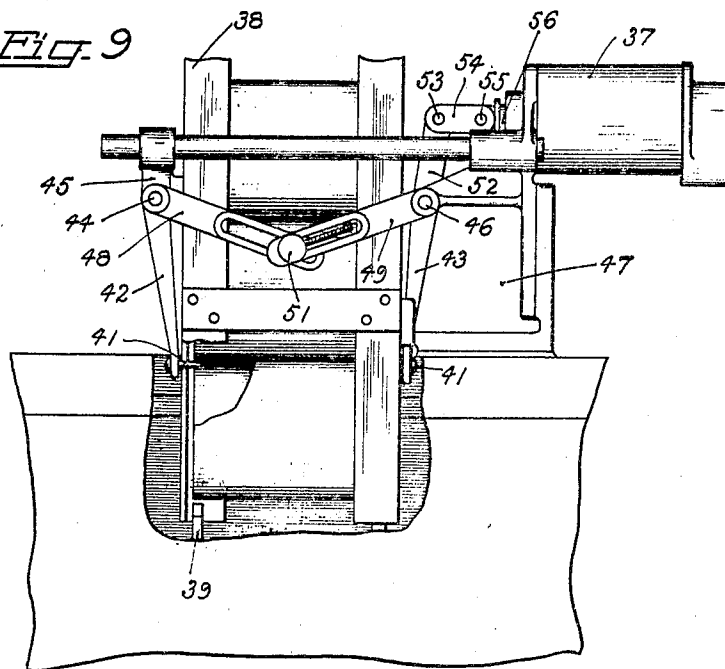


Fig. 9



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ELECTRICAL CONTROL FOR CAN MAKING MACHINERY

Application filed September 8, 1930. Serial No. 480,393.

This invention relates to an electrical control for can making machinery and the like, and has more particular reference to a control for governing feeding of cans to and from successively operating, closely synchronized can making units assembled together and inter-related in a unitary apparatus wherein the several units are connected by a transferring or conveying means, such, for example, as is shown and described and claimed in my co-pending application for Letters Patent of the United States, Serial No. 230,442 filed in the United States Patent Office November 2, 1927, now Patent 1,734,131 granted Dec. 9, 1930, for Improvements in can making machinery and apparatus.

A principal object of the present invention is the provision of an electric control for such a unitary apparatus, which will be fully automatic in its operation and which will be sensitive, certain, and rapid in its government of the operations of the several units upon the establishment of and termination of adverse conditions. As in my co-pending application I provide rocker or trip members that move in accordance with the weight of the can parts in the transfer or conveying system between the units as adverse conditions are created or removed in the operation of the apparatus.

My invention contemplates the provision of an electric control for the entire system, governed by switches preferably of the mercury type which move freely and substantially without friction of resistance with the rocker members or trips to accomplish speedy alteration of the control circuits.

Numerous other objects and advantages of the invention will be apparent as it is better understood from the following description, which, taken in connection with the accompanying drawings, discloses a preferred embodiment thereof.

Referring to drawings,

Figure 1 is a schematic view of so much line of can making machinery as is believed necessary to an understanding and showing of the present invention;

Figs. 2 and 3 are enlarged details of portions of a trackway forming a part of the

conveying and transfer system provided to move the cans from one operating unit to the next;

Fig. 4 is a section taken substantially upon the line 4—4 of Fig. 2;

Figs. 5 and 6 are sections taken upon the line 5—5 of Fig. 4, the parts being shown in the two positions they assume;

Fig. 7 is a section taken substantially upon the line 7—7 of Fig. 3;

Figs. 8 and 9 are detailed elevational views of devices influenced by the electric control to govern the feeding of can parts to the operating units; and

Fig. 10 is a wiring diagram showing schematically the electrical circuits.

For the purpose of illustrating my present invention I have shown schematically in Fig. 1 of the drawings, two can manufacturing units, indicated generally by reference characters 21 and 22, which are or may be, respectively, a flanger and a double seamer. The flanger receives tubular bodies from the body maker, and flanges each end outwardly for connection to the can ends by double seams. The flanged can bodies are received from the flanger down a chute 23, which delivers them to an elevator 24, in turn transferring them to an inclined trackway or guideway 25, down which they move to the double seamer 22, which in accordance with the usual practice supplies an end to one end of each body and seams it in place.

In the operation of the apparatus of which these flanging and double seaming units form parts, the operations of the several units are controlled by interruption of the feed of the can bodies or parts into them as adverse conditions occur in the line. For example,—it is not desired that the double seamer shall receive the can bodies for double seaming, unless, or except when, there is a storage of flanged bodies in the trackway 25 of predetermined amount. Accordingly, a rocker or trip member, generally indicated at 26, is arranged in the trackway at a predetermined distance away from the double seamer. This rocker or trip member 26 is held in position to permit feeding into the double seamer by backing up or accumulation

of the received can bodies to and beyond the trip member.

It is also contemplated that feeding of can bodies to the flanger will be interrupted when the surplus of bodies in the trackway reaches a maximum safe number, and a second trip or rocker member 27 is provided, which interrupts the feeding to the flanger when the accumulation of bodies and the resulting combined weight causes its depression.

The control is accomplished electrically, and each circuit is provided with an electro-magnet normally energized, which, as shown on the drawings in Figs. 8 and 9 retains can part restraining devices or trip out of action. Referring first to Fig. 8, reference character 28 indicates an electro-magnet suitably mounted adjacent a guideway 29 into the double seamer. The can bodies roll down a trackway 25, and at the double seamer are turned to an upright position and slide along a supporting plate 31. A pin 32 is arranged to be projected up into the interior of a can body when feeding to the double seamer is to be interrupted. The pin 32 is carried upon the end of a lever 33 pivoted at 34 in a bracket 35, which supports the electro-magnet. The lever 33 is also connected to the armature 36 of the magnet 28, and when current is flowing through this magnet, the armature or core is projected and the pin held retracted downwardly from the position shown in Fig. 8. When, however, the storage of can bodies behind the double seamer is insufficient to hold the rocker member or trip 26 depressed, the magnet 28 is de-energized and the pin 32 moved up within the presented can body, which holds it against advancement until the desired storage of can bodies in the trackway is accomplished.

Fig. 9 illustrates the mechanism provided to interrupt the feed to the flanger. This mechanism comprises a flanger magnet 37 mounted adjacent the delivery end of a conveying unit 38, transferring can bodies from a body maker to the flanger. The bodies are received into the flanger into turrets schematically shown at 39, and in horizontal position. Two pins 41 are provided upon two downwardly extending swinging arms 42 and 43. The arm 42 is fixed upon a shaft 44 carried in a bracket 45 at the left of the apparatus, viewing Fig. 9. The arm 43 is fixed upon a shaft 46 carried in a bracket 47 at the other side of the apparatus. Links 48 and 49 are fixed respectively on the shafts 44 and 46, and are connected at their free ends by a pin and slot connection 51. An arm 52 is fixed on the shaft 46 and extends up to a pivotal engagement 53 with a link 54, in turn pivoted at 55 to the end of an armature 56 of the magnet 37. The parts are shown in Fig. 9 in can restraining position in which the pins 41 are arranged within the presented can body, this being the position they assume

when and while there is a surplus of bodies in the trackway 25, causing them to accumulate beyond the trip or rocker member 27. Under normal running conditions the magnet 37 is energized and the armature arranged in a projected position. When thus projected the pins 41 are arranged out of the path of the cans presented to the turret, and feeding occurs.

The trip or rocker member 26 (Fig. 2) comprises a rod offset at 57. This rod is mounted in a clamp 58 fixed upon a rock shaft 59 having bearing in a bracket 61 extending down below the trackway 25. Beyond the clamp 58 the rod 26 is provided with a weight 62, which, when unrestricted, holds the opposite end of the rod 26 elevated above the bottom of the trackway, and in position to be depressed by a passing can body. There is normally a storage to and past the rod 26 and the rod is normally held depressed.

The construction and arrangement of the rocker or trip member 27 is shown in detail in Figs. 3 and 7. Two rods 65 are arranged in the bottom of the trackway 25. At the upper ends these rods are bent down, as indicated at 66, and rest on knife edges 67 carried in brackets 68 arranged beneath the trackway. The lower ends of the rods, i. e., the ends at the left in Fig. 3, extend downwardly at 69 and are embraced by clamps 71, mounted on a cross shaft 70, connected by links 72 with a cross rod or member 73. The cross rod or member 73 is provided with an arm 74 fixed in a clamp 75, in turn rigidly secured upon a rock shaft 76 in a bearing bracket 77 extending down beneath the trackway 25. A weight 78 is mounted upon the free end of the arm 74 and tends to hold the lower end of the rod 65 in an elevated position, the adjustment being such that single cans rolling down the trackway are without sufficient weight to depress the rod 65 and cause interruption of the flanger feed. When, however, cans accumulate in the runway so that a considerable number rest upon the rod 65, as illustrated in Fig. 3, the rod 65 is depressed, the weight 78 lifted, and the feed interrupted.

In accordance with the present invention, suitable electric controlling circuits are provided to de-energize respectively, the magnets 28 and 37 upon the creation of adverse conditions. Each of these electric circuits includes a gravity switch, which rocks in accordance with the rocking movement of the associated rocker or trip rod. These switches are preferably of the mercury type and comprise a suitable housing 81 fixed upon the associated rock shafts 59, 76. Each housing accordingly rocks or oscillates with the movement of the rocker member or trip 26, 27. A glass container 82 is secured in each housing by a clamp 83, in turn fixed to the housing at 84. A pair of contacts 86 are arranged in each container 82, and in position to be

engaged by a shifting body of mercury 87 when the parts have been moved to a switch closing position (as shown in Fig. 6). The quantity of mercury is such that when the parts are moved into their normal position, i. e., the position shown in Fig. 5, the mercury flows by gravity away from the contacts opening the switch.

Referring to Fig. 10 it will be noted that the electro-magnets 28 and 27 are normally supplied with current from a source of power generally indicated by reference character 88, which may conveniently be a generator. Two line wires 89 and 90 extend from the generator and to these the magnets are connected in parallel by wires 91 and 92. A shunt circuit which includes one of the gravity mercury switches just described is provided to de-energize each magnet upon the creation of adverse conditions and when the switch contacts 86 are closed through the body of mercury 87. This shunt circuit comprises a wire 93 leading from wire 91 to one of the contacts 86 and a wire 94 leading from the other contact 86 to the companion wire 92.

It will be manifest that upon movement of either of the rocker or trip members 26 or 27 from normal position, the associated mercury switch will be closed, and this without the need of bringing metal members into tightly engaged frictional contact. The action is sensitive and immediate.

It will be readily understood also that the flanger and double seamer are selected merely for the purpose of illustration, and that like control of other units of the apparatus is contemplated.

It is thought that the invention and many of its attendant advantages will be understood from the foregoing description, and it will be apparent that various changes may be made in the form, construction and arrangement of the parts without departing from the spirit and scope of the invention or sacrificing all of its material advantages, the form hereinbefore described being merely a preferred embodiment thereof.

I claim:

1. In an electrical control, the combination of a can feeding runway for can parts connecting with a can making machine, feeding control means associated with said machine for regulating the feeding of can parts thereto, an oscillating switch housing adjacent said runway and containing a liquid movable by gravity for making and breaking an electrical circuit connecting with said control means, and trip instrumentalities located in said runway and connecting with said switch housing whereby actuation thereof by can parts within said runway oscillates said switch housing and through said electrical circuit controls the feeding of can parts by said runway to said machine.

2. In an electrical control, the combina-

tion of a can feeding runway for can parts connecting with a can making machine, feeding control means associated with said machine for regulating the feeding of can parts thereto, an oscillating switch housing adjacent said runway, trip instrumentalities located in said runway and actuated by can parts therein for oscillating said switch housing, and a mercury switch movable with said housing and operating when in different positions to affect an electrical circuit connecting with said feeding control means and thereby regulate passage of can parts in said runway into said machine in accordance with runway conditions.

3. In an electrical control, the combination of a can feeding runway for can parts leading from one can making machine into a second machine, feeding control means associated with said second machine for regulating the feeding of can parts thereto, an oscillating switch housing adjacent said runway, trip instrumentalities located in said runway and actuated upon failure of maintenance of a predetermined number of can parts between it and said second machine, for oscillating said switch housing, and a mercury switch movable therewith, said mercury switch controlling an electrical circuit connected with said feeding control means whereby feeding of can parts in said runway and into said second machine from said runway is interrupted.

4. In an electrical control, the combination of a can feeding runway for can parts leading from one can making machine into a second machine, feeding control means associated with each of said machines for regulating the feeding of can parts thereto and therefrom, a pair of oscillating switch housings adjacent said runway, a pair of trip instrumentalities located in said runway, each instrumentality connecting with a said switch housing and receiving actuation from the passing can parts whereby a switch housing is oscillated and with it a mercury switch connecting with an electrical circuit leading through a said feeding control means, one of said instrumentalities operating upon accumulation of can parts in the runway to stop the feeding of can parts from said first machine, the other of said instrumentalities operating upon diminution of can parts in the runway to stop the feeding of can parts in said runway and into said second machine.

5. In an electrical control, the combination of a runway for can parts connecting two can making machines, feeding control means for regulating the feeding of cans through said machines, said means embodying a can part stop device associated with each machine, an electric magnet for normally holding each stop device out of can part engaging position, each magnet being connected with a normally closed electrical circuit for energiz-

- ing said magnet, and an instrumentality associated with each magnet circuit and located in said runway and actuated by said can parts to oscillate a switch housing carrying a mercury switch connected in a shunt circuit controlling one of said magnet circuits whereby the magnet is de-energized and the feeding of can parts into or from said machines is stopped.
6. In an apparatus for starting and stopping a can machine, the combination of a guideway for can parts connected with said machine, a movable element which is held in place by can parts in said guideway, a switch housing connected with said movable element and oscillatable thereby, electrical terminals in said housing, a fluid electrical conductor in the housing and movable into and out of position by the oscillation of the housing to electrically connect and disconnect said terminals, magnetic means to start and stop the feeding of can parts to said machine, and an electric circuit connecting said terminals with said magnetic means, whereby absence of can parts in said guideway will cause the oscillation of said housing, and presence of can parts in said guideway subsequently will cause the oscillation of said housing.
7. A guideway for can parts, having combined therewith a rockable part operated by an accumulation of can parts in said guideway and released in the absence of said parts, and a rockable electrical switch arranged in an electrical circuit and containing a fluid conductor, which is caused to flow with the rocking of said part of the guideway, a magnet in said circuit which is energized and de-energized by said switch, and means operated by said magnet to stop the feed of can parts from said guideway.

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