

Nov. 14, 1944.

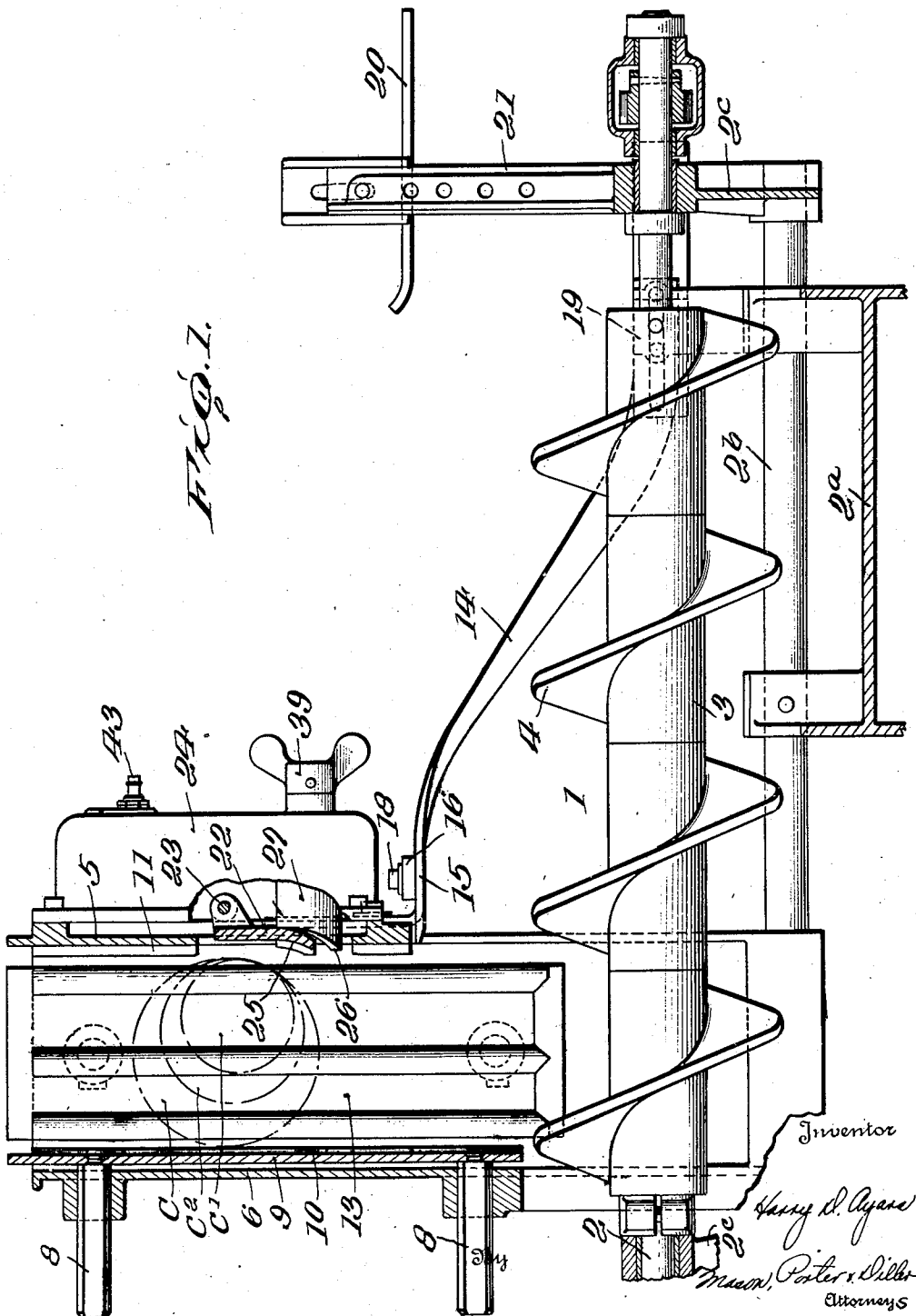
H. D. AYARS

2,362,792

STOP MECHANISM FOR CAN CONVEYERS

Filed Dec. 24, 1942

6 Sheets-Sheet 1



Nov. 14, 1944.

H. D. AYARS

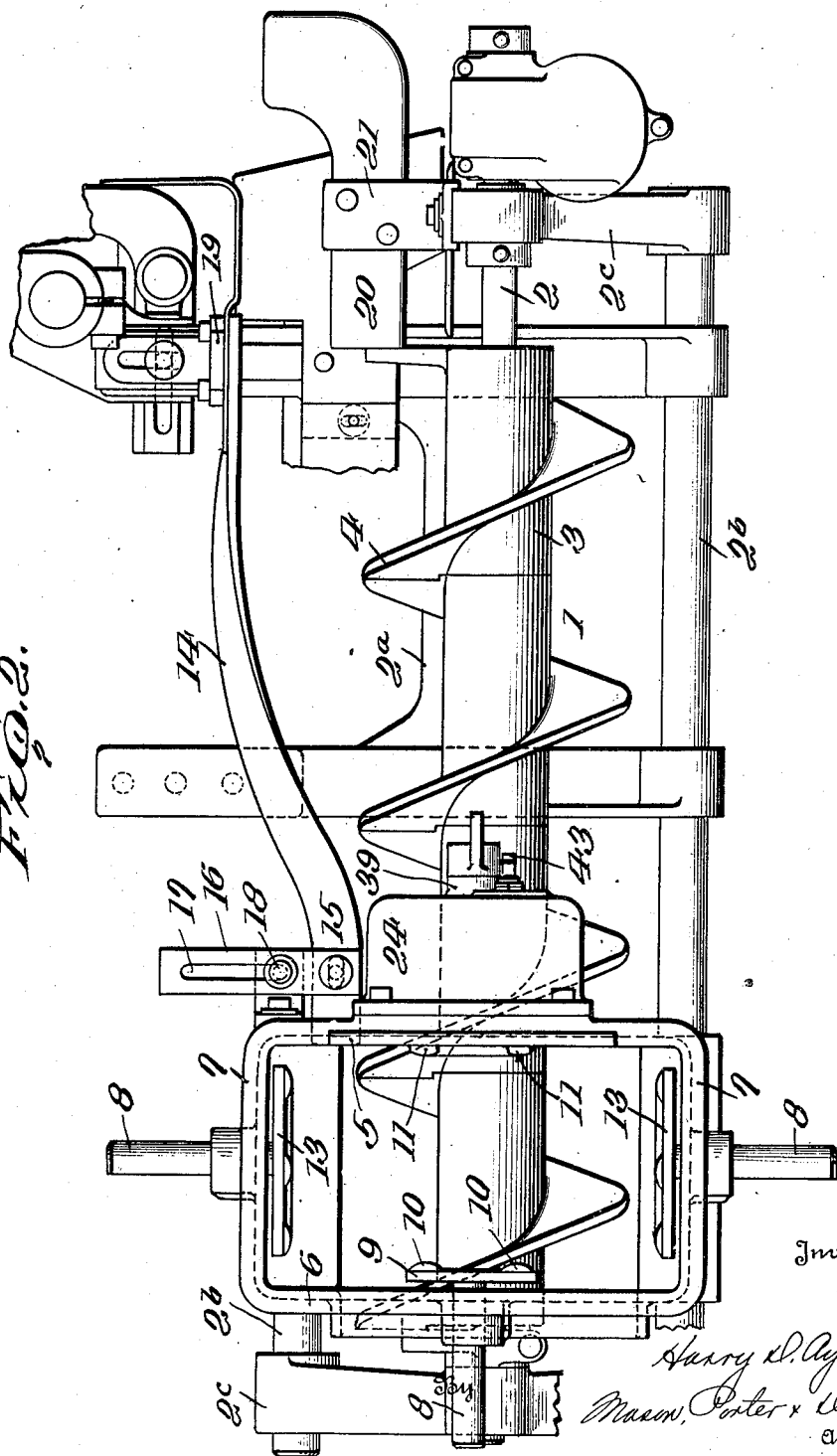
2,362,792

STOP MECHANISM FOR CAN CONVEYERS

Filed Dec. 24, 1942

6 Sheets-Sheet 2

FIG. 2.



Inventor

Harry D. Ayars
Maxon, Porter & Miller
Attorneys

Nov. 14, 1944.

H. D. AYARS

2,362,792

STOP MECHANISM FOR CAN CONVEYERS.

Filed Dec. 24, 1942

6 Sheets-Sheet 3

Attorneys

Nov. 14, 1944.

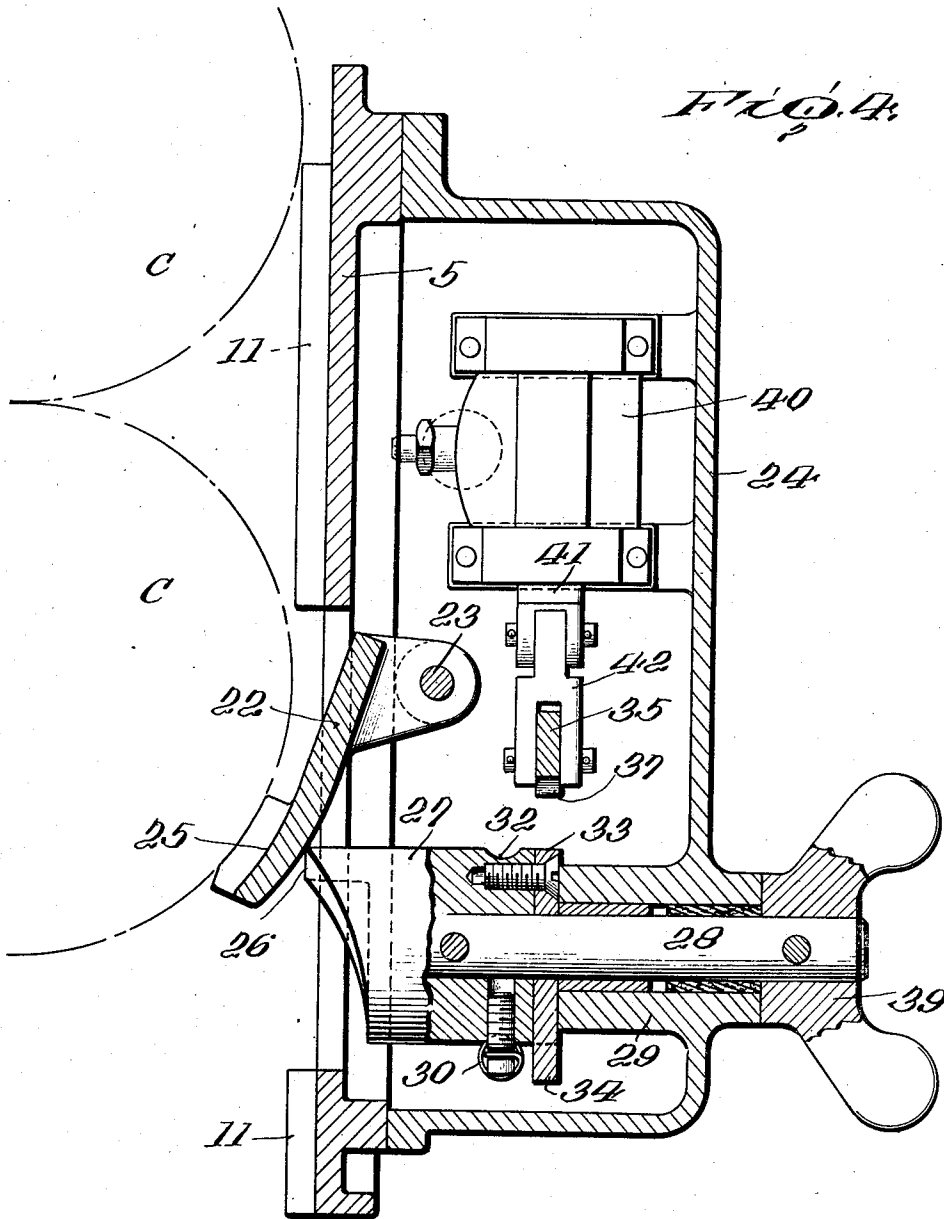
H. D. AYARS

2,362,792

STOP MECHANISM FOR CAN CONVEYERS

Filed Dec. 24, 1942

6 Sheets-Sheet 4



Inventor

Harry D. Ayars

By

Mason, Pater & Miller
Attorneys

Nov. 14, 1944.

H. D. AYARS

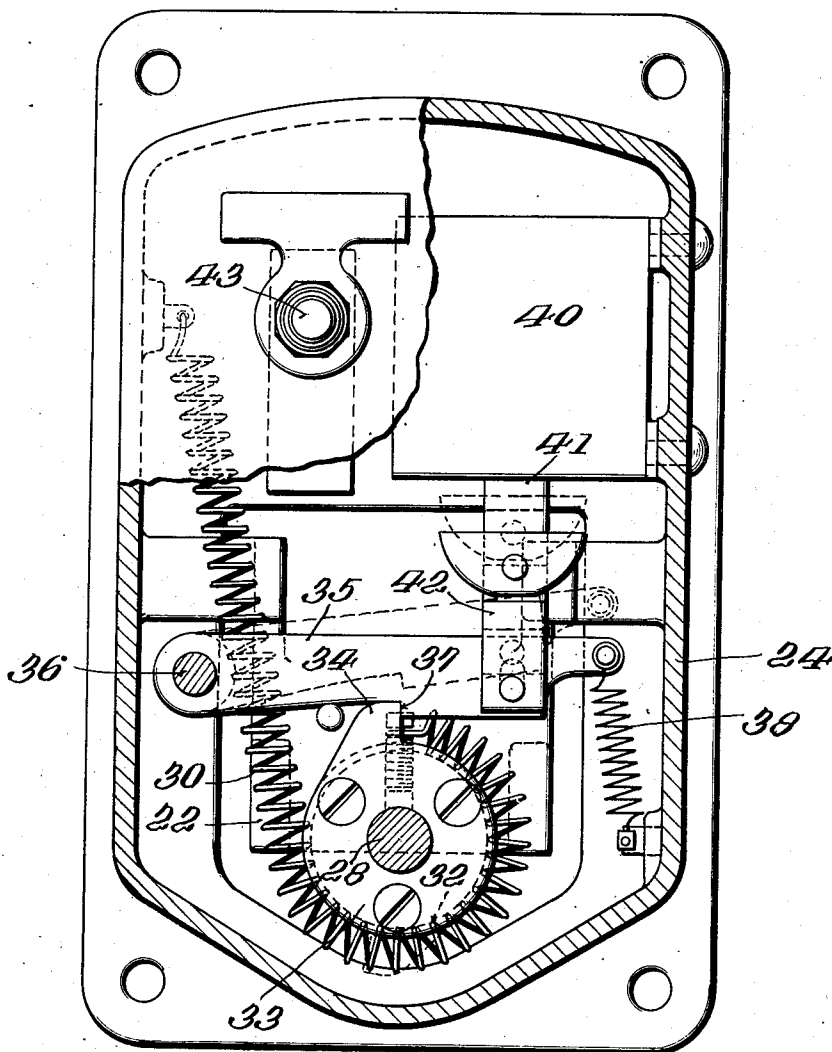
2,362,792

STOP MECHANISM FOR CAN CONVEYERS

Filed Dec. 24, 1942

6 Sheets-Sheet 5

FIG. 5.



Inventor

Harry D. Ayars

By

Mason, Porter & Miller
Attorneys

UNITED STATES PATENT OFFICE

2,362,792

STOP MECHANISM FOR CAN CONVEYERS

Harry D. Ayars, Philadelphia, Pa., assignor to
Continental Can Company, Inc., New York,
N. Y., a corporation of New York

Application December 24, 1942, Serial No. 470,066

9 Claims. (Cl. 193—40)

The invention relates to the new and useful improvement in a stop mechanism for stopping the flow of cans to a mechanism operating thereon.

An object of the invention is to provide a stop mechanism which will contact with the body of a moving can for stopping the travel thereof so as not to jam or mar the surface of the can body.

A further object of the invention is to provide a stop mechanism of the above character, which includes a stop member moved into the path of travel of the can body by a cam which is spring actuated and so shaped as to positively hold the stop member in a position for stopping the can.

A further object of the invention is to provide a stop mechanism of the above type, wherein the cam is operated by power stored in a spring, which cam is held by a latch in inoperative position so that when the latch is released, the stored power will move the cam for stopping the flow of cans.

A further object of the invention is to provide a stop mechanism of the above type wherein a solenoid is connected to the latch for operating the same.

A still further object of the invention is to provide a stop mechanism of the above type wherein manual means is employed for returning the cam to latched position and storing power in the spring for operating the same.

These and other objects will in part be obvious and will in part be hereinafter more fully disclosed.

In the drawings, which show by way of illustration one embodiment of the invention,

Figure 1 is a side view of a conveying means for conveying can bodies to a combined filling and closing machine, and showing partly in section my improved stop mechanism, which is employed for stopping the flow of cans.

Figure 2 is a plan view of the same.

Figure 3 is an enlarged sectional view of the stop mechanism showing the stop member in inoperative position.

Figure 4 is a view like Figure 3 but showing the stop member moved into position for stopping the cans.

Figure 5 is a sectional view through the stop mechanism on the line 5—5 of Figure 3, the solenoid coil being diagrammatically illustrated.

Figure 6 is a diagrammatic view showing the circuit for energizing the solenoid connected to a manually operated switch.

Figure 7 is a diagrammatic view showing the circuit for the solenoid as controlled by a switch

which in turn is controlled by a float in the tank of the filling machine.

Figure 8 is a diagrammatic view showing the circuit for the solenoid controlled by the can ends in the stack.

The stop mechanism embodying the invention is shown as employed in connection with a machine for filling cans and for closing the same. The empty cans are fed into a chute which discharges the cans one after another onto a timing mechanism which delivers the cans in spaced relation to each other to the filling machine. This timing mechanism is so constructed that it receives the can bodies from the chute in horizontal position and turns the can bodies into a vertical position ready for filling as they are delivered to the filling machine.

The invention has to do particularly with the control of the flow of cans to the timing mechanism. The cans pass through the chute by gravity, and in order to stop the flow of cans a stop member is moved into the path of travel of the cans. The stop member is moved by a cam which is so shaped that it shifts said stop member into the path of movement of the cans and positively holds the same in can stopping position. The cam for shifting the stop member is actuated by power stored in the spring, and a latch is provided for holding the cam in its inoperative position. When the latch is released, the cam is turned so as to force the stop member into the path of travel of the cans for stopping the same. The latch is controlled by means of a solenoid. This solenoid is connected to several circuits so that it may be operated under various independent conditions, such, for example, as when the liquid product in the tank of the filling machine drops to a certain predetermined level, or when the covers in the stack for the closing machine give out, or when the operator for any reason wishes to stop the flow of cans rather than to stop the entire unit.

Referring more in detail to the drawings, the timing mechanism which receives the cans from the chute conveyor is indicated at 1. This timing mechanism includes a shaft 2 which is rotated from the operating mechanism of the filling machine to which the cans are delivered by the timing mechanism. The timing device also includes a suitable supporting frame 2a in which rods 2b are mounted, and on the ends of these rods are supported yoke members 2c, 2c and the shaft 2 is journaled in these yoke members.

The filling machine and the operating mecha-

nism therefor is not shown, but may be of any desired type.

Mounted on the shaft 2 is a drum 3 provided with a spiral web 4 which receives the cans therebetween and delivers them to the filling machine.

The cans are delivered to the timing screw through a chute which as shown is vertically arranged directly over the timing screw. This chute includes a front member 5 and a rear member 6, also side members 7, 7. Within the chute are supported guide rails which may be shifted relative to the walls of the chute for adapting the chute so that it may be used for conveying cans of different sizes.

Mounted in the rear member 6 are two supporting devices 8, 8. These supporting devices carry a plate 9 located inside of the rear member. This plate carries ribs 10, 10, which are spaced from each other and serve as the guiding rails for the can bodies. These members 8, 8, which support the plate 9, may be adjusted so as to shift the plate relative to the rear side thereof for accommodating can bodies of different diameters.

In Figure 1 of the drawings there are shown can bodies of three different diameters. The larger can is indicated at C, the smaller can at C' and the can of intermediate diameter at C².

The front side of the chute 5 is provided with spaced guiding rails 11, 11, and these are fixed so that the can is guided along these rails regardless of the size of its diameter, and the rails 10, 10 carried at the rear side of the chute are shifted so as to bring them within guiding range of the can bodies which are passing through the chute. There are plates 13, 13 supported in the end walls in a similar manner so that they may be adjusted, and these plates carry guiding rails which are arranged adjacent the path of travel of the ends of the can bodies and these guide rails determine the path of travel of the cans.

The cans are moved through the chute by gravity, and are taken from the lower end of the chute by a timing screw. The stack of cans in the chute will rest on the spiral web of the timing device and will drop one by one in between the turns of the web, and therefore they are taken from the chute in certain timed relation and spacing for delivery to the pockets of the filling machine.

Associated with the timing screw is a guide rail 14. This guide rail is provided with a laterally projecting arm 15 which is adjustably mounted on a bracket 16 carried by the front wall of the chute for conveying the cans. The arm is provided with a slot 17 and is secured to the bracket by means of a screw 18. The other end of the guide rail is attached to a supporting bracket 19 which is mounted on the frame 2c carrying the timing shaft. The bracket 19 is likewise connected to the frame by a bolt and slot connection so that the guide rail may be adjusted bodily toward and from the timing shaft. This guide rail is shaped so that the cans which are received on the timing screw are carried by the timing screw against the guide rail which will contact therewith at one end of the can and above the can so as to force the end downward and cause the can to turn around the drum to an upright position. Cans, of course, are placed in the conveyer so that when turned by the timing screw to an upright position, the open end is properly positioned for the filling of the can. The can passes beneath a plate 20 mounted on the yoke member 2c, and this plate may be raised or lowered on the supporting bracket 21 therefor so as to position

the same for can bodies of different sizes. As the can body passes from beneath this plate 20, it moves into the pocket of the filling machine.

It is often desirable to stop the flow of cans to the filling machine without stopping the filling machine or the closing machine associated therewith. For this purpose a stop mechanism has been provided which is the essential feature of the invention. This stop mechanism includes an arm or stop member 22 which is pivotally mounted at 23 in a housing 24 which is bolted to the front wall or side of the conveyer for the cans. This arm 22 is curved at the lower end thereof inwardly toward the chute, as indicated at 25. Said arm may be provided with a pad on its inner face for contact with the can bodies passing down through the chute. When this stop arm is in the position shown in Figs. 1 and 3, the cans will pass by gravity through the chute without contacting with the arm. When the arm, however, is shifted to the position in dotted lines in Fig. 1 and in full lines in Fig. 4, then the can body will contact with the arm. Inasmuch as the guide rails carried by the front side portion 5 of the conveyer chute are fixed and the other guide rails are adjusted for different size cans, the path of travel of the can bodies regardless of their size will be along the guide rails 11, 11 carried by this front wall 5.

This stop member is shifted into a position for stopping the flow of the cans by means of a cam 26. This cam 26 is in the form of a face cam on a sleeve 27. The sleeve 27 is secured to a shaft 28 which is journaled in a bearing 29 carried by the housing 24. The cam 26 is gradually curved outwardly and extends around the sleeve 27 through an angle of substantially 180 degrees. When the cam is so positioned that the arm or stop member 22 contacts with that portion which is farthest from the center of the conveyer chute, then the stop arm is so positioned that the cans will pass freely by the same. When, however, the cam is turned to this angle of 180 degrees, it will positively force the stop arm into the path of travel of the can and thus stop the flow of the cans.

The cam for shifting the stop member is rotated by a coil spring 30. In this coil spring power is stored for operating the cam and the cam is held in inoperative position by a latch. When the latch is released, the cam is turned and moves the stop member into the path of travel of the cans. If a can is passing the pad on the stop arm so that the pad contacts with it near its horizontal diameter, there is not enough tension in the spring to cause the cam to turn and the stop member to jam the can. Just as soon, however, as the can passes the stop arm, it will be quickly sprung by the spring jamming the cam to a position which will stop further flow of cans. When the stop arm is in position to stop the cans, it is positively held in this position by the cam, as the stop arm cannot move to retracted position until the cam is returned to its inoperative position. In the present embodiment of the invention the spring 30 at one end is attached to a lug on the housing. This spring partially encircles the cam sleeve 27, lying in a groove 32 therein and serves as a means in which power can be stored for rotating the cam to force the stop member into the path of travel of the can. Mounted on the shaft 28 carrying the cam is a disk 33 provided with a projecting lug 34. Cooperating with this disk 33 is a latch 35. Said latch is pivoted at 36 to the housing and is provided with a shoulder 37 which is adapted to be

moved into the path of the lug 34 on the disk 33. When the shaft is turned in a clockwise direction, as viewed in Fig. 5, the spring will be put under tension and power stored in the spring for rotating the shaft and the cam. When this shaft is turned so that the lug passes the shoulder 37 on the latch, the latch will drop into the path of movement of the lug 34 and prevent the shaft from being rotated in a clockwise direction through the action of the spring. There is a spring 38 attached to the latch which presses it downwardly into the path of the lug 34.

On the outer end of the shaft 28 is a relatively large wing sleeve 39. This wing sleeve is fastened to the shaft and is adapted to be turned manually for storing power in the spring and moving the cam to inoperative position while the latch will engage the lug and hold the cam in this inoperative position until it is released by the lifting of the latch.

Mounted in the housing 24 is a solenoid 40. Associated with the solenoid 40 is a movable core member 41 of the usual type. The lower end of the core member is forked so as to straddle a link 42 which is pivoted to the core member. This link is also pivotally connected to the latch so that when the core member is raised, the latch will be raised and release the spring so that it will operate to turn the shaft 28 and the cam 26 mounted thereon for forcing the stop member into the path of travel of the cans.

Mounted on the housing 24 is a switch operated by a push button 43. The circuit from a source of supply to the coil of the solenoid 40 is indicated at 44, in Fig. 6 of the drawings. This circuit includes the manually operated push button switch 43. Whenever the operator for any reason desires to stop the flow of cans, all that is necessary is to push this button 43 and it will close the circuit, energizing the solenoid so that the core thereof is lifted and the latch released. This provides a means whereby the flow of cans to the filling and closing machine may be stopped at any time without stopping the filling machine or the closing machine.

In Fig. 7 of the drawings, there is illustrated diagrammatically the tank of the filling machine which supplies the liquid to the cans for filling the cans. In this tank is a float 45. The float is carried by a lever 46 pivoted to the frame at 47. This lever is connected to a vertically reciprocating bar 48 which may be a part of the mechanism for controlling the supply of liquid product to the tank. The bar 48 is connected to the lever at 49. Mounted above the bar 48 is a mercooid switch 50. This mercooid switch is pivoted at 51 and overlies the bar 48 so that when the bar is raised the left-hand end of the switch, as shown in Fig. 7, will be raised. This will cause the mercury in the switch to move away from the contacts and break the circuits controlled thereby, which is indicated at 52 in the drawings. When, however, the float 45 moves down to a predetermined position, preferably just before the fluid product in the tank is exhausted, the bar 48 will be lowered to such a point that the switch will turn in a clockwise direction to a position where the mercury will flow outward and close the circuit. This circuit 52 is connected to a suitable source of supply and to the coil of the solenoid 40. Therefore, when the liquid product in the tank reaches a point where there is no product to be filled into the cans, the mercooid switch will be closed, the solenoid 40 energized, the latch raised and the stop member moved into the path of movement of

the cans, thus stopping further delivery of cans to the timing mechanism. Thus, cans which have been delivered to the timing mechanism, will pass into the filling machine, which is not stopped, and through the filling machine to the closing machine which likewise is not stopped, so that the filling and closing unit will clear itself of cans.

If there are no covers to close the cans, then, of course, the feed of the cans to the filling machine should be stopped. A control of the solenoid for stopping the flow of cans when the covers in the stack give out is shown diagrammatically in Fig. 8. The stacked can covers are indicated at 53. Associated therewith is a mercooid switch 54 which is pivoted at 55, and this switch is connected to a member 56 associated with the stack holder so that when the can covers stacked in said holder are exhausted or substantially so, the member 56 will move into the stack and shift the mercooid switch so as to close the circuit 57 associated therewith. This circuit 57 is connected to a source of supply and to the coil of the solenoid 40. When the switch is shifted to close the circuit by the giving out of the covers in the stack, the solenoid is energized, the latch lifted and the stop member moved into the path of the can bodies for stopping the same.

While the invention for stopping the flow of cans is shown as applied to the feeding of can bodies to a filling machine, it will be understood that the stop mechanism may be used with a conveyor for conveying cans to any type of operating mechanism, and the embodiment of the invention illustrated in the drawings is solely for the purpose of making clear the construction and mode of operation of this stop mechanism. It will also be understood that while the can bodies are stopped while passing through a chute by gravity, other types of feeding mechanisms may be used for feeding the cans, it being essential, however, that the means which moves the cans that are to be stopped in their path of travel, shall be of a character that the flow of cans may be stopped.

It is also to be understood that the details of construction illustrating the embodiment of the invention may be greatly varied without departing from the spirit of the invention as set forth in the appended claims.

I claim:

1. A can conveyor including in combination, means for directing cans in succession in a single line of travel, a stop member movable into the path of travel of the cans, a cam for moving said stop member into engagement with the cans, a spring in which power is stored for moving the cam, a latch for holding the cam from movement by the spring, and a control means operating to release the latch to permit the cam to be moved and the stop member shifted into the path of travel of the cans.

2. A can conveyor including in combination, means for directing cans in succession in a single line of travel, a stop member movable into the path of travel of the cans, a cam for moving said stop member into engagement with the cans, a spring in which power is stored for moving the cam, a latch for holding the cam from movement by the spring, a control means operating to release the latch to permit the cam to be moved and the stop member shifted into the path of travel of the cans, and manually operated means for returning the cam to latched position, storing power in the operating spring therefor and per-

mitting the stop member to move out of the path of travel of the cans.

3. A can conveyer including in combination, means for directing cans in succession in a single line of travel, a stop member movable into the path of travel of the cans, a cam for moving said stop member into engagement with the cans, a spring in which power is stored for moving the cam, a latch for holding the cam from movement by the spring, a solenoid, and devices operated thereby when energized for lifting the latch to permit the cam to be moved and the stop member shifted into the path of travel of the cans.

4. A can conveyer including in combination, means for directing cans in succession in a single line of travel, a stop member movable into the path of travel of the cans, a cam for moving said stop member into engagement with the cans, a spring in which power is stored for moving the cam, a latch for holding the cam from movement by the spring, a solenoid, devices operated thereby when energized for lifting the latch to permit the cam to be moved and the stop member shifted into the path of travel of the cans, and manually controlled means for returning the cam to latched position, storing power in the operating spring therefor and permitting the stop member to move out of the path of travel of the cans.

5. A can conveyer including in combination, means for directing cans in succession in a single line of travel, a stop member movable into the path of travel of the cans, a cam for moving said stop member into engagement with the cans, a spring in which power is stored for moving the cam, a latch for holding the cam from movement by the spring, a solenoid, devices operated thereby when energized for lifting the latch to permit the cam to be moved and the stop member shifted into the path of travel of the cans, and a circuit for supplying current to the solenoid for energizing the same, said circuit including a control switch.

6. A can conveyer including in combination, means for directing cans in succession in a single line of travel, a stop member movable into the path of travel of the cans, and a spring actuated cam for moving the stop member into the path of the cans and means for controlling the operation of the spring actuated cam, said cam being so disposed as to positively restrain said stop member from movement when in engagement with the cans.

7. A can conveyer including in combination, means for directing cans in succession in a single line of travel, a stop member movable into the path of travel of the cans, a shaft mounted for rotation about an axis intersecting the stop member, a sleeve mounted on said shaft and having a segmental cam on the end thereof adapted to engage said stop member for moving the same into the path of the cans when the shaft is rotated in one direction and for releasing said stop member when the cam is rotated in the opposite direction.

8. A can conveyer including in combination, means for directing cans in succession in a single line of travel, a stop member movable into the path of travel of the cans, a shaft mounted for rotation about an axis intersecting the stop member, a sleeve mounted on said shaft and having a segmental cam on the end thereof adapted to engage said stop member for moving the same into the path of the cans when the shaft is rotated in one direction and for releasing said stop member when the cam is rotated in the opposite direction, and a spring for rotating said shaft in the direction for moving the stop member into the path of the cans, a latch for holding the cam from movement by the spring and means for releasing the latch to permit the cam to move the stop member.

9. A can conveyer including in combination, means for directing cans in succession in a single line of travel, a stop member movable into the path of travel of the cans, a shaft mounted for rotation about an axis intersecting the stop member, a sleeve mounted on said shaft and having a segmental cam on the end thereof adapted to engage said stop member for moving the same into the path of the cans when the shaft is rotated in one direction and for releasing said stop member when the cam is rotated in the opposite direction, a spring for rotating said shaft in the direction for moving the stop member into the path of the cans, a latch for holding the cam from movement by the spring, a solenoid connected to the latch for releasing the same to permit the cam to move the stop member, a circuit for energizing said solenoid, a switch in said circuit and means for closing the switch when it is desired to stop the flow of the cans.

HARRY D. AYARS.