March 30, 1943. A. O. GILES ET AL 2,315,255

CAN FILLING MACHINE

Filed March 2, 1942 4 Sheets-Sheet 1

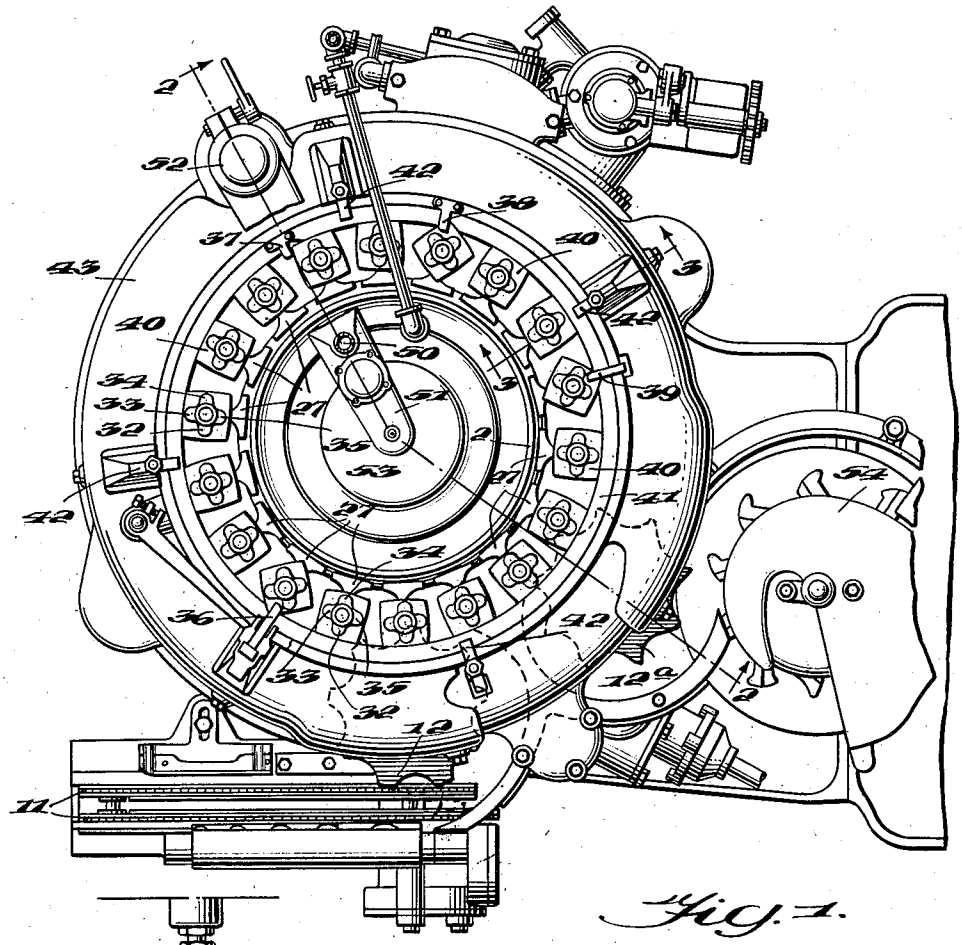


Fig. 1.

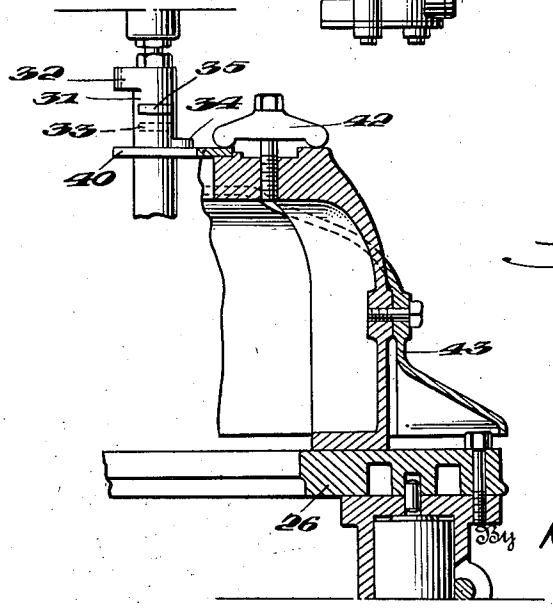


Fig. 3.

Inventors
ALFRED O. GILES,
EUGENE S. SHEFFIELD, JR.
FRANCIS T. MARUOKA,
BERNARD J. BUTLER,

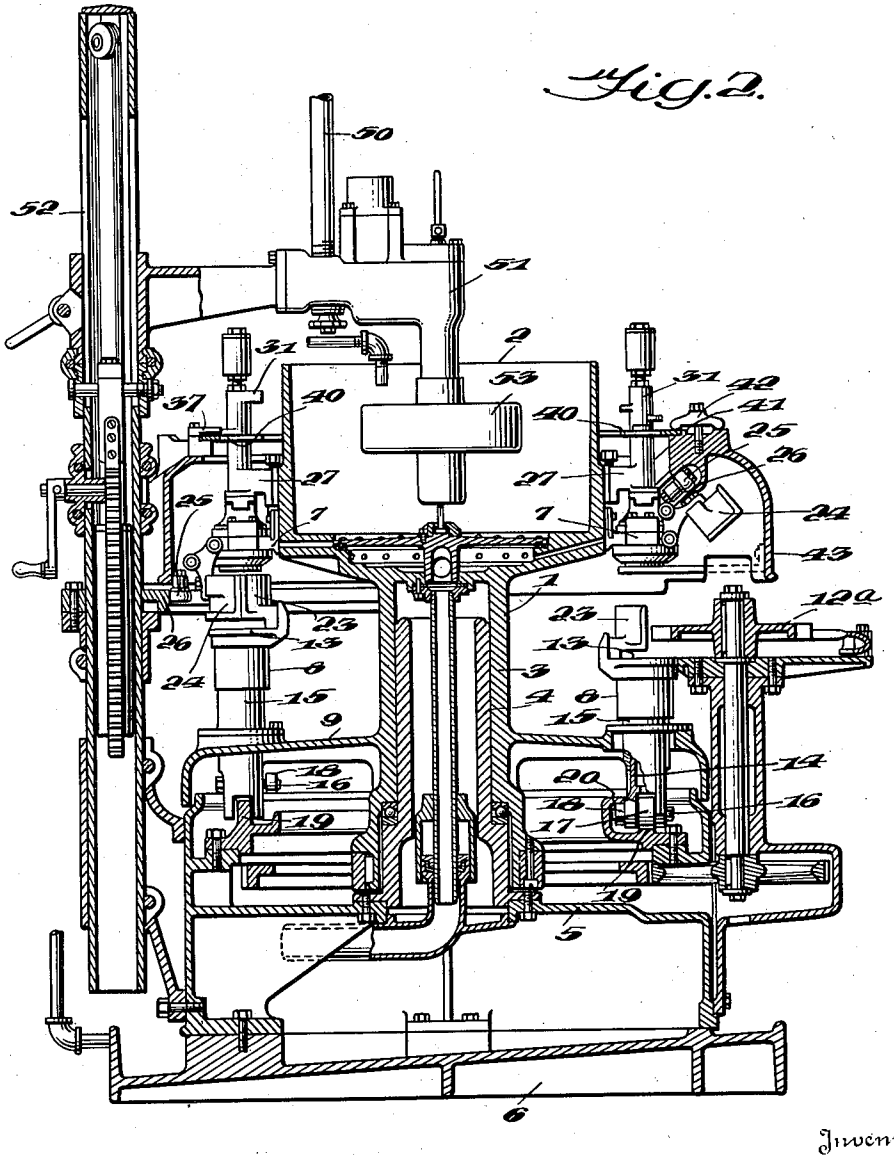
By Ritter, Maehler & Muir
Their Attorneys

March 30, 1943. A. O. GILES ET AL 2,315,255

CAN FILLING MACHINE

Filed March 2, 1942 4 Sheets-Sheet 2

Fig. 2.



Inventors

ALFRED O. GILES,
EUGENE S. SHEFFIELD, JR.
FRANCIS T. MARUOKA,
BERNARD J. BUTLER,

By Ritter, Maehler & Merriam

Their Attorneys

March 30, 1943. A. O. GILES ET AL 2,315,255

CAN FILLING MACHINE

Filed March 2, 1942 4 Sheets-Sheet 3

Fig. 5.

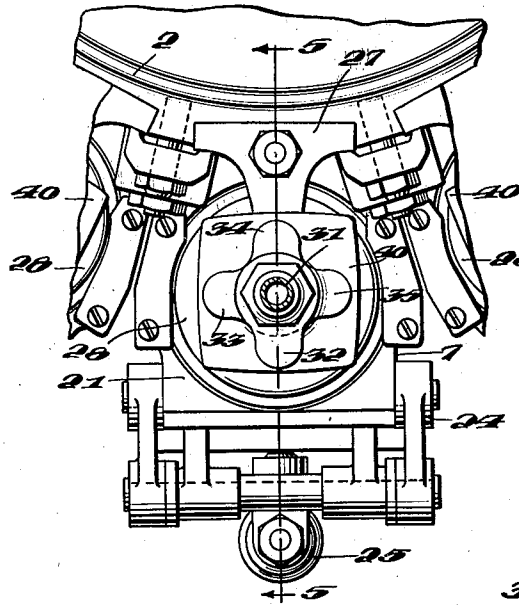
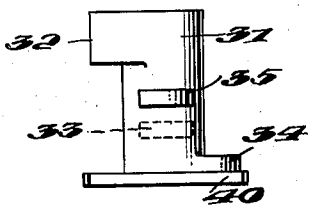


Fig. 4.

Fig. 6.



Inventors
ALFRED O. GILES,
EUGENE S. SHEFFIELD, JR.
FRANCIS K. MARUOKA,
BERNARD J. BUTLER,

By Ritter, Maehler & Meier

Their Attorneys

March 30, 1943. A. O. GILES ET AL 2,315,255

CAN FILLING MACHINE

Filed March 2, 1942 4 Sheets-Sheet 4

Fig. 9.

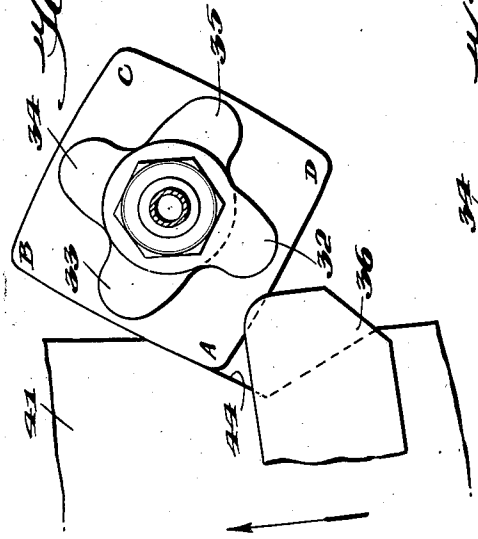


Fig. 10.

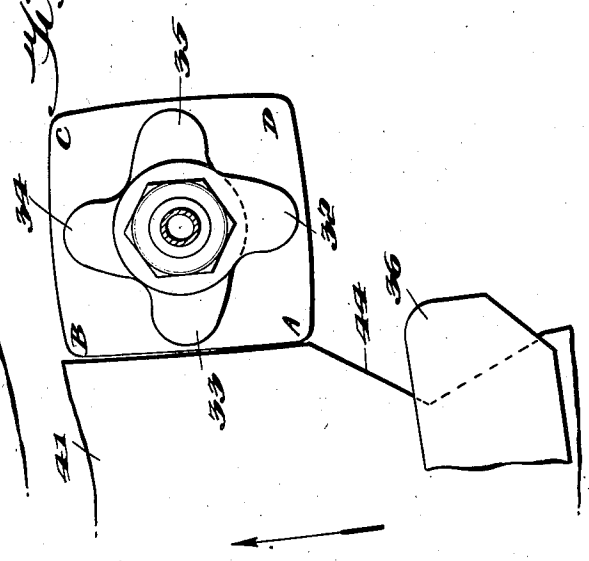


Fig. 7.

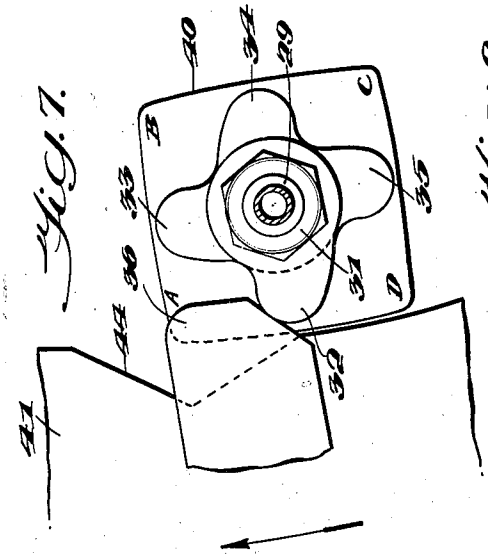
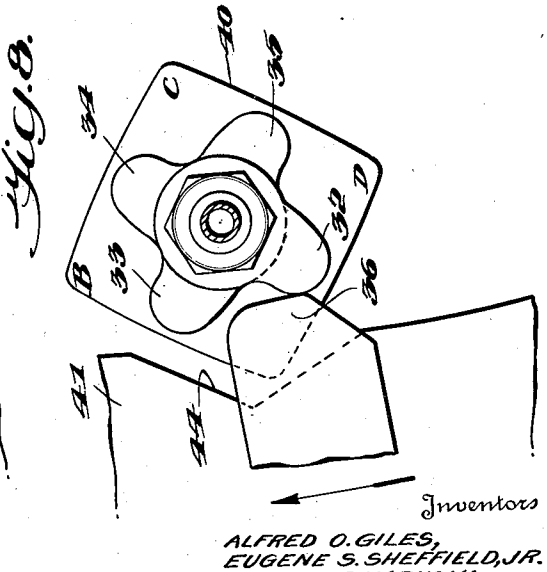


Fig. 8.



Inventors

ALFRED O. GILES,
EUGENE S. SHEFFIELD, JR.
FRANCIS T. MARUOKA,
BERNARD J. BUTLER,

By Ritter, Meehan & Meis

Their Attorneys

Patented Mar. 30, 1943

2,315,255

UNITED STATES PATENT OFFICE

2,315,255

CAN FILLING MACHINE

Alfred O. Giles, Eugene S. Sheffield, Jr., and Francis T. Maruoka, Kahului, and Bernard J. Butler, Paia, Territory of Hawaii, assignors to Maui Pineapple Company, Ltd., Paia, Territory of Hawaii, a corporation of the Territory of Hawaii

Application March 2, 1942, Serial No. 433,060

2 Claims. (Cl. 226—97)

The invention relates to improvements in can filling machines and more particularly to improvements in mechanism for operating the can filling valves in machines of the type shown in the patent to Robert Luthi, No. 2,124,581, July 26, 1938.

The principal object of the invention is to provide a valve operating mechanism which will insure smooth and accurate valve movement and will not be subjected to excessive wear.

The features of the invention, which reside in advantageous forms, combinations and relations of parts, will hereinafter appear and be pointed out in the claims.

In the drawings:

Figure 1 is a plan view of the type of can filling machine to which my invention is particularly applicable.

Figure 2 is an enlarged vertical sectional view taken on line 2—2, Figure 1.

Figure 3 is an enlarged fragmentary sectional view taken on line 3—3, Figure 1.

Figure 4 is a fragmentary plan view of one of the filling heads and valve units of the machine.

Figure 5 is a vertical sectional view taken through one of the filling heads and valve units and adjacent portions of the machine, the view being taken on the line corresponding to line 5—5 of Figure 4.

Figure 6 is a side elevational view of the valve operating fingers and locking block.

Figure 7 is an enlarged detail plan view of the valve operating mechanism, the parts being shown in the positions they respectively occupy at the beginning of one of the cycles of operations of the valve.

Figure 8 is a view similar to Figure 7 showing the parts of the valve operating mechanism in the positions they respectively occupy upon the completion of the first part of the cycle of operation of the valve.

Figure 9 is a similar view showing the parts of the valve operating mechanism in the positions they occupy at the beginning of the second part of the cycle of operation of the valve.

Figure 10 is a similar view showing the respective positions occupied by valve operating mechanism at the completion of the entire cycle of operation of the valve.

Referring more particularly to the drawings wherein the invention is shown as applied to the can filling machine shown in Patent No. 2,124,581, granted July 26, 1938, 1 illustrates the rotating turret of the machine whose upper portion is formed to provide a liquid supply tank 2 and whose lower portion is formed with a tubular member 3 which encircles and is revolubly mounted on a supporting column 4 bolted or otherwise secured to a casting 5 mounted on a suitable base 6. Liquid is supplied to the tank from a supply pipe 50 through a housing or head 51 adjustably mounted on a pipe or standard 52. Flow of the liquid from the housing 51 to the tank 2 may be controlled by a float 53.

Arranged about the periphery of the liquid supply tank 2 are a plurality of can filling heads 7. Directly beneath each can filling head is a can supporting device 8 which is mounted for vertical movement within a skirt or the like 9 formed integrally with the column 4 of the turret.

Open top cans 10 which may or may not contain fruit but which are to be filled with syrup or other liquid are moved toward the turret by any suitable means such as endless conveyor chains 11. The cans are transferred from the conveyor chains 11 to the can supporting devices by a star wheel 12 and they are removed from the can supporting devices by a star wheel 12a which may feed them to a vacuum seaming machine 54.

Each can supporting device comprises a platform 13 on which the can is positioned by the star wheel 12. The platform is mounted on the top of a plunger 14 which is vertically movable within a housing 15 carried by the skirt 9. The lower end of the plunger is provided with a pin 16 on which is mounted a main roller 17 and an auxiliary roller 18. The main roller 17 rides upon a circular cam track 19 which inclines upwardly in the direction of rotation of the turret from a point just beyond the star wheel 12 so that immediately after a can is transferred on to the platform of the can supporting device the device is moved upwardly to move the can into cooperation with the associated can filling head 7. The inner edge of a portion of the cam ring 19 extends upwardly and inwardly to form an overhanging arcuate cam track section 20 to cooperate with the auxiliary roller 18 so as to insure lowering of the platform 13 when desired.

Each filling head unit comprises a body portion 21 which is suitably secured on the outside of tank 2 of the turret. Each body portion 21 carries a rubber ring 22 adapted to be engaged by the upper edge of the can carried by the associated can supporting device so that the can will be tightly sealed.

If a high vacuum is desired in the liquid filling of a can, members or jaws may be provided for

encircling the can so as to prevent its collapse or distortion. For this purpose, a fixed jaw 23 may be carried by each can supporting device and a movable jaw 24 may be pivotally mounted on the outer end of the body portion 21 of the filling head. The movable jaw carries a roller 25 which is adapted to coact with a suitable cam track 26 for moving the jaw into and maintaining it in operative position and for retracting it into inoperative position at the desired time.

Each can filling head includes a valve unit comprising a bracket 27 suitably secured to a liquid supply tank 2 and a rotary valve 28 whose bottom surface is smooth so as to closely fit and coact with the smooth upper surface of body portion 21 of the filling head. This valve controls communication with the interior of the can which is held by the filling unit and in the particular type of can filling machine illustrated in the drawings the valve is designed to assume four different operative positions wherein (1) the can is subjected to a vacuum, (2) the can is cut off from the vacuumizing apparatus and a measured quantity of air is admitted to the can, (3) syrup or other liquid is admitted to the can, and (4) atmospheric pressure is admitted into the can.

The present invention is alone concerned with the mechanism for rotating the valve from one operative position to the next and as such mechanism is in no way concerned with the particular function or operation performed by the valve in any operative position it assumes, the various ports with which the valve body and cooperating body portion of the filling head must be provided to accomplish the specific functions of the valve of the machine shown in the drawings are not illustrated and need not be described. The improved valve operating mechanism includes a rotatable device which may advantageously consist of a vertical tubular member 29 which is journaled in a bracket 27. The valve may be removably connected to the lower end of this tubular member by forming its upper end with a rib or tongue 30 which extends into a slot formed in the lower end of the tubular member. When the tongue and slot are positioned along a radial line of tank 2, the valve may be easily disconnected from or connected to the tubular member.

Keyed to the upper end of the tubular member 29 is a sleeve 31 having a plurality of peripherally spaced arms 32, 33, 34 and 35, respectively, the number of arms corresponding with the number of different operative positions the valve is adapted to assume. In addition to being peripherally spaced approximately 90° apart, the arms are also vertically spaced on the sleeve 31 so as to respectively cooperate with stops or the like 36, 37, 38 and 39 which are arranged about the turret at different elevations so that each is disposed in the path of movement of the particular arm on the sleeve 31 with which it is intended to cooperate.

Also mounted on the sleeve 31 below the valve actuating arm is a member 40 which may advantageously be substantially in the form of a square block. In addition to performing the novel function hereinafter pointed out, member 40 is adapted to cooperate with a ring 41 which encircles the turret for locking the valve against movement as it is advanced by the turret from adjacent one valve actuating stop to the next one. This ring which is immovably secured by a plurality of clamps 42 to a stationary shell or the like 43 surrounding the liquid supply tank 2 is provided with a notched portion 44 adjacent each of the valve actuating stops for receiving a portion of the block-like member 40 and thus permit of rotation of the valve by the stops.

Each of the cooperating arms and stops for actuating the valve are designed so that the valve will be rotated through only a part of its arcuate path of travel from one operative position to the next instead of through its entire arc of travel because it has been found that, when the latter is attempted, the initial point of contact between each arm and its stop must necessarily be so far in advance of a line passing through the respective centers of rotation of the turret and valve that the valve movement is suddenly accelerated. This sudden acceleration has been found to cause an overflow of the valve unit which results in the leading corner of block 40, designated A in Figure 7, being jammed against the wall of the adjacent notched portion of the ring thus causing excessive wear of the parts and not infrequently the stoppage of the machine. This results in a rounding of the block corner and gouging and wearing away of the ring and it requires so much clearance between the ring 41 and the sides of the block member 40 that accurate valve setting and alignment of the ports is not possible.

By having each finger and its cooperating stop coact to rotate the valve through only a part of its arc of travel from one operative position to the next, the initial point of contact between each arm and its stop is only slightly in advance of the radial line connecting the centers of rotation of the turret and valve and consequently there will be no sudden acceleration of the valve. In the particular form of the invention illustrated in the drawings, each arm and its cooperating finger coacts during movement of the valve by the turret to rotate the valve approximately 45°. The relative positions of the stop and valve unit after the valve has been rotated by the cooperation of arm 32 and stop 36 is shown in Figure 8 of the drawings, while the relative position of the parts when finger 32 first contacts stop 36 is shown in Figure 7.

To cause the valve to rotate the remainder of its arc of travel to its next operative position after being partially rotated into the position shown in Figure 8, the corner A of the block which projects into the adjacent notch 44 of the ring is adapted to cooperate with the portion of the ring bounding the notch. Thus as the turret continues to rotate, corner A of the locking block is brought into engagement with the forward face of the notch, as shown in Figure 9, and the block and the valve will be smoothly and evenly rotated into the position shown in Figure 10 in which the valve is firmly held against further rotation by cooperation of the contiguous faces of block 40 and ring 41.

By breaking down each cycle of operation of the valve into two parts or movements instead of accomplishing it in a single movement, the parts of the machine are subjected to considerably less wear, and it is possible to obtain exceedingly more accurate valve setting and consequent alignment of valve ports.

Various details of construction of the machine shown in the drawings have not been described, as they are not essential to a complete understanding of the present improvement and those skilled in the art will appreciate that the improvement may be applied to can filling machines differing widely in construction from the one chosen for purposes of illustrating the invention. For a complete understanding of such details of

the machine which have not been described, reference may be had to Patent No. 2,124,581, dated July 26, 1938.

What we claim is:

1. The improvement in can filling machines of the type having a rotating turret provided with a plurality of filling units for holding the cans to be filled and in which a rotatable valve capable of assuming different operative positions is associated with each unit for controlling communication with the interior of the cans, said improvement including a rotatable device mounted on each of said units for actuating the valve associated therewith, said device being provided with a plurality of laterally projecting arms and with a member vertically spaced from said arms, a plurality of stops arranged about said turret respectively cooperable with said arms as the turret moves for rotating said valve through a part of its arc of travel from one operative position to the next one, and means adjacent each of said stops for cooperating with said member as the turret continues to move for rotating the valve the remainder of its arc of travel to its next operative position.

2. The improvement in can filling machines of the type having a rotating turret provided with a plurality of filling units for holding the cans to be filled and in which a rotatable valve capable of assuming different operative positions is associated with each unit for controlling communication with the interior of the cans, said improvement including a rotatable device mounted on each of said units for actuating the valve associated therewith, said device being provided with a plurality of laterally projecting arms and with a block-like member, a plurality of stops arranged about said turret respectively cooperable with said arms as the turret moves for rotating said valve through a part of its arc of travel from one operative position to the next one, and a ring encircling said turret having a notched portion adjacent each of said stops, said block-like member being movable into one of said notched portions when the valve is partially rotated by the adjacent stop and being cooperable with said notched portion as the turret continues to move for rotating the valve the remainder of its arc of travel to its next operative position, said ring being engageable with said block member for preventing rotation of the valve during movement of the block member from one notched portion to the next notched portion.

ALFRED O. GILES.
EUGENE S. SHEFFIELD, JR.
FRANCIS T. MARUOKA.
BERNARD J. BUTLER.