May 8, 1962 A. M. STOTT 3,033,175

ROTARY THRUSTER WITH GAS OPERATED AND MANUAL UNLOCK

Filed Sept. 23, 1959

FIG. 2.

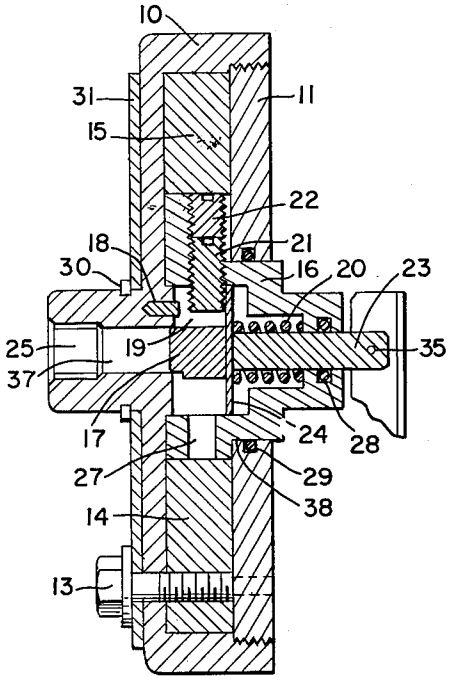


FIG. 1.

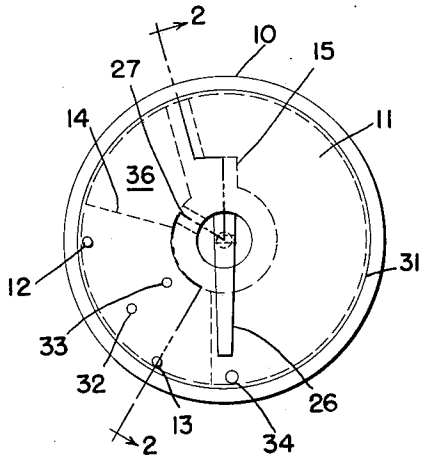
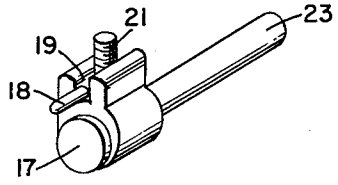


FIG. 3.



INVENTOR.
ALBERT M. STOTT

BY S. J. Rotondi, A. J. Dupont & S. Dubroff

ATTORNEYS:

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ROTARY THRUSTER WITH GAS OPERATED AND MANUAL UNLOCK

Albert M. Stott, Clifton Heights, Pa., assignor to the United States of America as represented by the Secretary of the Army

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2 Claims. (Cl. 121—97)
(Granted under Title 35, U.S. Code (1952), sec. 266)

The invention described herein may be manufactured and used by or for the Government for governmental purposes without the payment to me of any royalty thereon.

This invention relates to mechanisms which are operated by a gas pressure to actuate a load device, and has for its purpose to provide an improved actuator which has between its stationary and movable members a lock whereby these members may be released from one another either manually or automatically in response to the gas pressure by which the mechanism is operated.

The actuators or thrusters heretofore available have usually had their stationary and movable parts interconnected by a shear pin or the like. This is disadvantageous in that the mechanism cannot be operated manually to check its operating condition or to move the load device from one position to another. The present invention avoids this difficulty by the provision of a lock which is operable to unlock the movable member from the stationary member either manually or in response to the application of a gas pressure.

The invention will be better understood from the following description when considered in connection with the accompanying drawings and its scope is indicated by the appended claims.

Referring to the drawings:

FIG. 1 is an end view of the activator,

FIG. 2 is an enlarged section taken on the line 2—2 of FIG. 1, and

FIG. 3 shows an end view of the piston with the dowel pin extending into the same.

As indicated in these figures, the actuator includes a housing 10 and side cover 11 which are arranged to form an enclosure. Fixed within this enclosure by means of bolts 12 and 13 is a stationary member or vane 14. Arranged to cooperate with the stationary vane 14 is a movable vane 15 which is integral with an output shaft 16 and is keyed to a piston 17 by means of a set screw 21 and lock screw 22.

The dowel pin 18 is fixed to the housing 10 and extends into a groove 19 in the piston 17 when this piston is in the illustrated position to which it is biased by a spring 20. Also extending into the groove 19 is a dog point set screw 21 which is threaded into the movable vane 15 and is fixed in place by a lock screw 22. With this arrangement, the movable vane 15 is locked to the fixed vane 14 so long as the pin 18 extends into the groove 19 and is released from the vane 14 when the piston is far enough away from the housing 10 to clear

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the pin 18. In either position, however, the screw 21 remains in the groove 19 and the movable vane 15 is keyed to the piston 17.

As previously indicated, the piston 17 is biased to its illustrated closed position by the spring 20 which surrounds the piston rod 23 and extends between an abutment 24 and a bearing of the output shaft 16. The piston 17 is movable to its open position by either (1) a gas pressure applied through an inlet port 25 or (2) movement of a handle 26 into alinement with the axis of the piston rod 23 by movement of this handle 26 substantially 90° about its pivot 35. In the first case, the operating gas passes from the inlet port 25 unlocking vane 15 by longitudinal movement of piston 17. The gas then passes through an opening 27 in the hub of the movable vane 15 into the space 36 between the two vanes, and the movable vane is rotated until it engages the fixed vane after moving about 180° as shown in FIG. 1. In the second case, the movable vane may be rotated manually by means of either the handle 26 or the output shaft 16.

Seal rings 28 and 29 are between the rod 23 and the output shaft 16 and between the output shaft 16 and the side cover 11, a snap ring 30 anchors the housing 10 to a support plate 31, dowel pins 32 and 33 function to locate the parts with respect to one another, and a vent 34 releases the back pressure between the two vanes. A bearing 38 is provided for shaft 16. A pivot 35 for handle 26 enables this handle to be swung about this pivot to compress spring 20 shifting piston 17 to the right to enable pressure fluid to move through passageway 37 and through opening 27 into space 36 and act upon the movable vane 15.

I claim:

1. In an actuator, the combination of means forming an enclosure having an inlet port, a stationary member fixed within said enclosure, a member rotatable within said enclosure through a limited arc and having a hollow output shaft extending through a wall of said enclosure, said shaft having an opening for completing a passageway between said inlet port and a space between said members, a piston having a rod extending through said shaft and movable with said piston to open and close said inlet port, said piston having an axial groove in its outer periphery, means biasing said piston to a position where said inlet port is closed, means fixed to said rotatable member and extending into said groove for rotating said members together and for permitting axial movement therebetween, a pin fixed to said enclosure and arranged to extend into said groove for locking said piston to said enclosure when said piston is in a position to close said inlet port, and a handle pivoted to said rod and arranged to engage the end of said shaft for moving said piston to a position where said inlet port is open.

2. An actuator according to claim 1 wherein said biasing means is a helical spring surrounding said rod and extending between an abutment on said rod and the bearing of said rotatable member.

No references cited.