

[USPTO PATENT FULL-TEXT AND IMAGE DATABASE](#)[Home](#)[Quick](#)[Advanced](#)[Pat Num](#)[Help](#)[Bottom](#)[View Cart](#)[Add to Cart](#)[Images](#)

(1 of 1)

United States Patent
Burgess**4,133,288**
January 9, 1979

Device for indicating the operative position of a valve

Abstract

A rotary actuator for a valve is associated with an indicator mechanism provided entirely exteriorly to the housing of the valve and out of axial alignment with the valve spindle. The indicator rotates with an actuating member of the valve and is movable relative to a surface of the actuating member to provide a visual and tactile indication of the operative position of the valve.

Inventors: Burgess; Colin H. (Holcombe Brook, GB2)**Assignee:** *Dynamic Controls Limited (Oldham, GB2)***Family ID:** 10026861**Appl. No.:** 05/783,762**Filed:** April 1, 1977**Foreign Application Priority Data**

Apr 5, 1976 [GB]

13648/76

Current U.S. Class: 116/277; 116/271; 137/553**Current CPC Class:** F16K 37/0008 (20130101); Y10T 137/8225 (20150401)**Current International Class:** F16K 37/00 (20060101); F16K 037/00 ()**Field of Search:** ;116/125,114G ;137/553,556**References Cited** [\[Referenced By\]](#)**U.S. Patent Documents**

783447	February 1905	Meloon
1107800	August 1914	Joynes
1806462	May 1931	Hopkins
2930344	March 1960	Brasel
3134570	May 1964	Jarrett
3554160	January 1971	Fortune et al.

Foreign Patent Documents

797896

Jul 1958

GB

23. A rotary actuator according to claim 22 in which said controlled means comprises a valving element for controlling fluid flow through a valve.

24. A rotary actuator comprising:

a housing having a bore therein;

a spindle having first and second ends and extending through and being rotatable in the bore of said housing;

means securing said spindle against axial movement within the housing;

a rotatable actuating member located wholly outside said housing and coupled to said first end of said spindle whereby rotation of said actuating member causes rotation of said spindle;

means controlled by said actuating member, said means being connected to the second end of said spindle;

at least one indicator for indicating the position of said controlled means, said indicator being located wholly outside said housing and out of axial alignment with said spindle, said indicator being rotatable with said actuating member and being movable upon rotation of said actuating member relative to a given surface of said actuating member between a first position substantially flush with or recessed into said surface and a second position projecting from said surface; and

coupling means between an outer surface of said housing and said indicator to cause movement of said indicator between said first and second positions on rotation of said actuating member.

25. An actuator as claimed in claim 24, wherein:

said controlled means is directly connected to the second end of said spindle and is axially movable within said housing upon rotation of said actuating member.

Description

This invention relates to indicators for use with rotary actuators. There are a number of situations wherein a rotary actuator is used to control an element, and wherein movement of the actuator through more than 360.degree. is necessary to obtain the full required degree of control. In such cases it may be difficult to obtain from the rotary actuator a clear indication by sight or by touch of the condition of the part controlled by the actuator.

According to the present invention a rotary actuator comprises a housing, an actuating member extending through said housing and rotatable but axially fixed relative to said housing, an indicator movable relative to a given surface of said actuating member external of said housing, between a first position substantially flush with or recessed into said surface and a second position projecting from said surface, and means operable on rotation of said actuating member to cause relative movement between said indicator and said surface.

In a rotary actuator according to the invention the indicator is designed so that with the actuating member at one limit of its rotation the indicator lies in its first position substantially flush with or recessed into the given surface. As the actuating member is then rotated towards its other limit position the indicator moves relative to the given surface towards its other limit position projecting from the surface. Thus, the condition of any part operated by rotation of the actuating member may readily be detected by sight or touch of the indicator.

Preferably the actuating member comprises a spindle passing through said housing and a hand wheel secured to the spindle, and the given surface is a surface of the hand wheel. The given surface may be an axial surface of the hand wheel facing away from or towards the housing, or may be a circumferential surface of the hand wheel.

section 66 and the nut carries an indicator in the form of a pin 69. The pin passes through an axially extending slit 70 in the skirt 67 and is thereby constrained to rotate with the skirt. Such rotation causes the nut and thus the pin 69 to move axially on the threaded section 66 so that the pin can move between the first position shown in FIG. 6 wherein the pin lies in a radial groove 71 formed in the axial surface of the hand wheel which faces towards the housing, and a further limit position shown in broken lines wherein the pin projects from that surface.

Clearly, two or more axially spaced pins may be secured to the nut 68, such pins preferably also projecting from the nut at different radial angles.

In the arrangement shown in FIGS. 7 and 8 the housing 72 has an externally threaded section 73 and a spindle 74 extends through this section and is connected to a hand wheel 75. The hand wheel has a skirt 76 part of which is cut away to form a chamber 77 in which is housed a worm wheel 78 meshing with the threaded section 73 of the housing. The worm wheel 78 is carried by a pin 79 passing through a bore 80 in the hand wheel. Rotation of the hand wheel will cause rotation of the worm wheel and thus result in rotation of the pin 79 within the bore. In one limit position as shown in FIG. 8 the end of the pin projects from the circumferential surface of the hand wheel into which the bore opens. In the other limit position the pin has been rotated through 180.degree. so that the end of the pin then lies substantially flush with the open end of the bore 80.

It will be appreciated that many other different drives can be designed for causing relative movement between an indicator pin and a surface on rotation of the spindle of a valve and the invention is not limited to the particular forms shown in these drawings.

It will also be appreciated that the invention is not limited to use as an integral part of a valve. Thus, the invention is equally applicable to a rotary actuator designed to be used remote from a valve or other equipment which is to be operated, the actuator having an actuating member in the form of a flexible connection or a long spindle extending to the equipment. The invention may also be used in conjunction with apparatus such as screw jacks which are operative by a captive hand wheel and of rotary isolators for electric circuits, such isolators again being controlled by a hand wheel. Other apparatus wherein it is advantageous to incorporate an actuator according to the invention may readily be thought of.

* * * * *

