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ADJUSTABLE SELF-CENTERING MEANS FOR ROTATABLE SHAFTS

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FIG 1

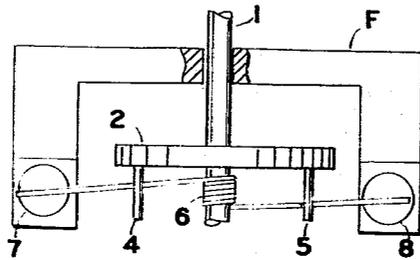


FIG 2

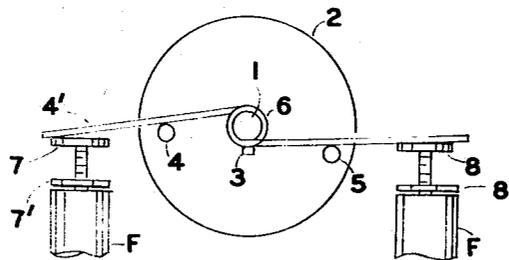
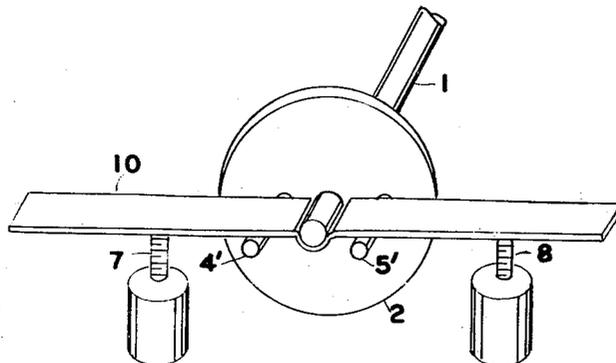


FIG 3



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3 Claims. (Cl. 267—1)

This invention relates to adjustable self-centering means for rotatable shafts and more particularly to such means for control shafts which are rotated a fraction of a revolution.

The present invention is directed to means for restoring to neutral position control shafts of the type which are used in instruments or vehicles for actuating control switches or valves.

Such devices of the prior art, are generally complicated and expensive, and do not have easily adjustable self-centering means.

The present invention provides a simple reliable and inexpensive mechanism for self-centering a shaft to a neutral position with adjustable stop means.

Accordingly, a principal object of the invention is to provide new and improved adjustable self-centering means for rotatable shafts.

Another object of the invention is to provide new and improved easily adjustable self-centering means for rotatable control shafts.

Another object of the invention is to provide new and improved self-centering means for rotatable control shafts of the type which are rotated a fraction of a revolution.

Another object of the invention is to provide new and improved adjustable self-centering means for a shaft rotatably mounted in a frame comprising, a pair of members fixedly connected to and spaced from said shaft, a spring mounted on said shaft adjacent said members, a pair of adjustable stops mounted in said frame and equally spaced outwardly of said members, the ends of said springs extending outwardly past said members and adapted to come into contact with said adjustable stops when said shaft is in neutral position so that when said shaft is rotated in either direction, one end portion of said spring will bear against one of said members in a direction to restore said shaft to neutral position, said neutral position being determined by the position of said adjustment stops.

These and other objects of the invention will be apparent from the following specification and drawings of which:

FIGURE 1 is a side view of the embodiment of the invention.

FIGURE 2 is a bottom view of the embodiment of FIGURE 1.

FIGURE 3 is a perspective view of a modification of the invention.

Referring to the figures, the shaft 1 may be a control shaft of the type which is rotated a fraction of a turn in either direction to actuate switches, potentiometers or other control devices for controlling movement in an instrument or vehicle.

The shaft 1 is mounted for rotation and without any axial motion in a frame F and would be connected to actuate a control switch or potentiometer which is not shown.

A flange 2 is fixedly attached to the shaft 1 for instance, by a key 3 and the lower end of the shaft extends past the flange. A pair of pins or equivalent members 4 and 5 are fixedly connected to and spaced from the shaft 1.

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A spring 6 is tightly wound to the shaft 1 or otherwise fixedly connected to the shaft 1 and the ends of the spring extend past the pins 4 and 5 as illustrated in FIGURE 2, so that if the shaft is rotated in either direction, the spring acts to restore it to a neutral position.

The neutral position is determined by the adjustable stop screws 7 and 8 and the ends of the spring 6 extend sufficiently far enough to come in contact with both adjustment stops when the shaft 1 is in neutral position.

If the shaft is rotated clockwise, as shown in FIGURE 2, the pin 4 will move the spring in a clockwise direction and the portion 4', of the spring 6 will be moved from the end of the screw 7 against the spring force. Therefore, when the turning force is removed, the spring 6 will press against the pin 4 and move the flange and shaft back to its neutral position, that is until it comes in contact with the adjustable screw 7.

Similarly, if the shaft 1 is moved counter-clockwise the spring 6 will bear on the pin 5 to return shaft 1 to its neutral position, when the turning force is removed.

The adjustable stop screws have relatively large heads to assure a good contact with the ends of the spring and they are easily adjustable to restore the shaft to neutral position. Lock nuts 7' and 8' are preferably provided to lock the adjustable stop screws in proper position.

Therefore, even if the spring force changes due to aging or comes unequal for any reason or if a new spring is installed, the adjustment may be made easily to compensate for any error effect.

FIGURE 3 is a modification of the invention illustrating use of a leaf spring 10. In this modification the pins 4' and 5' are mounted on the flange 2 and the leaf spring has a curvature which is adapted to fit around the shaft 1. The leaf spring is designed so that it will fit into position between the shaft 1 and pins 4' and 5' and be held there by its own spring force. The operation is the same as primarily described.

Therefore, the present invention provides a simple inexpensive self-centering means for control shafts which is easily adjustable.

Many modifications may be made by those who desire to practice the invention without departing from the scope thereof which is defined by the following claims.

I claim:

1. Adjustable self-centering means for a shaft rotatably mounted in a frame comprising:
 - a pair of members fixedly connected to and spaced from said shaft,
 - a spring mounted on said shaft adjacent said members,
 - a pair of adjustable stops mounted in said frame and equally spaced outwardly of said members, the ends of said springs extending outwardly past said members and adapted to come into contact with said adjustable stops when said shaft is in neutral position so that when said shaft is rotated in either direction, one end portion of said spring will bear against one of said members in a direction to restore said shaft to neutral position, said neutral position being determined by the position of said adjustment stops.
2. Apparatus as in claim 1 wherein said members are pins mounted in a flange fixedly connected to said shaft and said adjustable stop members are screws.
3. Apparatus as in claim 1 wherein said spring is a leaf spring.

No references cited.

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