Sept. 15, 1942. F. D. GROVES 2,295,731

FRICTIONAL ADJUSTER

Filed April 21, 1941

Fig. 2.

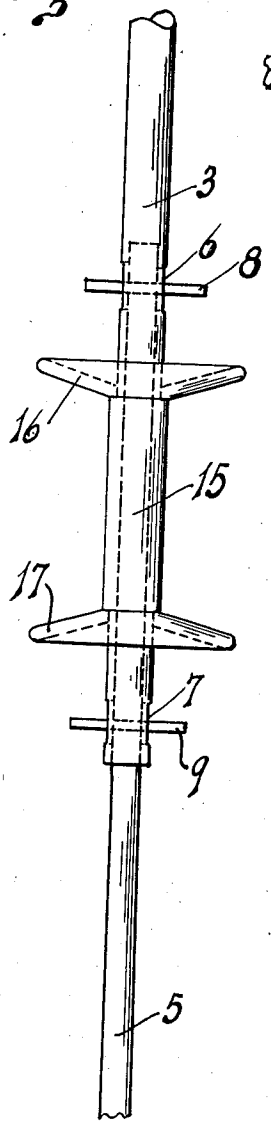


Fig. 1.

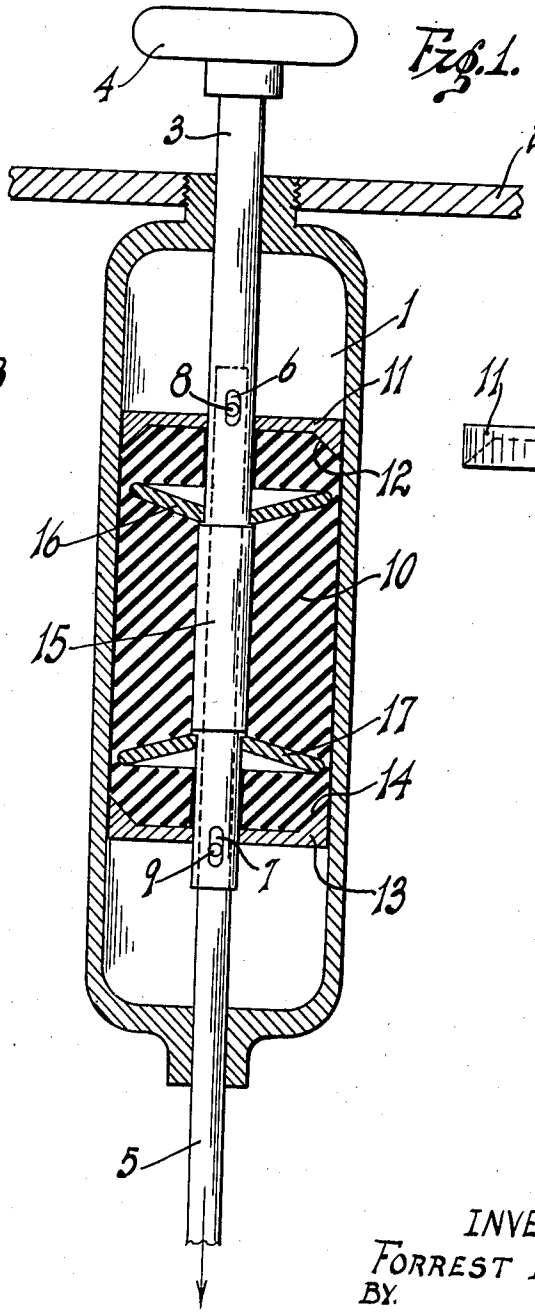
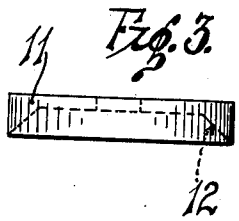


Fig. 3.



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FRICTIONAL ADJUSTER

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5 Claims. (Cl. 74—503)

This invention relates to a frictional adjuster particularly for control rods such as the rods, wires, or the like, which control a carburetor, brakes, shutters, heaters, and the like; for example, on automobiles, trucks, aircraft, and the like.

An object of my invention is to provide a novel frictional adjuster of the character stated in which a member frictionally engages a housing, this member being relieved of frictional engagement with the housing when the control rod is moved in either direction.

Another object is to provide a novel frictional adjuster of the character stated in which the frictional member is automatically pressed outwardly against the housing after movement of the control rod is completed.

A further object of my invention is to provide a novel frictional adjuster of the character stated which is simple in construction, inexpensive to manufacture, and effective in operation.

A feature of my invention resides in the novel means of engaging the expandible rubber member when the manually actuated pull tube is moved to release the wedging action of the tapered caps thereby retracting the rubber member from engagement with the wall of the housing.

Other objects, advantages and features of my invention may appear from the accompanying drawing, the subjoined detailed description and the appended claims.

In the drawing:

The numeral 1 indicates a housing which is cylindrical, semi-cylindrical or other convenient form. This housing is fixedly attached at one end to a dash 2, or other fixed wall. The housing may be threaded into the dash, or it may be attached thereto by means of a nut, all of which is usual and well known. A pull tube 3 extends through one end of the housing 1, and into said housing substantially as shown. The pull tube 3 is of sufficient length to permit appreciable longitudinal movement of the tube into and out of the housing 1.

A handle or button 4 is fixedly attached to the outer end of the pull tube 3 for the purpose of being grasped by the operator when the adjuster is to be moved. A control rod 5 extends through the lower end of the housing 1, and to the appliance which is to be controlled. The control rod 5 fits in the pull tube 3, and has a limited longitudinal movement relative to the pull tube by means of the following arrangement:

The pull tube 3 is provided with a pair of opposite elongated slots 6, adjacent the upper end thereof, and a similar pair of oppositely arranged elongated slots 7 adjacent the lower end. A pin 8 extends through the control rod 5, and through the slot 6, and projects beyond the periphery of the pull tube 3, as shown in Figure 2. A similar pin 9 extends through the control rod 5, and through the slot 7. It will thus be evident that the control rod 5 will have a limited longitudinal movement relative to the pull tube 3 by reason of the elongated slots 6 and 7. A rubber block 10 surrounds the pull tube 3 within the housing 1, and this block moves longitudinally in the housing as the adjuster is operated. The block 10 may be of rubber, synthetic rubber, or other suitable yieldable material, and is large enough to slightly and frictionally engage the housing.

A cap 11 bears against the upper end of the block 10, and the inner surface of the cap may be tapered as shown at 12, and engages the tapered upper end of the block for the purpose of pressing the rubber block inwardly and prevents bulging of the upper part of the block against the inner wall of the housing. The pin 8 bears against the upper face of the cap 11. A similar cap 13 bears against the lower face of the block 10, and is provided with an annular tapered surface 14 for the purpose of wedging the block 10 inwardly when an upward thrust is exerted on the block. The pin 9 similarly bears against the face of the cap 13 for the purpose of transmitting the force from the control rod 5 to the cap, and thence to the thrust disc which in turn expands the block. A constant pressure may be exerted on the control rod 5, this pressure being either downwardly or upwardly, but normally is in the direction shown by the arrow in Figure 1; in certain constructions there may be no pressure on the control rod.

This force is usually applied by a spring or a suitable element of that character, or any force. Assuming that the spring or other tension on the control rod 5 is in the direction of the arrow, the pin 8 will be pressed against the cap 11, and the wedge surface 12 will press the rubber block 10 inwardly to prevent bulging of the upper part of the block, the force is then transmitted to the thrust disc, which wedges the block outwardly, thus frictionally engaging the wall of the housing 2.

An enlarged shoulder 15 is provided on the pull tube 3 within the block 10, a thrust disc 16 bears against the top of the shoulder 15, and extends upwardly into the rubber block 10. A similar thrust disc 17 bears against the lower face of the

shoulder 15, and also extends outwardly and engages the rubber block 10.

The operation of the frictional adjuster is as follows: Assuming that there is a constant pull on the control rod 5 in the direction shown by the arrow in Figure 1. The pin 8 will then be pressed against the cap 11, and the tapered surface of this cap will press the upper part of the rubber block 10 inwardly; the force is then transmitted to the disc 16, causing the disc to press the center of the block outwardly to frictionally engage the inner surface of the housing 1.

The elongated slot 6 permits this action without moving the pull tube 3. If it is desired to adjust the control rod 5 to another position; for example, the pull tube 3 may be pulled upwardly. When this occurs the force is transmitted to the thrust disc 16, and thence to the upper portion of the rubber block 10. The control rod 5 is picked up when the thrust is transmitted to the cap 15 and to the pin 8, this movement causing a slight elongation in the rubber block 10, causing this block to contract and to move freely in the housing 1.

As soon as the pull tube 3 is released the previous wedging action first described is repeated. The same action occurs if the pull tube 3 is pushed downwardly except that the thrust disc 17 is brought into action and causes the movement and elongation of the rubber block 10.

Having described by invention I claim:

1. A frictional adjuster comprising a housing, a pull tube extending into the housing, a friction block surrounding the pull tube and positioned in the housing, wedging means at each end of the friction block, said pull tube having elongated slots positioned at each end of the friction block, a control rod extending into the pull tube, and pins extending through the control rod and through said slots and engaging said wedge means, said pins being positioned at each end of the friction block.

2. A frictional adjuster comprising a housing, a pull tube extending into the housing, a friction block surrounding the pull tube and positioned in the housing, wedging means at each end of the friction block, said pull tube having elongated slots positioned at each end of the friction block, a control rod extending into the pull tube, and pins extending through the control rod and through said slots and engaging said wedge means, said pins being positioned at each end of the friction block, and thrust means projecting from the pull tube into the friction block and engaging said friction block.

3. A frictional adjuster comprising elongated housing, a pull tube extending into one end of said housing, a control rod extending into the pull tube and projecting from the other end, means coupling the pull tube and the control rod, said control rod having a limited longitudinal movement relative to the pull tube, a friction block surrounding the pull tube within the housing, a wedge cap on each end of the friction block, and means on the control rod engaging each of the wedge caps.

4. A frictional adjuster comprising elongated housing, a pull tube extending into one end of said housing, a control rod extending into the pull tube and projecting from the other end, means coupling the pull tube and the control rod, said control rod having a limited longitudinal movement relative to the pull tube, a friction block surrounding the pull tube within the housing, a wedge cap on each end of the friction block, said means coupling the pull tube and the control rod engaging each of the wedge caps, a wedge block in each of the wedge caps and a pair of spaced thrust disks on the pull tube extending into and engaging the wedge block.

5. A frictional adjuster comprising an elongated housing, a pull tube extending in one end of the housing, a control rod extending into the pull tube and projecting from the other end of the housing, a friction block surrounding the pull tube within the housing, said pull tube having elongated slots adjacent each end of the friction block, a wedge cap mounted on each end of the friction block, a pin extending through the control rod and through said slots and engaging a wedge cap, and a pair of spaced thrust disks on the pull tube, said thrust disks extending into and engaging the friction block.

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