Dec. 4, 1951 C. DEMUTH 2,577,569

ADJUSTING DEVICE

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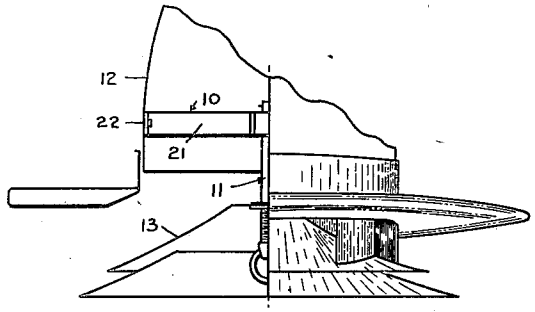


Fig. 1

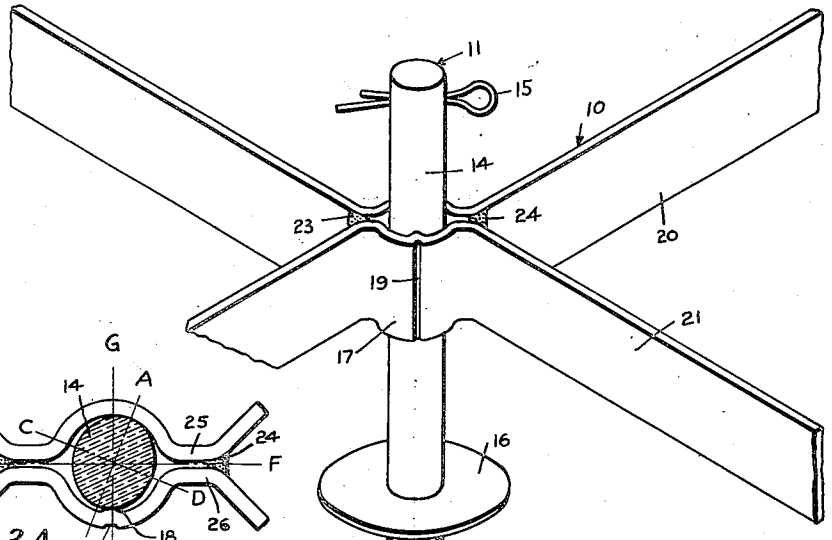


Fig. 2

Fig. 3A

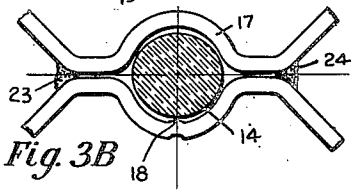


Fig. 3B

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ADJUSTING DEVICE

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2 Claims. (Cl. 74—531)

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This invention relates to adjusting devices wherein a movable part is movable with respect to a relatively fixed part to the desired degree of adjustment and then secured in adjusted position. The invention though useful in many environments furnishes a simple means ideally adapted for use in connection with a variable outlet air distributor, and hence an embodiment showing the invention adapted for this particular use will be described herein as illustrative of my invention.

In my Patent No. 2,367,104, issued January 9, 1945, there is disclosed a variable outlet air distributor comprising an adjusting device, and the present invention is in the nature of an improvement thereover.

An object of the present invention is to provide a greatly simplified adjusting device which may be economically manufactured and is capable of infinite increments of adjustment.

Another object of the invention is to provide an adjusting device which presents an improved mode of manipulation and durable in service.

Further objects and advantages of the invention will more fully appear from the following description taken in connection with the accompanying drawings which show, by way of example, the present preferred embodiment of the invention.

The invention consists of the novel feature, arrangement and combination of parts embodied by way of example in the structure hereinafter described as illustrating a present preferred form of the invention, and the invention will be more particularly pointed out in the appended claims.

Referring to the drawings:

Fig. 1 is a side elevation of an embodiment of my invention showing its adaptation for use in a variable volume air distributor;

Fig. 2 is a perspective view showing the adjusting elements per se on a somewhat enlarged scale, being approximately full size, with certain portions broken away;

Fig. 3A is a cross-sectional view illustrating the relative angular relationship of the parts shown in Fig. 2 in locked adjusted position; and

Fig. 3B is a similar view showing the parts in the position when free for relative adjusting operation.

Referring to the drawings, and more particularly to Fig. 1, 10 in general designates a relatively fixed part of the adjusting device and 11 in general designates a part which it is desired to move to adjusted position with respect to the part 10. In the present embodiment the fixed

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part 10 is rigidly secured to an air duct outlet 12 rigidly fixed in position, as on a ceiling (not shown; and the part 11 carries rigidly secured thereto a cone-shaped diffuser designated in general as 13 which it is desired to move upwardly and downwardly toward and away from the outlet 12 to desired adjusted position.

In the features essential to the present invention the member 11 comprises a shaft 14 which is of general oval cross-section (Fig. 3A) for an axial extent of its operable length, which in the present embodiment is determined by the cotter pin 15 and the flange 16 which serve as limit stops to engage the upper and lower surfaces of the adjacent portion of the member 10. The cross-section of the shaft 14 thus provides a major diameter (Fig. 3A) designated A—B and a minor diameter designated C—D, for the purposes to be more fully pointed out hereinafter. Likewise, the essential feature of the member 10 is the sleeve portion designated 17 through which the shaft 14 extends and with respect to which relative movement in an axial direction is desired for adjusting the parts to the desired position. In order to effect the desired locking of the parts in adjusted position the bore of the sleeve 17 is likewise provided with a major diameter (E—F) and a minor diameter (G—H). In the present embodiment the bore in general is defined by a cylinder whose diameter represents the maximum diameter of the bore and the minor diameter of the bore is provided by a protuberance 18 extending inwardly of the bore and between the inner surface of which and the diametrically opposite surface of the bore the minor axis is defined. This protuberance is preferably provided by inwardly deforming the sleeve 17 along the vertically extending narrow zone designated 19 (Fig. 2). In the preferred form the member 10 is shown as made of two metal strips 20 and 21, the outer ends of which are rigidly secured, as at 22, to the fixed duct outlet 12 (Fig. 1); each of the metal strips providing substantially rigidly extending oppositely disposed arms so that in all four arms are provided. Intermediate their ends the strips are bent and are permanently secured together by welding, as at 23—24 (Fig. 2). In the preferred form the strips are so bent and welded that the circular arcs of the strips, which together define the major bore of the sleeves 17, are bent to their respective arms by parallel portions, such as 25—26, which are spaced slightly apart so as to provide resiliency between the portions of the strips which define the sleeve. In order to augment this resiliency to the degree

preferred for the best results the strips 20—21 are made of spring steel or the like resilient material. The lower end of the member 11 is provided with a ring 27 which serves as a convenient means for engaging this member for the purpose of adjustment.

Operation

When it is desired to adjust the vertical position of the member 11 with respect to the member 10 the member 11 is engaged as by inserting the hook end of a pole to the ring 27 and angularly moving the member 11 so as to bring the oval shaft 14 in the angular relationship shown in Fig. 3B, at which time the member 14 is freely slidable axially in the bore of the sleeve 17, and then adjusting the member 11 to the desired position. When the desired position of adjustment is reached angular movement of the member 11 disposes the oval shaft 14 in the position indicated in Fig. 3A, in which position the member 11 is locked by the frictional engagement of the oval shaft 14 between the protuberance 18 and the opposite side of the bore of sleeve 17. In other words, with the major diameters of the shaft and sleeve in approximate alignment the members are free for relative movement one with respect to the other and when the major diameters of the shaft approaches a position of alignment with the minor diameters of the sleeve the parts are firmly secured together. It will be noted that in the preferred form a partial rotation of the shaft 14 in either direction causes this locking action to take place. Preferably, with the sleeve made of steel I have found it highly advantageous to make the shaft of a medium hard bronze to prevent undue wear of the parts and to provide improved gripping action between the members. It will be understood that conversely the strap members 20 and 21 may be made of bronze, preferably spring bronze and the shaft may be made of steel; in which event the bronze straps may be conveniently secured together by rivets or other means well known to those skilled in the art.

Having thus described my invention with particularity with reference to a presently preferred form of the same, it will be obvious to those skilled in the art after understanding the invention, that various changes and modifications may be made therein without departing from the scope of the invention, and it is my intention to cover in the appended claims such changes as come within the scope of the invention.

What I claim is:

1. In an adjusting device the combination of a shaft member and a sleeve member providing a bore through which said shaft extends, said shaft being of generally oval cross-section throughout its operable length, said bore having major and minor diameters greater than the respective major and minor diameters of said shaft, said sleeve comprising two sections each having a substantially semi-cylindrical portion with aligned diametrically opposed portions disposed as outwardly extending continuations thereof, the aligned portions of one section being spaced apart in a direction normal to the corresponding portions of the other section and being secured thereto at zones spaced outwardly from said semi-circular portions in the direction of said alignment, whereby said sleeve sections are resiliently yieldable for frictional engagement with said shaft when the latter is rotated to a position where its major diameter approaches alignment with the minor diameter of said sleeve, and said shaft is freely slidable through said sleeve bore in one angular position to provide for axial adjustment and is frictionally locked to said sleeve member in another angular position.

2. In an adjusting device the combination of a shaft member and a sleeve member providing a bore through which said shaft extends, one of said members being made of bronze and the other of steel, said shaft being of generally oval cross-section throughout its operable length, said bore having major and minor diameters greater than the respective major and minor diameters of said shaft, said sleeve comprising two spring strip sections each having a substantially semi-cylindrical portion with aligned diametrically opposed portions disposed as outwardly extending continuations thereof, said strip sections extending outwardly beyond said diametrically opposed aligned portions in generally radial divergent directions to provide four supporting arms, the aligned diametrically opposed portions of one section being spaced apart in a direction normal to the corresponding portions of the other section and being secured thereto at zones spaced outwardly from said semi-circular portions in the direction of said alignment, whereby said sleeve sections are resiliently yieldable for frictional engagement with said shaft when the latter is rotated to a position where its major diameter approaches alignment with the minor diameter of said sleeve, and said shaft is freely slidable through said sleeve bore in an angular position to provide for axial adjustment and is frictionally locked to said sleeve member in another angular position.

CHARLES DEMUTH.

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