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**GB 1128356**
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(54) **Device for Fastening Valve Housings**

(57) An arrangement is described for fastening a valve 14 to a rail 10 that is provided with at least one longitudinal bore 9 for carrying pressure medium to or from the valve 14. To enable the valve 14 to be secured to the rail 10 in a comparatively simple manner without the need for special tools, the valve 14 has a fastening projection 4 engaged by a U-shaped clip of the free ends 5 of which are engaged in a groove or slots 6 in the rail. The valve 14 has a valve opening constructed as a tubular extension 8 which is located in, and sealed to a transverse bore 7 in the rail 10, the transverse bore 7 being in connection with the longitudinally bore 9. The fastening projection 4 may be provided by a further valve opening which may also be connected to a further longitudinal bore in the rail. Preferably, there are two fastening projections engaged by respective clips which engage opposite sides of the rail.

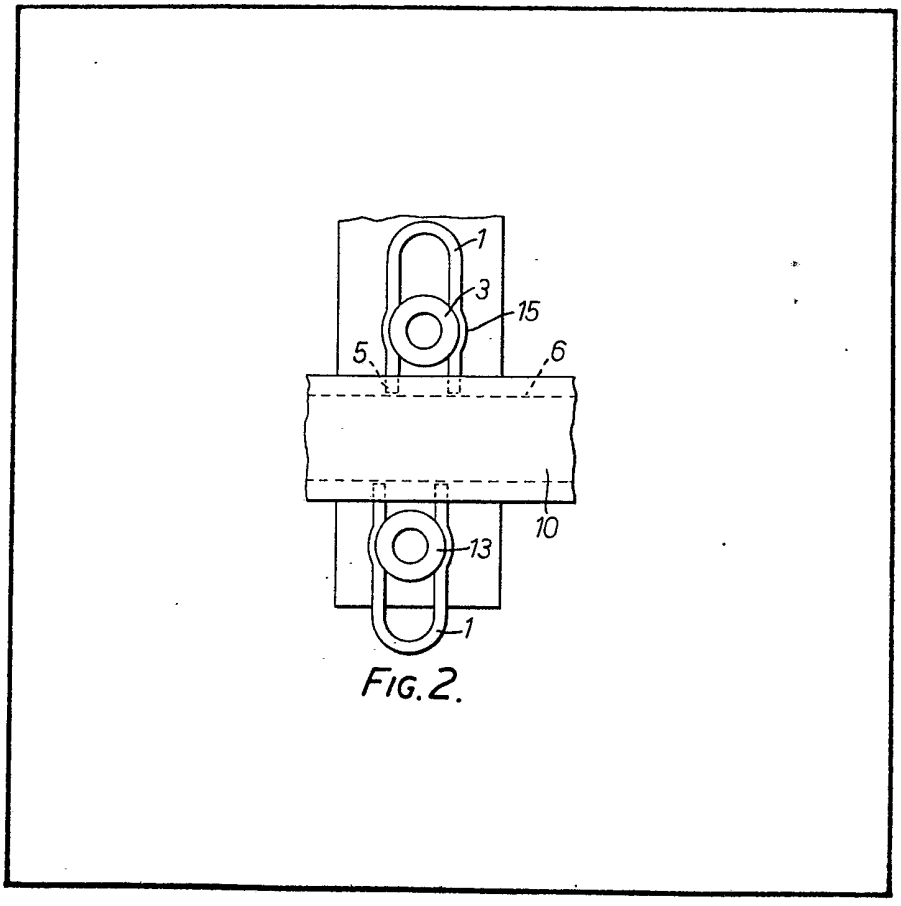

FIG. 2.

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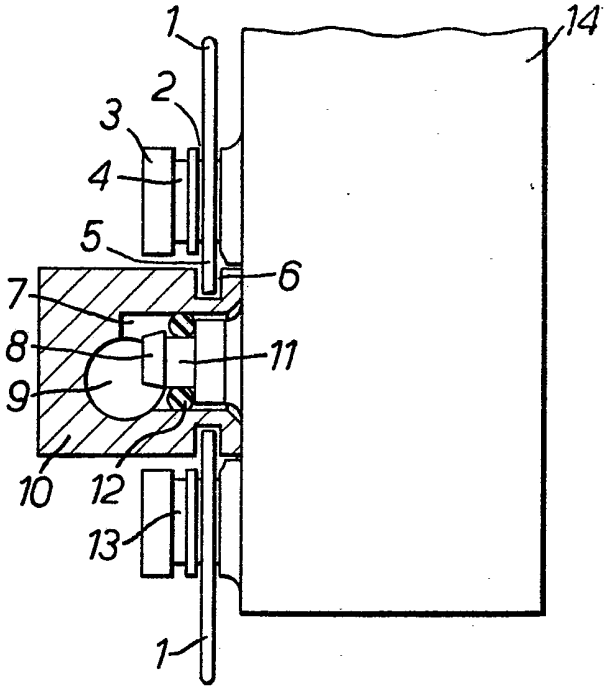


FIG. 1.

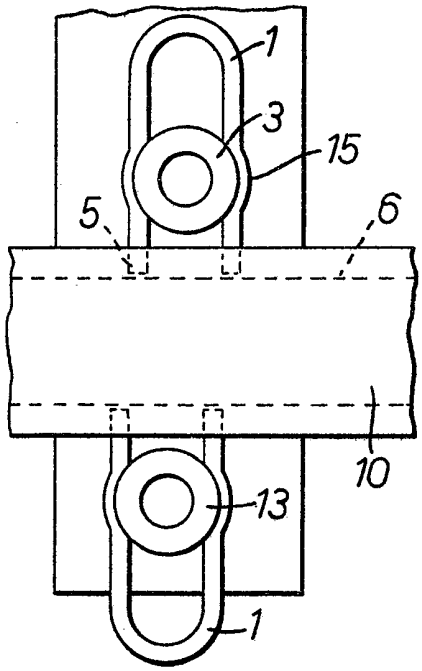


FIG. 2.

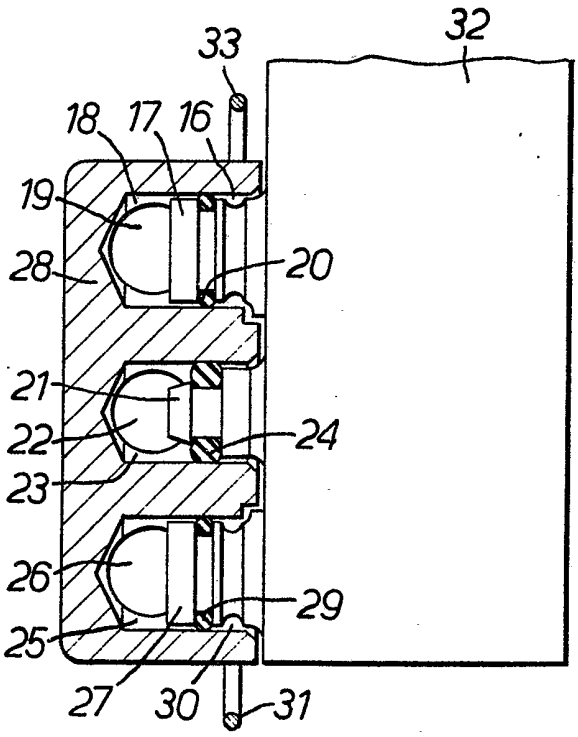


FIG. 3.

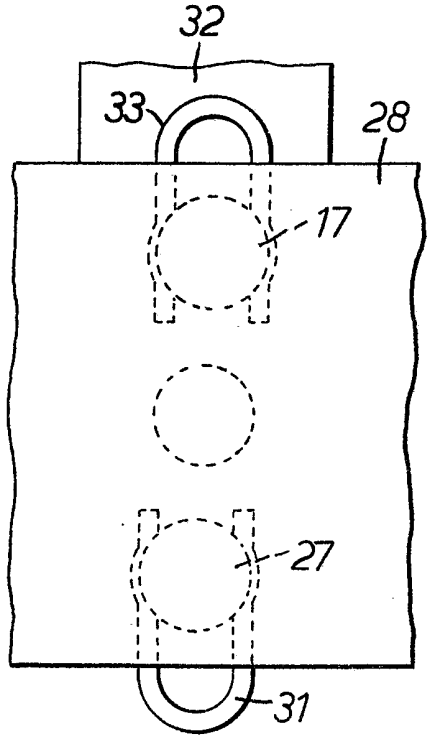


FIG. 4.

SPECIFICATION

**Device for Fastening Valve Housings**

The invention relates to an arrangement for fastening a valve or valve housing to a rail having at least one longitudinal bore through which pressure medium is conducted to or from the valve.

Rails of the kind mentioned have, therefore, to fulfil essentially two functions. Firstly, they serve as carrier elements for the valve housings fastened to them, and secondly they serve to join the valves to lines for admitting or carrying away pressure medium. For these reasons there are basically two functions that emerge in fastening a valve housing to one of the described rails. On the one hand the purely mechanical fastening of the valve housing must be ensured, and on the other hand an adequate seal between the valve housing and the rail must be achieved.

A known arrangement for fastening a valve housing to a rail utilized a hollow screw, which simultaneously serves as a short pressure medium line, and which is guided through a transverse bore in the rail, into an opening in the valve housing that is provided with an internal thread and serves to conduct pressure medium between the valve and a longitudinal bore in the rail. The required seal in this known arrangement is effected by means of two packing washers, one of which is arranged between the head of the hollow screw and the valve housing and the other of which is arranged between the rail and the valve housing.

One could consider reducing the number of seals required by using separate fastening screws instead of the hollow screw mentioned and by providing a tubular extension for the pressure medium connection, this tubular extension being installed in a recess opening through into the longitudinal bore of the rail. In this case, a seal arranged between the tubular extension and the rail is adequate to provide the seal. The use of fastening screws, however, means considerable expense, and assembly in particular is relatively time-consuming.

The invention is directed to the problem of producing a fastening device which enables the disadvantages of the previously described devices to be overcome and which, by using simple fastening means that are easy and quick to mount, enables a simple and relatively inexpensive seal to be used.

The present invention provides an arrangement for fastening a valve or valve housing to a rail that is provided with at least one longitudinal bore for carrying pressure medium to or from the valve, in which arrangement the valve or valve housing is provided with at least one fastening projection for receiving a fastening clip and the rail has a recess for receiving at least one free end of the fastening clip.

The invention is explained in greater detail, by way of example, with reference to two embodiments that are illustrated in the drawings, in which:

Figs. 1 and 2 show different views of a fastening device according to the invention with a rail that has only one longitudinal bore, and

Figs. 3 and 4 show different views of a fastening device according to the invention with a rail that has three longitudinal bores.

Fig. 1 shows a device for fastening a valve or valve housing 14 to a rail 10. The valve housing 14 has three openings for joining the particular valve to three corresponding lines for admitting and carrying away pressure medium. These openings in the valve housing are constructed as tubular extensions 4, 8 and 13 which thus serve as valve connections.

Two of the connections, 4 and 13, are provided with union nuts, for example 3 in the case of connection 4, which are suitable for fastening pressure medium lines (not shown).

The rail 10 serves to connect the third valve connection, 8, to a pressure medium line, and this carries out the two following functions for the valve 14 and, possibly, one or several other identical or similar valve (not shown). Firstly, the rail serves as a carrier rail or carrier plate for the valves fastened to it. Secondly, by means of a longitudinal bore 9 it serves as the connecting line between the connection 8 of the valve 14 (and corresponding connections of other valves) and a pressure medium line.

For the mechanical fastening of the valve 14 to the rail 10, the valve connections 4 and 13 are used also as fastening projections although, as an alternative, fastening projections which are additional to, and do not function as valve connections may be provided. The connections 4 and 13 are of identical construction so that in the following text reference need to be made only to the connection 4.

On two opposite sides of its periphery the connection 4 has depressions for receiving a U-shaped fastening clip 1. The said depressions are formed in the example illustrated by an annular groove 2.

The clip 1 is of such a size that, in the position shown, it lies prestressed against the connection 4. The clip 1 is furthermore so arranged that its free ends 5 point towards the rail 10 and are located in a groove 6 in the rail 10. In this manner the clip is joined by friction on the one hand to the connection 4 and on the other hand to the rail 10. The valve 14 is therefore adequately secured to the rail 10.

It will be noted that the clip 1 can be mounted simply and quickly. Special tools are not required for the mounting or dismantling since it is necessary only to move apart the two resilient limbs of the clip.

To connect the connection 8 of the valve 14 to the longitudinal bore 9 of the rail 10, the rail 10 is provided with a transverse bore 7 which opens through into the longitudinal bore 9 and is so dimensioned that it is able to receive the connection 8. A single O-ring 12 which lies in an

annular groove 11 of the connection 8 is provided as the seal between the valve 14 and the rail 10. This kind of seal is relatively inexpensive.

Fig. 2 illustrates a side view from the left onto the device shown in Fig. 1. It can be seen that the groove 6 for receiving the free ends 5 of the clips 1 extends along the length of the rail 10. Instead of the groove, suitable recesses, for example slots, could be provided on the rail 10. The free ends 5 of the clips 1 may also be bent in order to improve the friction-type connection between the clips 1 and the rail 10.

To improve the friction-type connection between the clips 1 and the connections 4 and 13, the clips 1 have bulges 15, at those places at which they touch the connections, which bulges are advantageously adapted to fit the shape of the connections.

The rail 10 may serve to connect the valve 14 to a compressed air line, in which case the connections 4 and 13 may advantageously act as air vents.

It will be apparent that, for the device described, only relatively few additional structural modifications to the valve 14 have been carried out. In those instances in which the valve 14 also has applications in which it is not fastened to a rail of the kind described, this means that there is no appreciable needless expense. It is, if desired, also possible to manage with only one clip.

Fig. 3 illustrates a device for fastening a valve or valve housing 32 to a rail 28. The valve 32 has three connections 17, 21 and 27 which are joined to corresponding pressure medium lines (not shown) by way of the rail 28.

The rail 28 has three longitudinal bores 19, 22 and 26 for this purpose into which three transverse bores 18, 23 and 25 open. The transverse bores receive the connections 17, 21 and 27 of the valve housing, the connections being sealed with respect to the rail 28 by respective O-rings 20, 24 and 29. The said O-rings lie in annular grooves of the associated connections.

To fasten the valve 32 to the rail 28 there are provided two U-shaped clips 33 and 31, to which the description relating to the clips 1 of Figures 1 and 2 also substantially applies. The clips 33 and 31 are inserted in openings in the rail 28. Their free ends lie in recesses in the rail 28 so that a friction-type connection between the rail 28 and the clips 33 and 31 is ensured.

With their middle section, the limbs of the clips 33 and 31 lie in annular grooves 16 and 30 of the connections 19 and 27. In this manner the clips 33 and 31 are connected by friction with the valve 32. The view from the left onto the device shown in Fig. 3 and illustrated in Fig. 4 shows the mutual arrangement of the clips 33 and 31 in the rail 28. It goes without saying that the rail 28 may also serve to carry further valves.

**Claims**

1. An arrangement for fastening a valve or valve housing to a rail that is provided with at least one longitudinal bore for carrying pressure medium to or from the valve, in which arrangement the valve or valve housing is provided with at least one fastening projection for receiving a fastening clip and the rail has a recess for receiving at least one free end of the fastening clip.

2. An arrangement according to claim 1, in which the valve or valve housing has a valve opening constructed as a tubular extension which is locatable in a transverse bore of the rail, the transverse bore being in connection with the longitudinal bore of the rail.

3. An arrangement according to claim 2, in which the tubular extension carries means for sealing the extension to the rail.

4. An arrangement according to claim 2 or claim 3, in which the tubular extension has an annular groove for receiving the sealing means.

5. An arrangement according to any one of the preceding claims, in which the fastening projection is formed by an opening of the valve or valve housing.

6. An arrangement according to any one of the preceding claims, in which the fastening projection has a groove for receiving the fastening clip.

7. An arrangement according to claim 6, in which the fastening projection is tubular and the groove is an annular groove.

8. An arrangement according to any one of the preceding claims, in which the fastening clip is of U-shaped construction and shaped to engage resiliently the fastening projection.

9. An arrangement according to claim 8, in which the clip is shaped to be fastened to the fastening projection by moving apart the limbs of the clip.

10. An arrangement according to claim 8 or claim 9, in which the rail is provided with a groove for receiving the free ends of the fastening clip.

11. An arrangement according to any one of claims 8 to 10, in which the fastening clip has an outwardly-directed bulge in the region at which the clip engages the fastening projection.

12. An arrangement according to any one of the preceding claims, in which the valve or valve housing has two fastening projections for receiving respective fastening clips for location on different sides of the rail.

13. An arrangement according to claim 8 or claim 9, in which the rail is provided with slots for receiving the free ends of the fastening clip.

14. An arrangement according to claim 5, in which the fastening projection is provided with an external thread for receiving a union nut.

15. An arrangement according to claim 5, in which the longitudinal bore of the rail serves to connect the valve to a compressed air line, and the fastening projection is an air ventilation means.

16. An arrangement according to claim 1, in which the valve or valve housing has three valve openings and the rail has three longitudinal bores for carrying pressure medium to or from the valve,

each of the valve openings being constructed as a tubular extension which is locatable in a respective transverse bore of the rail, each transverse bore being in connection with a respective one of the longitudinal bores of the rail, and the rail having recesses that are so dimensioned and so arranged that two fastening clips may be introduced into the recesses on opposite sides of the rail, which fastening clips in their final position are each in frictional engagement with a respective one of the tubular extensions and with the rail.

17. An arrangement for fastening a valve or valve housing to a rail, the arrangement being substantially as described herein with reference to, and as shown in, Figs. 1 and 2 or Figs. 3 and 4 of the accompanying drawings.

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