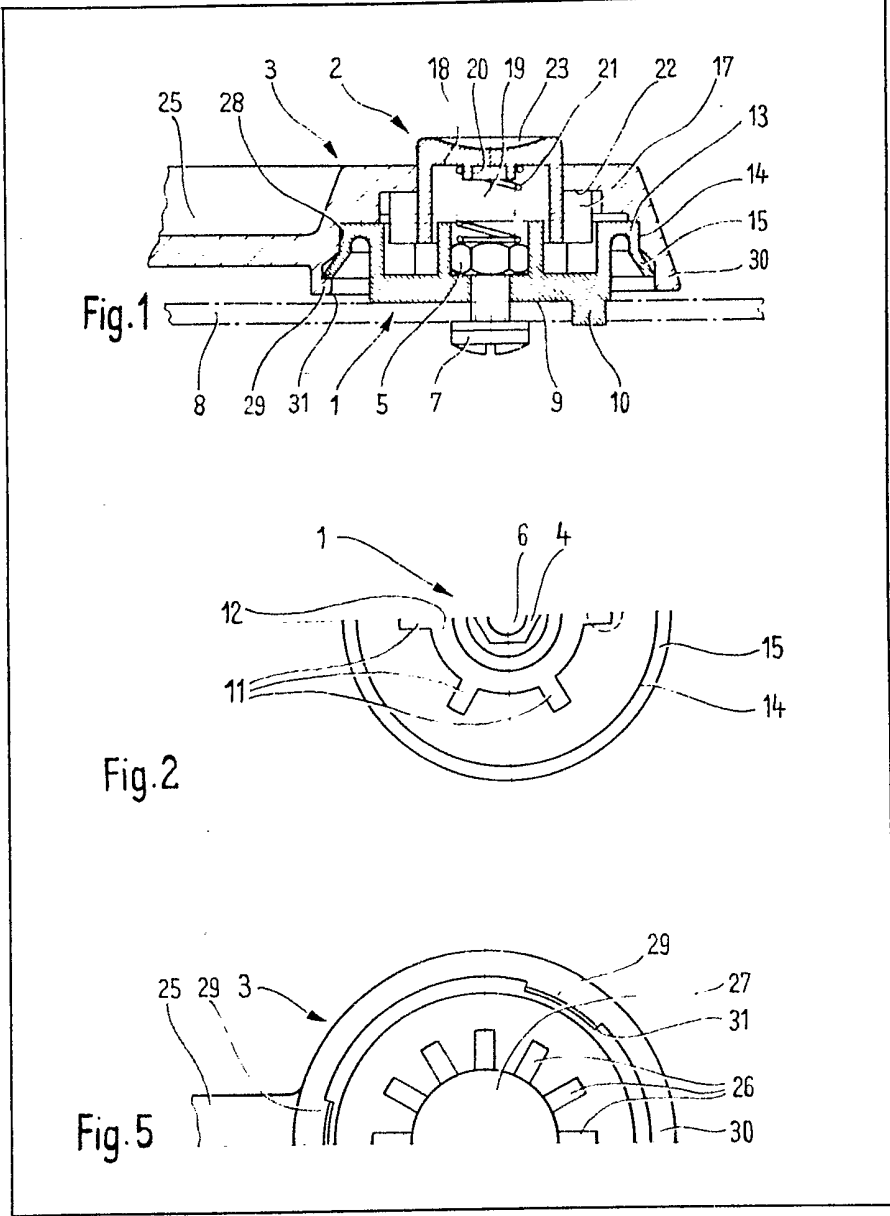


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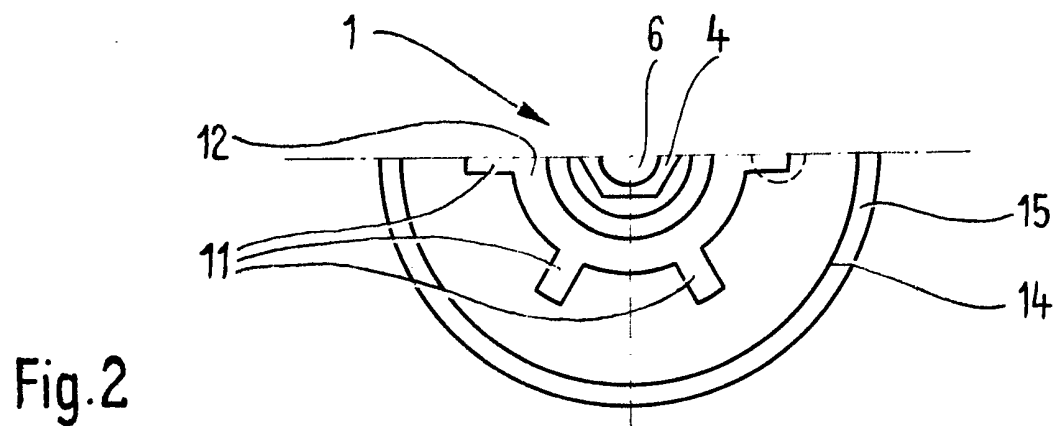
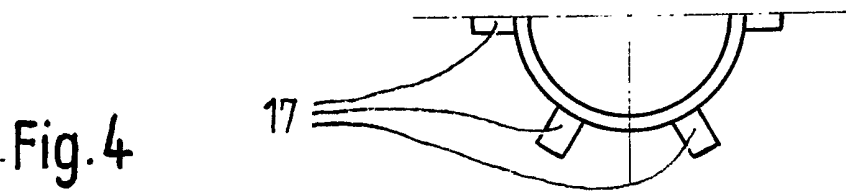
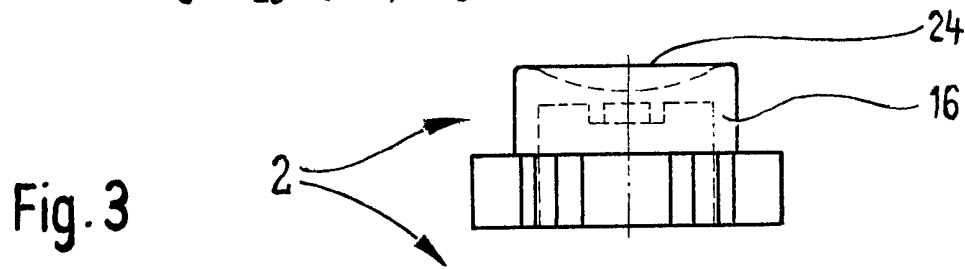
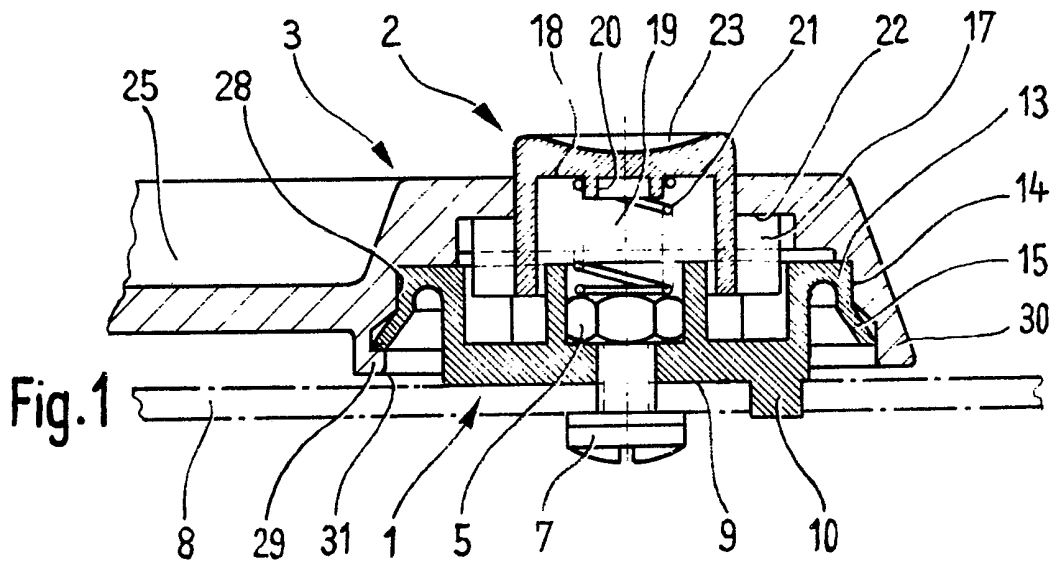
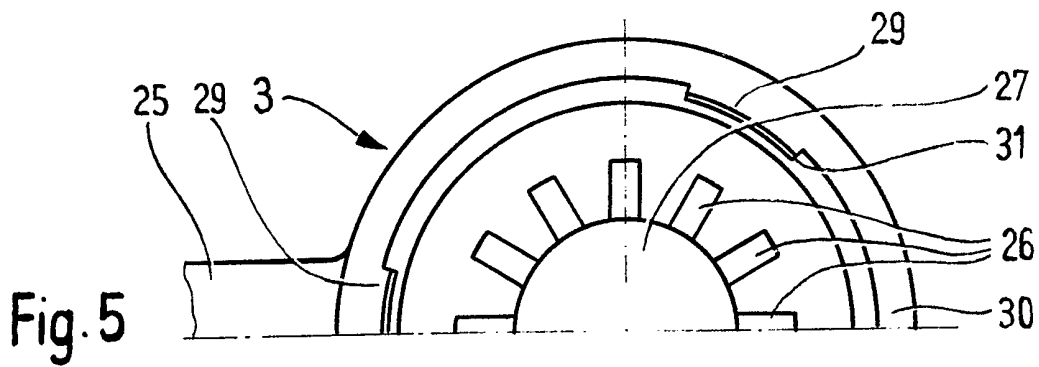
(54) Hinge connection

(57) A hinge connection for a swivelling carrying handle, usable as a stand, for the housings of electrical and electronic equipment, comprises a hinge lug 1, which has a ring of latching grooves 11 and a bearing ring 13; an actuating button 2 which engages by means of projections 17 in the hinge lug 1 and is loaded by a spring 21; a hinge head 3, on the end of handle arm 25 and which carries a ring of internal latching grooves 26

co-operating with the projections 17, and a bearing-ring bush 28. An easily assembled hinge connection is obtained in that projections 17 are axially displaceable in the grooves 11, 26, the button being pressed in to disengage the projections from the head grooves 26 so as to permit rotation of arm 25. The lug 1 and head 3 are interconnected by a tapering annular rim 15, on the hinge lug 1, and at least three inwardly extending claws 29 on the hinge head 3 which overlap the annular rim 15.



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SPECIFICATION

Hinge connection

The invention concerns a hinge connection for a swivelling carrying handle, usable as a stand, for the housings of electrical and electronic equipment and having a pressure-releasable latching device. The proposed hinge connection is used mainly for the housings of portable electrical and electronic measuring instruments.

Portable measuring instruments and radio equipment contained in cases are usually provided with a carrying handle extending over the entire width of the housing and fixed at the sides. If the operating and reading devices of such instruments are arranged on their upper narrow face, it is necessary to have a stand means which enable the instruments to be read and operated in one or more inclined positions of the instrument.

It is known to use the carrying handle as the stand means for measuring and radio equipment of the above-mentioned type of construction. For this purpose, the hinge connections of the carrying handle are provided with latching devices which immobilize the carrying handle in the carrying position, i.e. in the direction of the plane of the housing, on the one hand, and in various inclined positions on the other.

German Offenlegungsschrift 28 56 879 discloses a bowed carrying handle which incorporates a latching device and which comprises a hinge lug, a hinge head and an actuating button which, within a small space, has an inner and an outer ring of latching members which engage in the hinge lug and in the hinge head. Since, however, a bayonet connection is provided for connecting the hinge head to the hinge lug, the bowed carrying handle cannot be moved into any required angular position, and assembly is not altogether simple since for this purpose the parts have to be moved into a predetermined position; furthermore, there is a limit to the load that can be applied to the latching device because of the need for the inner ring of latching members to be restricted to a small radius.

The object of the invention is to provide a construction of easily assembled hinge connections for a carrying handle which is equipped with a latching device and which can be brought into desired angular positions.

According to the invention there is provided a hinge connection for a swivelling carrying handle, usable as a stand means, for the housings of electrical and electronic equipment and having a pressure-releasable latching device, which hinge connection consists of: a hinge lug which can be secured to the housing to rotate therewith and which comprises a ring of latching members and a bearing ring; an actuating button which engages by way of projections in the hinge lug and is axially displaceable under the action of a spring element; a hinge head which is mounted at the end of each arm of the carrying handle and which carries a ring of inner latching elements, co-operating with the

projections, as well as a bearing-ring bush; and fixing members serving to hold the hinge head on the hinge lug, wherein the hinge lug comprises latching members formed by radial grooves in a symmetrical star-like arrangement, the actuating button carries projections in the form of a star-like arrangement of teeth which are axially displaceable in the grooves and which engage in the latching elements of the hinge head, and the fixing members are constituted by an annular rim, which is provided on the hinge lug and tapers downwardly, as well as by at least three claws, arranged on the hinge head, which extend inwardly and overlap the annular rim. Assembly of these parts is very simple and completely uncomplicated, since, on the one hand, the actuating button has only a star-like arrangement of teeth and, on the other hand, a snap-action connection between the hinge lug and the hinge head is formed by the annular edge and the claws which overlap this edge, which connection, when pressure is simply applied, interconnects these parts rapidly and, as has been found, unreleasably.

The grooves in the hinge lug expediently communicate with an annular groove, in which engages the wall of the actuating button which has a cylindrical recess in which is accommodated the spring element. These measures ensure that the actuating button, when depressed, is guided in an efficient manner.

For design reasons, the annular rim of the hinge lug is preferably arranged to lie against its bearing ring.

Considerable advantage accrues if the number of grooves in the hinge lug and the number of teeth on the actuating button are half the number of latching elements provided in the hinge head; this results in a press tool that is relatively easy to produce.

An annular holder, carrying the claws, can be fitted on the bearing-ring bush of the hinge head.

For reasons of strength, the claws should be angularly spaced from each other to the extent of at least 20°.

To facilitate the fixing of the hinge lug on the housing, a hexagonal depression, with which communicates a centrally arranged fixing orifice, is formed in the hinge lug.

The invention will now be described in greater detail by reference to an example of construction illustrated in the accompanying drawings, in which:—

Figure 1 shows, in cross-section, an assembled hinge connection secured to a wall of a housing, the arm of the carrying handle being shown as broken away;

Figure 2 shows, in halved plan view, the lugs of the Figure 1 hinge connection;

Figure 3 is a side view of the actuating button of the Figure 1 hinge connection;

Figure 4 is a halved plan view of the actuating button of the Figure 3 hinge connection; and

Figure 5 is a halved plan view of the head of the Figure 1 hinge connection.

Referring to the drawings, the hinge connection consists mainly of a hinge lug 1, an actuating button 2 and a hinge head 3. The hinge lug 1, the actuating button 2 and the hinge head 3 are produced in one piece from a suitable plastics material by a moulding operation.

The hinge lug 1 has the shape of a short cylinder. Located at the centre of this hinge lug 1 (Figure 1) is a rectangular depression 4, in which is disposed a hexagonal nut (Figure 1). Communicating with the depression 4 is a centrally arranged fixing orifice 6, through which extends a fixing screw 7 with the aid of which the hinge lug 1 is secured to a wall 8 of the housing. A stud 10, projecting from the lower face 9 of the hinge lug 1, engages in an opening in the wall 8, so that twisting of the hinge lug 1 is prevented.

The hinge lug 1 has a ring of latching members in the form of radial grooves 11 (Figure 2) which are disposed in a symmetrical star-like arrangement and which each form an angle of 60° with an adjacent groove. These six grooves 11 communicates with an annular groove 12, the grooves 11 and the annular groove 12 being of the same depth.

The hinge lug 1 has a bearing ring 13, which has a cylindrical outer surface 14. Adjoining the bearing ring 13 is an annular rim 15 which tapers inwardly.

The actuating button 2, having a cylindrical body 16, carries on its wall a star-like arrangement of teeth 17 which extend radially outwards (Figures 3 and 4). The end face 18 of a cylindrical recess 19 in the actuating button 2 carries a circular rib 20.

Within the recess 19 in the actuating button 2 is a prestressed spring element 21 in the form of a cylindrical compression spring which, centred by the rib 20, bears against the end face 18 by one of its ends and on the hexagonal nut 5 by the other. The spring element 21 urges the actuating button 2 against the hinge head 3, the teeth 17 of the actuating button 2 bearing against the inner cover 22 of the hinge head 3 (see Figure 1). A shallow hollow 23 formed in the top 24 of the actuating button 2 prevents slipping of the finger when depressing the button 2.

The hinge head 3 is mounted (see Figure 5) on the end of each of the two arms 25 of the carrying handle of the housing. It has a ring of interior groove-like radially arranged latching elements 26 which communicates with a circular opening 27. Each two adjacent latching elements 26 are disposed at an angle of 30° from each other, and in the upper position of the actuating button 2, one of its teeth 17 engages in each alternate latching element 26.

The hinge head 3 carries a short cylindrical bearing-ring bush 28, in which the bearing ring 13 of the hinge lug 1 rotates by way of its outer face 14. Fixing members in the form of three claws 29 serve to hold the hinge head 3 on the hinge lug 1. These claws 29 are arranged on the edge of a ring 30 for retaining the hinge head 3; the claws 29 extend inwardly and each of them is separated

from adjacent claws by an angular distance of 30°. The claws 29 overlap the annular rim 13 of the hinge lug 1 and their inner edges are bevelled at 31 to facilitate introduction of the hinge lug 1 into the head 3.

The hinge head 3 is connected to the hinge lug 1 by a non-releasable snap-action connection, one part of which is formed by the tapered annular rim 15 of the hinge lug 1 and the other by the three inwardly extending claws 31 of the hinge head 3. After the hexagonal nut 5 has been fitted in the hexagonal depression 4 in the hinge lug 1, and the spring element 21 has been placed in the recess 19 in the actuating button 2, and when the actuating button 2 has been mounted on the hinge lug 1 by introduction of the teeth 17 of the button 2 into the grooves 11 in the hinge lug 1, the unit so formed is introduced into the hinge head 3 and is depressed with sufficient force to cause the three claws 29 to snap over the tapered annular rim 15, this being rendered possible by the elasticity of the retaining ring 30, on the one hand, and that of the annular rim 15, on the other. The hinge lug 1 and the hinge head 3 are then interconnected in a non-releasable manner. If an effort is made to separate the hinge head 3 from the hinge lug 1, the tapered annular rim 15 spreads outwardly under the action of the claws 29 so that the connection is further strengthened.

The hinge head 3 can be swivelled as required relatively to the hinge lug 1 in both rotary directions as long as the actuating button 2 remains depressed, and this causes its teeth 17 to move away from the latching elements 26 of the hinge head 3 and to disappear completely into the grooves 11 in the hinge lug 1.

Fixing of the carrying handle, equipped with the proposed pre-assembled hinge connection, on the housing could not be simpler: irrespective of position, it is carried out by introducing the studs 10 into the openings in the wall 8 that are provided for the purpose and by tightening up with the aid of the fixing screws 7.

CLAIMS

1. A hinge connection for a swivelling carrying handle, usable as a stand means, for the housings of electrical and electronic equipment and having a pressure-releasable latching device, which hinge connection consists of: a hinge lug which can be secured to the housing to rotate therewith and which comprises a ring of latching members and a bearing ring; an actuating button which engages by way of projections in the hinge lug and is axially displaceable under the action of a spring element; a hinge head which is mounted at the end of each arm of the carrying handle and which carries a ring of inner latching elements, co-operating with the projections, as well as a bearing-ring bush; and fixing members serving to hold the hinge head on the hinge lug, wherein the hinge lug comprises latching members formed by radial grooves in a symmetrical star-like arrangement, the actuating button carries projections in the form of a star-like arrangement of teeth which are axially

- displaceable in the grooves and which engage in the latching elements of the hinge head, and the fixing members are constituted by an annular rim, which is provided on the hinge lug and tapers downwardly, as well as by at least three claws, arranged on the hinge head, which extend inwardly and overlap the annular rim.
- 5 2. A hinge connection according to claim 1, wherein the grooves in the hinge lug communicate with an annular groove, in which engages the wall of the actuating button which has a cylindrical recess in which is accommodated the spring element.
- 10 3. A hinge connection according to claim 1, wherein the annular rim of the hinge lug is arranged to lie against its bearing ring.
- 15 4. A hinge connection according to any one of claims 1 to 3, wherein the number of grooves in the hinge lug and the number of teeth on the actuating button are half the number of latching elements provided in the hinge head.
- 20 5. A hinge connection according to any one of claims 1 to 4, wherein an annular holder, carrying the claws, is fitted on the bearing-ring bush of the hinge head.
- 25 6. A hinge connection according to any one of claims 1 to 5, wherein the claws are angularly spaced from each other to the extent of at least 20°.
- 30 7. A hinge connection according to any one of claims 1 to 6, wherein a hexagonal depression, with which communicates a centrally arranged fixing orifice is formed in the hinge lug.
- 35 8. A hinge connection substantially as hereinbefore described with reference to the accompanying drawings.