

[54] DRAFTSMAN COMPASSES  
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33/152 R, 153 R

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[57] ABSTRACT  
Draftsman compass having links pivoted at one end to the leg of the compass, respectively, and at the other end to one another through a pivotal connection guided in rectilinear grooves formed in the inner faces of two branches of an inverted U-shaped member to which the legs of the compass are pivoted, the arrangement being such that the links remain invisible, or substantially invisible, irrespective of the degree of divergence of the compass legs.

4 Claims, 5 Drawing Figures

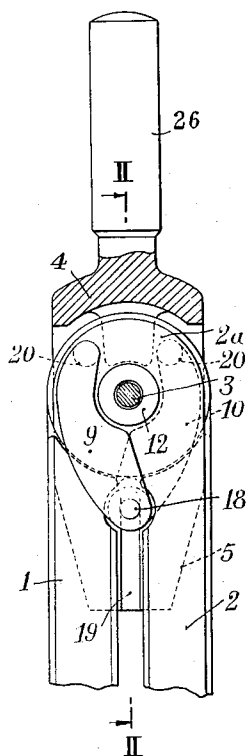
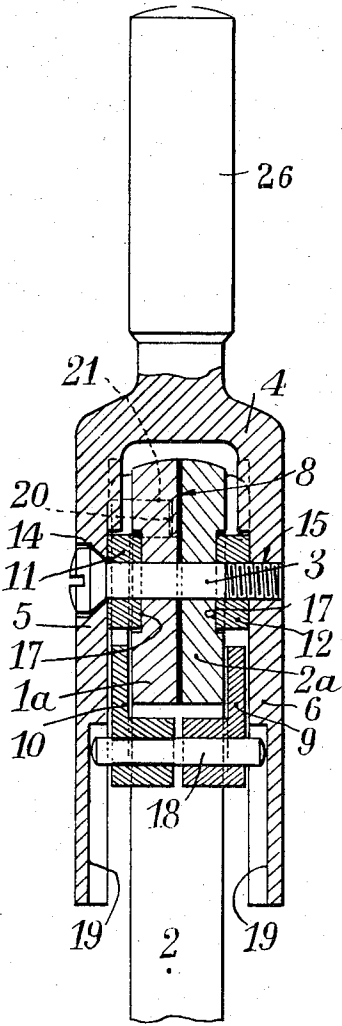
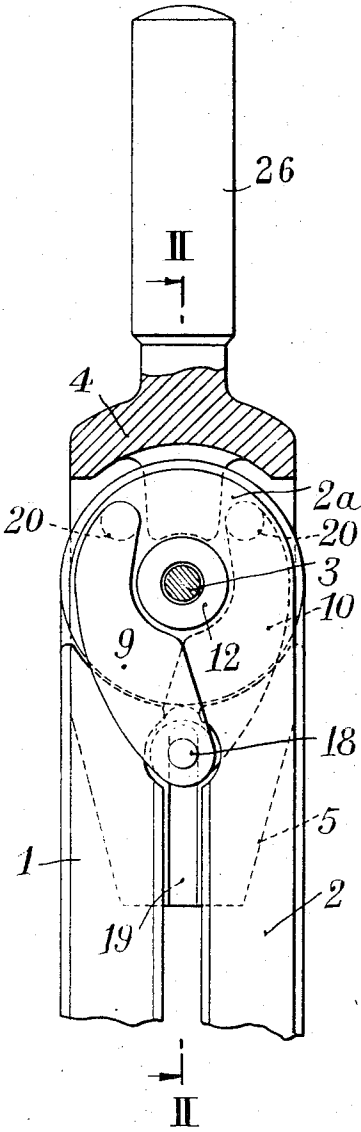
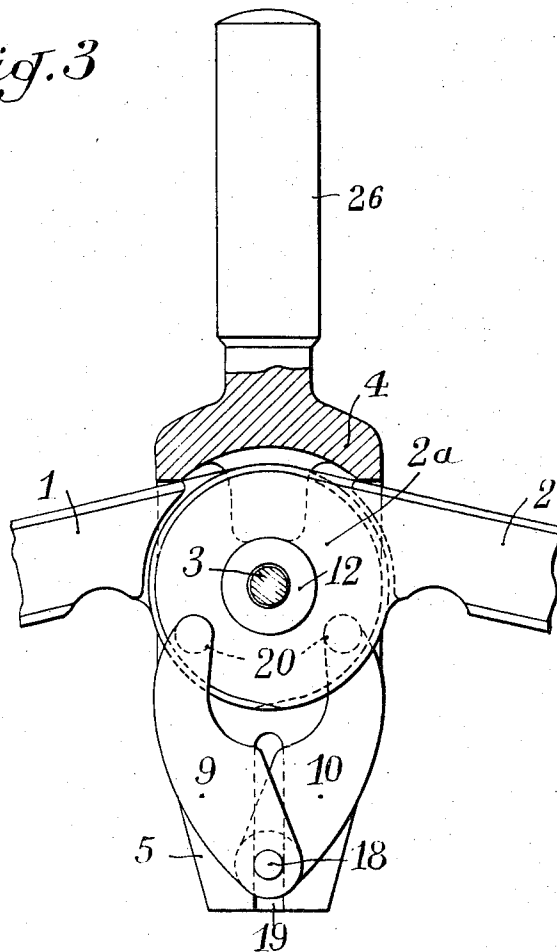


Fig. 1

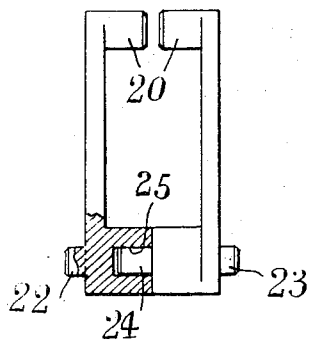
Fig. 2



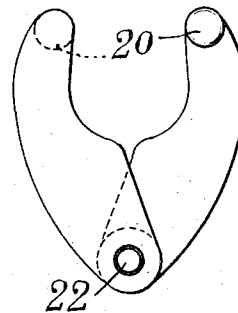
*Fig. 3*



*Fig. 4*



*Fig. 5*



## DRAFTSMAN COMPASSES

## BACKGROUND OF THE INVENTION

The present invention relates in general to pairs of compasses for draftsmen and has specific reference to improvements in the pivotal connection of the two legs of the compasses, which is designed to permit angular opening and closing movements of the compass legs that are symmetric in relation to the longitudinal axis of the gripping knob usually provided at the top of the head or inverted U-shaped member in which the two compass legs are hingedly interconnected.

Pairs of compasses comprising hinge means of this character are already known, wherein a pair of links are each pivoted at one end to a respective compass leg and at the opposite end to each other through linkage means guided in grooves formed in the lateral two legs or branches of said inverted U-shaped member, said groove extending parallel to said longitudinal axis of the gripping knob.

However, in compasses provided with hinged means of the general type set forth in the preceding paragraph the links are so disposed that, in addition to the inconvenience of the bulky appearance of the hinge system, said links are visible during the angular opening and closing movements of the legs, thereby unfavourably affecting the general aesthetic appearance of the compasses.

## SUMMARY OF THE INVENTION

It is therefore a primary object of the present invention to avoid these inconveniences by providing a pair of compasses comprising hinge means of the general type set forth hereinabove but characterized by a particularly compact appearance and having its two links invisible or nearly invisible during the opening and closing movements of the compass legs.

To this end, the draftsman compasses according to this invention, which comprise an inverted U-shaped member provided with a gripping knob extending in a direction opposite to that of the two lateral branches of said inverted U-shaped member, a pair of legs each provided at one end with a circular flange somewhat thinner than the leg proper and formed with a central hole, the circular flanges of said legs being disposed between the lateral branches of said inverted U-shaped member and pivoted thereto by means of a screw extending in succession through a hole formed in a first one of said lateral branches, a hole formed centrally of a first spacing washer, the central holes of said pair of circular flanges, a hole formed centrally of a second spacing washer, and finally a tapped hole formed through the second lateral branch of said inverted U-shaped member, said tapped hole being axially aligned with the hole in said first lateral branch, said first and second spacing washers providing gaps between said first lateral branch and the circular flange adjacent thereto and between the second lateral branch and the other circular flange adjacent thereto, respectively, and flat links disposed in said gaps and each pivoted at one end to a respective compass leg and at the opposite end to one another through a pivotal connection guided in rectilinear grooves formed in the inner faces of said lateral branches, respectively, and parallel to the longitudinal axis of said gripping knob of said inverted U-shaped member, is characterized in that said links have

an arcuate shape and are pivoted to the circular flanges of said compass legs at points thereof which are so located eccentrically with respect to the centre of said circular flanges that, in the closed position of the compass legs, the pivot centre of said legs, which is coincident with the screw axis, as viewed from one end thereof, lies inside the triangle formed between the two pivot points of said links in relation to said circular flanges and the pivot point corresponding to the guided pivotal connection between said pair of links.

With this arrangement, in contrast to known hinge systems wherein the links constituted the sides of a convex deformable quadrilateral, the present invention provides a concave deformable quadrilateral which, in combination with the arcuate shape of the links, not only reduces the over-all dimensions of the hinge system but confines said links within the contours of the two lateral branches of said inverted U-shaped member in order to conceal or substantially conceal said links irrespective of the angular position of the compass legs.

## BRIEF DESCRIPTION OF THE DRAWINGS

A preferred embodiment of this invention will now be described in detail by way of example with reference to the attached drawings, in which:

FIG. 1 is a part-sectional and fragmentary elevational view of the compass in its closed position;

FIG. 2 is a cross-section taken along the line II—II of FIG. 1;

FIG. 3 is a view similar to FIG. 1 but showing the compass in its open position; and

FIGS. 4 and 5 are detail views showing a modified embodiment of the pair of guide links.

## DESCRIPTION OF THE PREFERRED EMBODIMENT

As illustrated in FIGS. 1 to 3 of the drawings, the compass legs 1 and 2 of the draftsman compass are pivotally interconnected by means of a pair of relatively thin circular flanges 1a, 2a between which a friction washer 8 is disposed. These legs are assembled by means of a screw 3 extending in succession through a hole 14 formed in one of the lateral branches 5 of an inverted U-shaped member 4, a hole formed centrally of a first spacing washer 11, holes formed centrally of the circular flanges 1a and 2a, and a hole formed centrally of a second spacing washer 12, and finally engaging a tapped hole 15 formed through the other lateral branch 6 and axially aligned with hole 14. The spacing washers 11 and 12 are partially engaged in shallow circular recesses 17 formed centrally of the outer faces of said circular flanges 1a and 2a.

In the gaps left between the lateral branch 5 and flange 1a, on the one hand, and between the lateral branch 6 and flange 2a, on the other hand, a pair of flat links 9 and 10 are disposed; the lower ends of these links are pivoted to a common pivot pin 18 having its ends slidably engaged in gaged guide grooves 19 formed in the inner face of the lateral branches 5 and 6 in a direction parallel to the longitudinal axis of the gripping knob 26 of the inverted U-shaped member 4. Integral with each link 9, 10 on the side thereof facing the adjacent circular flange 1a or 2a, a cylindrical stud 20 is provided which engages a cylindrical blind hole 21 of corresponding diameter, formed in the outer face of the adjacent circular flange to permit movements of

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the link in relation thereto. The blind holes 21 are formed at such eccentric locations in relation to said circular flanges, that in the closed compass leg position illustrated in FIG. 1, the pivot centre of the compass legs, which is coincident with the axis of screw 3, as viewed from one end thereof, lies within a triangle having as its vertices the two pivot points (20, 21) of the links on said circular flanges and the pivot point coincident with the axis of pin 18, as clearly shown in FIG. 1. With this arrangement, and as clearly apparent from FIG. 1, the links 9 and 10 must have an arcuate configuration in order to avoid any interference with the screw 3 and the spacing washers 11 and 12 during the opening and closing movements of the compass legs.

As clearly shown in FIGS. 1 and 3 of the drawings the pair of links 9 and 10, during the compass leg opening movement, are substantially if not completely concealed by the lateral branches 5 and 6 of inverted U-shaped member 4.

FIGS. 4 and 5 illustrate a modified embodiment of said links. In these Figures, the links 9 and 10 comprise each at their upper end a lateral cylindrical stud 20 as in the structure illustrated in FIGS. 1 to 3, for the pivotal connection of these links to the circular flanges 1a, 2a of the compass legs, said studs engaging to this end corresponding blind holes 21 (not shown in FIGS. 4 and 5) formed in said flanges, respectively. At their opposite ends said links are pivotally interconnected by means of a cylindrical stud 24 formed integrally with one of the links and engaging a cylindrical blind hole 25 of corresponding diameter formed in the other link. Moreover, the links carry on their respective side opposite to the cylindrical stud 24 and to the cylindrical blind hole 25 cylindrical studs 22 and 23 axially aligned with the blind cylindrical hole 25 and with the cylindrical stud 24, respectively, and adapted to engage the guide grooves 19 formed in the inner faces of the lateral branches 5 and 6 of the inverted U-shaped member 4.

All the component elements of the above-described compass structure, namely the inverted U-shaped member 4, legs 1 and 2, links 9 and 10, may advantageously be manufactured by injection moulding from a suitable metal alloy such as "Zamac."

What I claim is:

1. Draftsman compasses comprising an inverted U-shaped member provided with a gripping knob extending in a direction opposite to that of the lateral branches of said member, a pair of legs provided at one end with a circular flange somewhat thinner than the leg proper and formed with a central hole, the lateral branches of said inverted U-shape member having a width which has a value substantially equal to that of the diameter of said circular flanges, and having a

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length which is about twice the value of the diameter of said circular flanges, the circular flanges of both legs being disposed between the lateral branches of said inverted U-shaped member and a gap being left between each circular flange and the adjacent branch of the inverted U-shaped member, spacer means in each gap, a screw extending through registering holes formed in said branches, in said spacer means and in said circular flanges for pivotally connecting said pair of legs to said branches, and a pair of arcuate-shape flat links disposed in said gaps, respectively, and each pivoted at one end to a respective circular flange of a compass leg and at the other end to one another through a pivotal connection guided in rectilinear grooves formed in the inner faces of the lateral branches of said inverted U-shaped member, respectively, said grooves extending below said screw in a parallel direction to the longitudinal axis of the gripping knob of said inverted U-shaped member, said links being pivoted to the circular flanges of the compass legs at points thereof which, in the closed position of the compass legs, are located above the centre of said circular flanges, whereby said links remain substantially entirely concealed by the branches of said inverted U-shaped member irrespective of the angular position of the compass legs.

2. Compasses as set forth in claim 1, wherein each link has on the side thereof which faces the adjacent circular flange a cylindrical stud fitting in a cylindrical blind hole of corresponding diameter formed in the outer face of the adjacent circular flange for pivoting the corresponding link thereto.

3. Compasses as set forth in claim 2, wherein said guided pivotal connection of said pair of links comprises a pivot pin extending through holes formed in said other ends of said links, the length of said pivot pin being sufficient to cause said pin to protrude from both side of the link assembly and to engage the guide grooves formed in the lateral branches of said inverted U-shaped member.

4. Compasses as set forth in claim 2, wherein said guided pivotal connection of said pair of links comprises a cylindrical blind hole formed in a first one of said links in a side thereof which faces the other link, a cylindrical stud rigid with said other link and adapted to fit into the cylindrical blind hole of said first link, and a pair of studs rigid with said first and second links, respectively, said pair of studs projecting from side of said links which face the lateral branches of said inverted U-shaped member, respectively, and being axially aligned with said cylindrical blind hole and said cylindrical stud, respectively, for engaging said guide grooves in said lateral branches.

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