May 7, 1963 E. HAUPT ETAL 3,088,367

PRISM BINOCULAR WITH CARRYING STRAP

Filed Jan. 23, 1958 4 Sheets-Sheet 1

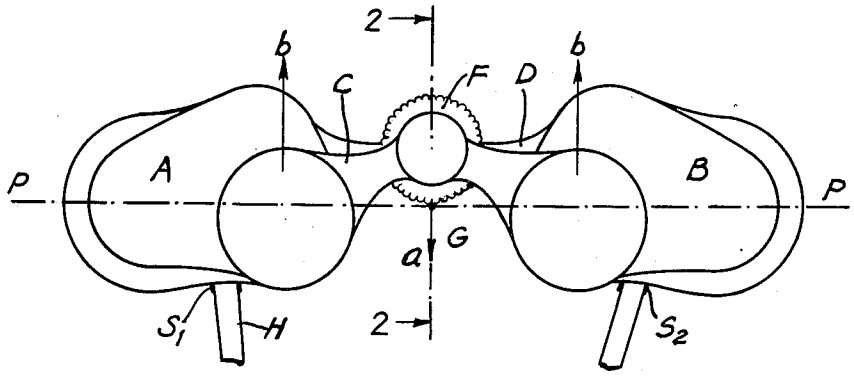



Fig.1
PRIOR ART

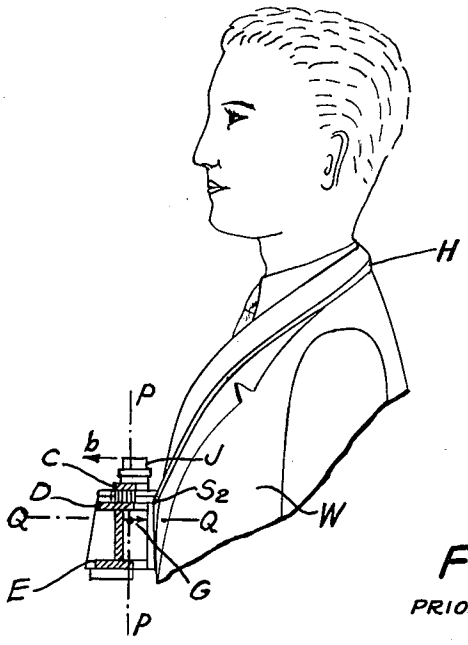



Fig.2
PRIOR ART

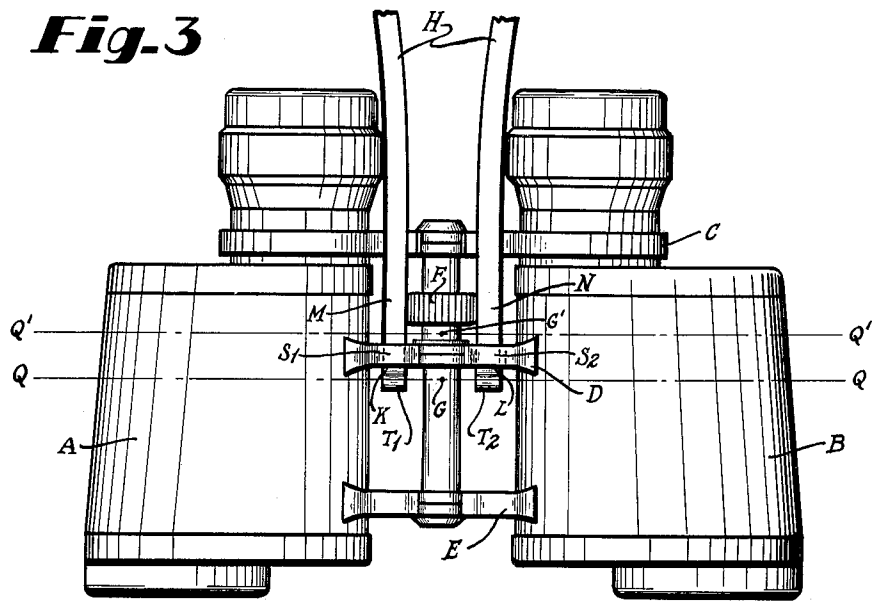
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Fig. 3



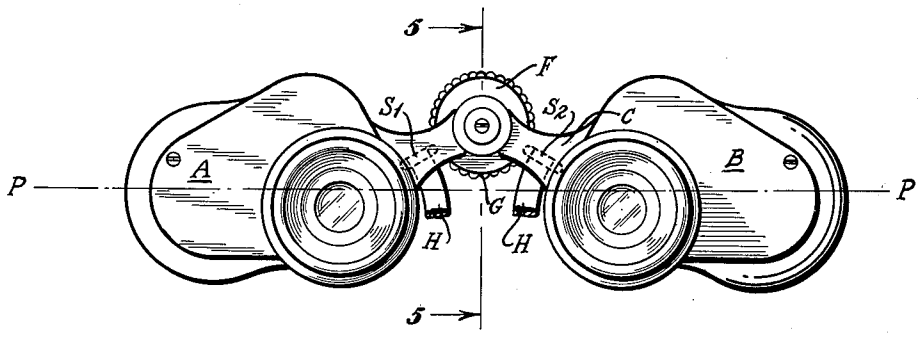




Fig. 4

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PRISM BINOCULAR WITH CARRYING STRAP

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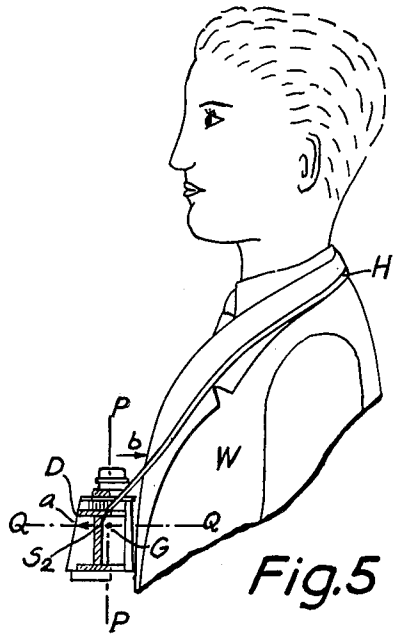



Fig.5

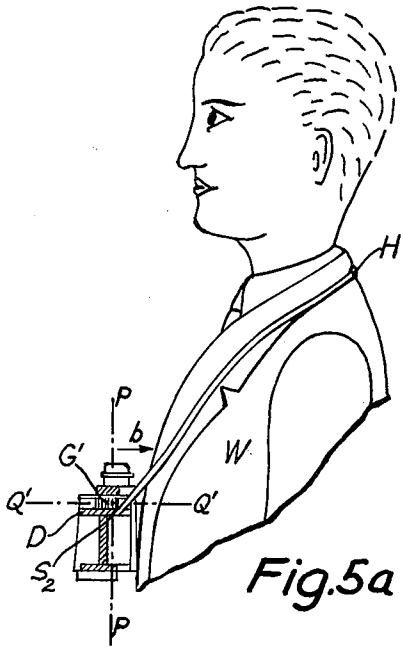



Fig.5a

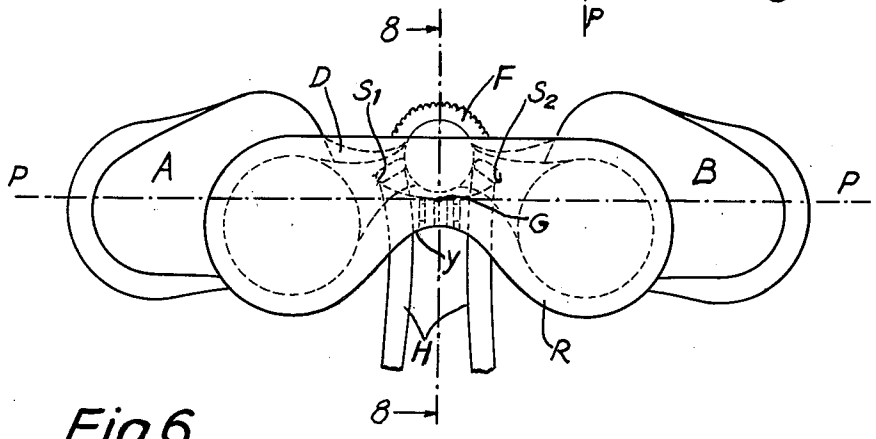



Fig.6

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PRISM BINOCULAR WITH CARRYING STRAP

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Fig. 1

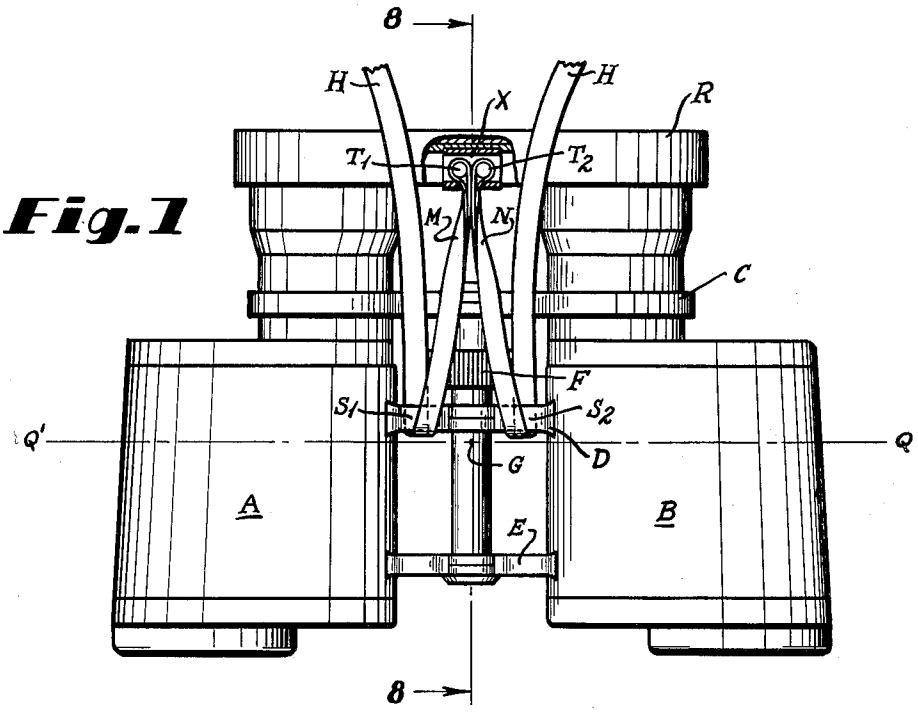
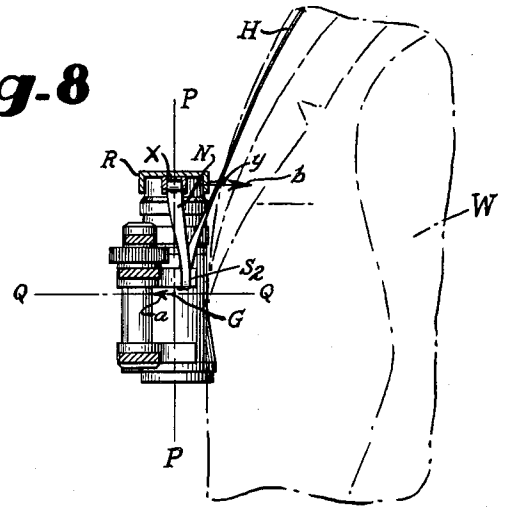



Fig. 8




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# PRISM BINOCULAR WITH CARRYING STRAP

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Claims priority, application Germany Dec. 10, 1953
1 Claim. (Cl. 88—36)

This invention relates to a binocular, and more particularly to a novel arrangement of the carrying strap therefor.

Binoculars of all kinds and in particular prism binoculars used as field glasses, are worn by means of a carrying strap of leather or similar suitable material, which strap is fastened at both ends at the binocular, thus forming a loop which extends about the back of the neck of the wearer, so that the binocular, due to its weight, rests against the breast of the wearer.

In the known binoculars, this carrying strap is attached on that side of the binocular housing which is in contact with the wearer's body, and the points of fastening of the strap ends at the binocular housing are at a distance from the body of the wearer, which is shorter than the distance of the center of gravity of the binocular therefrom.

In such a suspension arrangement, because of the aforesaid greater distance of the center of gravity of the binocular from the wearer's body, the binocular has a strong tendency to tilt with its upper portion away from the breast of the wearer. Consequently, the binocular does not rest firmly against the body of the wearer but swings away from and hits back against the bearer's body and also swings from left to right and back while the bearer walks or moves about, so that the binocular is a source of continuous annoyance to the wearer while the latter moves.

It is an object of our invention to provide a binocular equipped with a novel suspension arrangement for carrying the same, which assures that the binocular has at all times the tendency to rest at least with its upper portion against the wearer's body, and preferably rests against the same with the entire backside of the binocular, which side faces the wearer's body, thereby substantially eliminating the annoying swinging motions of the conventionally suspended binoculars.

This object is attained and the above described drawbacks are overcome in accordance with our invention, wherein by a new arrangement of the carrying strap, the points of attachment of the latter to the binocular are located at a distance from the wearer's body which is at least equal or slightly greater than the distance of the vertical plane passing through the center of gravity of the binocular and forming a longitudinal section through the binocular by extending through both optical elements of the binocular and being approximately parallel to the wearer's breast.

It is particularly important to locate the aforesaid points of attachment, reckoning from the wearer's breast, at least in, and preferably outside and beyond the aforesaid longitudinal vertical plane, and in certain arrangements also in or somewhat above the horizontal plane perpendicular to the aforesaid vertical plane and also passing through the center of gravity.

If the points of attachment are located sufficiently away from the wearer's breast and from the aforesaid vertical longitudinal plane comprising the center of gravity, they may also, in another similar arrangement according to the invention, be located somewhat below the last-mentioned horizontal plane.

In either case, a certain tilting tendency of the binocular towards the body of the wearer is brought about and a firm rest thereof against the body of the wearer assured.



It is further desirable to employ for fastening the strap a hinge-link bridge, which unites both of the monoculars forming the binocular, preferably at their prism housing, and secures one to the other, the link bridge extending substantially in a horizontal sectional plane parallel to the above-mentioned horizontal plane passing through the center of gravity of the binocular. The link bridge is provided with two oblong slots through which the two strap ends of the carrying strap may be drawn. The strap ends can either be buttoned together beneath the link bridge or secured by toggles thereto.

It will be understood, however, that, when corresponding to the type of construction of the binocular, no link bridge is located in a plane as described, attachment of the strap ends can be made by means of two eyes which are placed on the inner walls of the monocular housings which walls face one another, and which eyes are located in a horizontal and a vertical plane passing through the center of gravity, or in a plane lying beyond the center of gravity, reckoning from the wearer's breast, and/or in horizontal planes somewhat above or below the above-mentioned horizontal plane.

The advantages gained with the new strap attachment of this invention may also be retained when using with the binocular a rain guard in the form of a cover which may be provided with a central recess which permits an at least approximately vertical passage of the carrying straps upwardly and about the neck of the wearer. At the same time in order to secure the rain guard in place, two like slots are provided in a lower link bridge, which permits arrangement of a strap loop fastened on to the bottom side of the rain guard. The rain guard is thus secured against losses at all times. Pull of the strap also aids to hold the rain guard in its protective position on top of the binocular, when the latter is not used for observation.

The object and advantages of this invention will be understood from the following detailed description of the drawings illustrating a preferred embodiment thereof.

FIGURE 1 illustrates in a top view a binocular provided with a known fastening arrangement of the carrying strap, for the sake of comparison;

FIGURE 2 depicts a wearer carrying a binocular having a known carrying strap arrangement as illustrated in FIGURE 1, the binocular being shown in cross section along line 2—2 in FIGURE 1;

FIGURE 3 shows a view of that side of a binocular which comes to rest against the breast of a wearer, and illustrates the new arrangement of the fastening strap according to the invention;

FIGURE 4 is a top view of the binocular shown in FIGURE 3;

FIGURE 5 depicts a wearer carrying a binocular provided with the carrying strap arrangement according to this invention and illustrating the forces causing the binocular to rest snugly and firmly against the body of a wearer; the binocular is shown in cross sectional view along line 5—5 in FIGURE 4;

FIGURE 5*a* depicts a similar view as FIGURE 5, but with the carrying strap fastened to the binocular in a slightly different manner according to the invention;

FIGURE 6 shows a top view of a binocular provided with a rain guard fastened with the aid of a carrying strap in yet a different embodiment of the fastening arrangement according to the invention;

FIGURE 7 is a lateral view of a binocular provided with the carrying strap arrangement illustrated in FIGURE 6 and showing the side of the binocular which comes to rest against the breast of the wearer, and

FIGURE 8 depicts the binocular shown in FIGURES 6 and 7, worn by a wearer, the binocular being shown

in cross sectional view along line 8—8 in FIGURES 6 and 7.

Referring now to the drawings more in detail, FIGURES 1 and 2 illustrate two monoculars, for instance prism monoculars A and B, which are joined together to form a binocular by means of articulated link bridge members C, D, E which bear the conventional ocular adjusting screw mechanism F. Link bridge D extends in a plane at right angle to the optical axes of the monoculars A and B and passing in the vicinity of or directly through the center of gravity of the binocular which is designated by G. Vertical longitudinal plane P—P extends through that center of gravity G and also through both monoculars A and B, thereby being approximately parallel to the breast W of the wearer. A horizontal plane Q—Q extends perpendicularly to plane P—P through the center of gravity G of the binocular.

Carrying strap H is fastened at both ends to attachment eyes forming attachment or suspension points $S_1$ and $S_2$. These points of attachment $S_1$ and $S_2$ of the carrying strap are thus located nearer the wearer's breast W than is plane P—P including the center of gravity G. Consequently, the center of gravity G tends to move, as indicated by arrow *a*, toward a position below the suspension or attachment points $S_1$ and $S_2$, while the heavy upper portion J of the binocular tends to tilt away from the wearer's body as shown by arrow *b* in FIGURE 1.

In the arrangement of the strap attachment according to the invention, which is illustrated in FIGURES 3 and 4, the parts of the binocular similar to those shown in FIGURES 1 and 2 bear like reference letters.

The horizontal plane pasing through the center of gravity G below the suspension points $S_1$ and $S_2$ is designated by Q—Q. If the center of gravity of the binocular is G', the horizontal plane Q'—Q' including the same, is located slightly above the suspension points $S_1$ and $S_2$. Of course, the suspension points may also be located directly in that horizontal plane. The suspension points $S_1$ and $S_2$ are constituted by slots K and L provided in the middle link bridge D. The ends M and N of strap H are drawn through these slots K and L and are prevented from slipping out of the latter by toggles $T_1$ and $T_2$.

FIGURE 5 ilustrates the tendency to move of the center of gravity G, below the suspension points as indicated by arrow *a*, and the tendency of the binocular to rest firmly against the wearer W as indicated by arrow *b*; in this figure the plane Q—Q including G is located slightly below the suspension points $S_1$ and $S_2$ ($S_2$ only being shown in the figure), while in FIGURE 5*a*, the plane Q'—Q' including the center of gravity G' extends slightly above these suspension points. Forces *a* and *b* have the same effect in both cases, namely to cause the binocular to rest firmly against the wearer's breast, due to the fact that the suspension points $S_1$ and $S_2$ lie at the outside of the vertical plane P—P through the center of gravity G or G' relative to the wearer's breast W.

In the arrangement according to the invention illustrated in FIGS. 6 and 7, a rain guard R covers the top of the monoculars A and B. This rain guard R bears on its bottom side suitable means such as eyes X in which the ends M and N of strap H can be inserted, toggles $T_1$ and $T_2$ preventing the strap ends from slipping out of eyes X.

In order to avoid that the rain guard R hinders or adversely influences the full suspension effect of the arrangement according to the invention, the rain guard is preferably provided, at its long side facing the wearer's breast, with a central recess Y.



FIGURE 8 illustrates how the binocular provided with the suspension arrangement shown in FIGURES 6 and 7 is worn. Strap ends M and N (of which only N is visible in FIGURE 8) are fastened at eyes X of rain guard R and are slung about the middle link bridge, passing upwardly through slots K (not shown) and L and forming a loop about the rear of the neck of the wearer W. Owing to the recess Y in rain guard R, the latter does not impede the suspension effect of strap H at suspension points $S_1$ (not shown in FIGURE 8) and $S_2$.

Arrows *a* and *b* indicate that the binocular shows the same effect of resting safely against the breast of the wearer.

At the same time the downward pull of strap ends M and N exerted on the rain guard R at X holds the latter firmly on top of monoculars A and B, unless the wearer lifts the binocular to his eyes, whereupon the pull on strap ends M and N is relieved and the rain guard can be removed from monoculars A and B, while still being secured to the strap so that it cannot be lost.

Since, due to the improved arrangement provided by the invention, the customary eyes (loops) on the prism housing are no longer necessary. The invention thus provides considerable manufacturing advantages. Moreover, since the suspension is provided close to the center of gravity, any tendency of the binocular to form a pendulum with resulting swinging motion is eliminated.

This application is a continuation-in-part of the copending application Ser. No. 472,336 filed on December 1, 1954 by the same-named inventors and now abandoned.

It will be understood that this invention is susceptible to modification in order to adapt it to different usages and conditions and, accordingly, it is desired to comprehend such modifications within this invention as may fall within the scope of the appended claim.

What is claimed is:

A prism binocular comprising two monocular parts, link bridges coupling said monocular parts, a strap adapted to suspend the binocular from the neck of a wearer so that it rests on the wearer's breast, said strap engaging in the binocular symmetrically on two points of the surfaces of said monocular parts turned toward and facing each other, which points lie at least approximately in a plane forming a cross-section of the binocular, and including the center of gravity of the binocular, and at least as remote from the wearer's breast as said center of gravity.


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