Dec. 6, 1966 S. POLONSKY 3,289,630

CLOCK DIAL HAND

Filed Oct. 30, 1964

Fig. 1.

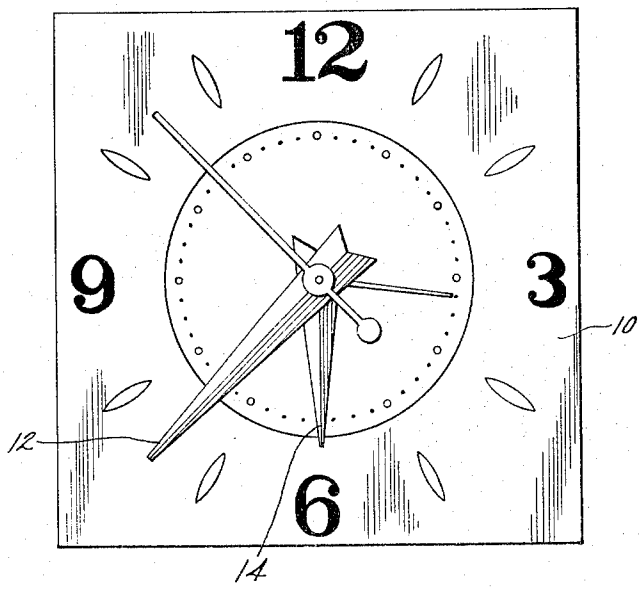


Fig. 2.

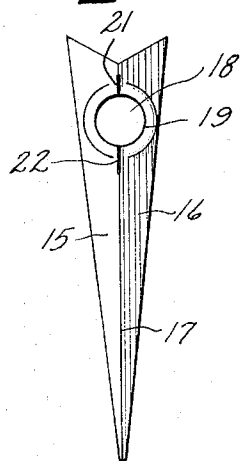


Fig. 3.

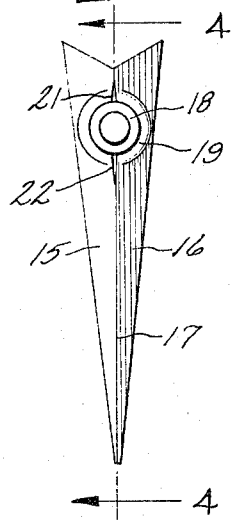


Fig. 4.

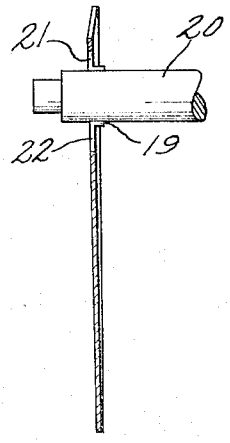
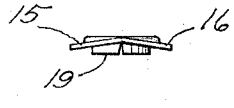


Fig. 5.



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CLOCK DIAL HAND

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1 Claim. (Cl. 116—136.5)

This invention relates to dial pointer hands for use in clock mechanisms or similar devices, and more particularly to an improved means for properly mounting non-planar dial hands.

Dial pointer hands for clocks and similar devices are typically slit from the mounting hole outwardly through the periphery of the hand to facilitate its attachment to a rotary shaft or sleeve. This arrangement provides acceptable results on flat hands; however, when a hand having a non-planar cross-section is desired, perhaps for reasons of style, this conventional slitting method results in stresses being produced in the hand when it is mounted on its driving shaft which cause the hand to bow in an undesirable manner. For example, when a hand having a shallow V-shaped cross-section is formed with a conventional slit extending through the periphery of the hand and is pressed onto a shaft, the resulting stresses cause the free end of the hand to curl or bow away from the plane of the hand. Naturally, such bowing of the hand is undesirable in that it may cause interference with other hands or components of the total assembly. Also, a bent or bowed clock hand suggests poor workmanship and an inferior product.

A hand having a non-planar cross-section is normally much stiffer than a more conventional flat hand. Consequently, attempts to manually adjust the hand for proper clearance by bending after assembly, often leads to loosening of the hand on its shaft because of the poor balance between hand retention and structural stiffness.

It is a primary object of this invention to provide a non-planar dial pointer hand having an improved, simplified low cost means for mounting the hand on a driving shaft.

Briefly stated, the invention includes a dial pointer hand having an elongated shape bent or curved about its longitudinal axis so that the hand does not have a planar cross-section but instead has a somewhat concave-convex cross-section. A hole for frictionally mounting the hand on a driving shaft or sleeve is positioned along the hand axis and spaced from the periphery of the hand. A pair of slits intersecting the hole and extending from opposite sides of the hole along the axis and terminating before the periphery of the hand, facilitate mounting the hand on the shaft. With such an arrangement, no undesirable stresses are introduced with the result that the hand does not bow or deflect to an undesirable extent.

Further features, object and attendant advantages will become apparent with reference to the following description and drawing wherein:

FIG. 1 is a front elevational view of a clock including dial pointer hands incorporating the improved mounting means of the invention;

FIG. 2 is an enlarged top plan view of the hour hand shown in FIG. 1;

FIG. 3 is a top plan view of the hand of FIG. 2 shown mounted on its driving shaft;

FIG. 4 is a cross-sectional view of the hand and shaft taken along lines 4—4 of FIG. 3; and

FIG. 5 is an end elevational view of the hand of FIG. 2.

For aesthetic purposes, it is in some cases desirable that pointer hands for clocks, timers or other similar devices having indicating dials be provided with more

complex configurations than the simple typical flat shape. For example, the clock **10** shown in FIG. 1 has a minute hand **12** and an hour hand **14** each having an elongated tapered shape with a somewhat shallow V-shaped cross-section. This may be observed more clearly in the enlarged view of a hand in FIGS. 2–5, and particularly in FIGS. 4 and 5. In manufacture the hand side portions **15** and **16** are bent from a single plane about longitudinal axis **17** to form the V-shaped cross-section. In addition to providing a pleasing appearance, such a dial hand configuration is more rigid than a completely flat hand.

As previously explained, the typical means for mounting a clock hand on its driving shaft does not produce satisfactory results. In the usual arrangement, a slit is formed in the hand extending from the mounting hole **18**, defined by hub **19**, outwardly through the periphery of the hand. It has been found that when a hand having the configuration shown is formed with a slit extending from the hole through the periphery of the hand and forced onto a driving shaft or sleeve **20**, compressive forces are produced in the hand periphery which causes the tip or free end of the hand to deflect away from the dial face of the clock, as viewed in FIG. 1.

In accordance with the invention, this deflection or curling of the hand is uniquely prevented by forming a pair of slits **21** and **22** intersecting the hole **18** and extending from opposite sides of the hole on the hand longitudinal axis **17**. The critical factor of this arrangement is that the slits **21** and **22** terminate before reaching the periphery of the hand so that the periphery remains unbroken. The result is that when the hand is forced onto its driving shaft tension forces are produced in the periphery of the hand rather than compressive forces as in the conventional slitting method discussed above. These tension forces do not cause the free end of the hand to deflect or curl away from the dial face; but instead, the hand remains in approximately its original plane.

As seen in FIG. 3, when the hand is mounted on the shaft **20**, the slits **21** and **22** open slightly so that the hole is enlarged sufficiently to receive the shaft. The material is thin and adequately flexible to permit such action. It has been found that with this unique arrangement, a relatively wide tolerance range between the shaft dimension and the hole dimension is permitted, thus facilitating low cost mass production. For example, in a production version of the dial hand shown, the interference tolerance range is from .0005 to .003 inch. The length of the slits may be varied to fit the material and configuration of the hand and the location of the hole. By proper selection and balancing of these factors, the deflection of the tip may be made insignificant.

While in the arrangement shown, the hand cross-section is perhaps best described as a shallow V-shape, it should be understood that the problem of deflection and the means for solving this problem, as described herein, applies to hands having similar cross-sections. For example, a hand having a somewhat U-shaped cross-section would be improved with the unique slitting arrangement described herein. Or more broadly stated, any non-planar hand having a somewhat concave-convex cross-section could utilize the invention. It should be understood that for purposes of this application the phrase "concave-convex" covers a large variety of non-planar hands including the V-shape shown and is not limited to a smoothly curved concave-convex configuration. It will also be understood from the preceding statements that it is not necessary to have the sharply defined rib or bend line along the longitudinal axis as shown in the hand of the drawings. Further, while with

the hand configuration shown it has been found that a single pair of slits arranged on the longitudinal axis is most satisfactory, it should be understood that more than two slits may be utilized if desired, and that with some shapes it may not be essential that these slits be exactly aligned with the longitudinal axis.

Further variations and modifications may come to mind with a reading of the foregoing description; however, it should be understood that all such variations and modifications that fall within the true spirit and scope of the invention are to be included within the appended claim.

What is claimed is:

A timing mechanism comprising:

(a) a generally cylindrical rotatable driving shaft;

(b) a dial pointer hand having a periphery and a longitudinal axis, said hand having an elongated shape tapering from a point to a larger end portion;

(c) said hand being bent about its longitudinal axis so that the hand has a shallow V-shaped cross-section;

(d) said hand including a first wall portion, a second wall portion and a ridge disposed between said first and second wall portions, said first and second wall portions being inclined at a shallow angle with respect to each other;

(e) a generally circular aperture for frictionally receiving said generally cylindrical driving shaft formed in the larger end portion of said hand, said ridge extending along the longitudinal axis of said hand and said longitudinal axis being coincident with a diameter through the center of said generally circular aperture; and

(f) a pair of slits intersecting said generally circular aperture and extending from opposite sides of said circular aperture along said longitudinal axis and both of said slits terminating before the periphery of said hand.

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