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PEN SUPPORT FOR RECORDING INSTRUMENTS

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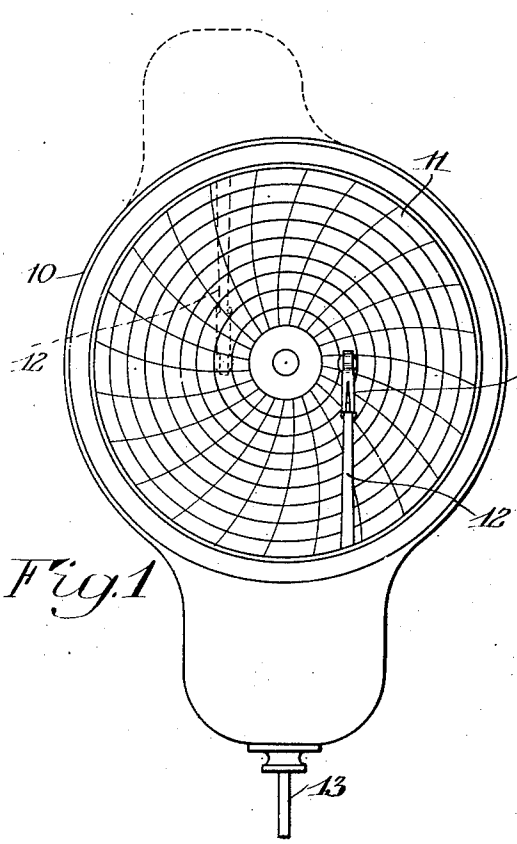


Fig. 1

Fig. 3

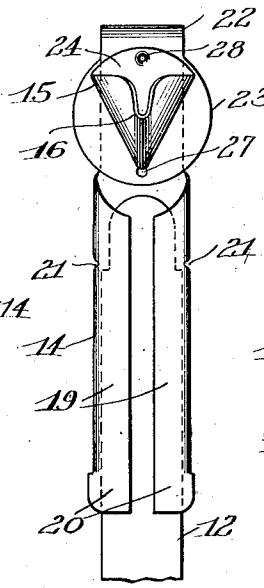


Fig. 2

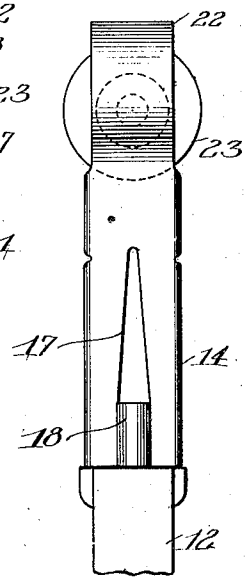
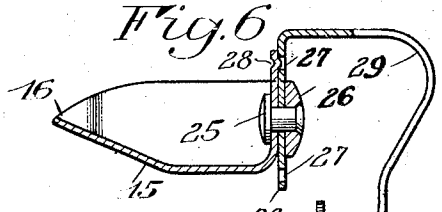


Fig. 6



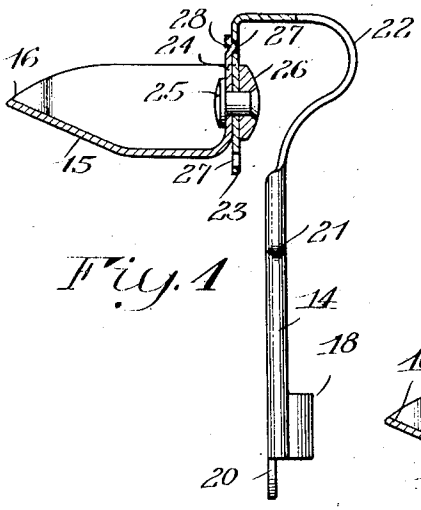
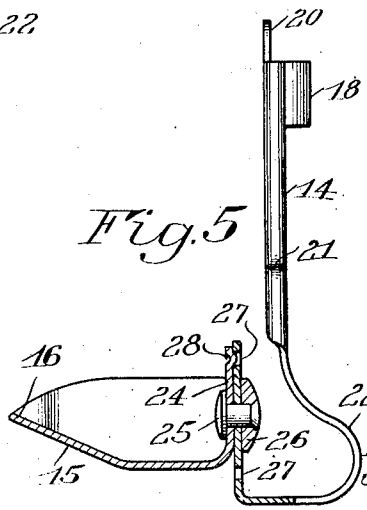
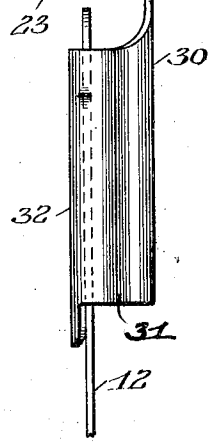


Fig. 4

Fig. 5





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UNITED STATES PATENT OFFICE.

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PEN SUPPORT FOR RECORDING INSTRUMENTS.

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This invention relates to recording instruments, such, for example, as temperature and pressure recorders, and more particularly to pen supporting means for use in such instruments, one object of the invention being to provide an improved supporting means by which a reservoir pen is adapted for use in its upright ink retaining position in conjunction with pen arms arranged to extend either upwardly or downwardly or in other directions. Another object is to provide a simple and effective clip means for detachably supporting the pen on the pen arm with which such instruments are usually provided. A further object is to provide such clip means so constructed as to be detachably but firmly engageable with the pen arm and capable of supporting the pen both resiliently and so that it may be readily adjusted to the chart in use.

To these and other ends the invention resides in certain improvements and combinations of parts, all as will be hereinafter more fully described, the novel features being pointed out in the claims at the end of the specification.

In the drawings:—

Figure 1 is a front elevation of a recording instrument having the present invention applied thereto;

Figure 2 is an enlarged front elevation showing the end of the pen arm provided with the pen and supporting means of the present invention;

Figure 3 is a rear elevation similar to Figure 2;

Figure 4 is a side elevation corresponding to Figure 3, with parts shown in central section;

Figure 5 is a view similar to Figure 4, but showing the pen adjusted to position for use with a downwardly extending pen arm, such as indicated in dotted lines in Figure 1, and

Figure 6 is a view similar to Figure 4, but showing a modified form of construction.

Similar reference numerals throughout the several views indicate the same parts.

The present invention provides a reservoir pen for recording instruments of an adjustable nature adapting it for use in its intended upright position irrespective of the direction of extent of the pen arm with which such instruments are provided. In the preferred embodiment the pen is swiveled on a simple and advantageous form of clip detachably associated with the pen arm, the clip itself having various improved features adapting it for detachable but firm engagement with the pen arm and for resiliently and adjustably supporting the pen for purposes which will more fully appear in connection with the following detailed description.

Referring to the drawings, there is shown at 10, Figure 1, a conventional type of temperature or pressure recorder, comprising a casing housing a clock driven chart 11 with which cooperates a marking element on a pen arm 12 vibrated by the usual or any suitable mechanism (not shown) actuated in response to pressure transmitted by the usual capillary tube 13, as well understood in the art. Instruments of this character commonly have their pen arms extending either upwardly as shown in full lines in Figure 1, or downwardly as in the dotted line showing or in still other directions. The present invention provides a sheet metal clip 14 for detachable engagement with the outer end of the pen arm and having pivotally mounted thereon the usual form of trough-like reservoir pen 15 comprising an ink container preferably formed from sheet metal with an open top and a pointed marking end 16, as shown, so that whatever the direction of extent of the pen arm and clip the pen may be adjusted or rotated to its upright operating position.

The clip 14 is preferably formed up from a single sheet of metal to provide a resilient sleeve for engagement over the end of the pen arm. To this end the body portion of the clip preferably has a longitudinally extending slit 17, Figure 2, cut therein as shown to extend from the point of engagement with the upper end of the pen arm adjacent the lower end of the sleeve where a bridge of metal 18 is left to connect the sides of the slit. This metal bridge 18 is curved outwardly as shown to render it flexible and permit the opposite sides of the sleeve to move in a resilient manner relatively to each other. The opposite longitudinal margins of the clip blank are bent inwardly upon themselves as at 19 to form the sleeve which is given a flattened shape conforming to the

shape of the pen arm. Portions 19 are preferably extended downwardly somewhat as at 20, below the end of the sleeve, to assist in guiding the pen arm into the latter. At 21 are indented portions in the sleeve serving as stops for engagement with the shouldered upper end of the pen arm. The clip thus provides a simple and effective form of sleeve which may be readily attached to and removed from the end of the pen arm and is adapted to frictionally grip and firmly engage the latter in use.

The body of clip 14 is preferably extended upwardly to provide a resilient neck portion 22 which is curved as shown to increase its resiliency and terminates in an inwardly or downwardly extending straight portion 23 on which the pen is swiveled. Preferably the pen is constructed with a flat end 24 adapted to bear on the clip portion 23 and a rivet or other pivoting means 25 is passed through the pen and clip to support the pen for pivotal adjustment relative to the latter. At 26 is a stiffening washer over which the rivet head is expanded. Detent means are also preferably provided for retaining the pen in its different positions of pivotal adjustment. Such means is shown in the present instance in the form of recesses or openings 27 in the clip portion 23 with a cooperating boss 28 struck up from the end of the pen and adapted to be sprung into and out of recesses 27. Any number of such recesses may be provided for variously positioning the pen, but two being shown in the present instance, one above and one below corresponding to the desired positions of the pen when used with upwardly and downwardly extending pen arms, respectively. The curved neck portion 22 of the clip not only affords a resiliently yielding mounting for the pen to hold it lightly in engagement with the chart, but also provides a portion which may be permanently flexed by manual pressure to adjust the point 16 of the pen to bring it into exact registry with the radially extending time lines of the chart.

Figure 4 shows the adjusted position of the pen for use with an upwardly extending pen arm, while Figure 5 shows the same construction with the pen adjusted to position for use on a downwardly extending arm, the pen in both adjustments being in the desired upright ink retaining position.

Figure 6 shows a somewhat modified form of construction for the clip in which the neck portion 29 is extended from a longitudinal rib 30 formed in the body of the clip to stiffen the latter as a whole. The sides of the rib 31, however, carrying the marginal portions 32 corresponding to the portions 19 of the first embodiment, afford resilient sides for the sleeve for yielding engagement with the sides of the pen arm, the rib in this modification taking the place of the slit 17 and bridge or rib 18 of the embodiment first described.

The invention thus affords a simple form of clip capable of being readily struck up from a single blank of sheet metal and of being easily but firmly applied to and removed from the end of the pen arm, with an integral yielding support on which the pen is swiveled for adjustment to different positions to adapt the same pen and its mounting for use interchangeably with variously arranged pen arms.

We claim as our invention:

1. In a recording instrument of the type having a pen arm, a clip detachably engaged with said arm, and a pen having a swivel mounting on said clip to adapt the same for operation in upright position in either an upwardly or downwardly extending arrangement of said pen arm.

2. In a recording instrument of the type having a pen arm, a clip detachably engaged with said arm, and a pen pivotally mounted on said clip and provided with detent means for holding the same in upright position in either an upwardly or downwardly extending arrangement of said pen arm.

3. In a recording instrument of the type having a pen arm, a clip detachably engaged with said arm comprising a flexible, curved neck portion, a pen pivotally mounted on said neck portion, and detent means on the latter and said pen for holding the pen in upright position in either an upwardly or downwardly extending arrangement of said arm.

4. In a recording instrument of the type having a pen arm and an open-reservoir pen carried thereby, the combination of a pen arm; a pen provided with an open reservoir, and a pivotal connection between the arm and the pen, permitting movement of the latter so that for all positions of the pen arm in a substantially vertical plane, the reservoir of the pen may be in an upright position.

5. In a recording instrument of the type having a pen arm and an open-reservoir pen carried thereby, the combination of a pen arm, a pen provided with an open reservoir, the pen extending substantially at right angle to the arm, and a pivotal connection between the arm and the pen permitting movement of the latter about a line forming substantially a right angle with the arm.

6. In a recording instrument of the type having a pen arm and an open-reservoir pen carried thereby, the combination of a pen arm, a pen defining a trough-like reservoir, the pen extending substantially at right angle to the arm, and a pivotal connection between the arm and the pen permitting movement of the latter about a line forming substantially a right angle with the arm.

7. In a recording instrument of the type

having a pen arm and an open-reservoir pen carried thereby, the combination of a pen arm, a pen defining a trough-like reservoir, the pen extending substantially at right angle to the arm, a pivotal connection between the arm and the pen, permitting movement of the latter about a line forming substantially a right angle with the arm, and means for preventing movement between the arm and the pen in a plurality of relative positions.

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