Nov. 20, 1945. A. C. BRUNS 2,389,485

THERMOMETER CASE

Filed Feb. 7, 1944

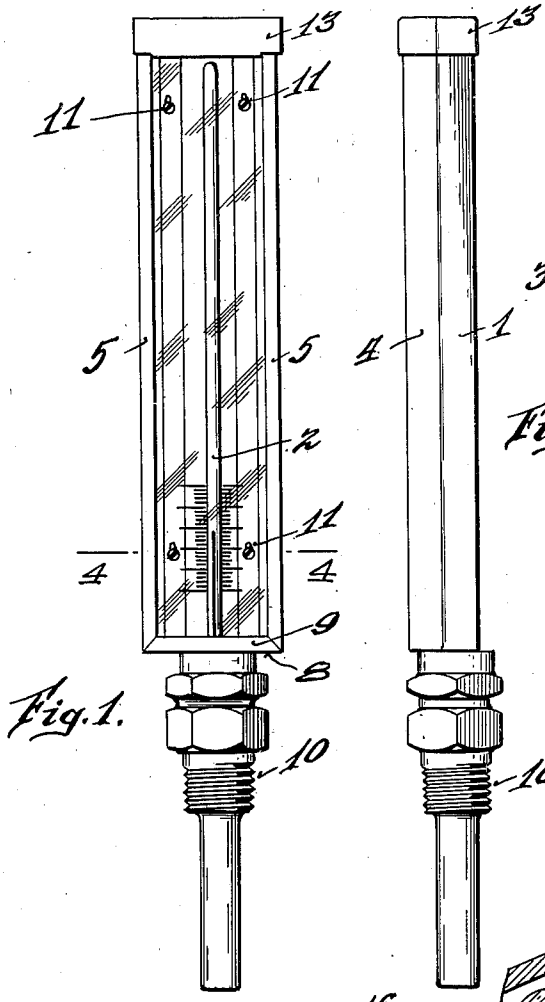


Fig. 1.

Fig. 2.

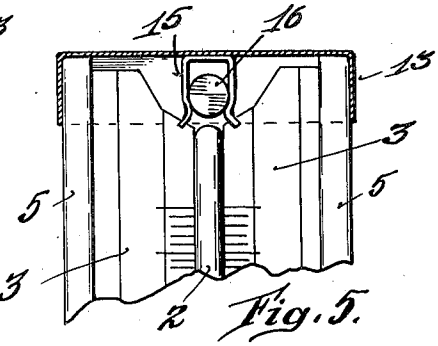


Fig. 5.

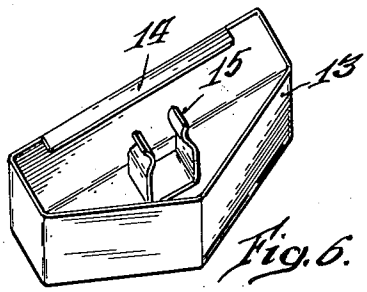


Fig. 6.

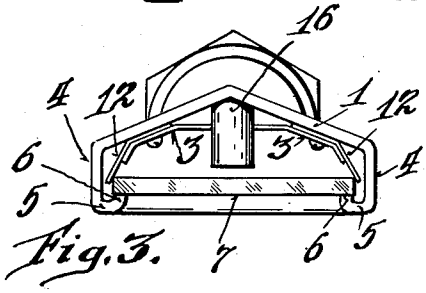


Fig. 3.

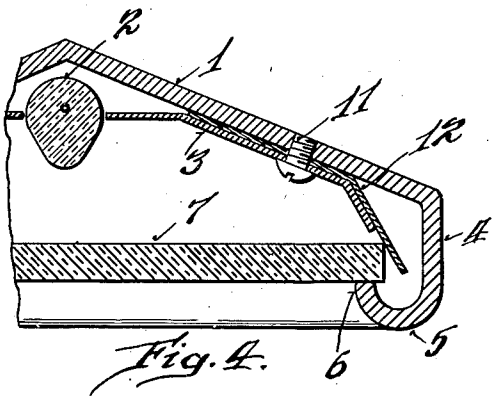


Fig. 4.

INVENTOR.

Anthony Charles Bruns

BY Oliver B. Kaiser

atty.

Patented Nov. 20, 1945 2,389,485

UNITED STATES PATENT OFFICE

2,389,485

THERMOMETER CASE

Anthony Charles Bruns, Cincinnati, Ohio, assignor to The Palmer Company, Norwood, Ohio, a corporation of Ohio

Application February 7, 1944, Serial No. 521,381

4 Claims. (Cl. 73—374)

This invention relates to improvements in thermometers, and particularly to the case and the means for resiliently mounting the transparent cover plate within the face side of the case.

An object of the invention is to produce the body of the case as a selected length section cut from a channel bar, of appropriate cross-sectional design, formed from either flat strip material or by extrusion molding, to the elimination of special dies or molds for each of a large number of different length sizes of thermometer cases required, thereby materially facilitating the casing production and at a reduction in cost and particularly for industrial thermometers which require a case of sturdy construction.

Another object of the invention is to provide simple and efficient means permitting ready insertion of the transparent cover plate within the body, resiliently sustained against rattle and shatter and to avoid breakage of glass closure incident to heavy vibration, with the margins of the plate urged in sealing contact with the adjoining surfaces of the case to maintain the same in substantially moisture-proof and dust-proof relation.

Another object is to provide for resiliently mounting the transparent cover plate within the case devoid of displaceable fastener and spring elements which complicate the insertion and removal of the plate.

Various other features and advantages of the invention will be fully apparent from the following description of the accompanying drawing, illustrating a preferred embodiment, and forming a part hereof, in which

Figure 1 is a front elevation of the improved thermometer.

Figure 2 is a side elevation thereof.

Figure 3 is an enlarged top plan view, with the cover removed.

Figure 4 is an enlarged section, taken on line 4, 4, Figure 1.

Figure 5 is a front plan view of the upper end of the thermometer with the cover in section.

Figure 6 is a perspective view of the cover with the inner or bottom side up.

The conventional practice in the manufacture of sturdy industrial thermometer cases is to embody the same in a one piece construction, necessitating individual patterns and molds for each different size length of case. This procedure, in addition to the expense of numerous molds for the large number of different length sizes, usually required, necessitate some form of removable clip or displaceable fastener elements for removably mounting the transparent cover plate to or within the front side of the case. Such methods usually result in inconvenience and complications to the user in a renewal of a transparent cover plate.

The present improvement provides a casing body structure universal for all length sizes, each for its selected length being cut from stock bar material of appropriate channel or cross-sectional configuration common to the full length of the bar. The bar is capable of formation or production from strip sheet metal, extrusion molding or by other conventional methods, offering low cost production, accuracy and smooth high quality surface finish, both inside and out, and to the elimination of special machining.

Referring to the drawing, the case represents a section cut from a channel bar and of appropriate length for a selected size of thermometer. Its cross-sectional channel design, as exemplified, comprises a web portion for the rear wall 1, of the case, of acute or divergently angled form, with the apex central and outward, following a general design characteristicly adopted for thermometer casings. Such design provides a greater depth centrally of the body for the reception of the capillary tube 2; and wall section disposed divergently to position the scale plates 3, 3, fixed to the inner side of the rear wall, angularly relatively at opposite sides of the tube.

The rear wall joins with a pair of relatively opposite and parallel side walls 4, 4, of the channel, for the full length of the body, and each side wall respectively, for its outer or front longitudinal edge terminates with a laterally extending flange 5, which may be either convex in cross section or of other configuration for a beading finish for the sides of the front face opening of the case and to provide an inturned edge 6, for a bearing for the transparent cover plate 7.

The gap at the lower end of the body of the case is bridged and sealed by a base plate 8, having a front edge 9, in correspondence with the front edges of the sides of the opening of the case, to match therewith and provide a crosswise bearing for the bottom margin of the cover plate.

The base plate 8, may constitute an integral part of the mounting fitting with which the thermometer is equipped, for housing the bulb end of the capillary tube and installing the thermometer to an appliance.

The mounting fitting 10, selected and as exemplified in the drawing, represents a straight tubular shank to provide an enclosure for the bulb portion of the capillary tube and for making a vertical installation. The fitting provides a bulb chamber and a means for mounting the ther-

mometer and may extend at an angle to the case to accommodate for various modes or types or installation requirements, the detail construction of the fitting is therefore optional, so that further explanation need not be made herein. It may possess the characteristics as fully disclosed in Letters Patent No. 2,312,873, issued to me March 2, 1943. It being recognized, however, that the base plate 8, as a closure for the bottom of the case may constitute a head for the fitting for making a union assembly either permanently or removably of the case and fitting.

The graduated scale plates 3, 3, respectively, at relative opposite sides of the capillary tube are secured to the rear wall of the case, each by a pair of set screws 11, threaded into the rear wall of the case, and each respectively traversing a slot in the scale plate, following a common practice.

The scale plates are preferably bent to provide wings or angularly flared portions longitudinally for the opposite sides, with the central portion for overlying and in parallelism with the rear wall of the case to which the scale plate is secured. This adapts an edge of each of the scale plates to be brought in abutting contact or immediate relation with the capillary tube or the beveled faces of the lens front thereof, bringing the graduations very close to the mercury column, and to have the scale plates serve to reduce the internal light reflections within the glass tube. It also serves to position the graduation marks on a plane radially of the tube, offering better visibility for reading and avoiding any distorting reflection from the glazed scale surface, as when disposed tangentially or at an angle to the circular surface of the tube, which tends to visionally pitch the graduation marks, causing interference to quick accurate reading.

The outer flared portion or margin of each scale plate, provides a clearance between the plate and wall of the case for the reception and freedom of movement of an exposed longitudinal margin or portion of a spring plate 12, interposed between the rear wall of the case and scale plate and also as a stop for the spring. The spring is secured in a place to the case by the set screws 11, for mounting the scale plates. The spring may also be welded or otherwise permanently secure to the scale plates. The spring plates extend longitudinally of the scale plates and correspondingly for the full length thereof which is approximately the length of the transparent cover plate.

The spring longitudinally is divergently bent, to provide a flaring yielding margin, bearing under tension against the outer relative flaring margin of its adjoining scale plate and of width to extend therebeyond and at an obtuse angle to the face and edge sides of the transparent cover plate, bearing against an inner corner thereof for yielding urging the cover plate in sealing contact with the inturned edge of the molding or beading as the terminal of a side wall of the case.

As a spring structure corresponds for each of the relative outer ends of the pair of scale plates, and the transparent cover plate being slightly short of the interior width of the case, the springs serve to compressively sustain the cover plate and hold the same against lateral shift, resiliently mounting the cover plate against rattle and shatter. The springs in their angular disposition also exert pressure in a direction laterally of the case, thereby, forcibly urge the margins of the cover plate against the bearing surface or edges of the front of the case, effecting a sealing joint connection therewith, maintaining the same in a substantially moisture-proof and dust-proof relation.

The upper end of each of the springs may be bent to taper outward for a convenient starting entry of the cover plate between the springs, in the cover plate insertion, and with a slight backward compression on the cover plate the springs will be caused to yield sufficiently to clear the margins of the cover plate from the bearing edges of the case and thereby provide more freedom in sliding the cover plate downwardly of the case to its complete closure position. The springs normally with the coverplate in contact with the bearing edges of the case provides sufficient friction to resist movement of the cover plate.

The upper end of the case is sealed by a closure cap 13, telescopically engaged thereover and its front side or wall is provided with an inturned lip or flange 14, which bears against the outer side of the transparent cover plate for a sealing connection therewith. The cover is firmly clipped to the body of the case by a U-form of spring clip 15, fixed on the inner side of the top wall of the cover for a straddling engagement with a lug 16, fixed to the rear wall of the case and extending laterally from the inner side thereof.

Having described my invention, I claim:

1. A thermometer, comprising: a case of channel form in cross-section providing a front opening with the sides of the case each terminating with an inturned margin providing an outer bearing for a closure plate, a transparent cover plate, providing a removable closure for the opening of the case and a pair of spring plates fixed within the case and extending longitudinally of the opening, each respectively for a side of the opening and extending at an angle to the face plane of the cover plate to intersect a relative inner corner at an edge of the cover plate, resiliently sustaining the cover plate therebetween and compressively urging the same against the margins of the case forming the front opening.

2. A thermometer case, comprising: a body having a rear wall, opposing side walls and an open front, the outer longitudinal ends of the side walls each having a lapped edge for bearing and bordering a transparent cover plate, a transparent closure plate removably disposed within the case for a closure of the open front of the case, in bearing contact with the lapped edges of said side walls and sheet metal strips mounted upon and within the case extending longitudinally of the open front of the case relatively at opposite sides thereof and at an angle to the face plane of the closure plate, each for engaging an edge corner of the closure plate to laterally confine and compress the same against the lapped edges of the side walls of the case.

3. A thermometer case, comprising: a body having a rear wall, opposing side walls and an open front, the outer longitudinal ends of the side walls being convexed for providing a bearing edge for a transparent cover plate, a transparent closure plate for the open front of the case removably disposed within the case and in contact with the bearing edges of said side walls and resilient means mounted upon and within the case extending longitudinally of the open front of the case yieldingly sustaining the cover plate therebetween and compressively against the bearing edges of the side walls of the case.

4. A thermometer, comprising: a case having an open front, a cover plate providing a removable closure for the open front of the case, the

case providing a marginal bearing for the cover plate, flat springs fixed within the case and disposed in spaced opposing relation at an angle to the plane of the cover plate for slidingly sustaining the cover plate therebetween and compressively against the said marginal bearing of the case for effecting a sealing connection therewith, a case mounting and capillary tube bulb encasing fitting being fixed at one end of the case and providing a closure therefore, and a bearing surface for one end of the cover plate, and a cap removably engaged upon the opposite end of the case and providing a bearing surface for the opposite end of the cover plate.

ANTHONY CHARLES BRUNS.