July 12, 1927.

C. J. MANUEL ET AL

1,635,680

THERMOMETER

Filed Oct. 5, 1926

Fig. 1.

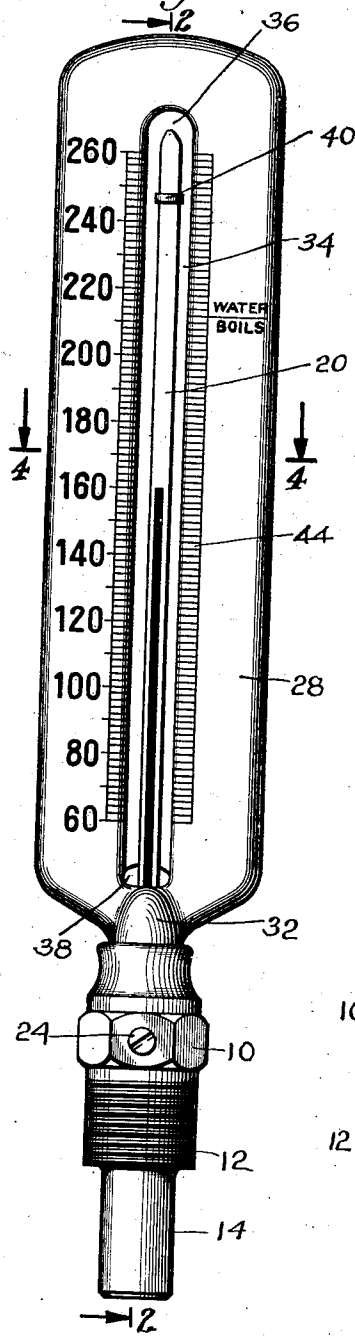


Fig. 2.

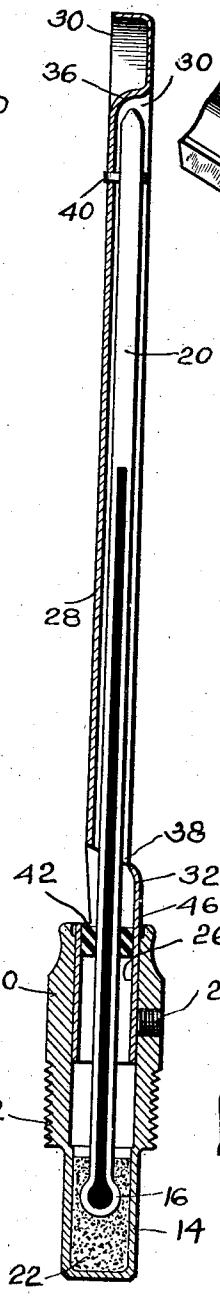


Fig. 3.

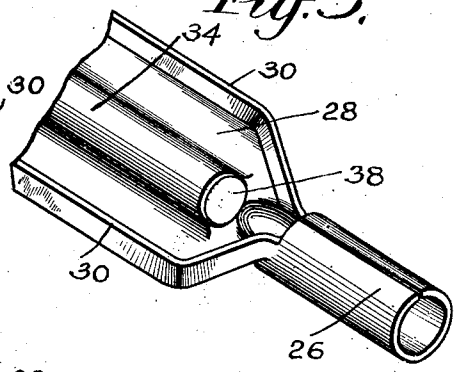


Fig. 4.

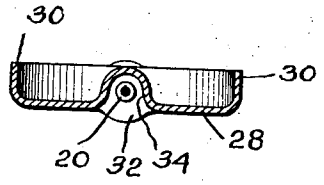
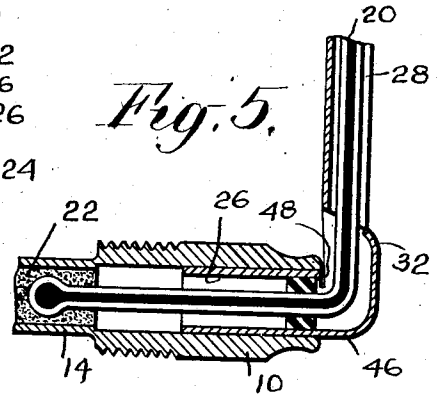


Fig. 5.



Inventors
C. J. Manuel
and W. H. Lentz

By their Attorneys
Cooper, Kerr & Dunham

Patented July 12, 1927. 1,635,680

UNITED STATES PATENT OFFICE.

CHARLES J. MANUEL AND WILLIAM H. LENTZ, OF SELLERSVILLE, PENNSYLVANIA, ASSIGNORS TO UNITED STATES GAUGE COMPANY, OF NEW YORK, N. Y., A CORPORATION OF PENNSYLVANIA.

THERMOMETER.

Application filed October 5, 1926. Serial No. 139,585.

This invention pertains to thermometers, more particularly those known as hot water thermometers and which are adapted to be applied to heating boilers to indicate the temperature of the water therein.

One object of this invention is to so form the shell of the thermometer as to better protect the glass tube against breakage in service.

Another object is to reinforce the structure of the shell not only to stiffen it in service but to enable it to hold its shape while being enameled.

Another object is to so shape the shell that it will be adapted to be coated with a uniform coating of vitreous enamel.

Another object is to form the shell with a thimble which partially extends up over the face of the shell in order to reinforce the shell.

Another object is to form the thimble and shell so that the parts comprising the thermometer may be assembled and held in operative relationship without the use of auxiliary plates, brackets, etc., such as are frequently used in thermometers of this kind.

Another object is to so form the shell and thimble that the same structure, slightly modified, may be used for both straight and angle type instruments.

Another object is to incorporate the above objects and advantages in a design suitable for pressed steel construction.

Further and other objects and advantages will be hereinafter set forth in the accompanying specification and claims, and shown in the drawings, which by way of illustration show what is now considered to be the preferred embodiment of the invention.

Fig. 1 shows a front view of the thermometer herein disclosed.

Fig. 2 is a cross-section on line 2—2 of Fig. 1.

Fig. 3 is a perspective detail view of the thimble and lower end of the shell.

Fig. 4 is a cross-section on line 4—4 of Fig. 1.

Fig. 5 is a cross-sectional detail of an angle type.

The instrument is provided with a body portion 10, threaded as at 12 for ready attachment to the boiler. The lower end of the body portion has a well-like portion 14 into which extends the bulb 16 on the lower end of the thermometer stem 20. The well 14 may be packed with suitable heat-conducting material 22.

Inserted in the upper end of member 10, and held in position by set screw 24, is the lower, tubular thimble portion 26, of shell 28. The exposed portion of shell 28 is shaped as shown in Figs. 2 and 4. It is provided with a rearwardly extending rim 30 which extends along both sides and across the top of the shell, merging at the bottom with thimble 26. The lower portion of shell 28 is also swelled outwardly at 32 for the purpose of reinforcing and stiffening the shell against fore and aft stresses. Reinforcement 32 is practically an extension of thimble 26 upwardly to overlap shell 28. Also, extending from the upper end of 32 to a point near the top of shell 28 is a narrow depression or groove 34 of substantially the same depth as flanges 30.

The relationship of shell 28, groove 34, and thimble 26 is such that when the bulb of a straight thermometer is located centrally in well 14 the stem thereof will lie below the front surface of shell 28 in groove 34, parallel thereto and only slightly out of contact therewith at the rear and at both sides of the tube, as may best be seen in Fig. 4.

The upper end of groove 34 is closed as indicated at 36, and the lower end is cut away to form the opening 38 through which passes stem 20.

Near the upper end of the tube a clip 40 serves to hold stem 20 in proper operative, spaced relationship with groove 34. In its preferred form, clip 40 is simply a narrow strip of metal surrounding the stem, the ends of the strip passing through a hole in the rear of groove 34 and being bent over to prevent their withdrawal.

A rubber washer 42 placed around stem 20 near the upper end of thimble 26 serves to resiliently support the lower end of the tube and prevent entry of dirt.

It will be noted that the above described construction provides exceptional protection for the thermometer stem. It is located in groove 34, no part of the stem projecting in front of the face of shell 28, and is thoroughly protected at both sides and rear by the walls of the groove.

Groove 34 also serves another very use-

ful purpose. Shell 28 is usually coated with vitreous enamel. The process of applying the enamel requires that the material be heated to red heat, and it has been found very difficult to prevent warping of the heated articles during the subsequent cooling operation, especially if the enamel is applied to thin unsupported plane surfaces. The present design provides suitable support at the sides of shell 28 in the form of flanges 30 and also supplies the additional support required at the middle of the shell, in the form of groove 34. These stiffening supports are provided while still maintaining a uniform thickness of metal, which is another imperative requirement for successful enameling.

Still another imperative requirement for successful enameling is that all enamel surfaces must have well rounded corners, otherwise enamel will be thin on the corners and they will be a different color from the rest of the surface. This feature is well taken care of in the present design, all corners being well rounded, so that the front of the shell will be of uniform color.

Thermometer shells have in the past been formed of cast iron to embody some of the characteristics of the present design, but they have been heavy, clumsy and costly as compared with the present shell, which is a unitary structure of thin material, therefore light in weight, neat in appearance, and cheap to manufacture.

A structure such as above described may be fabricated from separate pieces of metal joined together by welding or other process, but we prefer to form the complete shell and thimble from a single sheet of metal.

The front face of shell 28 is provided with the usual graduated temperature scale 44, which it will be noted is in a plane substantially tangent to the front of the stem.

Thimble 26 is pressed from the same blank as shell 28, being formed in cylindrical shape of proper diameter to slip inside the body portion 10. The thimble is left unenameled.

Fig. 5 shows a modification of thimble 26 adapting it for an "angle" type of instrument in which shell 28 stands at right angles to the axis of body portion 10, instead of parallel thereto. This modification is produced by bending neck 46 as in Fig. 5. This bending is facilitated by cutting a groove as at 48 in the other side of the neck.

It is to be understood that the invention is not limited to the construction herein specifically illustrated and described but can be embodied in other forms without departure from its spirit.

We claim—

1. A shell for a thermometer comprising in combination, a metallic plate; a flange around the edge of said plate; a narrow groove along the middle of said plate to accommodate the stem of the thermometer, said groove being closed at one end and open at the other end to allow the stem of the thermometer to pass through the end of said groove; and a cylindrical thimble axially aligned with said groove; said plate, flange, groove, and thimble being of uniform thickness whereby the shell is rendered suitable for finishing by the vitreous enamel process.

2. The invention set forth in claim 1 in which a portion of the end of said thimble extends over the end of the plate to which it is attached for the purpose of stiffening said shell.

3. The invention set forth in claim 1 in which the entire structure is formed from a single sheet of metal.

4. A thermometer comprising in combination, a thermometer stem and a shell supporting said stem; said shell comprising a metallic plate having a flange around its edge; a narrow groove along the middle of said plate to accommodate said stem, said groove being closed at one end and open at the other end to allow the stem to pass through the end of said groove; and a cylindrical thimble axially aligned with said groove, said plate, flange, groove and thimble being formed from a single sheet of thin metal.

In testimony whereof we hereto affix our signatures.

CHARLES J. MANUEL.
WILLIAM H. LENTZ.