June 5, 1934. F. G. BOVARD 1,961,331

EXPANSION CHAMBER

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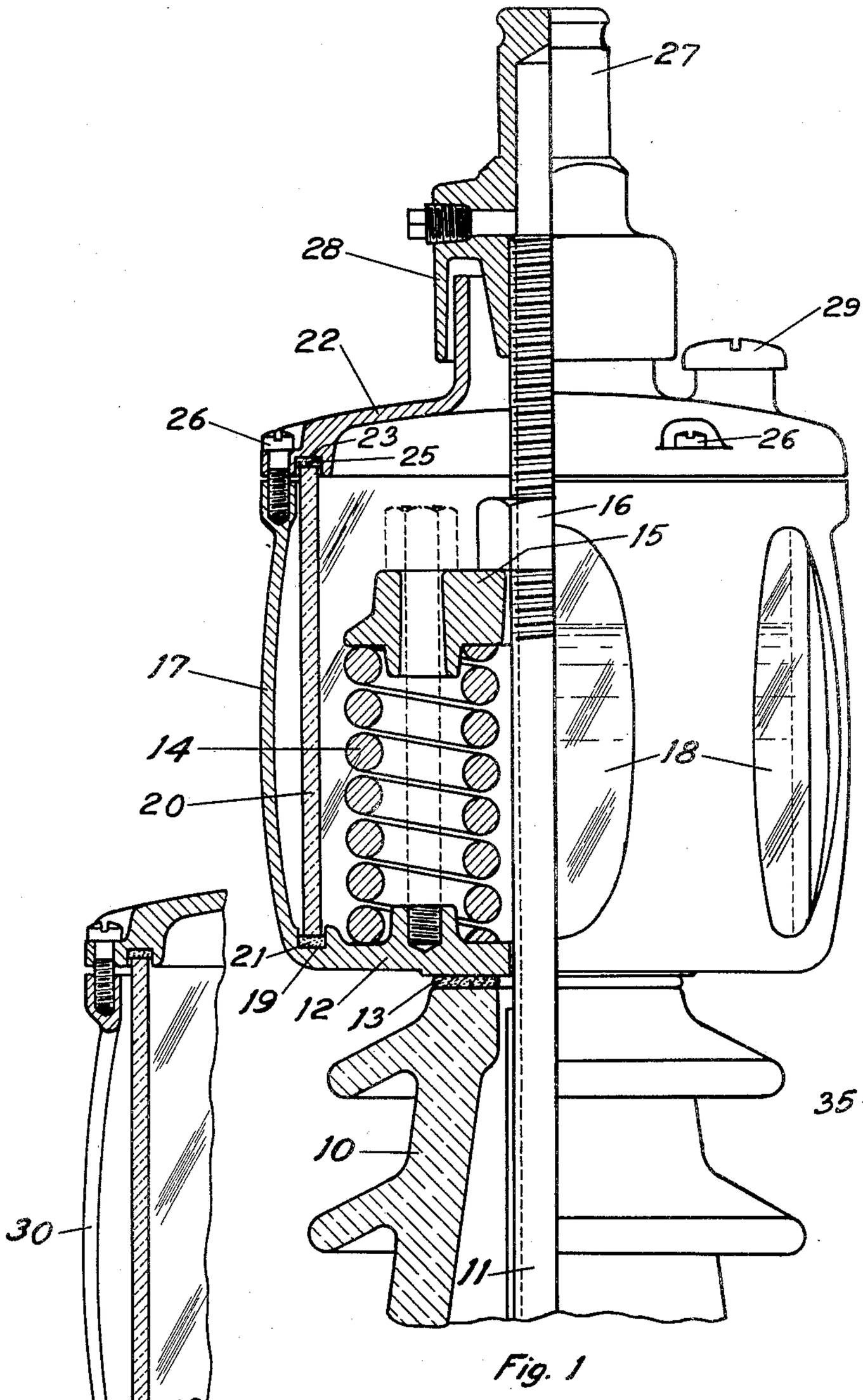

Fig. 1

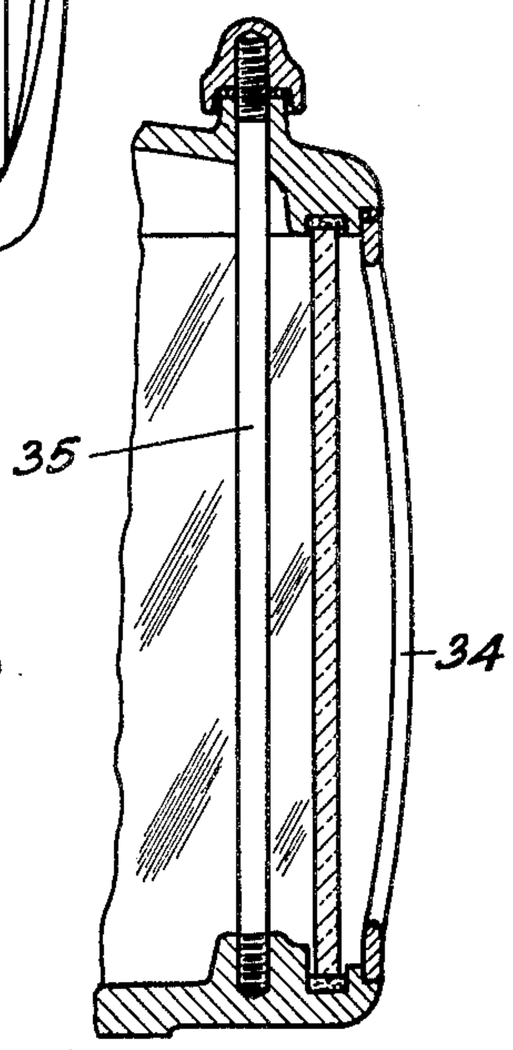

Fig. 3

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EXPANSION CHAMBER

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5 Claims. (Cl. 220—82)

This invention relates to bushing insulators and other devices to be filled with a liquid and has for one of its objects to provide a plenum or expansion chamber for the contained liquid in which the surface level of the liquid may be readily observed.

Another object of the invention is to provide an expansion chamber having glass walls and an outer metal housing which will protect the glass walls both from mechanical injury and from electrical discharge and yet permit the surface level to be seen.

Another object of the invention is to provide an expansion chamber having glass side walls and means for maintaining a liquid tight joint between the side walls and the other portions of the expansion chamber.

Another object of the invention is to provide a device of the class named which shall be of improved construction and operation.

Other objects and advantages will appear from the following description.

The invention is exemplified by the combination and arrangement of parts shown in the accompanying drawing and described in the following specification, and it is more particularly pointed out in the appended claims.

In the drawing:

Fig. 1 is a part elevation and part section showing one embodiment of the present invention.

Figs. 2 and 3 are fragmentary sectional views showing modifications of the invention.

In Fig. 1 the numeral 10 designates the upper end of a bushing insulator surrounding a conductor 11. An expansion chamber is mounted on the top of the insulator and provided with a base plate 12 which rests on the upper end of the bushing 11 having a gasket 13 interposed between the bushing and the plate to form a tight joint. The plate 12 is held down upon the gasket by the conductor 11 and springs 14 which engage a plate 15 held by a nut 16 threaded on the upper end of the conductor 11. The plate 12 has an upwardly extending side wall 17 formed integral therewith; the side wall being provided with windows 18 through which the interior of the expansion chamber and the surface level of the liquid therein may be observed. The conductor 11 fits loosely in the opening in the base plate 12 to permit communication between the interior of the bushing 10 and the interior of the expansion chamber. The base plate 12 is provided with a seat 19 for receiving the lower end of a glass cylinder 20. As gasket 21 is interposed between the lower end of the cylinder and the seat 19. A cover 22 rests upon the upper end of the cylinder 20 and is provided with a seat 23 fitting the top end of the cylinder. A gasket 25 is disposed in the seat 23. The cover 22 is held to the side wall 17 by screws 26 or other suitable means. A terminal member 27 is secured to the upper end of the conductor 11 and is provided with a weather shed 28 to prevent the entrance of moisture into the expansion chamber. A filling plug 29 may be provided in the cover 22 through which the bushing and expansion chamber may be filled.

It will be observed that the wall 17 of the compression chamber is bowed outwardly. This imparts a degree of resiliency to the wall so that when the cover plate 23 is tightened down upon the glass cylinder 20 it will be held down by a spring pressure exerted by the wall 17. The amount of resiliency may be regulated by the thickness of the wall and the width of the wall sections between the windows 18. This resiliency will insure pressure upon the gaskets 21 and 23 at all times irrespective of differential expansion and contraction between the metal and glass parts and any compression of the gaskets which may take place in time. The outwardly curved wall also protects the glass against mechanical injury and against electrical discharges which otherwise might shatter the glass.

Sometimes difficulty is experienced in expansion chambers of this kind which are made entirely of cast metal due to porous castings. In the present invention the only portion of the casting which need be liquid tight is the lower plate 12 which is ordinarily thicker than the side walls, and since this part of the casting will usually be formed in the bottom of the mold, there is less danger of poor structure in this part than in the side walls of the casting.

In the modification shown in Fig. 2, the side wall 30 is formed as a separate piece from the bottom plate 31 and is provided with an inwardly projecting flange 32 at its lower end, which engages a shoulder 33 on the plate 31. This permits the base plate and side wall to be cast or otherwise formed separately to facilitate manufacture and assembly.

In Fig. 3 the side wall 34 is formed separately from the base plate, as in Fig. 2, but in this case the bottom and top plates are held together by through bolts 35 so that the only function of the side wall 34 is to form a protecting shield for the glass.

I claim:

1. An expansion chamber comprising a base plate, resilient side walls secured to said base

plate, a glass housing, and means secured to said side walls for exerting pressure on said glass housing to hold said glass housing in place.

2. An expansion tank comprising a base plate, a glass housing resting upon said base plate, packing interposed between said base plate and housing to form a tight joint, resilient side walls secured to said base plate, and a cover attached to said side walls and bearing upon the upper end of said glass housing.

3. An expansion chamber comprising a metal base plate having a seat thereon, a glass housing open at its top and bottom and having its lower end resting upon said seat, outwardly bowed side walls secured to said base plate and disposed outside of said glass housing, and means secured to said side walls for bearing upon the upper end of said glass housing to press said housing upon its seat.

4. An expansion chamber for a bushing insulator comprising a glass housing, a cover for said housing, and outwardly bowed metal side walls surrounding said housing and having a window therethrough, said cover being secured to said metal side walls and resiliently held thereby in position on said glass housing.

5. An expansion chamber for a bushing insulator comprising a metal base plate having a seat thereon, a glass housing having its lower end resting on said seat, outwardly bowed side walls secured to said base plate and disposed outside of said housing and having a window therethrough, a cover for said expansion chamber resting upon the upper end of said housing and means for securing said cover to said outwardly bowed side walls and for pressing said cover upon the upper end of said housing so that the resiliency in said outwardly bowed side walls maintains a tight joint between said cylinder and the seat on said base plate.

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