Aug. 15, 1939. A. P. HULTGREN 2,169,447

INSTRUMENT DIAL

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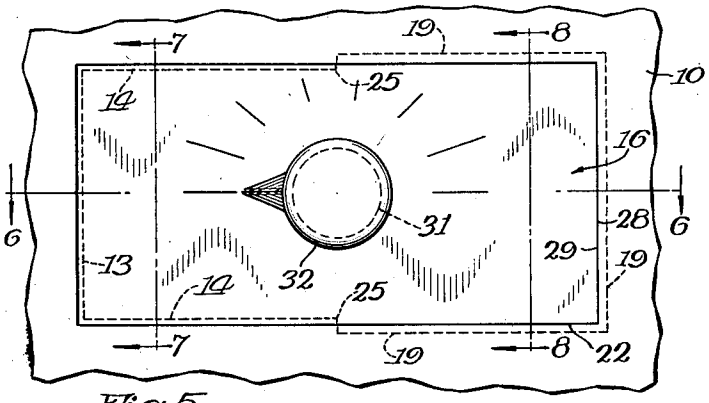


Fig.5

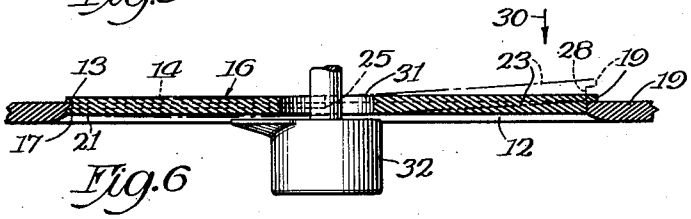


Fig.6

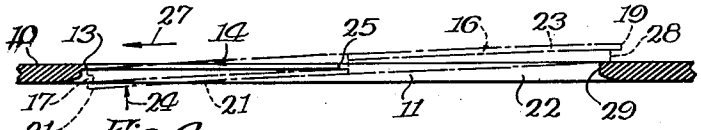


Fig.4

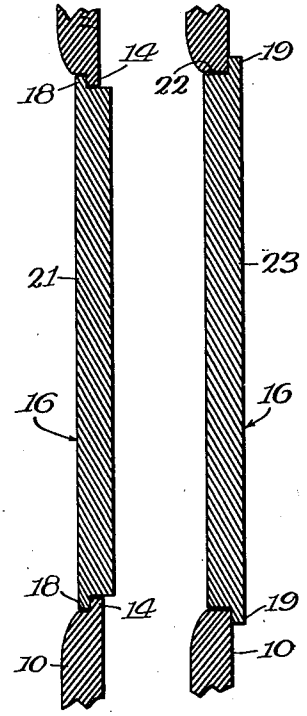


Fig.7 Fig.8

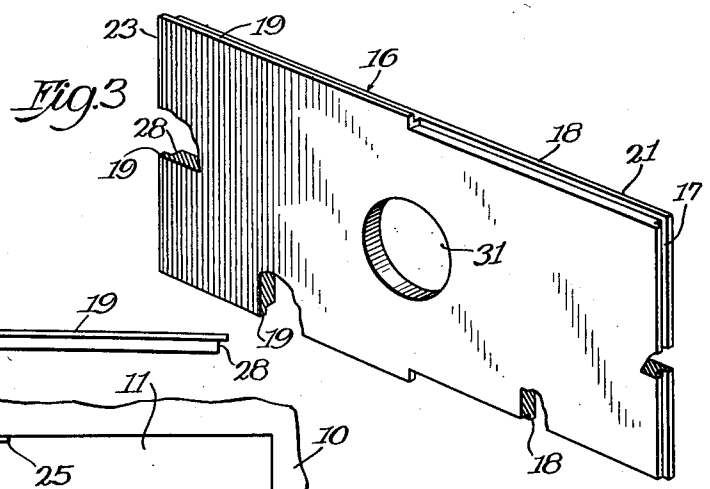


Fig.3

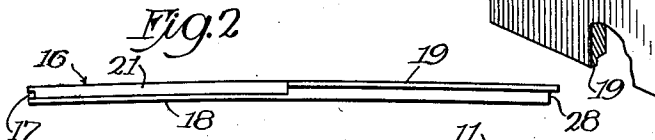


Fig.2

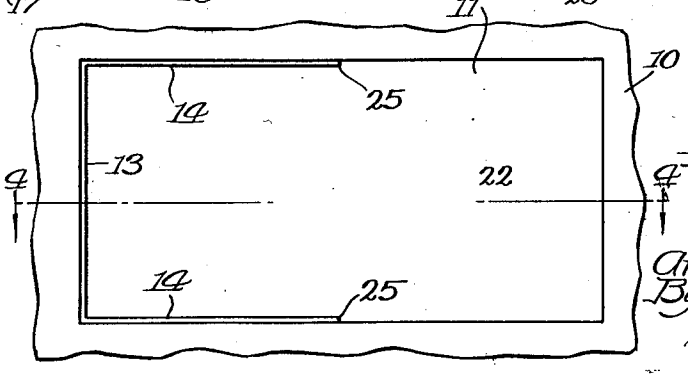


Fig.1

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Fig. 9

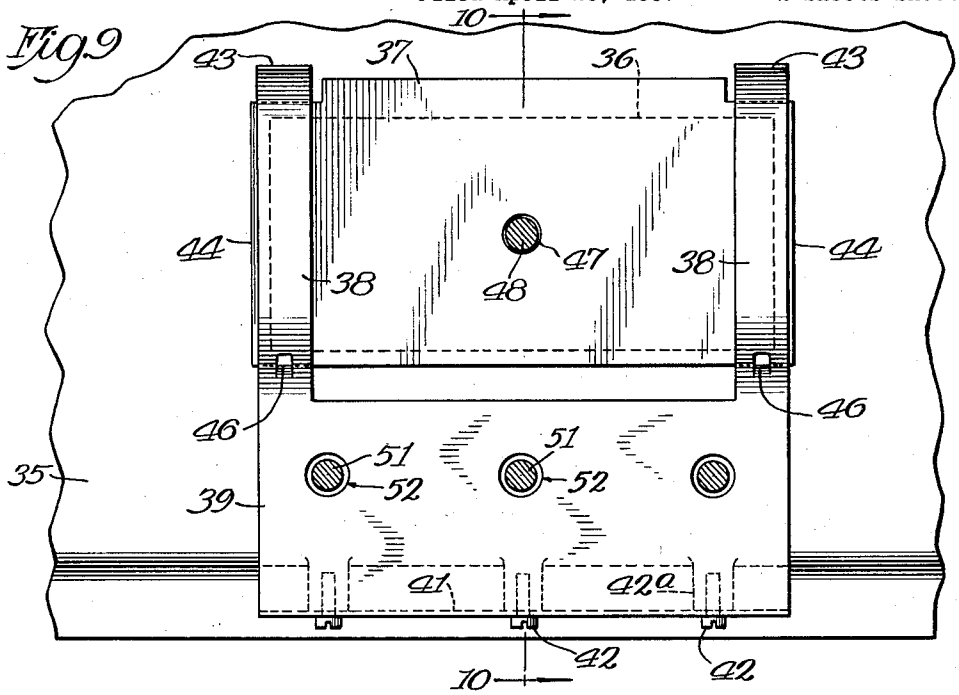
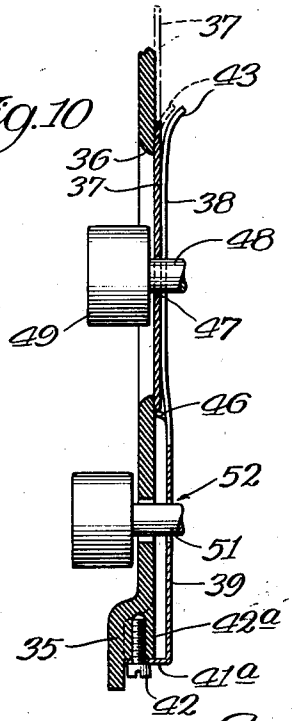


Fig. 10



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Patented Aug. 15, 1939

2,169,447

UNITED STATES PATENT OFFICE

2,169,447

INSTRUMENT DIAL

Arnold P. Hultgren, Chicago, Ill., assignor to Sears, Roebuck and Co., Chicago, Ill., a corporation of New York

Application April 23, 1937, Serial No. 138,561

17 Claims. (Cl. 116—124.1)

This invention relates to dials and the mounting thereof in radio and other instrument panels and cabinets.

It is an object of my invention to provide a dial mounting without employing a bezel.

It is another object to provide a dial mounting without the use of fastening means other than the dial and the panel in which it is mounted.

A further object resides in the provision of an instrument panel dial which is resilient and adapted to be snapped or sprung into interlocked relation to the panel.

It is also an object to provide an instrument panel dial mounting capable of being secured in proper assembly with the panel in substantially a single operation.

Another object is to provide a dial mounting characterized by its extreme simplicity, speed of assembly, efficiency and low cost.

Other objects and advantages of the invention will appear as the description proceeds.

The invention in two illustrative forms is shown in the accompanying drawings, in which—

Fig. 1 is a fragmentary front elevation of an instrument panel frame constructed in accordance with one form of the invention.

Fig. 2 is an edge view in plan of a dial adapted to be mounted in the panel frame of Fig. 1.

Fig. 3 is a rear isometric view of the dial of Fig. 2, parts being sectioned to show details of construction.

Fig. 4 is a section taken on the line 4—4 in Fig. 1, and shows in dash-dot lines the first step in the method of mounting the dial on the panel.

Fig. 5 is a view similar to Fig. 1 but with the dial assembled with the panel.

Figs. 6, 7 and 8 are sectional views taken on the lines 6—6, 7—7 and 8—8, respectively, in Fig. 5.

Fig. 9 is a fragmentary rear elevation of a modified dial mounting embodying my invention.

Fig. 10 is a section taken as indicated by the line 10—10 in Fig. 9.

Referring now more particularly to the drawings, a panel 10 of a radio cabinet or other instrument has a dial opening 11 of generally keyhole shape and which for illustrative purposes is planar and rectangular but obviously may be of any shape desired and planar or otherwise. Tongue or flange portions are provided at one end 13 and along the adjacent portions of the upper and lower edges 14 of the opening.

A dial 16, formed of flexible and resilient material, for example, of a moldable plastic, and preferably slightly bowed as shown in Fig. 2 and constructed to be mounted in the opening 11, has one end edge grooved at 17 to accommodate the end tongue 13. The dial also has upper and lower front flange portions 18 for a portion of its length engageable with the fronts of the panel tongue portions 14, and upper and lower and end rear flange portions 19 engageable with the back face of the panel at the margin of the opening 11.

The dial plate 16 is applied from the rear right side of the panel as shown in Fig. 6. The reduced width portion 21 of the dial is slipped into the wider end 22 of the opening 11. The clearance between said portion and said end is preferably merely sufficient to allow said portion to be slid in easily. The dial plate is first projected forwardly to position its flanges 18 in front of the panel tongues 14 until the groove 17 is adjacent the tongue 13, as seen in Fig. 4. At this time it will be observed that the plate is disposed diagonally in the opening 11, as shown in dash-dot lines in Fig. 4.

Now, with the other end 23 engaged with the back of the panel as shown in Fig. 4, the smaller end 21 of the plate is shoved rearward as shown by the arrow 24. Since the free ends 25 of the panel tongues 14 at this time engage the backs of the flanges 18, this shoving results in a bowing of the plate end 23 about the places of such engagement and is continued until the ends of the flanges 18 at the groove 17 abut the ends of the tongues 14 adjacent the tongue 13, thereby placing the groove 17 in juxtaposition to the tongue 13. The plate 16 is then shoved to the left as indicated by the arrow 27 until the tongue 13 is received in the groove 17, the relation of the parts being that shown in Fig. 5 in dash-dot lines outlining the dial plate. The ledge 28 adjacent the flange 19 of the plate under such circumstances projects or is adapted, upon flexing of the plate, to project slightly into the larger part 22 of the opening 11, so as to engage the adjacent end edge 29 of the opening. The end 23 of the plate is then shoved forward as indicated by the arrow 30 in Fig. 6 so as to spring or snap the plate from a forwardly bowed shape to a substantially flat shape with the flange 19 engaged substantially throughout with the back of the panel, and the flanges 18 likewise engaged with the tongues 14, as seen in Figs. 5 to 8.

The dial is thus frictionally self-clamped in the frame formed by the panel, and is maintained so by its own resilience, tending to bow it rearwardly to the shape shown in Fig. 2, and the rigidity of the enclosing panel. It is evident

that the operation of securing the dial in assembly with the panel is performed readily with ease and dispatch, requiring no securing devices of any sort and eliminating the need for a bezel, the panel itself performing the function of a bezel.

The dial plate may be suitably graduated and may have an opening **31** through which a spindle or shaft, secured to a condenser or other adjustable apparatus, may extend and receive a knob **32**. The size of the hole is such as to afford adequate clearance for the spindle or shaft. Should for any reason the plate become loosened and free of the panel **10**, the spindle will anchor the plate so as to keep it from falling.

Another dial mounting is illustrated in Figs. 9 and 10. It comprises a panel **35** having an opening **36** behind which a dial plate **37** is held. The means for so holding the plate comprises preferably spaced leaf springs **38** at the ends and behind the opening **36**. The springs may be individually mounted or, as shown, may conveniently extend from a head **39** having a lip **41** secured at **42** to bosses **42***a* provided at the back of the panel. The springs are arranged to exert forward pressure and their upper ends **43** are turned rearwardly to provide entrances for the reception of the dial ends **44** between said ends **43** and the panel.

In mounting the dial **37**, it is placed behind the panel **35** above the opening **36** in a position suggested by the dash-dot lines in Fig. 10, with the dial ends **44** above the respective springs **38**. Then the dial is lowered, camming the spring ends to the full line positions shown in Fig. 10, the plate coming to rest on stops such as the tangs **46** projecting forward from the springs. Suitable stop means for this purpose could be formed at the back of the panel or otherwise provided. The dial plate may be suitably graduated and has a hole **47** through which the spindle **48** of an indicator knob **49** is projected. The size of the hole is such as to afford adequate clearance for the spindle or shaft as may be necessary in various installations to allow for manufacturing tolerances. The spindle, secured to a tuning condenser or other adjustable apparatus, locks the plate in place and cooperates with the stops **46** in preventing substantial angular displacement of the plate, while the springs press against the plate and hold it against the panel with the dial graduations properly framed in the panel opening.

For accommodating the shafts or spindles **51** of additional adjusting knobs, registered openings in the panel and spring head are provided as indicated at **52**.

The dial plate in each embodiment illustrated is resiliently held in place, and is preferably made of unbreakable and transparent or translucent material, though it may be opaque if desired. In the first embodiment, the plate is resilient as well as unbreakable and hence may be made of any suitable material for this purpose, including among others Celluloid, "Tennite" and other phenolic condensation or resinous products.

A lamp at the rear of the panel or other suitable location may be employed to illuminate the translucent or transparent dials.

I am aware that reversals of parts may be resorted to and that other changes may be made and details of construction varied through a wide range without departing from the principles of this invention, and I therefore do not purpose limiting the patent granted hereon otherwise than necessitated by the prior art.

I claim:

1. A radio dial mounting comprising a panel having a dial opening and a radio dial edge-clamped in said opening with the full area of the outer surface of said dial exposed.

2. A radio dial mounting comprising a panel having a dial opening and a resiliently flexible dial edge-clamped by its own resilience in said opening, the front faces of said panel and dial terminating at said edge.

3. An integral radio cabinet panel having a dial opening, and a radio dial fitted in said opening and having a tongue-and-groove connection with an edge portion of the opening and having a relatively flat surface friction connection with an opposed edge portion of the opening and held in engagement therewith solely by friction.

4. A radio cabinet panel having a dial opening, and a resilient radio dial fitted in and in edgewise engagement with the edge defining said opening and flexed, when so fitted, to an abnormal shape so that the tendency of said dial to assume its normal shape sets up friction between said dial and said edge, whereby said dial is frictionally held in said opening by said edge.

5. In combination with a radio cabinet panel having an opening, a radio dial sprung in and closing said opening and having a narrower part insertable through said opening to a position along and in engagement with one side of said panel at said opening, said dial having a part engageable with the opposite side of the panel at said opening.

6. A radio cabinet panel having a dial opening, a radio dial larger than and resiliently clamped in closing relation to said opening, and means including a dial indicator shaft extending through said dial for anchoring said dial relative to said opening.

7. An integral radio cabinet panel having a dial opening, a radio dial fitted in said opening and having a tongue-and-groove connection with an edge portion of the opening and having a friction connection with an opposed edge portion of the opening, and means for preventing said dial at said opposed portion from passing in one direction through said opening.

8. In combination with a radio dial panel having an opening, a radio dial having an edge interlocked with an edge of the opening and having an opposite edge in a sliding frictional force fit with another edge of the opening.

9. In combination with a radio cabinet panel having a dial opening, a radio dial slightly larger than said opening and having a flat edge normal to its plane and engageable with a like flat edge of the opening and formed to have a tongue-and-groove interlock with the opposite edge of the opening, said dial being slidable substantially in the plane of the opening and being resilient so as to permit the tongue-and-groove portions to interlock while said flat edge of the dial is flexed out of the opening, said flat edge of the dial being arranged to be shoved into a force fit with the flat edge of the opening so as to prevent disturbance of the tongue-and-groove relationship.

10. In combination with a radio cabinet panel having an opening, a radio dial closing said opening and having a narrower part insertible through said opening to a position along and in engagement with one side of said panel at said opening, said dial having a part engageable with the opposite side of the panel at said opening, and means for maintaining both engagements.

11. In a radio cabinet construction including a panel having a keyhole dial opening, a radio dial for covering said opening and having a portion insertible through the wider part of the opening to engage the sides of the narrower part of the opening, said dial having a portion wider than the wider part of the opening to engage the sides of the wider part of the opening, and means for maintaining both engagements.

12. In a radio cabinet construction including a panel having a keyhole dial opening, a radio dial for covering said opening and having a portion insertible through the wider part of the opening to engage the sides of the narrower part of the opening, said dial having a portion wider than the wider part of the opening to engage the sides of the wider part of the opening, said dial being resilient and flexed to an abnormal shape when so engaged, and arranged to be held so engaged by its own resilience and the rigidity of the panel.

13. A radio dial mounting comprising a panel having a dial opening, and a dial in said opening, an edge portion of said dial being interlocked with an edge portion of said opening, said dial being frictionally engaged in said opening beyond said portions, the periphery of said dial adjacent the ends of said edge portions being engaged with one face of said panel, the periphery of said dial remote from said ends being engaged with the opposite face of said panel.

14. A radio cabinet panel having a dial opening, a radio dial larger than and disposed behind said opening, spring means clamping said dial over said opening, means including a dial indicator shaft extending through said dial for preventing shift of said dial relative to said opening, and a handle on said shaft.

15. A radio cabinet panel having a dial opening, a radio dial larger than and disposed behind said opening, spring means clamping said dial over said opening, and means including a dial indicator shaft extending through said dial for preventing shift of said dial relative to said opening.

16. A radio cabinet panel having a dial opening, spring means behind said opening for supporting a dial plate behind said opening, said spring means being turned so as to provide a guide surface to facilitate insertion of a dial plate into position between said spring means and said opening and means cooperating with said dial for preventing turning of said dial.

17. A radio cabinet panel having a dial opening, spring means at one side of said opening for holding a dial at said side, said spring means having a guide surface to facilitate insertion of a dial between said spring means and said side, means for limiting the extent of insertion of the dial, and means arranged to extend through the dial for cooperating with the spring and limiting means to maintain the dial in proper covering relation to the opening.

ARNOLD P. HULTGREN.