Jan. 27, 1959 S. FURER 2,870,625

CEILING INSERT FOR CONCRETE

Filed Dec. 6, 1955

FIG. 1.

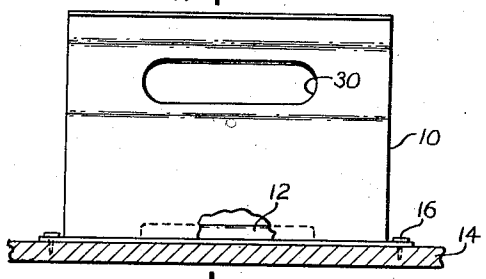


FIG. 2.

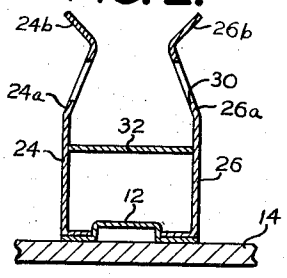


FIG. 3.

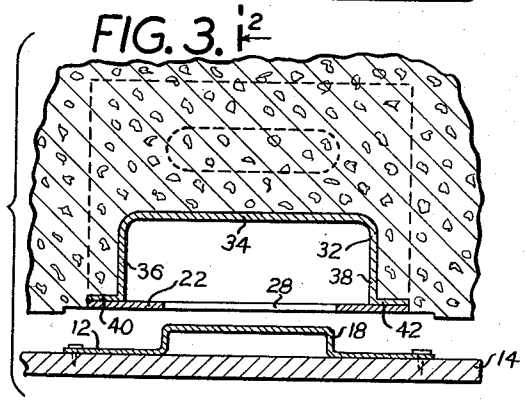


FIG. 4.

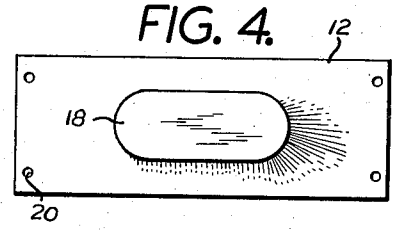


FIG. 5.

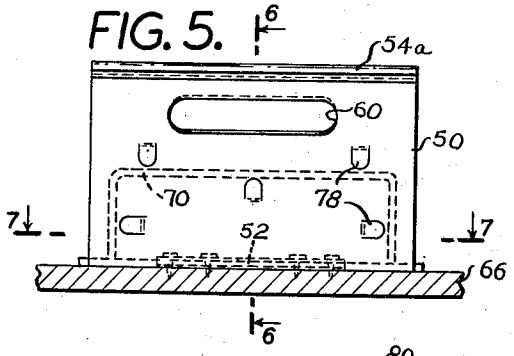


FIG. 6.

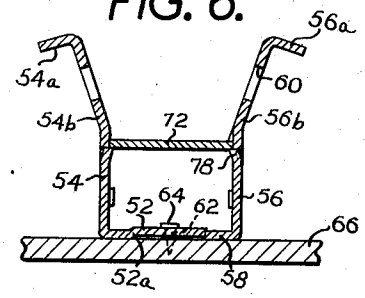


FIG. 7.

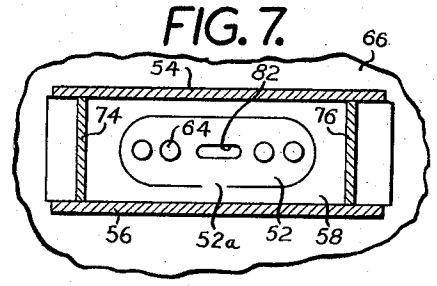
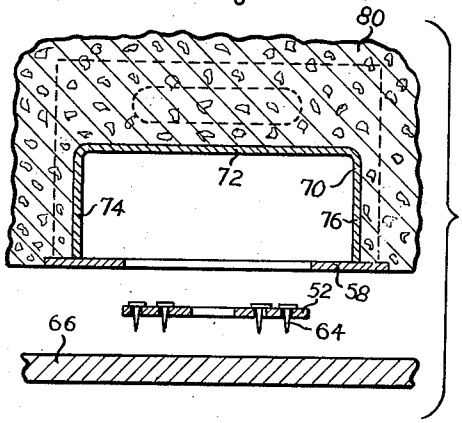


FIG. 8.



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CEILING INSERT FOR CONCRETE

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1 Claim. (Cl. 72—105)

This invention relates to removable clips for ceiling inserts and ceiling inserts adapted to be used in conjunction therewith.

It is frequently necessary to provide overhead supports for steam pipes, sprinkler pipes, other conduits and also many other devices and fixtures which are pendently supported from room ceilings. Metal inserts (commonly known as concrete inserts) are embedded in the concrete ceiling and threaded rods or bolts are suspended therefrom. The pipes or other objects to be pendently supported from the ceiling are then secured to said threaded rods or bolts by means of pipe hangers or like supporting means.

This is all conventional and the conventional manner of embedding the inserts into the ceiling may be described as follows: A plurality of inserts are nailed to a wooden form or deck on which the concrete is to be poured. After the concrete sets, the form or deck is stripped away leaving the concrete ceiling and the inserts exposed, and the nails hanging therefrom. It now becomes necessary to clip each individual nail flush with the ceiling to provide a clean, finished appearance. In large installations, where thousands upon thousands of these inserts are used, the task of cutting the nails away assumes serious proportions. Moreover, what remains after the exposed portions of the nails are clipped away, is a series of end portions which rust and mar the appearance of the ceiling.

The principal object of this invention is the provision of a clip for a ceiling insert, said clip to be nailed to the concrete form and said insert to be detachably secured to said clip. The clip is attached to the form by conventional means, that is, by nailing it to said form. The insert is simply snapped into place on the clip and the concrete is then poured in conventional fashion. When the poured concrete sets, the form is stripped away in the usual manner. The clip remains on the form since it is nailed thereto but the insert remains embedded in the ceiling without any nails hanging therefrom to mar its appearance. The clip may be removed from the form and then re-used as needed.

There are two basic forms of this invention. In the first form, the clip and the insert are made of the same material and they are integrally connected to each other. In one exemplification of this form of the invention, the clip is simply struck out of the insert except for a very small neck portion which is permitted to remain to keep the clip attached to the insert until such time as it is desired to detach it therefrom. In this case, when the clip is nailed to the form, the effect is to nail the insert to the form since the clip and insert are integrally joined with each other. However, the form may be detached from the clip, since they are only nailed to each other, and the clip may be detached from the insert since the narrow neck portion may readily be ruptured. What remains is the insert without the clip or the nails.

In the second form of this invention, the clip and the insert are two separate members which are detachably secured to each other. In one exemplification of this

form of the invention, the clip is in frictional engagement with the insert and may readily be detached therefrom. When the form is removed from the concrete ceiling, the clips are retained thereon and only the inserts are left in the ceiling. The clips may then easily be detached from the form.

The invention is illustrated in the accompanying drawing wherein:

Fig. 1 is a side view of a ceiling insert mounted upon a clip of the character herein clamped and showing said clip nailed to a concrete form, said form being shown in section.

Fig. 2 is a vertical section therethrough on the line 2—2 of Fig. 1.

Fig. 3 is a fragmentary section through the poured concrete and also through said insert, clip and form, said view being exploded to show the insert cast into the concrete and the form stripped away from the concrete with the clip remaining secured thereto.

Fig. 4 is a top view of the clip.

Fig. 5 is a side view of a modified form of ceiling insert and clip attached thereto, showing said clip nailed to a form.

Fig. 6 is a vertical section on the line 6—6 of Fig. 5.

Fig. 7 is a horizontal section on the line 7—7 of Fig. 5.

Fig. 8 is an exploded sectional view showing the insert of Figs. 5, 6 and 7 cast into the concrete, the clip detached therefrom and also detached from the form.

Referring now to the first form of this invention and to Figs. 1 to 4 inclusive, it will be observed that the present invention requires the use of two elements, namely, a ceiling insert **10** and a clip **12**. The clip is nailed to a wooden form or deck **14** by means of conventional nails or tacks **16**. The ceiling insert **10** is snapped into engagement with the clip after the clip is nailed to the form and it is only then that the concrete is poured onto the form. The means for supporting the form preparatory to the pouring operation is not shown since it is purely conventional.

It will be observed that clip **12** is simply a rectangular sheet of metal having a generally oval-shaped embossment **18** formed thereon. A plurality of holes **20** are formed in the corners of said clip through which nails may be driven into the form. The insert **10** may be described, generally, as a box, having a bottom wall **22** and a pair of side walls **24** and **26** respectively. A generally oval-shaped opening **28** is formed in the bottom wall **22** to accommodate the oval-shaped prominence **18** of the clip. Of course, said opening and said prominence are made to engage each other so that the shape of the one will dictate the shape of the other. A press-fit or snap fit is contemplated so that the insert will be held securely in place on the clip during the concrete pouring operation.

It will be observed that the walls **24** and **26** are bent inwardly to form converging portions **24***a* and **26***a* respectively, adjacent their upper ends **24***b* and **26***b* respectively, which upper ends diverge as shown in Fig. 2. Openings or slots **30** are formed in the converging portions **24***a* and **26***a*. It will be understood that this configuration of the sides of the insert and the openings formed therein are intended to provide a strong anchorage in the poured concrete. This prevents the insert from being pulled out of the concrete under heavy loads.

An enclosure **32** is mounted within the insert **10**, and more particularly between its two side walls **24** and **26**, below their bent portions **24***a* and **26***a*. Said enclosure forms a part of the insert and provides it with its box-like form. The enclosure consists of a top wall **34**, a pair of end walls **36** and **38** and a pair of outwardly extending flanges **40** and **42** at the lower ends of the end walls. These flanges are supported upon the bot-

tom wall **22** of the insert and said enclosure is thereby supported across and above the opening **28** in the bottom wall **22** of said insert. The side edges of the top and end walls of the enclosure frictionally abut the side walls **24** and **26** and said enclosure is thereby held securely in place during the concrete pouring operation. It will be understood that said enclosure prevents the concrete from pouring onto that portion of the base plate **22** of the insert which is intended to support a threaded rod or bolt. By this is meant that marginal portion of said base plate or lower wall **22** which immediately surrounds the opening **28**.

In the use of this device, clip **12** is secured to the wooden form **14** by means of said nails **16** driven through the holes **20**. The clip is now held securely in place and ready to receive the insert. The insert is then placed over the clip until embossment **18** of said clip enters and engages the opening **28**. The edges of the bottom wall **22** which surround and define said opening frictionally engage the sides of said embossment **18** and the insert is now held securely in place on the form. Enclosure **32** may be inserted into the insert at the factory so that there would be no need to assemble the enclosures into the inserts on the job or in the field. Similarly, the clip may also be attached to the insert at the factory so that even this minor bit of assembly work is avoided in the field. In this connection, it will be noted that the clip **12** is somewhat longer than the bottom wall or base plate **22** of the insert, at least sufficiently so to enable the holes **20** to clear the ends of the insert. Since these holes remain exposed even after the insert is pressed into place upon the clip, it will be understood that the clip may be nailed to the wooden form irrespective of whether the insert is mounted thereon or not. Since all three parts of the device herein described may be assembled at the factory, namely, the clip, the insert and the enclosure, the job of affixing said assembly to the wooden form in the field becomes completely simplified. The workman nails the entire assembly to the form in precisely the same manner as he would nail a conventional insert to the form. When the concrete pouring operation is at an end, the form may be stripped from the ceiling at the proper time and with considerably less effort than is required to strip a form from conventional inserts. The reason is that in stripping a form from conventional inserts, it is necessary to detach the form from the nails which secure it to the inserts. In the present case, on the other hand, stripping the form from the ceiling means simply that the form and attached clips are detached from the inserts without separating the nails from the form. This is a very simple operation since the clips are merely frictionally held by the inserts. Following the stripping operation, the clips may be detached from the form by conventional means and this, too, is a simple operation because the form may now be placed in a handy position for removal of the clips.

Referring now to the second form of this invention and to Figs. 5 to 8 inclusive, it will be observed that an insert **50** is provided which carries its own clip **52** as an integral part thereof. Insert **50** is provided with a pair of side walls **54** and **56** respectively and it will be observed that these walls are joined at the bottom by a bottom wall or web **58**. The upper end portions **54***a* and **56***a* of the side walls are bent laterally outwardly and the wall portions **54***b* and **56***b* immediately below said upper end portions are bent outwardly to assume diverging positions. Openings **60** are formed in said diverging portions and it will be understood that this configuration of the side walls of the insert and said openings are intended to provide good anchorage in the poured concrete.

Clip **52** is simply a portion of the bottom wall **58** of the insert, struck out therefrom except at a small portion **52***a* by which the clip remains attached to said bottom wall. But this connecting portion is small and weak and it may readily be ruptured when it is desired to remove the clip from the insert. It will be noted that a plurality of holes **62** are formed in clip **52** and it will be understood that it is through these holes that nails **64** may be driven into form **66**. Since the clip **52** is connected to the bottom wall of the insert in the manner described, the task of nailing the clip to the form takes place while it constitutes a part of the insert. Consequently, nailing the clip **52** to the form also nails the insert thereto.

When the nailing operation is terminated, enclosures **70** are inserted into the inserts. Each enclosure is provided with a top wall **72** and a pair of end walls **74** and **76** respectively, defining a structure of inverted U-shape. The side edges of the enclosure frictionally engage the side walls **54** and **56** of the insert to hold said enclosure in place therein during the concrete pouring operation. In addition, a plurality of lugs or ears **78** are struck out of the side walls of the insert to guide and hold the enclosure in place. Some of these ears engage the inner sides of the enclosure and others engage the outer surface of its top wall thereby locking the enclosure in place in the insert.

After the inserts are attached to the form, by means of nails **64** passing through holes **62** in the clip portions **52**, the concrete **80** is poured and after it sets the form or forms **66** are stripped therefrom. Since the clips **52** are still attached to the inserts, the forms will also be stripped from them, leaving the clips **52** and the nails **64** behind. In a conventional operation, the exposed portions of these nails would be clipped away but in the present invention the clips themselves are removed and, of course, the nails with them. It will now be noted that an elongated slot **82** is formed in each clip **52** and it will be understood that this slot is intended to receive a screwdriver or like tool which may be inserted therein and then used as a lever to detach the clip from the insert. What remains exposed is the bottom wall **58** of the insert which serves to support a threaded rod or bolt in conventional manner.

The foregoing is illustrative of preferred forms of this invention and it will be understood that these preferred forms may be modified and other forms may be provided within the broad spirit of the invention and the broad scope of the claim.

I claim:

A concrete ceiling insert, comprising a housing, a cover and a clip, said housing having a bottom wall and a pair of upwardly extending side walls, said side walls having lower portions which extend vertically in parallel relation to each other, and having upper portions which are bent at an angle to the vertical and which are provided at their upper ends with diagonally disposed flanges, said clip comprising a slug struck out from said bottom wall of said housing and being detached therefrom except for a narrow neck portion which joins said clip to said bottom wall, said narrow neck portion being rupturable to completely detach said clip from said bottom wall, nail holes formed in said clip, whereby said housing may be detachably secured to a wooden form on which concrete is poured to form a concrete ceiling, by means of nails driven through said nail holes and into said form, said cover being of inverted U shape, the legs of said inverted U being disposed between the lower vertically extending portions of the side walls of the housing, the yoke of said inverted U extending horizontally across and above said clip, between said legs of the inverted U and between said lower portions of the side walls of the housing, thereby forming an enclosure above said bottom wall of the housing which prevents entry of the concrete which is poured upon said form, and thereby forming a chamber having as its bottom wall the bottom wall of the housing and said clip, said upper bent portions of the side walls of said housing

and said diagonally disposed flanges being adapted to be embedded into said poured concrete so as to support said ceiling insert therein, said clip being detachable from said bottom wall of the housing after the concrete sets and the form is removed therefrom, in order to remove the nails from said housing and to provide an opening through which a nut may be inserted into said chamber, lugs being struck out of the side walls of the housing and being engageable with and positioning the cover therein, some of said lugs being engageable with the legs of said cover to prevent lateral displacement thereof, other of said lugs being also engageable with the yoke of said cover to prevent upward displacement thereof, said clip being provided with an elongated slot which

is engageable with a tool of the character of a screw driver so that said clip may readily be detached from the bottom wall of said housing after the concrete is set and the form is removed therefrom.

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