April 21, 1931. W. CLIFFORD, JR 1,801,723

HOLDER OR RETAINER FOR CONCRETE INSERTS

Filed Feb. 27, 1930

Fig. 1.

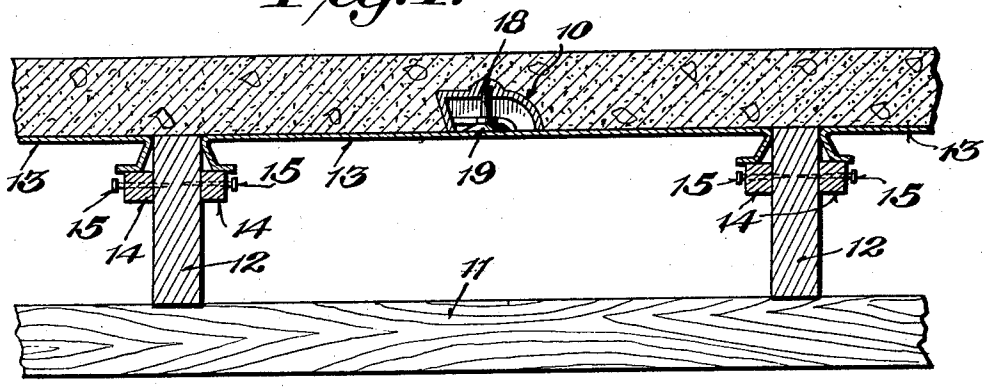


Fig. 2.

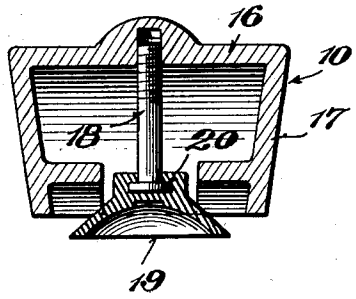


Fig. 3.

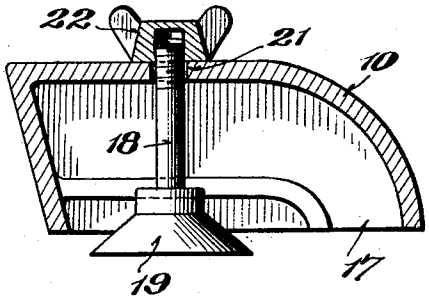


Fig. 4.

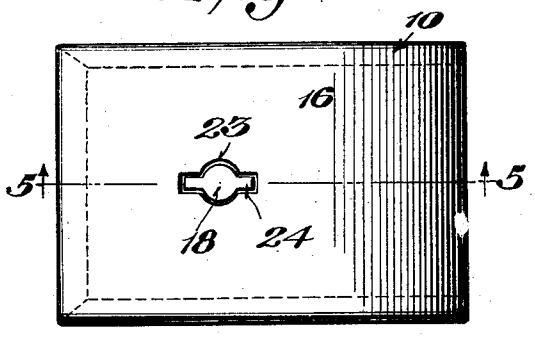
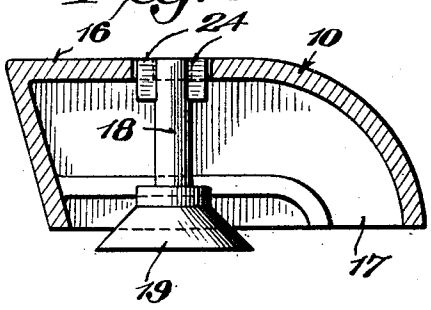


Fig. 5.



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UNITED STATES PATENT OFFICE

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HOLDER OR RETAINER FOR CONCRETE INSERTS

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This invention relates to holders or retainers for concrete inserts, which inserts are cast in the concrete floors or ceilings, and from which hangers may be suspended for supporting conduits, pipes and the like from the floor or ceiling.

In the construction of concrete floors some suitable temporary formwork is employed, and it has been customary to use wood formwork with wood sheathing supported on this formwork onto which the concrete is poured. The cost of using wood formwork and the salvage thereof, has to a large extent caused this character of formwork to be supplanted by metal formwork, using wood struts, or T-heads with beams or joists mounted thereon and then applying metal forms or plates upon these beams or joists. There is practically no loss of material with this character of formwork and therefrom the metal forms can be used over and over, and after a pouring operation can be taken down and used in the construction of additional floors in the building much more readily and easily than with wood forms.

The present invention is particularly adapted for use in connection with this metal formwork. Many devices have been provided for holding or retaining these inserts in position on the formwork during the casting operation but their use has been confined to the wood forms wherein nails or other sharp instruments could be driven into the wood sheathing for holding the inserts in place. Even this has been found objectionable because after the casting operation it was necessary to cut off or clip the ends of protruding nails before the ceiling and other construction work could be proceeded with. As it is practically impossible without injuring the metal forms to use nails and the like for holding these inserts therein great difficulty has been encountered in finding some means for holding the various inserts in position on the metal forms and in proper alignment during the casting of the floor, without their being displaced as the concrete is poured upon the forms.

The present invention has been devised to overcome these objections and is equally applicable with wood sheathing forms as with the metal forms as nails and the like are eliminated in attaching the inserts to the forms. Briefly, the invention consists of a vacuum or suction cup attached to a stem which stem has engagement with the insert and is so encompassed or enclosed by the insert that the suction cup can be caused to engage with the metal or wood formwork and retain and hold the insert snugly upon the sheathing or metal form and against movement while the concrete is being poured upon the formwork. After the concrete has been poured and has sufficiently set this formwork is removed and in its removal the suction cup may be withdrawn from the insert or easily disengaged therefrom. After the suction cup and stem are disengaged from the inserts any suitable type of hanger may be inserted in the inserts, and pipes and conduits suspended by these hangers from the various inserts located in the flooring.

The invention consists of certain novel features of construction and combinations of parts which will be hereinafter described and pointed out in the claims.

In the accompanying drawings:

Fig. 1 is a transverse vertical sectional view of a conventional form of metal formwork showing the insert in section supported thereon by the suction device and the concrete cast thereabout;

Fig. 2 is a transverse vertical sectional view through an insert and the suction device;

Fig. 3 is a longitudinal vertical sectional view showing the suction device attached thereto in a slightly different manner;

Fig. 4 is a top plan view of an insert showing another form of suction device in top plan; and

Fig. 5 is a vertical sectional view on line 5—5 of Fig. 4 showing the suction device in position.

The insert herein described and designated 10, is one form of insert now in general use and has been taken to illustrate the application of the invention to this form and other forms of a similar character that might be used with this invention. It is the purpose,

to employ this invention in connection with any hollow insert to which it may be attached for mounting the inserts upon the metal or wood formwork employed in the construction of a building, and as illustrated in Fig. 1 a stringer 11 is shown having beams 12 thereon for supporting metal forms 13 by means of longitudinaly strips 14 which are attached to the beams by suitable fastenings 15. All of this formwork is capable of being removed after the floor has been cast and allowed to set for a sufficient length of time.

In the form disclosed in Fig. 2 the insert 10 is shown as being of hollow construction having a top 16 and side wall 17 which side walls are adapted to be supported and rest upon the metal form 13. A stem 18 has at one end thereof screw-threads which have screw-threaded engagement with the top 16 of the insert 10, and at its lower end a vacuum or suction cup 19 is attached. The end of the stem is enlarged as at 20 and the elastic disc 19 is molded or formed about the head so that it is embedded therein. The elastic disc 19 is preferably made cup-shaped and when forced down upon the metal form 13 it will be pressed outwardly forcing out the air therebeneath, causing a vacuum to be created between the disc and metal form, and when in this position it will lie within the confines of the walls 17, of the insert 10, allowing the side walls of the insert to rest upon the metal form and be held rigidly in place so that as the concrete is poured upon the metal forms and about the insert the insert will become cast or embedded within the concrete and the concrete will not enter between the lower edges of the side walls and the metal form.

After the concrete is set and the formwork is removed the metal forms will be readily disengaged from the floor slab and from the inserts as the amount of suction or vacuum is so slight that it can be readily broken. The stem 18 may now be unscrewed from the insert whereupon the insert will be in readiness to receive its hanger for supporting pipes or conduits beneath the floor.

In the forms shown in Fig. 3 the stem 18 extends through an opening 21 in the top 16 of the insert and has a wing nut 22 attached thereto for connecting the stem and vacuum cup 19 to the insert.

In Figures 4 and 5 a slightly different arrangement is provided in that the top 16 of the insert is provided with a key-hole slot 23 in which a key 24 formed on the upper end of the stem 18 is received for attaching the insert to the stem.

As illustrated in the several figures the stem 18 is capable of vertical adjustment with response to the inserts and as disclosed in Figs. 2 and 3 the upper ends of the stem are covered or housed so that in the pouring of the concrete these stems will not become embedded in the concrete and may be easily disengaged from the inserts.

With these several forms it will be readily appreciated that the stems and suction cups are readily detached from the inserts and will in no way interfere with the use of the insert after they have been cast in the floor nor will the mounting of these devices on the inserts cause any material change or alteration in the insert in its construction but are capable of being readily and easily applied thereto.

While this invention has been disclosed as being applied particularly to metal formwork it is thought that it will be readily appreciated that the suction or vacuum cup may be used in connection with the wood sheathing employed where the formwork is entirely constructed of wood, and therefore the invention is capable of being employed with other form work than metal. With a device of this character which can be readily applied to the various inserts in use with concrete floor construction for supporting pipes and the like, it is possible to attach these inserts to metal forms or wood sheathing without the use of nails or wood fastenings which have been heretofore employed in holding and retaining these inserts in their proper position on the formwork during the casting of the floor slabs. The stem 18 can be so connected with respect to the insert and the suction device or elastic washer positioned with respect to the lower surfaces or edges of the insert, that the necessary adhesion will be obtained between the formwork and the washer, to cause the insert to snugly rest upon the formwork and be held against movement. After the floor has been cast the stem and suction device can be detached from the insert and may be employed in connection with other inserts if so desired.

Having described my invention what I claim as new, is:—

1. A retaining device, comprising a hollow insert for concrete construction, including a vacuum means carried and encompassed by said insert.

2. The combination with a temporary support and a hollow insert mounted thereon, of flexible means connected to said insert and adapted to adhere to the upper surface of said support for retaining the insert in position thereon, said means being interposed between said insert and support.

3. The combination with a temporary support and a hollow insert mounted thereon, of a stem detachably connected to said insert, and a vacuum cup on said stem for engagement with said support for holding the insert thereon during the pouring of the concrete slabs.

4. In a retaining device, the combination with a support and a hollow insert, of a stem detachably connected to said insert, and vacuum means on said stem for engagement with

a support for retaining the insert in position on the support during the pouring of concrete, said stem and vacuum means encompassed by said insert when the insert is in engagement with said support.

5. A retaining device for inserts employed with concrete construction, consisting of a hollow insert, and vacuum means detachably connected thereto and encompassed by said insert, for engagement with a support for holding the insert in position during the pouring of concrete thereabout.

6. A retaining device for cooperation with an insert for concrete constructions, including means detachably connected thereto and encompassed within the insert and adapted to have suction engagement with a support for holding the insert in place during the pouring of the concrete thereabout.

7. A retaining device adapted for cooperation with a hollow insert for concrete construction having an opening in a wall thereof, a detachable member extending through said opening and having engagement with the insert for holding the same against movement with respect to said member, and means on said member for retaining said insert in place on a support by suction.

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