Dec. 15, 1942. C. N. HAYDEN 2,305,252

CONCRETE INSERT

Filed Jan. 28, 1942

Fig. 1

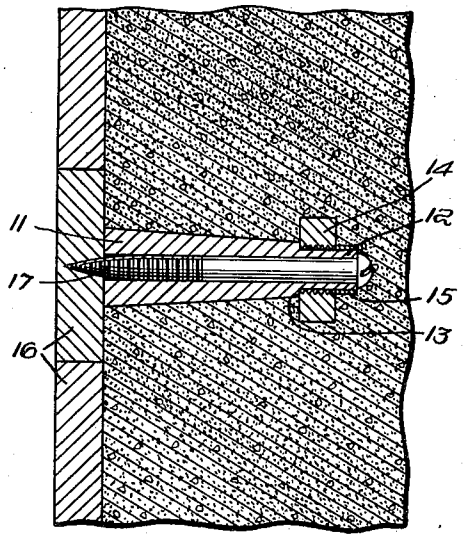


Fig. 2.

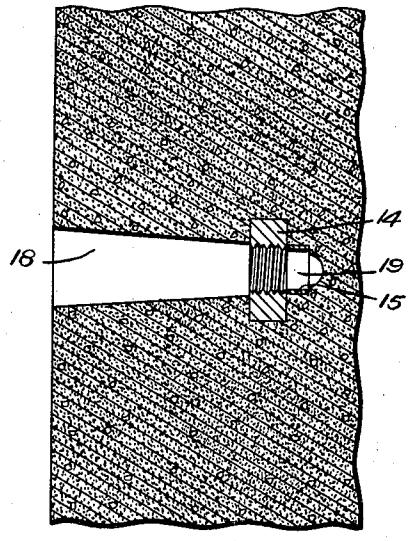
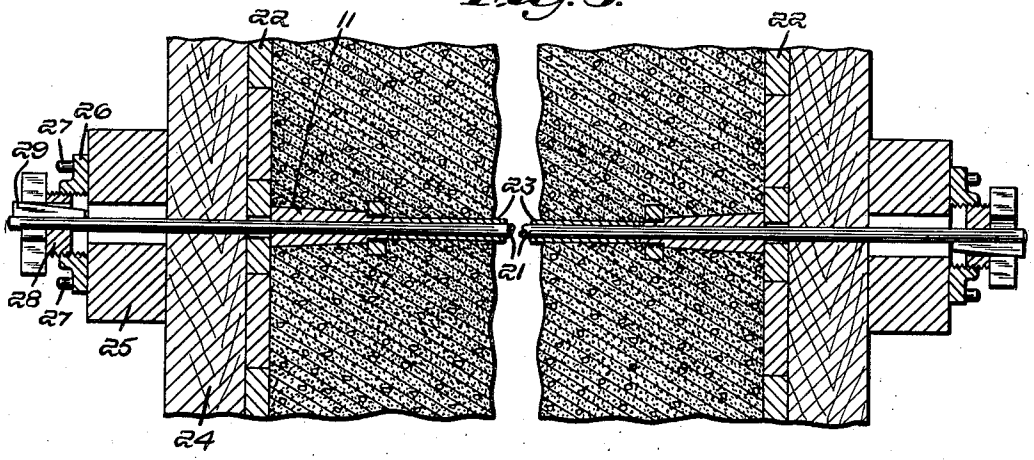


Fig. 3.



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CONCRETE INSERT

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3 Claims. (Cl. 72—105)

This invention relates to concrete inserts of the character employed with concrete forms to embed a nut within the formed concrete in such a manner that the threads of the nut are accessible to receive the threaded end of a bolt, hook or other appliance which is to be secured in the concrete.

The principal purpose of the invention is to provide an improved concrete insert of simple and economical construction, which is easily located in any desired position on the concrete form before or after the form is erected; which is suitable for use in concrete floors as well as posts, walls or ceilings; and which locates the inserted nut remote from the surface of the concrete so that no metal is disposed within an inch of that surface, as required by many building regulations.

Recommended embodiments of the invention are shown in the accompanying drawing, but it will be understood that the size, shape and structural details of the devices herein illustrated may be varied to suit particular conditions without departing from the essence of this invention as defined in the appended claims.

In the drawing:

Fig. 1 is a fragmentary sectional view of a concrete form to which the improved insert is attached, showing the poured concrete surounding the insert and its embedded nut;

Fig. 2 is a similar view of the hardened concrete after the wooden form and the nut-locating part of the insert have been removed, showing the embedded nut in position to receive a threaded hook, bolt or the like; and

Fig. 3 is a fragmentary vertical section of a set of concrete forms connected by a tie rod on which a pair of the improved inserts and an intermediate spacing tube are located.

In the particular form chosen for the purpose of illustration in Fig. 1, the concrete insert comprises a wooden cone, or frusto-conical tube 11, having a reduced cylindrical tip 12 at its inner and smaller end, providing a circumferential shoulder 13; and a nut 14 frictionally retained on the tip 12 against the shoulder 13. The tip of the cone is preferably longer than the width of the nut so that it projects therefrom, and a paper or fibre collar 15 is preferably fitted around the projecting end of the tip 12, as shown.

The insert as a whole is fastened to the inside surface of the sheathing 16 constituting the concrete form, so that the cone projects axially into the space to be occupied by the concrete; and a screw 17 or other fastening device (such as the tie rod hereafter described) passes through the bore of the wooden cone 11 and into the form 16 to fasten the insert in position on the form.

After the concrete has been poured within the form and around the insert, and has hardened, the form together with the cone attached thereto is stripped off, leaving the nut 14 embedded in the concrete and adapted to receive the threaded end of a hook or bolt inserted in the conical, metal-free opening 18 formed by the removed wooden cone 11. It will be observed that the bolt or hook end may extend through the nut into the recess 19 vacated by the tip of the cone and formed by the collar 15; and it will be apparent that the paper collar not only provides ample space for the end of the inserted hook, but also acts as a seal to prevent the wet concrete from penetrating into the threads of the nut 14.

It will also be understood that any desired number of improved inserts may be quickly, easily and accurately fastened to the concrete form to provide threaded receptacles for coiling hooks, wall brackets, partition bolts, floor bolts or the like, wherever such fixtures or appliances are to be located; and it will be appreciated that the inserts can be thus located after the metal reinforcements are in place and just prior to the pouring of the concrete, especially in ceiling or floor forms.

In the modified arrangement shown in Fig. 3, a pair of the improved inserts are mounted on a form tie 21 connecting two parallel forms 22 and are secured against the respective forms by an intervening spacer tube 23, when the forms are pressed inwardly by clamps engaging the ends of the tie rod 21; and the wooden cones 11 also serve as spacing elements, and may be shaped or trimmed for accurate adjustment of the space between the forms. The inserts shown in Fig. 3 do not include the paper collar on the tip of the cone, as shown in Fig. 1, for that advantageous addition is not essential to all forms of this invention; but the collars may obviously be employed, if desired.

The clamps shown in Fig. 3 are of an improved wedge type, but are not within the scope of the present invention; and only one such wedge clamp is required for each rod if the opposite end is firmly held against displacement. In utilizing spreader ties of this type, it is customary to erect studding 24 on which are nailed horizontal walers 25 which serve to support the clamping devices. Each of the clamps herein disclosed comprises a base collar 26 provided with upstanding lugs 27 around its margin, and internally threaded

to receive nut 28. The nut has an axial opening which receives the end of rod 21, and a radial slot which receives a steel wedge 29 for clamping the rod to the nut; and the forms are then compressed against the spacer tubes 23 and the inserts 11 by tightening the collar 26. The lugs 27 permit the collar to be conveniently gripped by the claw of a hammer whenever the collar is to be tightened or loosened.

In this arrangement, the stripping of the forms will not of itself withdraw the insert cones 11, but they may be easily loosened and pried out of the hardened concrete by a suitable implement, thus leaving the nuts 14 embedded as shown in Fig. 2.

In each of the recommended embodiments herein disclosed, the improved concrete insert comprises the axially apertured, frusto-conical wooden member or cone 11, provided with the reduced substantially cylindrical tip 12 on which the nut 14 is frictionally or otherwise removably retained until the wooden cone is withdrawn from the hardened concrete; and the axial opening of the insert receives the screw 17, rod 21 or other suitable means for mounting the wide end of the cone against the inner surface of the form. In both arrangements, the end of the tip projects beyond the nut to form a recess for the end of the hook or bolt which is intended to be threaded into the embedded nut; and the provision of the optional fibre collar 15 serves to enlarge that recess, thereby providing adequate depth for easy adjustment of the bolt or hook threaded in the nut 14, and to prevent wet concrete from flowing into the threads of the nut.

The new device substantially reduces the quantity of metal required in making former types of inserts, and ensures that no metal is disposed adjacent the surface of the hardened concrete, after the wooden cone and mounting screw or rod are removed. When used in forming concrete floors, the use of the improved inserts permits the floor skids to be accurately leveled and bolted down.

I claim:

1. A concrete insert of the character described, comprising a frusto-conical, wooden member, axially apertured to receive means for mounting the wider end of said member against the inner surface of a concrete form, the narrower end of said member having a substantially cylindrical tip, an internally threaded member fitting on said tip and adapted to be embedded in the hardened concrete, remote from the surface thereof, when the wooden member is withdrawn therefrom, said tip projecting beyond the threaded member, and a collar fitting over the projection of the tip.

2. A concrete insert of the character described, comprising a frusto-conical, wooden member, axially apertured to receive means for mounting the wider end of said member against the inner surface of a concrete form, the narrower end of said member having a substantially cylindrical tip forming an annular shoulder remote from its end, a nut fitting over said shoulder and removably retained thereon against said shoulder inwardly of the end of the tip, so that the nut is embedded in the hardened concrete remote from the surface thereof, when the wooden member is withdrawn therefrom, and a fibre collar fitting over the tip between the nut and the end of the tip to prevent wet concrete from penetrating into the threads of the nut and to provide space for the end of a threaded member thereafter screwed into said nut.

3. A concrete insert of the character described, comprising a frusto-conical, wooden member having a reduced, substantially cylindrical tip at its narrower end and an axial aperture to receive a screw for fastening the wider end of the insert to a concrete form, a nut surrounding said tip and removably retained thereon remote from its end, and a fibre collar fitting around the extreme end of the tip.

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