June 26, 1928. 1,674,628

H. S. ASHENHURST

FLOOR FILL AND METHOD OF INSTALLING THE SAME

Filed Feb. 16, 1925

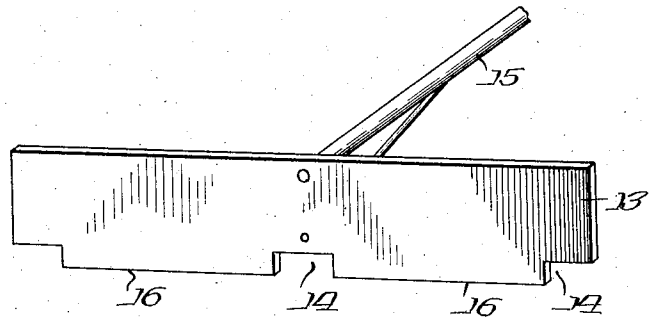



Fig. 1.

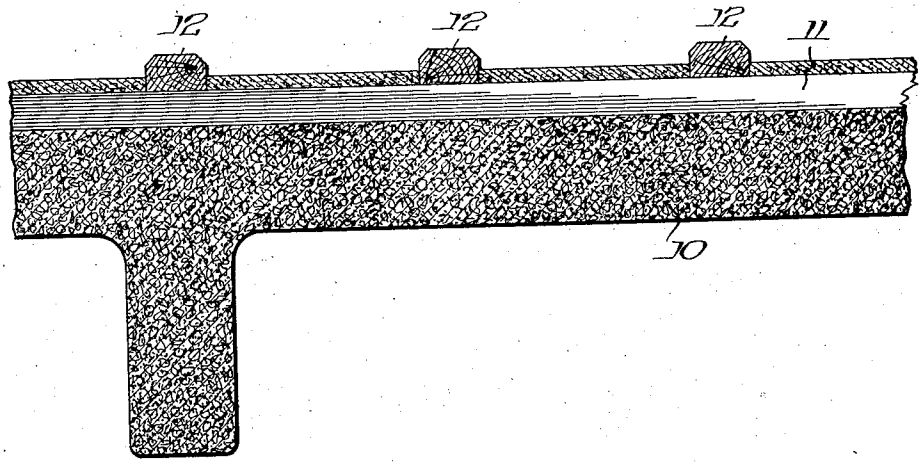
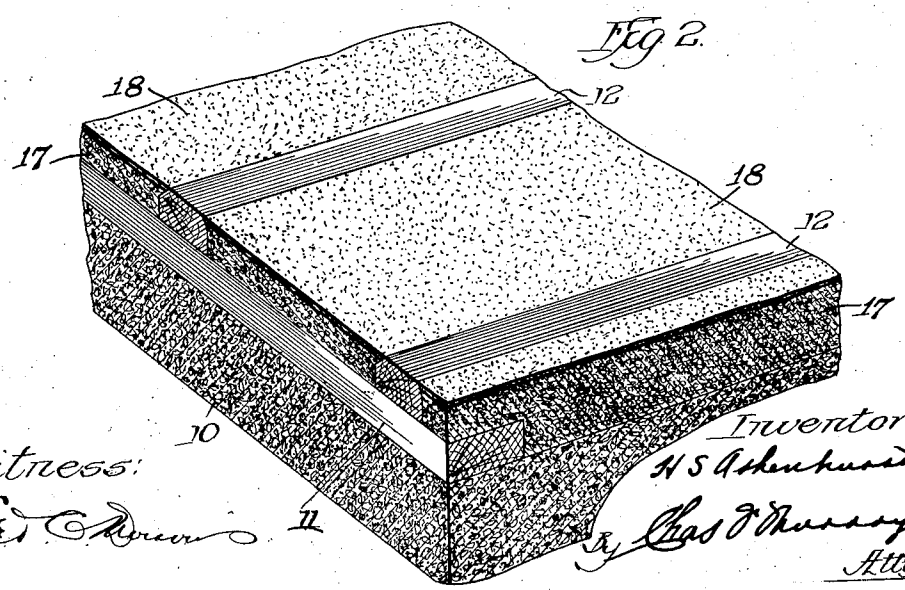



Fig 2.




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# UNITED STATES PATENT OFFICE.

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## FLOOR FILL AND METHOD OF INSTALLING THE SAME.

Application filed February 16, 1925. Serial No. 9,638.

My invention relates to the art of constructing buildings and particularly to a method of imbedding and holding sleepers by the use of light weight plastic material.

It is customary in all cases where a wood floor is to be laid to provide suitably spaced sleepers to which the floor boards may be nailed. In order to provide a means for holding the sleepers, particularly for floors of monolithic character, it is customary to provide either anchors which are embedded in the concrete while still plastic, or to provide a plastic mass adapted to be poured between and around the sleepers. The latter practice is followed in many instances where the floor base is composed of tile, wood or other material instead of concrete. The practice of embedding the sleepers is considered preferable to other forms where a firm and well supported floor is required, and it is to this branch of the art that my invention relates.

It has been customary for many years to provide a fill for the sleepers, consisting of so-called cinder-concrete. However, this material while cheaper than concrete is relatively expensive, very heavy, has limited insulating qualities and cannot be used in contact with iron pipes or conduits, this for the reason that certain acids present in the compound react on and cause deterioration of the iron.

An object of my invention is to utilize a substance similar to that disclosed in my Reissue Patent No. 15,952 of November 25, 1924, and to install the same by a novel method which will now be disclosed.

One of the most important advantages in the method and substance used in connection therewith is that arising from the elimination of the labor cost of tamping. In the use of cinder concrete, it is necessary after pouring to employ some means for forcing the plastic material beneath and around the sleepers in order to secure a firm and continuous supporting base. This is usually accomplished by tamping. In the method here disclosed, the tamping step is unnecessary as the material rises into contact with every point on the under surface of the sleeper and finally surrounds the sleeper in intimate contact with all faces thereof except the top.

A desirable result so far as supporting and retaining the sleepers are concerned may be secured even if the material does not rise to the level of the tops of the sleepers. A space beneath the floor boards is unobjectionable in some cases and may be allowed where rapidity of construction is essential. It will be understood that where the fill rises to the top level of the sleepers, and where the floor is to be immediately laid, a layer of waterproof paper should be superposed on the monolithic body to avoid the absorption of moisture by the floor boards.

Whether or not the surface of the fill is to be flush with the tops of the sleepers, the leveling and screeding will take place, not only to provide a uniformly level surface, but also to provide the hard crust hereinafter described.

The invention will be more readily understood by reference to the accompanying drawing, in which;

Figure 1 is a view showing a section through a floor shortly after the plastic material of my invention has been poured, and

Figure 2 is a view showing the floor in its completed condition before the floor boards have been laid.

In carrying out the invention, the floor base, 10, which may be composed of concrete, tile or other material, has been prepared and timbers, 11, laid thereon. On these timbers are superposed sleepers 12, the upper corners of which are bevelled in the usual manner. With the floor in this condition, a mixture is made of the material of my invention heretofore identified, to produce a relatively fluid and easily-flowing mass. This is poured into place and fills the space around the timbers and between the sleepers. Immediately thereafter, a device such as shown in the upper portion of Fig. 1 is employed, the device consisting of a plate or board, 13, having notches, 14, therein, and provided with a handle, 15. The notches are so shaped that they receive the sleepers therein, the depending portion 16 between the notches serving to spread, level and partially trowel the upper surface of the plastic material. This must be done immediately following the pouring of the plastic material inasmuch as the material rises and hardens quickly and the leveling and trowelling should be done before any appreciable setting takes place.

The depth of the notches is to be such that the operation of screeding by the use of the device shall lower the level of the material to such point that the subsequent rising of

the material will bring the surface substantially flush with the top faces of the sleepers.

The screeding and levelling operation performs another important function; in fact the most important function from one viewpoint. Due to the character of the material, the action of screeding or trowelling serves to provide a dense and relatively tough top surface which hardens in advance of the complete setting of the body of material and provides a surface that will bear the weight of a workman within a very few minutes after the operation is performed. This enables the rapid carrying on of operations in marked contrast to the accustomed loss of time in awaiting the setting and drying of cinder-concrete. In Fig. 2, the body of the material embedding the sleepers is indicated by the numeral 17, while the dense tough surface portion is indicated by the reference numeral 18.

A few of the fundamental advantages of the material in this situation are:

1st, No tamping is necessary in order to secure a firm support for the sleepers.

2nd, The material provides not only a fill within which the sleepers are held, but insulates the floor to a very substantial extent.

3rd, The material is, in addition, a sound deadener, the only vibration being transmitted through the connection of the timbers with the floor base.

4th, The material compound, compared to other fillers, is relatively extremely light, weighing approximately only one-fifth that of cinder concrete. This permits a reduction in the size of the structural members of the building and a consequent saving in the construction cost.

5th, The material is inert relative to the iron pipes or conduits and no provision is necessary for the protection thereof as in the case of other fills.

6th, The material being relatively soft, access may subsequently be gained to pipes or conduits by merely cutting out the fill with an ax or other edged tool, it being unnecessary as in the case of concrete to chip it out.

7th, The cost of the material and the cost of installing it are materially less than the total cost of cinder concrete installed, and pipes and conduits are protected from corrosion.

By following the method here disclosed, the material may be quickly and economically laid and the surface made as hard and dense as conditions require. As stated, when the surface is treated as described, the workman may walk thereon within a few minutes after pouring the material, and the time required for setting and drying is only a fraction of that required for concrete. The screeding device is of very simple construction, and can be built on the job in accordance with tests or other data for determining the depth to make the notches, which is dependent upon the character of material used and the depth of the body of material. The work may be carried on by unskilled labor. Due to the rapidity of setting, three men may work continuously on successive adjacent sections of a floor. Relatively small batches of the material are mixed and poured in order that a reduction of the time from the addition of the water to the pouring into place may follow.

I do not desire to claim broadly by this application the idea of screeding or trowelling the top face of a mass of plastic material which is adapted to expand and set in cellular condition, since this expedient is disclosed and claimed in my co-pending applications Serial No. 736,892, filed September 10, 1924, and Serial No. 12,883, filed March 3, 1925. Neither do I wish to cover by this application the construction as shown and claimed in my co-pending application Serial No. 20,730, filed April 4, 1925.

While I prefer to employ the form of material as disclosed in my said prior reissue patent, it will be understood that I do not wish to be limited to the use of any particular form of material or to any particular proportions of ingredients except as the same may be specifically claimed. I have had very good results, however, by the use of a mixture of the following form,—100 pounds of calcined gypsum, 1¼ ounces of commercial retarder, 3 pounds of a suitable carbonate such as calcium carbonate, and 6 pounds of aluminum sulphate containing its water of crystallization, all of such ingredients being finely ground and thoroughly mixed in a dry state.

I claim:

1. The method of making a sleeper fill which consists in locating sleepers, then adding water to a quantity of a material that will expand and set in expanded condition, then pouring the mass on the floor, then allowing the mass to partly rise and partly set, and then screeding the material between the sleepers to evenly spread the same and provide a relatively hard surface.

2. The method of making a sleeper fill which consists in locating sleepers, then adding water to a quantity of a material that will expand and set in expanded condition, then pouring the mass on the floor, allowing the mass to partly rise and partly set, and then screeding the material between the sleepers to evenly spread the same and provide a relatively hard surface, the leveling being done at such point that the subsequent rising will bring the surface of the material to substantially the level of the top of the sleeper.

3. The method of making a sleeper fill which consists in locating the sleepers in suitably spaced relation, then providing a

plastic mass of material that will expand and set in expanded condition, then immediately pouring the mass around the sleepers, and then leveling the material at a point below the plane of the tops of the sleepers, the level being established at such point that the subsequent rising of the material will bring its surface to substantially the plane of the tops of the sleepers.

4. The method of embedding sleepers on a floor base which consists in locating the sleepers on said base, then providing a relatively fluid mixture of a material that will expand and set in expanded condition, then pouring the mass on a floor base around the sleepers, and then leveling and screeding the material at such time and at such point below the tops of the sleepers that the subsequent rise of the material will bring its surface to substantially the plane of the tops of the sleepers.

5. The method of embedding sleepers which consists in providing a plastic mass that will expand and set in cellular form, then pouring said mass on to a base and permitting the mass to rise and to embrace the supporting surfaces of the sleepers, and then leveling and screeding the top of the mass to provide a relatively dense and hard surface.

6. The method of insulating a floor, which comprises pouring on the deck of the floor a free-flowing plastic mass adapted to spread in a single unit over the whole face of the deck and adapted to expand and set in expanded cellular condition, and then before the setting and hardening process is complete breaking down the cellular form of the material at the top surface for forming an integral face of non-cellular material.

7. A floor comprising a deck, sleepers extending thereacross, and a body of cellular material on said deck about said sleepers, said body of cellular material having an integral top face portion of non-cellular formation.

Signed at Chicago, Illinois, this 13th day of January, A. D. 1925.

HAROLD S. ASHENHURST.