United States Patent

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[54] **BUILDING FOUNDATION WITH FROST DEFLECTOR**

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[52] **U.S. Cl.** **52/169,** 52/292

[51] **Int. Cl.** **E02d 27/34**

[58] **Field of Search**.....52/169, 294, 515, 516, 292, 52/480, 309

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[57] **ABSTRACT**

A building foundation that comprises a deflector so that frost which may accumulate under the building will be deflected. This prevents the frost from raising the foundation off the ground.

7 Claims, 3 Drawing Figures

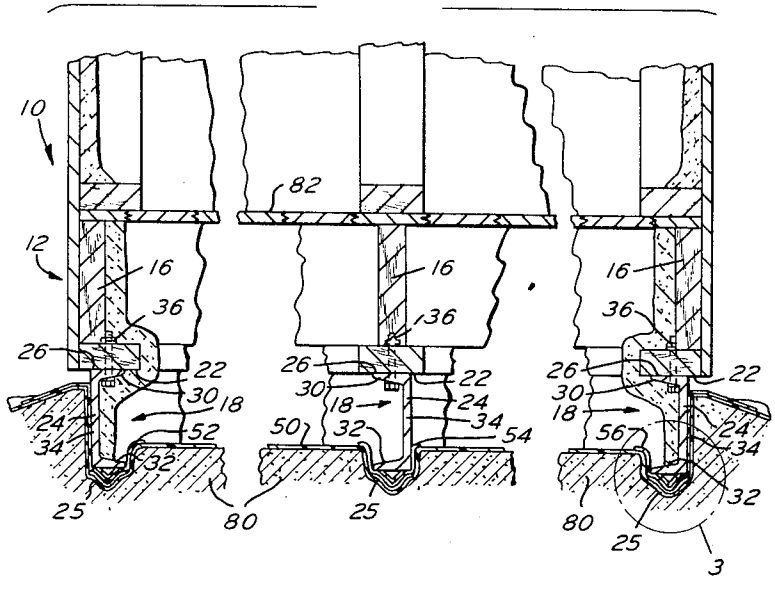


FIG. 1

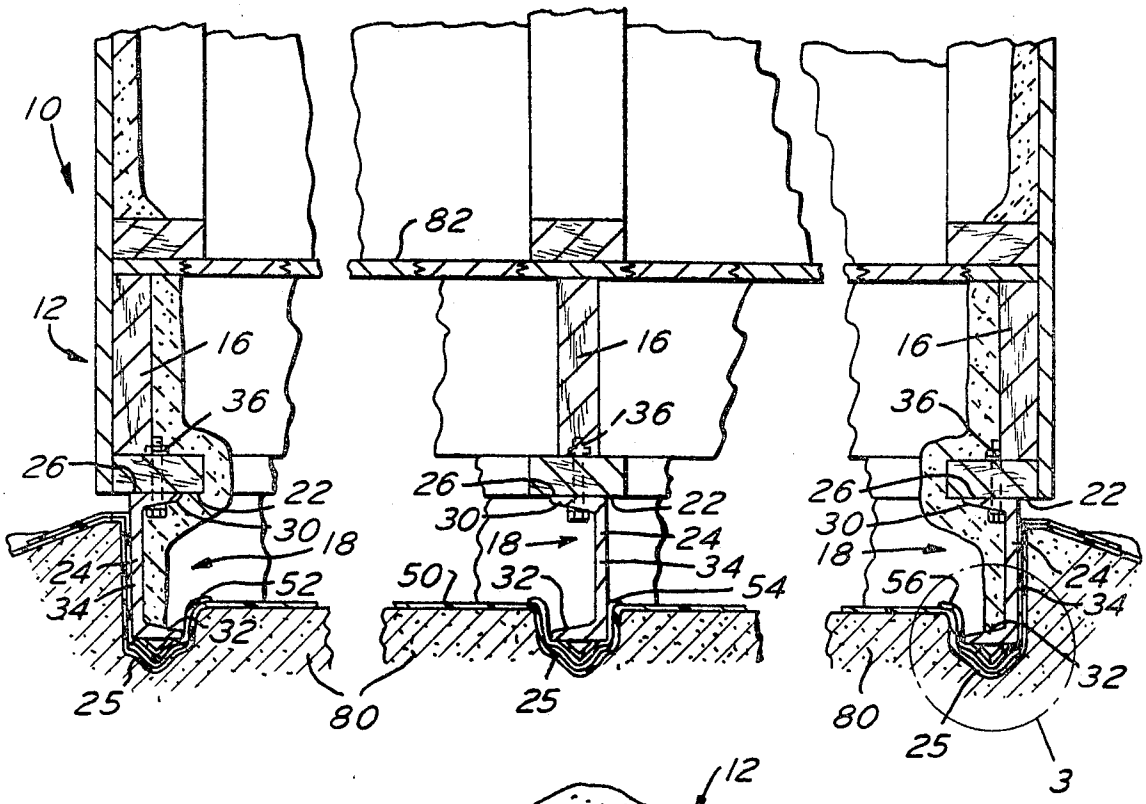


FIG. 2

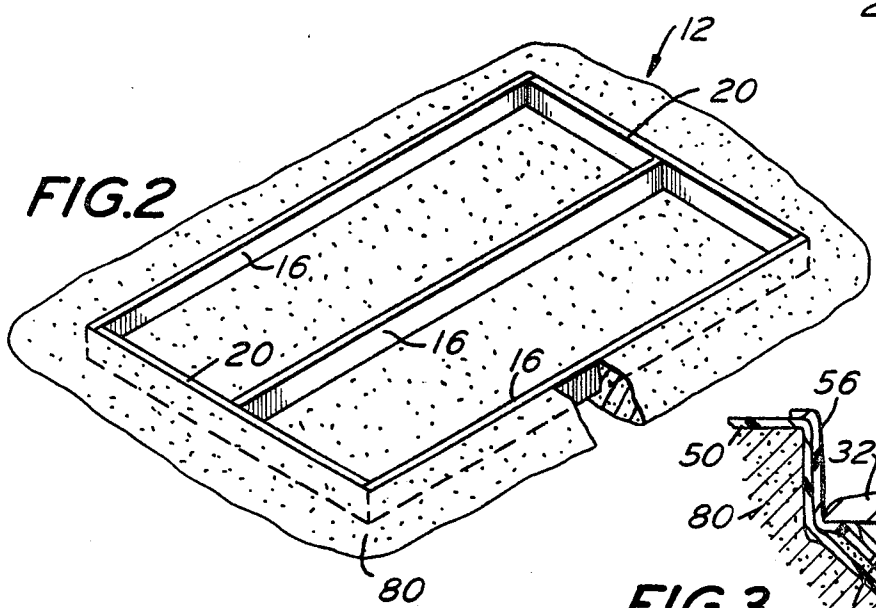
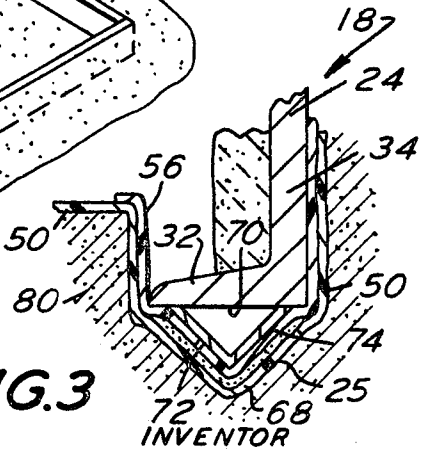


FIG. 3



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BUILDING FOUNDATION WITH FROST DEFLECTOR

This invention relates to a building foundation and more particularly to a foundation for an inexpensive building or mobile home which does not change its elevation when subjected to upwardly directed forces caused by ground frost.

A substantial part of the cost of building a house goes into the preparation of the foundation. Since the foundation will normally support the entire weight of the house, it is generally made of concrete or the like and is quite strong. Additionally, in order for it not to be affected by frost, which might move it relative to the ground, it is normally prepared in such a way that it extends down below the frost line of the soil. By doing this, the upwardly directed force which is normally exerted against the foundation by frost is avoided.

However, it has been recognized that in order to produce low cost housing, a technique for avoiding the costly and time-consuming procedures of installing a foundation have to be abandoned. But, if traditional type building foundations are not utilized, then over the years, repeated changes in the temperature of the soil due to the annual cycle would ultimately destroy any building set on a foundation structure that did not go below the frost line.

Mobile homes have become increasingly popular as an alternative to expensive housing. However, there is considerable expense associated with the initial purchase of a mobile home. Hence, it is necessary to purchase a special rig for transporting the mobile home. Also, special stairs must be provided for entering the raised mobile home. The stairs are not only expensive but also may present a safety hazard. Raised mobile homes are also subject to wind factors which present problems which include increasing heating costs and creating instability of the structure.

Accordingly, it is an object of this invention to provide an inexpensive building foundation that can be used in construction of low cost housing.

It is another object of this invention to provide a building foundation that rests on the surface of the ground but does not move vertically in response to upwardly directed forces caused by frost accumulation.

It is a further object of this invention to provide a building foundation that causes frost accumulations under the foundation to be moved laterally thereof.

It is another object of the present invention to provide a foundation which can be incorporated on a mobile home to permit the mobile home to become affixed to the ground and thus obviate many problems attendant to the use of mobile housing.

Generally, the invention relates to a building foundation that resists the upwardly directed forces caused by ground frost. It comprises means defining a perimeter of a building. A frost deflector which is connected to the means comprises a member having at least one surface for engaging the ground along the perimeter. The surface is fixed at an angle that is in the range between substantially 45° upward from the horizontal and substantially vertical so that the upward directed frost is directed laterally of the foundation.

The frost deflector of the present invention may be secured to a mobile home to permit the mobile house to be made stationary. The house could be made mobile again by raising the same and placing the house on a transporting ring. When the frost deflector is provided on a mobile home, the home can be delivered to a specific location. The home can be lowered into place and the wind factor will not present any special problems. Special stairs will not have to be purchased and a transport rig may be rented for a single use wherein the expense of buying such rig will not have to be borne by the purchaser of the mobile home. Hence, by the use of the present invention, a mobile home can be converted into a permanent home resting upon the ground and reconverted into a mobile home.

Other objects and advantages of the subject invention will become apparent from a detailed discussion thereof which follows wherein:

FIG. 1 is a side sectional view of a building constructed in accordance with a preferred form of the invention.

FIG. 2 is a perspective view of a portion of a building constructed in accordance with FIG. 1.

FIG. 3 is a close-up view of a portion of the building foundation illustrated in FIG. 1.

Referring now to the drawings, FIG. 1 shows a typical low cost building **10** that includes an intermediate support structure **12**, which is carried by a foundation constructed in accordance with a preferred form of the invention.

The intermediate support structure may have a plurality of generally parallel members **16** that rest upon foundation members **18**. In addition to the parallel member **16**, transverse member **20** may also be employed so that the foundation members **18** support the entire perimeter of the building **10**.

Each of the parallel and transverse members **16** and **20** has a substantially flat bottom surface **22** for bearing contact with one of the foundation members **18**.

Each of the foundation members comprises elongated beams **24** and a force deflector **25**. Preferably the beams **24** are comprised of steel and have upper and lower flanges **30** and **32** that are connected by a web **34**. The upper flange **30** has a flat upper surface **26** for mating contact with flat bottom surface **22**, while the lower web **32** carries the frost deflector **25**.

While C-shaped sections have been illustrated for the purposes of describing the invention, it is to be understood that other configurations such as "I" beams, "H" beams, channels or the like would be suitable in achieving the objects of this invention.

Each upper flange **30** may be connected to one of the members in the intermediate support structure **12** by suitable fasteners such as nuts and bolts **36**.

The frost deflector may be welded to lower flange **32**. However, it is apparent that it could be fastened to it by other means or, if desired, could be formed integrally with the web **34**.

Referring now to FIG. 3 where an enlarged view of a portion of the foundation member **18** is illustrated, it is seen that the frost deflector **25** rests on a plurality of flexible sheets made from plastic materials. A first flexible plastic sheet **50** which covers the entire area defined by the building perimeter is placed on a lot that has been graded to a desired profile. This plastic material may be comprised of a suitable flexible plastic material such as polyethylene or polypropylene. Other flexible plastic materials could also be utilized. Supported immediately on top of sheet **50** are a plurality of

smaller sheets **52**, **54** and **56** of similar flexible plastic material. Each of these second sheets is slightly wider than the flanges on each of the elongated members **24** but is the same length as each of those members. The space **68** between each of the sheets at each of the members is filled with a suitable viscous liquid such as a lubricant. Preferably, these viscous liquids should have a silicone base.

Interposed between the bottom surface **70** of the bottom flange of each of the elongated members **24** and the plastic sheets **52**, **54** and **56** is one of the above-mentioned frost deflectors. In a preferred form of the invention, they may be of "V" shape having opposed inwardly directed and downwardly converging side surfaces **72** and **74**. The frost deflectors are continuous around the entire perimeter of the building.

It is to be observed that moisture and water in the soil, when frozen, will turn to frost and exert an upward pressure on the foundation tending to raise it off the ground. However, the frost will encounter the angled surfaces of sheet **50**. Since they are made of a substantially frictionless material the frost will be forced upwardly and outwardly to either side of the "V's." Thus, it is important that these surfaces lie in a range that is between substantially vertical and 45° upward from the horizontal so that the frost will slide past the sheet **50**.

The viscous liquid under each of the force deflectors **25** permits relative movement between the plastic sheet **50** and each of the plastic sheets **52**, **54** and **56** to facilitate movement of the frost.

By the above discussion it is apparent that many other configurations for the force deflectors **25** could be provided and it is the intention of this invention to include all of those configurations. For example, such a configuration could be wedge-shaped or merely a sloped surface. The utilization of a non-symmetrical device under the foundation would not cause the building to shift laterally since the upwardly directed force applied to one of the non-symmetrical faces on the frost deflector would be compensated by a similar force being applied to all points on the perimeter. Thus, the forces being applied around the perimeter balance each other out preventing lateral movement.

Additionally, if desired, the ground on which the foundation is to be laid can first be rough-graded so that it is substantially flat and then sand **80** can be utilized to prepare a bed on which the plastic sheets **50**, **52**, **54** and **56** are to be laid. Thus, what has been described is a simple, inexpensive foundation for a low cost building that has a minimum upward movement in response to the upwardly directed force occurring when the ground freezes.

While the invention has been described with reference to a particular embodiment of a building foundation, it is apparent that many other embodiments of this invention will be obvious to those skilled in the art in light of the foregoing disclosure.

Accordingly, in the preferred embodiment, the sheet **50** may be approximately 42 inches while the sheets **52**, **54** and **56** may be approximately 8 inches wide. Sheets **52** and **56** may be combined into a single sheet which extends around the entire periphery of the building perimeter.

The frost deflector under the beam **24** in the center of the building may be eliminated if there is sufficient heat in the crawl space under the floor **82** of the building to prevent formation of frost thereat.

Furthermore, the sheets **50**, **52**, **54** and **56** may be eliminated and lubricant applied directly to the outer exposed surfaces of the frost deflectors. However, it is believed that maximum effectiveness is achieved by providing said sheets.

When the frost deflector is to be secured to a mobile home, the lubricant is preferably applied to the outer exposed surface thereof. However, if desired, the plastic sheets and lubricant can be supplied to the purchaser of the mobile home in kit form with explicit instructions regarding the use of such sheets in cooperation with the frost deflector.

The present invention may be embodied in other specific forms without departing from the spirit or essential attributes thereof and, accordingly, reference should be made to the appended claims, rather than to the foregoing specification as indicating the scope of the invention.

We claim:

1. A frame assembly supporting a building on the gtound while substantially negating any upwardly directed normally disruptive force occasioned by frost in the underlying support comprising:

a plurality of interconnected members defining a perimeter of a building, each member having a lower surface with a downwardly converging V-shaped portion projecting downwardly therefrom with the top of the V-shaped portion being narrower than said lower surface of the member to define a bearing surface on either side of the V-shaped portion, the side surfaces of the V-shaped portion lying between substantially 45° upward from the horizontal and substantially vertical, a friction reducing material between said V-shaped portion and the ground, so that upwardly moving frost in the ground is directed laterally of the foundation.

2. The assembly of claim **1** in which the friction reducing material is a layer of plastic material.

3. The assembly of claim **1** in which the friction reducing material is two layers of plastic material.

4. A frame assembly supporting a building on the earth while substantially negating any upwardly directed normally disruptive force occasioned by frost in the underlying support comprising:

a plurality of interconnected metallic channel members defining a perimeter of a building, each member having a lower surface with a downwardly converging metallic V-shaped portion secured thereto and projecting downwardly therefrom with the top of the V-shaped portion being narrower than said lower surface of the member, bearing surface means on each side of the V-shaped portion defined by the lower surface of the member left exposed by the narrower V-shaped portion, the side surface of the V-shaped portion lying between substantially 45° upward from the horizontal and substantially vertical so that upwardly moving frost in the earth is directed laterally of the foundation.

5. The assembly of claim **4** including a friction reducing material below said V-shaped portion.

6. The assembly of claim **5** in which the friction reducing material is a layer of plastic material.

7. The assembly of claim 4 including a first and second layers of plastic material below said V-shaped portion.

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