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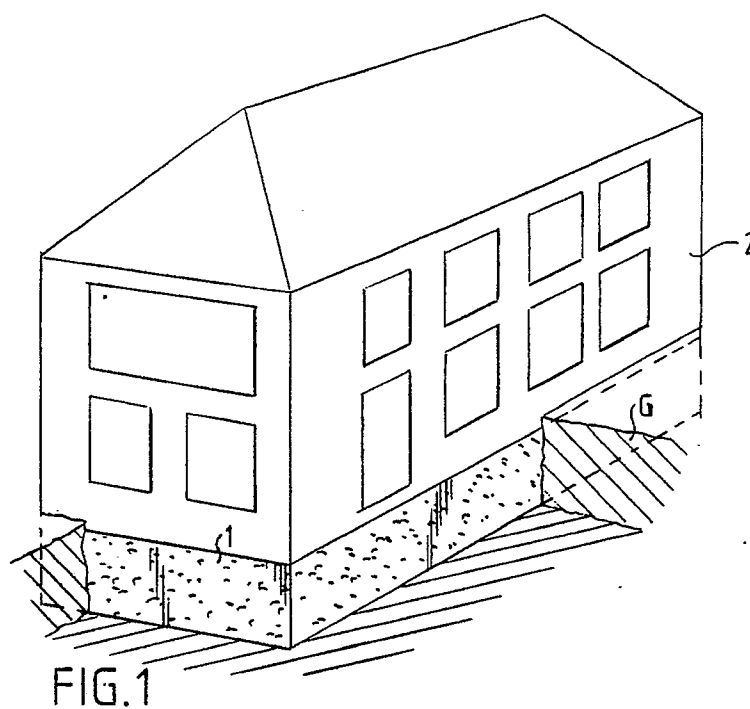
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(54) **Building structure with foundation.**

(57) A building structure consisting of a foundation set into the ground and a bearing, frontage and roof construction built thereon, wherein as foundation a solid walled supporting body (1) is wholly or partially sunk into the ground, wherein the bearing construction of the building to be placed thereon is a timber frame. In marshy or unstable ground the supporting

body is of a size such that the weight of the displaced ground is greater than that of the foundation and building. Due to the timber frame construction, the construction with such a light weight can easily be placed on unstable ground.



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BUILDING STRUCTURE WITH FOUNDATION

The invention relates to a building structure consisting of a foundation set into the ground and a bearing, frontage and roof construction built thereon.

It is known to place under a building structure a foundation in the form of concrete blocks or piles, on the heads of which a concrete construction is arranged which usually consists of bearing beams on which the bearing construction of the building structure lying above ground supports. In order to transfer the weight and the load on the building structure onto the foundation, the bearing construction has to take rather a heavy form, mainly because of the fact that all forces must be transferred onto one or more points, namely the heads of the piles. It is also known to take up a part of the weight of the building by giving the cellar levels a watertight form, whereby an upward force is obtained because of the displaced ground water. The pressure on the pile heads is hereby reduced, but the total building weight nevertheless remains relatively great as a result of the use of piles.

The invention has for its object to improve the foundation with the building structure such that the use of piles becomes unnecessary, the building time is shortened and a good ground insulation is obtained.

The building structure according to the invention is distinguished in that as foundation a solid walled supporting body is wholly or partially sunk into the ground, wherein the bearing construction of the building to be placed thereon is a timber frame. In marshy or unstable ground the supporting body is of a size such that the weight of the displaced ground is greater than that of the foundation and building. Due to the timber frame construction, the construction with such a light weight can easily be placed on unstable ground.

According to the invention an especially simple and insulating supporting body is obtained by giving the body a wholly or almost wholly solid form as a block of foam material, such as gas concrete, foam cement, polystyrene and/or mixtures thereof.

In order to further reduce the weight of the building structure, it is recommended to cover the timber frame-bearing construction thereof with front panels of reinforced foam material.

In order to be able to mount the panels of foam material easily to form a continuous frontage, it is recommended to embody a reinforcement as a metal wire mesh that is partially sunk into the foam material.

The protruding parts can therein serve for adhering a covering layer of for instance mineral mortar to be applied to the foam material. In this

way an unbroken frontage surface is thereby created, in which door and window openings can be formed in the usual way.

Through use of a foundation embodied as a block the timber frame-bearing construction does not have to transfer the forces exerted on the building structure onto one point but onto a random position on the block-shaped foundation, whereby extra supporting beams or heavy beams are no longer necessary, which also contributes to the low weight of the superstructure of the building structure, whereby the quantity of ground to be moved can be reduced, that is, the outer periphery of the block-shaped foundation part does not have to protrude beyond the outer frontage of the superstructure of the building structure.

Above mentioned and other features of the invention will be further elucidated in the figure description of an embodiment hereinbelow.

In the drawing:

Fig. 1 shows a perspective view of a building structure with a foundation according to the invention arranged thereunder,

fig. 2 shows a standing section through the building structure of fig. 1,

fig. 3 shows a detail of the frontage construction in the building structure of fig. 1.

The building structure shown in the figures is depicted as a house. It is of course the case that any building structure provided with a foundation, bearing and frontage constructions with roof arranged thereon falls within the definition of building structure. It is therein of no importance what the dimensions of the house are, whether it is detached or terraced, or what sort of roof is chosen.

According to the invention the foundation 1 of the building structure is embodied as a solid walled body which is wholly or partially set in the ground G, see fig.2. For this purpose the ground is partially dug away and the excavated space is filled with a block of a material with a low specific gravity, for example foam cement, gas concrete, polystyrene granules, expanded polystyrene or mixtures thereof.

Although the block is shown in the figures as a solid body, cavities can be arranged in the body 1 for storage and cellar purposes etc. If desired a force-distributing cover in the form of a wire matting 1' can be arranged therein.

The superstructure 2 of the building structure consists of a bearing construction 3, preferably in the form of a timber frame as shown in fig. 2. The timber frame consists of a number of posts 3 with transverse connections, for example the coupling rail 5, with lintel 6. This is completed with floor

joists 7 to obtain an upper story. The whole bearing construction of timber is of particularly light in weight and is placed directly on a wall plate 8, which rests directly on the foundation 1. It is noted that in the space between the outer frame can be placed supporting posts 4' which likewise support on the foundation via a bottom plate 8'. It can be seen here that the location of the intermediate posts 4 is not determined by the particular foundation 1, but that these can be placed anywhere.

The foundation 1 is finished with a finishing layer 9. The timber frame 3 is covered on the outside with front panels of relatively large dimensions, which likewise consist of a layer of foam material, for example polyurethane foam 12, in which a reinforcement 13 is arranged. The panels 11 are placed abutting each other on the outside of the timber frame 3. The joins of the panels are covered with a connecting mesh 14 of metal, whereafter a plaster layer 15 is applied on the protruding parts of the three-dimensionally curved mesh 13, see fig. 3. The finishing layer 15 is continuous and from the outside of the building structure it is therefore not possible to see that the frontage is constructed from panels 11. The finishing layer 15 can also consist of brickwork.

It is further noted that the panels 11 are arranged to below ground level M in fig. 2 along the outside of the foundation 1. A closed unit is hereby created from the frontage onto the foundation.

Window and door openings can be formed in the frontages in appropriate manner, which can be finished in typical manner with window frames, window sills and drip rails. On the inside of the front panels 11 the space between the timber frame 3 is filled with rock wool 16 or the like which is covered on the inside with a damp-inhibiting layer 17 and a finishing layer, for example in the form of plaster board sheets 18.

As a result of the foam materials used, the whole frontage construction, which in current building practice would have a weight of 420 kg/m², can be reduced to one seventh thereof, that is, 60 kg/m². For a single family dwelling with a surface area of 60 m² the ground only needs to be excavated to a depth of 1 metre and to be filled with the foundation body 1, in order to obtain, at a specific weight of 1.3 to 1.6 tons per m³, a bearing capacity, of a maximum of 78 to 96 tons. With the building method described above houses of 30 to 45 tons in weight including the foundation can be realized, so that an overload of twice the building structure weight is possible.

The manner of constructing the building structure according to the invention is preferably according to the prefabricated system. The walls of the building structure 2 in accordance with the above described timber frame and foam front panels can

be already pre-fabricated in the factory in larger or smaller units. These units can then be transported to the construction site, whereafter the building structure can be assembled in a short time, for instance in one or two days. This construction can take place once the foundation has been arranged and has hardened. Since the superstructure is very light, it can also be temporarily arranged on a layer of beams placed on the ground surface, whereafter the ground under the house is excavated and filled with the proposed foam foundation. The temporary layer of beams can then be removed.

The invention is not limited to the embodiments described above.

Claims

1. Building structure consisting of a foundation set into the ground and a support, frontage and roof construction built thereon, **characterized in that** as foundation a solid walled supporting body is wholly or partially sunk into the ground, wherein the bearing construction of the building to be placed thereon is a timber frame.

2. Building structure as claimed in claim 1, **characterized in that** the supporting body is a completely or partially solid block of foam material, such as gas concrete, foam cement, polystyrene and/or mixtures thereof.

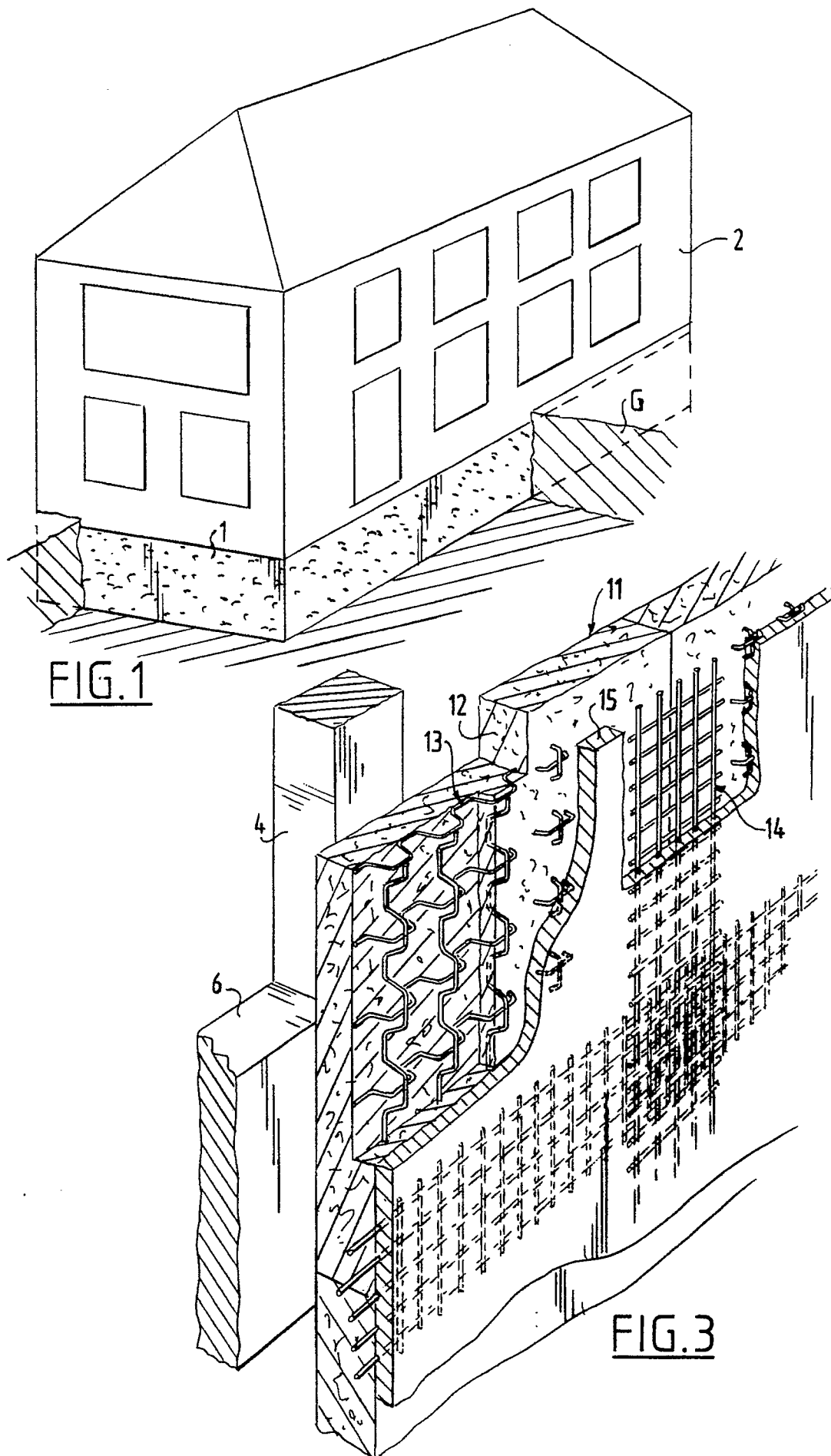
3. Building structure as claimed in claim 1 or 2, **characterized in that** the timber frame-bearing construction of the superstructure is covered with front panels of reinforced foam material.

4. Building structure as claimed in claim 3, **characterized in that** the foam material for the front panels is polyurethane, into which a metal wire mesh is wholly or partially sunk.

5. Building structure as claimed in claim 3 or 4, **characterized in that** a part of the mesh protrudes outside the foam material, onto which a layer of mineral wool can be adhered.

6. Building structure as claimed in any of the claims 3-5, **characterized in that** the front panels are arranged to reach below ground level and along the outside of the foundation (1).

7. Building structure as claimed in any of the claims 3-6, **characterized in that** the timber frame-like bearing construction is filled on the inside of the front panels with rock wool or similar, on which are arranged a damp-inhibiting layer and a finishing layer, for example in the form of a plaster board sheet.



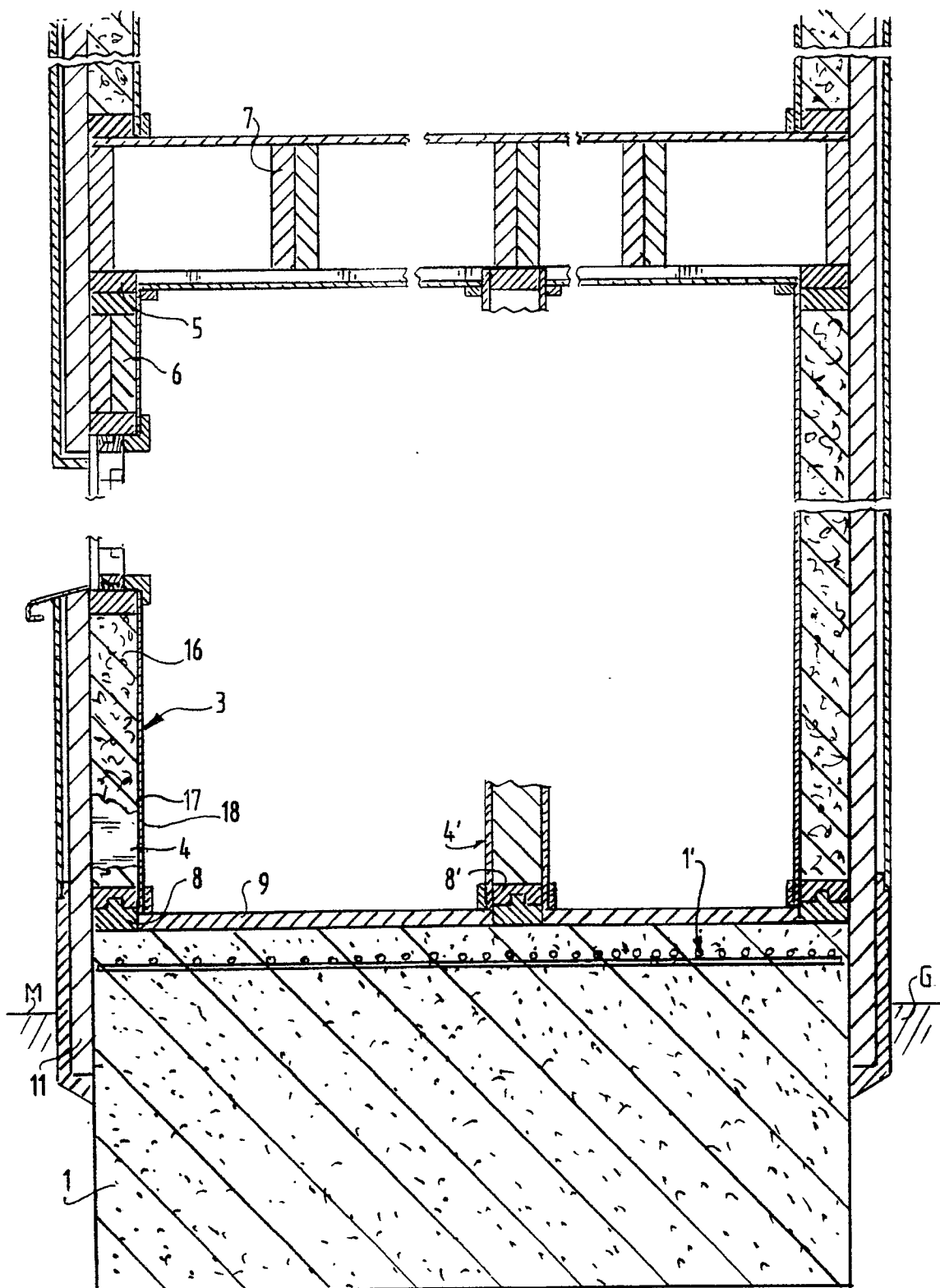


FIG.2.



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EUROPEAN SEARCH REPORT

Application Number

EP 90 20 2871

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
X	US-A-4 549 385 (COHEN) * Column 1, lines 16-45; column 3, lines 41-53; figure 2 * - - -	1	E 02 D 27/06 E 04 B 1/00
Y		2-5	
Y	US-A-3 626 702 (MONAHAN) * Column 2, line 10 - column 3, line 3; column 3, line 53 - column 4, line 24; column 5, line 72 - column 6, line 34; figures 1,2 * - - -	2	
Y	FR-A-2 523 177 (GINESTIERE) * Page 2, lines 5-19; page 2, line 35 - page 3, line 9; page 4, line 6; figure 1 * - - -	3-5	
A	FR-A-2 365 669 (NILSEN) * Page 2, line 20 - page 3, line 27; figures 1-4 * - - -	3-6	
A	BAUPHYSIK, vol. 9, no. 5, September 1987, pages 200-208, Berlin, DE; E. REYER et al.: "Erdberührte Aussenwände -Nutzungstrends, Bauphysik, Konstruktion" * Pages 206-208, paragraph 5.3; figures 10-13 * - - - - -	6,7	
			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			E 02 D E 04 B E 04 H
The present search report has been drawn up for all claims			
Place of search		Date of completion of search	Examiner
The Hague		31 January 91	KERGUENO J.P.D.
CATEGORY OF CITED DOCUMENTS			
X: particularly relevant if taken alone		E: earlier patent document, but published on, or after the filing date	
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A: technological background		L: document cited for other reasons	
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P: intermediate document			
T: theory or principle underlying the invention			