United States Patent

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[31] **13166/1968**

[54] **METHOD OF ASSEMBLING SUPPORTING STRUCTURES UTILIZING AN INFLATABLE TUBE**
2 Claims, 5 Drawing Figs.

[52] **U.S. Cl.** **52/743,** 52/2, 52/421, 249/65
[51] **Int. Cl.** **B28b 7/32,** E04g 11/04
[50] **Field of Search** 52/421, 2, 743, 741, 744, 576, 577; 249/65

[56] **References Cited**

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ABSTRACT: A joint between concrete coffer beams and between slabs which are placed on the beams with sound insulation between the slabs and beams. A rubber tube is located at the joint, and is inflated while the slab joint is filled. The tube is then deflated, and possibly withdrawn, and this leaves a clean unbridged gap which prevents the sound insulation being impaired at this juncture.

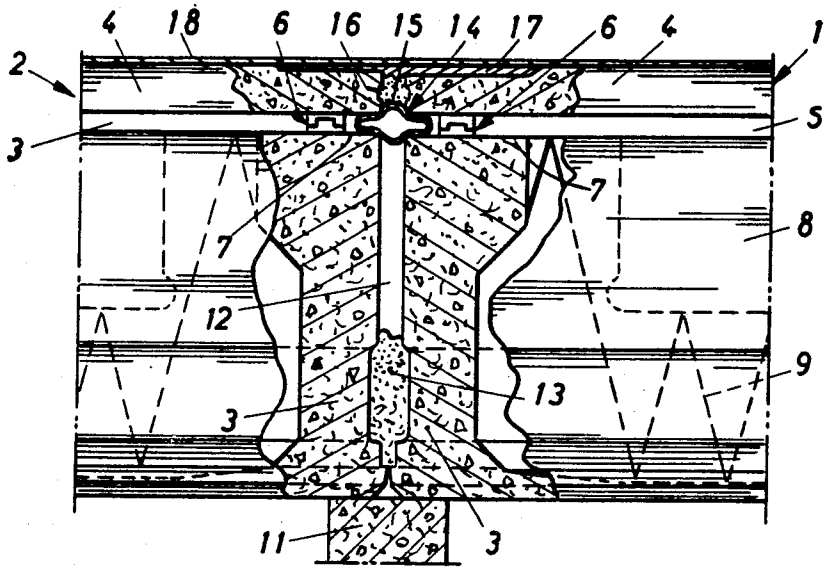

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Fig.1

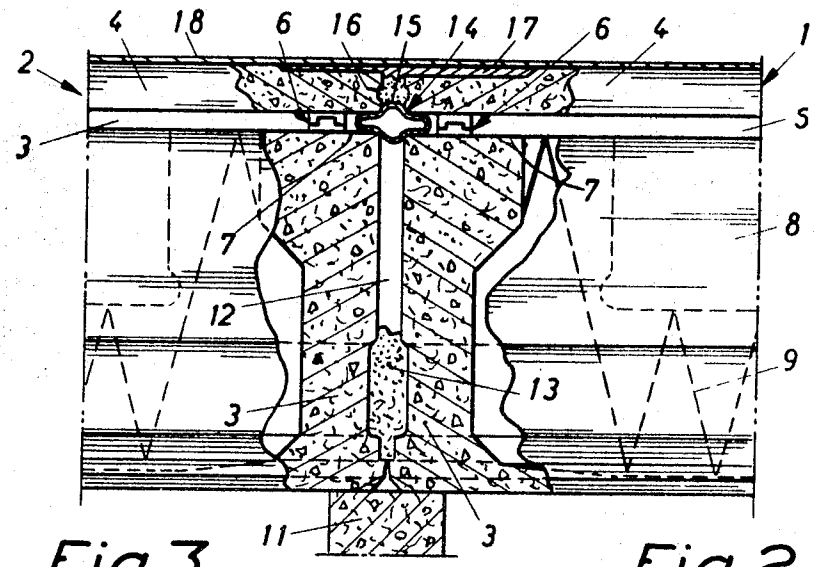


Fig.3

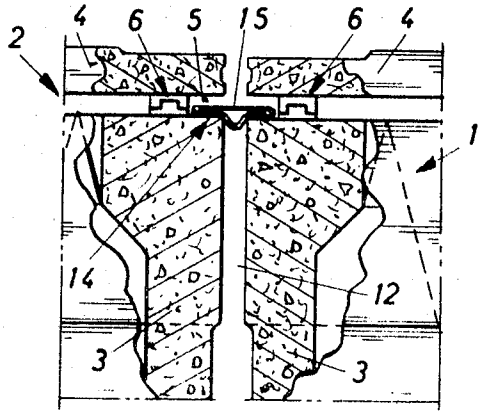


Fig.2

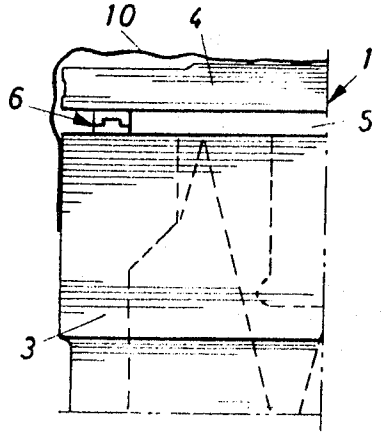


Fig.5

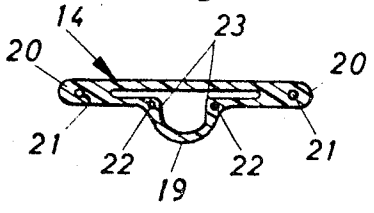
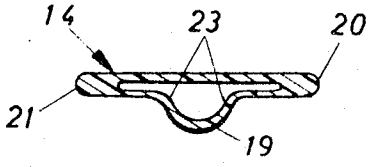


Fig.4



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METHOD OF ASSEMBLING SUPPORTING STRUCTURES UTILIZING AN INFLATABLE TUBE

BACKGROUND OF THE INVENTION

It is known to assemble supporting structures in buildings in the form of adjacent light concrete constructional elements each consisting of a longitudinal concrete coffer and closed by a concrete slab and a sound insulation disposed in the gap between this slab and the concrete coffer. After these composite constructional elements had been laid on a support, e.g. on transverse support beams, the joint between adjacent compound elements was often filled with mortar, either accidentally or because of poor workmanship. This mortar formed a type of bridge between the concrete slabs and the concrete coffers in the various building elements. This bridging was found to be very deleterious from the sound insulation aspect, since sound waves were able to pass readily from the concrete slab to the coffer. The effect of the sound-damping material applied in the gap between the concrete slab and the coffer was therefore almost lost.

SUMMARY OF THE INVENTION

The object of the present invention is to overcome this defect. The characteristic feature of the invention is that in the said gap beneath the joint there is laid a tube of flexible material, filled with air, so that the tube walls on both sides of the joint are pressed sealingly against the slab-shaped building elements, to prevent any material being forced into and filling the said gap. There can thus be no filling up of the joint with mortar to affect sound insulation, so that sound insulation is very satisfactory in the composite building elements. This method also makes the seaming of the concrete-building elements considerably cheaper than with previously used methods wherein the gap was filled to the upper surface of the slab by a soft material, such as mineral wool or foam.

The invention also relates to a specific form of the tube used in this method.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a vertical cross section through a joint between two adjacent concrete-building elements of the type described above,

FIG. 2 is a side view of one end of a composite concrete-building element with a transport casing,

FIG. 3 is a vertical section through the joint between two adjacent concrete-building elements before it is filled with mortar,

FIGS. 4 and 5 are cross sections through two different embodiments of tubes for use in this method.

DETAILED DESCRIPTION OF A PREFERRED EMBODIMENT

The concrete-building elements **1** and **2** shown in the drawings each consist of a concrete coffer **3** reinforced by strengthening bars (not shown) and a superimposed flat concrete slab **4**, also reinforced by strengthening bars (not shown). A sound barrier **6** is disposed in the gap **5** between these two elements **3** and **4**. In the embodiment shown, this barrier consists of wedges of neoprene or other suitable istrophic and flexible plastic or rubber, superimposed in pairs and axially movable relative to each other to vary their total thickness, these pairs of wedges being laid at equal distances on the upper edge **7** of the concrete coffer **3**. The wedges are so chosen and located, and the elasticity of the wedge material is such, that with an increase in the load on the concrete slab by e.g. 50 kg., the wedges are compressed by about 0.2—0.5 mm. Very effective sound-damping values are produced by such a construction. A layer **9** of mineral wool or similar heat- and sound-absorbing material is applied in the cavity **8** in the interior of the concrete coffer **3**.

The composite concrete-building elements **1**, **2** are factory made so that they all have the same thickness. Before being sent to the building site, the building elements preferably have their upper part covered by a protective plastic foil **10** (FIG. 2), so that the gap **5** between the concrete coffer **3** and the concrete slab **4** is completely closed.

On the building site the concrete-building elements **1**, **2** are laid out so that their ends rest on a support, for example on transversely aligned support beams **11**. Cement mortar **13** is then dropped into the gap **12** between the adjacent building elements **1**, **2** so that the coffers **3** can be bonded together. In the gap **5** between the sound-damping means **6** there is then inserted a rubber or plastic tube **14** which is sufficiently inflated for its walls **15** to be pressed upwards against the concrete slab **4** on both sides of gap **12**. A seaming material **16**, e.g. fine mortar, is then filled into the gap between the two plates **4**, which have a longitudinally extending groove along their edges. The adjacent edge portions of the plates **4** are smoothed over with the aid of a filler **17**, and finally a floor covering **18**, e.g. a sheet of linoleum, is laid on the finished support surface.

As soon as the seaming material **16** has set, the air in the tube **14** is let out, so that the tube collapses and lies flat on the top **7** of the concrete coffer **3**. If so desired, the tube **14** can then be withdrawn and reused in further seams between concrete building elements **1**, **2**.

It is obvious that with the use of a sealing tube the danger of a solid bridge being formed by the seaming material **16** between the concrete slab **4** and the concrete coffer **3** does not arise. It also becomes possible to provide good air circulation, e.g. of hot air, through the gaps between the adjacent concrete-building elements **1**, **2**.

As shown for instance in FIG. **4**, the tube **14** can with advantage have a channel-shaped longitudinal expanded portion **19** or a bead which when the tube is applied enters the gap **12** between the concrete coffers **3** and thus centers the tube in its correct position immediately below the seam joint between the concrete slabs **4**. In order to give the tube **14** the necessary stiffness it may be desirable to provide longitudinal reinforcing filaments or wires **21** in its two diametrally opposite fins **20**. Similar reinforcing filaments or wires **22** should also be embedded in the longitudinal edge portions **23** of the tube whereat the channel-shaped widened portion **19** joins the head portion of the tube **14**.

The embodiment shown and described is only to be considered as an example; both the shape and construction of the concrete-building elements **1**, **2** and the shape of tube **14** can be changed in various ways within the scope of the following claims.

What we claim is:

1. A method of assembling supporting structures comprising a number of adjacently disposed composite concrete-building elements each consisting of a preferably coffer-shaped first concrete support element, a vertically spaced superimposed slablike second concrete element and sound insulation means disposed in the horizontal gap between said first and second concrete elements, wherein after these composite concrete-building elements have been laid on a support portions of the composite concrete-building elements are spaced apart forming a vertical gap, the vertical gap between adjacent composite concrete-building elements is filled with mortar or similar material to bond together these composite concrete-building elements, wherein the improvement comprises placing in the said, horizontal gap at the joint between the superimposed composite concrete-building elements a tube of flexible material, filled with air, so that the tube walls lie on both sides of the joint and are pressed sealingly against the building elements to prevent any mortar from the vertical gap being forced into and filling the said horizontal gap.

2. Method as in claim **1**, wherein the improvement comprises letting out, after setting of the material in the joint, the air in the tube, so that the tube collapses and can if desired then be removed from the said gap.