May 21, 1957 P. L. KOOIMAN 2,792,704

BUILDING BLOCK AND HOLLOW WALL FORMED THEREWITH

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FIG:1

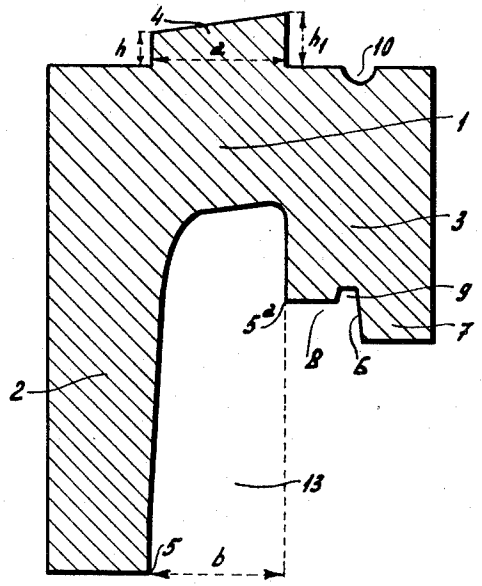
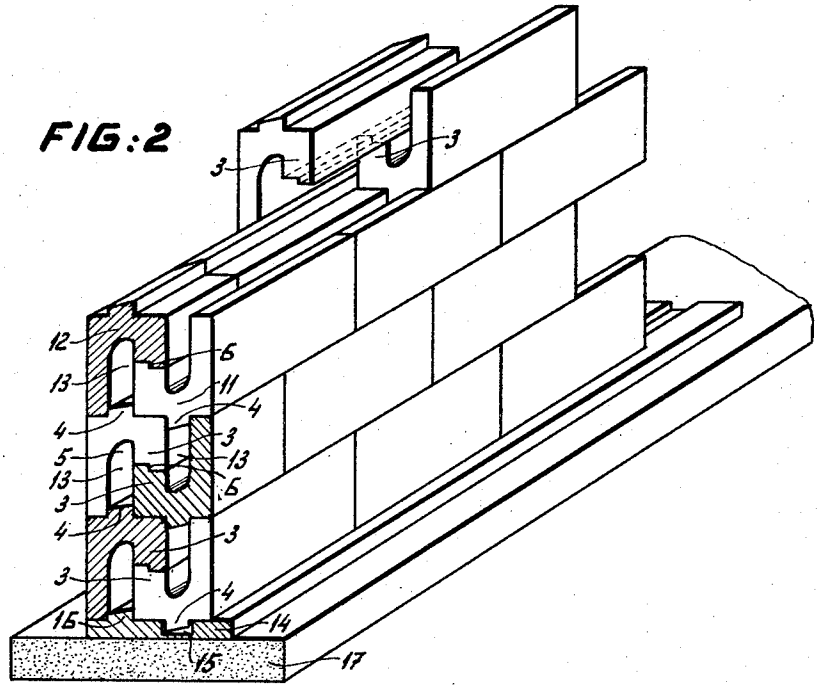


FIG:2



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FIG: 3

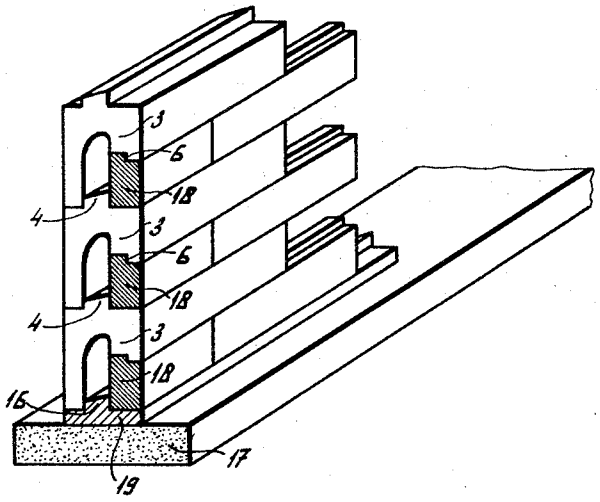
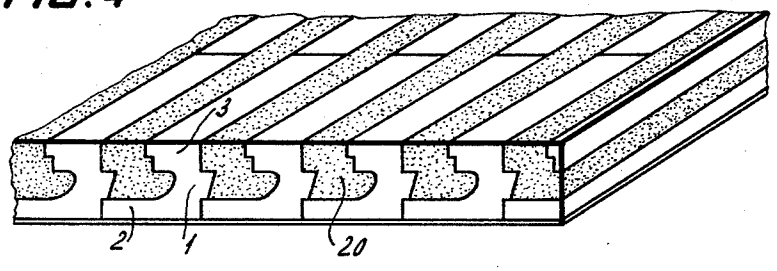


FIG: 4



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BUILDING BLOCK AND HOLLOW WALL FORMED THEREWITH

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Claims priority, application Netherlands January 28, 1952

2 Claims. (Cl. 72—39)

This invention relates to a building stone of J-shaped cross section and comprising a web and two parallel flanges, of which one is substantially twice as long as the other.

With building bricks or blocks of this kind walls can be built up having air channels running either in vertical or in horizontal direction through the interior of the wall. However, the known J-shaped building bricks present the drawback that a relative displacement of the bricks in transverse direction of the wall is not effectively prevented, so that said bricks have to be built up in the usual manner with the aid of mortar adhering to the adjoining faces of the bricks. In order to obtain a clear vertical wall, it is, therefore, necessary to lay and to pile up the bricks very exactly and with great care.

The primary object of the present invention is to provide a building stone or building block of the above mentioned kind in which this drawback is eliminated. According to the invention the web of the stone is provided on its exterior face with a portruding rib which is so dimensioned and located that said exterior face of the web presents on either side of the rib a bearing surface, the width of which is equal to the thickness of the free extremity of the corresponding flange. When piling up the stones with their flanges disposed vertically, the said rib of each stone will be engaged by and locked between the flanges of adjoining stones or other component elements of the wall, such as e. g. filling blocks, so that at least in each vertical row of piled up stones the individual stones are secured against relative transverse displacement.

A further object of the invention is to effectively prevent transverse displacement, both in outward and in inward direction, of any of the component elements of the wall to be formed, by providing the free extremity of the short flange of each building stone with a toothing or similar locking means.

The J-shaped building stones according to the invention may be piled up in such a manner that a wall is formed with two adjacent vertical rows of stones, one of said rows comprising a plurality of stones having their long and short flanges turned downwardly and an adjacent vertical row of stones with their long and short flanges directed upwardly, the short flanges of the stones of both said vertical rows being inserted in interlocking engagement between each other, so that the wall is provided with two adjacent rows of horizontal inner air channels and the adjacent parts of the wall are effectively secured against any relative transverse displacement. Or a wall may be formed comprising a single vertical row of stones piled up with their flanges either turned upwardly or downwardly and the spaces between the short flanges of the consecutive stones being closed by filling blocks provided with corresponding locking means.

The particular advantage of the building stones or blocks according to the invention resides in the fact that the binding layers between the stones may be extremely reduced in thickness or may even be completely omitted, if desired. Nevertheless the walls built up with these

stones present a very great strength and solidity and they can be erected in exact vertical position with plane and clear outer and inner faces.

Still further objects, features and advantages of the present invention will appear from the following description with reference to the accompanying drawings, in which some practical embodiments have been illustrated by way of example and in which:

Fig. 1 shows the building block according to the invention in cross section.

Fig. 2 is a perspective and cross sectional view of a part of a wall built up with the stones or blocks shown in Fig. 1, said wall presenting two adjacent vertical rows of horizontal air channels.

Fig. 3 is a similar view of a part of a wall presenting a single vertical row of horizontal air channels, and

Fig. 4 is a similar view of a floor composed by means of the building stones according to Fig. 1.

The building stone or building block is J-shaped in cross section and comprises a web **1** and two parallel flanges **2** and **3** at right angles thereto. Measured along the outer sides of the flanges **2**, **3** until the exterior face of the web **1**, the long flange **2** is twice as long as the short flange **3**. The building stone further comprises a projecting longitudinal rib **4** which is provided on the exterior face of the web **1** and has an inclined top. The width *a* of said rib **4** substantially corresponds to the distance *b*, measured in the direction of the web **1**, between the inner edges **5** and **5***a* of the extremities of the flanges **2** and **3**, so that the rib **4** can be introduced without pinching, but nevertheless closely fitting, into the space **13** which is formed when the stones are piled up in the manner indicated in Fig. 2. The smallest height *h* of the rib **4** is determined in such relation to the width *a* that the abutments formed on either side of the rib are mechanically so strong that they are able to resist the lateral pressures acting thereupon without being damaged. On the other hand the largest height h_1 is chosen so as to reduce the height of the horizontal air channels in the wall (see Figs. 2 and 3) as little as possible. It will be understood that the invention is not limited to a rib **4** with an inclined upper face, but any other suitable shape, e. g. with a horizontal upperface, provided with rounded edges, if desired, may be adopted for said rib. Also the upper wall of the space **13** may be formed otherwise, such as horizontal, with right angles, or the like.

The short flange **3** of the building stone is provided, at its end, with a lateral step **6** to define a projecting rib **7**, at the outer side of the short flange **3** and a longitudinal recess or free space **8** of the same width as said rib **7** and at the inner side thereof.

The wall shown in Fig. 2 presents two vertical rows of horizontal air channels and is composed of two adjacent vertical rows **11** and **12**, each comprising a plurality of consecutive, correspondingly disposed building stones according to Fig. 1. However, the stones in the row **11** are arranged reversely with regard to those in the row **12**, i. e. in the row **11** the stones have their flanges turned upwardly and in the row **12** the flanges are directed downwardly. In each continuous horizontal row in the longitudinal direction of the wall the building stones are bearing with their short flanges **3** upon each other. The distance along which said short flanges **3** rest upon each other depends on the bond adopted during the piling up of the stones. The ribs **4** of the stones project into the horizontal air channels **13**; in the vertical row **11** they constitute the upper wall and in the vertical row **12** the bottom of said channels **13**. It appears clearly from the drawing that the ribs **4**, which extend throughout the length of the wall, will prevent any transverse displacement of a horizontal row with regard to the adjoining upper or lower horizontal

row of stones. The lateral steps **6** in the short flanges **3** engage each other in each horizontal row over the entire length of the wall. By this arrangement a strong mechanical connection is obtained in the central portion of the wall between the vertical rows **11** and **12**, said connection being effected at equal intervals over the full height of the wall.

Upon the foundation **17** of the wall a base plate **14** is laid which is provided with a groove **15** of such depth that the ribs **4** of the lowermost horizontal row of stones belonging to the vertical row **11** will fit therein. Moreover the said base plate **14** carries a rib **16** of substantially the same shape as the rib **4**, said rib **16** being engaged by the lowermost stones of both vertical rows **11** and **12**. By this a lateral displacement of the wall with regard to the foundation **17** is effectively prevented. If the base plate **14** has been finished carefully, the lowermost horizontal row of stones will take an exact horizontal position. The face of step **6** may be vertical, but, as shown in Fig. 1, said face of step may also be bevelled, so that there will be a wedge-like cooperation between the step **7** of a building stone and the free space **8** of a contiguous building stone. This will enhance the solid bond between the vertical rows **11** and **12**. The channel **9** shown in Fig. 1 may serve for collecting any pushed away grit, when the steps slide along each other during piling up of the stones, or for collecting any pushed away mortar, if thin binding layers are applied between the stones. Finally the groove **10** shown in Fig. 1 constitutes the half of a channel to be formed between the stones in the wall and in which an anchoring rod or the like may be embedded.

The wall shown in Fig. 3 comprises a single row of horizontal air channels and is composed of a single vertical row of consecutive building stones piled up correspondingly. The spaces which would appear between the short flanges **3** of a horizontal row of stones and the webs **1** of the stones of a contiguous horizontal row are closed by filling blocks **18**. The shape of said filling blocks **18** exactly corresponds to that of the short flange of the building stone according to the invention. Also in this embodiment the ribs **4** of a horizontal row of building stones extend into the horizontal air channel of the next horizontal row of stones, so that a relative lateral displacement of the horizontal rows is prevented. The single base plate **19** only comprises a rib **16**, by which any lateral displacement of the wall with regard to said plate and to the foundation **17** is prevented. The steps **6** prevent the lateral displacement of the filling blocks **18**.

The floor illustrated in Fig. 4 is formed by placing the adjoining building stones upon their long flange **2**. The channels **20** between the consecutive stones are filled with concrete or the like.

What I claim is:

1. A wall having a central longitudinal partition and two rows of vertically spaced horizontal air channels, each of said rows of air channels being disposed between said central partition and one exterior face of the wall; said wall being built up by means of identical building blocks; each of said blocks comprising a web and two parallel, spaced apart flanges extending at right angles to said web in the same direction therefrom, one of said flanges being substantially twice as long as the other of said flanges so that each of said building blocks has a substantially J-shaped cross-section, said web of each of said building blocks having a longitudinal rib projecting from the surface thereof facing in the direction away from said flanges, said rib having a width equal to the distance between said spaced apart flanges and being aligned, across said web, with the space between said flanges so that seats are defined by said surface of the web at opposite sides of said rib which have respective widths equal to the thicknesses of the adjacent flanges, said other, relatively short flange of each building block having a stepped end face defining a longitudinal rib and a longitudinal free space next to the latter, with the cross-sections of said longitudinal rib of the relatively short flange and of said next free space being congruent and reversed relative to each other; said building blocks being arranged in consecutive layers in two adjacent vertical rows with the flanges disposed vertically and turned downwardly on the building blocks in one row and with the flanges disposed vertically and turned upwardly on the building blocks in the adjacent row, the relatively short flanges of the blocks in both rows being in vertical alignment and forming the central partition of the wall, the longitudinal rib on the web of each block being locked between the relatively long flange of a block located in an adjacent layer of the same vertical row and the short flange of a block located in an adjacent layer of the other vertical row, and the relatively short flanges of the blocks located in the same layer of both vertical rows having their longitudinal ribs and next free spaces in interlocking engagement with each other.

2. A building block comprising a web and two parallel, spaced apart flanges extending at right angles to said web and in the same direction therefrom, one of said flanges being substantially twice as long as the other of said flanges so that the building block has a substantially J-shaped cross-section, said web having a longitudinal rib projecting from the surface thereof facing in the direction away from said flanges, said rib having a width equal to the distance between said spaced apart flanges and being aligned, across said web, with the space between said flanges so that seats are defined by said surface of the web at opposite sides of said rib which have respective widths equal to the thicknesses of the adjacent flanges, said other, relatively short flange having a stepped end face defining a longitudinal rib adjacent the edge of said end face remote from the relatively long flange and a longitudinal free space next to the rib of the short flange, with the cross-sections of said free space and the next longitudinal rib being congruent and oppositely directed relative to each other.

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