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(54) **A chimney assembly**

(57) A free-standing chimney assembly (1) has a one piece fireplace (2) and a gas flue comprising flue pipes (3). A number of main flue blocks (4, 5) surround the flue pipes (3) and are connected by tie-bars (41) and sleeve connectors (43) which are recessed in the main flue blocks (4, 5).

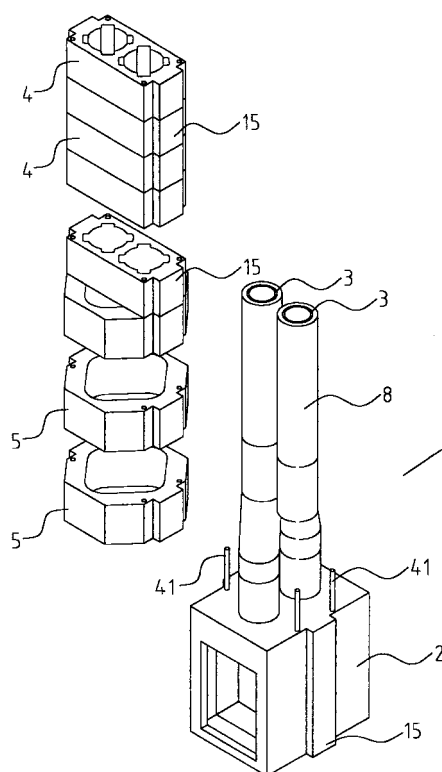


Fig. 4

Description

Introduction

[0001] The present invention relates to free-standing chimney assemblies of the type comprising a number of prefabricated components assembled together to form a fireplace communicating by a combustion gases vent hole with a vertically arranged gas flue.

[0002] Such prefabricated assemblies are used extensively in buildings and particularly in buildings such as timber-frame buildings and the like. It is known, for example, in timber-frame buildings to build up free-standing chimney assemblies by conventional blocks and mortar. Such free-standing chimney assemblies are banned for use with party walls within timber framed housing because of poor quality control in erecting the chimney. Even when they do comply with building regulations they have the problem that very often the chimneys are not vertical in that it is almost impossible to build them sufficiently accurately by conventional means and to provide a chimney assembly that is structurally sound. This is one of the main reasons why free-standing chimney assemblies are provided where the components comprise a number of relatively large prefabricated components assembled together.

[0003] Unfortunately, prefabricated chimney assemblies have not heretofore been particularly successful. They have either been very difficult to assemble or alternatively, have not been sufficiently rigid in use. Further, what is required is a free-standing chimney assembly that can be made in many configurations. Thus, for example, it should be possible to have a free-standing chimney assembly that forms part of the outer wall of the house in which case the free-standing chimney assembly may encompass only one fireplace. In other situations, it should form an interior wall of the house which is often the most preferable construction, which chimney, being incorporated in the interior wall of the house, would almost certainly be required to provide two fireplaces for back to back rooms in the house.

[0004] The present invention is directed towards providing such a construction of free-standing chimney assembly, which will be relatively easy to assemble, structurally rigid and which will integrate conveniently into the surrounding structures such as the walls of the house or the party wall between two houses.

Statements of Invention

[0005] The invention provides such a free-standing chimney assembly of the type comprising a number of prefabricated components assembled together to form a fireplace communicating by a combustion gases vent hole with a vertically arranged gas flue, characterised in that:

the fireplace comprises a one-piece fireplace enclosure having base, top, side and back walls;

the gas flue comprises an inner flue member formed from a plurality of interengaging flue pipes communicating with the combustion gases vent hole and in which there is a main support structure comprising a plurality of main flue blocks, having a block bore larger than the outside diameter of the flue pipe, each mounted one on top of the other on the fireplace enclosure to receive the flue pipes and define an enclosure therebetween for reception of heat insulation material to encompass the flue pipes; and

connecting means for securing the main flue blocks in position.

[0006] The advantage of having this assembly is that it is relatively easy to assemble and it will form a vertical and rigid structure. Ideally, the flue pipes are surrounded by an insulation material.

[0007] In one embodiment of the invention the one-piece fireplace enclosure forms two separate fireplaces with a common back wall and parallel flues, the flue pipes adjacent the combustion gases vent provide a transition bend in the flue so that the parallel flues are moved through a right angle between the fireplace and the top of the chimney, in which intermediate flue blocks are mounted between the main flue blocks having a pair of side-by-side block bores and in which the intermediate main flue block has a block bore to accommodate the two flues. By providing the intermediate main flue blocks it is relatively easy to arrange the flues initially, for example, on either side of a party wall and then to crank them to lie parallel to the party walls as they are led up the building to exit the building.

[0008] Ideally there is provided a longitudinally arranged open air vent slot is formed in the main flue block bore. The advantage of this is that it ensures that there is an adequate flow of air around the flue to ensure for example, if there is any leak of combustion gases through the flues that they will be taken to atmosphere. It also aids in cooling the assembly and provides good heat transfer when required.

[0009] Preferably there are four vent slots equispaced circumferentially around the block bore. This is a particularly useful construction.

[0010] Ideally the connecting means comprises:

a plurality of sets of interconnected vertically arranged tie-bars each set engaging in-line through-holes in the main flue blocks, each bar having threads adjacent each end for reception of an internally threaded sleeve connector, the through-holes in the blocks having enlarged distal and proximal bores for reception of the sleeve connectors; and

a threaded socket in the top of the fireplace enclosure

sure for anchoring of the set of bars.

[0011] By using separate short lengths of bar it is possible to tighten the various parts of the chimney together, without imposing undue strain on adjacent parts. While at the same time by connecting them all in effectively the one tie-bar the overall assembly is adequately secured.

[0012] Ideally each of the flue blocks and the sides of the fireplace include a laterally projecting wall anchorage rib having an end face and two side faces, the side faces forming supports for spaced apart wall panels. This allows the party walls to be easily mounted adjacent the chimney assembly thus providing a very rigid unit.

[0013] Ideally the components are manufactured from a light-weight concrete. Light-weight concrete is particularly suitable because it allows for ease of assembly and the relatively light weight minimises difficulties in manipulating the components and placing them one on top of the other.

Detailed Description of the Invention

[0014] The invention will be more clearly understood from the following description of an embodiment thereof, given by way of example only described with reference to the accompanying drawings in which:

Fig. 1 is a perspective view of a construction of chimney assembly according to the invention;

Fig. 2 is a front view of the chimney assembly on the side of a house;

Fig. 3 is a perspective view of portion of a chimney assembly according to the present invention in a party wall of a house;

Fig. 4 is an exploded view of portion of the chimney assembly illustrated in

Fig. 3;

Fig. 5 is a front view of a fireplace forming part of the chimney assembly;

Fig. 6 is a sectional view along the lines VI-VI of fig. 5;

Fig. 7 is a sectional view along the lines VII-VII of Fig. 6;

Fig. 8 is a sectional view along the lines VIII-VIII of Fig. 7;

Fig. 9 is a sectional view along the lines IX-IX of Fig. 5;

Fig. 10 is a plan view on an enlarged scale of an intermediate main flue block according to the invention;

Fig. 11 is a side view of the intermediate main flue block;

Fig. 12 is a front sectional view of the intermediate main flue block along the lines XII-XII of Fig. 10;

Fig. 13 is a plan view in an enlarged scale of an upper main flue block;

Fig. 14 is a side view of the upper main flue block;

Fig. 15 is a side sectional view of the upper main flue block along the lines XV-XV of Fig. 13.; and

Fig. 16 is a side view of tie bars and sockets according to the invention.

[0015] Referring initially to Figs. 1 to 4 and particularly Fig. 1 of the drawings, there is illustrated a free-standing chimney assembly, indicated generally by the reference numeral 1 comprising a one-piece fireplace 2, an inner flue member formed by a pair of sets of inner flue pipes 3 over the fireplace 2 and surrounded by a main support structure formed by upper main flue blocks 4 and intermediate main flue blocks 5. External cladding 6 and a chimney plate 7 are illustrated, these do not form part of the invention. Heat insulation material 8 is shown in Fig. 3 surrounding the inner flue pipes 3.

[0016] Referring now to Figs. 5 to 9 inclusive, the fireplace 2 comprises a one piece enclosure forming two separate fireplaces with a common back wall 10, base 11, top 12 and side walls 13. Mounted in each top wall 12 is a combustion gases vent hole 14. A laterally projecting rectangular wall anchorage rib 15 having an end face 16 and a pair of side faces 17 projects from each side wall 13. Holes 18 are provided in the top 12 for reception and anchorage of threaded sockets, not shown.

[0017] Referring now to Figs. 10 to 12, an intermediate main flue block 5 is illustrated in which parts similar to those described with reference to the previous drawings are identified by the same reference numerals. Thus, parts such as the wall anchorage rib 15 is not described again. Each intermediate main flue block 5 is a substantially octagonal block having a hollow block bore 20, top 21 and bottom face 23 and side faces 24, through-holes 25 having enlarged bores at their proximal and distal ends form socket retaining recesses 26 at the top face 21 and the bottom face 23.

[0018] Referring now Figs. 13 to 15 inclusive which illustrates the main flue block 4 parts similar to those described with reference to the previous drawings are identified by the same reference numerals. The main flue block 4 has a pair of block bores 30 communicating between top and bottom faces 31 and 32, respectively,

the internal diameter of the block bore 30 is greater than the outside diameter of each inner flue member 3. Four longitudinally arranged open-air vent slots 33 are provided equi-spaced around the block bore 30. Through-holes 25 and respective recess 26 are again provided as are the ribs 15.

[0019] Referring now to Fig. 16, there is illustrated a connecting means indicated generally by the reference numeral 40, for securing the chimney assembly in position, said connecting means 40 comprising a plurality of sets of interconnected tie-bars 41 having adjacent each end threads 42 for reception of an internally threaded sleeve connector 43.

[0020] In operation, to construct the chimney assembly and referring initially to Fig. 4 the fireplace assembly 2 is placed in position and a pair of inner flue pipes 3 are mounted in the combustion gases vent holes 14 and some of the inner flue pipes 3 are so-configured as to provide a 45° bend in each flue so that the parallel flues are moved through 90° between the fireplace and the top of the chimney. Intermediate flue blocks 5 are then mounted on the fireplace assembly 2 and tie-bars 40 are mounted in the fireplace assembly 2 and some of the intermediate blocks 5 are formed one on top of each other and are grouted into position. Then the tie-bars 40 are tightened together by means of the sleeve connectors 42. A number of main flue blocks 4 are then placed in position. Further inner flue pipes 3 are placed in position and the outside of the flue pipes 3 is covered with the heat insulation material 8. Again when sufficient main flue blocks 4 have been placed in position, further tie-bars 40 and sleeve connectors 42, together with grouting are used to secure the main flue blocks 4 in position. The building then continues up the whole chimney until the entire chimney is assembled. Fig. 3 shows the building of a party wall 50 formed from two panels 51 mounted against the side faces 17 of the rib 15 sandwiching insulation panels 52 therebetween.

[0021] While in the embodiment described above the chimney has been illustrated between two walls of a house, the chimney could equally well be constructed as a single fireplace, in which case the fireplace assembly would contain only one fireplace. The remainder of the construction would be exactly the same as heretofore, except that there would be no need for intermediate flue blocks and the main flue block would simply contain one hole for reception of a flue pipe.

[0022] Ideally the chimney assembly according to the invention is manufactured from a light weight concrete.

[0023] In the specification the terms "comprise, comprises, comprised and comprising" or any variation thereof and the terms "include, includes, included and including" or any variation thereof are considered to be totally interchangeable and they should all be afforded the widest possible interpretation and vice versa.

[0024] The invention is not limited to the embodiment hereinbefore described, but may be varied in both construction and detail within the scope of the claims.

Claims

1. A free-standing chimney assembly (1) of the type comprising a number of prefabricated components assembled together to form a fireplace communicating by a combustion gases vent hole with a vertically arranged gas flue, characterised in that:

the fireplace (2) comprises a one-piece fireplace enclosure having base (11), top (12), side (13) and back (10) walls;

the gas flue comprises an inner flue member formed from a plurality of interengaging flue pipes (3) communicating with the combustion gases vent hole (14) and in which there is a main support structure comprising a plurality of main flue blocks (4, 5), having a block bore larger than the outside diameter of the flue pipe, each mounted one on top of the other on the fireplace enclosure to receive the flue pipes and define an enclosure therebetween for reception of heat insulation material to encompass the flue pipes; and

connecting means (40) for securing the main flue blocks (4, 5) in position.

2. A chimney assembly (1) as claimed in claim 1, in which the flue pipes (3) are surrounded by an insulation material (8).
3. A chimney assembly (1) as claimed in claim 1 or 2, in which the one-piece fireplace enclosure forms two separate fireplaces (2) with a common back wall (10) and parallel flues, the flue pipes (3) adjacent the combustion gases vent hole (14) provide a transition bend in the flue so that the parallel flues are moved through a right angle between each fireplace (2) and the top of the chimney, in which intermediate main flue blocks (5) are mounted between the upper main flue blocks (4) having a pair of side-by-side block bores (30) and in which the intermediate flue block has a block bore (20) to accommodate the two flues.
4. A chimney assembly (1) as claimed in any preceding claim, in which a longitudinally arranged open air vent slot (33) is formed in the main flue block bore (30).
5. A chimney assembly (1) as claimed in claim 4, in which there are four vent slots (33) equi-spaced circumferentially around the block bore (30).
6. A chimney assembly as claimed in any preceding claim in which the connecting means comprises:

a plurality of sets of interconnected vertically arranged tie-bars (41) each set engaging in-line through-holes (25) in the main flue blocks (4, 5), each tie-bar (41) having threads (42) adjacent each end for reception of an internally threaded sleeve connector (43), the through-holes (25) in the main flue blocks (4, 5) having enlarged distal and proximal bores (26) for reception of the sleeve connectors (43); and

a threaded socket in the top of the fireplace enclosure for anchoring of the set of tie-bars (41).

7. A chimney assembly (1) as claimed in any preceding claim in which each of the main flue blocks and the sides of the fireplace include a laterally projecting wall anchorage rib (15) having an end face (16) and two side faces (17), the side faces (17) forming supports for spaced apart wall panels.

8. A chimney assembly (1) as claimed in any preceding claim manufactured from a light-weight concrete.

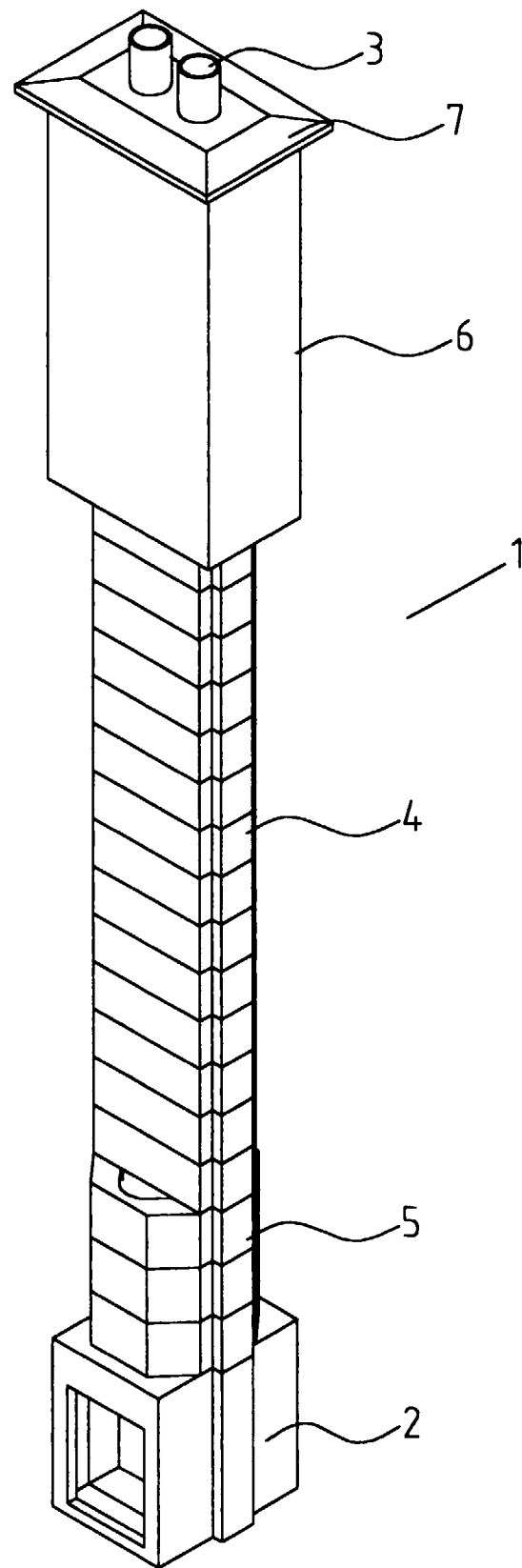


Fig. 1

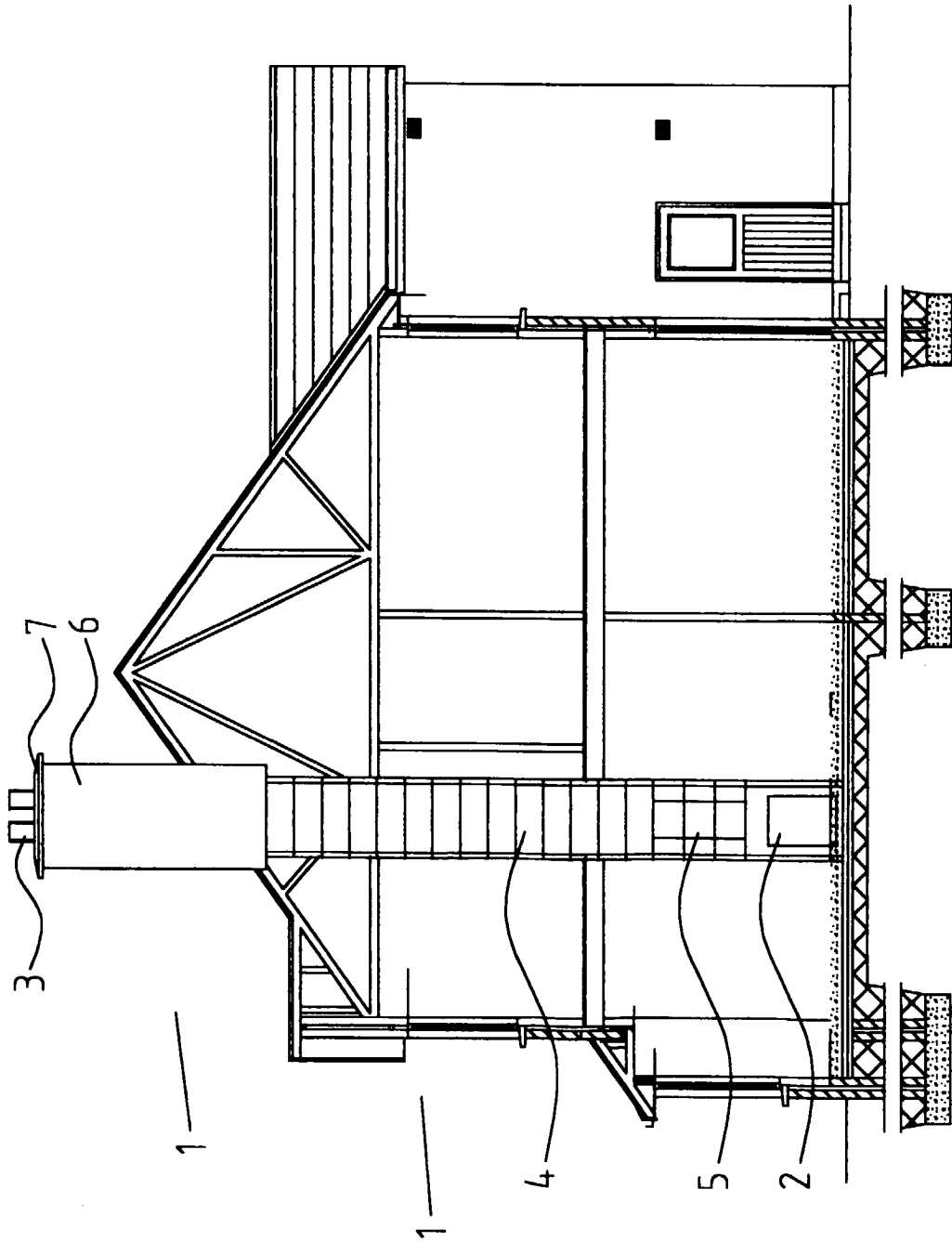


Fig. 2

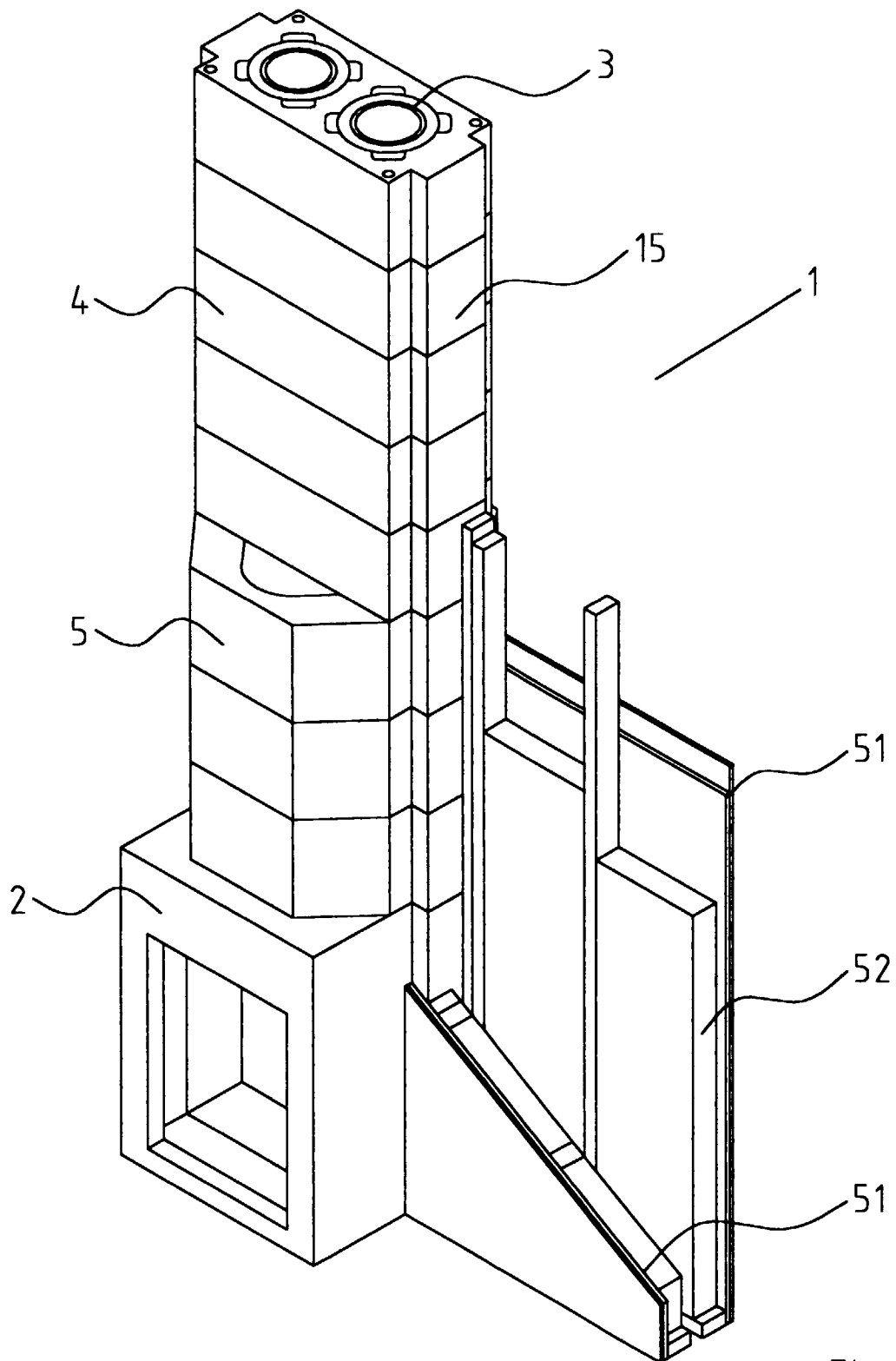


Fig. 3

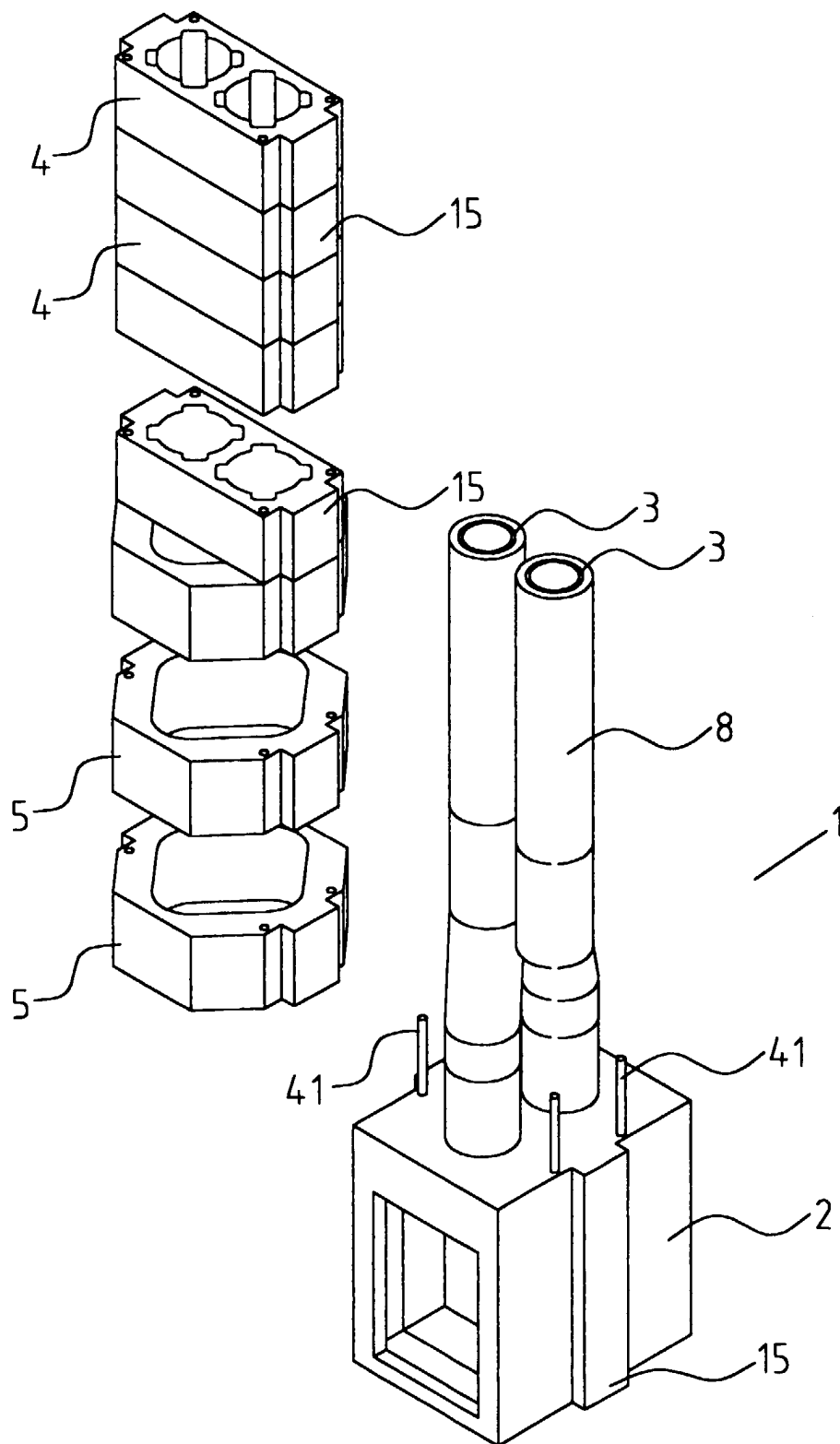


Fig. 4

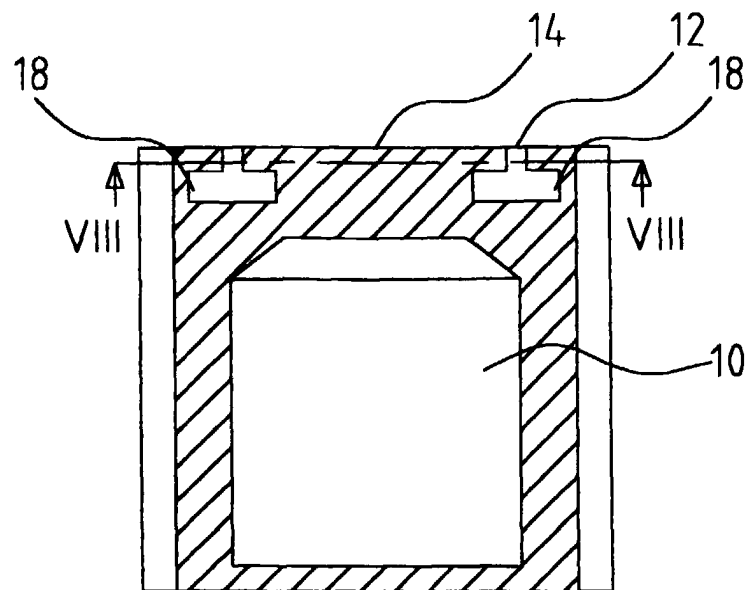


Fig. 7

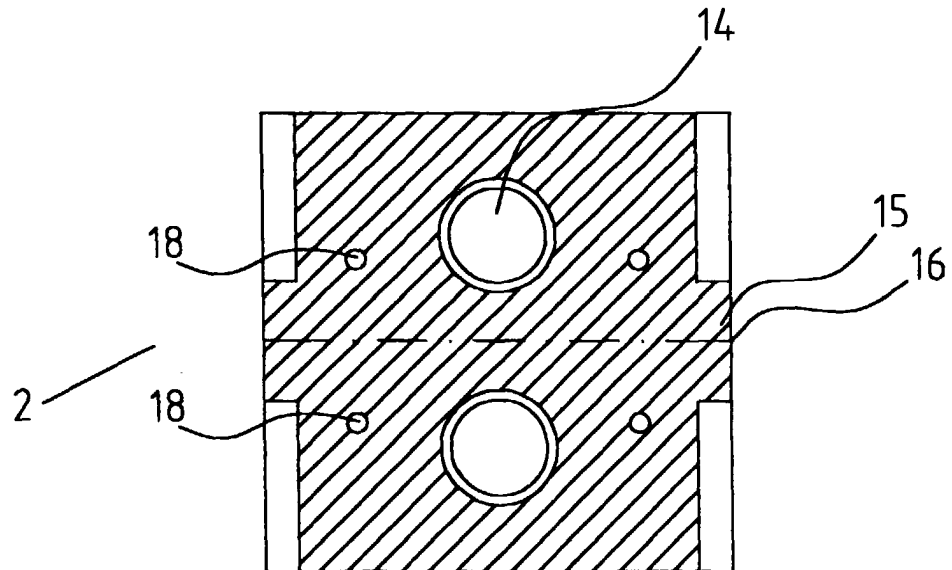


Fig. 8

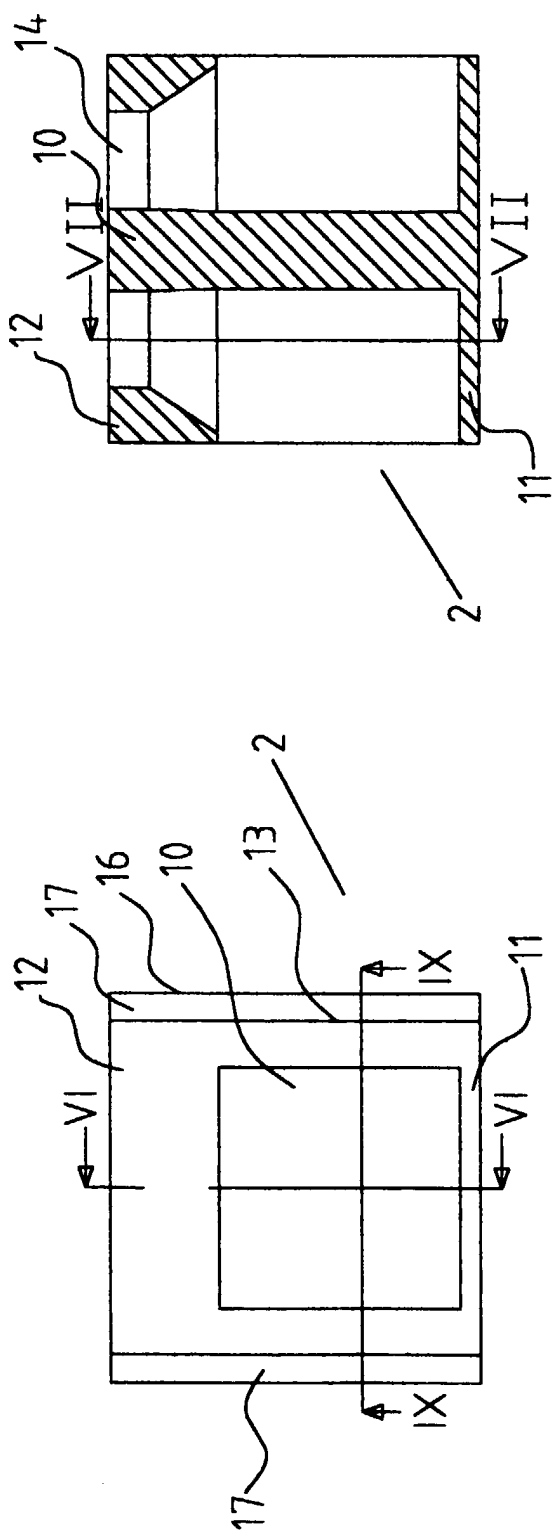


Fig. 6

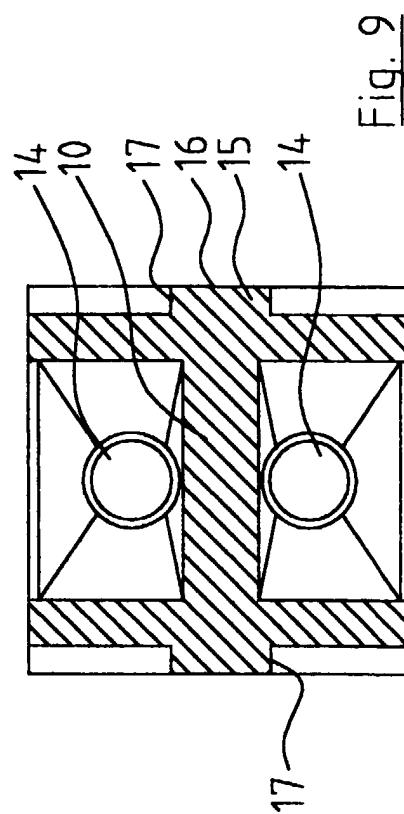


Fig. 9

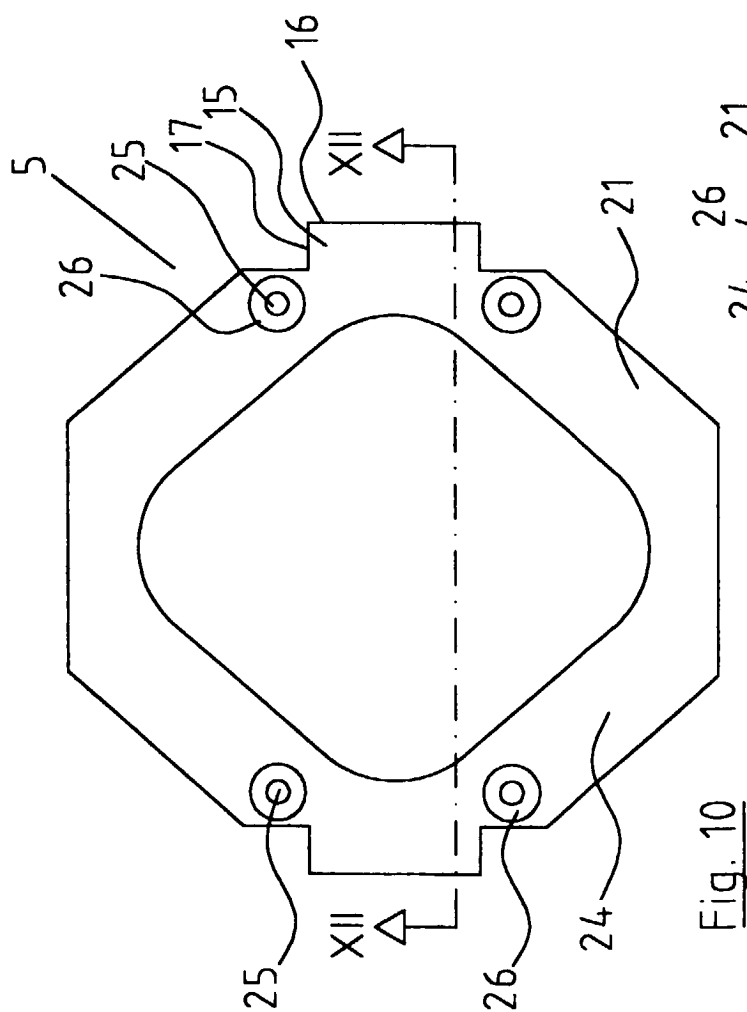


Fig. 10

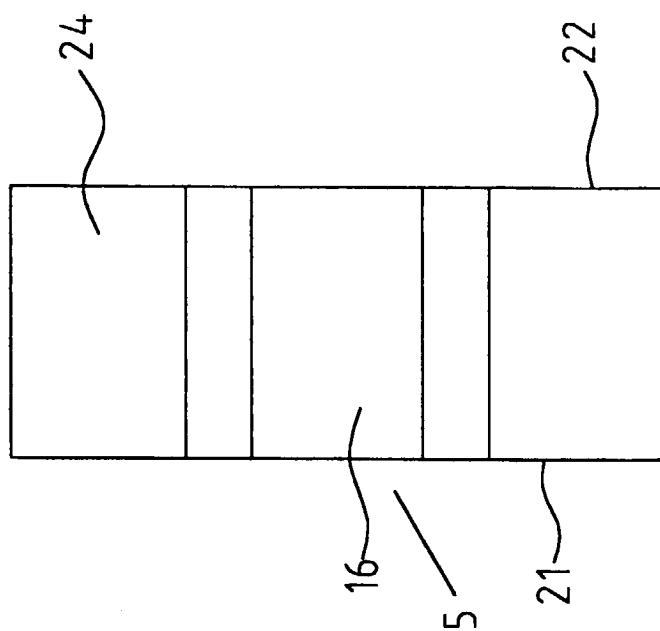


Fig. 11

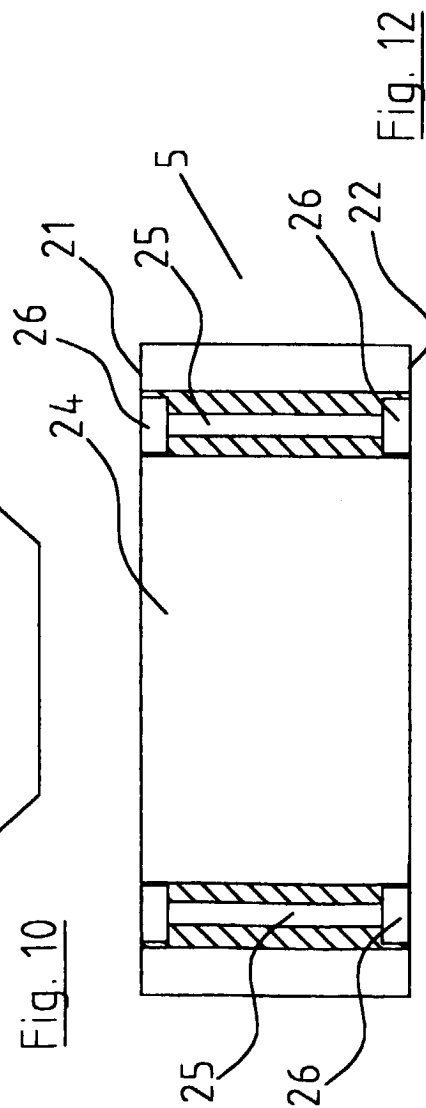


Fig. 12

