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(54) **BLOCK FOR CONSTRUCTING RETAINING WALL, PREFABRICATED REINFORCED RETAINING WALL CONSTRUCTED USING THE BLOCK AND CONSTRUCTION METHOD OF THE PREFABRICATED REINFORCED RETAINING WALL**

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(76) **Inventor: Jeung Su Lee, Kunpo-city (KR)**

Correspondence Address:
VOLENTINE FRANCOS, & WHITT PLLC
ONE FREEDOM SQUARE
11951 FREEDOM DRIVE SUITE 1260
RESTON, VA 20190 (US)

(57) **ABSTRACT**

Provided are blocks for constructing a retaining wall, a prefabricated reinforced earth retaining wall constructed using the blocks, a method for constructing the prefabricated reinforced earth retaining wall. The block for constructing a retaining wall comprises a front surface **10** forming a surface of the retaining wall, and a rear surface **20**; left and right sides **30** and **30'** having corresponding intermeshing portions **32** and **32'** formed thereon; a top surface **40** having reinforcement member insertion grooves **44** formed in a front-to-rear direction, and fixture grooves **46** formed on either side of the front of the reinforcement member insertion grooves **44** for fixing the reinforcement member or anchor; and a bottom surface **50** corresponding to the top surface **40**, wherein a connecting pin insertion hole **h1** for pinning upper and lower blocks with a connecting pin and a lifting pin insertion hole **h2** for simultaneously lifting the upper and blocks, penetrate through the top and bottom surfaces **40** and **50**.

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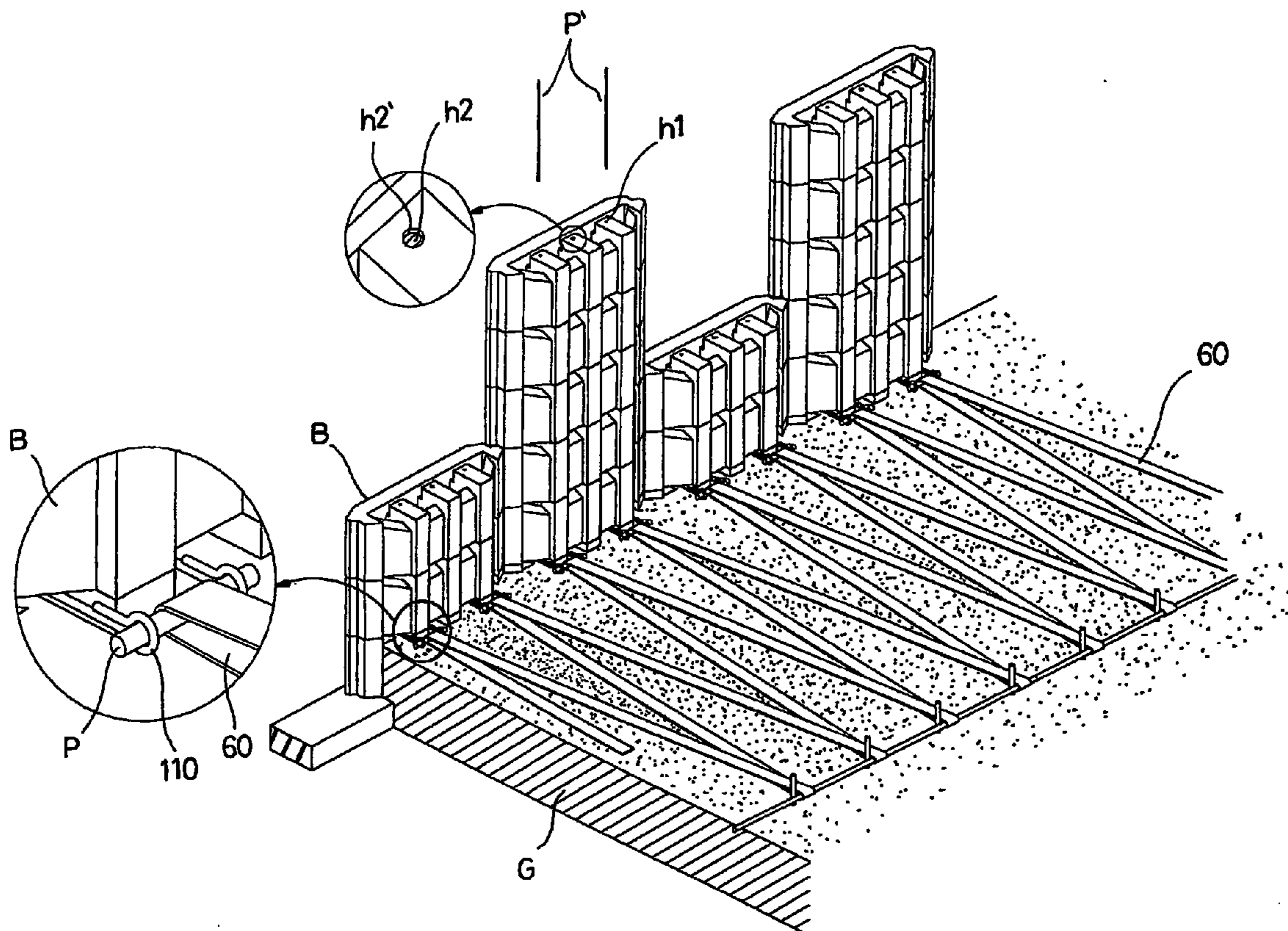


FIG. 1

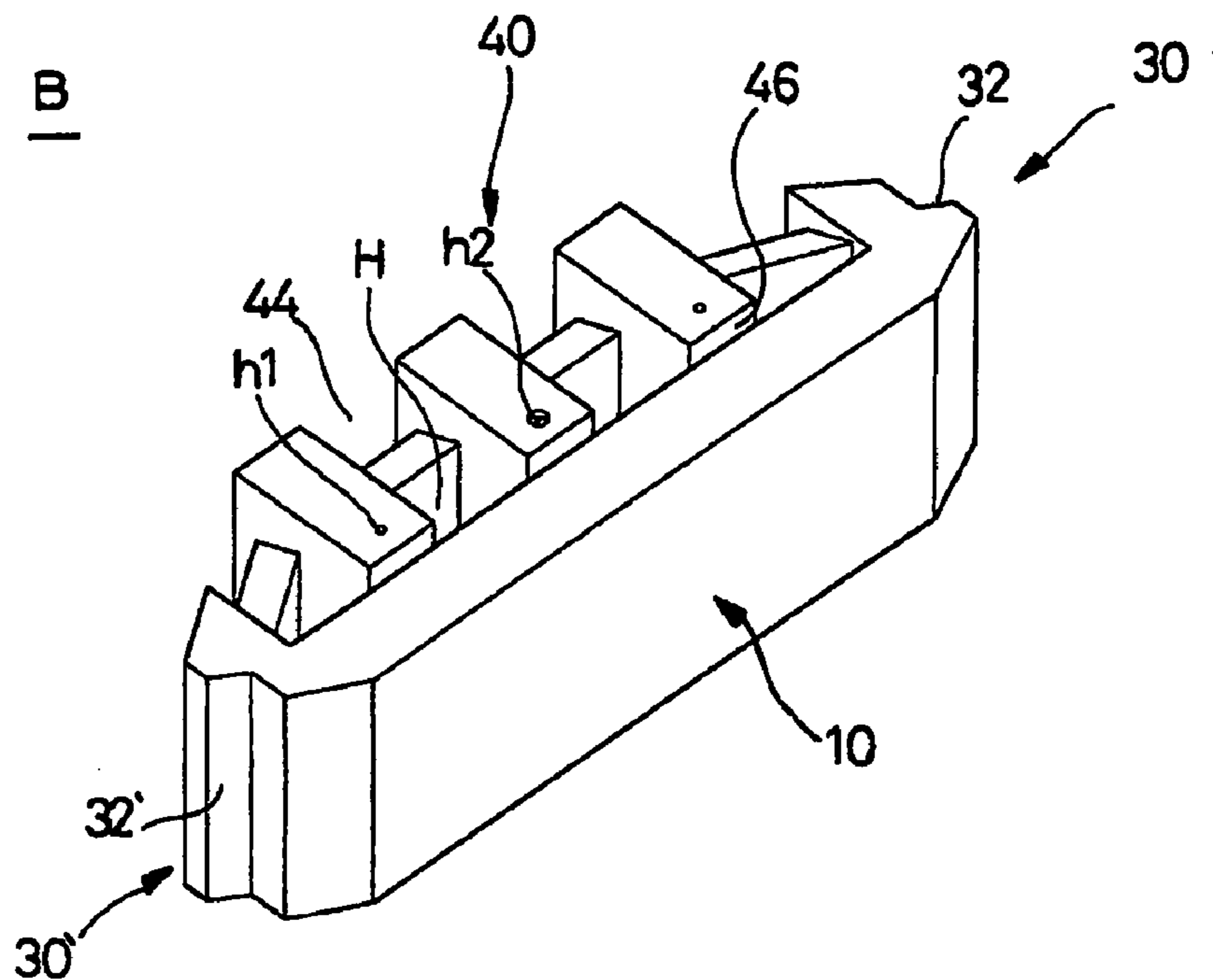


FIG. 2

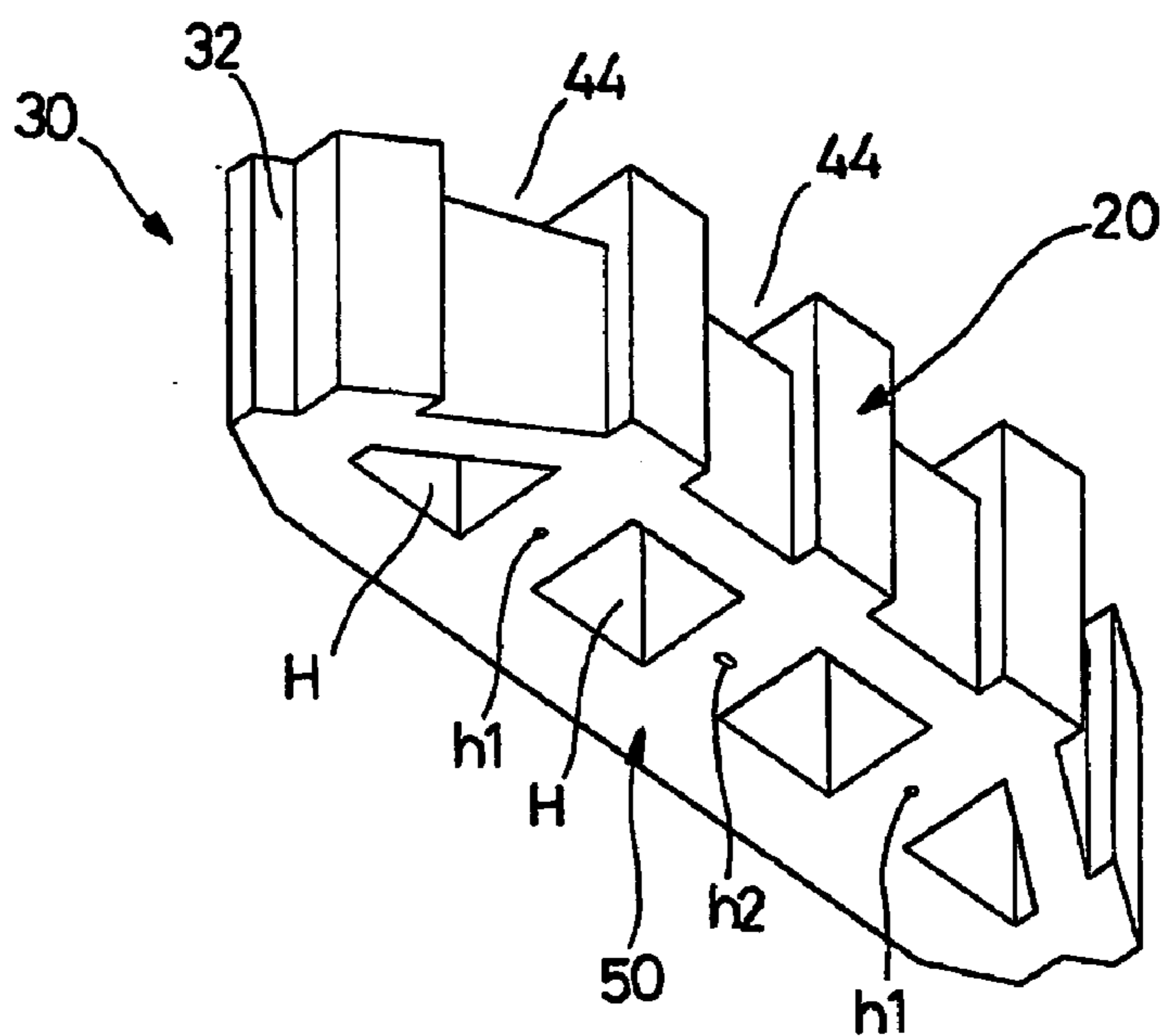


FIG. 3

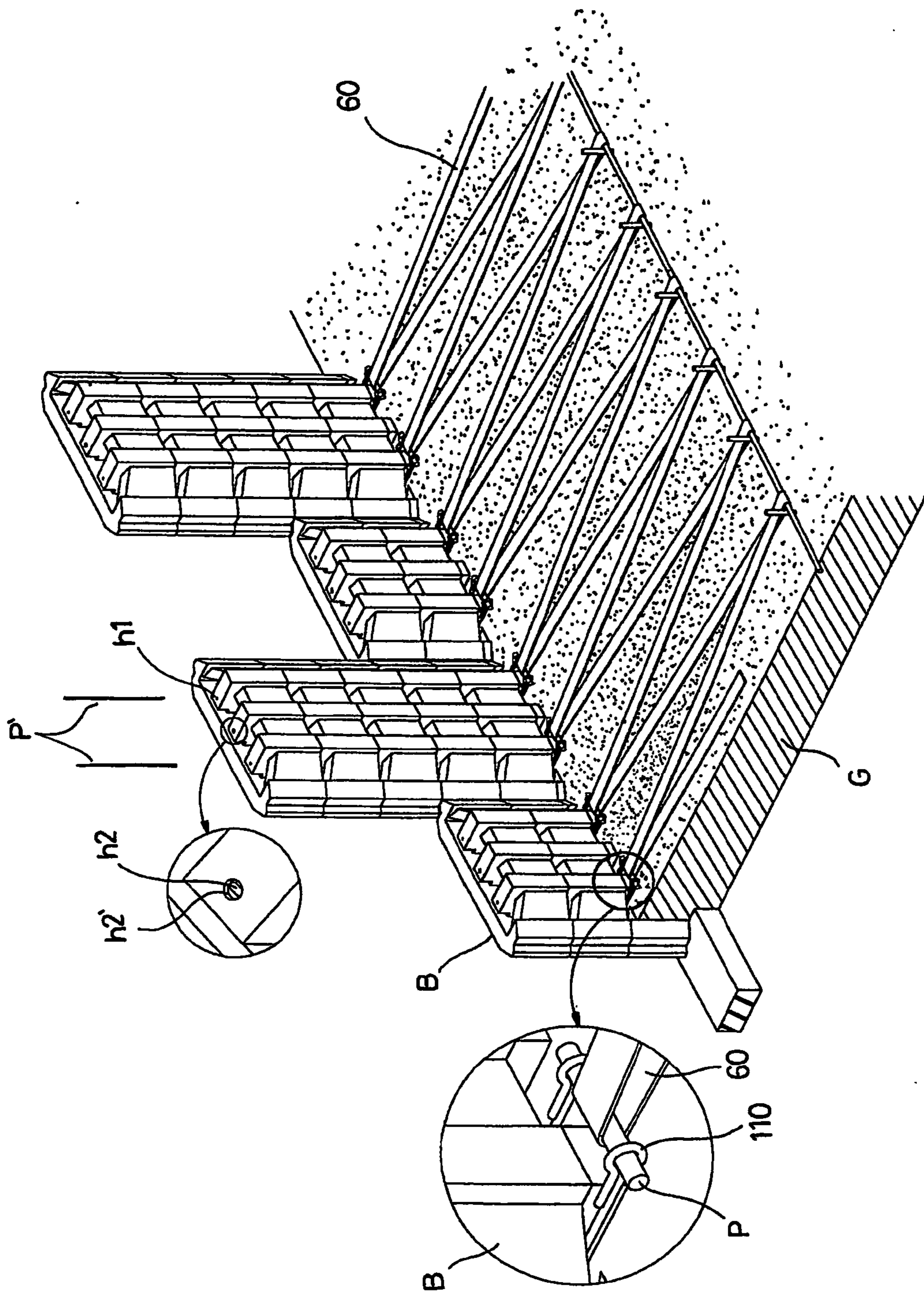


FIG. 4

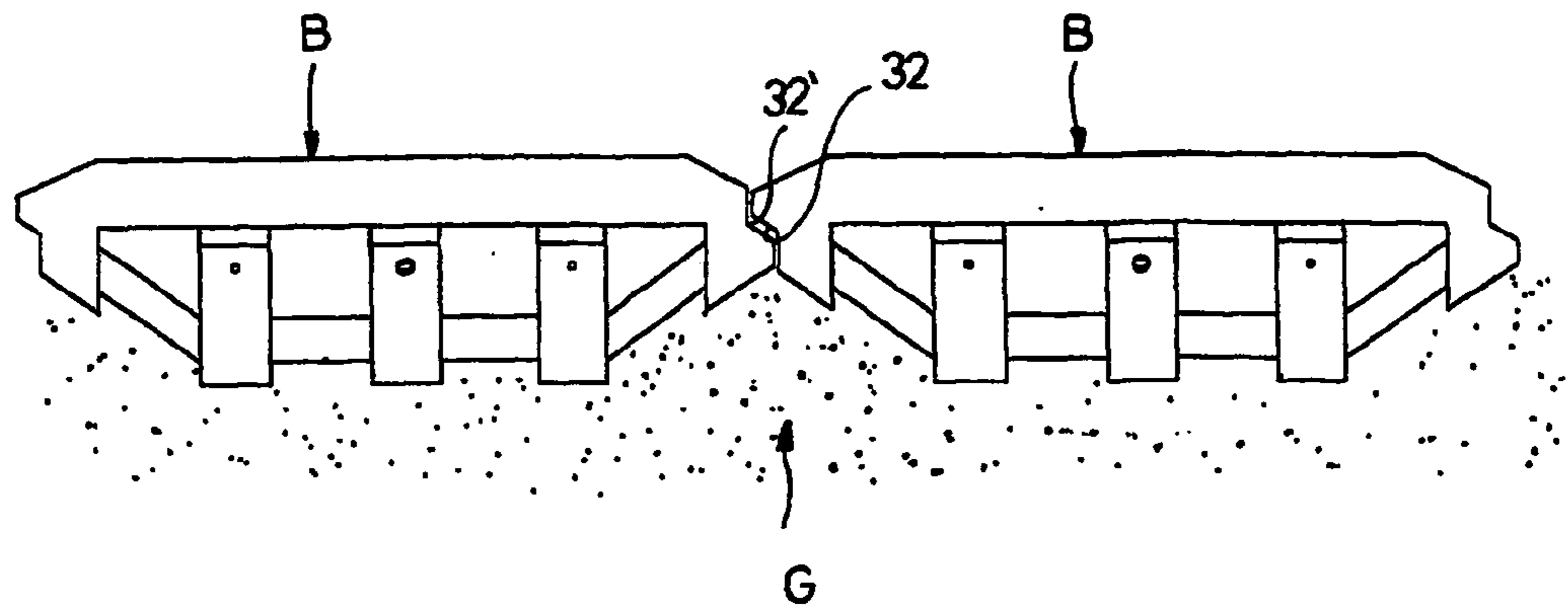


FIG. 5

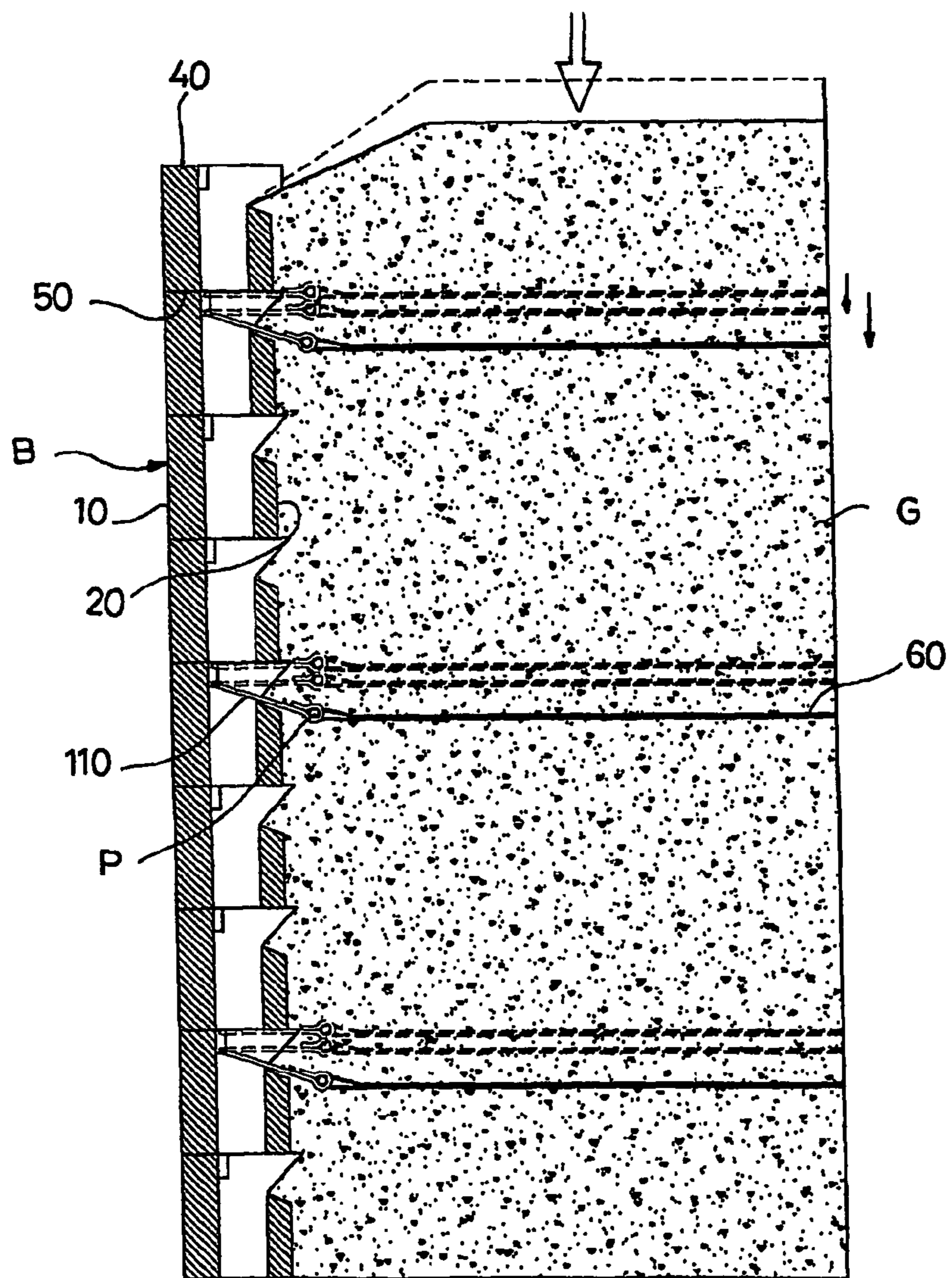


FIG. 6

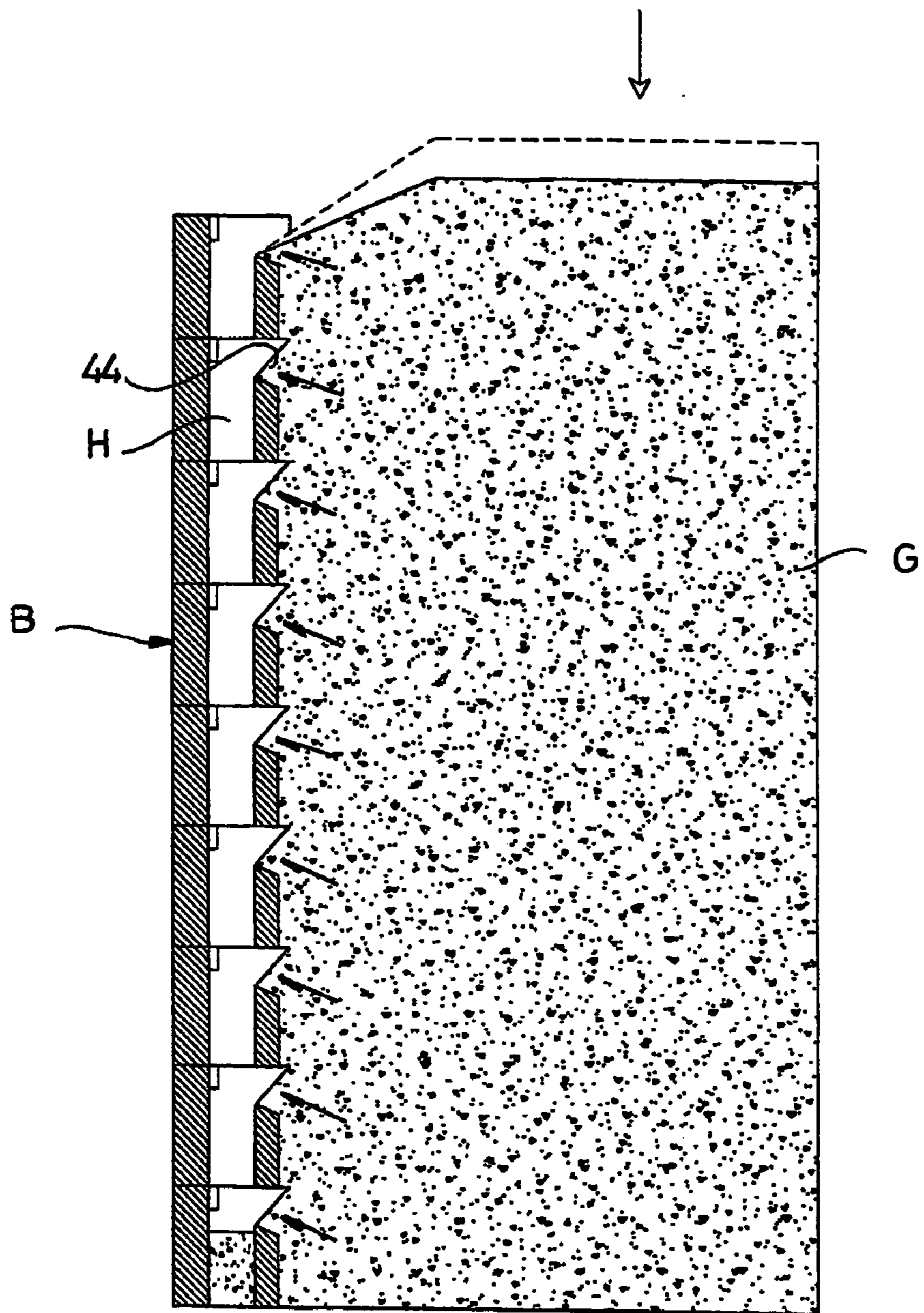


FIG. 7

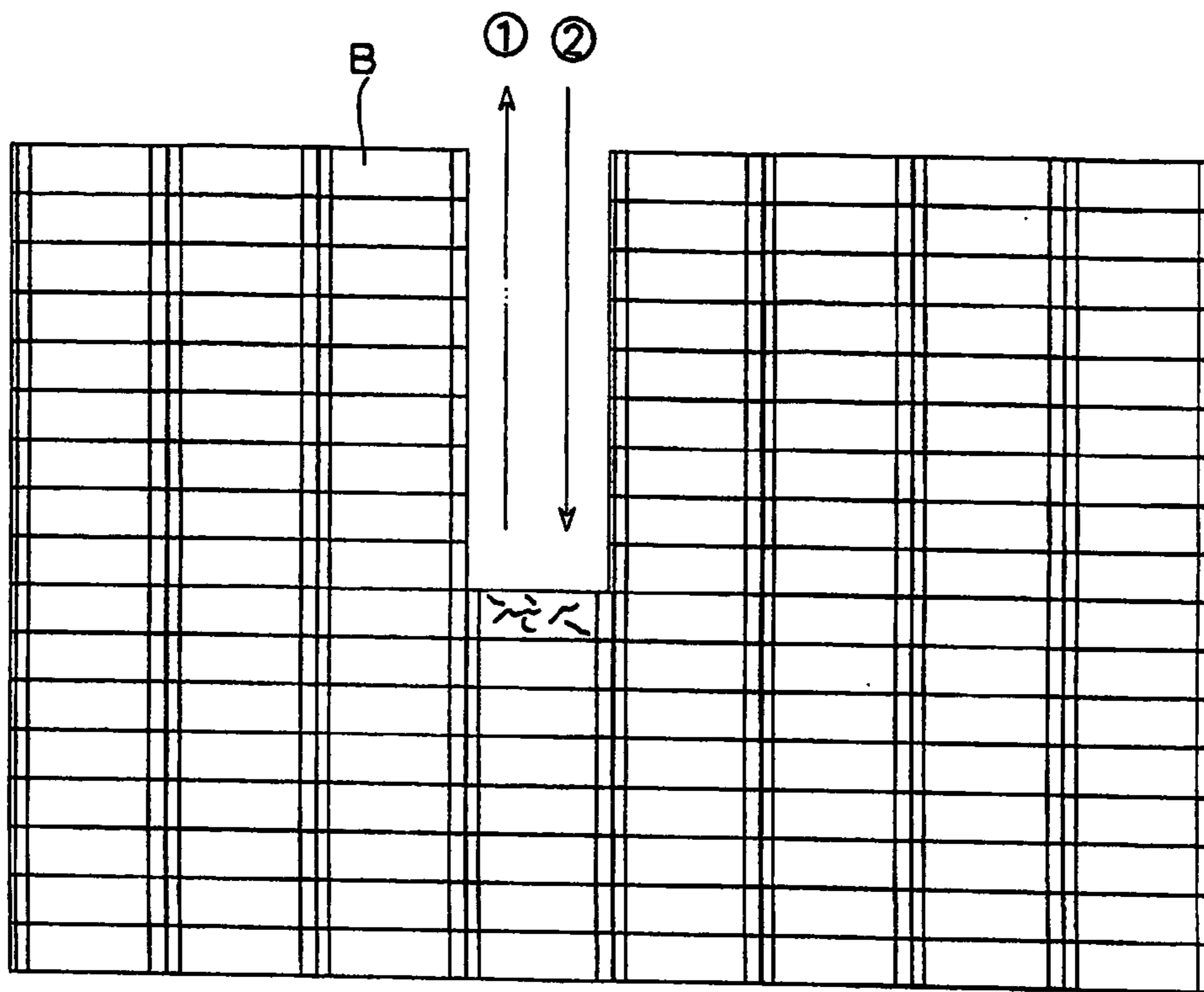


FIG. 8

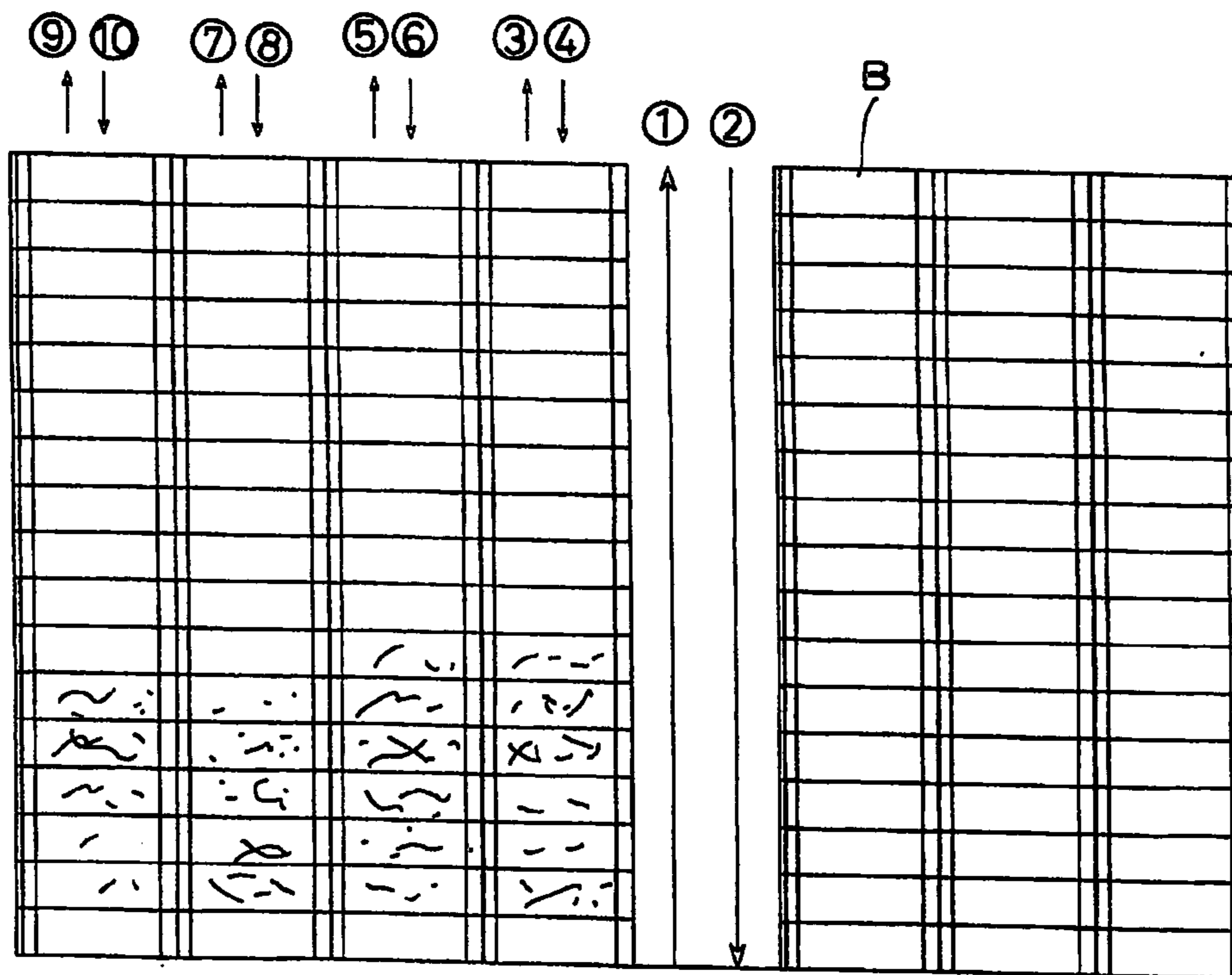


FIG. 9

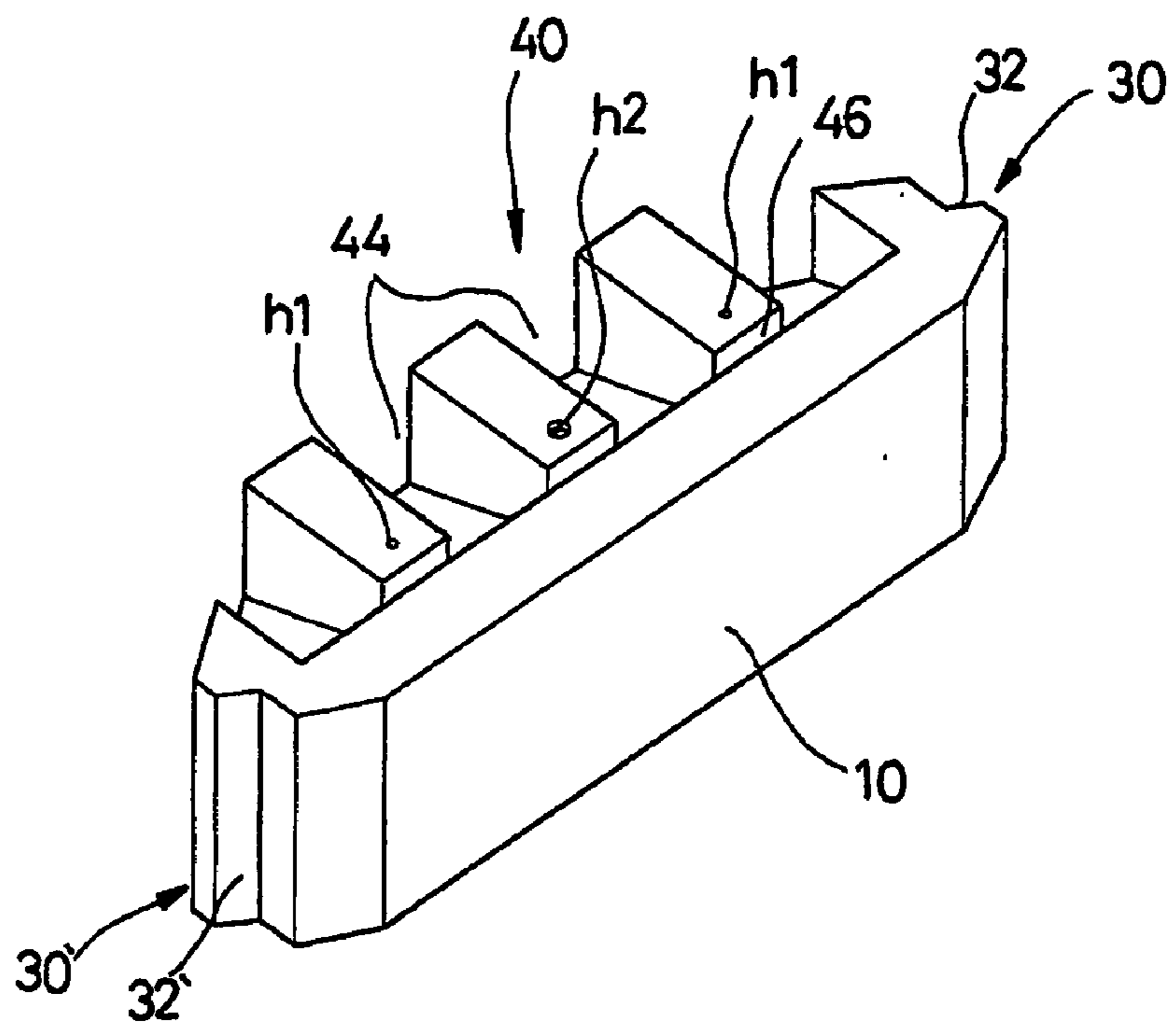


FIG. 10

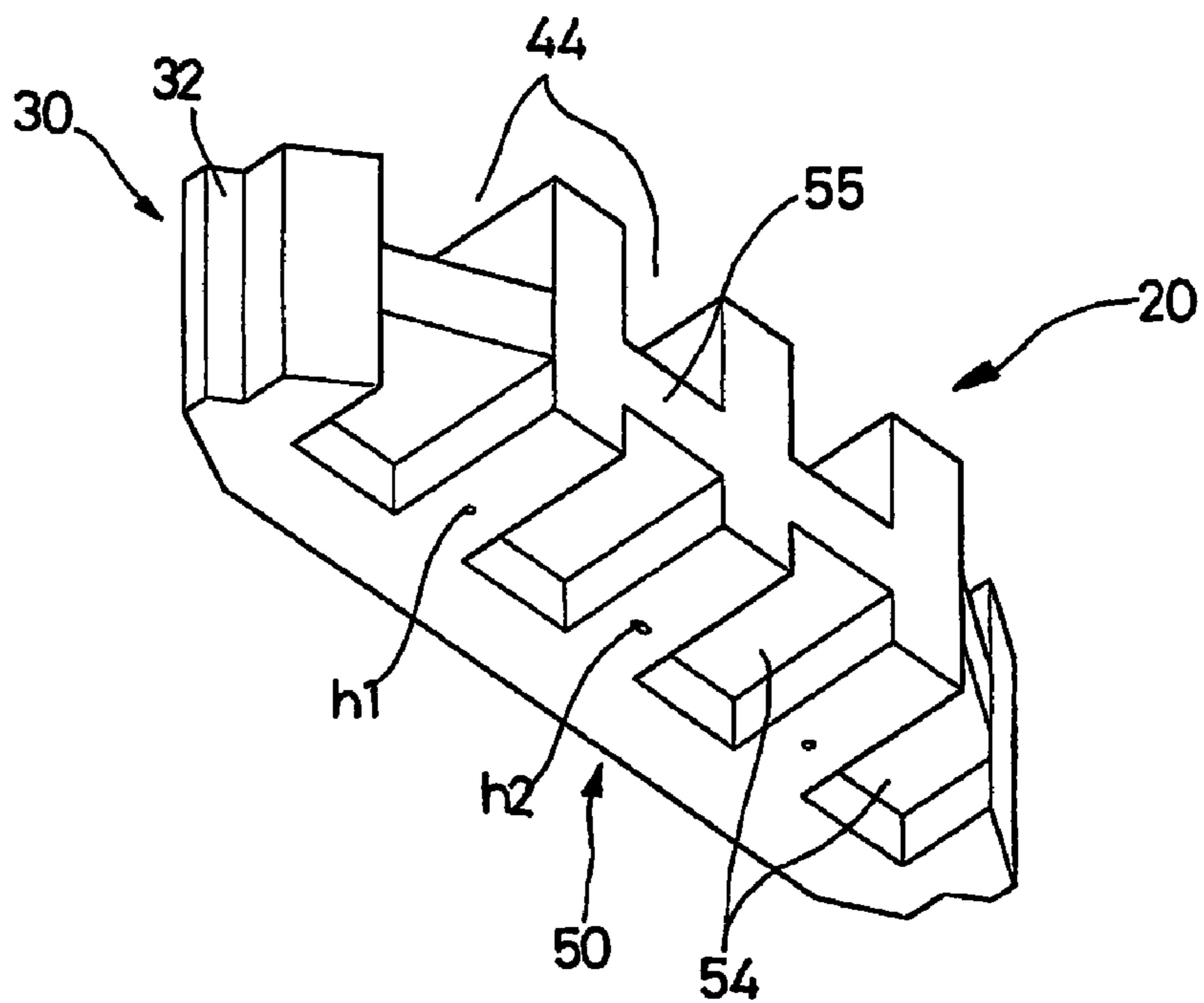


FIG. 11

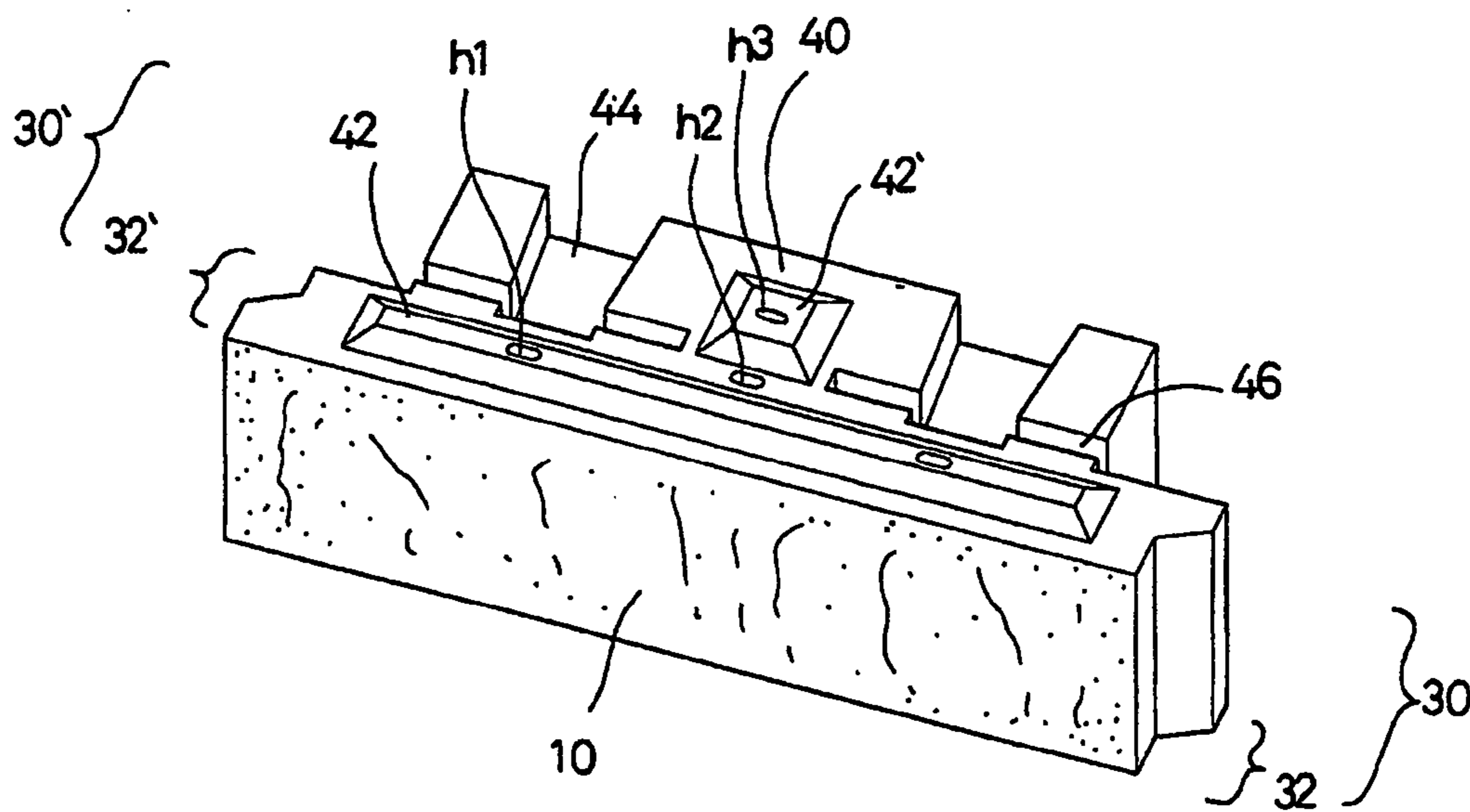


FIG. 12

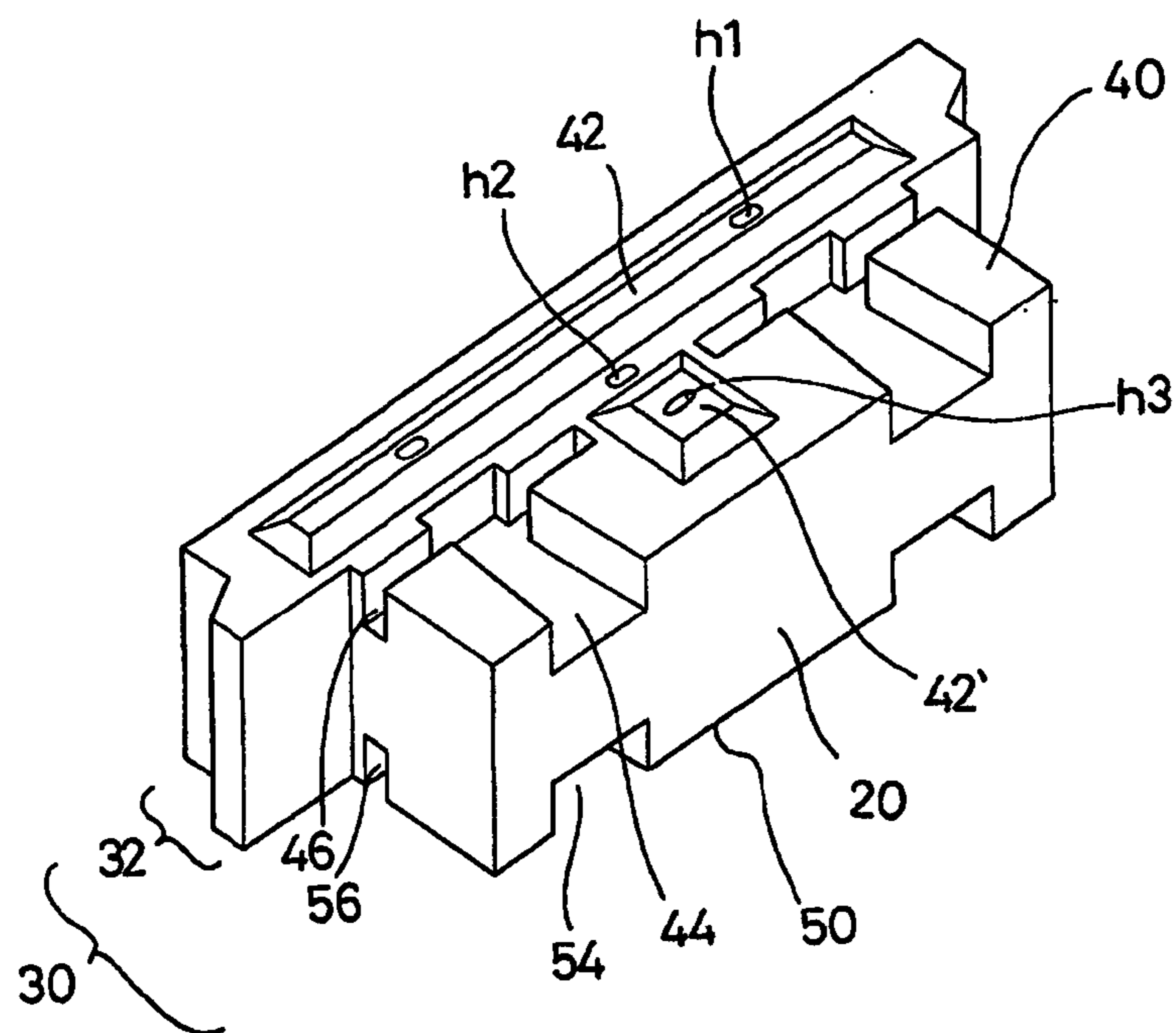


FIG. 13

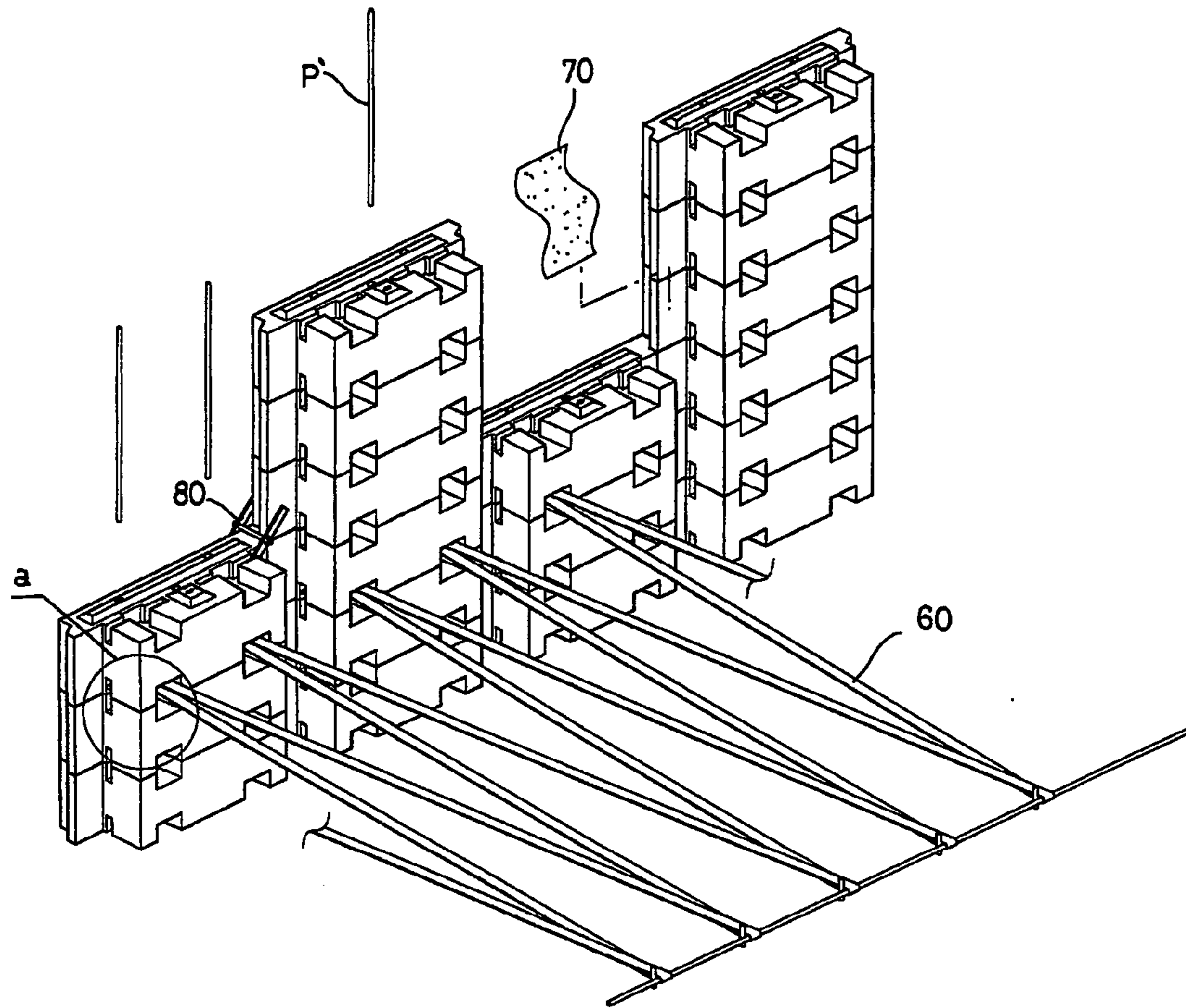


FIG. 14

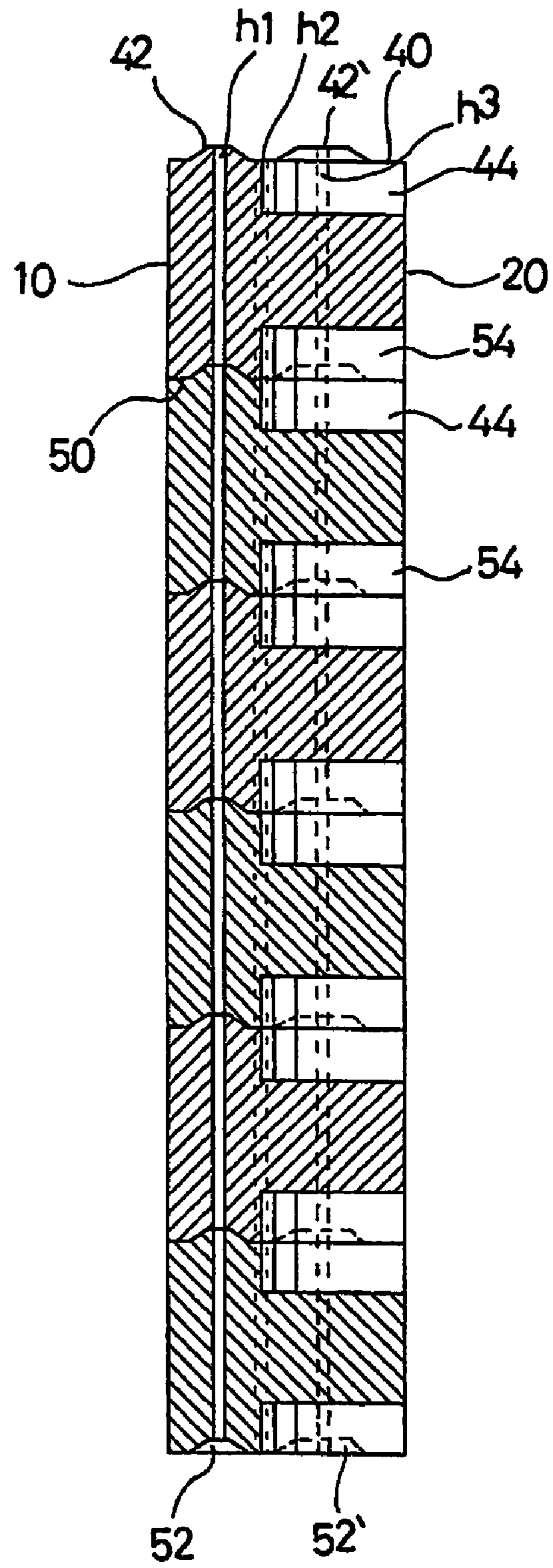


FIG. 15

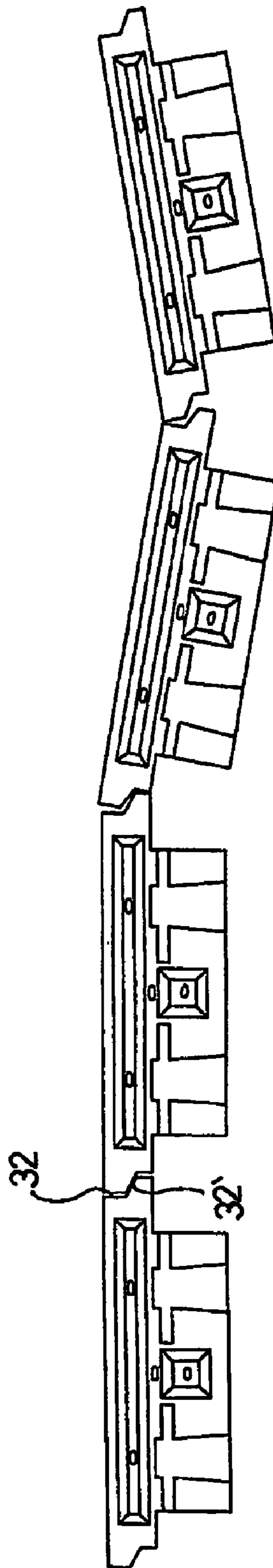


FIG. 16

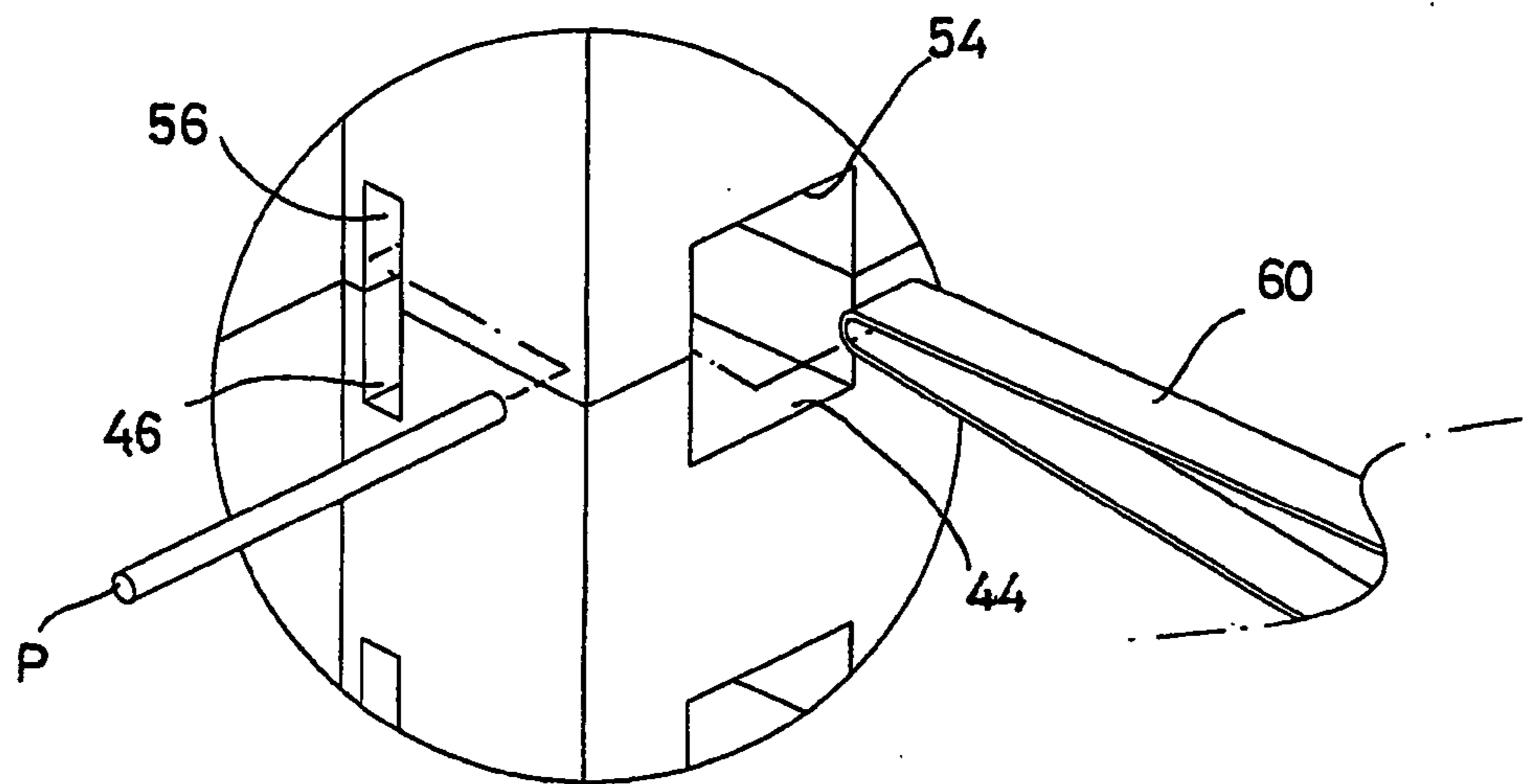


FIG. 17

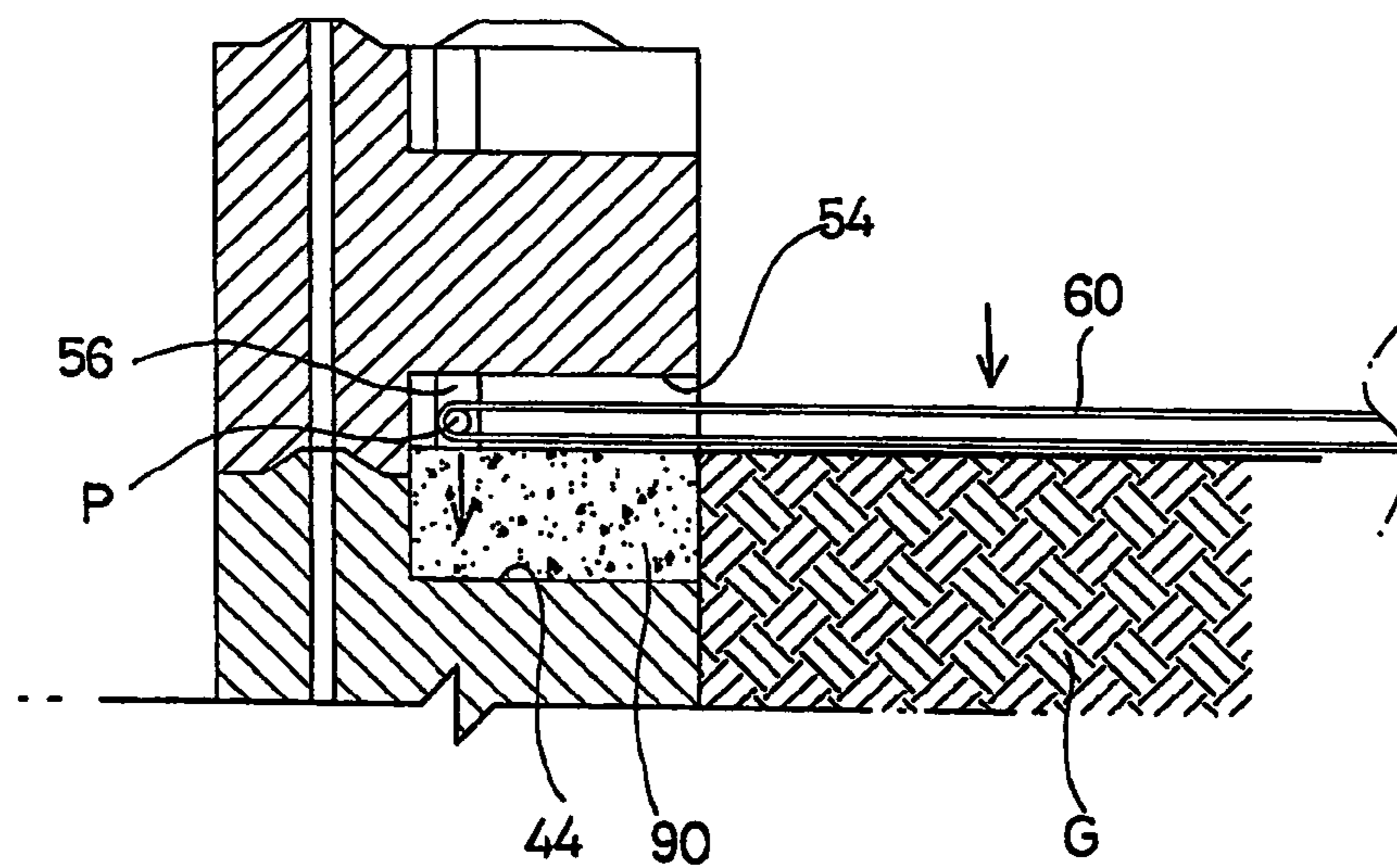


FIG. 18

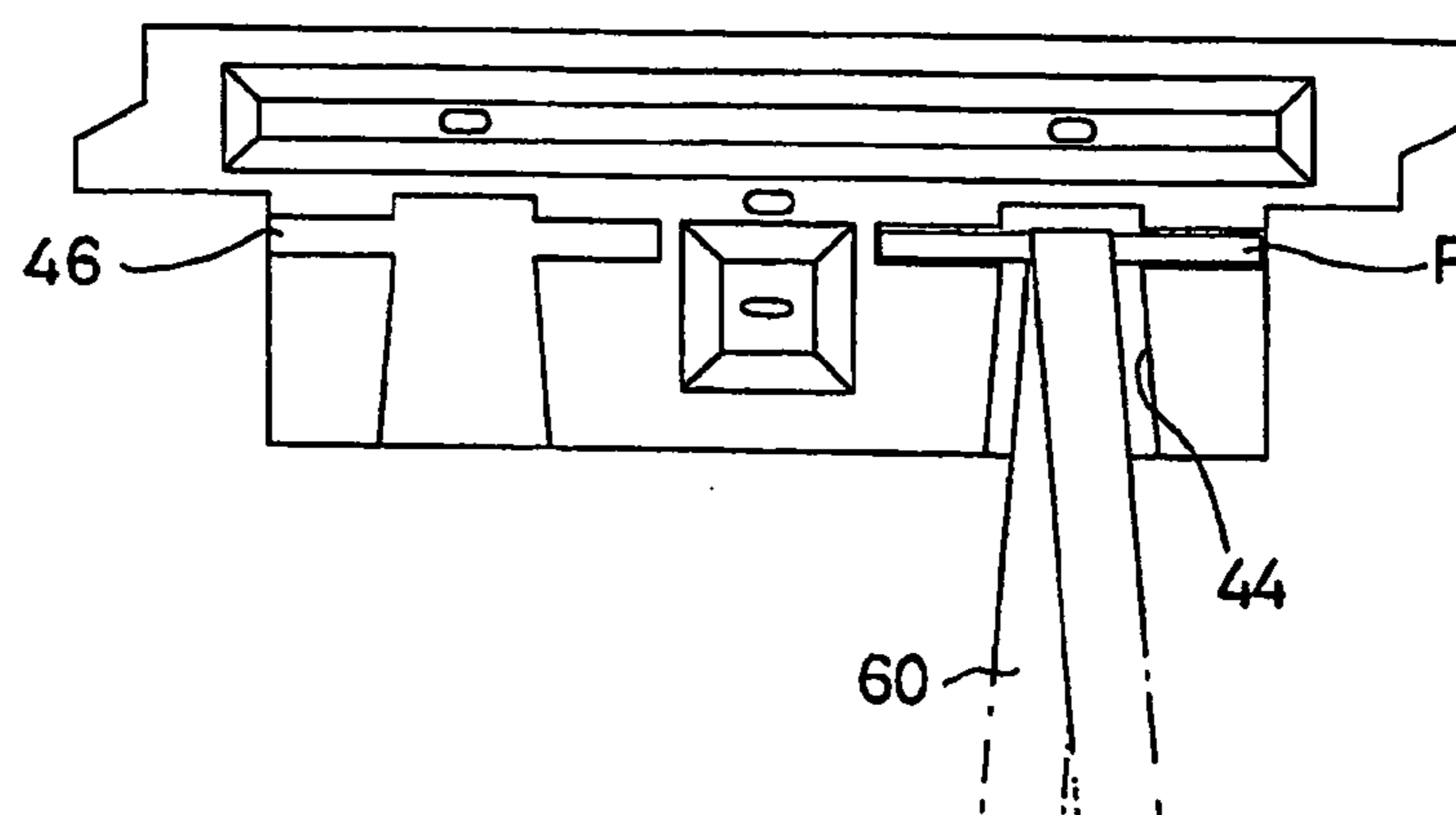


FIG. 20

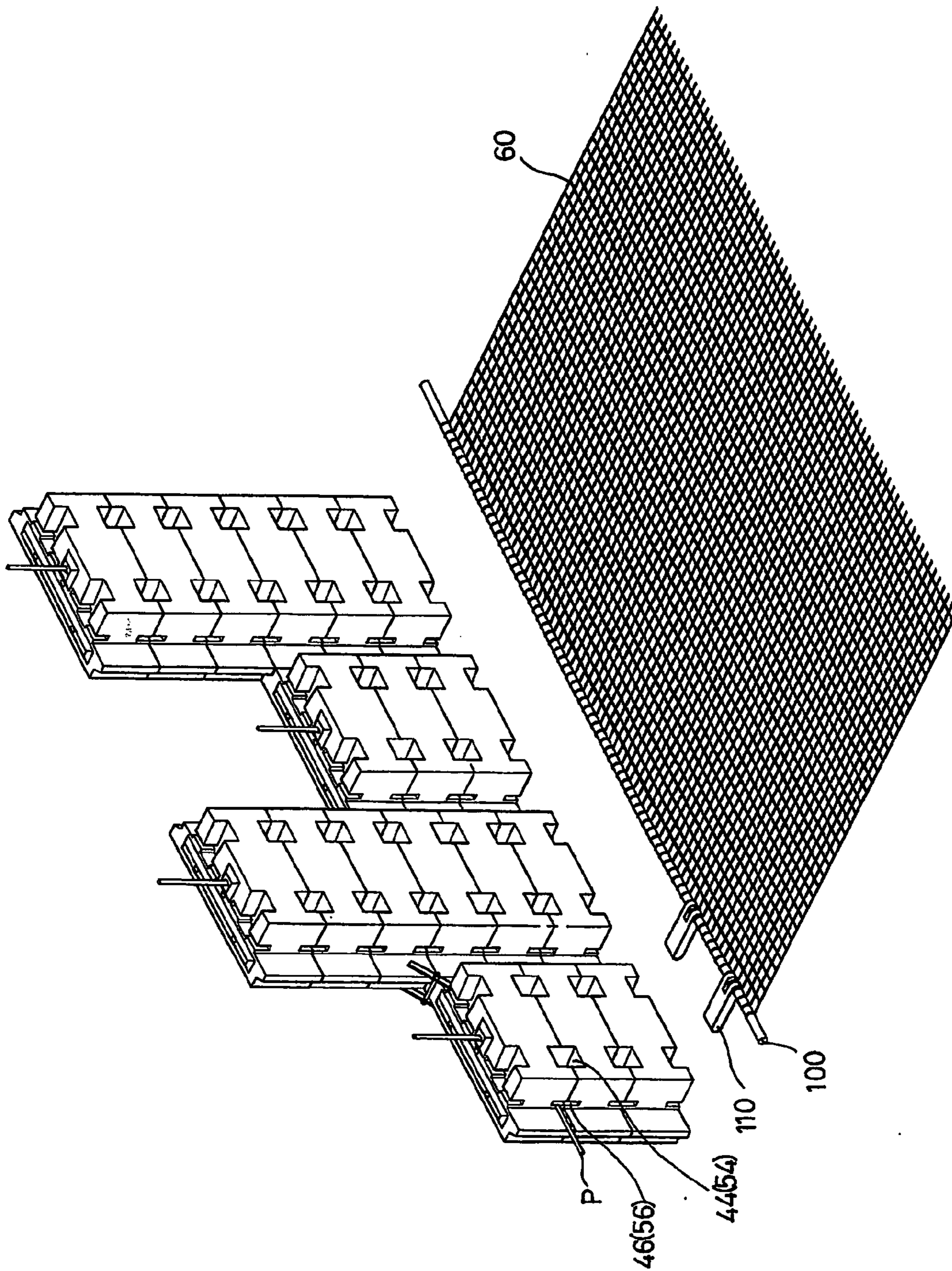


FIG. 21

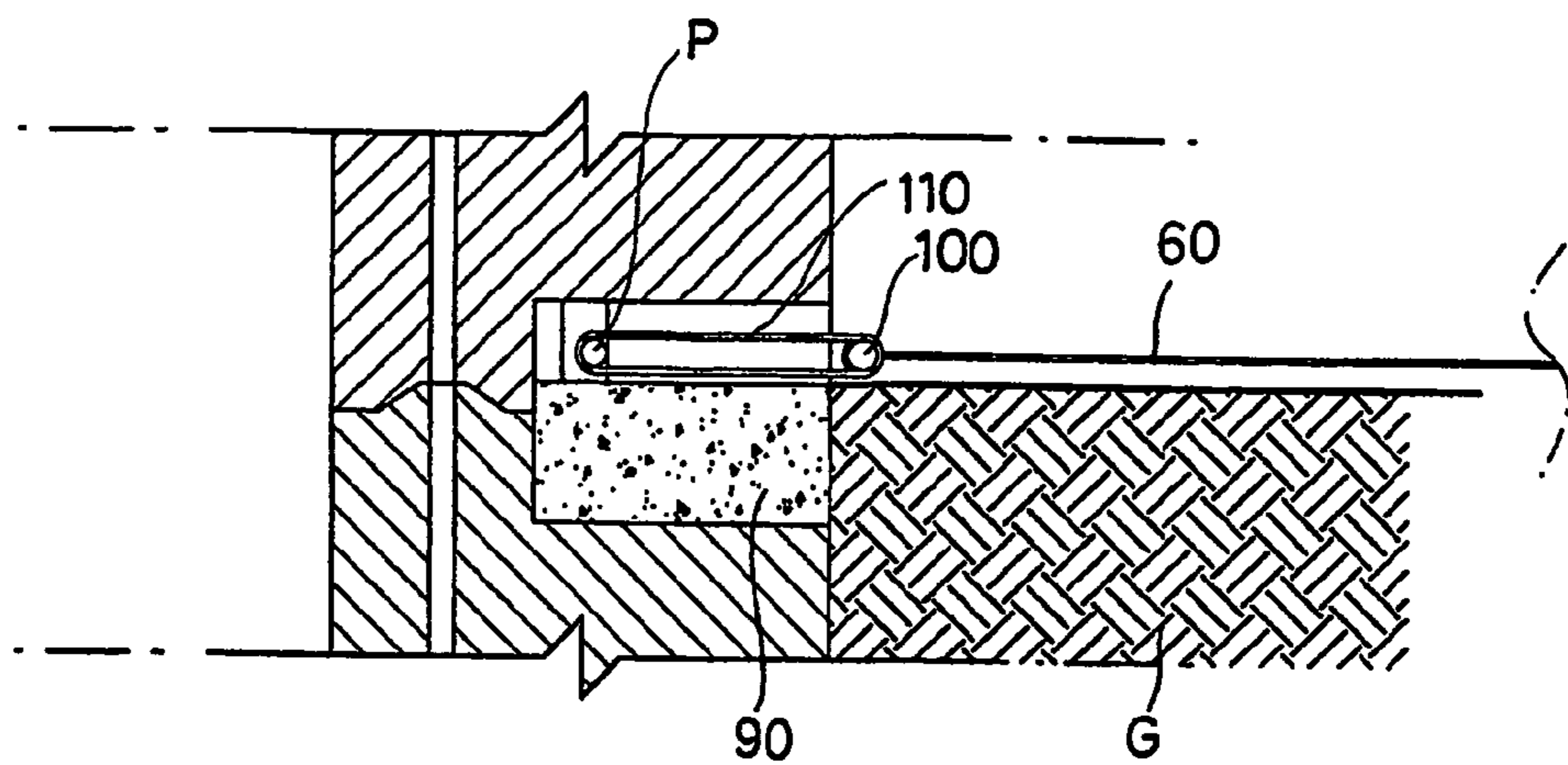


FIG. 22

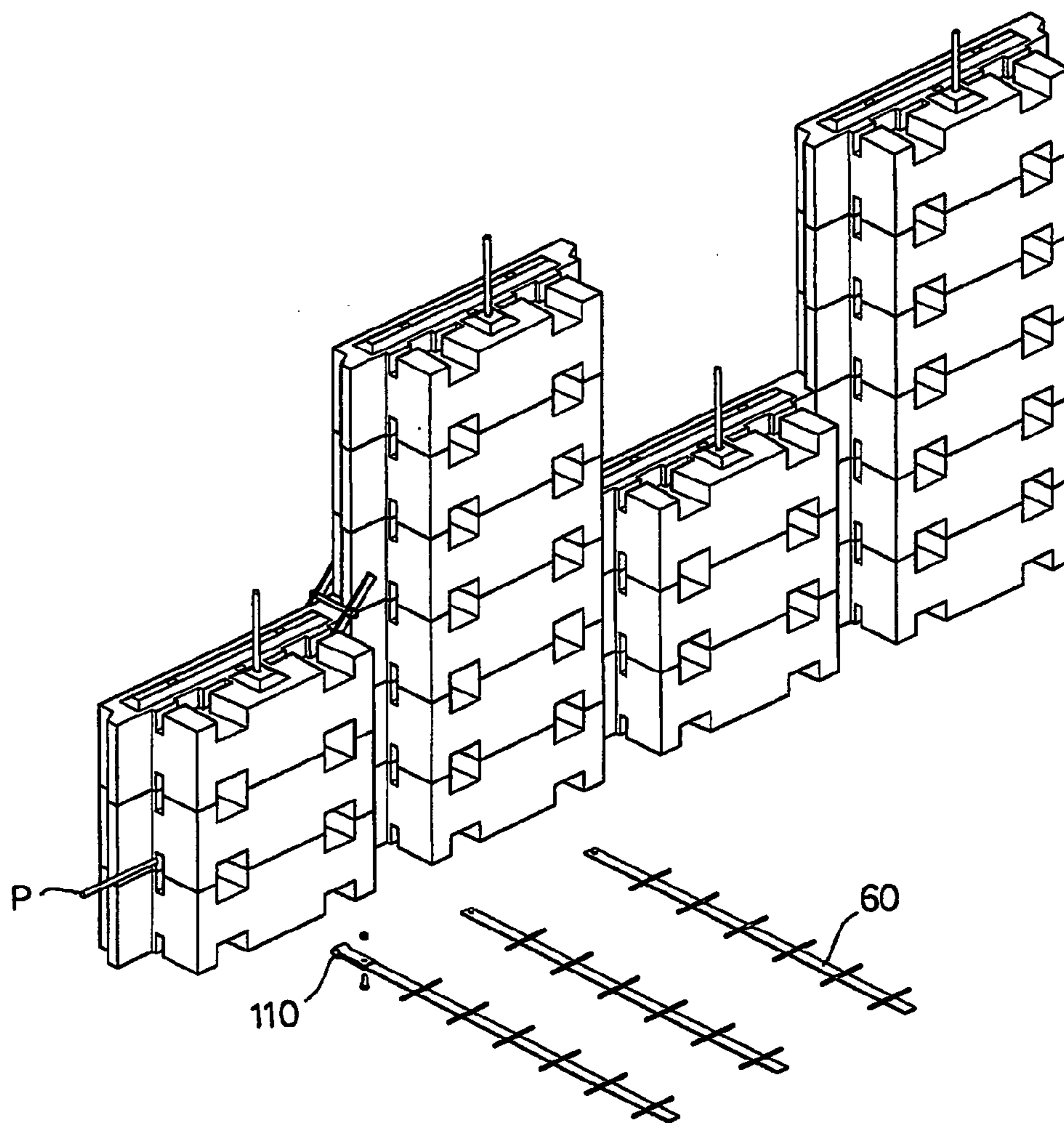


FIG. 23

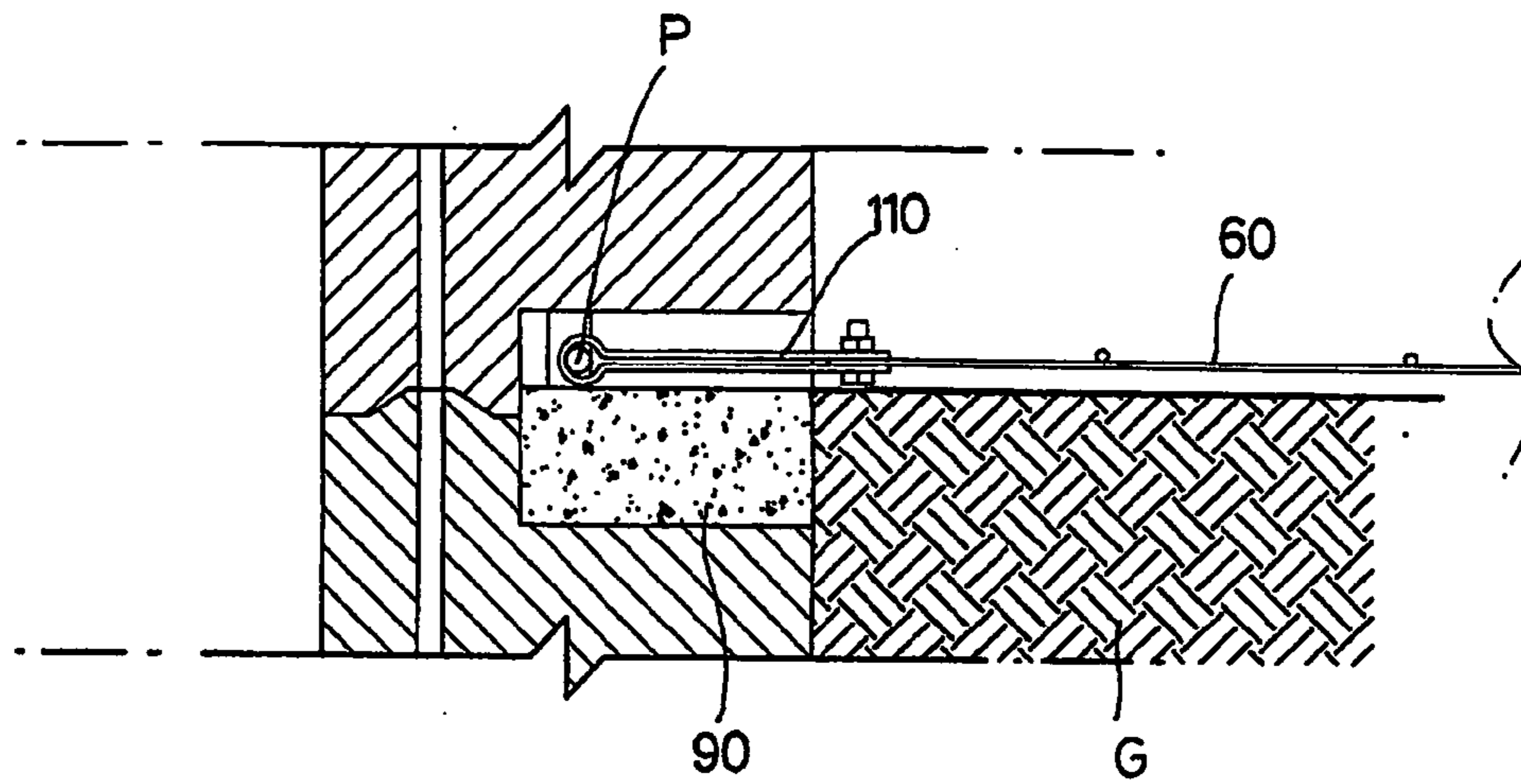


FIG. 24

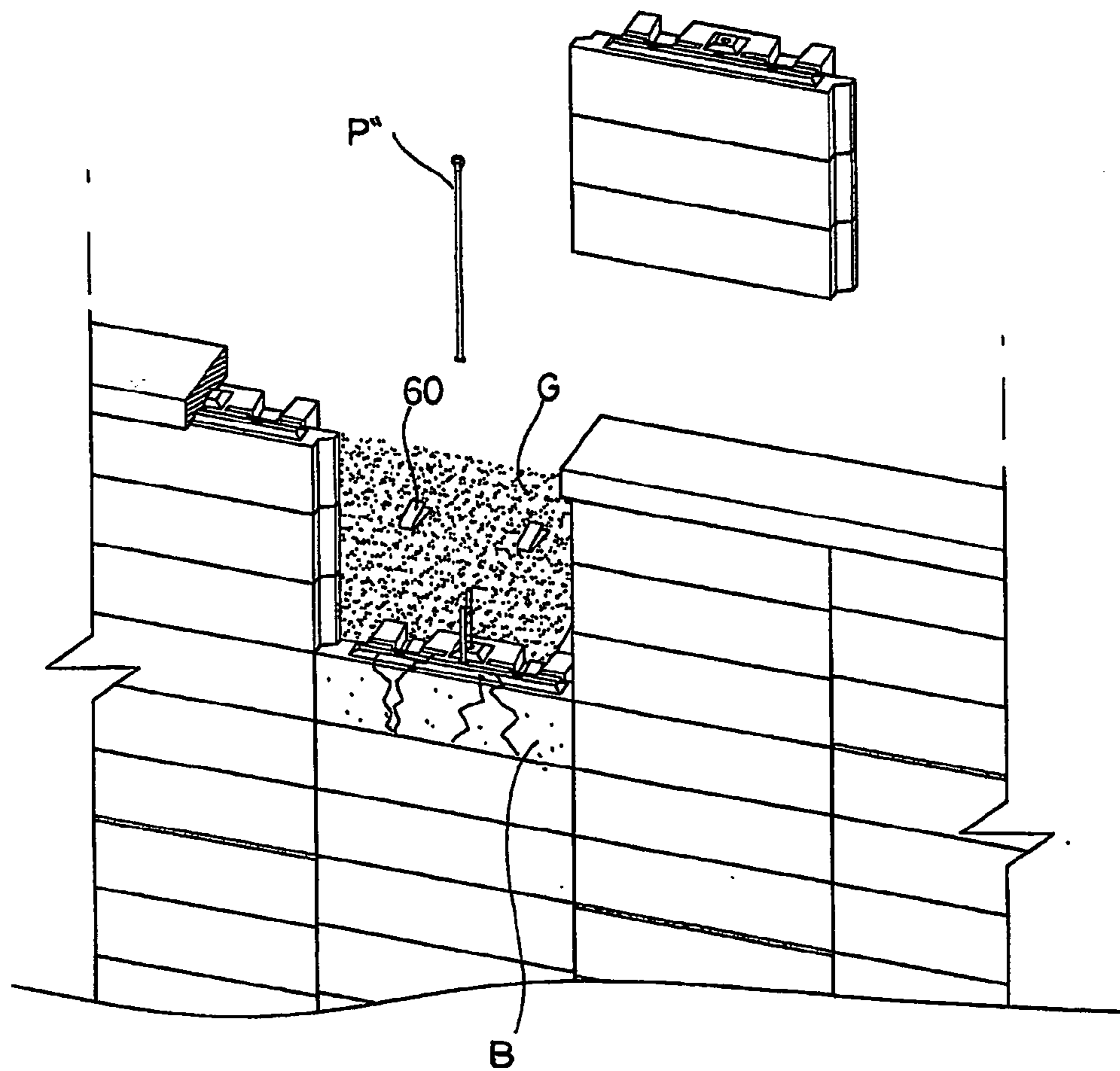


FIG. 25

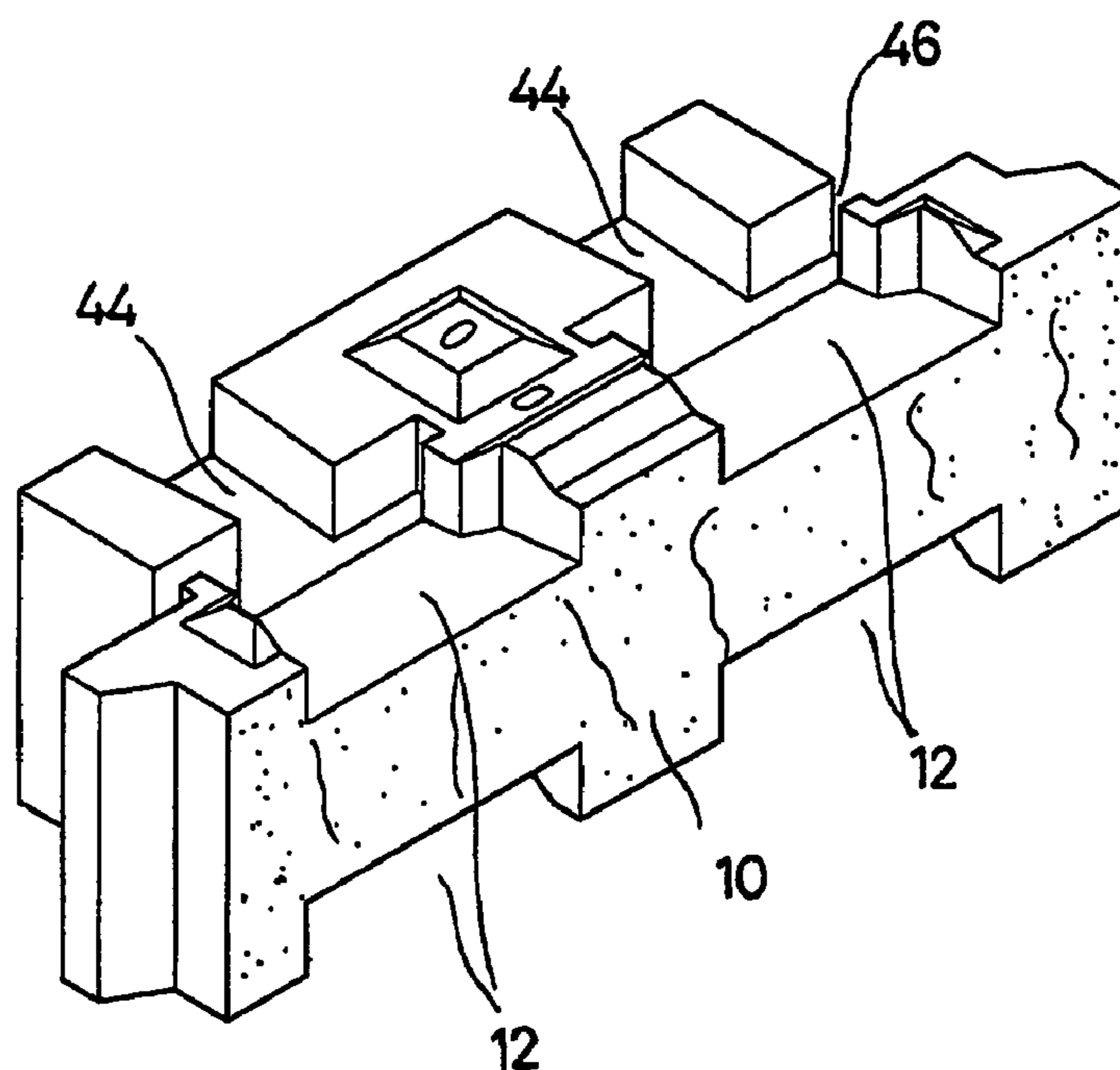


FIG. 26

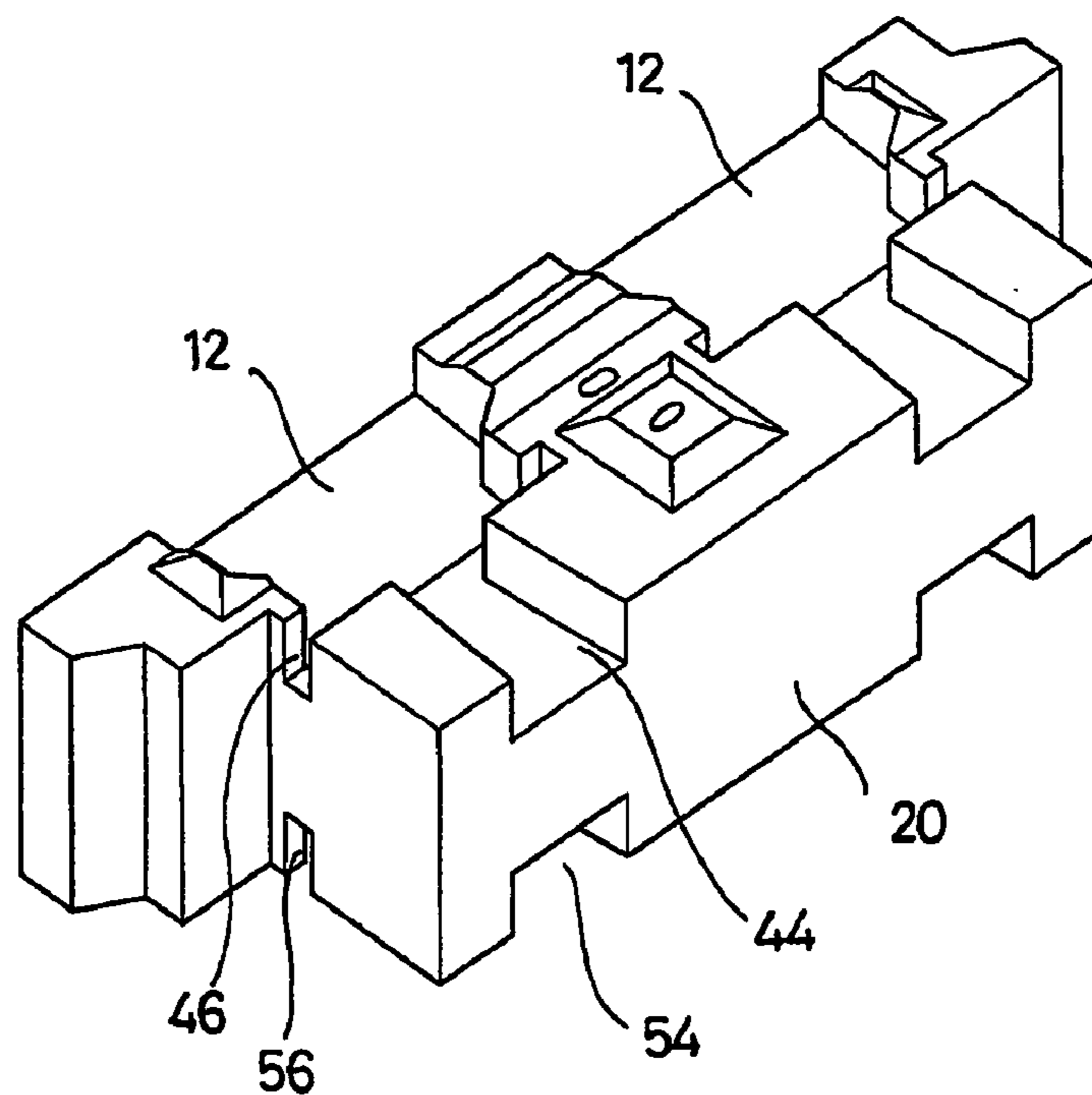


FIG. 27

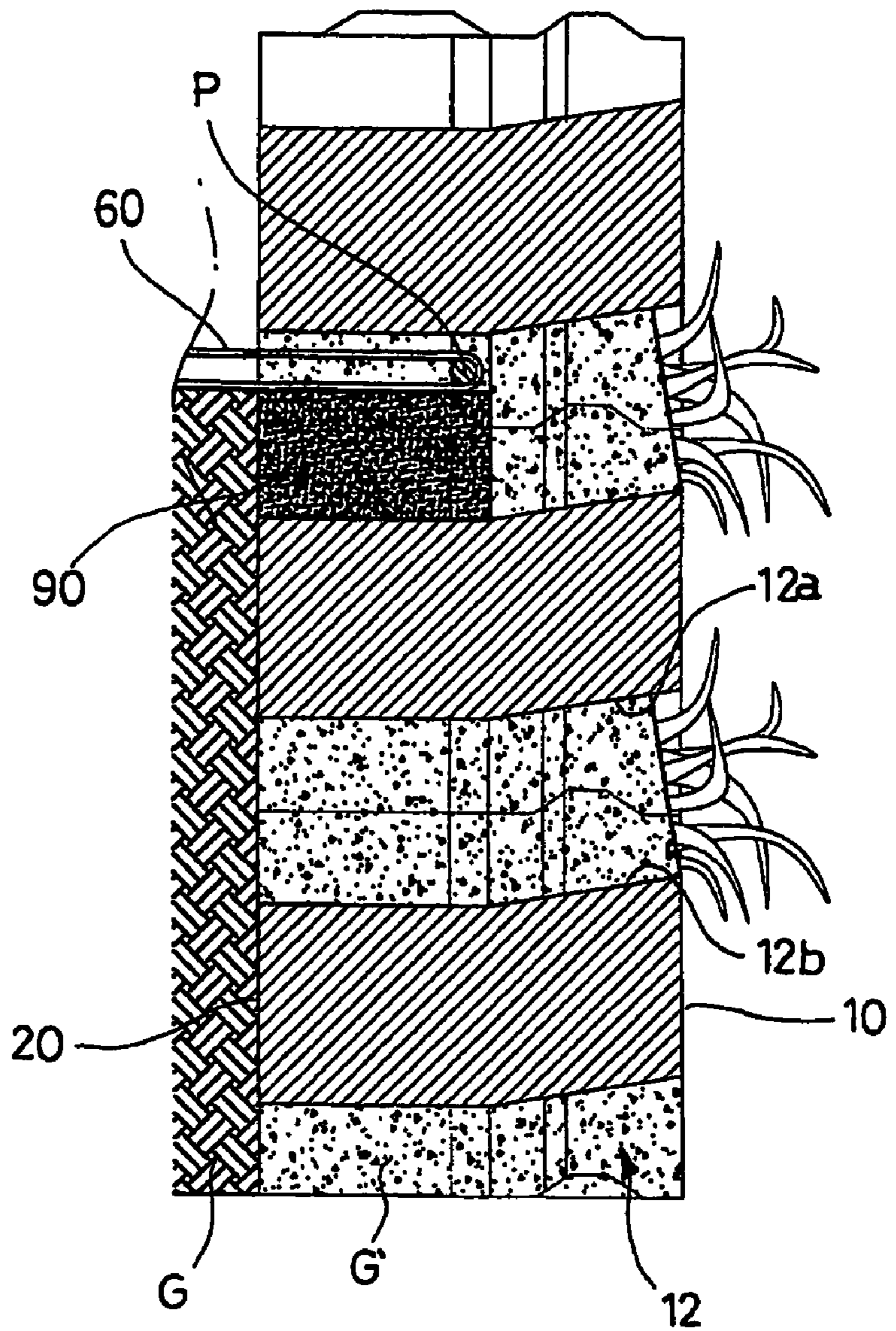


FIG. 28

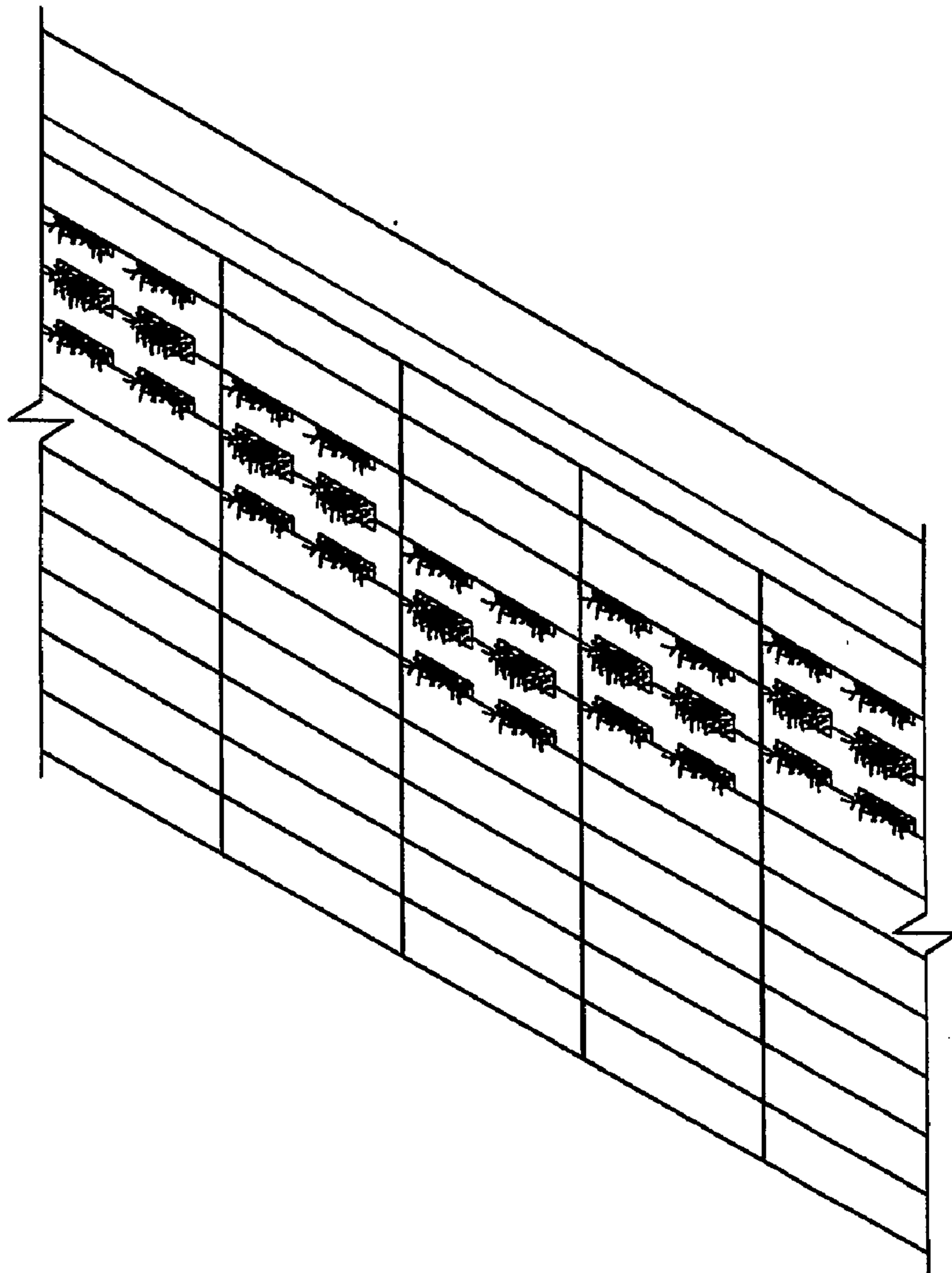


FIG. 29

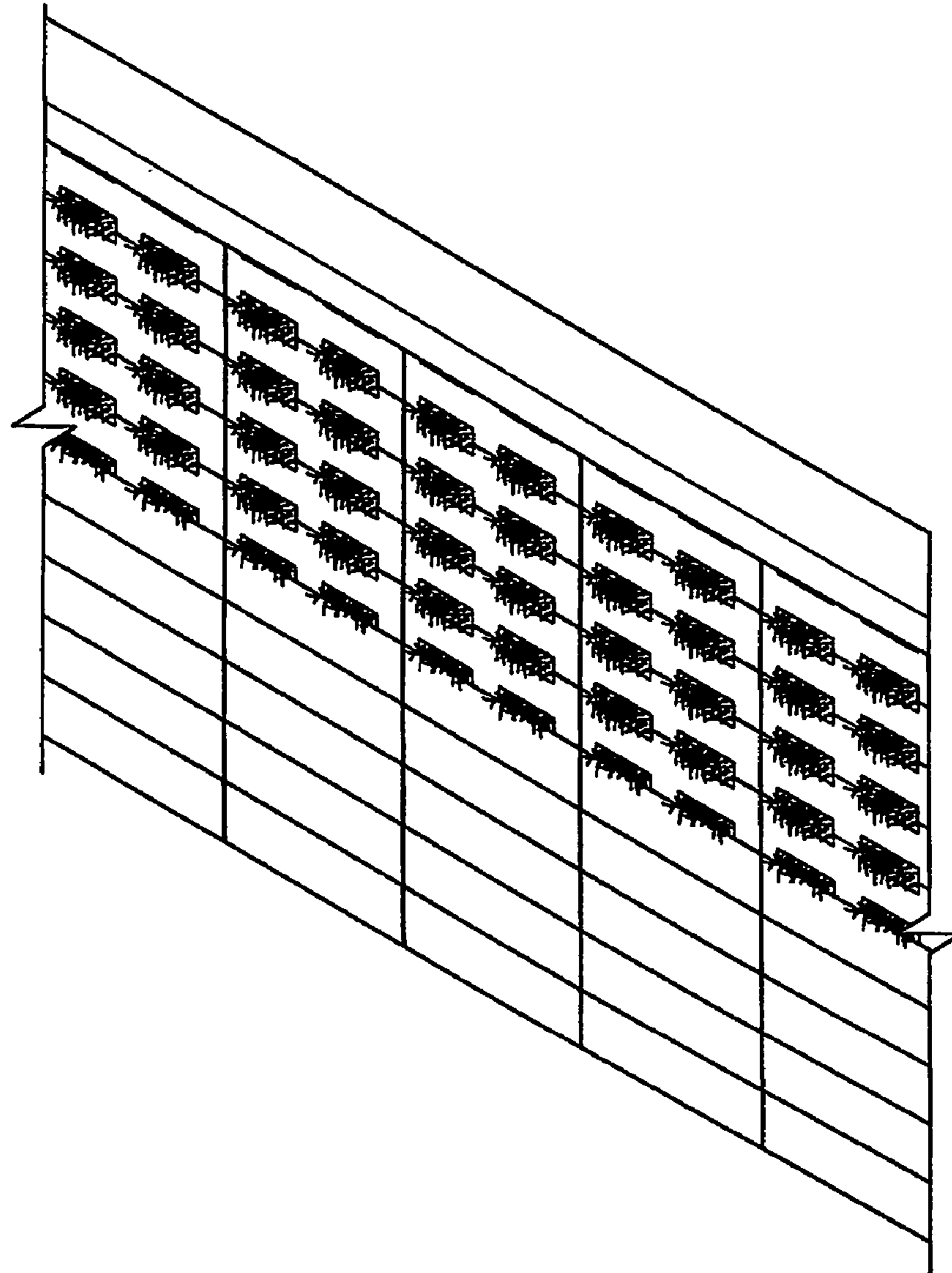


FIG. 30

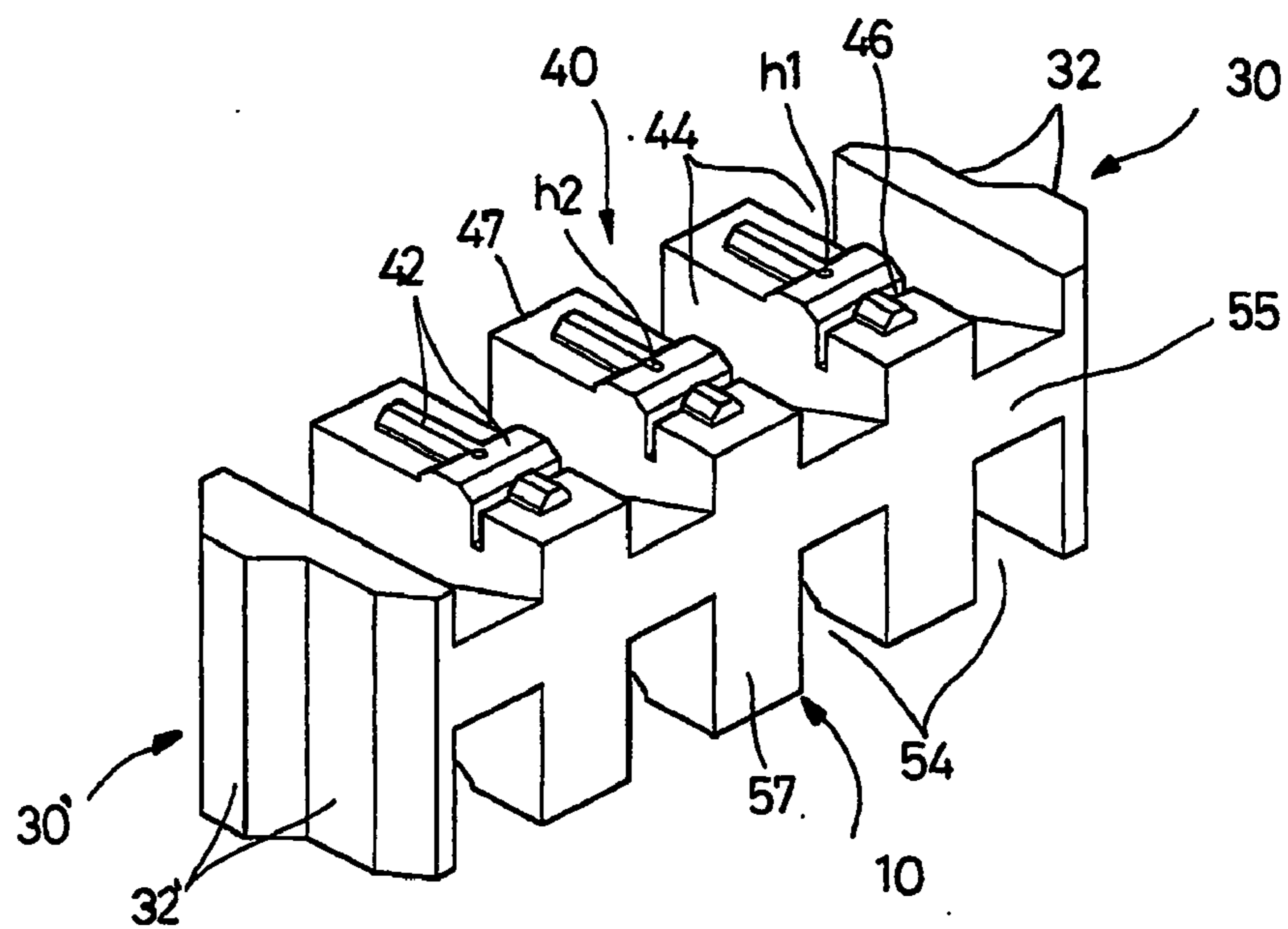


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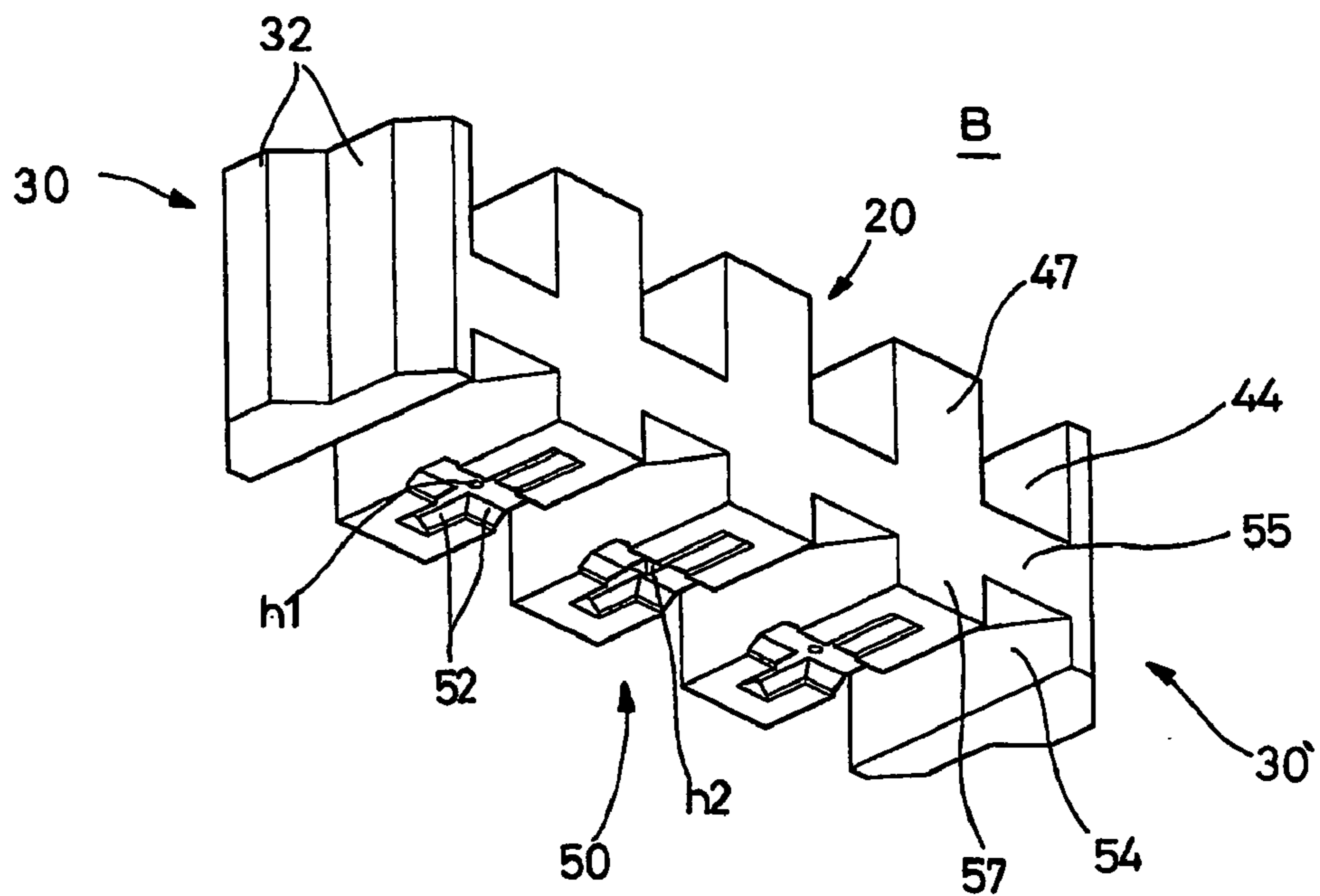


FIG. 32

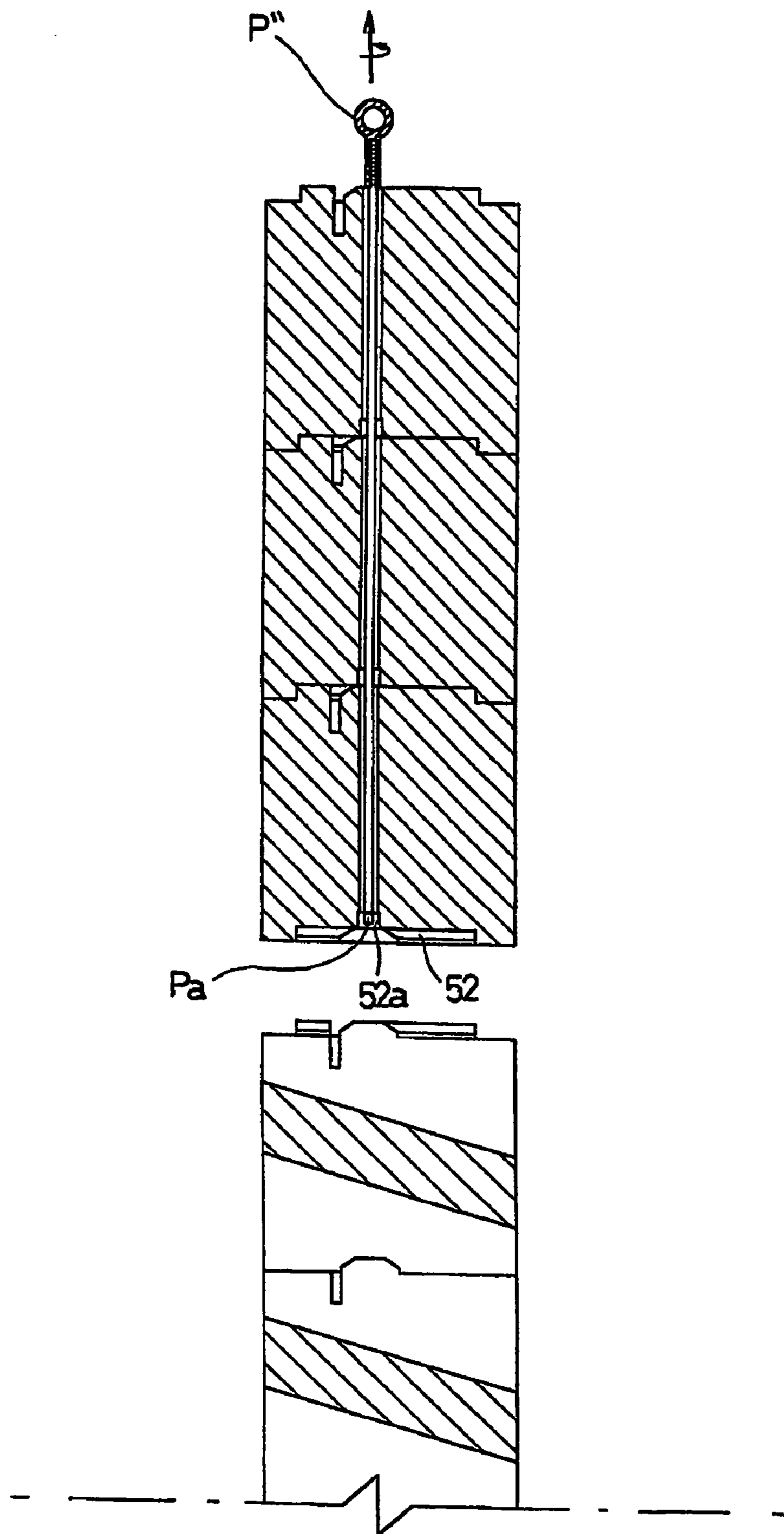


FIG. 33a

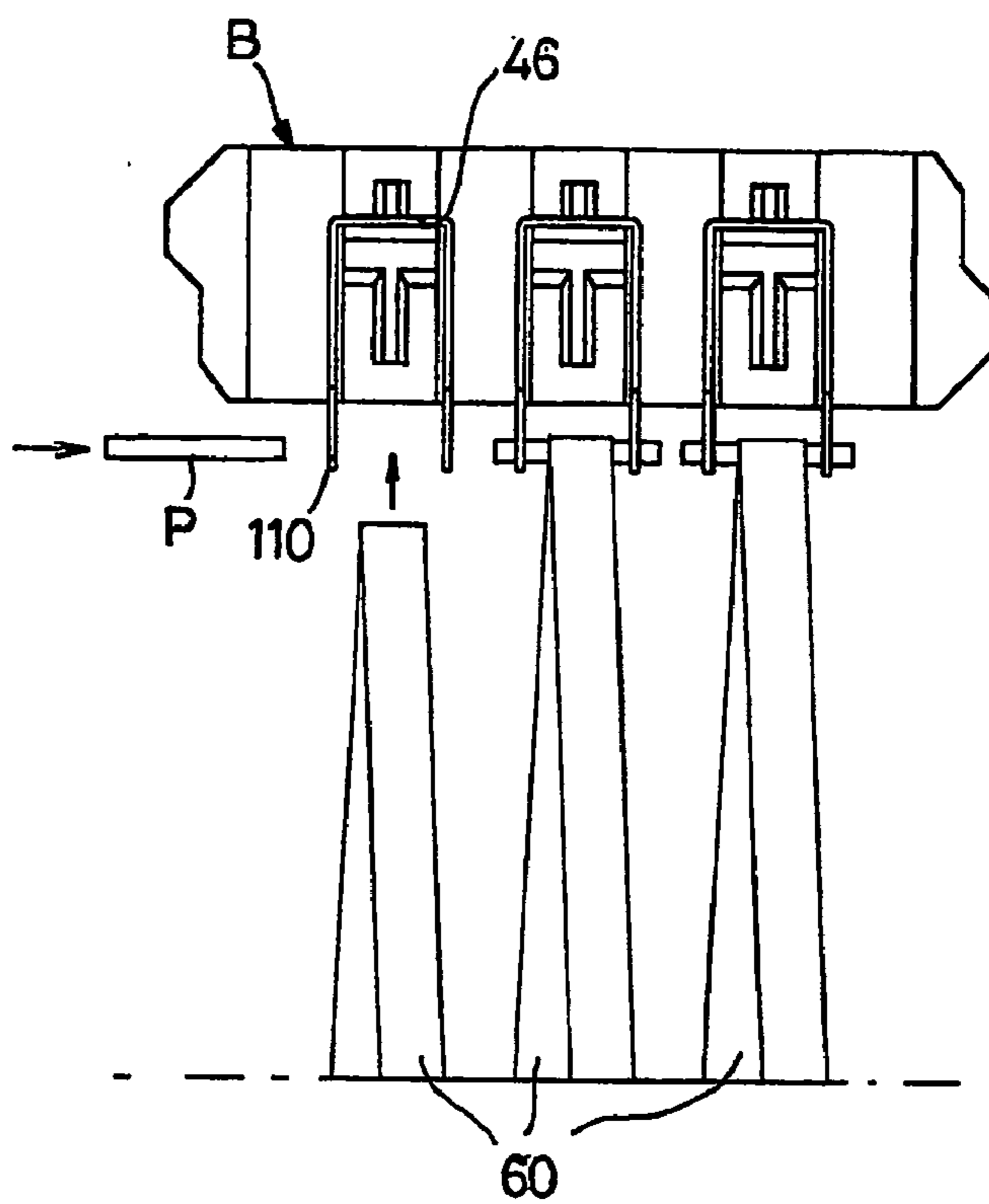


FIG. 33b

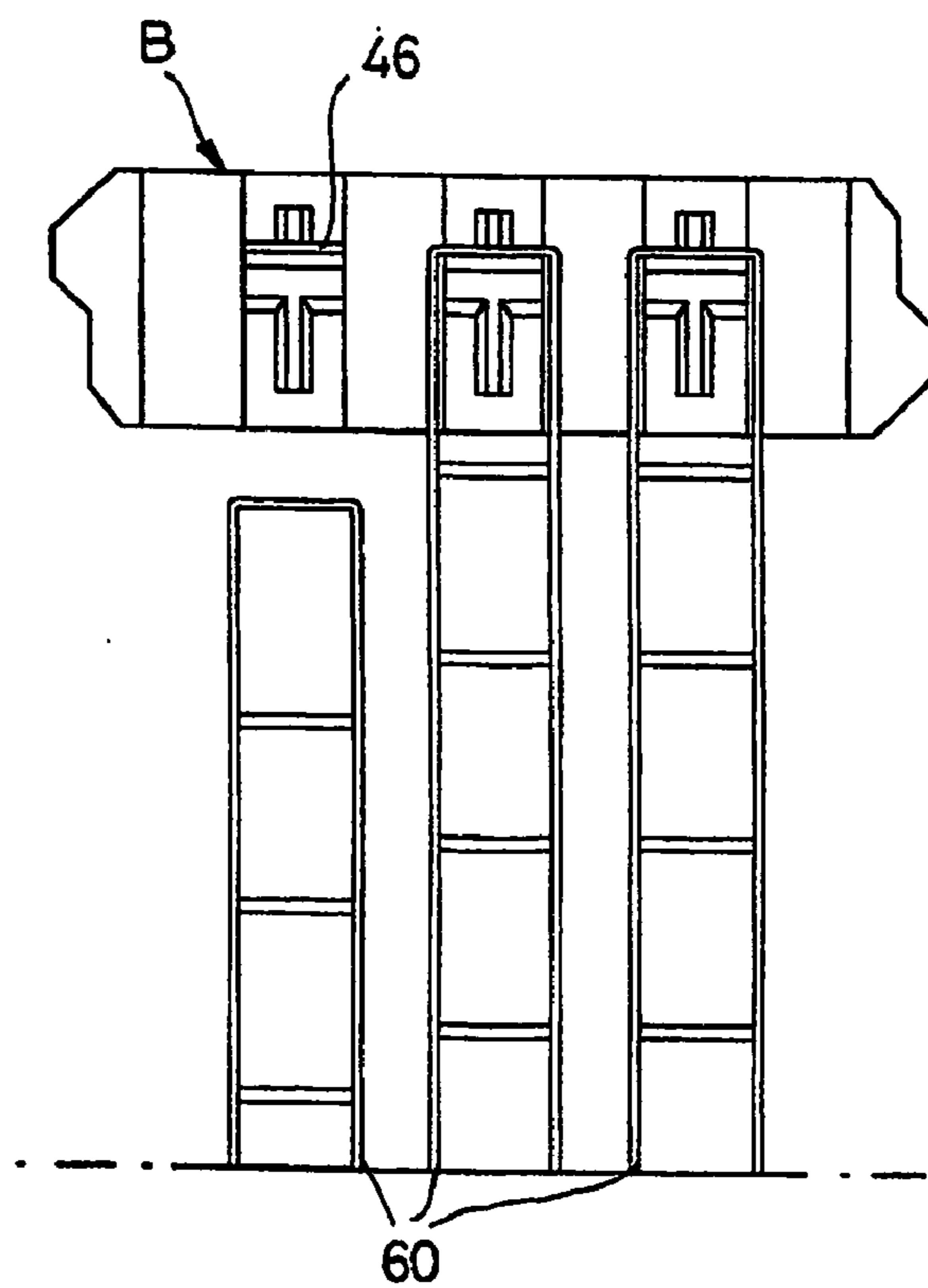


FIG. 33c

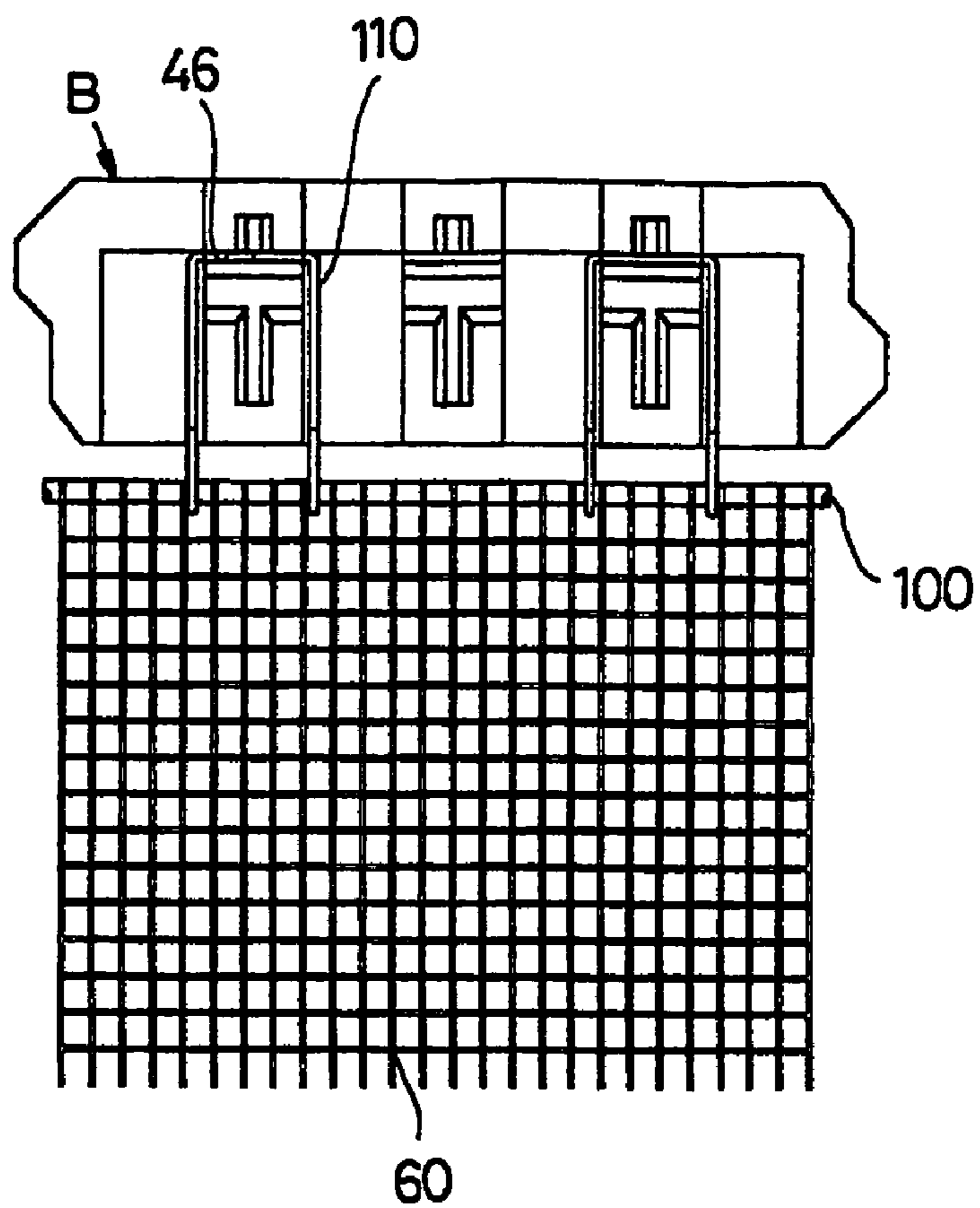


FIG. 34

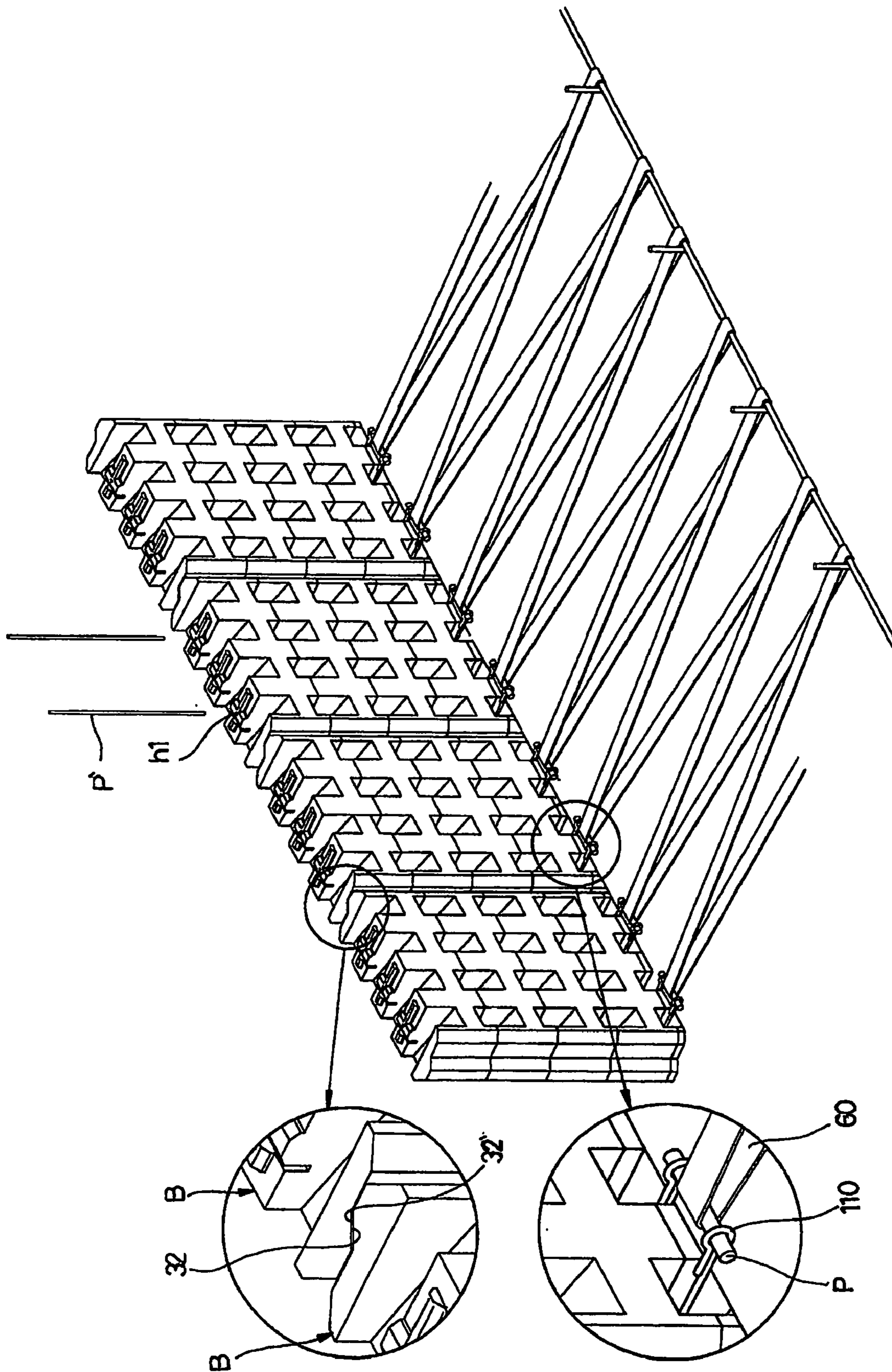


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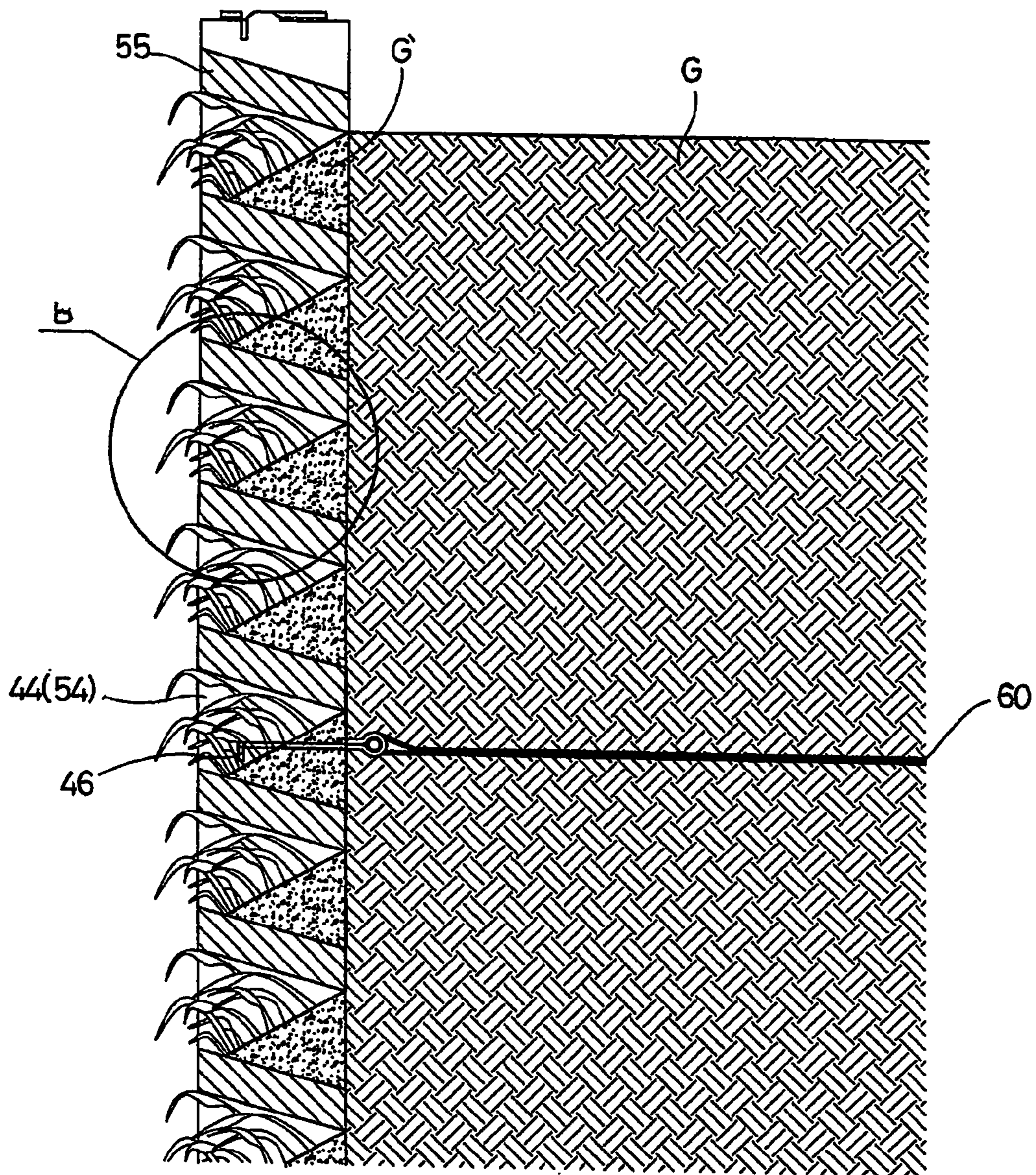


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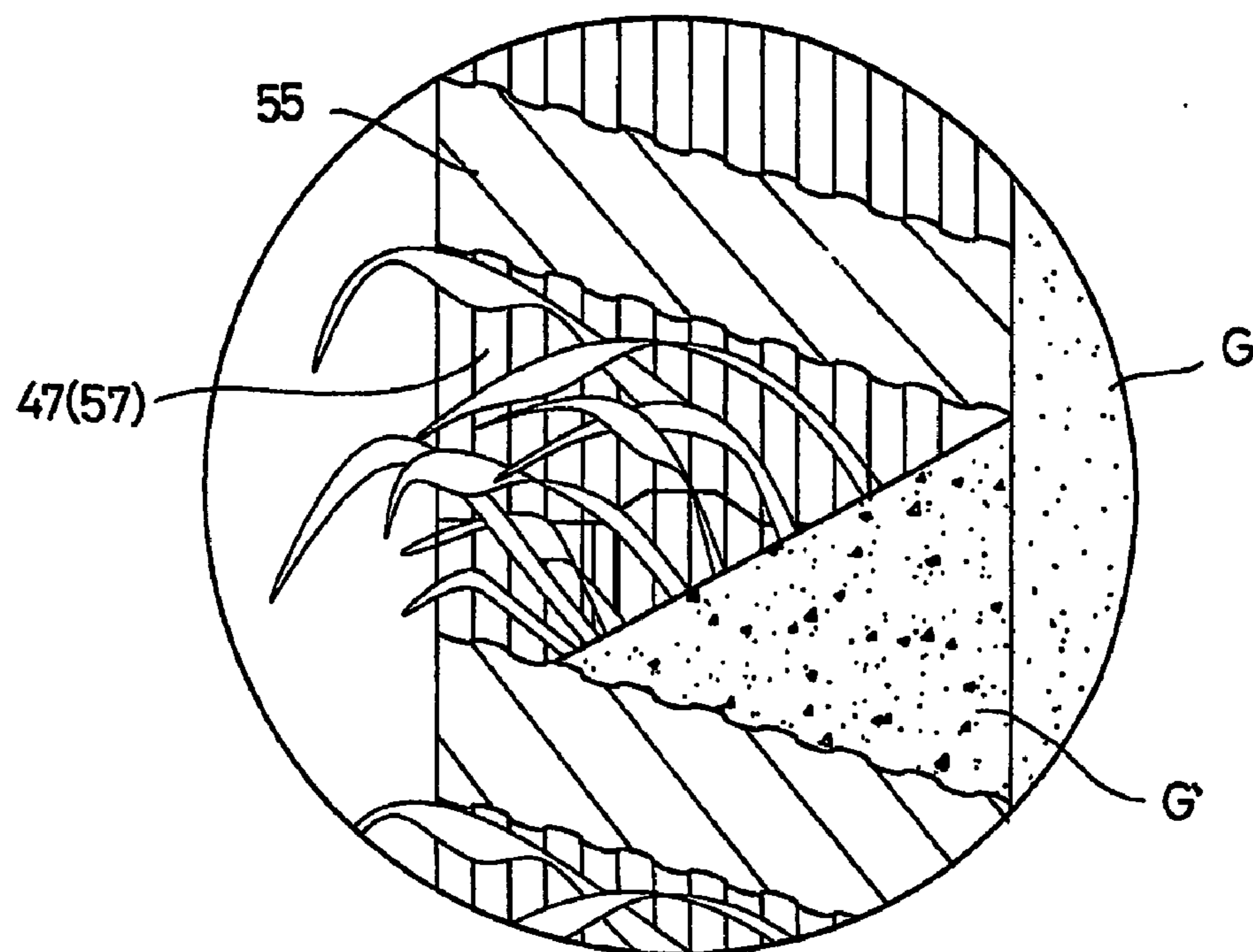


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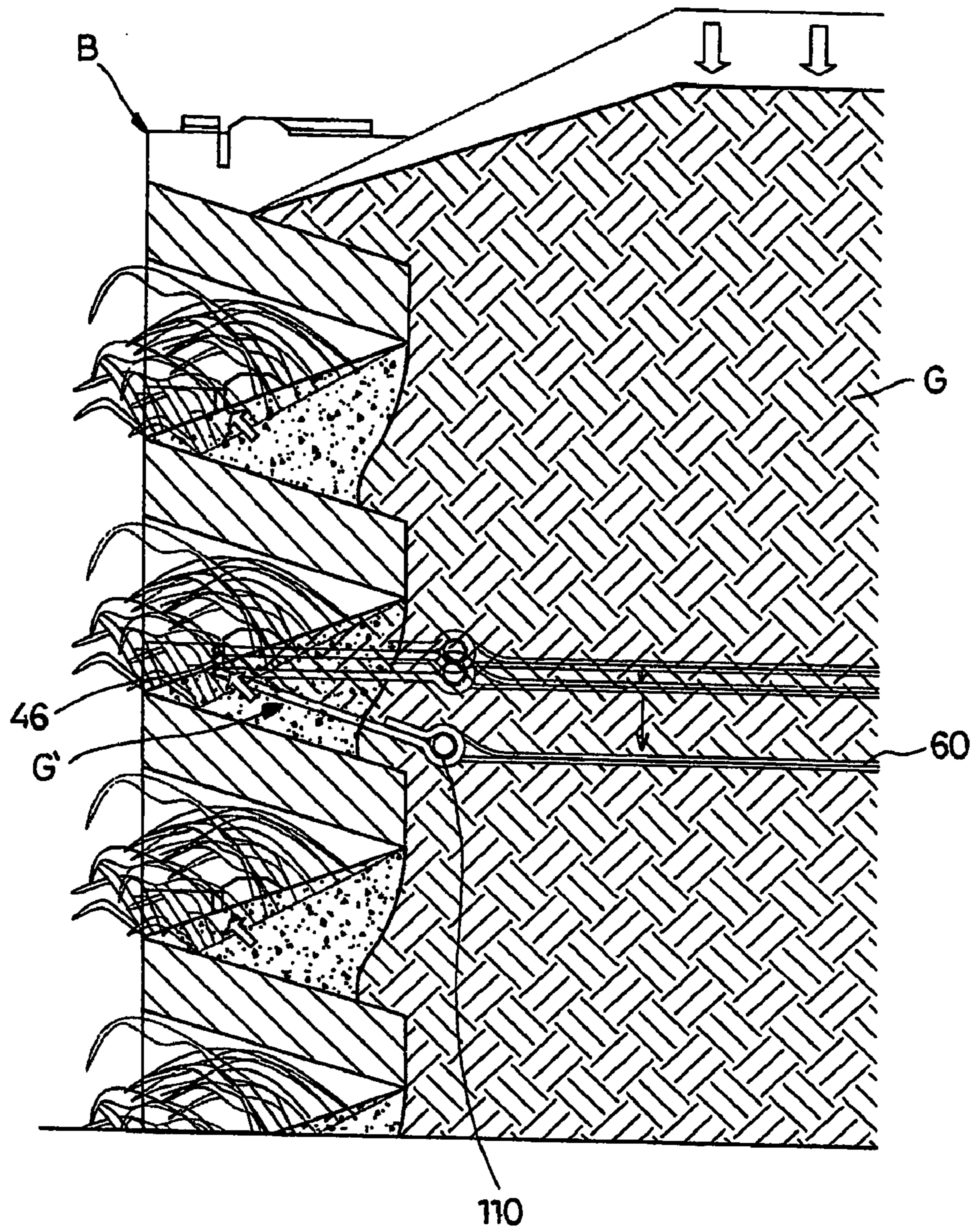


FIG. 38

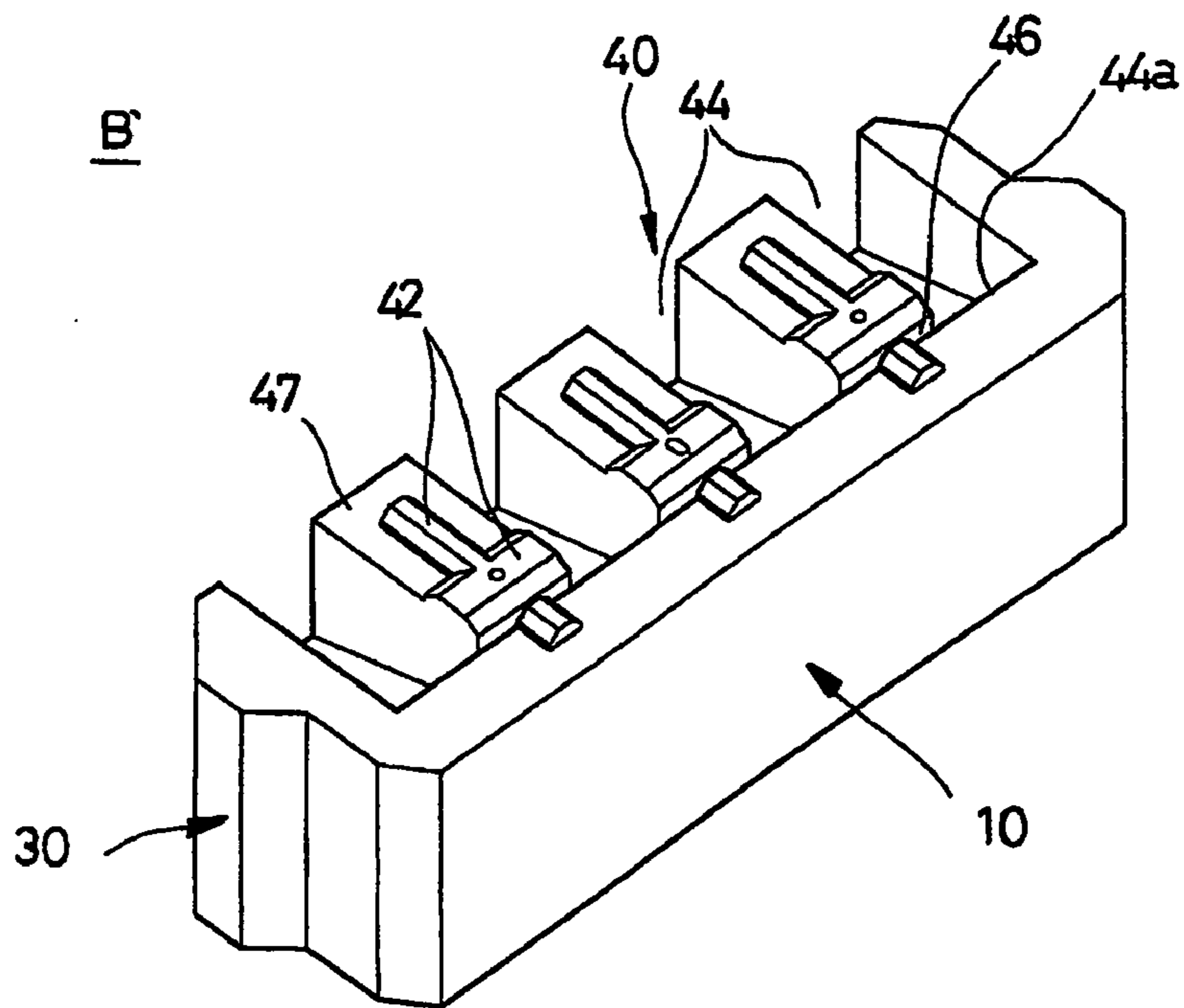


FIG. 39

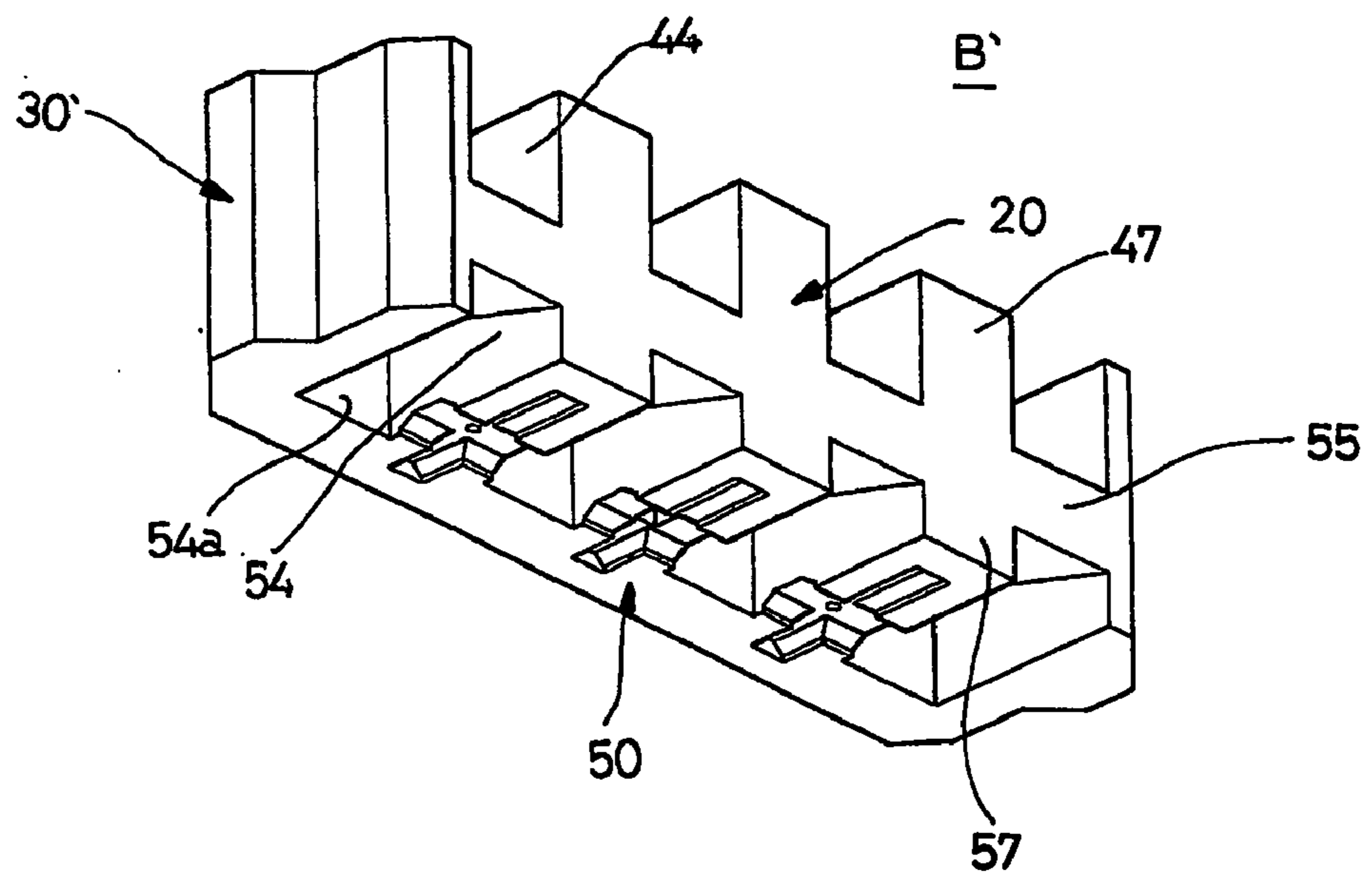


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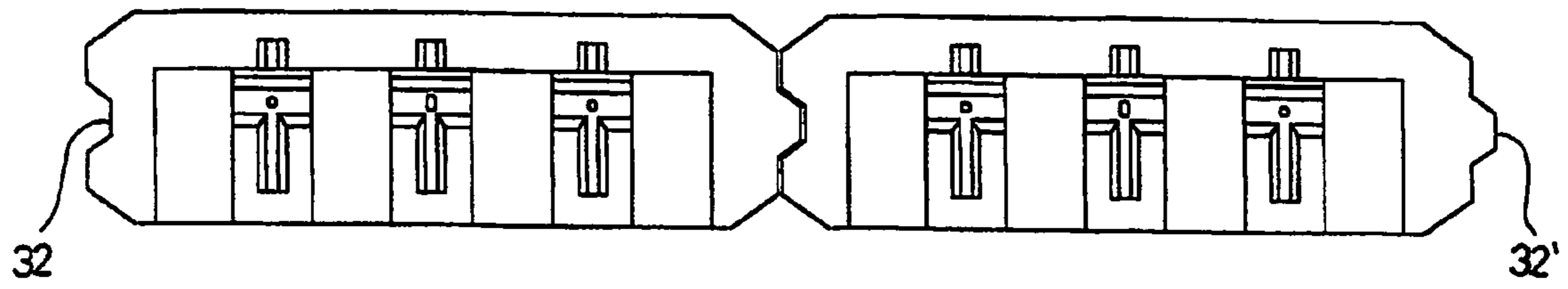


FIG. 41

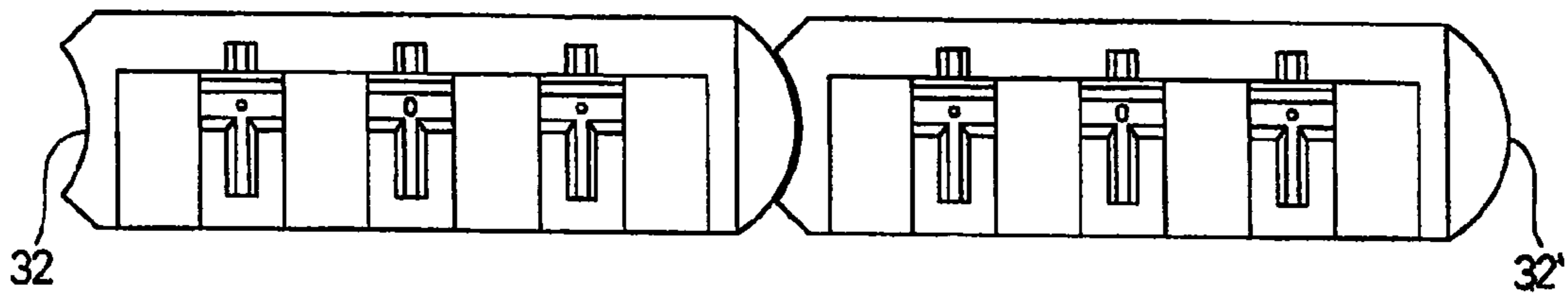


FIG. 42

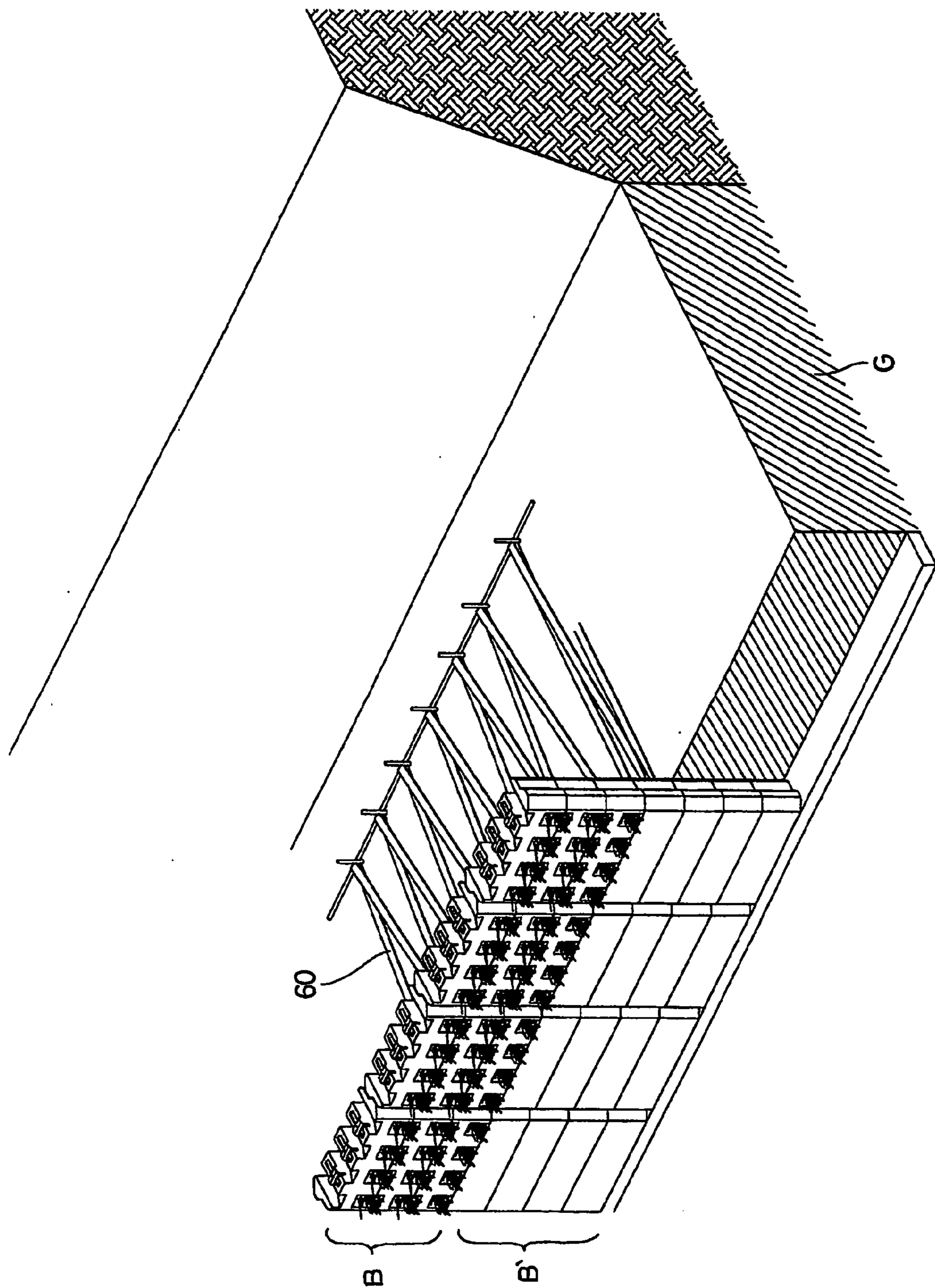


FIG. 43

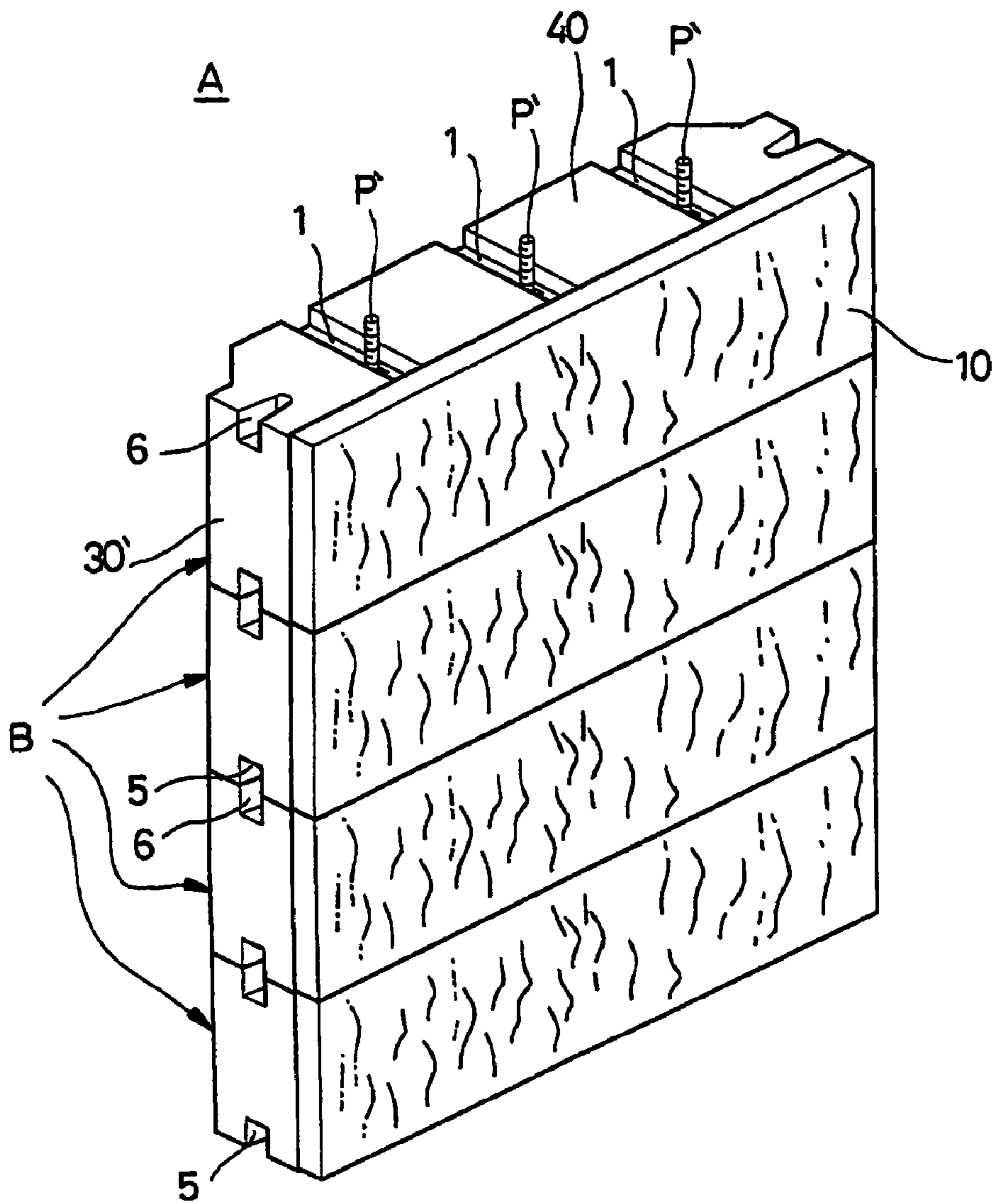


FIG. 44

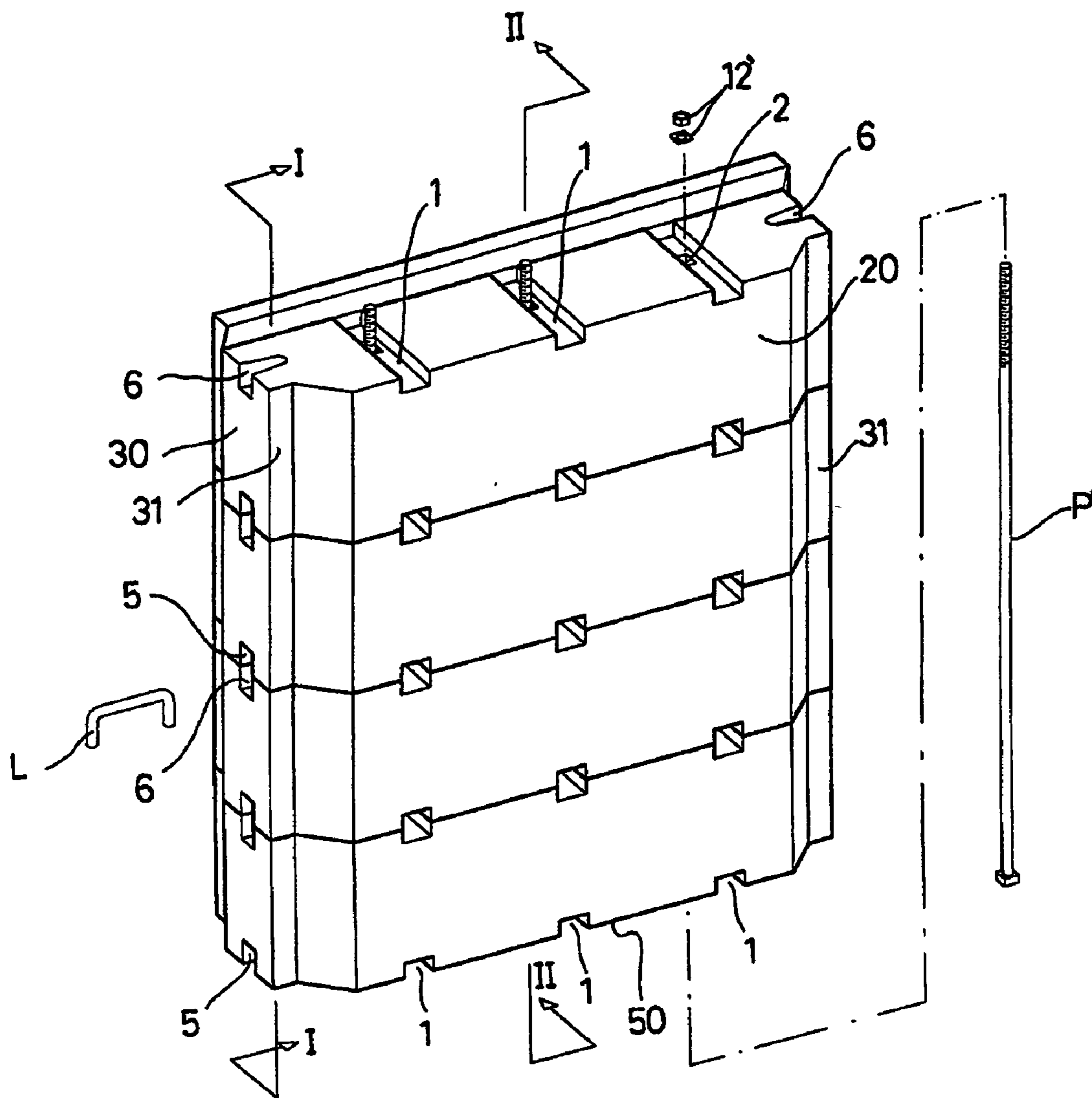


FIG. 45

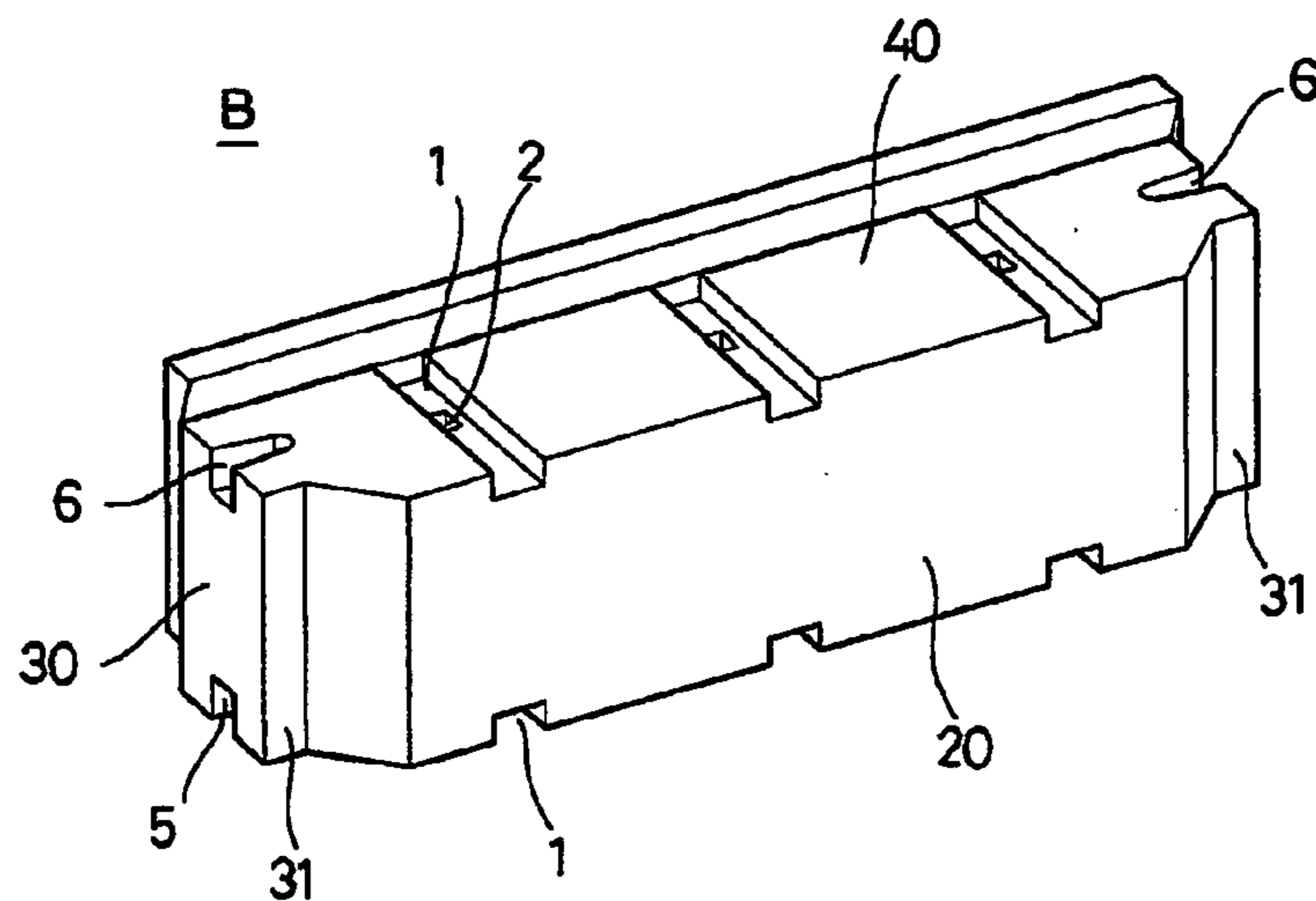


FIG. 46

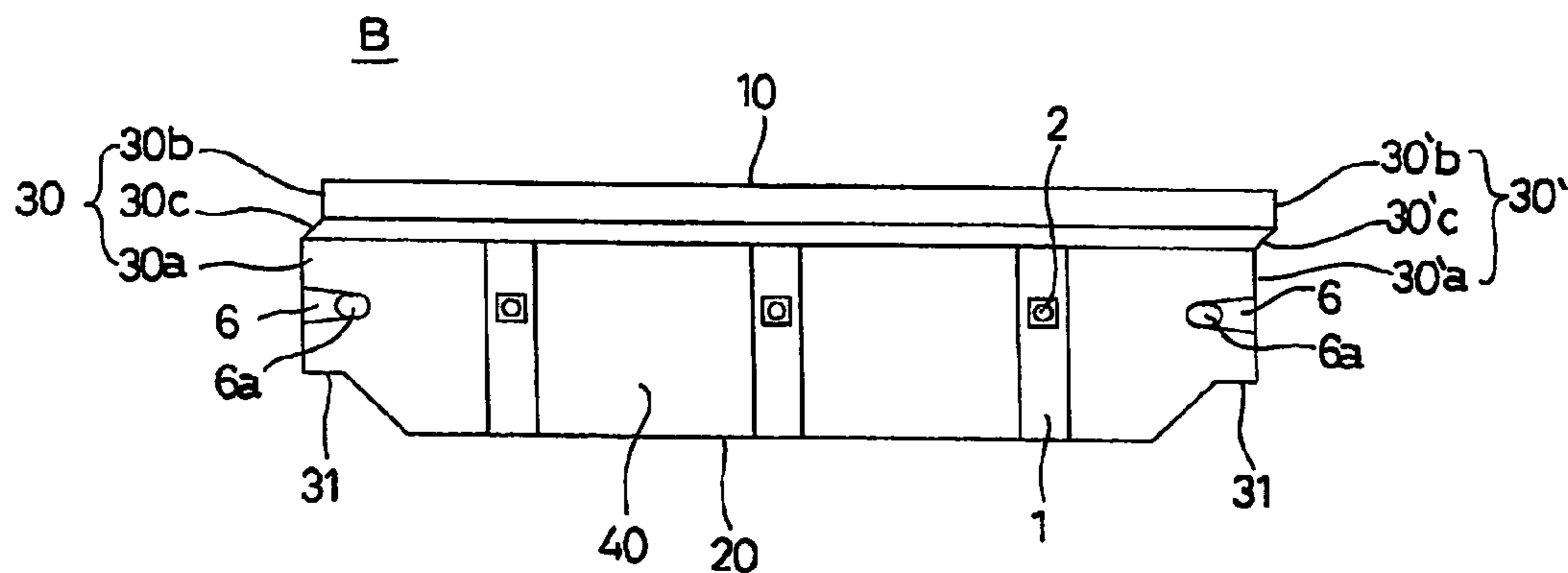


FIG. 47

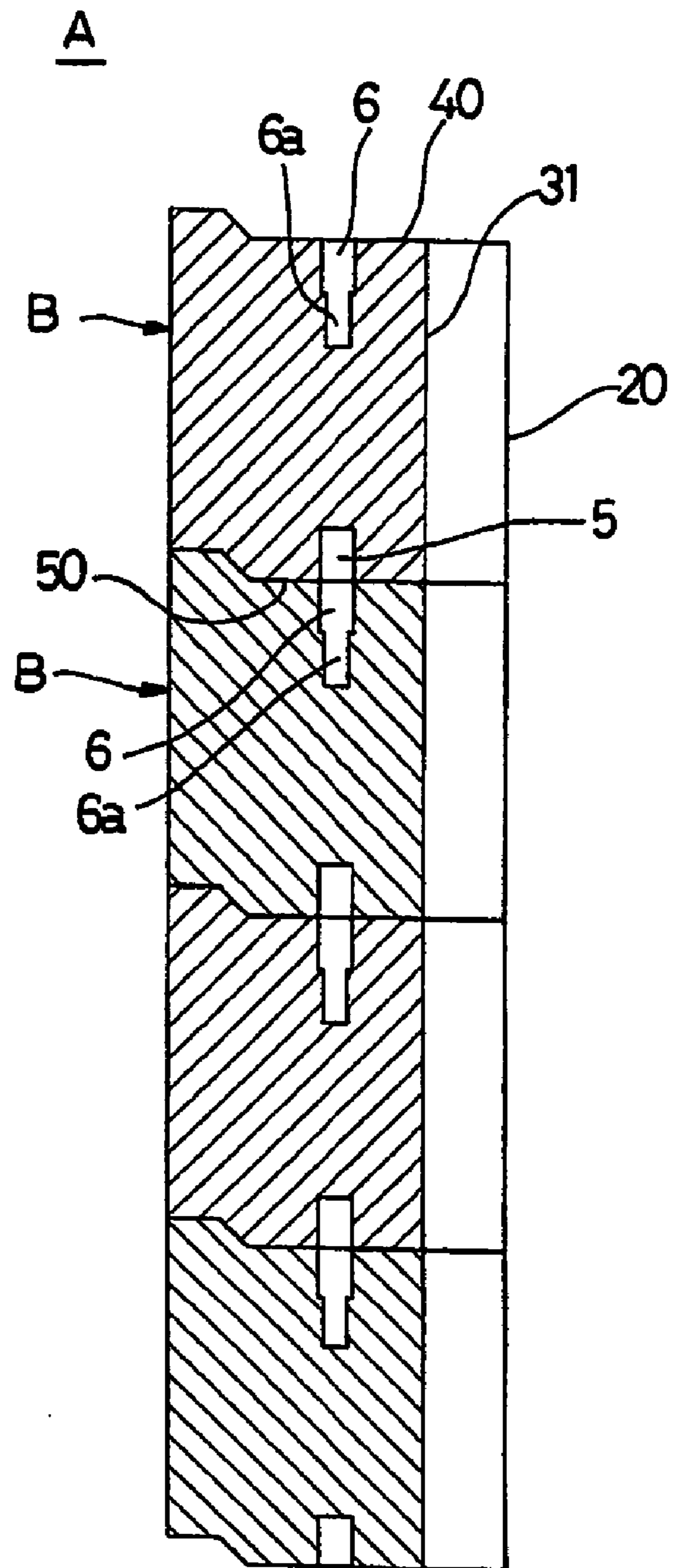


FIG. 48

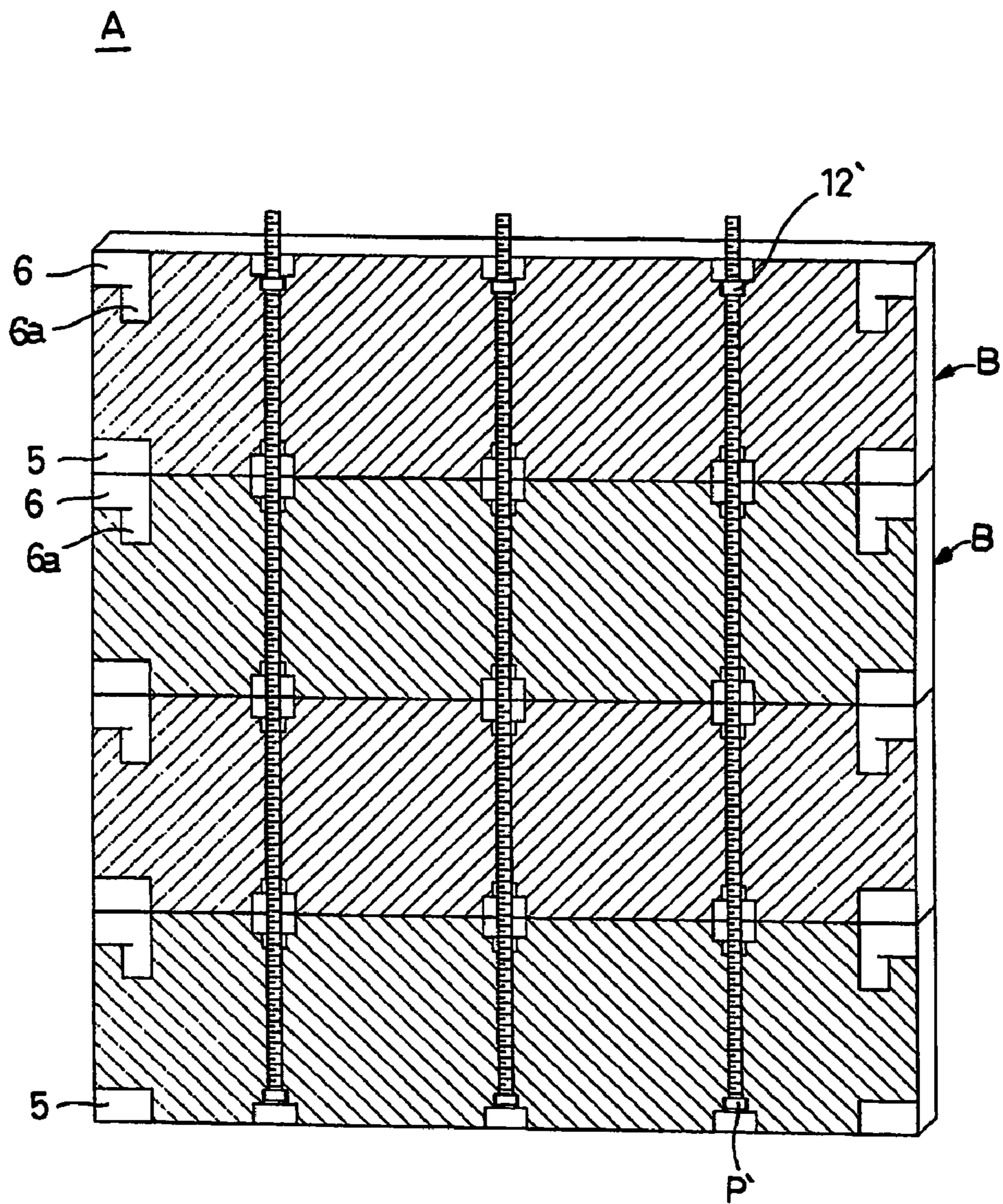


FIG. 49

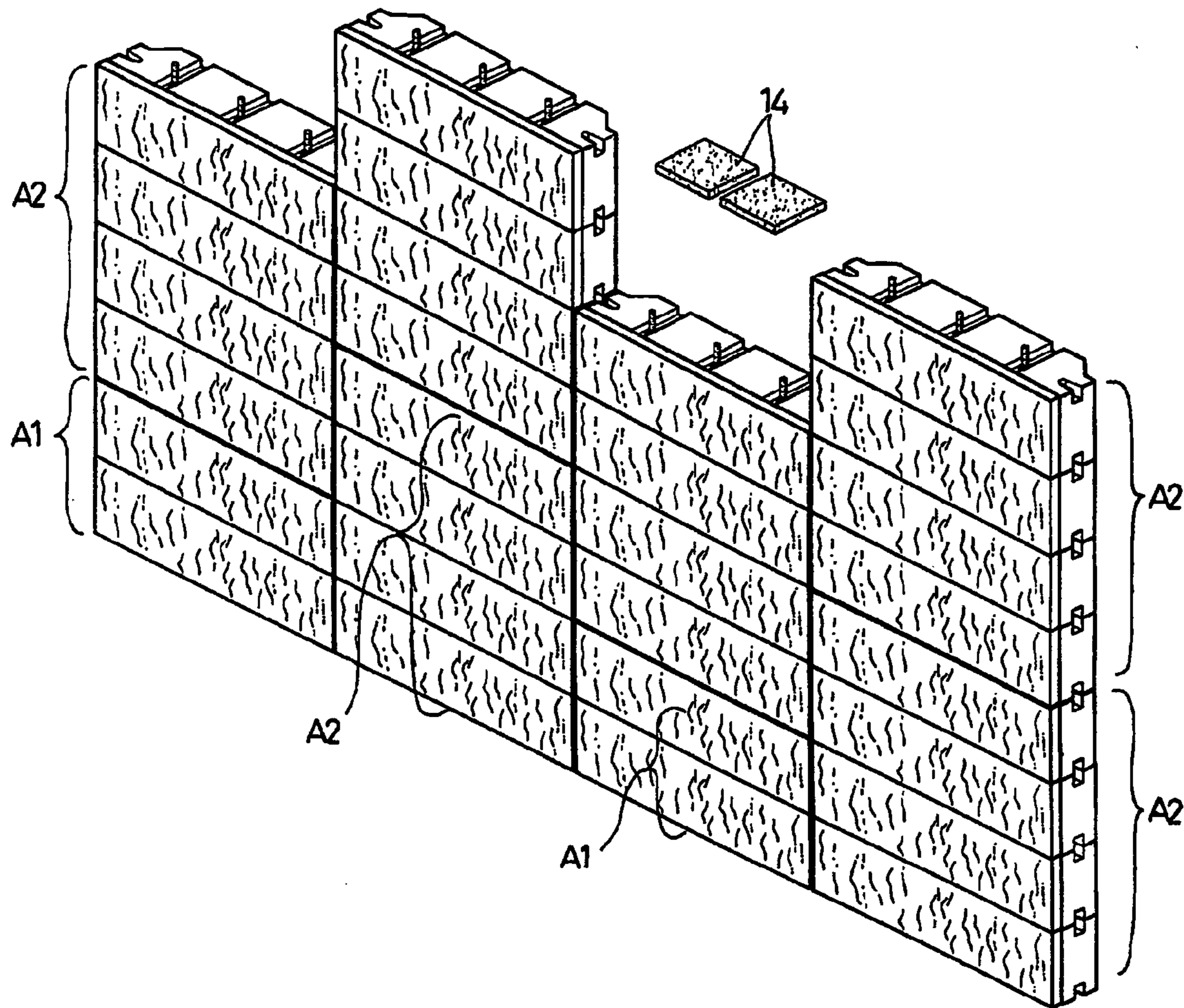


FIG. 50

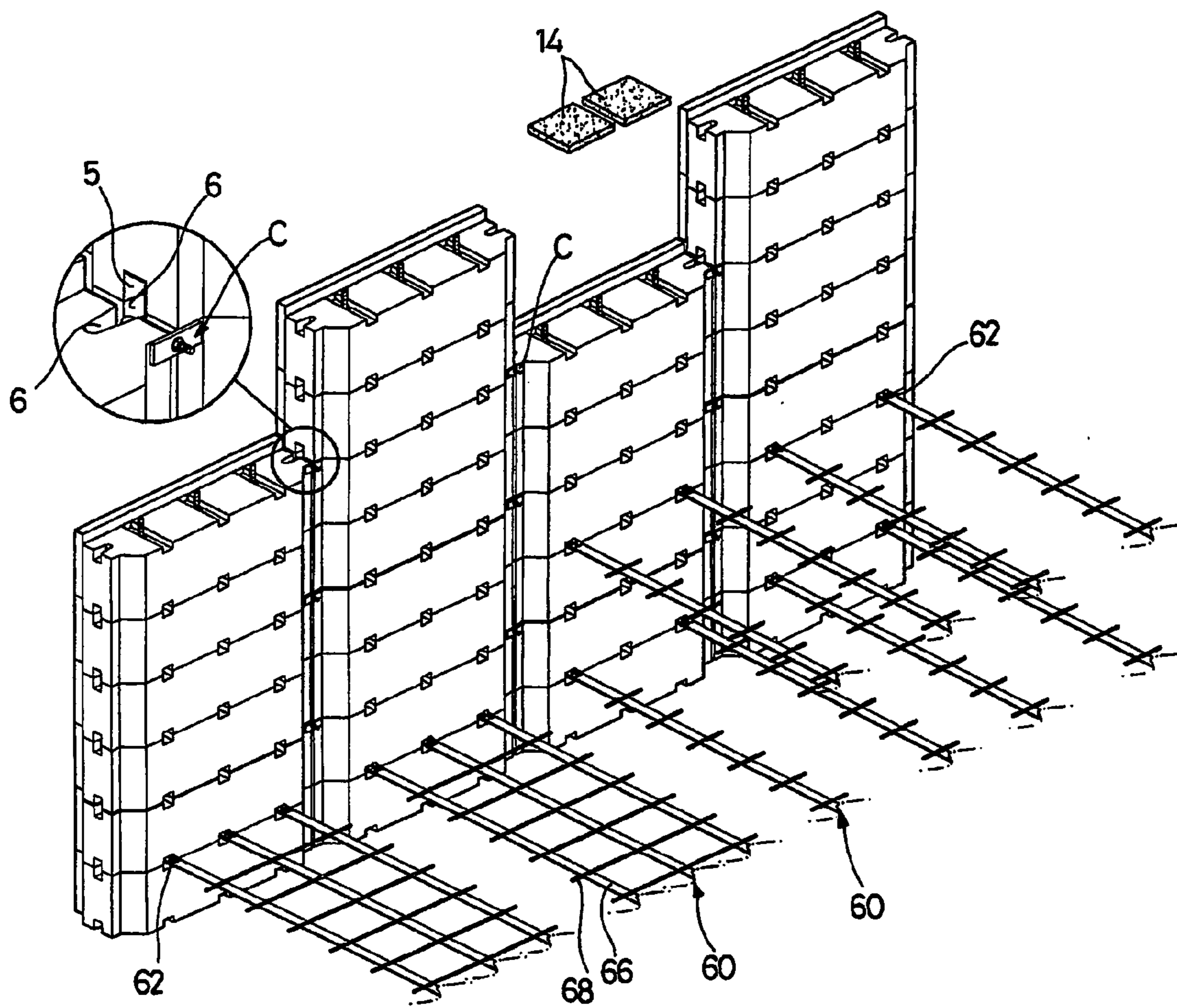


FIG. 51

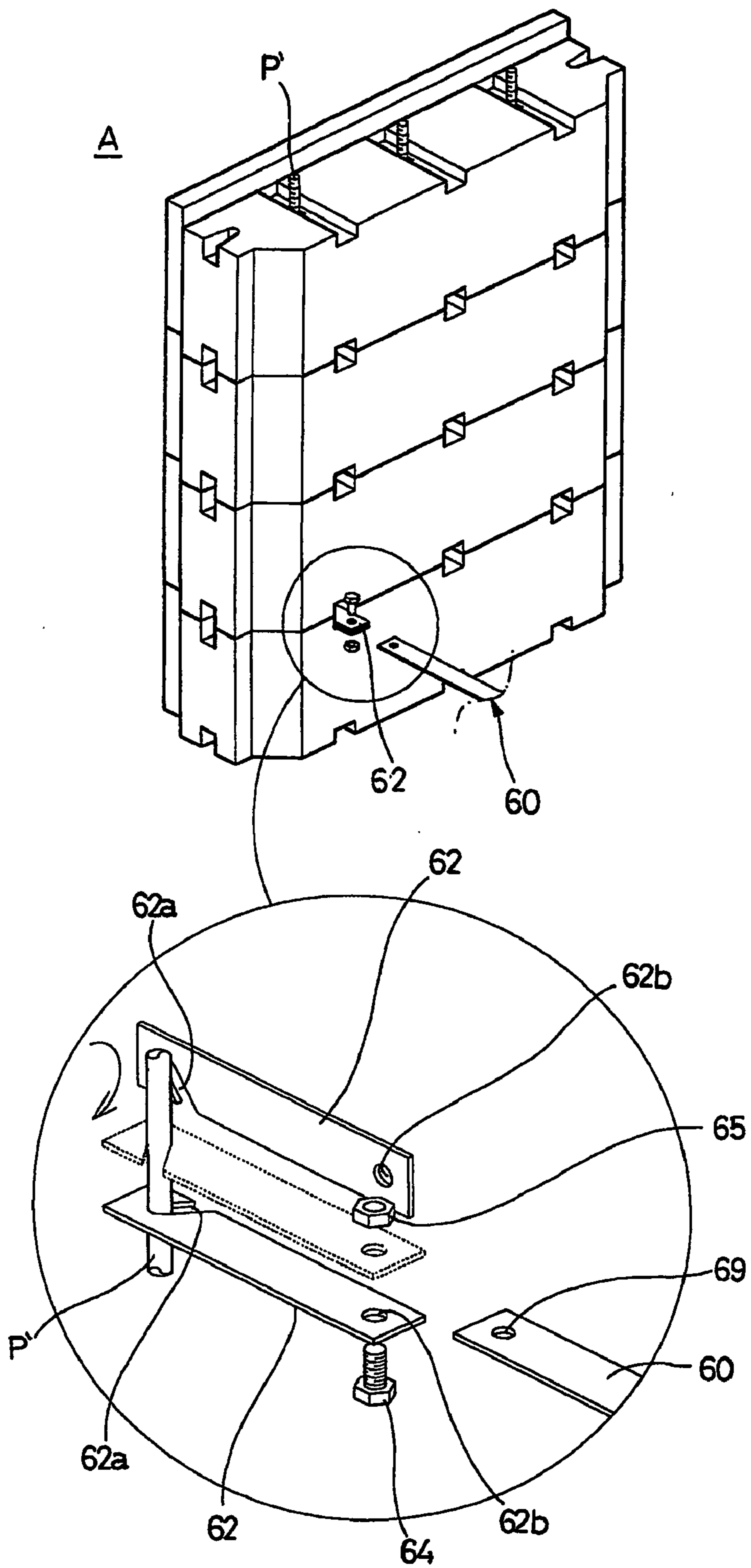


FIG. 52

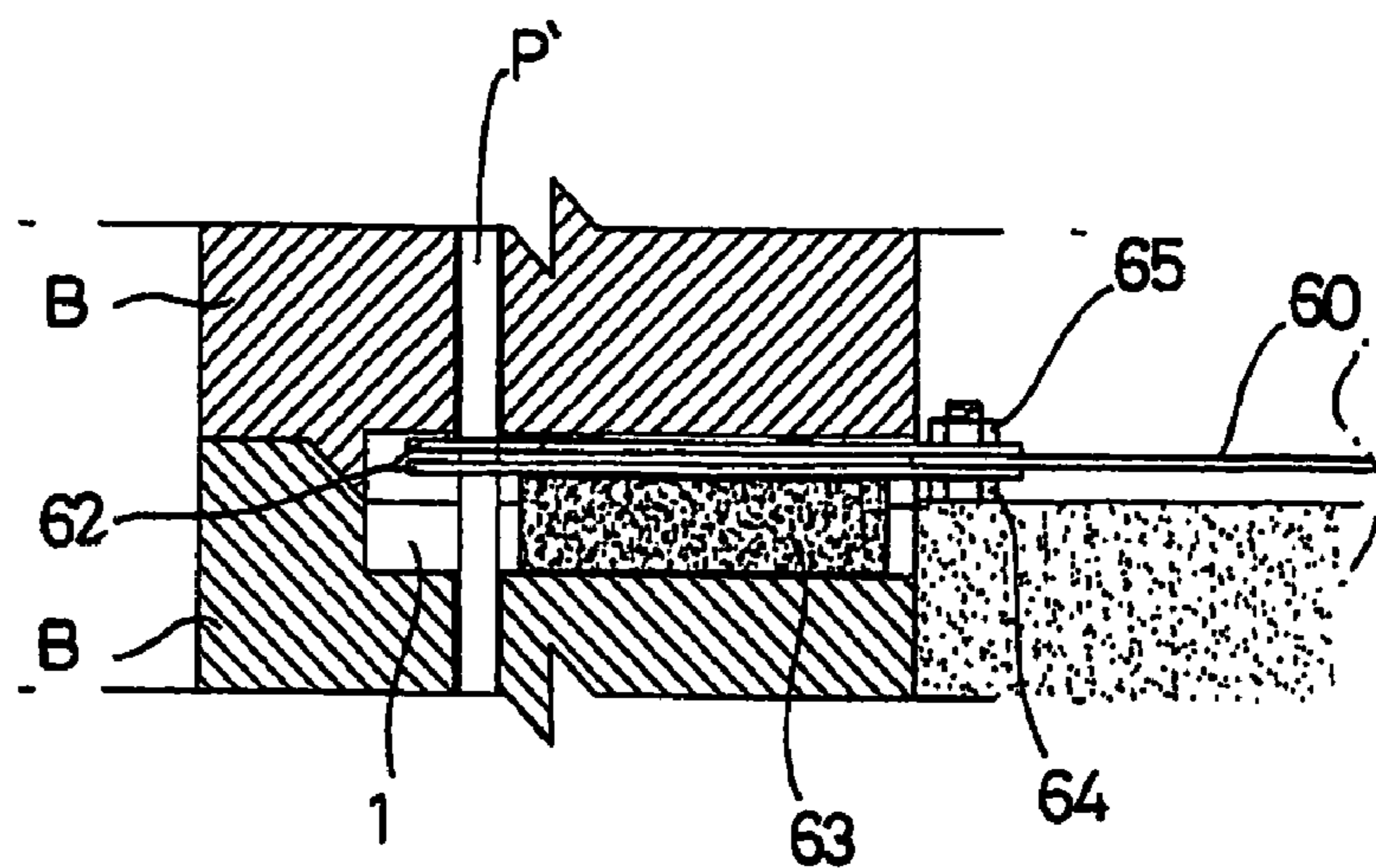


FIG. 53

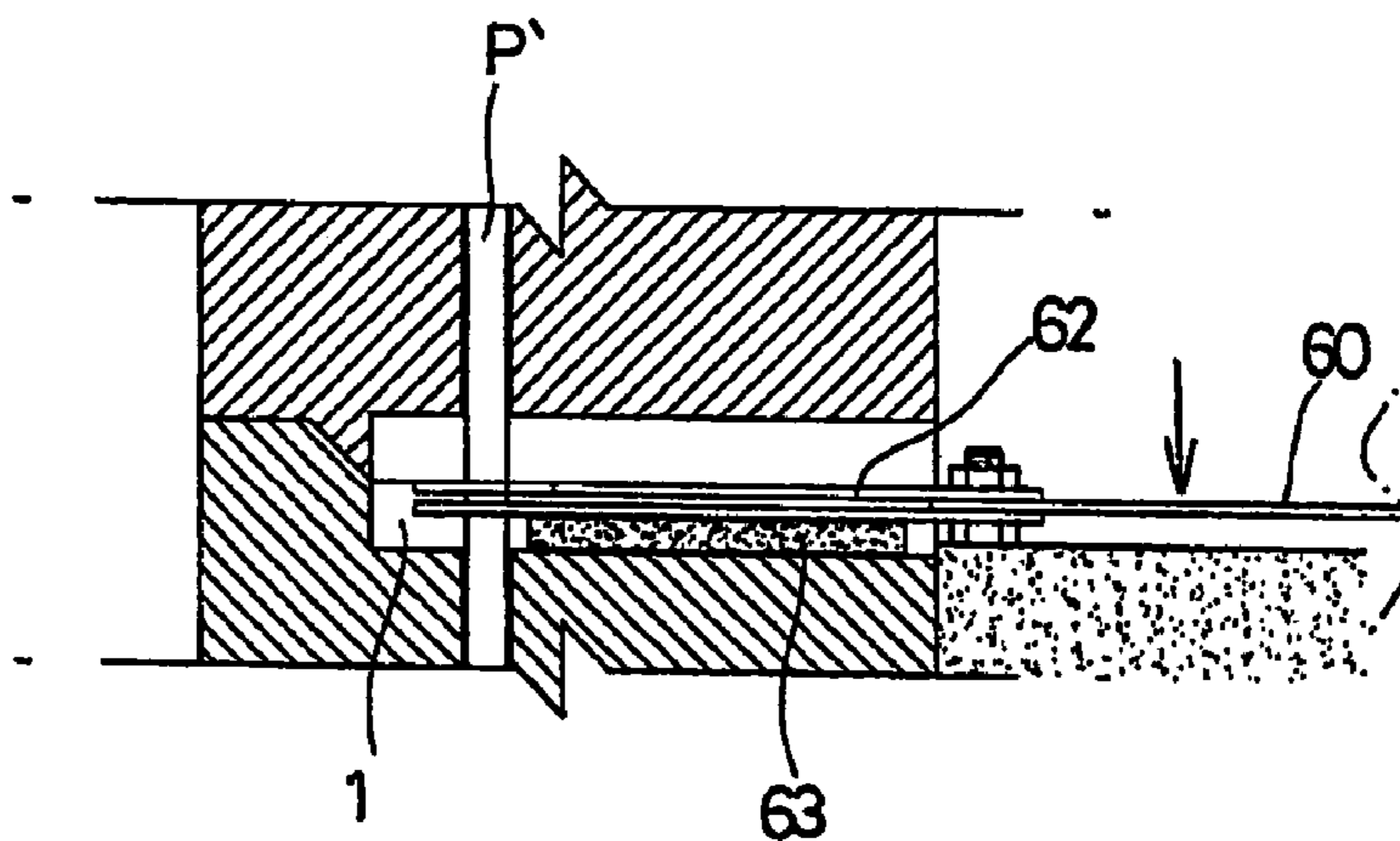


FIG. 54

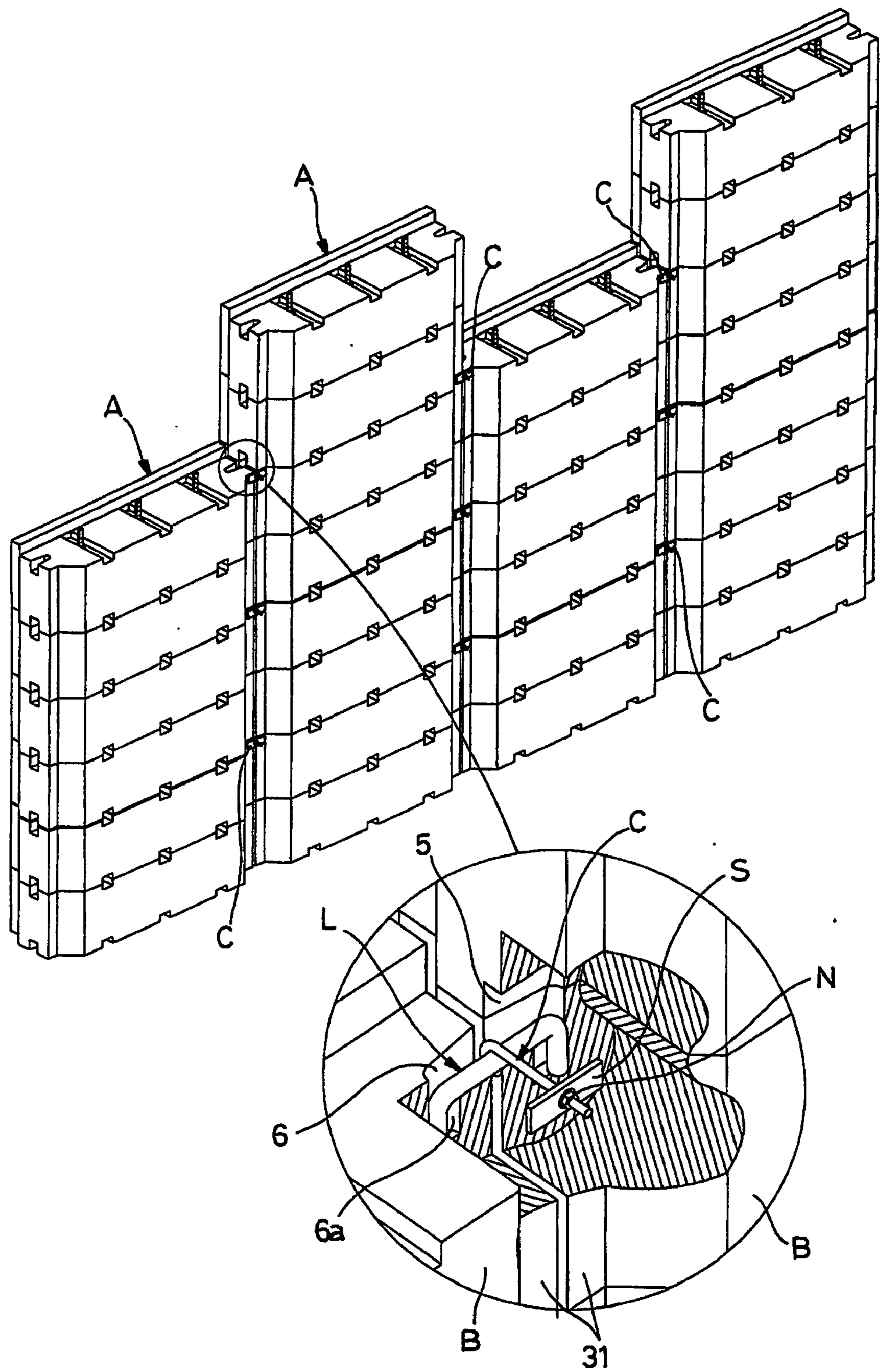


FIG. 55

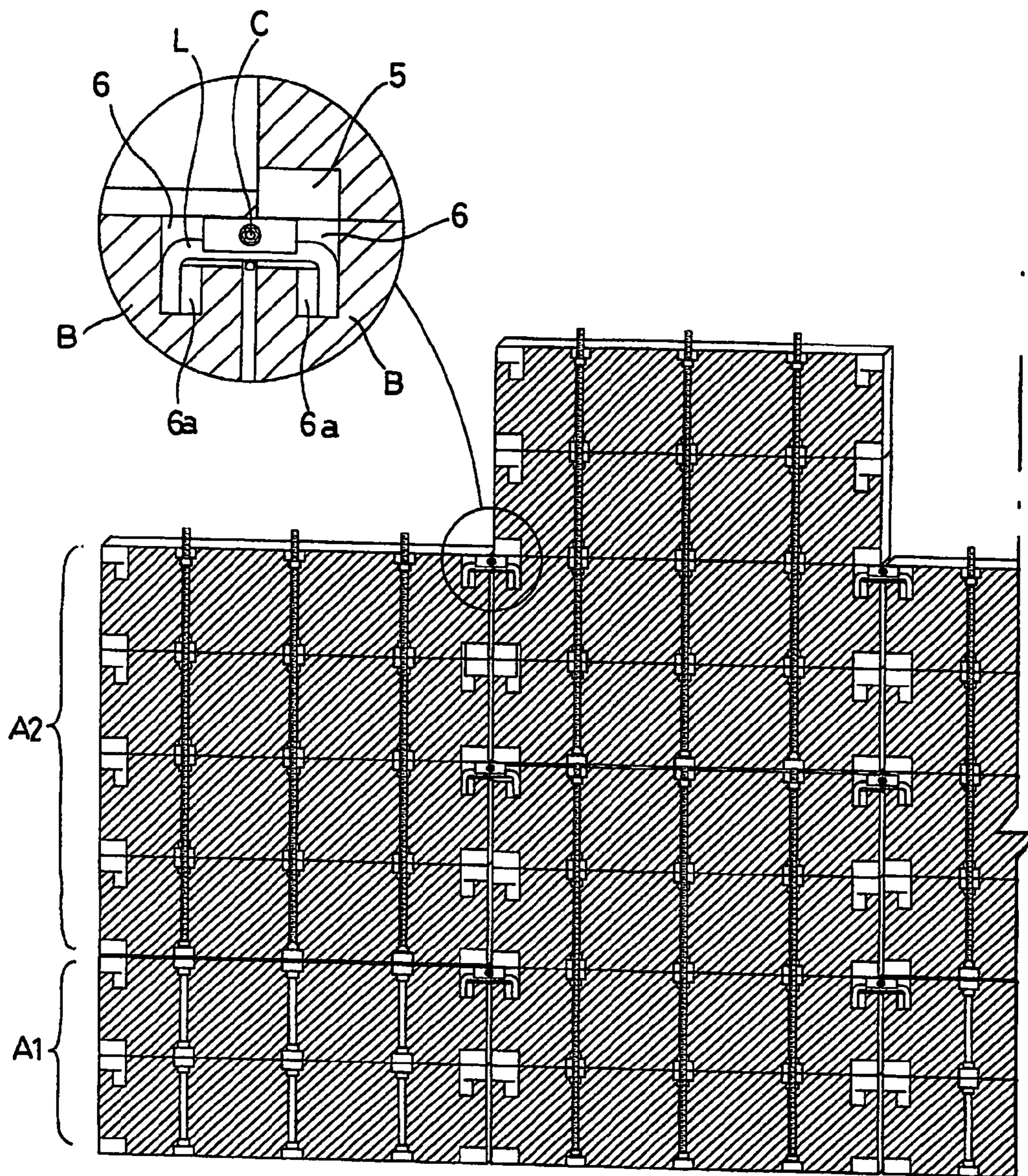


FIG. 56

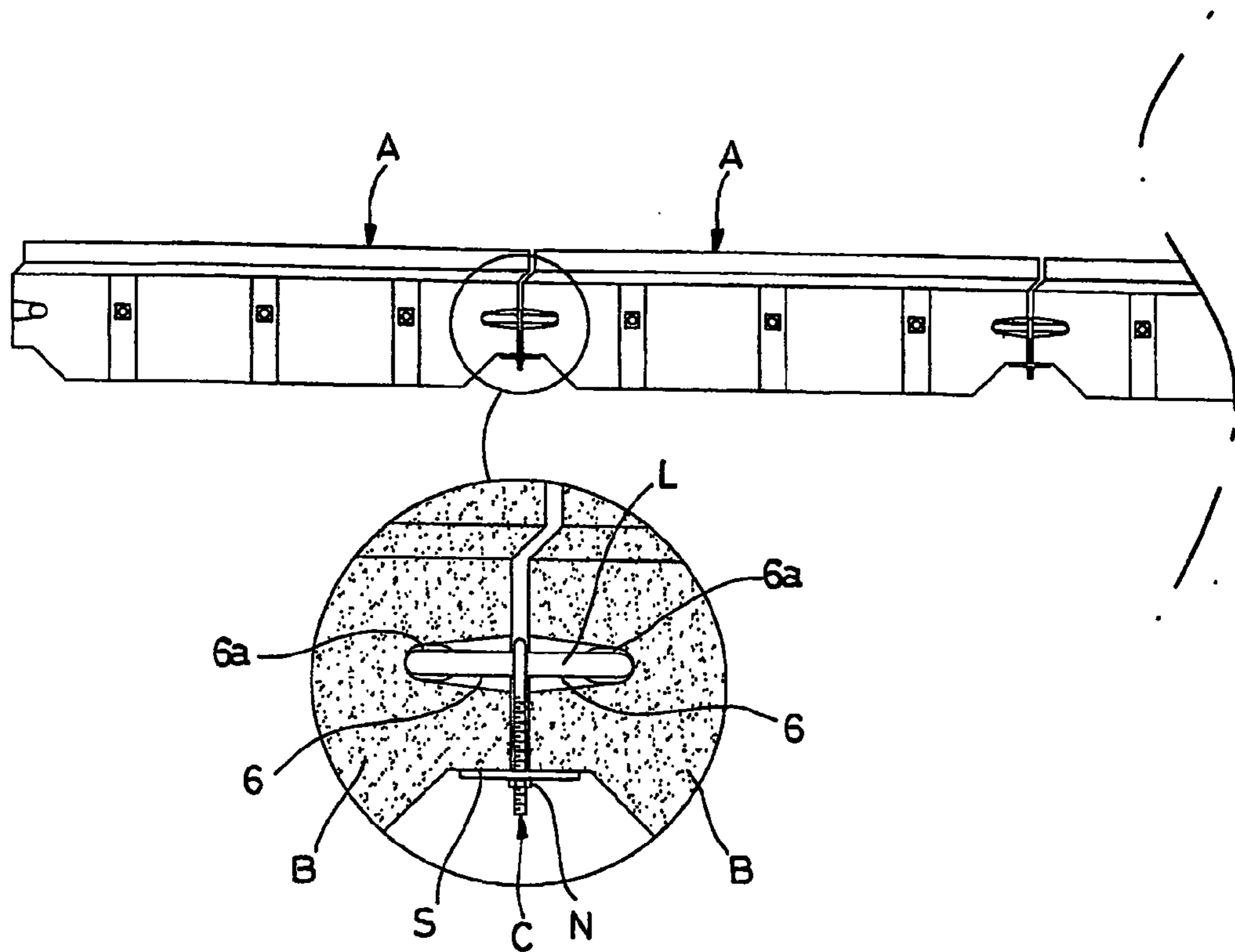


FIG. 57

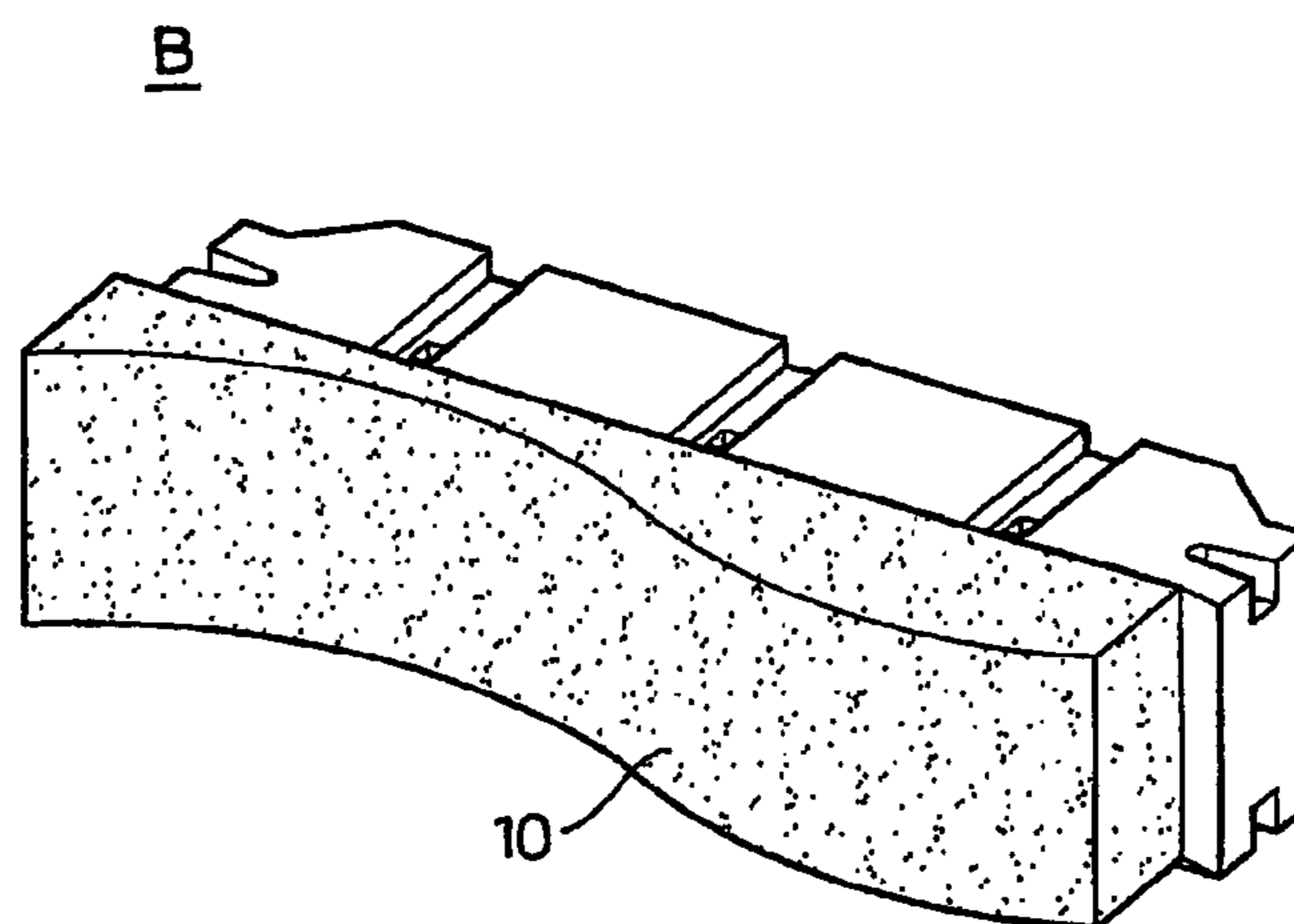


FIG. 58

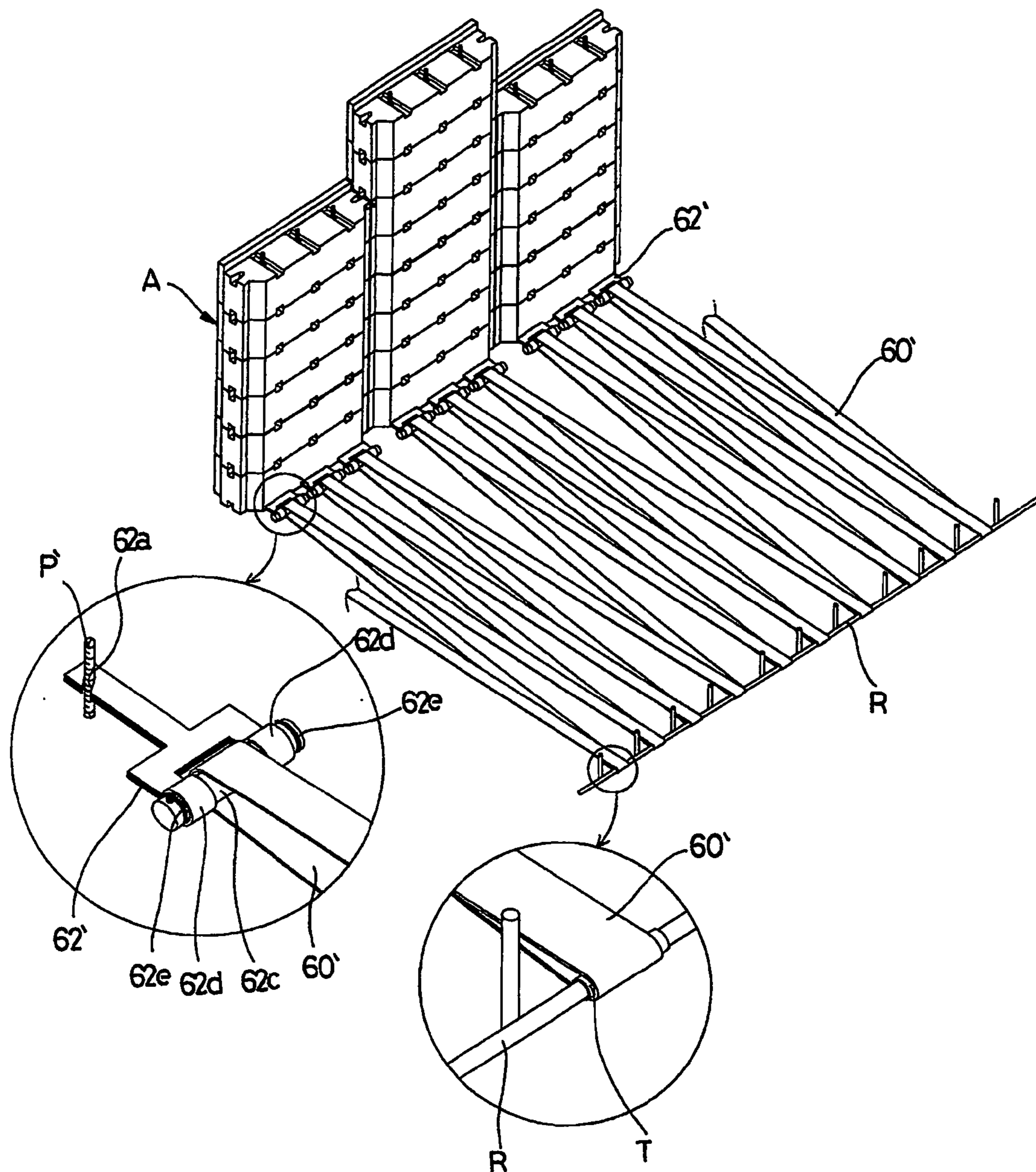
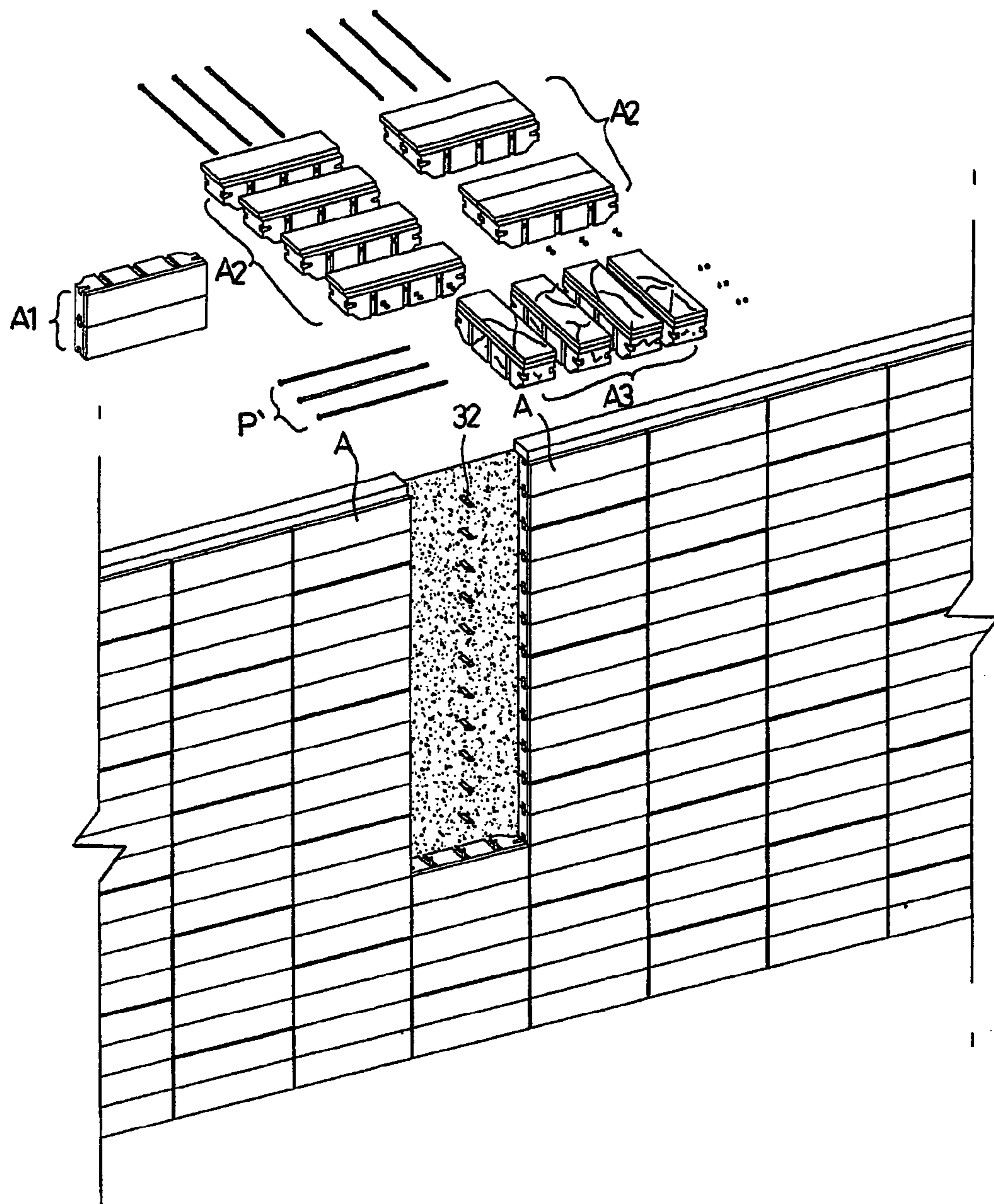


FIG. 59



BLOCK FOR CONSTRUCTING RETAINING WALL, PREFABRICATED REINFORCED RETAINING WALL CONSTRUCTED USING THE BLOCK AND CONSTRUCTION METHOD OF THE PREFABRICATED REINFORCED RETAINING WALL

TECHNICAL FIELD

[0001] The present invention relates to blocks for constructing a retaining wall, a prefabricated reinforced earth retaining wall constructed using the blocks, a method for constructing the prefabricated reinforced earth retaining wall, and a method for repairing the retaining wall. The present invention is devised to reduce transportation and material costs by making a front wall face of the retaining wall light in weight while offering excellent workability with use of equipment to minimize on-site labor during construction. Other advantages of the invention include high durability in enduring displacement of an earthen structure, which may occur after construction, and easier repair works in an event of partial damages occurring to the retaining wall.

BACKGROUND ART

[0002] A prefabricated reinforced earth retaining wall, which is a field related to the present invention, has the following advantages over conventional concrete retaining walls: efficient use of limited land is allowed because the retaining wall can be constructed vertically. Use of factory-manufactured products ensures reliability in quality. The reinforced earth retaining wall also eliminates the need for special equipment and is easily constructed, which allows a shorter construction period. Also, strict quality control of earthen structures is possible. Furthermore, since the reinforced earth retaining wall has a flexible structure, it is possible to flexibly cope with differential subsidence of foundation ground or seismic load. In addition, since the front wall face is lightweight compared to the conventional concrete retaining wall, foundation treatment is simplified, ensuring an economic efficiency.

[0003] In 1980, Korea's first reinforced earth retaining wall was tentatively constructed along national highway by Architecture Laboratory of the Ministry of Construction using a galvanized steel plate as a reinforcement member. Although since then several test construction works using the same reinforcement member and on-site investigation were carried out by government-funded institutions including Architecture Laboratory, Korea Highway Corporation, and Korea Land Corporation, some problems were found in galvanizing technology, selection of backfill soil (reinforced earth), and construction management during the investigation on reinforced earth retaining wall using a galvanized steel sheet as reinforcement member. For these reasons, reinforced earth retained walls using the galvanized steel plate as reinforcement member failed to gain popularity domestically. By solving problems associated with galvanized steel plates with introduction of band-shaped geotextile reinforcement members in 1986, the band-shaped geotextile has emerged as a new reinforcement member. While a prefabricated block-type reinforced earth retaining wall using high strength geogrids as a reinforcement member was introduced in 1994, a panel-type reinforced earth retaining wall using a band-shaped geotextile reinforcement member

and a prefabricated block-type retaining wall using geogrids now have a wide range for use.

[0004] Meanwhile, the conventional prefabricated panel-type reinforced earth retaining wall had the following disadvantages. Above all, the monotonous shape and appearance of the conventional panel-type reinforced earth retaining wall are unappealing. From an environmental-friendly viewpoint, the conventional retaining wall that is not in harmony with its surroundings, since growth of vegetation is not possible, looks very bleak. Furthermore, even where a minor damage occurs to a lower panel of the retaining wall, conventionally, an extensive disassembling work should have been done on an overlying panel as well as adjacent panels to replace the damaged panel with a new one. Thus, repairing the conventional retaining wall is expensive, labor-intensive and even more difficult than newly constructing a retaining wall, and requires a considerable amount of equipment.

[0005] The conventional prefabricated block-type reinforced earth retaining wall has problems that since blocks are alternately staggered, an underlying block of an overlapping portion tends to be sheared easily if a load from an upper portion of the retaining wall acts as a shearing force after construction is completed. The repairing works have difficulties comparable to those encountered with the panel-type reinforced earth retaining wall. Since the blocks for the conventional reinforced earth retaining wall have a front-to-rear length that is much greater than the left-to-right width in order to prevent overturning and localized overlooking portioning, individual blocks have a heavy load, consuming much constructional material accordingly. This heavy load also makes construction of the retaining wall difficult, thus causing inconvenience in work. Furthermore, because of difficulties in mobilizing equipment for construction, a construction period may be prolonged.

DISCLOSURE OF THE INVENTION

[0006] The present invention is devised to reduce material and construction cost by offering lightweight retaining wall blocks.

[0007] The present invention provides a prefabricated block-type reinforced earth retaining wall which can form a structurally strengthened wall and is easily repaired in an event where the reinforced earth retaining wall is partially damaged.

[0008] The present invention also provides blocks for constructing a prefabricated reinforced earth retaining wall capable of offering excellent efficiency for growth of vegetation.

[0009] Further, the present invention provides blocks for constructing a retaining wall, which can offer high durability in enduring displacement of a reinforced earth, which may occur after construction is completed, and can be easily repaired in an event where the reinforced earth retaining wall is partially damaged.

[0010] The present invention also provides a method for constructing a prefabricated reinforced-earth retaining wall using the blocks, which can construct a strengthened retaining wall structure, and a method for repairing a damaged portion in an event where the reinforced earth retaining wall is partially damaged.

[0011] According to an aspect of the present invention, there is provided a block for constructing a retaining wall comprising: a front surface forming a surface of the retaining wall, and a rear surface contacting a reinforced earth structure; left and right sides having corresponding intermeshing portions formed thereon for intermeshed connection between adjacent blocks, respectively; a top surface having reinforcement member insertion grooves formed in a front-to-rear direction, into which a reinforcement member or an anchor for connecting the reinforcement member is fitted and fixture grooves formed on either side of the front of the reinforcement member insertion grooves for fixing the reinforcement member or anchor; and a bottom surface corresponding to the top surface, wherein a connecting pin insertion hole for pinning upper and lower blocks with a connecting pin and a lifting pin insertion hole for simultaneously lifting the upper and blocks, penetrate through the top and bottom surfaces.

[0012] According to another aspect of the present invention, there is provided a method for constructing a retaining wall using the block, the method comprising: digging trenches for footing and then casting footing concrete in order to construct the footing; placing blocks on the cast footing in a horizontal direction so that they are adjacent to one another and stacking and aligning another block on each block placed horizontally using a vertical connecting pin P' in order to install the blocks; and arranging reinforcement members on a reinforced earth structure and filling and compacting the reinforced earth placed in the rear of the installed block with soil, such that a leading edge of each reinforcement member is inserted into a reinforcement member insertion groove to thereby connect the reinforcement member to the block, the reinforcement members are arranged on the reinforced earth, and then, the reinforcement members arranged on the reinforced earth are backfilled and compacted with soil.

[0013] According to still another aspect of the present invention, there is provided a method for repairing a reinforced earth retaining wall constructed by the constructing method, the method comprising: lifting up blocks positioned above the damaged portion of a block, the blocks belonging to a row containing the damaged block, to disassemble the overlying block after lifting a reinforcement member fitted into a reinforcement member insertion groove and separating the same from the block; removing the damaged block after disassembling the overlying block; placing a new block at the location of the previously damaged block, inserting a vertical connecting pin, and fitting a leading edge of the reinforcement member buried inside a reinforced earth into a reinforcement member insertion groove of the new block in order to connect the reinforcement member to the block; and reversing the order of the above disassembling step to reconstruct the disassembled block.

[0014] Also, the present invention provides a panel for a prefabricated block-type reinforced earth retaining wall comprising: a plurality of unit blocks each unit including a front surface forming an outer surface of a retaining wall, a rear surface contacting a reinforced earth structure, a bottom surface and a top surface having a plurality of channels and throughholes vertically formed at a predetermined position of each channel, and left and right sides having an insertion portion and a locking groove, creating a portion into which an insertion portion for preventing the unit blocks of an

adjacent panel from alienating from or getting close to each other by interlocking unit blocks of the adjacent panel, is inserted; connecting elements inserted into the throughholes in a state in which the plurality of unit blocks are vertically stacked; and connecting means engaged with one end of the connecting element and connecting the stacked plurality of unit blocks with one another.

[0015] The prefabricated block-type reinforced earth retaining wall can be manufactured by vertically stacking two, three, or four blocks having a uniform shape at factories or on construction sites, assembling the stacked blocks with connecting element and assembling means, and piling up the assembled panels on the foundation of the retaining wall using equipment. Since adjacent panels are connected and fixed by inserting the fixture element into the insertion portion and locking groove formed on either side of each unit block of the panel and engaged to the rear of the panel by inserting a clamp for temporary fixing, it is possible to prevent separation or adhesion due to interlocking between adjacent panels. Another advantage is to improve resistance against vibration or other external forces since each panel is spaced apart from adjacent panels by a predetermined distance by the insertion portion.

BRIEF DESCRIPTION OF THE DRAWINGS

[0016] FIG. 1 is a perspective view illustrating a front surface of a block according to a first embodiment of the present invention;

[0017] FIG. 2 is a perspective view illustrating a rear surface of the block shown in FIG. 1;

[0018] FIG. 3 is a perspective view of the rear surface, illustrating a constructed state of the block shown in FIG. 1 or 2;

[0019] FIG. 4 is a plan view illustrating a constructed state of a block according to the present invention;

[0020] FIG. 5 is a cross-sectional view illustrating a constructed state of the block according to the present invention;

[0021] FIG. 6 is a cross-sectional view showing a reduction effect of earth pressure by the block according to the present invention;

[0022] FIG. 7 is a front view showing a process of partially repairing a reinforced earth retaining wall constructed using blocks according to the present invention;

[0023] FIG. 8 is a front view showing a process of entirely repairing a reinforced earth retaining wall constructed using blocks according to the present invention;

[0024] FIG. 9 is a perspective view illustrating a rear surface of a block according to a second embodiment of the present invention;

[0025] FIG. 10 is a perspective view illustrating a front surface of the block shown in FIG. 9;

[0026] FIG. 11 is a perspective view illustrating a front surface of a block according to a third embodiment of the present invention;

[0027] FIG. 12 is a perspective view illustrating a rear surface of the block shown in FIG. 11;

[0028] FIG. 13 is a perspective view illustrating a rear surface, illustrating a constructed state of a block-type retaining wall according to the present invention;

[0029] FIG. 14 is a side cross-sectional view showing a constructed state of the block-type retaining wall according to the present invention;

[0030] FIG. 15 is a plan view showing a constructed state of the block-type retaining wall according to the present invention;

[0031] FIG. 16 is an enlarged view of the portion "a" shown in FIG. 13;

[0032] FIG. 17 is a cross-sectional view illustrating a sliding state of a reinforcement member connected to a block;

[0033] FIG. 18 is a plan view showing the state in which the reinforcement member of FIG. 17 is connected to the block;

[0034] FIGS. 19A-19C are front views illustrating states in which blocks are constructed in various patterns;

[0035] FIG. 20 is a perspective view of a rear surface illustrating a state in which a prefabricated block-type retaining wall according to the present invention is constructed using a geogrid reinforcement member;

[0036] FIG. 21 is a cross-sectional view showing the state in which the geogrid reinforcement member is connected to the retaining wall block shown in FIG. 20;

[0037] FIG. 22 is a perspective view illustrating a rear surface of a retaining wall block according to the present invention constructed using a galvanized steel plate as a reinforcement member;

[0038] FIG. 23 is a cross-sectional view showing the state in which the galvanized steel plate serving as a reinforcement member is connected to the retaining wall block shown in FIG. 22;

[0039] FIG. 24 is a perspective view of a front surface of a retaining wall according to the present invention, illustrating a repaired state when partial damage occurs to the retaining wall;

[0040] FIG. 25 is a perspective view illustrating a front surface of a retaining wall block according to a fourth embodiment of the present invention;

[0041] FIG. 26 is a perspective view illustrating a rear surface of the retaining wall block of FIG. 25;

[0042] FIG. 27 is a cross-sectional view illustrating a constructed state of a retaining wall block;

[0043] FIGS. 28 and 29 are perspective views illustrating examples of a front surface of a retaining wall having an upper portion landscaped with plants, wherein the blocks according to the fourth embodiment of the present invention are positioned above the blocks according to the third embodiment thereof;

[0044] FIGS. 30 and 31 are perspective views of a front surface and a rear surface of a retaining wall block for constructing a prefabricated reinforced earth retaining wall according to a fifth embodiment of the present invention, respectively;

[0045] FIG. 32 is a cross-sectional view showing a state in which a pin for lifting a plurality of blocks at the same time is inserted into an insertion hole;

[0046] FIGS. 33A-33C are plan views showing states in which various kinds of reinforcement members are connected to the retaining wall block according to the present invention;

[0047] FIG. 34 is a perspective view of a rear surface, illustrating a constructed state of the retaining wall block according to the present invention;

[0048] FIG. 35 is a side cross-sectional view illustrating a constructed state of the retaining wall block of the present invention;

[0049] FIG. 36 is an enlarged view of a portion "b" shown in FIG. 35;

[0050] FIG. 37 is a cross-sectional view showing primary and secondary sliding states of a reinforcement member caused by subsidence of a reinforced earth occurring after constructing a retaining wall with the blocks according to the present invention;

[0051] FIGS. 38 and 39 are perspective views illustrating front and rear surfaces of a block according to a sixth embodiment of the present invention;

[0052] FIGS. 40 and 41 are plan views illustrating connected states of adjacent blocks according to seventh and eighth embodiments of the present invention;

[0053] FIG. 42 is a perspective view illustrating a front surface of a retaining wall constructed using blocks according to the present invention;

[0054] FIG. 43 is a perspective view of a front surface in a connected state of a basic type panel of a prefabricated block-type reinforced earth retaining wall according to a ninth embodiment of the present invention;

[0055] FIG. 44 is a perspective view of a rear surface of the reinforced earth retaining wall shown in FIG. 43;

[0056] FIG. 45 is a perspective view of a rear surface of a unit block for the reinforced earth retaining wall shown in FIGS. 43 and 44;

[0057] FIG. 46 is a plan view of a unit block;

[0058] FIG. 47 is a cross-sectional view taken along line I-I of FIG. 44;

[0059] FIG. 48 is a cross-sectional view taken along line II-II of FIG. 44;

[0060] FIG. 49 is a perspective view illustrating a front surface of a retaining wall panel according to the present invention;

[0061] FIG. 50 is a perspective view illustrating a rear surface of a retaining wall panel according to the present invention being in a constructed state;

[0062] FIG. 51 is an enlarged broken-away perspective view of a portion where a reinforcement member is connected to a panel according to the present invention;

[0063] FIGS. 52 and 53 are cross-sectional views of a connecting portion for connecting a reinforcement member to show an initial constructed state of a reinforcement

member and a state in which the reinforcement member slides downward due to ground subsidence;

[0064] FIG. 54 is an enlarged view showing a state in which each panel of the present invention is constructed to interlock with adjacent panels;

[0065] FIG. 55 is a cross-sectional view of a rear portion of the retaining wall being in the interlocked state shown in FIG. 54;

[0066] FIG. 56 is a plan view of the retaining wall being in the interlocked state shown in FIG. 54;

[0067] FIG. 57 is a perspective view illustrating a front surface of a unit block according to a tenth embodiment of the present invention;

[0068] FIG. 58 is a perspective view illustrating a connected state of a reinforcement member at a rear portion of a retaining wall, to show a use example of a band-shaped reinforcing fiber employed for a method for constructing the retaining wall according to the present invention; and

[0069] FIG. 59 is a perspective view illustrating a front surface of a retaining wall constructed using panels of the present invention, illustrating the retaining wall is partially disassembled to be repaired and reinforced.

BEST MODE FOR CARRYING OUT THE INVENTION

[0070] FIGS. 1-8 illustrate a block according to a first embodiment of the present invention, a retaining wall constructed using the block, a method for constructing the retaining wall, and a method for repairing the same in the event of damage. As shown in FIGS. 1 and 2, a block B for constructing a retaining wall according to the first embodiment of the present invention includes a front surface 10 forming a surface of the retaining wall, a rear surface 20 contacting a reinforced earth structure, left and right sides 30 and 30' having corresponding intermeshing portions 32 and 32' formed thereon for intermeshed connection between adjacent blocks, respectively, a top surface 40 having reinforcement member insertion grooves 44 formed in a front-to-rear direction, into which a reinforcement member or an anchor for connecting the reinforcement member is fitted and fixture grooves 46 formed on either side of the front of the reinforcement member insertion grooves 44 for fixing the reinforcement member or anchor, and a bottom surface 50 corresponding to the top surface 40. A connecting pin insertion hole h1 for pinning upper and lower blocks with a connecting pin and a lifting pin insertion hole h2 for simultaneously lifting the upper and blocks, penetrate through the top and bottom surfaces 40 and 50.

[0071] Since the block B of the present invention has a front-to-rear length that is much less than a left-to-right width, as evident from the illustrative first embodiment of the present invention, it is possible to reduce the number of blocks needed to construct a retaining wall by more than half compared to a conventional block where the former is much greater than the latter while providing a lightweight structure. According to the invention, since upper and lower blocks are joined together firmly as described later, this strong adhesion between upper and lower blocks can prevent the wall from localized sliding (bulging) or overturning.

[0072] Reference character H denotes a hollow that penetrates the top and bottom surfaces 40 and 50 to reduce an earth pressure exerted on the block while offering a lightweight block. An upper portion of the rear surface 20 that is in contact with a reinforced earth is cut by formation of the reinforcement member insertion grooves 44. The cuffing surface is inclined rearward and downward.

[0073] In addition, while the connecting pin insertion pins h1 are formed on either side of the top and bottom surfaces 40 and 50, lifting pin insertion holes h2 are formed at the center thereof in consideration of the center of gravity during lifting. An extension groove h2' having a larger diameter is formed around the lifting pin insertion hole h2 on the top surface 40 so that the lower end of the lifting pin can rotate.

[0074] FIG. 3 is a perspective view illustrating a rear surface of the block of

[0075] FIGS. 1 and 2 constructed to show that a band-shaped reinforcing fiber 60 is used as a reinforcement member connected to the block B. The present invention is not limited thereto, but various other kinds of reinforcement members including geogrid reinforcing material and ladder-shaped reinforcement member can be used.

[0076] A process for constructing a reinforced earth retaining wall with blocks according to the present invention includes the steps of: digging trenches for footing and then casting footing concrete in order to construct the footing; placing blocks on the cast footing in a horizontal direction so that they are adjacent to one another and stacking and aligning another block on each block placed horizontally using a vertical connecting pin P' in order to install the blocks; and arranging reinforcement members on a reinforced earth and filling and compacting the reinforced earth placed in the rear of the installed block with soil. Specifically, to perform the last step, a leading edge of each reinforcement member is inserted into a reinforcement member insertion groove to thereby connect the reinforcement member to the block, and the reinforcement members are arranged on the reinforced earth. Then, the reinforcement members arranged on the reinforced earth are back-filled and compacted with soil.

[0077] FIG. 4 is a plan view of a block of the first embodiment of the invention constructed. The block includes intermeshing portions 32 and 32' formed on the left and right sides 30 and 30', respectively, for intermeshing between adjacent blocks B. The presence of the intermeshing portions 32 and 32' prevents a reinforced earth G placed to the rear of the block B from being visually exposed or carried away on the front surface 10. In this case, since each block B does not interlock with adjacent blocks B, the block B is not affected by vertical displacement experienced by its adjacent block B. However, the adjacent blocks B are affected by sliding in front or rear direction due to intermeshing between the sides of each block B, thus maintaining planarization on the front surface 10 of the retaining wall.

[0078] Furthermore, even where the intermeshing portions 32 and 32' on the left and right sides of the block B are not parallel to but inclined to each other at a predetermined angle, it is possible to prevent the reinforced earth G from being carried away from the rear of the block B and still maintain the clamping between the intermeshing portions 32 and 32' since the three faces on either side of the block B contact one another.

[0079] FIG. 5 is a cross-sectional view of the block according to the first embodiment of the invention constructed. Where subsidence of the reinforced earth G and ground occurs, a portion of a reinforcement member 60 buried inside the reinforced earth G connected to the block B can undergo primary sliding vertically parallel to one another and secondary sliding in a way such that that an anchor 110 can slope downward. Thus, it is possible to ensure deformation of the retaining wall structure where subsidence of reinforced earth G or ground or differential subsidence with the retaining wall occurs. This excellent resistance against deformation makes construction possible even in winter when the reinforced earth G will bulge due to sharp temperature fall. It is also possible to use backfill soil with high water content as reinforced earth G and construct a retaining wall on a soft ground. Since no concentration of stress occurs in a portion of the reinforcement member 60 connected to the front wall structure, it is possible to prevent the retaining wall from overturning, which is one of critical defects occurring at a front end of the reinforcement member 60.

[0080] As shown in the cross-sectional view of FIG. 6, even in the case where the pressure of the reinforced earth G is applied to the rear surface 20 of the retaining wall structure due to subsidence of the reinforced earth G, some of reinforced earth G is introduced into the hollow H vertically penetrating the block B through the reinforcement member insertion groove 44 formed in the upper portion of the rear surface 20 as indicated by arrow. Thus, it is possible to disperse and absorb the stress caused by earth pressure exerted on a joint between adjacent blocks B, which may mitigate vertical displacement (bulging) of the wall structure.

[0081] FIGS. 7 and 8 are front views showing processes of partially and entirely repairing a reinforced earth retaining wall constructed using a block according to the present invention, respectively. When partial damage occurs in a block after construction of the retaining wall according to the invention, a repair process proceeds in the same order as 1→2 and includes the steps of: lifting up blocks positioned above the damaged portion of a block, the blocks belonging to a row containing the damaged block, to disassemble the overlying block after lifting a reinforcement member fitted into a reinforcement member insertion groove and separating the same from the block; removing the damaged block after disassembling the overlying block; placing a new block at the location of the previously damaged block, inserting a vertical connecting pin, and fitting a leading edge of the reinforcement member buried inside a reinforced earth into a reinforcement member insertion groove of the new block in order to connect the reinforcement member to the block; and reversing the order of the above disassembling step to reconstruct the disassembled block.

[0082] Since the retaining wall constructed using the blocks of the present invention is designed to prevent interlocking or crossing between horizontally adjacent blocks, where damage occurs to a block belonging to one of rows of retaining wall blocks, it is possible to disassemble only the row containing the damaged block downward in a sequential order, remove the damaged block, and reconstruct the new block. This allows a quick repair work with less labor in a space-limited workplace compared to a conventional repair process that has involved extensively dissem-

bling blocks or panels in order to replace the damaged block or panel in a conventional block or panel-type retaining wall. Where many rows of blocks are damaged, as shown in FIG. 8, the same repair process as described above proceeds from one row to another in sequential order, i.e., 1→2→3→4→5→6→7→8→9→10.

[0083] FIGS. 9 and 10 are perspective views illustrating front and rear surfaces of a block according to a second embodiment of the present invention. Like the first embodiment of block, the block of this embodiment includes a front surface 10 forming a surface of a retaining wall, a rear surface contacting a reinforced earth structure, left and right sides 30 and 30' having corresponding intermeshing portions 32 and 32' formed thereon, a top surface 40 having reinforcement member insertion grooves 44 and fixture grooves 46, and a bottom surface 50 corresponding to the top surface 40. The difference between the first and second embodiments is that the block of the second embodiment further includes a partition wall 55 at the center of the rear surface 20 that horizontally extends both rearward from the rear portion of the front surface 10 and horizontally.

[0084] Also in this embodiment, a connecting pin insertion hole h1 for pinning upper and lower blocks with a connecting pin and a lifting pin insertion hole h2 for simultaneously lifting the blocks penetrate through the top and bottom surfaces 40 and 50. The block of this embodiment can be realized as a lightweight block by further including reinforcement member insertion grooves 44 and 54 separately formed vertically with respect to the partition wall 55. In order to reduce earth pressure exerted on the block, an upper portion of the rear surface 20 contacting with a reinforced earth has a reinforcement member insertion groove 44 with the upper surface sloping downward and rearward. The reinforcement member insertion groove 54 formed at the lower portion of the partition wall 55, has a top surface, corresponding to the bottom surface of the partition wall 55, made horizontal in order to enable block formation.

[0085] FIGS. 11-15 show a block according to a third embodiment of the present invention and a retaining wall constructed using the block. FIGS. 11 and 12 are perspective views illustrating front and rear surfaces of the retaining wall block for constructing prefabricated reinforced earth retaining wall according to the third embodiment of the present invention. FIG. 13 is a perspective view illustrating a rear surface of the retaining wall block according to this embodiment of the invention constructed. FIGS. 14 and 15 are side cross-sectional view and plan view showing the retaining wall block of this embodiment constructed.

[0086] Referring to FIGS. 11-15, the block according to this embodiment of the invention includes a front surface 10, left and right sides 30 and 30', a top surface 40 and a bottom surface 50. The front surface 10 forms a surface of a retaining wall. The rear surface 20 contacts a reinforced earth structure. The left and right sides 30 and 30' are formed rearward toward the rear surface 20 at left and right sides of the front surface 10, and have intermeshing portions 32 and 32' for intermeshed connection between adjacent blocks at their front portions, and narrow portions stepped with the intermeshing portions 32 and 32' at their rear portions. The top surface 40 has assembling protrusions 42 and 42' formed on the front and middle portions thereof, reinforcement member insertion grooves 44 formed in the rear portion in

a front-to-rear direction, into which a reinforcement member or an anchor for connecting the reinforcement member is fitted, and fixture grooves 46, into which a fixture pin P for fixing the reinforcement member or anchor is inserted, formed on either side of front of the reinforcement member insertion groove 44 in such a way as to be opened toward the left and right sides 30 and 30'. The bottom surface 50 has assembling recesses 52 and 52' recessed at its front and middle portions to be located at positions corresponding to the assembling protrusions 42 and 42' formed on the top surface 40, and reinforcement member insertion grooves 54 and fixture grooves 56 formed at its rear portion corresponding to the counterparts 44 and 46 of the top surface 40.

[0087] Also, the block of this embodiment includes another assembling protrusion 42' and assembling recess 52' at the middle portions of the top and bottom surfaces 40 and 50, respectively. In this case, the assembling recess 52' is formed at the location corresponding to that of the assembling protrusion 42'. Elongated connecting pin Insertion holes h1 and h3 for inserting a connecting pin P' that connects upper and lower blocks penetrate through the assembling protrusions 42 and 42' and assembling recesses 52 and 52'.

[0088] An elongated lifting pin insertion hole h2 is formed vertically between assembling protrusions 42 and 42' or between assembling recesses 52 and 52' in such a way as to lift blocks. A small groove (not shown) is formed around the lower rim of the lifting pin insertion hole h2 for hooking a projection positioned in the lower end of a lifting pin P". To lift up the stacked blocks, the lifting pin P" is inserted and turned at angle of 90 degrees so that the lower end of the lifting pin P" is hooked into the locking groove.

[0089] Reference numbers 60, 70, and 80 denote a reinforcement member, a non-woven drainage filter made installed between adjacent courses of blocks, and a clamp for temporarily fixing the block, respectively.

[0090] As shown in FIGS. 13 and 16, which are a perspective view illustrating a rear surface of the block constructed, and an enlarged view of the portion "a", a leading edge of the reinforcement member 60 is inserted directly into the block, and the fixture pin P is inserted into the side of the block so that the reinforcement members 60 are firmly connected to the block. The leading edge of the reinforcement member 60 is inserted into a portion opened rearward, the portion formed by the reinforcement member insertion grooves 54 and 44 formed on bottom and top surfaces 50 and 40, respectively. The fixture grooves 46 and 56 for inserting the fixture pin P are formed on top and bottom portions of the left and right sides 30 and 30' of the upper and lower blocks in such a way as to be opened toward the sides 30 and 30'. The reinforcement member insertion grooves 54 and 44 and the fixture grooves 46 and 56 are constructed in this way to facilitate insertion of the reinforcement member 60 and the fixture pin P, respectively. Furthermore, as shown in FIG. 17, a contractible propping element 90 placed into the reinforcement member insertion grooves 44 and 54 enables the fixture pin P at the leading edge of reinforcement member connected to the block to slide downward along the fixture grooves 46 and 56 together with the reinforcement member 60 when reinforced earth G placed to the rear of the retaining wall block subsides. Thus, it is possible to reduce deformation of the retaining wall due to subsidence of the reinforced earth G as much as possible

while preventing deterioration to structural soundness caused by localized deformation in the leading edge of the reinforcement member 60.

[0091] To make upward or downward sliding of the fixture pin P easier, it is preferable to vertically install a metal panel (not shown) on the rear surfaces of the fixture grooves 46 and 46 and to apply a lubricant, such as grease, thereto, followed by inserting the fixture pin P.

[0092] FIG. 18 is a plan view showing the state in which the reinforcement member of FIG. 17 is connected to the block. Since the reinforcement member insertion grooves 44 and 54 formed in the top and bottom surfaces 40 and 50 of the block, respectively, become wider toward the rear, it is possible to prevent the reinforcement member 60 from interfering with the reinforcement member insertion grooves 44 and 54 when the reinforcement member 60 buried inside the reinforced earth G is continuously connected in a staggered fashion.

[0093] As shown in FIG. 15, since the retaining wall of the present invention is installed so that the intermeshing portions 32 and 32' formed on the left and right sides 30 and 30' are spaced apart from each other by a predetermined distance, it is possible to prevent reinforced earth in the rear of the retaining wall from being exposed or carried away on the front surface of the wall while avoiding damage to the block wall structure since the distance between the left and right sides of the blocks absorbs displacement in the event of differential subsidence of earth or ground. The blocks can be arranged in a straight line or to have optional radii of curvatures as shown in FIG. 15.

[0094] A method for constructing a retaining wall with the block of this embodiment is the same as the first embodiment, and a detailed explanation thereof will not be given.

[0095] Since the block of this embodiment has assembling protrusion 42 and assembling recess 52 formed on the top and bottom surfaces 40 and 50, respectively, it is possible to construct the block correctly by engagement between the protrusion 52 and the recess 52 while maintaining an erection of retaining wall without a separate clamp during installation of a block, thereby enhancing convenience and safety during construction. A vertical connecting pin P' can be inserted when necessary for assembling between upper and lower blocks to improve structural soundness during or after construction.

[0096] The block of this embodiment is used to construct various types of retaining walls using the above construction method. For example, several blocks grouped together into a single unit may be prefabricated into a single panel. As shown in FIG. 19A, the panel can be stacked in a staggered fashion by inserting a separator used in a conventional panel-type retaining wall between the blocks. As shown in FIGS. 19B and 19C, the panel may be arranged vertically along a straight line independently of horizontally adjacent panels.

[0097] FIG. 20 is a perspective view illustrating a rear surface of a retaining wall block according to the present invention constructed using a geogrid reinforcement member, and FIG. 21 is a cross-sectional view showing a state in which the geogrid reinforcement member of FIG. 20 is connected to the retaining wall block. In this embodiment in which a geogrid reinforcement member is used, a steel bar

is inserted into a leading edge of a reinforcement member **60** along a straight line and connected to an anchor **110**. The anchor **100** is fitted into the reinforcement member insertion grooves **44** and **54** of the block and fixed by a fixture pin P. Like in the third embodiment of the invention, as shown in **FIG. 21**, a contractible propping element **90** can be placed into the reinforcement member insertion grooves **44** and **54** to enable the anchor **110** and the fixture pin P at the leading edge of reinforcement member **60** connected to the block to slide downward along fixture pin insertion grooves **46** and **56** together with the reinforcement member **60** when reinforced earth G placed to the rear of the retaining wall block subsides. Thus, it is possible to reduce deformation of the retaining wall due to subsidence of the reinforced earth G as much as possible while preventing deterioration to structural soundness caused by localized deformation in the leading edge of the reinforcement member **60**.

[0098] **FIG. 22** is a perspective view illustrating a rear surface of a retaining wall block according to the present invention constructed using a galvanized steel plate as a reinforcement member, and **FIG. 23** is a cross-sectional view showing the state in which the galvanized steel plate of **FIG. 22** serving as a reinforcement member is connected to the retaining wall block. Likewise, the retaining wall block according to this embodiment also uses an anchor **110** to fix a galvanized reinforcing steel plate **60** to the block so that the reinforcing steel plate **60** and anchor **110** can slide vertically, thereby preventing occurrences of problem due to subsidence of reinforced earth G.

[0099] **FIG. 24** is a perspective view illustrating a front surface of a retaining wall constructed according to the present invention subjected to a repair when a defect occurs in a part of the retaining wall. Where partial damage occurs to the retaining wall constructed using the blocks according to the present invention, a repair process includes the steps of: lifting up blocks positioned above the damaged portion of a block B, the blocks belonging to a row containing the damaged block B, one by one in order to disassemble the overlying block after lifting a reinforcement member fitted into a reinforcement member insertion groove by a fixture pin and separating the same from the block; removing the damaged block B after disassembling the overlying block; placing a new block at the location of the previously damaged block, inserting a vertical connecting pin, and fitting a leading edge of the reinforcement member buried inside a reinforced earth into a reinforcement member insertion groove of the new block by the fixture pin in order to connect the reinforcement member to the block; and reversing the order of the above disassembling step to reconstruct the disassembled block.

[0100] Since the retaining wall of the invention experiences no interference between horizontally adjacent blocks, in the event where partial repair is intended, it is possible to replace the damaged block with a new one by lifting up only overlying blocks of the damaged block, the overlying blocks belonging to a row containing the damaged block. Furthermore, it is easy to separate the reinforcement member from the block by lifting a fixture pin out of the fixture pin insertion groove formed in a top surface of the block without disassembling or carrying away the reinforced earth structure. To lift up the blocks, the lifting pin P" as shown in **FIG. 14** is inserted into the lifting pin insertion groove **h2** and turned at angle of 90 degrees so that a projection at the lower

end of the lifting pin P" is hooked into the locking groove formed in the bottom of the block. This makes it easier to lift up many blocks at the same time. A process for constructing a new block includes stacking blocks one by one in the reverse order that they are lifted, and inserting and fixing the reinforcement member **60** into the insertion groove by a fixture pin P.

[0101] **FIG. 25** is a perspective view illustrating a front surface of a retaining wall block according to a fourth embodiment of the present invention, **FIG. 26** is a perspective view illustrating a rear surface of the retaining wall block of **FIG. 25**, and **FIG. 27** is a cross-sectional view illustrating a constructed state of a retaining wall block.

[0102] The block according to the illustrative embodiment is basically similar to that according to the third embodiment, and an explanation of the similar portions will not be given.

[0103] The block according to the illustrative embodiment is configured such that a recessed portion **12** is further formed inward with respect to the front surface **10**. A top surface **12a** and a bottom surface **12b** of the recessed portion **12** slope upward with respect to a front, upper portion of the block, as shown in **FIG. 27**. The recessed portion **12** is led to reinforcement member insertion grooves **44**, **54** of the rear surface **20** of the block.

[0104] The block according to the illustrative embodiment is characterized in that it allows growth of vegetation. In detail, as shown in **FIG. 27**, recessed portions **12** of upper and lower blocks form a space, and vegetative earth G' is filled into the space so that plants can grow therein. The vegetative earth G' is provided such that a bottom surface **12b** of the recessed portion **12** slopes upward, and a top surface **12a** thereof also slopes upward, thereby preventing forward outflow of the vegetative earth G'. Moisture required for growth of vegetation can be maintained by water supplied from reinforced earth G from the rear portion of the block and raindrop from the front portion of the block.

[0105] **FIGS. 28 and 29** are perspective views illustrating examples of a front surface of a retaining wall having an upper portion landscaped with plants, wherein the blocks according to the fourth embodiment of the present invention are positioned above the blocks according to the third embodiment thereof. As shown, blocks permitting growth of vegetation are installed in various patterns so that an environmental-friendly wall surface can be produced so as to be in harmony with surroundings.

[0106] **FIGS. 30 and 31** are perspective views of a front surface and a rear surface of a retaining wall block B for constructing a prefabricated reinforced earth retaining wall according to a fifth embodiment of the present invention. The block according to this embodiment includes front and rear surfaces **10** and **20**, left and right sides **30** and **30'**, a top surface **40**, and a bottom surface **50**. The front surface **10** forms a surface of the retaining wall and the rear surface **20** contacts a reinforced earth structure.

[0107] The left and right sides **30** and **30'** are formed rearward from the left and right of the front surface **10** toward the rear surface **20** and have intermeshing portions **32** and **32'** for connecting adjacent blocks in an intermeshed fashion. The top surface **40** includes a crosswise assembling projection **42**, a reinforcement member insertion groove **44**

and a fixture groove 46. The crosswise assembling projection 42 connects upper and lower blocks with each other in an intermeshed fashion. The reinforcement member insertion groove 44 is formed in a front-to-rear direction in which a leading edge of the reinforcement member buried inside a reinforced earth structure or a reinforcement member connecting anchor is inserted. The fixture groove 46 is formed in the left and right of the reinforcement member insertion groove 44, and the reinforcement member or the anchor is inserted into the fixture groove 46. The bottom surface 50 includes a crosswise assembling groove 52, a reinforcement member insertion groove 54, a vertical wall 57 and a partition wall 55. The crosswise assembling groove 52 is recessed at a location corresponding to the crosswise assembling projection 42 of the top surface 40. The reinforcement member insertion groove 54 is formed at a location corresponding to the reinforcement member insertion groove 44. The vertical wall 57 extending from the reinforcement member insertion groove 44 is formed between the reinforcement member insertion grooves 44, 54. The partition wall 55 is formed between the reinforcement member insertion grooves 44 and 54 in a left-to-right direction ranging from the front surface to the rear surface 20.

[0108] In the block according to this embodiment, among insertion holes h1, h2 formed at interconnections of the assembling projections 42 and the assembling grooves 52 formed on the top and bottom surfaces 40 and 50, respectively, the centrally located one is shaped of a slot elongated in a front-to-rear direction to be used to insert upper and lower connecting pins P' (see FIG. 34) for connecting upper and lower blocks, like the circular insertion holes h1 at either side. In addition, as shown in FIG. 32, a lifting pin P'' for simultaneously lifting many blocks can be inserted into the elongated hole. The lifting pin P'' is inserted into the insertion hole h2 and turned at angle of 90 degrees, the projection Pa in the lower end of the lifting pin P'' is hooked on an internal locking portion 52a of the assembling groove 52 formed on the bottom surface 50 of the block in the left-to-right direction to then be lifted up. Then, if the lifting pin P'' is again turned at angle of 90 degrees, the projection Pa in the lower end of the lifting pin P'' is separated from the internal locking portion 52a, thereby extracting the lifting pin P'' from the insertion hole h2.

[0109] FIGS. 33A-33C are plan views showing states in which various kinds of reinforcement members are connected to the retaining wall block according to the present invention.

[0110] As shown in FIG. 33A, a leading edge of a band-shaped synthetic resin reinforcement member 60 is connected to the reinforcement member insertion groove 52 of the block B according to the present invention using a U-shaped anchor 110 and a fixture pin P. As shown in FIG. 33B, a leading edge of a ladder-shaped reinforcement member 60 can be directly connected to the reinforcement member insertion groove 52. Also, as shown in FIG. 33C, a geogrid reinforcement member 60 is connected to the block B using an anchor 110 and a long steel bar 100. In this manner, a suitable reinforcement member can be adaptively constructed according to the soil quality of a construction site or the length of a reinforced earth structure.

[0111] FIG. 34 is a perspective view of a rear surface, illustrating a constructed state of the retaining wall block

according to the present invention, FIG. 35 is a side cross-sectional view illustrating a constructed state of the retaining wall block of the present invention, and FIG. 36 is an enlarged view of a portion "b" shown in FIG. 35.

[0112] As shown in FIGS. 34 through 36, in a case of constructing a vertical retaining wall using blocks of the present invention, left and right adjacent blocks B overlap with each other in a state in which they are spaced about 1 to 2 cm apart from each other by intermeshing portions 32 and 32' formed on left and right sides 30 and 30' and, which is evident from the corresponding partially enlarged views of the respective drawings. Thus, it is possible to prevent reinforced earth structure in the rear of the retaining wall from being carried away on the front surface of the retaining wall or exposed to a front surface.

[0113] Also, the intermeshing portions 32 and 32' of the left and right sides 30 and 30' of the blocks are not limited to those forming a straight line connecting the blocks. Rather, the intermeshing portions 32 and 32' may connect adjacent blocks at angles adapted to the geographical features of the construction site, thereby constructing a curved retaining wall without carrying away the reinforced earth structure or exposing the reinforced earth structure.

[0114] Also, the partition wall 55 is not parallel with the bottom but slopes toward the front, upper portion of the block B, that is, toward the rear, lower portion of block B. Thus, the block B itself is durable against damage due to a vertical shearing force. Also, when the upper and lower blocks are stacked, a latticed rigid structure can be formed.

[0115] Since the partition wall 55 slopes upward with respect to the front, upper portion of the block, as shown in FIG. 35, the reinforced earth structure G in the rear of the block B and the vegetative earth G' filled in the upper and lower reinforcement member insertion grooves 44 and 54 are not carried away to the front of the block B.

[0116] Preventing the upper and lower blocks from slipping during or after construction can be ensured by a connecting power established inserting the upper and lower connecting pins P' into the connecting holes h1, as well as by an intermeshed connection between the assembling projection 42 and the assembling groove 52 formed on the top and bottom surfaces 40 and 50. Also, the blocks can be prevented from turning upside down or leaning, that is, collapse can be avoided.

[0117] The top and bottom surfaces of the partition wall 55 and sides of the vertical walls 47 and 57 are shaped of uneven waveforms, as shown in FIG. 36, which increases a connection power between the partition wall 55 or vertical walls 47 and 57, and the vegetative earth G' filled in the reinforcement member insertion grooves 44 and 54, forming upper and lower spaces, thereby preventing the vegetative earth from being carried away due to rainstorm. The upper and lower reinforcement member insertion grooves 44 and 54 are configured such that the lower reinforcement member insertion groove 54 is positioned above and connected to the upper reinforcement member insertion groove 44 during vertical construction of blocks, forming a box-shaped space. The box-shaped space is about 10 cm in width and at least 20 cm in height, that is, spacious enough to store a sufficient amount of vegetative earth. Also, the space slopes frontward and upward, so that roots of grass or trees can extend well

toward the reinforced earth structure. Since a bottom surface of the box-shaped space is waveform-shaped, an appropriate amount of water, including rainfall or other externally introduced moisture, can be stored therein, rather than being discharged away, thereby preventing plants from withering due to dryness of vegetative earth, during an initial growth period.

[0118] FIG. 37 is a cross-sectional view showing primary and secondary sliding states of a reinforcement member caused by subsidence of a reinforced earth structure occurring after constructing a retaining wall with the blocks according to the present invention.

[0119] In an event of subsidence of reinforced earth structure G, the retaining wall with the blocks according to the present invention primarily vertically slides along a leading edge of a reinforcement member 60 or an anchor 110 buried inside the reinforced earth structure G, or a fixture groove 46 vertically formed on a top surface 40 of a block B, and secondarily rotates and falls along a reinforcement member insertion groove 44. Thus, subsidence power of the reinforced earth structure G is not directly transferred to the block B, causing a small amount of displacement of the block B, thereby keeping the retaining wall at a stable construction state in spite of subsidence of the reinforced earth structure G.

[0120] Also, some of the earth pressure of the reinforced earth structure G is applied to the retaining wall structure (block) is absorbed in the box-shaped space formed by the reinforcement member insertion grooves 44 and 54 horizontally penetrating the block B. That is, the earth pressure of the reinforced earth structure G is applied to vegetative earth G' filled in the box-shaped space formed by the reinforcement member insertion grooves 44 and 54, rather than totally being applied to the block B. Then, the vegetative earth G' is slightly pushed forward and the earth pressure is absorbed in the box-shaped space. Thus, bulging of the retaining wall structure can be prevented and the earth pressure exerted on the wall can be reduced, thereby effectively suppressing various kinds of displacement, including bulging, of the wall structure.

[0121] FIGS. 38 and 39 are perspective views illustrating front and rear surfaces of a block B' according to a sixth embodiment of the present invention, in which front faces of upper and lower reinforcement member insertion grooves 44 and 54 are closed by blocking walls 44a and 54a. When a retaining wall not permitting growth of vegetation is constructed, a box-shaped space in the block is prevented from being exposed to the front portion of the wall structure by closing the front portions of the upper and lower reinforcement member insertion grooves 44 and 54 by the blocking walls 44a and 54a. In a case where the blocking walls 44a and 54a are integrally formed with the block, the structural strength of the block B itself can be increased. Thus, it is preferable that a lower portion of a retaining wall, to which a heavier load is applied, is constructed using the block B' shown in FIG. 38 and an upper portion of the retaining wall is constructed using the block B shown in FIG. 30.

[0122] FIGS. 40 and 41 are plan views illustrating connected states of adjacent blocks according to seventh and eighth embodiments of the present invention. Referring to FIG. 40, intermeshing portions 32 and 32' formed on left and right sides 30 and 30' are different from those in the

above-described embodiments. In the illustrative embodiment, horizontally adjacent blocks are strongly connected to each other although it is difficult to intermesh the blocks in a rounded manner. Referring to FIG. 41, intermeshing portions 32 and 32' formed on left and right sides 30 and 30' are also different from those in the above-described embodiments. That is, the intermeshing portions 32 and 32' are arc-shaped, resulting in a slight reduction in the connecting power between horizontally adjacent blocks. However, the illustrative block is advantageously used for constructing a round retaining wall having a small radius of curvature. Patterns of the intermeshing portions 32 and 32' formed on left and right sides 30 and 30' of the block according to the present invention are not limited to those of the illustrated embodiments, and fabrication in various patterns is possible.

[0123] The block according to the present invention is simply intermeshed with horizontally adjacent blocks at its lateral surfaces. Thus, in the event where the block is partially damaged, it is possible to replace the damaged block with a new one after sequentially lifting up only overlying blocks belonging to a row containing the damaged block, while leaving the horizontally adjacent blocks intact. Furthermore, a repair or reinforcement work can be facilitated without disturbing the reinforced earth structure in the rear of the retaining wall.

[0124] FIG. 42 is a perspective view illustrating a front surface of a retaining wall constructed using blocks according to the present invention. Referring to FIG. 42, a lower portion of a retaining wall is constructed using the block B' not permitting growth of vegetation, as shown in FIG. 38, and an upper portion of the retaining wall is constructed using the block B permitting growth of vegetation, as shown in FIG. 30, so that trees and grass can grow at the upper portion of the retaining wall, thereby achieving a landscape. As shown in FIG. 42, according to the illustrative embodiment, the lower and upper portions of a retaining wall are sectioned straightly at a predetermined height, and blocks not permitting growth of vegetation and blocks permitting growth of vegetation are separately constructed. The blocks permitting growth of vegetation can be constructed to have a waveform pattern. Also, the blocks permitting growth of vegetation can be constructed using a spacing provided between each other. Arrangement of blocks not permitting growth of vegetation and blocks permitting growth of vegetation can be made in various patterns so as to be in harmony with natural surroundings of a construction site where the retaining wall is to be constructed. Of course, panels for growth of vegetation can be arranged to form various patterns or characters.

[0125] FIG. 43 is a perspective view of a front surface in a connected state of a basic type panel of a prefabricated block-type reinforced earth retaining wall according to a ninth embodiment of the present invention, FIG. 44 is a perspective view of a rear surface of the reinforced earth retaining wall shown in FIG. 43, FIG. 45 is a perspective view of a rear surface of a unit block for the reinforced earth retaining wall shown in FIGS. 43 and 44, FIG. 46 is a plan view of a unit block, FIG. 47 is a cross-sectional view taken along line I-I of FIG. 44, and FIG. 48 is a cross-sectional view taken along line II-II of FIG. 44.

[0126] As shown in FIGS. 43 through 48, the reinforced earth retaining wall panel according to the present invention

includes a plurality of unit blocks B, connecting elements P' and connecting means 12'. Each unit block B includes a front surface 10 forming an outer surface of a retaining wall, a rear surface 20 contacting a reinforced earth structure, a bottom surface 50 and a top surface 40 having a plurality of channels 1 and throughholes 2 vertically formed at a predetermined position of each channel 1, and left and right sides 30 and 30' having an insertion portion 5 and a locking groove 6, creating a portion into which an insertion portion L for preventing the unit blocks B of an adjacent panel A from alienating from or getting close to each other by interlocking unit blocks B of the adjacent panel A, is inserted. The connecting element P' are inserted into the throughholes 2 in a state in which the plurality of unit blocks B are vertically stacked. The connecting means 12' is engaged with one end of the connecting element P' and connects the stacked plurality of unit blocks B with one another.

[0127] As shown in FIGS. 45 and 46, the unit block B forming the panel according to the present invention is formed of cement concrete by a compressive dry process, and a front surface 10 thereof preferably has a natural stone texture. Various faces 20, 30, 30', 40 and 50 are made smooth or slightly rough, to give an appropriate force of friction between unit blocks when the unit blocks are stacked. Intermeshing portions corresponding to the bottom surface 50 and the top surface 40 are preferably formed thereon, thereby easily tuning an accurate connection position during stacking.

[0128] To impart the respective unit blocks B with a granite-like texture, cement, sand, stone powder and other aggregate are mixed at an appropriate mixing ratio, and the resulting mixture is poured into a mold for compressive formation. In a state in which front surfaces 10 of the respective unit blocks B contact each other, the mold is cut by a slicer so that the front surfaces 10 are naturally configured to simulate granite or another stone. Also, the front surfaces 10 of the respective unit blocks B may be formed with various patterns including an arc or waveform, instead of a linear pattern.

[0129] The unit block B, as shown in FIG. 45, is fabricated in a single pattern. A plurality (three in the drawing) of channels 1 extend rearward at vertically coinciding locations on the bottom surface 50 and the top surface 40. The front surface 10 and the rear surface 20 of the unit block B, as shown in FIG. 46, are stepped vertically, that is, the front surface 10 is a tier higher than the body that is the rear portion of the unit block. The left and right sides 30 and 30' of the unit block B have the insertion portion 5 and the locking groove 6, creating a portion into which the insertion portion L is inserted. When the unit blocks B are stacked, the insertion portion 5 overlaps above the locking groove 6 so that the fixture element L is easily inserted through the insertion portion 5 and both ends of the fixture element L is fitted into the locking groove 6.

[0130] The insertion portion 5 is formed at lower edges of either side of the unit block B in such a way as to be opened laterally and downward. The locking groove 6 has substantially the same shape with that of the insertion portion 5, and has a horizontally elongated, elliptical groove 6a extending downward so that both ends of the fixture element L are inserted thereinto to be hooked thereon.

[0131] As shown in FIG. 46, the insertion portion 5 and the locking groove 6 get wider toward the outside, thereby allowing engaging of the fixture element L even when adjacent panels are not in a straight line in constructing a rounded retaining wall.

[0132] Also, a closely adhering surface 31, to which a support plate S of a clamp C is closely adhered, is formed at either side of the rear surface 20 of the unit block B. The clamp C temporarily fixes adjacent panels by locking the fixture element L.

[0133] The unit block B has the front surface 10 and the rear surface 20 stepped not only vertically but also horizontally, as shown in FIG. 46. Thus, while sides 30, 30' of the unit block B, forming adjacent retaining wall panel, can be prevented from contacting with one plane, two alternately parallel planes 30a, 30'a, 30b and 30'b are contacted with sloped planes 30c and 30'c disposed therebetween, thereby preventing an internal reinforced earth structure from being visually exposed or carried away on the front surface 10 of the retaining wall.

[0134] FIG. 49 is a perspective view illustrating a front surface of a retaining wall panel according to the present invention, and FIG. 50 is a perspective view illustrating a rear surface of a retaining wall panel according to the present invention being in a constructed state.

[0135] As shown in FIGS. 49 and 50, when stacking upper and lower prefabricated panels A, a shock-absorbing pad 14 having a predetermined thickness and made of rubber, cork or other shock-absorbing material is interposed between the panels A, thereby maintaining a predetermined distance therebetween and absorbing a shock which may be applied during stacking.

[0136] In the retaining wall constructed using panels according to the present invention, the fixture element L allows horizontally adjacent panels A to be spaced a predetermined distance apart from each other, rather than being adhered to or separated from each other or, which is called an interlocked state. Upper and lower panels A that are vertically stacked are also spaced apart from each other by a predetermined distance, thereby improving resistance against vibration or other external forces.

[0137] As shown in FIG. 49 illustrating a constructed state of a retaining wall, prefabricated panels A1 each having two unit blocks and prefabricated panels A2 each having four unit blocks are alternately arranged on a retaining wall foundation (not shown), forming a first tier. Then, for next tiers, prefabricated panels A2 each having four unit blocks are stacked. Finally, for the uppermost tier, unit blocks are fabricated to be adapted to a height of the retaining wall to be constructed.

[0138] FIG. 51 is an enlarged broken-away perspective view of a portion where a reinforcement member is connected to a panel according to the present invention.

[0139] In the panel A according to the present invention, a leading edge of the reinforcement member 60 is connected to a connecting element P' inserted into the panel A by a locking element 62 so that the panel A is disposed rearward and a reinforced earth structure (not shown) is laid and compacted, thereby supporting the retaining wall. Useful examples of the is reinforcement member 60 include con-

ventional geogrid, galvanized steel plate, band-shaped synthetic resin reinforcing fiber and so on. A reinforcement member can be connected to any portion of a panel, and any reinforcement members are connectable according to conditions of a construction site or construction design.

[0140] The reinforcement member 60 of this embodiment includes a pair of panel-shaped locking elements 62, a reinforcing plate 66, and resistors 68. The pair of panel-shaped locking elements 62 are engaged with a connecting element P' connecting vertically stacked unit blocks B through a rectangular hole formed by channels 1 formed between the stacked unit blocks B. A leading edge of the reinforcing plate 66 is engaged to a locking element 62 by a bolt 64 and a nut 65. The resistors 68 are spaced a predetermined interval from each other and attached at right angle along the length of the reinforcing plate 66. Preferably, the reinforcement member 60 of this embodiment is of a continuous type, in which a plurality of metal reinforcing plates 66 are installed in parallel with each other, and rod-shaped metal resistors 68 are welded at a predetermined interval along the length of the reinforcing plates 66, as shown in the left of FIG. 50. Also, as shown in the right of FIG. 50, the reinforcement member 60 of this embodiment may be of an individual-type, in which rod-shaped metal resistors 68 are fixed at a predetermined distance along the length of the single metal reinforcing plate 66.

[0141] As shown in FIG. 51, two symmetrical locking elements 62 for locking the reinforcement member 60 to the connecting element P' vertically inserted into the unit block B forming the panel A, the locking elements 62 each having a locking portion 62a formed at a side (frontward) toward the interior, front portion, and a connecting hole 62b connected to the reinforcing plate 66 of the reinforcement member 6, are vertically superposed, thereby preventing the reinforcement member 60 locked to the connecting element P' from being unlocked.

[0142] As shown in FIGS. 52 and 53, the locking element 62 according to the present invention prevents is locked on an upper portion of the channel 1 at an initial construction stage and a cushioning member 63 made of, for example, synthetic resin sponge, is provided thereunder. In such a manner, it is possible to prevent concentration of stress by the locking element 62 sliding downward when the reinforcement member 60 slides downward due to ground subsidence according to passage of time after construction of the retaining wall is completed, thereby preventing the retaining wall from deforming or collapsing.

[0143] FIG. 54 is an enlarged view showing a state in which each panel of the present invention is constructed to interlock with adjacent panels, FIG. 55 is a cross-sectional view of a rear portion of the retaining wall being in the interlocked state shown in FIG. 54, and FIG. 56 is a plan view of the retaining wall being in the interlocked state shown in FIG. 54.

[0144] In the present invention, a fixture element L is fabricated by bending a steel bar in a bottom-opened rectangular (⊃) shape. Both ends of the fixture element L, which are bent downward, are inserted into grooves 6a of the locking groove 6 through an insertion portion 5 formed at upper and lower portion on both sides of a unit block B forming a panel A. A temporary fixing clamp C is hooked on a middle portion of the fixture element L inserted into the

locking groove 6 of the unit block B forming an adjacent panel A and tightened by a nut N, so that a support plate S is closely adhered to a closely adhering surface 31 in the rear of the unit block B, thereby maintaining a firmly interlocked state between adjacent panels.

[0145] As shown in FIGS. 54 through 56, in the construction method of the retaining wall according to the present invention, the fixture element L is inserted between horizontally adjacent panels A, and the clamp C is engaged to the fixture element L, thereby establishing an interlocked state, that is, a state in which the adjacent panels A are kept being spaced a predetermined distance apart from each other without getting further separated from or closer to each other. Thus, the thus-constructed retaining wall can be prevented from deforming or distorting due to vibration or other external forces. Also, since the retaining wall is constructed by vertically adjacent panels A interlocked at their sides by the fixture element L in a zigzag manner, the panels of the present invention ensure higher and safer construction compared conventional precise concrete panels, thereby facilitating a panel construction work.

[0146] FIG. 57 is a perspective view illustrating a front surface of a unit block according to a tenth embodiment of the present invention, in which the front surface 10 of the unit block B is shaped of a waveform having a predetermined curvature, rather than being planarly shaped, such that a half is convex and the other half is recessed inwardly.

[0147] A method of constructing a reinforced earth retaining wall using prefabricated panel according to a ninth embodiment of the present invention will now be described.

[0148] The method includes steps of panel assembling, adjusting, finishing, interlocking, arranging and assembling, and compacting. In the panel assembling step, two or four unit blocks B, formed at factories, are stacked to be fabricated a two-tier panel (A1) or four-tier panel (A2) using connecting elements P' and connecting means 12'.

[0149] In the adjusting step, prefabricated panels, reinforcement members and other materials including fixture elements, temporary fixing clamps and so on, are transported to a construction site, and the site is digged to be wide enough for installation of reinforcement members.

[0150] In the finishing step, footing concrete having a width of about 40 cm and a height of about 20 to 25 cm is cast at a place where panels are to be installed, and the top surface of the footing concrete is planarized.

[0151] In the interlocking step, panels A are transported from the warehouse and placed on the footing, and adjacent panels are interlocked such that a fixture element L is inserted into a locking groove 6 through an insertion portion 5 formed on a unit block B forming each panel A, and a temporary fixing clamp C is locked on the fixture element L in the rear of the panel to be engaged.

[0152] In the arranging and assembling step, another panels A are sequentially rested on the panels to interlock adjacent panels using the fixture element L, and reinforcement members is arranged in a horizontal direction in the rear of the panels A.

[0153] In the compacting step, a reinforced earth structure is applied over the horizontally arranged reinforcement members, followed by compacting.

[0154] In the construction method according to the present invention, prefabricated panels are lifted up using equipment and sequentially piled up. Here, the lifting is performed using a lifting hook of a crane engaged with a connecting element P' projecting at an upper portion of the prefabricated panel. The lifted panel is released at a stacked position, while shock-absorbing pad 14 is inserted between upper and lower panels to maintain a predetermined distance therebetween and to absorb a shock. When the prefabricated panel is placed at an accurate position, it is interlocked with an adjacent panel. In this case, the fixture element L is inserted through the insertion portion 5 opened laterally from the side of the panel to be fitted into the fixture groove 6. In this state, the temporary fixing clamp C is hooked on a middle portion of the fixture element L inserted into the locking groove 6 and tightened by the nut N, so that a support plate S is closely adhered to a closely adhering surface f7 in the rear of the unit block B forming the panel, thereby maintaining a firmly interlocked state between adjacent panels so as to be vertically supported.

[0155] Inserting the fixture element and engaging the temporary fixing clamp makes horizontally adjacent panels spaced a predetermined distance apart from each other and making the surface of a retaining wall constructed by the panels even. Also, upper and lower panels are vertically supported by an interlocking action by the fixture element and the temporary fixing clamp, thereby installing panels in a stable manner even before a reinforcement member is constructed.

[0156] Further, according to the present invention, concentration of stress can be prevented from occurring at a connected portion of the fixture element by the characteristic interlocking action of the fixture element, thereby improving resistance of the retaining wall against vibration or differential subsidence which may occur after construction of the retaining wall is completed.

[0157] After the installing work of the panel is completed, a reinforcement member is connected to a rear portion of the panel, and a reinforced earth structure is applied over the resulting structure to then be compacted. The prefabricated panel according to the present invention does not have an anchor projecting on the rear portion thereof. Instead, the connecting element P' vertically inserted into the panel serves as an anchor. Thus, small-sized compacting equipment is easily accessible, so that a compacting work of a reinforced earth structure can be perfectly carried out even at a portion close to the rear surface of the panel.

[0158] FIG. 58 is a perspective view illustrating a connected state of a reinforcement member at a rear portion of a retaining wall, to show a use example of a band-shaped reinforcing fiber employed for a method for constructing the retaining wall according to the present invention, in which the reinforced earth retaining wall panel according to the present invention is supported by a band-shaped reinforcement fiber, which is generally used for construction of reinforced earth retaining walls. That is, there are provided a locking element 62' for locking the band-shaped reinforcement fiber 60' on the connecting element P' of the block B, and a PVC tube T inserted into a temporary fixing steel R in the rear of the band-shaped reinforcement fiber 60', and the reinforcement fibers 60' are installed in a zigzag manner. In this state, the reinforcement fiber 60' is pulled by a rein-

forcement member pulling mechanism (not shown) to provide an appropriate tensile strength, thereby smoothly pulling the reinforcement member 60' without forcibly bending the leading or trailing edges thereof.

[0159] The locking element 62' shown in FIG. 58 has a locking portion 62a formed inwardly and frontward at one side thereof, and a hook 62d, into which a rod 62c for hooking the reinforcement member 60' is inserted, formed at the other side thereof (rearward). Escape preventing elements 62e for preventing the rod 62c from being escaped during pulling of the reinforcement member 60' are provided at both ends of the rod 62c.

[0160] FIG. 59 illustrates a state in which the retaining wall is partially disassembled to be repaired and reinforced. In a case where the retaining wall constructed using the prefabricated panel according to the present invention is to be replaced because there is a damaged panel due to impacts or other reasons, only panels A1 and A2 stacked directly over the damaged panel A3 are sequentially disassembled, which is because the prefabricated panel is rectangular and adjacent panels are interlocked by a fixture element inserted at each side, the damaged panel can be removed by disassembling only the fixture element to separate the overlying panels into the respective blocks B, without affecting adjacent panels A. Then, new panels, which are fabricated by stacking unit blocks B one by one using connecting elements P', are placed again in a state in which they are interlocked with the existing adjacent panels A using fixture elements L. In such a manner, a repair work can be easily made. Also, the reinforced earth structure compacted at the rear of the panel forming the retaining wall can be easily separated from or engaged with the reinforcement member and panel without digging, thereby facilitating the repair work of the retaining wall.

[0161] In the above-described embodiments of the present invention, when the reinforcement members buried inside the reinforced earth structure are connected to blocks forming a front wall surface of the retaining wall, distances among the reinforcement members arranged vertically and horizontally can be freely adjusted according to design variations depending on construction site conditions. According to the present invention, since multiple blocks are formed by a single mold, the productivity is high, the manufacturing cost is low and manageability of formed blocks is also ensured, compared to the conventional various type panels.

INDUSTRIAL APPLICABILITY

[0162] According to the present invention, since a hollow or space is formed in a block itself in a direction in which it contacts a reinforced earth structure, the block can be made lightweight, allowing a reduction in material cost and easy transportation, thereby providing excellent workability compared to the conventional panel for construction a retaining wall. Also, the block according to the present invention can be installed more easily and safely than the conventional block. Even if there is displacement occurring to reinforced earth structure after construction, a connected portion of a leading edge of a reinforcement member subsides while primarily sliding vertically and secondarily rotating, thereby preventing deformation of the retaining wall or disconnection of the reinforcement member, ensur-

ing high durability. Since horizontally adjacent blocks are in an intermeshed state with each other, rather than in an interlocked state, only partial damage due to differential subsidence of the reinforced earth structure or ground, if any, can be easily repaired by sequentially disassembling only blocks belonging to a row containing the damaged portion to be reconstructed, without adversely affecting the reinforced earth structure. Further, since a relatively large area of lower and upper portions of the retaining wall is used for landscaping, roots of plants can extend well toward the reinforced earth structure. Since the upper and lower portions of the retaining wall have a capacity of holding reinforced earth and water, the retaining wall can provide an excellent efficiency in growth of vegetation growth even in an area having insufficient raindrop. According to another aspect of the present invention, an interlocking action between adjacent panels allows a vertical supporting structure to be achieved just by installing prefabricated panels, thereby preventing the retaining wall from collapsing or overturning during construction. In an event of subsidence of a reinforced earth structure, a locking element configured to be slidable downward, can prevent concentration of stress. Also, since an anchor is not exposed in the rear of the panel, small-sized compacting equipment is easily accessible to the rear surface of the panel, thereby perfectly carrying out a compacting work. Thus, defects, which may be produced after the construction is completed, can be prevented. When localized defects are produced after the construction is completed, panels forming the retaining wall can be partially disassembled just by releasing an interlocked state of adjacent panels, thereby facilitating a local repair work.

1. A block for constructing a retaining wall comprising:
 - a front surface **10** forming a surface of the retaining wall, and a rear surface **20** contacting a reinforced earth structure;
 - left and right sides **30** and **30'** having corresponding intermeshing portions **32** and **32'** formed thereon for intermeshed connection between adjacent blocks, respectively;
 - a top surface **40** having reinforcement member insertion grooves **44** formed in a front-to-rear direction, into which a reinforcement member or an anchor for connecting the reinforcement member is fitted and fixture grooves **46** formed on either side of the front of the reinforcement member insertion grooves **44** for fixing the reinforcement member or anchor; and
 - a bottom surface **50** corresponding to the top surface **40**, wherein a connecting pin insertion hole **h1** for pinning upper and lower blocks with a connecting pin and a lifting pin insertion hole **h2** for simultaneously lifting the upper and blocks, penetrate through the top and bottom surfaces **40** and **50**.
2. The block of claim 1, wherein a hollow H penetrating the top and bottom surfaces **40** and **50** thereof is formed.
3. The block of claim 1 or 2, wherein the connecting pin insertion pins **h1** are formed on either side of the top and bottom surfaces **40** and **50**, lifting pin insertion holes **h2** are formed at the center thereof in consideration of the center of gravity during lifting, an extension groove **h2'** having a larger diameter is formed around the lifting pin insertion hole **h2** on the top surface **40** so that the lower end of the lifting pin can rotate.

4. The block of claim 1, wherein a partition wall **55** is formed at the center of the rear surface **20**, the partition wall **55** horizontally extending both rearward from the rear portion of the front surface **10** and horizontally, so that reinforcement member insertion grooves **44** and **54** are separately formed vertically with respect to the partition wall **55**.

5. The block of claim 4, wherein the upper surface of the partition wall **55** slopes downward and rearward.

6. A block for constructing a retaining wall comprising:

a front surface **10** forming a surface of a retaining wall, and a rear surface **20** contacting a reinforced earth structure;

left and right sides **30** and **30'** formed rearward toward the rear surface **20** at left and right sides of the front surface **10**, and having intermeshing portions **32** and **32'** for intermeshed connection between adjacent blocks at their front portions, and narrow portions stepped with the intermeshing portions **32** and **32'** at their rear portions;

a top surface **40** having assembling protrusions **42** and **42'** formed on the front and middle portions thereof, reinforcement member insertion grooves **44** formed in the rear portion in a front-to-rear direction, into which a reinforcement member or an anchor for connecting the reinforcement member is fitted, and fixture grooves **46**, into which a fixture pin **P** for fixing the reinforcement member or anchor is inserted, formed on either side of front of the reinforcement member insertion groove **44** in such a way as to be opened toward the left and right sides **30** and **30'**; and

a bottom surface **50** having assembling recesses **52** and **52'** recessed at its front and middle portions to be located at positions corresponding to the assembling protrusions **42** and **42'** formed on the top surface **40**, and reinforcement member insertion grooves **54** and fixture grooves **56** formed at its rear portion corresponding to the counterparts **44** and **46** of the top surface **40**.

7. The block of claim 6, wherein another assembling protrusion **42'** and assembling recess **52'** are formed at the middle portions of the top and bottom surfaces **40** and **50**, respectively, the assembling recess **52'** is formed at the location corresponding to that of the assembling protrusion **42'**, elongated connecting pin insertion holes **h1** and **h3** for inserting a connecting pin **P'** that connects upper and lower blocks penetrate through the assembling protrusions **42** and **42'** and assembling recesses **52** and **52'**, an elongated lifting pin insertion hole **h2** is formed vertically between assembling protrusions **42** and **42'** or between assembling recesses **52** and **52'** in such a way as to lift blocks, and a small groove is formed around the lower rim of the lifting pin insertion hole **h2** for hooking a projection positioned in the lower end of a lifting pin **P''**.

8. The block of claim 6 or 7, wherein a recessed portion **12** is further formed inward with respect to the front surface **10**, and a top surface **12a** and a bottom surface **12b** of the recessed portion **12** slope upward with respect to a front, upper portion of the block, the recessed portion **12** being led to reinforcement member insertion grooves **44**, **54** of the rear surface **20** of the block.

9. A block for constructing a retaining wall comprising:
a front surface **10** forming a surface of the retaining wall and a rear surface **20** contacting a reinforced earth structure;

left and right sides **30** and **30'** formed rearward from the left and right of the front surface **10** toward the rear surface **20** and having intermeshing portions **32** and **32'** for connecting adjacent blocks in an intermeshed fashion;

a top surface **40** having a crosswise assembling projection **42** connecting upper and lower blocks with each other in an intermeshed fashion, a reinforcement member insertion groove **44** formed in a front-to-rear direction in which a leading edge of the reinforcement member buried inside a reinforced earth structure or a reinforcement member connecting anchor is inserted, and a fixture groove **46** formed in the left and right of the reinforcement member insertion groove **44**, and into which the reinforcement member or the anchor is inserted into; and

a bottom surface **50** having a crosswise assembling groove **52** recessed at a location corresponding to the crosswise assembling projection **42** of the top surface **40**, a reinforcement member insertion groove **54** formed at a location corresponding to the reinforcement member insertion groove **44**, a vertical wall **57** extending from the reinforcement member insertion groove **44** and formed between the reinforcement member insertion grooves **44** and **54**, and a partition wall **55** formed between the reinforcement member insertion grooves **44** and **54** in a left-to-right direction ranging from the front surface to the rear surface **20**.

10. The block of claim 9, wherein connecting pin and lifting pin insertion holes **h1** and **h2** are formed at interconnections of the assembling projections **42** and the assembling grooves **52** formed on the top and bottom surfaces **40** and **50**, respectively, the lifting pin insertion hole **h2** is shaped of a slot elongated in a front-to-rear direction, and an internal locking portion **52a** is formed in the assembling groove **52** formed on the bottom surface **50** of the block in the left-to-right direction so that a lifting pin **P''** is hooked therein.

11. The block of claim 9 or 10, wherein front faces of upper and lower reinforcement member insertion grooves **44** and **54** are closed by blocking walls **44a** and **54a**.

12. A prefabricated reinforced earth retaining wall constructed using the block claimed in any one of claims **1**, **2**, **4**, **5**, **6**, **7**, **9** and **10**.

13. A method for constructing a retaining wall using the block claimed in any one of claims **1**, **2**, **4**, **5**, **6**, **7**, **9** and **10**, the method comprising:

digging trenches for footing and then casting footing concrete in order to construct the footing;

placing blocks on the cast footing in a horizontal direction so that they are adjacent to one another and stacking and aligning another block on each block placed horizontally using a vertical connecting pin **P'** in order to install the blocks; and

arranging reinforcement members on a reinforced earth structure and filling and compacting the reinforced earth placed in the rear of the installed block with soil,

such that a leading edge of each reinforcement member is inserted into a reinforcement member insertion groove to thereby connect the reinforcement member to the block, the reinforcement members are arranged on the reinforced earth, and then, the reinforcement members arranged on the reinforced earth are backfilled and compacted with soil.

14. A method for repairing a reinforced earth retaining wall constructed by the method claimed in claim 13, the method comprising:

lifting up blocks positioned above the damaged portion of a block, the blocks belonging to a row containing the damaged block, to disassemble the overlying block after lifting a reinforcement member fitted into a reinforcement member insertion groove and separating the same from the block;

removing the damaged block after disassembling the overlying block;

placing a new block at the location of the previously damaged block, inserting a vertical connecting pin, and fitting a leading edge of the reinforcement member buried inside a reinforced earth into a reinforcement member insertion groove of the new block in order to connect the reinforcement member to the block; and

reversing the order of the above disassembling step to reconstruct the disassembled block.

15. The method of claim 14, where many rows of blocks are damaged, comprising:

disassembling blocks positioned above rows containing the damaged blocks in a sequential order from one row to another;

removing the damaged blocks after disassembling the overlying blocks;

placing new blocks at locations of the previously damaged blocks, inserting vertical connecting pins, and fitting leading edges of the reinforcement members buried inside a reinforced earth structure into reinforcement member insertion grooves of the new blocks; and

reversing the order of the above disassembling step to reconstruct the disassembled blocks.

16. A panel for a prefabricated block-type reinforced earth retaining wall comprising:

a plurality of unit blocks **B** each unit including a front surface **10** forming an outer surface of a retaining wall, a rear surface **20** contacting a reinforced earth structure, a bottom surface **50** and a top surface **40** having a plurality of channels **1** and throughholes **2** vertically formed at a predetermined position of each channel **1**, and left and right sides **30** and **30'** having an insertion portion **5** and a locking groove **6**, creating a portion into which an insertion portion **L** for preventing the unit blocks **B** of an adjacent panel **A** from alienating from or getting close to each other by interlocking unit blocks **B** of the adjacent panel **A**, is inserted;

connecting elements P' inserted into the throughholes **2** in a state in which the plurality of unit blocks B are vertically stacked; and

connecting means **12'** engaged with one end of the connecting element P' and connecting the stacked plurality of unit blocks B with one another.

17. The panel of claim 16, wherein the fixture element L is in a bottom-opened rectangular (□) shape.

18. The panel of claim 16, wherein the insertion portion **5** is formed at lower edges of either side of the unit block B in such a way as to be opened downward and laterally, and the locking groove **6** has substantially the same shape with that of the insertion portion **5** the locking groove **6** having a horizontally elongated, elliptical groove **6a** extending downward so that both ends of the fixture element L are inserted thereinto to be hooked thereon.

19. The panel of claim 18, wherein the insertion portion **5** and the locking groove **6** are configured to extend in a front-to-rear direction toward outside.

20. The panel of claim 16, wherein a closely adhering surface **31**, to which a support plate S of a clamp C for fixing adjacent panels by locking the fixture element L is closely adhered, is formed at either side of the rear surface **20** of the unit block B.

21. A method for constructing a reinforced earth retaining wall using a prefabricated panel, comprising:

assembling panels such that unit blocks B, formed at factories, are assembled using connecting elements P' and connecting means **12'**;

transporting panels and placing the same on a footing of the retaining wall, and interlocking the panels A such that a fixture element L is inserted into a locking groove **6** through an insertion portion **5** formed on a unit block B forming each panel A, and a temporary fixing clamp C is locked on the fixture element L and tightened by a nut N in the rear of the panel A, thereby maintaining an interlocked state between the panels;

sequentially resting another panels A on the panels to interlock adjacent panels using the fixture element L in the same manner as in the interlocking step, and arranging reinforcement members in a horizontal direction in the rear of the panels A; and

applying a reinforced earth structure over the horizontally arranged reinforcement members and compacting.

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