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(54) Improvements for ports with mooring point servicing posts

(57) Disclosed are docks for ports, of the type which comprise multiple elements (1) in the form of floating concrete caissons connected to one another, characterized by the arrangement, at the lateral edges of each of the elements (1) constituting the dock, of individual incorporated galleries (8,8') which pass along the dock

and which carry the pipes, tubes, and conductors (9,9', 10,10',11,11') for the various services for the mooring points, the interior of the galleries (8,8') being accessible at any point in their length for the incorporation, at the desired point, of vertical posts (15,16,17) connected rigidly to the dock and carrying the connections for servicing the various mooring points.

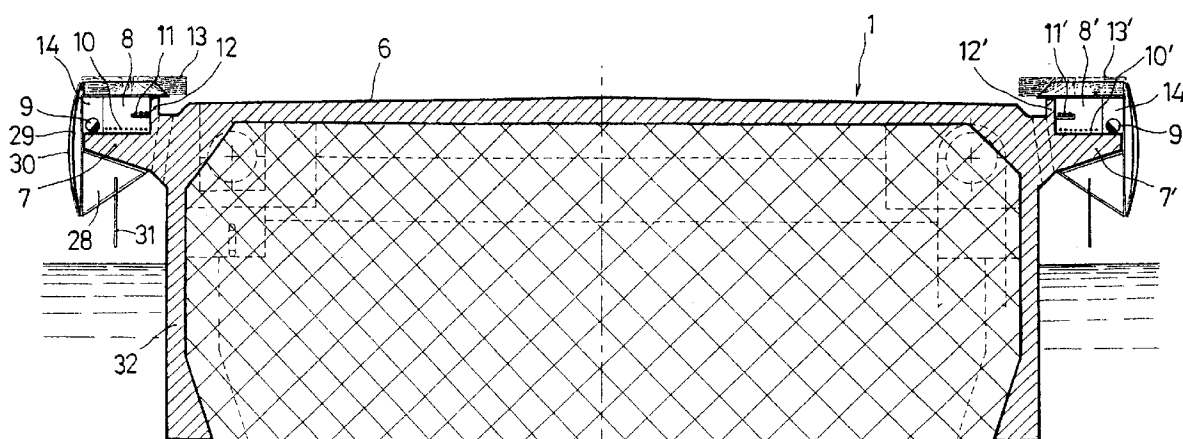


FIG.3

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Description

The present invention is intended to make known certain improvements to docks for ports, which improvements have notable characteristics of novelty and inventive activity in relation to what is currently known in this sector.

The improvements to which the present invention relates will be especially applicable to docks of the so-called "floating" type, that is those which are made up of a series of floating elements in order to maintain a constant level in relation to the surface of the water, something which is especially necessary in the case of ports with a substantial tidal influence, with consequent variations in water level.

The improvements to which the present invention relates are especially intended to solve the problems which currently arise in docks at the connecting points for services at the mooring points, for example power sockets and connections for drinking water, although others might also be included such as conductors for a sound system, fibre optic conductors, etc. In particular, the present improvements make provision for the specific construction of the lateral edges of the upper part of the elements constituting the docks in such a way that they have incorporated in them specific galleries which carry the various electrical conductors, tubes, etc. for supplying water, low-voltage current, telephony, television and other services and constitute galleries which are accessible from the upper part in order to permit the connection of posts at the desired places in the said galleries, which posts are intended to provide link-up points for the various systems contained in the aforesaid galleries at a suitable height above the level of the dock in order to allow the connections to the various services to be made in a convenient and practical manner.

The present improvements will be especially applicable to docks constituted by means of concrete elements in the form of caissons in which there will be arranged, on both lateral edges, individual cantilevers, preferably angular in shape, which are closed at the top by workable elements, such as decorative wood resistant to the effect of the sea, and will be closed at the front by a metal structure which will provide a buffer zone for the vessels and which, moreover, will have a specific structure by means of lower deflectors intended to absorb the swell which may be set up inside the port for natural reasons or as a result of the actual manoeuvres of the vessels, thus avoiding splashes of water on the upper part of the docks themselves.

The present invention may also be put into practice by means of detachable elements carrying the service galleries, which elements are formed separately in relation to the floating modules of the dock, being attached subsequently at the lateral edges of the said modules in order to achieve the desired function. In a preferred embodiment, the said elements may be constituted by means of extruded metal profiles made of aluminium,

thus constituting a number of galleries carrying the conducting tubes and cables for connection to the special posts for servicing the moorings. At the same time, the said detachable elements will carry profiles for connection to the lateral edges of the docks, and also anti-swell deflectors and, possibly, belaying cleats for mooring vessels.

By implementing the present improvements, it will be possible to manufacture floating docks with all the installations incorporated for the purpose of servicing any point along the dock and on both sides of the latter, thus making it possible to vary the arrangement of the mooring points, etc. without any problem for the new and rapid positioning of the posts or vertical elements for the connection of the various services.

For the sake of better comprehension, there are attached, as an explanatory but non-limitative example, a number of drawings of a floating dock which incorporates the improvements to which the present invention relates.

Figure 1 shows a plan view of part of a floating dock which incorporates the present improvements.

Figure 2 is a view in lateral elevation of the same part of a floating dock.

Figure 3 shows a transverse section of the floating dock along the indicated section.

Figure 4 shows an elevational view, with partial sections, of a floating dock element produced in accordance with the present improvements.

Figure 5 shows a partial view of the same floating dock element.

Figure 6 shows a representative elevational view, in diagrammatic form, of a connecting post in accordance with the present improvements.

Figure 7 is a detail, in section, of the connection zone of a services post on a dock which incorporates the present improvements.

Figure 8 is a view similar to figure 7 in the event of connection to a service gangway or "finger".

Figure 9 is a transverse section through a dock element provided, at its lateral edges, with galleries produced by means of one or more extruded profiles.

Figure 10 shows an elevational view, with partial sections, of the embodiment in figure 9.

Figure 11 shows a transverse section, in detail, through a gallery produced on the basis of extruded elements and connected to a dock element.

In the dock which has been represented in figure 1, there can be seen a modular element of the said dock which is represented, in a general way, by the numeral -1- and which adopts the general structure of a caisson of very elongated parallelepipedal shape, which is preferably made of concrete and is of the type to which there may possibly be connected various lateral mooring gangways or "fingers" such as those represented by the numerals -2-, -3-, -4- and -5-.

As can be perceived from figure 3, the element -1- comprises an upper plate -6- which determines the main

transit zone of the dock and, in accordance with the present improvements, has individual lateral cantilevers -7- and -7'- which are preferably made from the same mass as the dock element -1- itself, that is to say in a totally incorporated manner, thus determining individual channels or galleries -8- and -8'- intended to comprise the various conductors, tubes, etc., for the dock's services. There have been diagrammatically represented, for example, tubes -9- and -9'- for the distribution of water, and various conductors such as -10-, -10'- and -11-, -11'-. As a whole, the said conductors and tubes will be intended to supply any point on both lateral edges of the dock elements with all the services it requires, such as an electrical supply at various voltages, telephone cables, television, fibre optics cables, water, compressed air, etc.

According to the present improvements, the galleries -8- and -8'- will preferably be determined by means of the cantilevers -7- and -7'- and of the walls -12- and -12'- which are arranged at right angles in relation to the said cantilevers, closure of the galleries preferably being effected by means of wooden covers at the upper part, which are indicated by the numerals -13- and -13'-, and by metal frontal closing structures -14-, -14'- fitted and fixed to the cantilevers -7- and -7'-.

As will be understood, the service galleries -8- and -8'- could be produced in a different way to the one shown, the only thing that is essential being their incorporation in the sides of each of the elements making up the floating dock.

One of the important features of the present improvements which result from the application of the latter, is the possibility of incorporating the various service posts, which are indicated in figure 2 by the numerals -15-, -16- and -17-, at any point, or at least with a wide capacity for variation, along the dock element. Figure 4 shows the service post -17- which will carry, in the conventional way, various connecting elements for servicing the mooring points and is incorporated on one wooden element -18- of the group of covering elements, on one or other side, which have been previously indicated by the numerals -13- and -13'-. In this way, the changing of the position of the posts is facilitated by simply changing the wooden element on which they are incorporated.

The post -17- is shown diagrammatically in figure 6, in which there can be perceived, in diagrammatic form and by way of an example, a possible speaker grille -19- at the upper part, various sockets such as -20- and -21- and other controls or accessory elements such as -22- and -23-, service taps -24- and -25-, auxiliary structures -26- and -27- for coiling hoses or other elements, etc.

As can be perceived from the detail in figure 7, the frontal closing structure -14- may comprise a vertical plate fitted to the front end of the cantilever -7- with lower brackets -28- for imparting rigidity and assisting in the fixing of the metal structure which will carry a frontal shield -29- which may possibly be provided with an elas-

tic buffer-type covering such as neoprene or the like -30-. At the bottom, the structure -14- will carry a deflecting plate -31- which is preferably arranged vertically and determines, together with the lateral wall -32- of the dock element, an intermediate chamber -33- in which the effect of the swell generated in the port itself for various reasons will be absorbed.

Figure 8 represents a similar arrangement, in which the auxiliary gangways or "fingers" such as -35- will be articulated in the front plate -34- of the closing structure.

In the version shown in figures 9 to 11, the concrete elements of the dock, one of which is indicated by the numeral -36-, have on their lateral edges individual detachable galleries which are produced in a separate or detachable manner in relation to the dock element. The said galleries have been indicated, as a whole, by the numerals -37- and -38-. As can be observed in the said figures, the elements constituting the gallery are formed by extruded profiles, preferably made of aluminium, which are associated, as a group, with the edges of the dock. As can be observed in the transverse section in figure 11, one of the said galleries comprises a main extruded element -39- which will determine, in a single piece and by the extrusion method, a central cavity -40- with possible partitions -41- in order to support conductors -42- of a different kind and a bottom or floor -43- intended to support the pipes -44-, with a shape similar to the embodiment made of cast concrete. The floor -43- will preferably have a groove -45- for the introduction of a combined rib on the anti-swell deflector -46- which will be incorporated in a fixed manner, similar to the concrete embodiment previously explained. An extruded profile -47- fitted to the upper floor -48- of the dock will permit the connection of the wooden planks -49- intended to close, at the top, the junction between the detachable gallery and the dock. The main profile -43- will be joined to a profile of substantially right-angled shape -50- intended to be connected at the corner of the lateral edge of the dock element. The profile may be extruded in a single piece or in various pieces of smaller dimensions. In this latter case, the union may be produced by means of welding, screw-type connections or specific corrugations arranged for this purpose. The union between the main tubular element -43- and the profile -50- and also, possibly, the anti-swell plate -46-, may be produced by welding.

Claims

- Improvements to docks for ports, of the type which comprise multiple elements in the form of floating concrete caissons connected to one another, characterized by the arrangement, at the lateral edges of each of the elements constituting the dock, of individual incorporated galleries which pass along the dock and which carry the pipes and tubes for the various services for the mooring points, the interior

of the galleries being accessible at any point in their length for the incorporation, at the desired point, of vertical posts connected rigidly to the dock and carrying the connections for servicing the various mooring points.

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2. Improvements to docks for ports according to claim 1, characterised in that the various galleries are produced in a manner integrated into the lateral edges of the dock elements in the actual concrete constituting the dock element. 10

3. Improvements to docks for ports according to the preceding claims, characterised in that the incorporated galleries are constituted by cantilevers projecting from the zones of the lateral edges of each dock element, with an upper partition acting as one of the lateral walls and with demountable wooden upper closing elements for upper closing and a metal closing structure at the front face which, at the same time, carries the buffer-type zone for the mooring of vessels, and swell-absorbing deflectors. 15
20

4. Improvements to docks for ports according to claim 3, characterised in that the structures for closing the sides of the service galleries have front closing walls provided with elastic buffer-type coverings and lower partitions arranged vertically and acting as swell-absorbers. 25
30

5. Improvements to docks for ports according to claim 1, characterised in that the lateral galleries for the services are constituted by extruded aluminium elements which determine the cavities for the incorporation of the conductors and tube systems of the services, the said elements being installed in an integral manner in the lateral edges of the dock elements. 35

6. Improvements to docks for ports according to claim 5, characterised in that the detachable galleries are constituted by a central extruded element of substantially prismatic shape, which determines the internal passages for the service tube conductors and pipes, the said element being joined laterally in an integral manner to a profile in the form of a right angle which can be fitted to the corners of the blocks of the dock and, by its bottom part, to a dihedral laminar element determining the anti-swell deflector partition. 40
45
50

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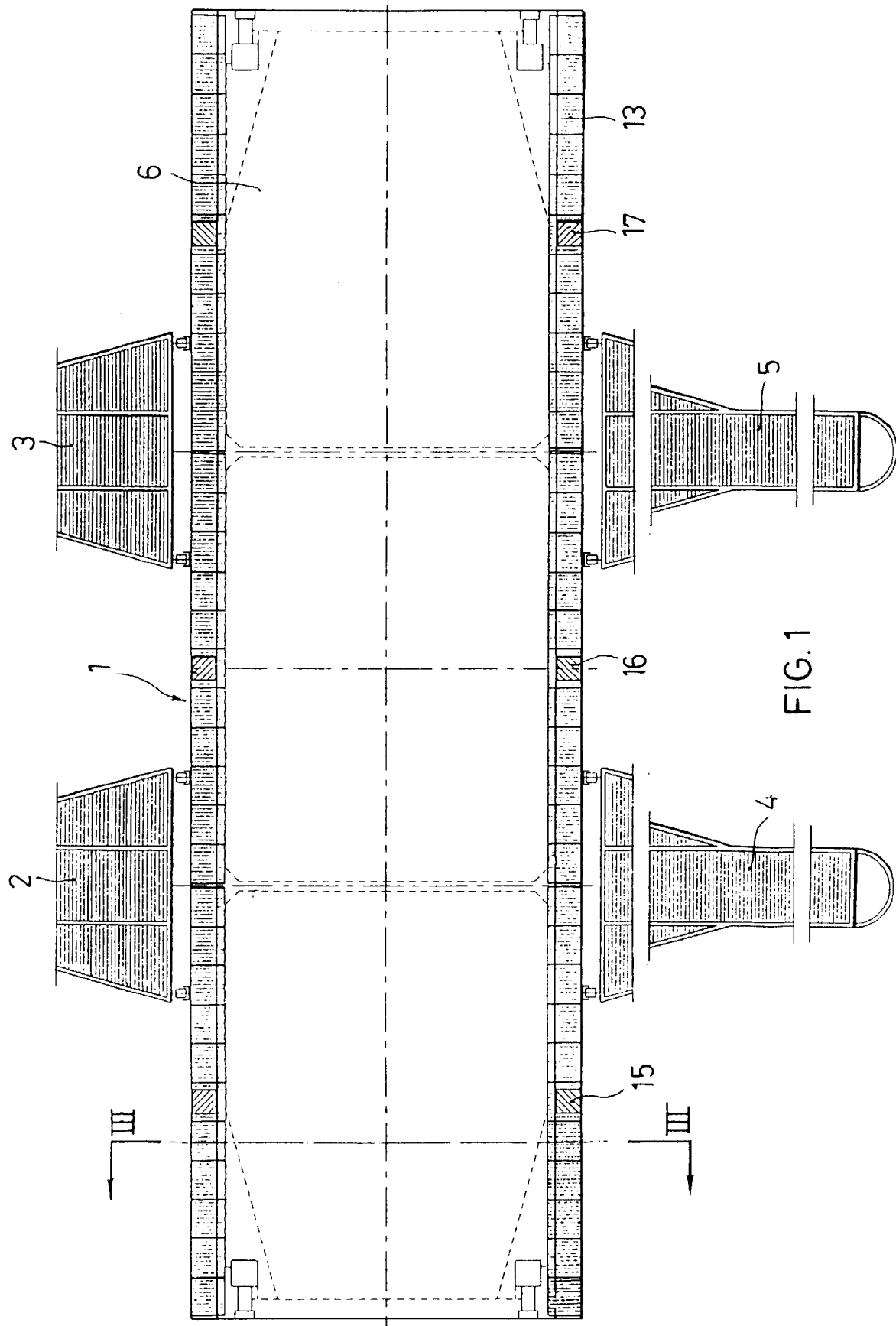
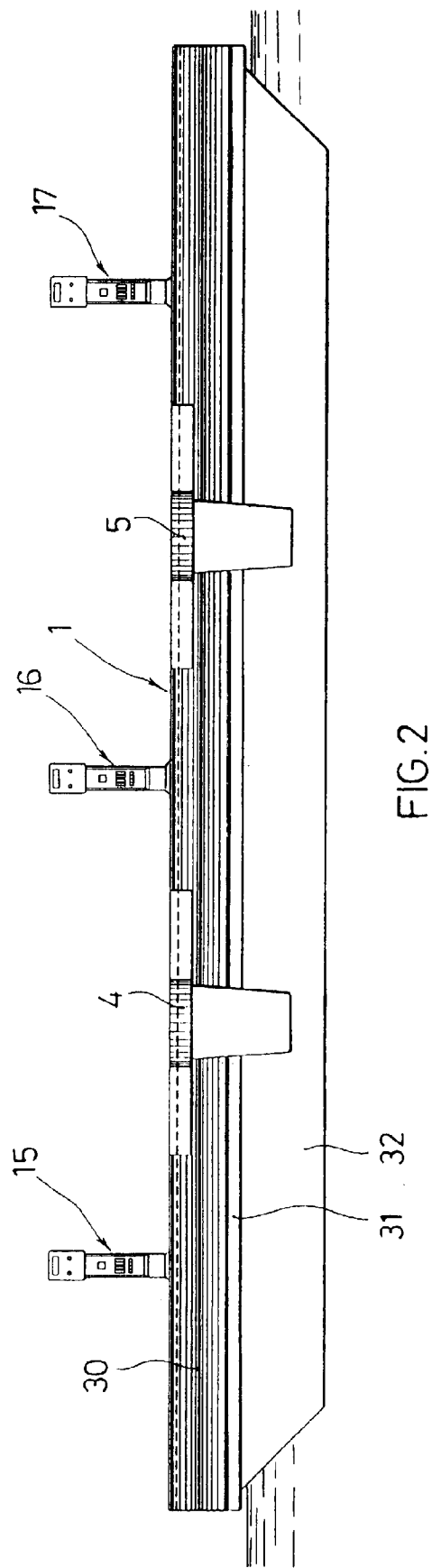


FIG. 1



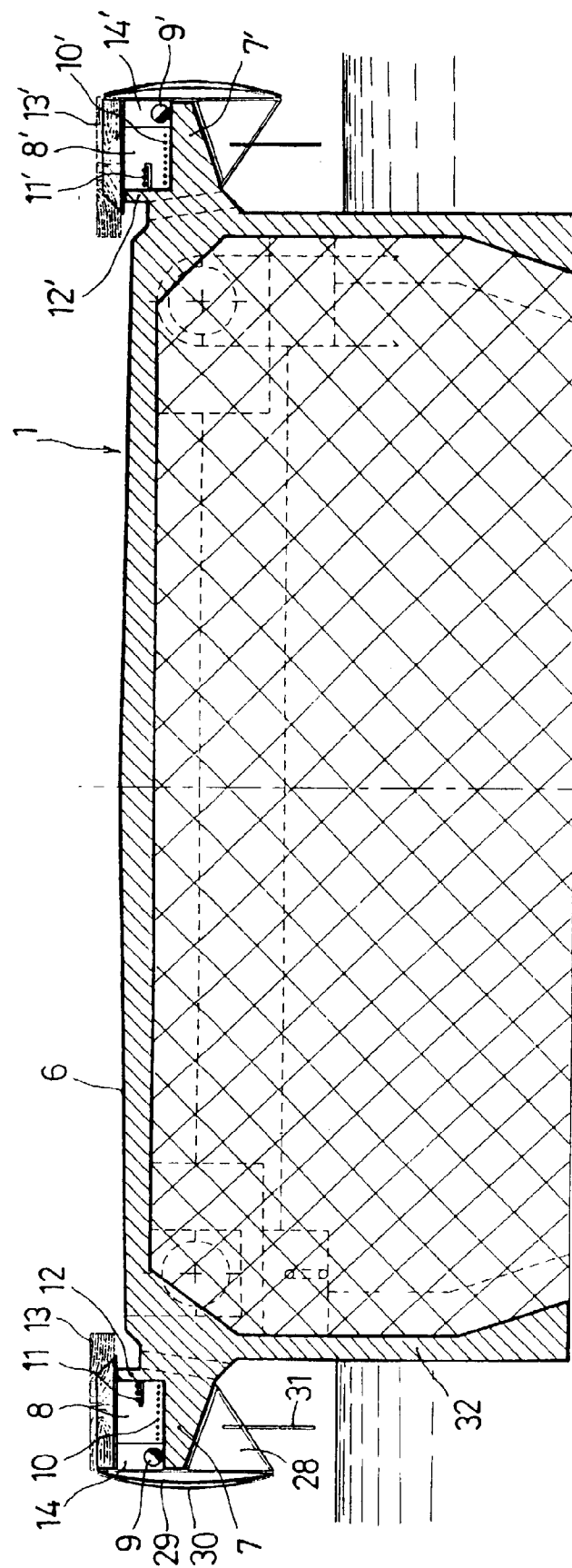


FIG.3

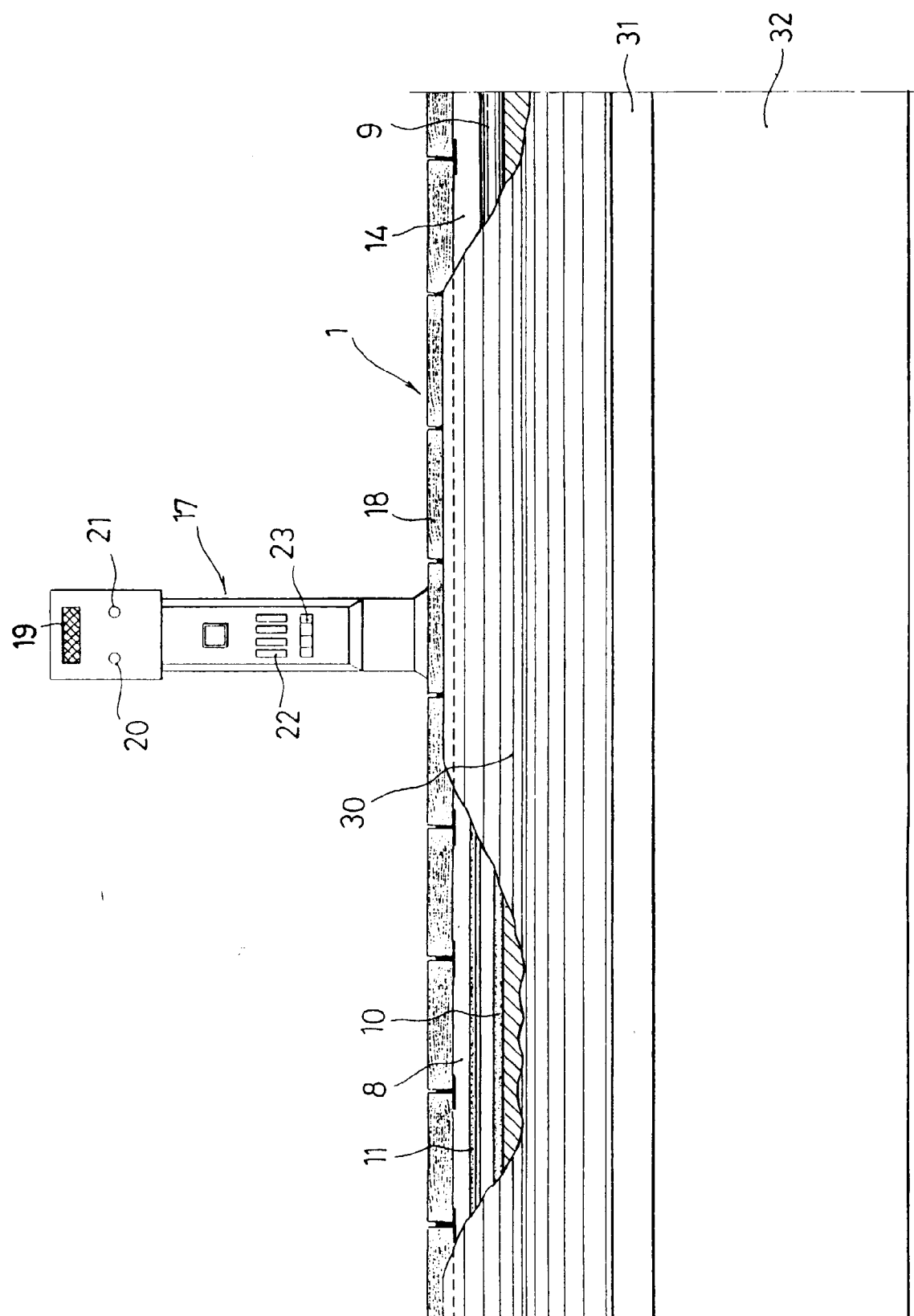


FIG. 4

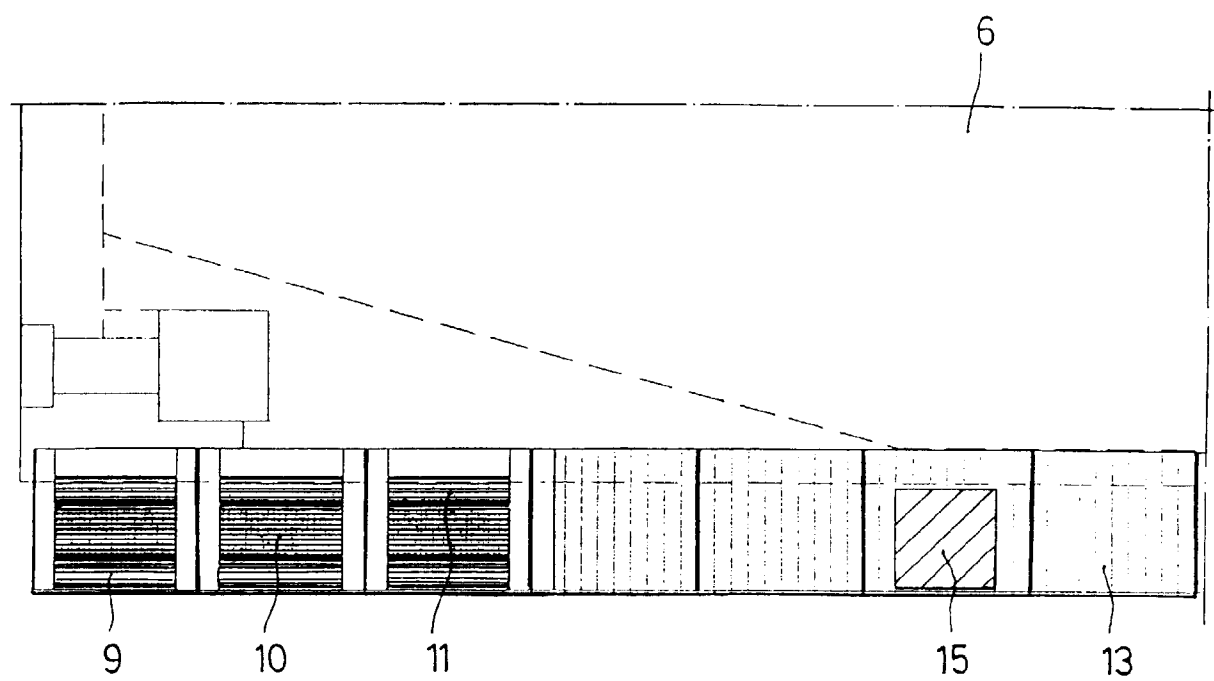


FIG. 5

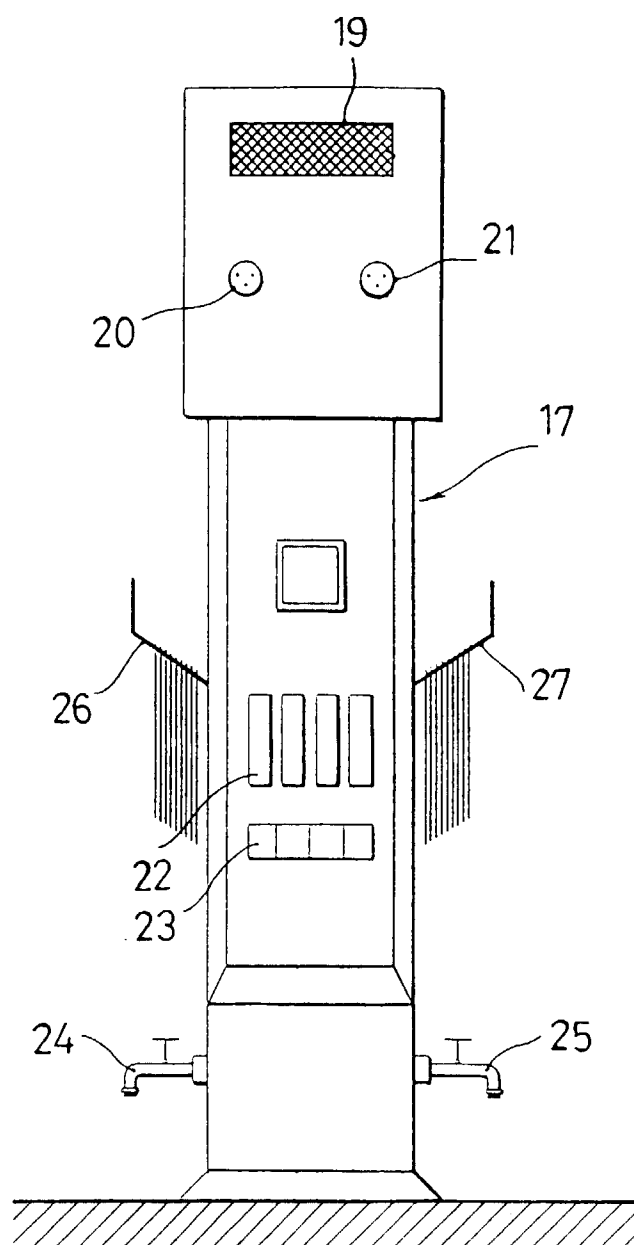


FIG. 6

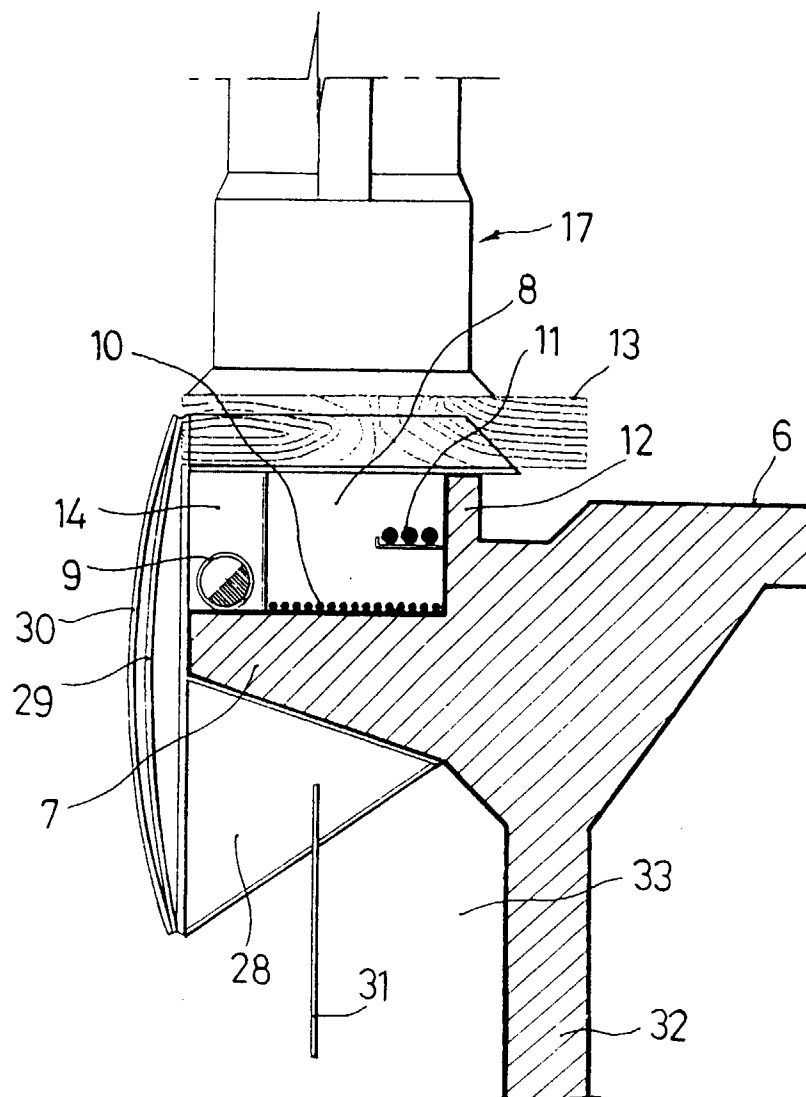


FIG. 7

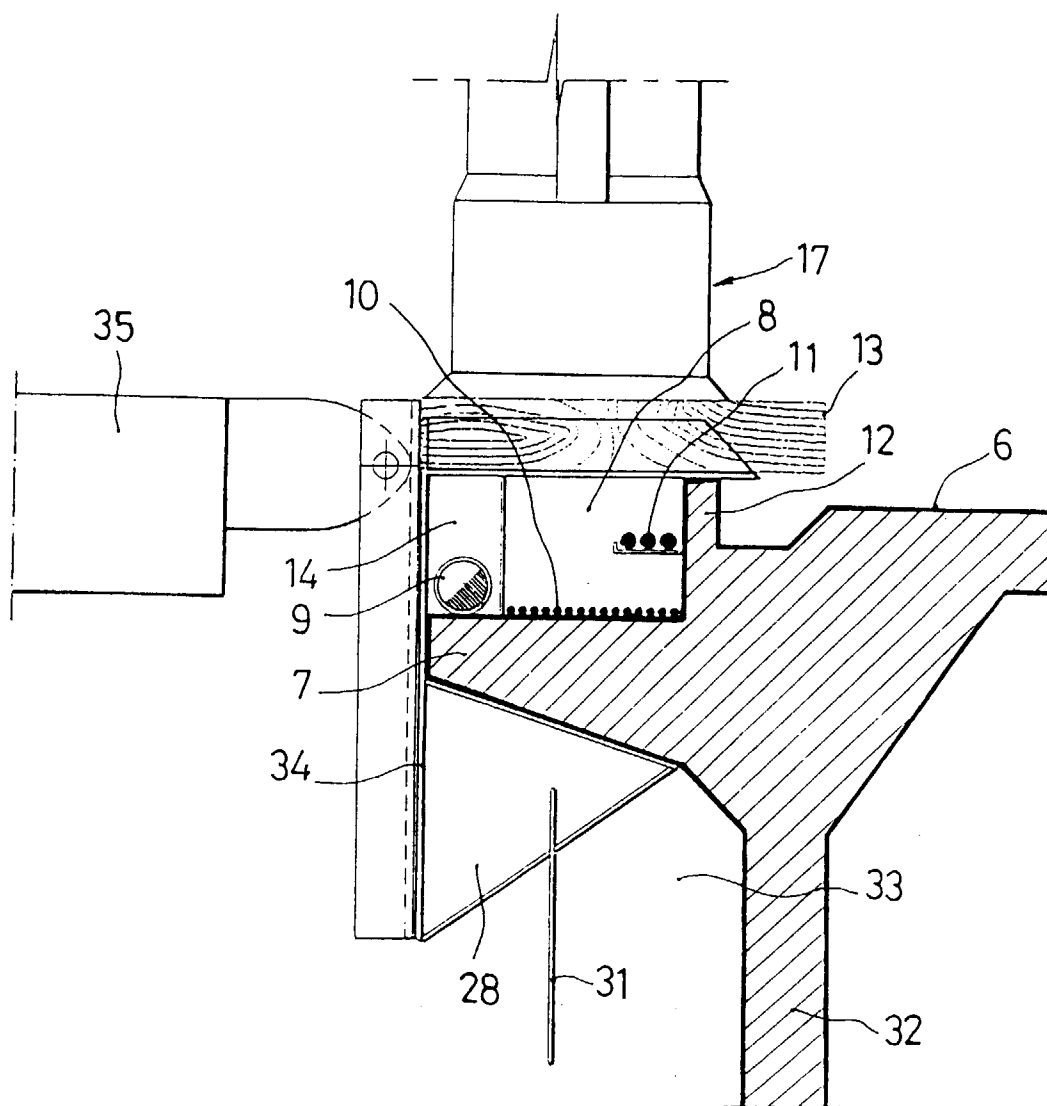


FIG. 8

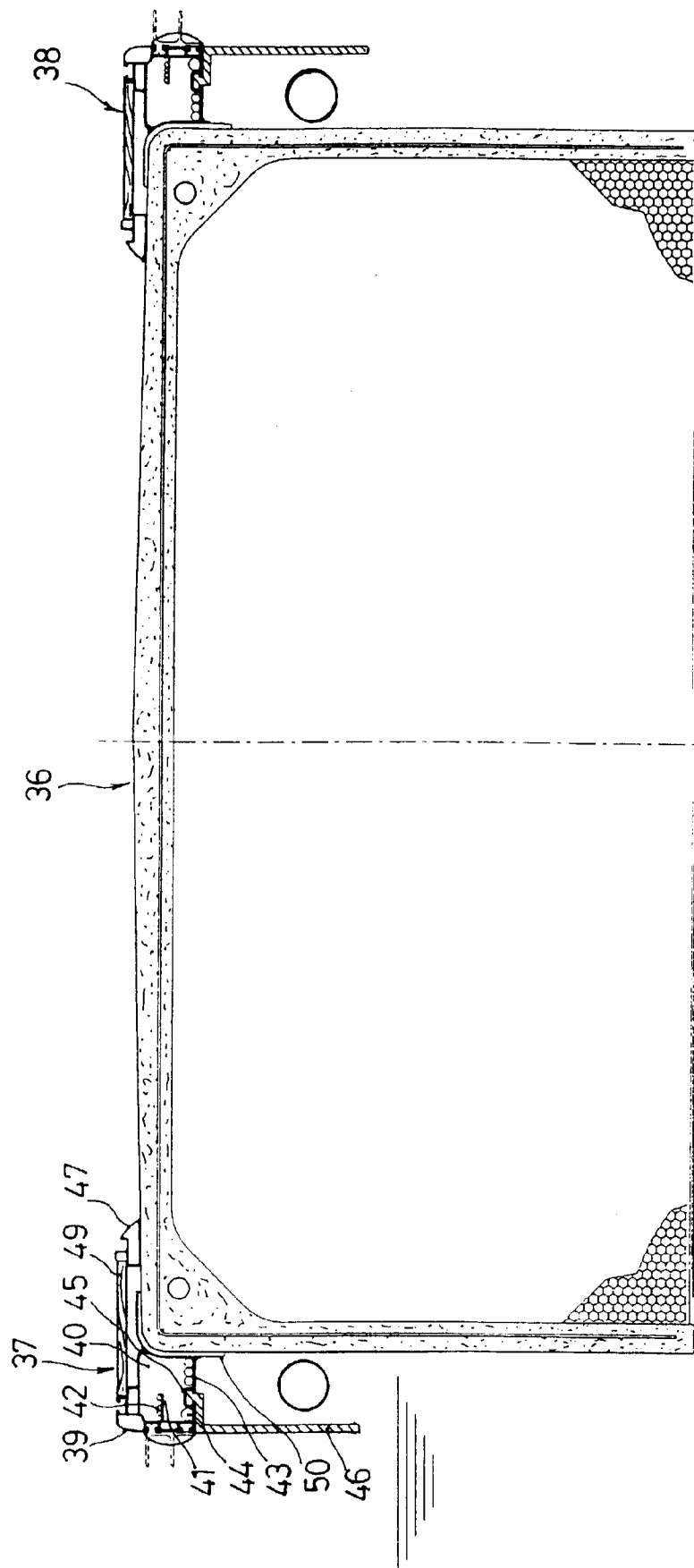


FIG. 9

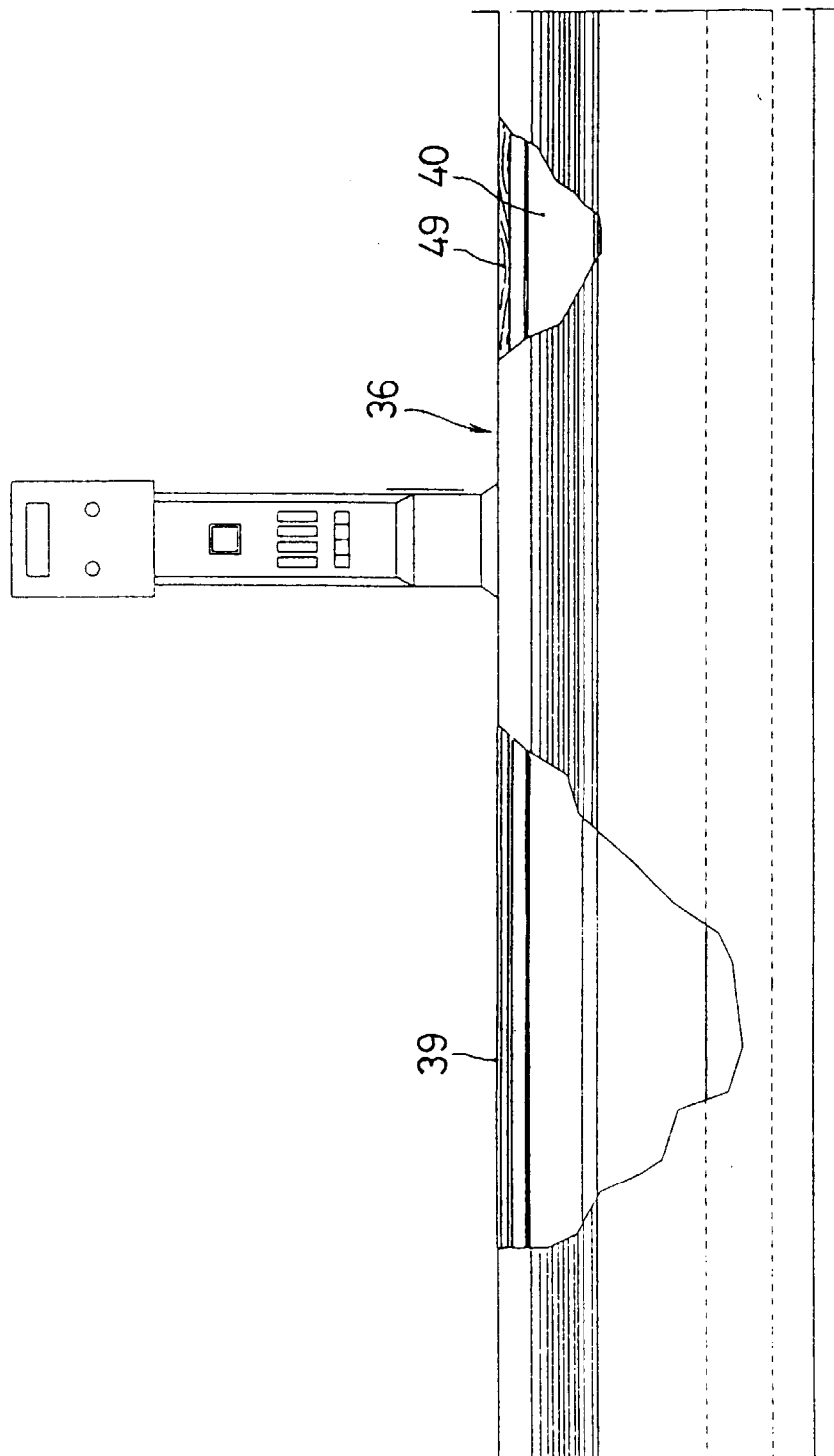


FIG. 10

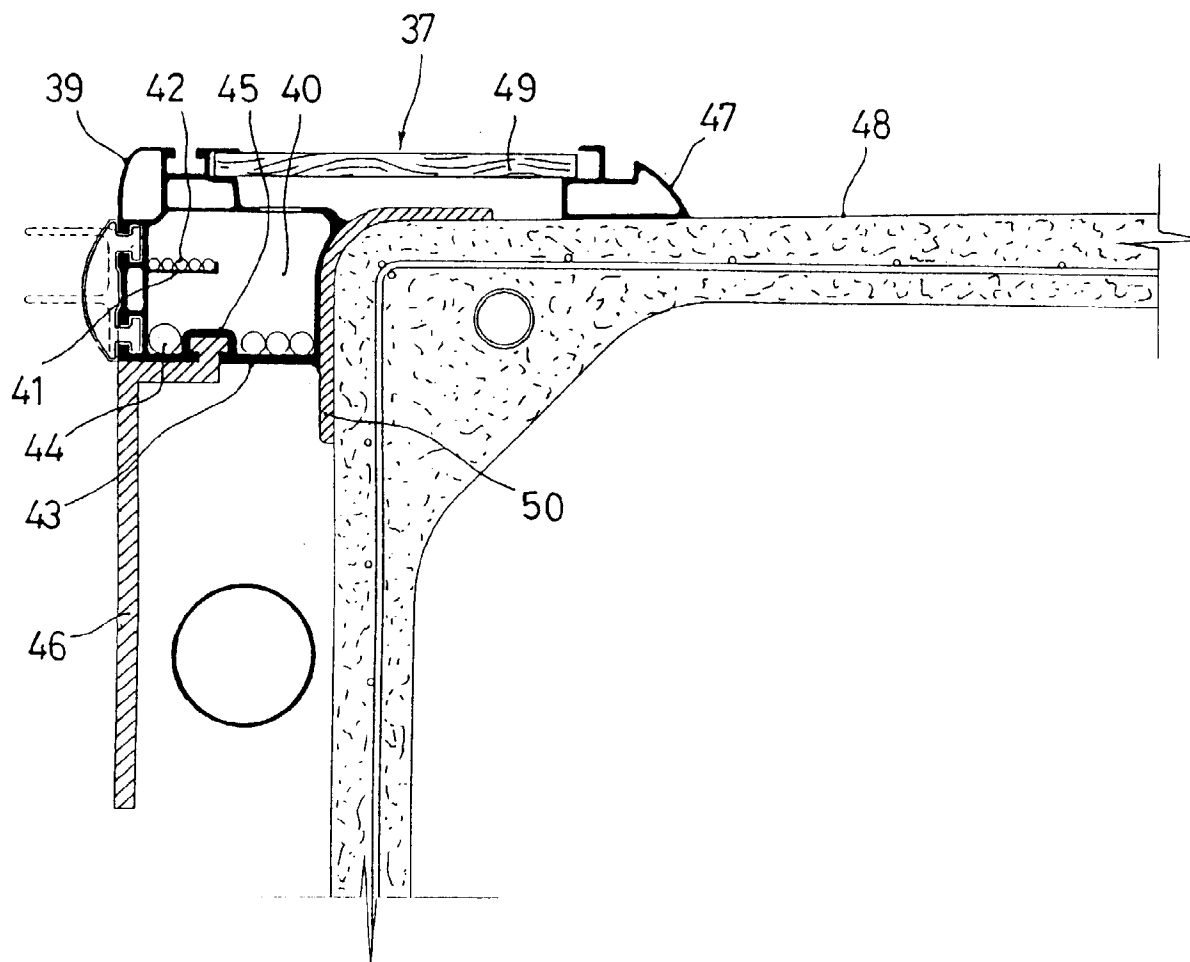


FIG. 11