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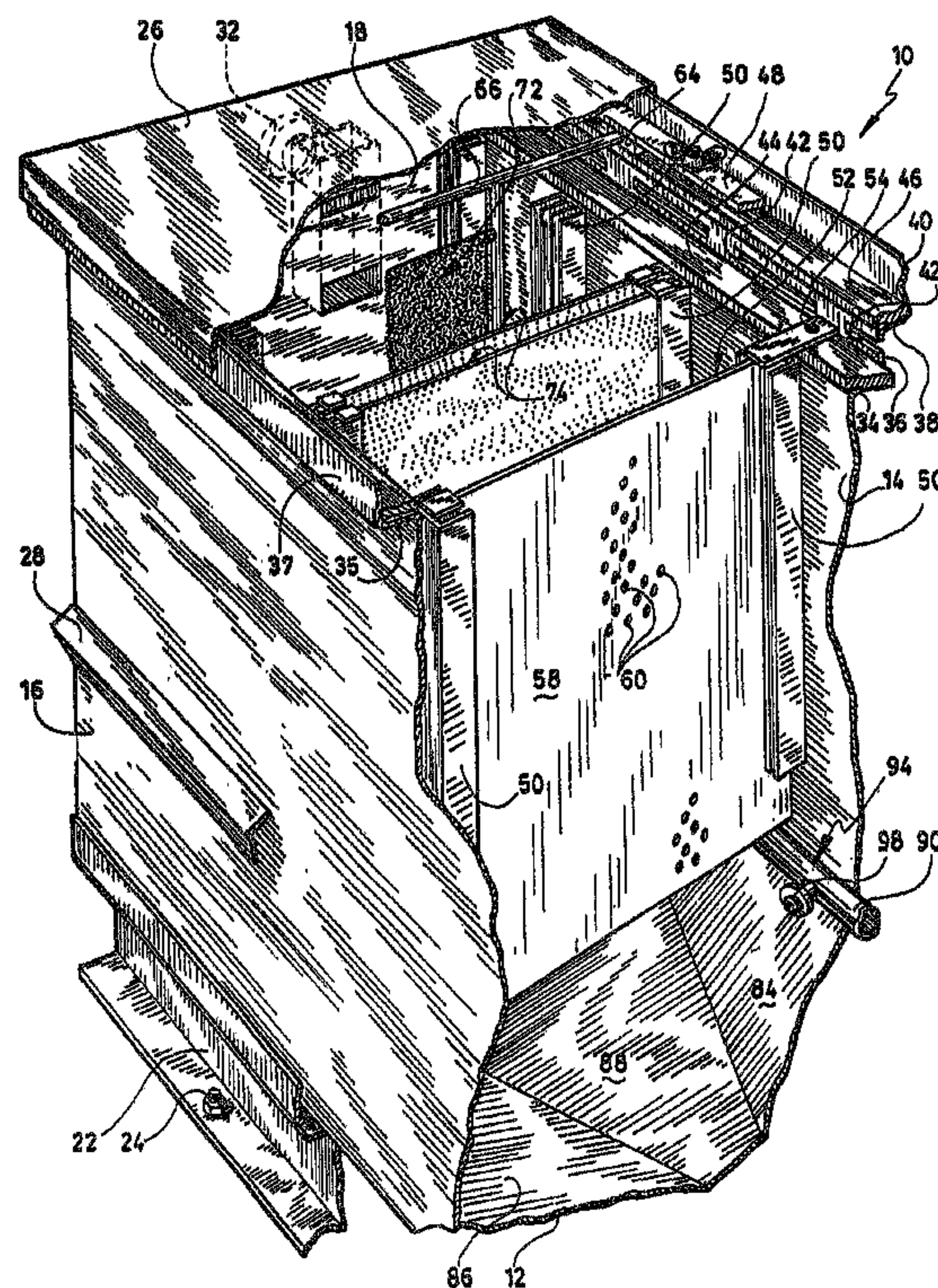
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(54) Title: ELECTROLYTIC CELL



(57) Abrégé/Abstract:

There is provided an electrolytic cell suitable for use in recovery of precious non ferrous or ferrous metals, the cell having a cell body of a substantially rectangular configuration, a plurality of alternating anodes and cathodes with a separator interposed between the alternating anodes and cathodes, the anodes, cathodes and separators being spaced from the floor of the cell, the cell floor having slopes from both the side and end walls extending to a drain in the floor, and multi-directional jets located near the cell floor for directing sediment to a drain.



## ABSTRACT

There is provided an electrolytic cell suitable for use in recovery of precious non ferrous or ferrous metals, the cell having a cell body of a substantially rectangular configuration, a plurality of alternating anodes and cathodes with a separator interposed between the alternating anodes and cathodes, the anodes, cathodes and separators being spaced from the floor of the cell, the cell floor having slopes from both the side and end walls extending to a drain in the floor, and multi-directional jets located near the cell floor for directing sediment to a drain.



The present invention relates to electrolytic cells and more particularly, relates to improvements in electrolytic cells suitable for the recovery of precious non ferrous or ferrous metals.

10 Electrolytic cells are well known in the art and have been used for many different purposes throughout the years. Recently, improved processes for the recovery of metals such as gold have involved the use of electrolytic cells as part of the carbon in pulp process for replacement of the old Merrill Crow Process. One of the advantages of the processes used is the elimination of pollution.

It is an object of the present invention to provide an improved electrolytic cell having minimum maintenance and maximum operation duty requirements and which is suitable for use in the recovery of precious non ferrous or ferrous metals.

20 According to one aspect of the present invention, there is provided an electrolytic cell having a cell body of a substantially rectangular configuration, a plurality of alternating anodes and cathodes, a separator intermediate each anode and cathode, means for supplying electric current to the anodes and cathodes, a sloping floor spaced from the bottom of the anodes and cathodes, the sloping floor leading to a drain, and spray means for directing sediment to the drain.

In greater detail, the electrolytic cell is preferably of a conventional generally overall rectangular configuration having a pair of opposed side walls, a pair of opposed end walls, a base or floor, and a cover member. The



cell may be formed of known suitable materials; in a preferred embodiment, it is formed of a glass fiber reinforced material such as plastic. If required, reinforcing members may be employed to add greater strength to the structure. The cell, depending upon the structure, may either sit directly on the floor or on a suitable support member.

The interior of the cell has, in a conventional manner, a plurality of alternating spaced anodes and cathodes. However, the present invention provides a system of slides such that ready access may be had for maintenance and replacement.

In a preferred embodiment, slide members are provided on the opposed side walls for receiving the anodes, cathodes and separators (which are interposed between the anodes and cathodes). The slides may either be formed integrally with the side walls or alternatively, they may be formed as a separate unit suitable secured to the side wall. The slides will consist of a groove formed therein to receive the anode, cathode or separator as appropriate.

Many types of anodes are known and conventionally in electrolytic cells of the type discussed herein, the anodes are formed of a wire mesh. However, according to the preferred embodiment of the present invention, the anode is formed of foraminous sheet metal which has been found to function substantially better than the wire mesh. The anode, in the form of the sheet metal, may have a frame member on opposed sides thereof adapted to fit within the slide as previously discussed. Also, at the top, there is provided a



contact member adapted to engage a bus bar for supplying current thereto and a support member.

The cathode, in the preferred embodiment, is formed of a steel wool within a suitable frame. The steel wool may be either stainless (in which the gold falls off) or non stainless in which case the steel wool is destroyed for recovery of the gold. The frame member will fit within the slide on the sides of the cell walls. Also, the frame member will include a contact portion for engaging the bus bar for supplying current thereto as well as a support portion as will be described in greater detail hereinbelow.

Interposed between each anode and cathode is a separator. Each separator is encased in a frame member and is formed of a suitable material such as a polypropylene. Thus, one may have a sheet polypropylene material with a frame of polypropylene adapted to fit within the slides. Support members are provided as will be discussed hereinbelow.

The above described members (anodes, cathodes and separators) are all designed to sit above the base or floor of the cell to leave a space therebetween. The floor is provided with a double slope to a drain portion formed therein. In other words, the base or floor slopes from one end to the other while it also slopes downwardly from the side walls or at least one of the side walls.

Located adjacent to the side walls are fluid supply means for supplying water or other fluid which are directed out through multi-directional nozzles mounted therein to remove sediment from the floor and towards the drain.



The cell will include suitable inlet and outlet means for the fluid and a cover member is also provided.

Having thus generally described the invention, reference will be made to the accompanying drawings, illustrating an embodiment thereof, in which:

Figure 1 is a perspective view, in partial cutaway, of an electrolytic cell;

Figures 2A, 2B and 2C are side elevational views of the cathode, separator and anode elements respectively;

Figure 3 is a perspective view of the exterior of an electrolytic cell;

Figure 4 is a side elevational view of the spray system in the electrolytic cell;

Figure 5 is a top plan view of the spray system of Figure 4;

Figure 6 is a sectional view of a spray nozzle; and

Figures 7A, 7B and 7C are side elevational views of the electrolytic cell showing opening of the cover member.

Referring to the drawings, there is illustrated that an electrolytic cell 10 which has a base 12 (Figure 4), opposed side walls 14 and 16, and opposed end walls 18 and 20 to provide an overall rectangular configuration. Cell 10 has a cover 26 and the cell may be mounted on a suitable support member 22 which is secured to the floor by bolts 24. A reinforcing frame member 28 extends about the periphery of the cell walls as may be seen in Figure 1.

As may be seen from Figure 4, an inlet 30



is provided in end wall 20 with outlet 32 being provided in end wall 18.

Side wall 14, at its upper portion, extends outwardly to provide a first ledge 34. An upper vertical portion 36 joins the end of ledge 34 to extend horizontally to provide a second ledge 38. A vertically extending flange 40 extends from second ledge 38. As may be seen from Figure 1, a plurality of venting apertures 42 are provided in vertically extending wall 36.

10        Mounted on ledge 34 is a bus bar 44 which is connected to the positive terminal of an electrical supply means (not shown). A bus bar 46 is connected to the negative supply terminal. Bus bar 46 is held in position by means of a contact bar 48.

20        The materials used, as previously mentioned, may be various types of plastic materials. Particularly at the bus bar area, it is desirable to use an insulating material such as a glass fiber reinforced composite to reduce and/or minimize the potential damage to the fiber reinforced plastic from excessive heat generated by electric current going through the bus bars.

      Mounted on side walls 14 and 16 are guides generally designated by reference numeral 50. Guides 50 are adapted to provide for ease of access to the interior members of the cell as discussed hereinbelow.

      Mounted within guides 50 are anodes 52, cathodes 62 and separators 74. The structure of each of these elements is shown in greater detail in Figures 2A, 2B and 2C and will now be referred to.



Anode 52 is formed of a sheet 58 of a suitable material such as stainless steel 1/8" thick. A plurality of apertures 60 are provided throughout plate 58. At one upper side edge, a contact member 54 is provided while at the other upper side edge, a support member 56 is mounted. As may be seen in Figure 1, contact member 54 is in contact with bus bar 44 to maintain a positive electrical potential for anode 52.

10 Cathode 62 has a side frame portion 70 and an upper frame portion 66. A contact portion 64 is in contact with bus bar 46 while support 68 supports the other side of the cathode. Steel wool 72 is mounted over a portion of the upper frame 66.

Each separator 74, as shown in Figure 2B, has a frame 75 about the main portion 78 of the separator which consists of polypropylene approximately 1/8" thick. A plurality of apertures 78 are provided therein. At either upper side edge are support members 76 while a handle 82 is  
20 provided.

Each of anodes 52, cathodes 62 and separators 74 are sized to be spaced a distance from floor 12. As may be seen in Figure 1, extending from side wall 16 is a sloping floor portion 86 with a further sloping portion 84 extending downwardly from side wall 14. A central sloping portion 88 extends from end wall 18. Sloping portions 84, 86 and 88 all slope to a drain 89 as may be seen in Figure 3.

Mounted along the side walls and end wall is a fluid supply tubing 90 having an inlet 92 for supplying fluid



thereto and a plurality of nozzles generally designated by reference numeral 94. Nozzles or valves 94 have a rotatable joint 96 which connects to a spray head 98 which are adapted to spray the floor 12 of cell 10 to direct any sediment to drain 89.

10 Cover member 26, as may be seen in Figures 7A, 7B and 7C have a cover reinforcing member 108 to which is secured a handle 102. A spring 104 has one end secured to cover 26 with a further end secured to handle 102. As shown in Figure 7B, the cover may be partially open with handle 102 being used as a propping member to retain the cover in an open position for inspection. Further movement will permit the cover to be completely opened for access to permit removal of the components. A retaining cable 106 may be provided to limit the degree of opening of the cover.

It will be understood that the above described embodiment is for purposes of illustration only and changes and modifications may be made thereto without departing from the spirit and scope of the invention.



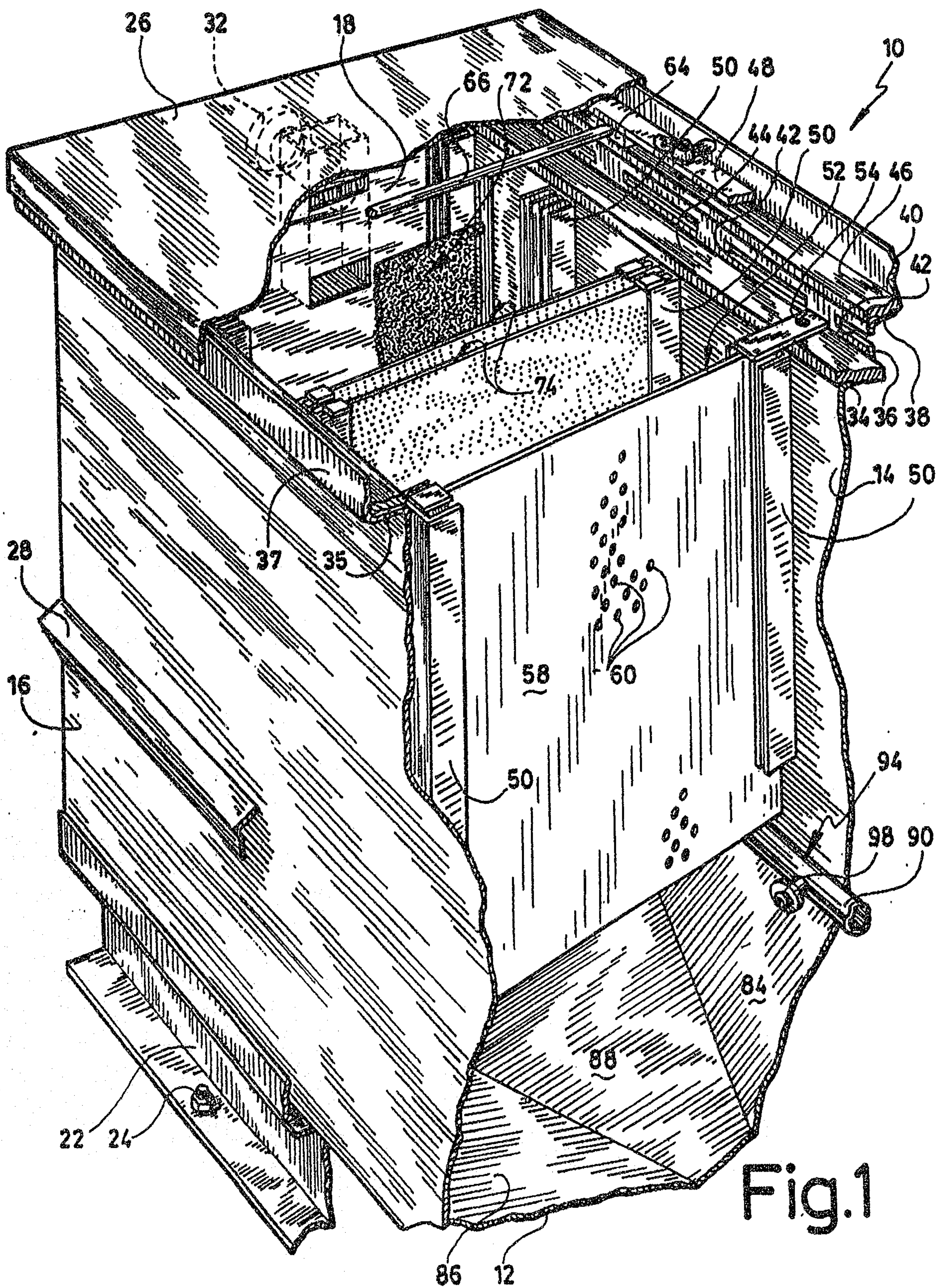
The embodiments of the invention in which an exclusive property or privilege is claimed are as follows:

1. An electrolytic cell comprising a cell body of a substantially rectangular configuration, a plurality of alternating anodes and cathodes, a separator intermediate each of said anodes and said cathodes, means for supplying electric current to said anodes and said cathodes, a sloping floor spaced from the bottom of said anodes and said cathodes, drain means in said sloping floor located proximate a low point therein, spray means to direct sediment to said drain means, and a cover member adapted to fit on the top of said cell.
2. The electrolytic cell of Claim 1 further including ventilation means providing ventilation between the interior and exterior of said cell.
3. The electrolytic cell of Claim 1 wherein said spray means are located proximate the body of said cell and the sloping floor, said spray means comprising a plurality of individual spray heads connected to fluid supply means.
4. The electrolytic cell of Claim 1 wherein said anodes are formed of a foraminous sheet material.
5. The electrolytic cell of Claim 1 wherein said cell body has a pair of opposed side walls and a pair of opposed end walls, each of said pair of opposed side walls having a plurality of guide members thereon, said guide members being adapted to receive said anodes, cathodes, and separators.



6. An electrolytic cell comprising a cell body of a substantially rectangular configuration, a plurality of alternating anodes and cathodes, a separator intermediate each of said anodes and said cathodes, means for supplying electric current to said anodes and said cathodes, each of said cathodes comprising steel wool mounted in a frame member, said frame member having a portion thereof in electrical communication with the steel wool and said means for supplying electricity to said cathode, a sloping floor spaced from the bottom of said anodes and said cathodes, drain means in said sloping floor located proximate a low point therein, and spray means to direct sediment to said drain means.







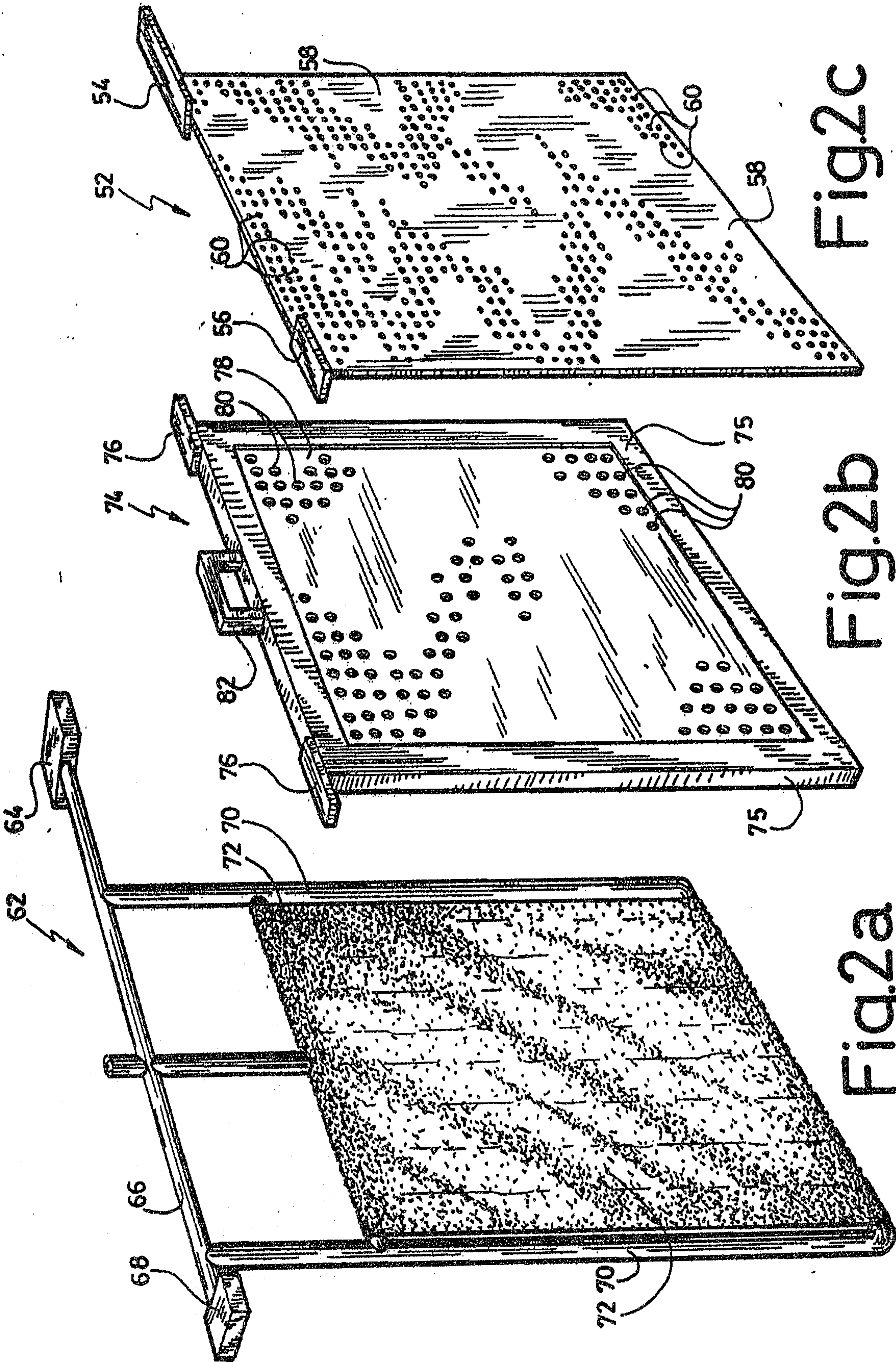


Fig.2c

Fig.2b

Fig.2a



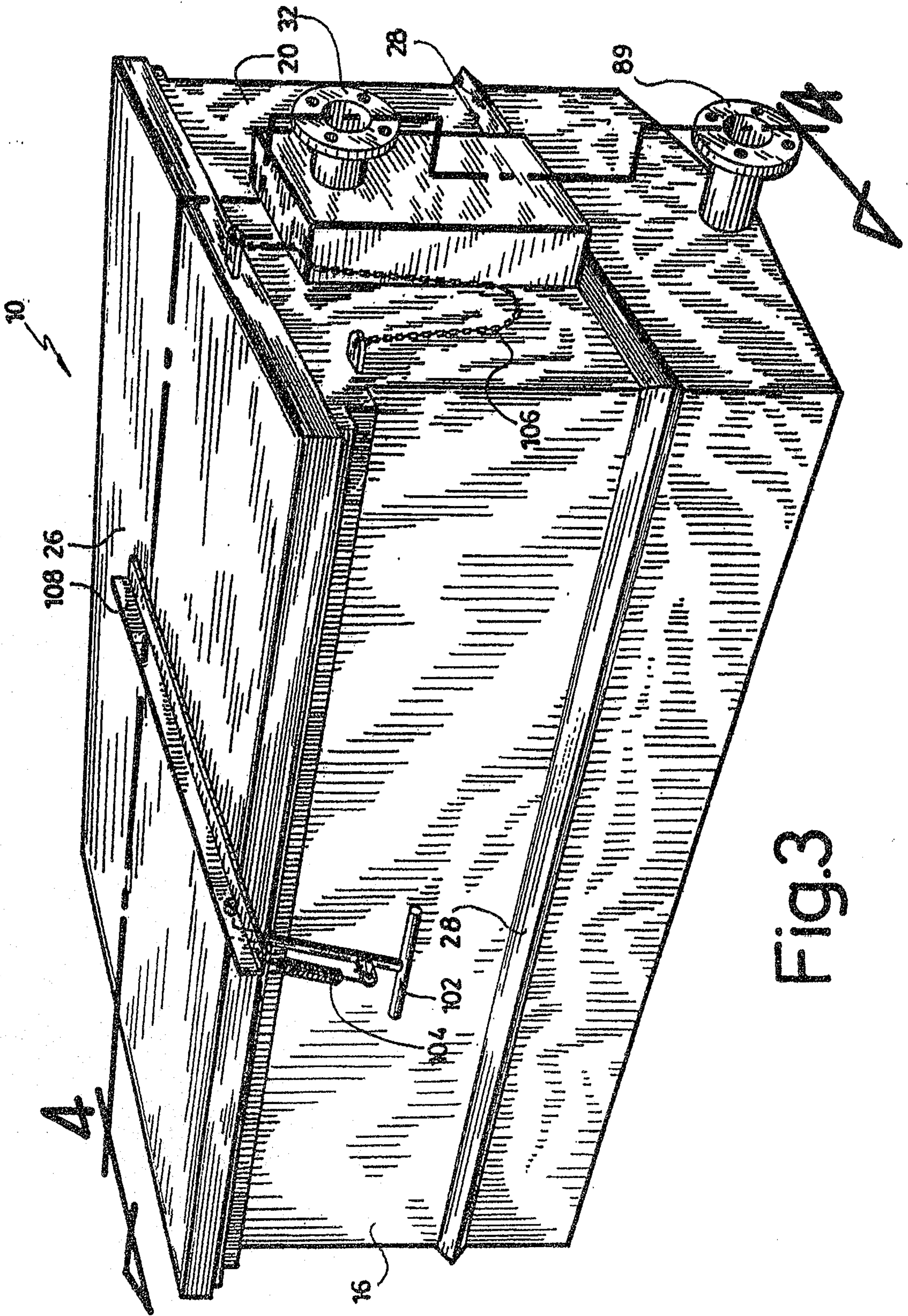


Fig. 3



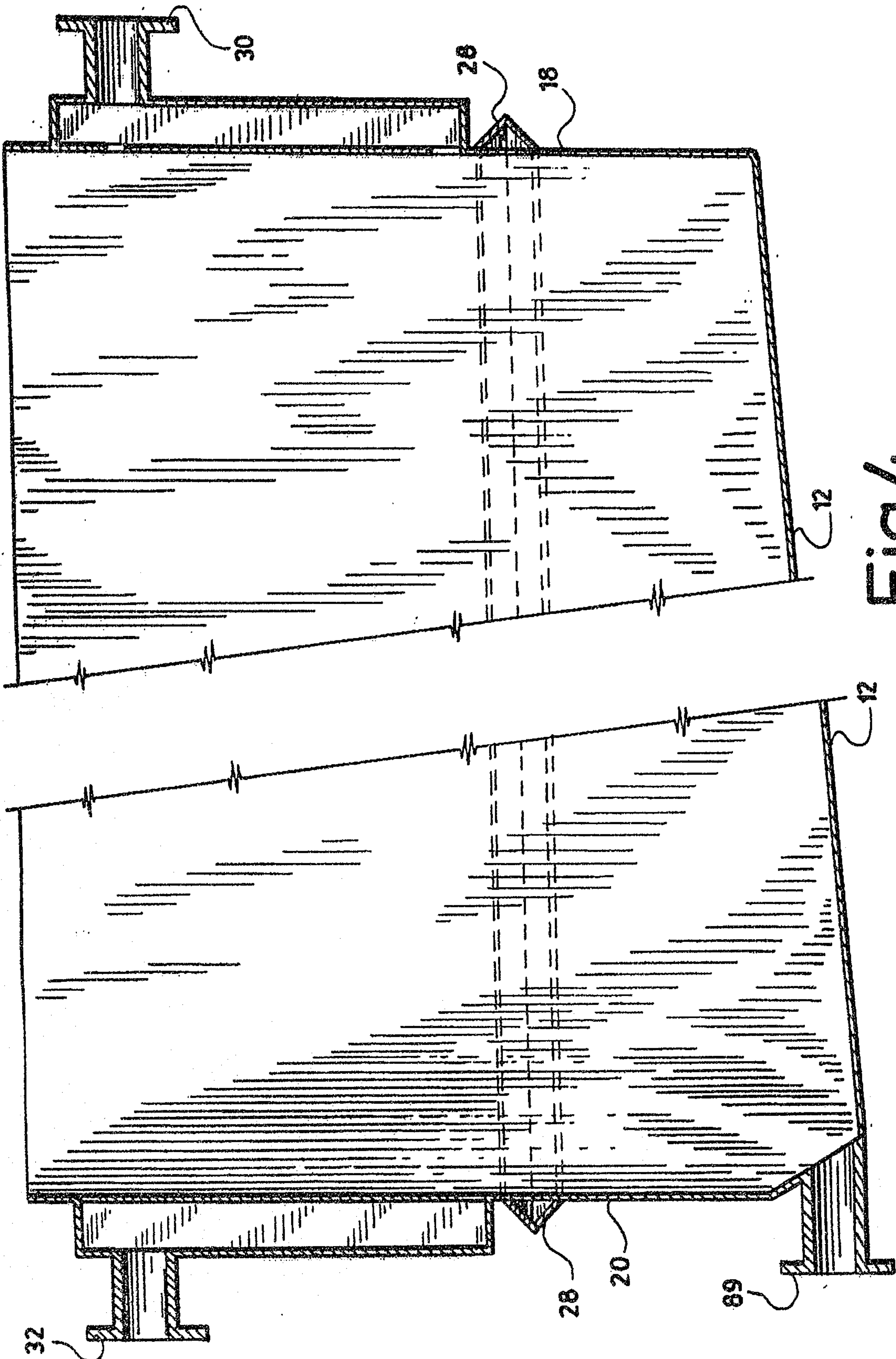


Fig.4



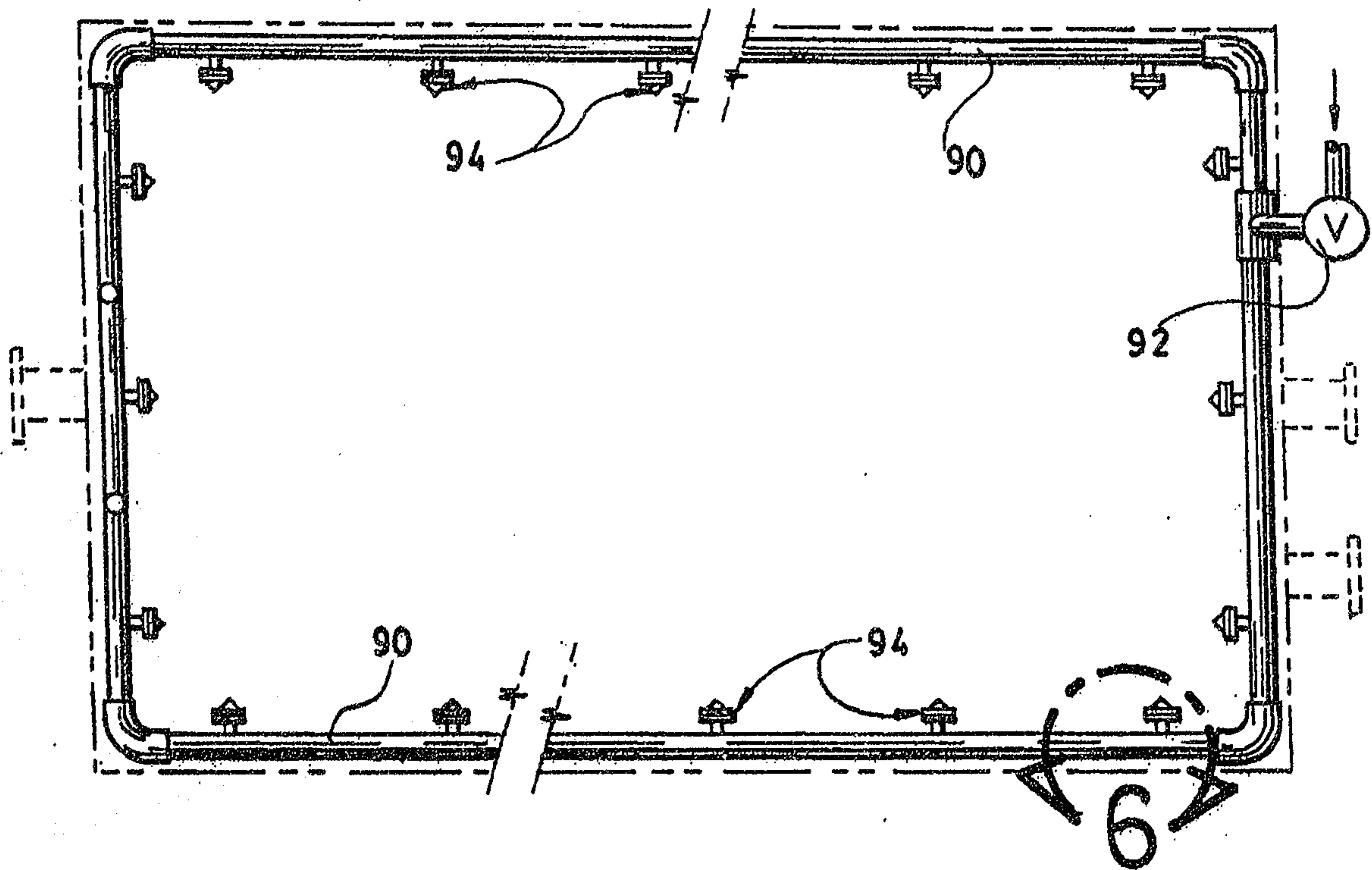


Fig.5

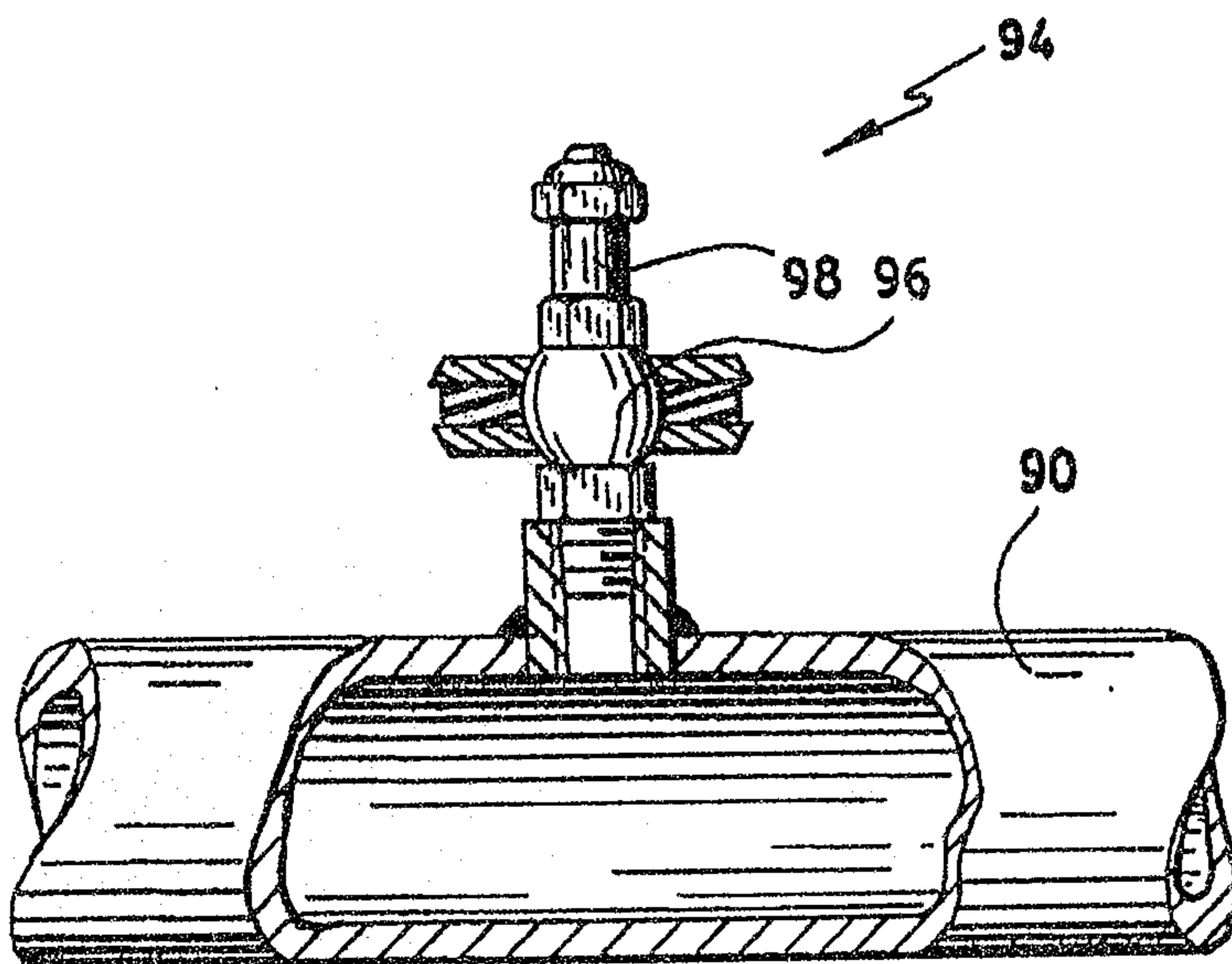


Fig.6



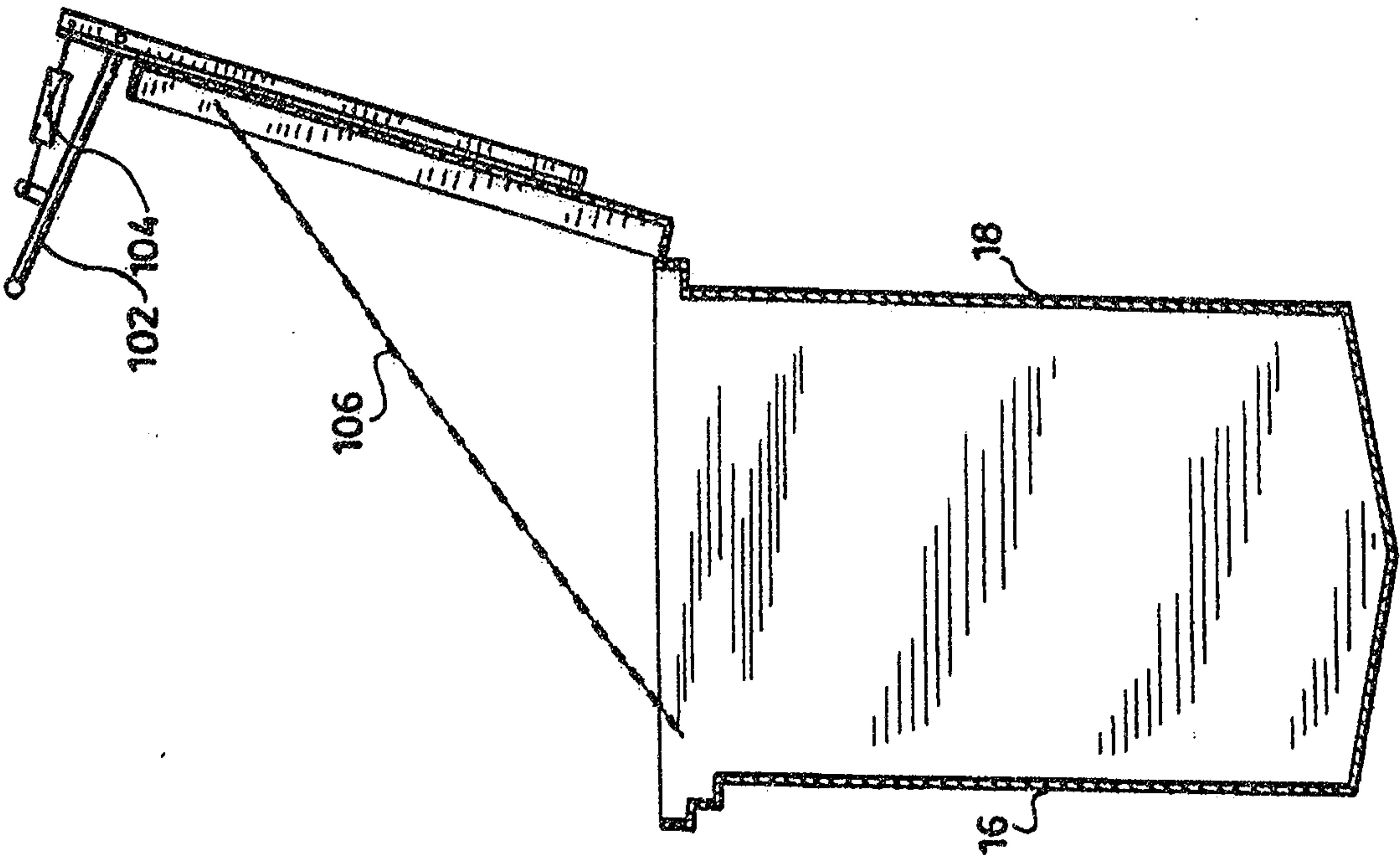


Fig. 7c

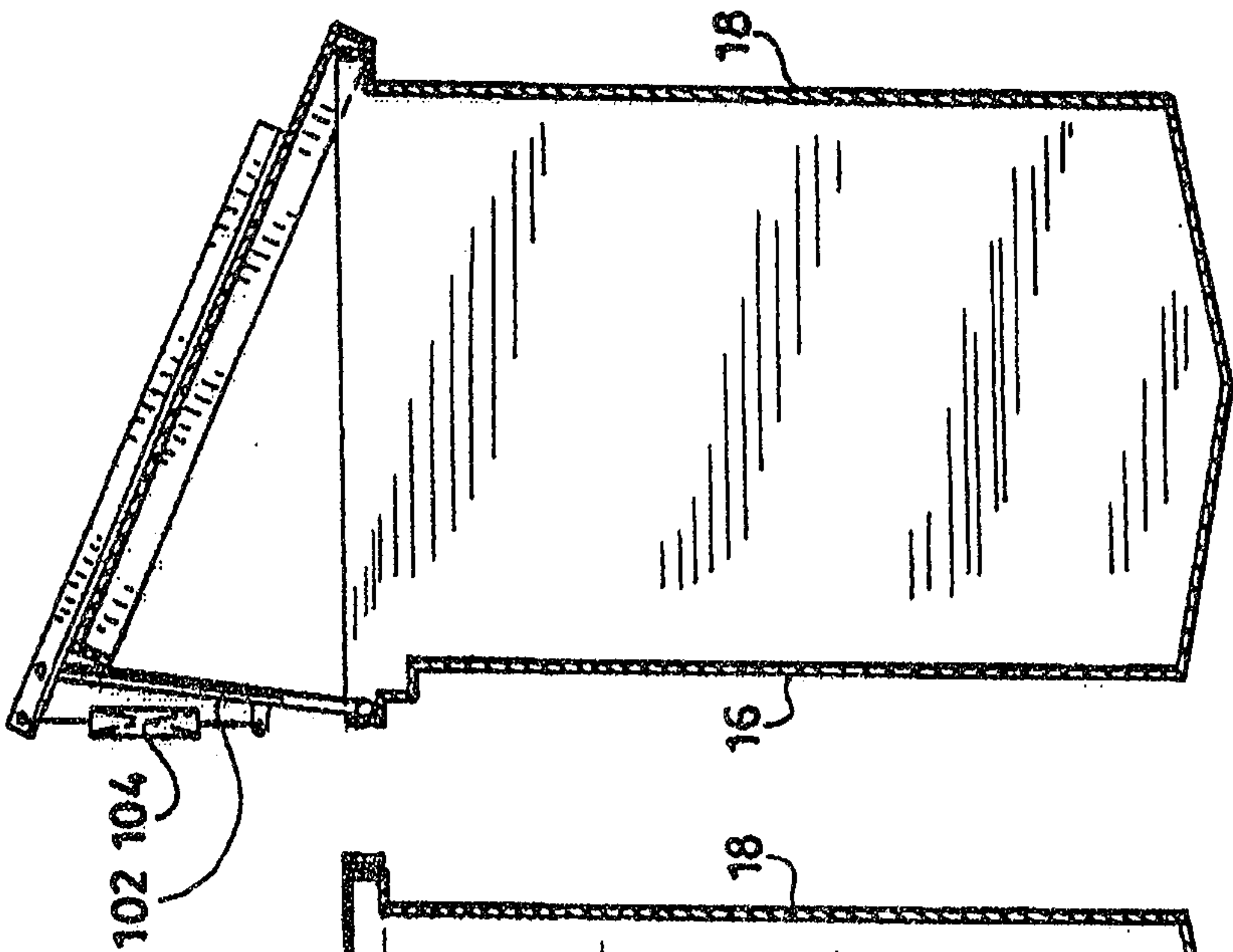


Fig. 7b

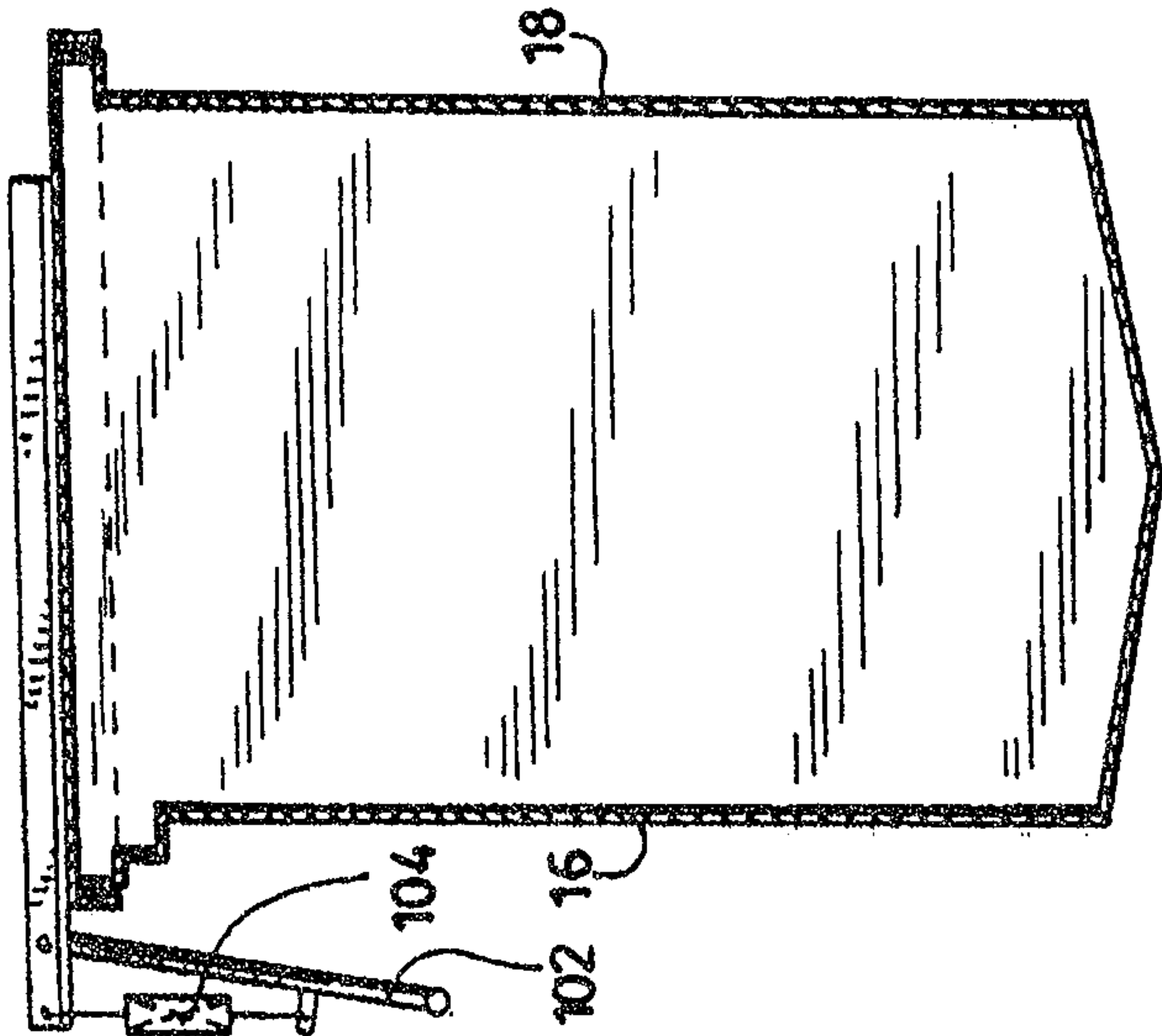


Fig. 7a



