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(54) **GRATING FOR AERATION DUCTS**

GITTER FÜR LÜFTUNGSKANÄLE

GRILLE POUR CONDUITS D'AERATION

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- **PATENT ABSTRACTS OF JAPAN vol. 1998, no. 05, 30 April 1998 (1998-04-30) & JP 10 026370 A (FUJITSU GENERAL LTD), 27 January 1998 (1998-01-27)**

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Description

[0001] The invention refers to the gratings, particularly of the type to be mounted on the aeration duct of the rooms in which operate combustion apparatus, for example, for example boilers, stoves or the like and in which must be ensured a constant supply of atmospheric oxygen. Generally, the aeration ducts are obtained in the walls of the room and are closed on the two opposite faces by means of suitable gratings. The installation of the grating outside of the aeration duct, becomes problematic and it is sometime impossible when the room is placed at the upper floors of a building and is not externally provided with balconies or terraces.

[0002] The object of the invention is to realise a grating with reducible overall dimensions, which can be inserted from the inside of the room, in an aeration duct, until it comes out from said duct and in such a manner that, with few and simple manoeuvres the same grating can be restored in the flat condition and can be correctly and firmly assembled on the outer front of the same duct. Further purpose of the invention is to allow that said grating can be in any moment easily removed from the user for the periodical cleaning of the possible net which prevents the transit of the insects. Another purpose of the application is to allow that the same grating, if necessary, can be assembled also on the inner front of the aeration duct, like a very common grating of the known type.

[0003] These and other purpose are reached with a grating usually obtained by injection of plastics in a mould, formed by at least two pieces book-articutated between them, which can be lowered the one upon the other with reciprocally approach of their internal front, so that the transversal overall dimensions of the same grating can be substantially reduced by half and that the same grating can be inserted and caused to slide inside the aeration duct. At least one of the two pieces of the grating is provided in the internal front with fasteners which are used to retain the same grating when it has come out of the aeration duct, so that the two pieces of the same grating can be opened and disposed on the same plane, these fasteners being, if required, useful to fix the grating outside of the aeration duct.

[0004] Further features of the invention, and the advantages deriving therefrom, will appear better evident from the following description of a preferred embodiment of same, made by way of non-limiting example, with reference to the figures of the attached sheets of drawings, in which:

- Figure 1 is an elevation front view from the inside of the grating of the type which is referred to, provided with a rod with springs for setting in place;
- Figure 2 shows the grating of Figure 1 sectioned along the line II-II;
- Figures 3, 3a, 4, 4a and 5, 5a show the grating in lateral elevation and during as many subsequent phases of the assembly upon the external end of a aeration duct;
- Figure 6 is an elevation front view from the inside of an embodiment of the grating;
- Figure 7 shows the grating of Figure 6 in lateral elevation, in the condition of reduced overall dimensions and during the phase of insertion inside the aeration duct;
- Figure 8 is an elevation view from the inside of a grating according to a further embodiment;
- Figure 9 shows the grating of Figure 8 in lateral elevation, in the condition of reduced overall dimensions and during the phase of insertion inside the aeration duct;
- Figure 10 shows in lateral elevation the setting in place of a grating as shown in Figures 8 and 9, through a aeration duct having a small diameter and/or very long;
- Figure 11 is an elevation view from the inside of an embodiment of the grating;
- Figure 12 shows laterally and enlarged details pertinent to the hinges used in the grating of Figure 11;
- Figure 13 is a lateral view and with parts in section of a grating according to the invention, with other fasteners in place;
- Figure 14 is a frontal view of the fasteners of the grating of Figure 13;
- Figure 15 shows in perspective a fitting for the grating of Figure 13, which allows the assembly of the same grating also on the inside of an aeration duct;
- Figure 16 shows in elevation from the inside, a copper or other material grating having reducible overall dimensions, according to the invention;
- Figure 17 shows details of the grating of Figure 16 sectioned along the line XVII - XVII;
- Figure 18 shows in elevation from inside an embodiment of the grating;
- Figure 19 is a frontal view of the fasteners in place of the grating of Figure 18;
- Figure 20 is a elevation view of the inside of a grating according to a further embodiment;
- Figure 21 is an elevation view from the inside of a grating according to the invention, in the built-in version;
- Figure 22 shows in perspective view details pertinent to the reciprocal articulation of the two pieces composing the grating of Figure 21;
- Figure 23 shows in lateral elevation the possible removable realisation of the manipulating means of the grating of Figure 21;
- Figure 24 shows the grating of Figure 21 sectioned transversally and fixed inside the aeration duct;
- Figure 24a shows a simplified embodiment of the built-in grating;
- Figure 25 shows in perspective view of an embodiment of the reciprocal articulation hinges of the two portions which usually compose the grating and of the articulation hinge to the same grating of the rod with the anchor spring;

- Figure 26 shows frontally the rod with the anchor spring, partially sectioned in the articulation zone to the relative appendix of one of the two portions of the grating;
- Figure 27 shows further details obtained according to the section line XXVII - XXVII of figure 26.

With reference to Figures 1 and 2, it should be noted that the grating G according to the invention obtained in any known manner by means of injection of plastics into a mould, is fundamentally characterised by being composed of at least two pieces, 1, 101, joined, for example, upon a transversal axis, substantially median and mutually connected with one or more hinges 2 preferably placed inside of the same pieces and such that these pieces can be, if required, folded the one on the other like a book, so that the grating can assume an overall dimension in width H1 for example substantially halved with respect to its normal width H and so can be inserted through an aeration duct C (Figure 3) having a diameter inferior to said width H of the grating. It is clear how this condition increases as a consequence the range of the sections of the aeration conducts upon which it can be assembled a same grating of the type is referred.

[0005] It is understood that the pieces 1, 101 which form the grating, can be formed, at their turn, by means one or more pieces in the case in which the grating must include a net R to prevent the transit of insects, which can be integral, fixed or removable for the periodical cleaning. The presence or not of the net R in the grating is a marginal and secondary argument of the same grating, extraneous to the understanding of the invention and therefore it is not here subsequently considered and examined closely, also because it is within the capacity of the common person skilled in the art.

[0006] The hinges 2 can be formed, for example, by portions opportunely shaped, integrally obtained with the pieces which form the grating and pre-arranged in order to be reciprocally snap connected and in an articulated manner, or in order to be reciprocally articulated by means of pins, rivets or other suitable means. The hinges 2 can be, on the other hand, made of different material from the one that is composing the pieces 1, 101, and can be applied upon these, for example with solutions that will be considered further. The same hinges 2 can be finally placed in any suitable position of the grating, also different from the one that is shown in the drawings.

[0007] One of the pieces of the grating, for example the piece 1, carries for example in the central position an attachment 3 to which is articulated on an axis 4, for example orthogonal to the axis of the hinges 2, the end of a rod 5 of suitable length, integral with the end opposed to the center line of at least one leaf spring 6 externally convex and provided with sharp ends 106. The length Z of the spring 6 is opportunely superior to the diameter of the aeration duct C.

[0008] According to known techniques, the grating can be commercialised with the rod 5 disconnected from the attachment 3, so that it can be superimposed with the minimum overall dimensions to the same grating, said rod 5 being predisposed for example for a snap coupling to the fulcrum axis 4. The connection of the rod 5 to the attachment 3 is such that the same rod can be turned against the grating as shown in Figure 1 and then can be rotated perpendicularly to the same grating. The thus conceived grating is installed in the following manner.

[0009] After the rod 5 has been brought the grating as shown in Figure 1, the piece 101 is rotated upon the piece 1 of the same grating, as illustrated in Figure 2 with dotted line. With the pieces 1, 101 of the grating downwardly oriented, as illustrated in Figure 3, with one hand is grasped the spring 6 and it is bent to reduce the length, in such a manner that the assembly of the grating in the condition of reduced overall dimensions can be inserted through the aeration duct C, as shown in Figure 3. The duct C usually has a length variable between 20 an 30 cm and usually has a diameter such that it can be easily passed through by the arm and the hand of the operator. When the hand with the grating comes out from the duct C, as shown in the Figure 3a, the operator leaves the spring 6 and grasp firmly the proximal portion of the rod 5 which protrudes, after which the said operator rotates the rod 5 of 180° around its own vertical axis, as shown in the sequence of the Figures 3a and 4, so that the two pieces 1 and 101 of the grating dispose themselves upon the same plane the one to the other, with the piece 1 which is directly connected to the rod, upwardly oriented. During the passage from the condition of Figure 3a to that of Figure 4, the pieces 1 and 101 of the grating touch reciprocally at the level of the articulation zone, to ensure structural and aesthetic continuity to the grating and the strict maintenance of the condition of co-planarity of the same pieces. In this phase, the fins A of the grating are already correctly downwardly oriented. As shown in Figure 4a, the operator then turns the grating downwardly of 90°, fulcrumed about the grasping point, so that for gravity the two pieces 1 and 101 of the same grating arrange themselves perpendicularly to the rod 5. Spring 6 is oriented with its own longitudinal axis lengthwise of duct C.

[0010] In sequence of phase the operator rotates the grating upwardly of 90°, fulcrumed about the grasping point of the rod 5 in such a manner as to dispose said rod horizontally and the grating vertically, as shown in Figure 5. The two pieces of the grating remain in co-planar and position and perpendicular to the rod 5 and the pieces 1 remains upwardly oriented. The fins A of the grating are correctly downwardly oriented and the spring 6 is vertically disposed. At this point, the operator has to do nothing else than to withdraw the arm from the duct C, to introduce the spring 6 which flexes and that with its own sharp extremities 106 sliders on the same duct C, preventing the contrary movement of extraction of the grating. When the grating G comes against the external front of the wall upon which is opened the duct C, as shown in Figure 5a, the operator leaves the grasp of the

rod 5 and takes off completely the hand form the duct C. So the grating remains, firmly installed.

[0011] In the Figures from 1 to 5a, with numeral reference 7 is indicated one string secured to a slot that, during the phase of installation of the grating remains secured with the other end for example to the other hand of the operator which effects the described assembling operation, in such a manner to allow the recover of the grating in case that this one accidentally escapes to the same operator.

[0012] It is evident how the described grating can be also used like a traditional grating and it can be assembled by pushing, also on the end of the duct C which is open inside the room to be ventilated.

[0013] In Figure 6 is shown an embodiment which provides the rod 5 formed by two pieces 105, 205, articulated between them upon an axis 9, for example orthogonal to that 4 of fulcrum of the same rod to the grating G, one of the said pieces being provided, for example, with a side ledge 10 for the other piece, in order to ensure the alignment of the same pieces during the phase of assembling of the grating. The articulation 9 allows to rotate the piece 205 in overlap to the piece 105 when this one is lowered upon the grating, like indicated with K1 in Figure 6. In this condition the spring 6 remains substantially comprised in the plan overall dimensions of the grating and the whole can be packaged with reduced overall dimensions. During the phase of installation of the grating, the articulation 9 allows to rotate the piece 205 perpendicularly to the piece 105 of the rod 5, as illustrated with K2 in Figure 6, so that the spring 6 results disposed parallel to the articulation axis of the hinges 2 of the grating. This condition allows the insertion of the grating in the aeration duct C, without the need of bending the spring 6, like in the previous case shown in Figure 1, because the same hinge results now oriented according to the longitudinal axis of such duct, as appears from Figure 7.

[0014] This same condition can be obtained with the embodiment illustrated in Figure 8, according to which the fulcrum axis 4 of the rod 5 is oriented parallel to the axis of articulation of the hinges 2. When the rod 5 has been lowered upon the piece 1 and when the piece 101 has been lowered upon the piece 1, the grating can be inserted in the aeration duct C without flexion of the spring 6, because it is oriented with is own major axis according the length of said duct, as clearly shown in Figure 9. When the grating of Figure 8 is installed, its fins A being parallel to the articulation axis of the hinges 2, the spring 6 results disposed horizontally and because of its weight the grating can go down and can partially uncover the aeration duct C. To avoid this drawback, the inferior piece 101 of the grating is provided in the internal front and in a median position of its own perimetrical edge, with one or more raised appendices 11 which can be inserted in the duct C in order to maintain the grating correctly disposed upon this latter.

[0015] Figure 10 shows an embodiment of the grating which provides the head rod 5 provided with an appendix 12 to which it can be articulated in 13 an extension rod 14; useful to manoeuvre the grating during the insertion and assembling phases in the duct C, if said duct is with a diameter so reduced and/or with a length so elevated that it can not be passed through by the hand and/or the arm of one person. The rod 14 can be connected to the articulation 13 in such a manner that it can be traction-removed, the whole in a conceivable manner and easily realisable by persons skilled in the art.

[0016] The embodiment shown in Figure 11, evidences out a grating G having the fins A perpendicular to the rotation axis of the hinges 2 so the same does not require the appendices 11 as in the solution of Figure 8, because in the phase of installation the spring 6 results to be disposed vertically. The pieces 1 and 101 of the grating are provided with diametrical ribs 15, 115 integral with the otherwise free ends of the fins. To the midline of the rib 15 is articulated in two points 4, 4' the fork or bow shaped foot of the rod 5. It is to be understood that with a similar bow configuration can be structured the foot of the rod 5 also in the other solutions shown in the drawings, for example also in the solution of Figure 8.

[0017] From the Figures 11 and 12 it is pointed out that the hinges 2, 2' can be constituted by means of articulated inserts, inserted or obtained with the technique of the bi-injection, realised for example in soft PVC, in polypropylene or in nylon. The inserts referred to are provided with two interconnected portions by means of a weakened zone, which acts like a hinge. The hinges of this type can be placed upon the frame of the grating, or in another suitable position.

[0018] The grating G shown in Figure 13, differs from the previous solutions because the piece 1 is provided in the midline of the side articulated to the other piece 101, with an appendix 16 to which is anchored the end of a string 17 in its turn connected with the other end to the body 18 of an anchor (Fig. 14) the points of which are formed by three or four spring leafs 6 of the type already examined, placed to form an Y or an X. The grating G according to this variant, carries upon the inferior piece 101 the appendices 101 already considered with reference to Figure 8, suitable to bear upon the inferior edge of the external mouth of the duct C, to ensure the right disposition upon this one of the same grating which for gravity and for flexibility would tend to go down and partially uncover the duct C. According to an embodiment not shown, the string 17 can be assisted or replaced with a spring or the same can be made with elastic material, in order to ensure a correct permanence in the time of the grating G according to the solution referred.

[0019] Equipped with the grating as shown in Figures 13 and 14, can be provided a rod 19 as from figure 15, provided with ends 119 and 119' prearranged for the aligned coupling and with snap with the appendix 118 of the anchor 18 with the springs, whenever the same appendices 16 and 118 must be connected reciprocally no more in a flexible manner, by means of the string 17 above mentioned, but in a stiff manner, in order to allow

the assembly of the grating upon the front which is directly accessible of a aeration duct, like a traditional grating.

[0020] Figure 16 shows a grating formed by two pieces 1, 101 with fins and made of copper or other metallic material, the peripheral neck 20 of which is refolded like shown in Figure 17, to pinch the ends of frames 1', 101' of plastics, book-articulated between them with the hinges 2, one of the which is provided in central position to the grating, of the attachment 3 for the rod 5 or for other means of installation of the same grating, of the type described in the previous figures. According to an embodiment, not shown, the hinges may be made of flexible inserts crimped on the frame of the two pieces of the metallic grating and placed like a bridge between the same pieces, while the frames 1', 101' can be eliminated because an appendix for the anchorage of a string of the type shown in the solution of Figure 13, can be directly obtained in one of the two metallic pieces 1 or 101.

[0021] Figure 18 shows a type of grating G with the pieces 1, 101 reciprocally articulated by means of hinges made of inserts of flexible plastic 2 as from Figures 11, 12 and in which the support 5 of the installation springs has a portal configuration and is formed by two pieces 105, 205, articulated with one end in 4, 4', to appendices obtained integral with the fins of said pieces 1, 101, and provided on the other end with respective springs 6, 6' which realise in the whole a bow spring, said ends being predisposed with complementary snap coupling means, for example with respective concave and convex shapes 21, 121, which remain reciprocally connected when, with the grating assembled, the springs 6, 6' act against the internal wall of the aeration duct, but which allow in the initial phases of the assembly, to lower the pieces 105 and 205 in opposite directions upon the pieces 1, 101 of the grating, to can rotate the same pieces of the grating in reciprocal approach and to insert the same grating in the aeration duct C.

[0022] Figure 20 shows a grating G formed with three pieces instead of two like in the previous hypothesis, with the central piece 201 which carries the attachment 3 for the installation fasteners of the grating and which carries couples of hinges 2, 2', for the articulation of the external pieces 1, 101.

[0023] Figure 21 shows a grating which unlike the gratings previously considered, is of the built-in version, provided with a peripheral neck which surrounds the fins A and which is pre-arranged for the friction engagement of the end of the aeration duct C: Also this grating can be divided into at least two pieces 1, 101, reciprocally articulated with hinges 2' which interest the edges of the annular neck for the containment of the fins, which can be placed projecting upon the internal side of said edges, like in the hypothesis of Figure 21 or can be obtained in a complementarily manner upon the same edges, like in the hypothesis of Figure 22: One of the pieces of the grating is provided in substantially central position with respect to the same grating and in the internal front, with an appendix 22 for example having a shape like a bushing, for example orthogonal to the fins A, in which there is snap and rotatably assembled the end bent at right angles of a rod 23, suitable to support the grating during the phase of installation like from Figure 24, said rod being destined to remain inside the aeration duct C and being provided with a double slope upon its own end 123, so that once the grating is installed, the same rod can be easily unthreaded from the bushing 22. It is to be understood that, in the field of the invention it is comprised also that constructive variation to the grating with reference to Figures 21 and 24, as shown in Figure 24a, according to which the bushing 22' is perpendicular to the fins A and is pre-arranged for the anchorage of a manipulation string 7 which can freely remain inside the aeration duct C.

[0024] With reference to Figures 25, 26 and 27, it is now described a particularly advantageous and functional realisation of the hinges 2 and of the articulation attachment of the rod 5, to one of the portions of the grating G. In a different way with respect to what is illustrated in the previous Figures, where the attachment 3 it has always been illustrated with a fork shape which was surrounding the foot of the rod 5, in the solution illustrated in the Figures referred to, the above mentioned terms are inverted. The attachment 3 is formed with a flat appendix integral for example with a transversal orientation to a near couple of fins A of the portion 1 of the grating and said appendix carries integral upon the opposite edges, pins aligned between them to form a single pin 4 and shaped with their free end having a flute spout shape, in such a manner to form inclined planes which converge toward the end of said appendix that is farther from the interior face of the grating. Said appendix 3 is for example inclined in such a manner that the axis of the pin 4 lies upon an ideal plane which is substantially perpendicular to the body of the grating and that intersects substantially the same in the median zone and/or of reciprocal contact of the portions 1, 101 of the same grating (Fig. 27).

[0025] The foot of the rod 5 is structured with a fork shape 105, has the internal ends 24 opportunely flared and is provided with opposite bores 25, equal and aligned between them, having such a diameter which can rotatably house the pins 4 above mentioned, which snap enter in said bores when the fork 105 is pushed upon the appendix 3. The inclined planes of the pins 4 progressively divaricate the fork 105 until the same pins reach the bore 25 of the fork 105 and snap engage the same thanks to the elasticity of the material which forms the rod 5 which is such that the same fork comes back rapidly in the initial condition as from Figure 26.

[0026] To avoid that appendix 3 undergoes undesired transversal bendings during the installation of the grating, on the edges of the fork foot 105 of the rod 5 are obtained integral and laterally projecting, bow runners 26 which co-operate with a ancillary rib 27 parallel to the pins 4 and connected to a near fin A of the grating, with small reinforcement and load distribution ties 28.

[0027] Upon the internal sides of the fork 105, are pro-

vided projections 205 aligned between them and structurally disjointed in order not to limit the flexibility of the fins of said fork, which when the rod 5 is perpendicular to the grating, as shown in Figure 26 and 27, co-operate with the function of end abutment with a end tooth 103 of the appendix 3, stabilising the portions 5, 1, 101 in the correct use position. It is to be understood that with the same principle describe for the rod 5, can be articulated to the grating referred to, the feet of others similar structures, bow-shaped which carry the anchorage spring 6, as shown for example in Figures 11 and 18.

[0028] With the same principle of articulation of the rod 5, can be realised the hinges 2, 2' of reciprocal articulation of the two portions of the grating 1 and 101. From Figure 25 it is noted that each hinge comprises a flat and bent appendix 102, parallel for example to said appendix 3 for the attachment of the rod 5 and integral to the near fins A and to said rib 27 of the portion 1 of the grating and which comprises a couple of flat and bent appendices 202 parallel between them and having a distance substantially equal to the thickness of said appendix 102 and integral with near fins A of the portion 101 of the grating, the appendix 102 being provided integrally with opposite pins 29 with the free end inclined like a flute spout, similar to the pins 4 above mentioned, while the couple of appendices 202 are provided with aligned bores 30 to house rotatably and with snap the said pins 29, when the same appendices 202 are forced upon those numbered 102. Because the hinges 2, 2' above mentioned, project from the internal face of the grating, as shown in Figure 27, the same hinges are placed in a such position so that they can engage the aeration duct C, when upon this one there is assembled the grating G referred to, as shown in Figure 5a.

Claims

1. Grating for the application on the outer front of aeration ducts, made usually of plastics, **characterised by** the fact that it is formed by at least two pieces (1, 101) articulated between them in such a manner that they can be brought the one upon the other and to form a structure having a width at least substantially reduced by half with respect to the overall width of the same pieces, so that said reduced dimensions structure can be inserted from the inside in an aeration duct (C), crosses completely the same and comes out on the outside, means being provided to easily carry back and to firmly maintain the same pieces of the grating in the reciprocally co-planar position, to rearrange the same grating and to dispose it perpendicularly to the duct, means provided to easily and safely support the grating during the phases of insertion above mentioned and in the following phases and means being provided for the anchorage to the duct to firmly maintain installed in place said grating.

2. Grating according to claim 1), in which the pieces (1, 101) which compose the same grating are articulated by means one or more hinges of any suitable kind (2, 2') placed preferably upon the inner front of said pieces so that they can rotate in reciprocal approach with this front, there being provided that, when the same are disposed on the same plane, the same pieces enter in reciprocal contact to ensure structural and aestethic continuity to the grating and to remain between them on the same plane when the said grating is installed.

3. Grating according to claim 1), of the type having a completely external collocation to the aeration duct, **characterised by** the fact that one of the pieces which constitutes the same grating carries articulated in a substantially central zone of the same grating, a rod (5) having a suitable length, which can be lowered upon the grating to allow the reduction of the overall dimensions during the installation and which it can then be carried perpendicularly to the same grating after having traversed of the aeration duct, the said rod being provided on the other end with at least a bow spring (6) having its ends pointed (106), suitable to be disposed with correct bending and transversally inside the aeration duct, to be firmly anchored to this one and to correctly and firmly retain the grating upon the front of said duct (C).

4. Grating according to claim 3), in which the rod (5) with the anchorage spring (6) is articulated to one piece (1) of the same grating, with the possibility to oscillate upon an axis (4) orthogonal to the axis of the articulation hinges (2, 2') for the articulation of the pieces which compose the same grating.

5. Grating according to claim 4), in which the rod (5) with the anchorage spring (6) is formed by two pieces (105, 205) articulated between them upon an axis (9) orthogonal to the one (4) for the articulation of the same rod to the grating, in such a manner that lowering the main piece (105) upon the grating and disposing the other piece perpendicular to the first one, the anchor springs result oriented according the longitudinal axis of the aeration duct when inside this one is inserted the grating in the condition of reduced overall dimensions.

6. Grating according to claim 3) in which the rod (5) with the anchorage spring (6) is articulated to one piece (1) of the sale grating with the possibility to oscillate upon an axis (4) parallel to the one of the hinges (2, 2') for the articulation of the pieces (1, 101) which compose the same grating, so that said spring results oriented according to the longitudinal axis of the duct when inside this one is inserted the grating in the condition of reduced overall dimensions.

7. Grating according to claim 6) **characterised by** the fact that if its fins (A) are parallel to the axis of the articulation hinges of the pieces (2, 2') which compose the same grating, the piece of the grating that during the installation remains in the low position, is provided inside and in correspondence of the perimetrical edge, with projecting appendices (11) which bear upon the inferior portion of the edge of the aeration duct, to maintain the same grating correctly and firmly positioned in front of said duct.

8. Grating according to claim 6), **characterised by** the fact that it has the fins (A) orthogonal to the axis of the hinges (2, 2') for the articulation of the pieces (1, 101) which compose the same grating.

9. Grating according to the preceding claims, **characterised by** the fact that the rod (5) which supports the anchorage spring (6) for the installation of the same grating, is symmetrically articulated in two points (4, 4') to one piece (1) of the said grating, and is substantially portal shaped.

10. Grating according to claim 9) in which the rod (5) having a shape like a portal is divided into two pieces (105, 205) that by their foot are articulated to the respective pieces (1, 101) which compose the grating, with the articulation axis (4, 4') orthogonal to the axis of the hinges (2, 2') for the articulation of the same pieces to the grating, the other ends of said two pieces of the rod, being predisposed for a snap-coupling (21, 121) and being provided with respective portions of leaf-springs (6, 6'), so that they can be disconnected and lowered upon the respective piece of grating when this latter must be reduced in its dimensions for the assembling in the aeration duct.

11. Grating according to claim 3), **characterised by** the fact that it is formed with three pieces, with the central piece (201) which carries articulated on the opposite sides the other two pieces (1, 101) and which carries the anchorage spring means to be fixed inside the aeration duct.

12. Grating according to claim 3), **characterised by** the fact that the end of the rod (5) which carries the anchorage spring (6) can be predisposed for the articulated connection (12, 13) to the end of a rod (14) suitable like extension in the case in which the hand and/or the arm of the operator are prevented from the crossing the aeration duct (C) for the installation of the same grating.

13. Grating according to claim 2) in which the hinge or the hinges (2, 2') of reciprocal connection of the pieces which compose the same grating, are constituted by portions integrally obtained with the two pieces which compose the same grating and reciprocally snap-coupled or with other technique which allows the reciprocal rotation of the portion of the hinge.

14. Grating according to claim 2), in which the reciprocal articulation hinges (2, 2') of the pieces which compose the same grating, are realised in any other material different from the one of the grating and are obtained and fixed on the inside of the pieces which compose the same grating.

15. Grating according the claim 1) in which the reciprocal articulation hinges (2,2') of the pieces which compose the same grating, are realised with soft plastics, are provided with a bending weak zone and such hinges are applied upon the grating or are obtained integral with this one, with the injection technique or multi-injection technique of different materials.

16. Grating according to claim 3), **characterised by** the fact that instead of the rod (5) with the anchorage springs (6), one of the pieces which compose the same grating is provided in a substantially central position to the same grating, with an appendix (16) to which is anchored a string (17) that with the other end is connected to the body (18) of an anchor having three or more points formed by leaf springs (6) for the anchorage inside the aeration duct.

17. Grating according to claim 16, in which the appendices (16, 118) fixing the string (17) to the grating and to the body (18) of the anchor with the springs (6), are predisposed to be snap connected, rather than with said string, to a rod (19) which allows the assembling of the grating upon the front directly accessible of the aeration duct, like a conventional grating.

18. Grating according to claim 3), **characterised by** the fact that it is realised in copper or any other metallic material and by the fact that the two or more pieces which compose the same, are fixed by means of bending of their perimetrical edges (20) upon hinges or upon the periphery of frames (1, 101') made of plastics, book-articulated between them and provided with means for the anchorage to the internal surface of the aeration duct, like in the previous gratings

19. Grating according to claim 3), **characterised by** the fact that it provided with a string (7) to be anchored to the opportunely predisposed end of the rod with the anchorage springs (6), suitable for the manipulation and/or for the recover of the grating in the case this one escapes from the hand of the operator which is installing the same into the duct.

20. Grating according to claim 1) particularly if intended to be built-in upon the end of a aeration duct (C)

characterised by the fact that the articulation hinges (2, 2') of the pieces which compose the same grating are arranged to connect of the neck of the grating which is inserted with pressure in said duct, the grating being provided for the installation with an articulated rod (23) or with a string (7) anchored in permanent or removable manner to a bush or to other appendix (22, 22') integral to the inside of one of the pieces which compose said grating.

21. Grating according to claim 2), in which the reciprocal articulation hinges (2, 2') of the two portions (1, 101) which compose the same grating (G) comprise in correspondence of the conjunction side of the two said portions, inclined and flat appendices (102) integral to one side (1) of the grating and provided integral upon the end, with lateral and opposite pins, aligned between them, having the free end shaped like a flute spout, while on the other portion (101) of the grating are provided couple of flat and inclined appendices parallel between them (202) having a distance between them substantially equal to the thickness of said appendices (102) and provided with aligned bores (30) in which can be snap inserted the pins (29) of this said appendices (102) when in the same are forced the internally flared ends of said couple of parallel appendices (202).

22. Grating according to claim 21) in which the inclined planes formed from the flute spout ends of the pins (4) of the flat appendices (102) of the hinges (2, 2') converge towards the free end of said appendices (102).

23. Grating according to claim 21), in which the appendices (102, 202) of the articulation hinges (2, 2') of the two portions (1, 101) which compose the grating (G), being projecting from the inside of the same grating, are integral to pairs of nearby fins (A) of said portions of the grating and are placed in intermediate zones and such to engage the aeration duct (C) upon the end of which is assembled the same grating.

24. Grating according to claim 9), in which the foot of the rod (5) with the anchorage spring (6) or the feet of the equivalent bow or portal structure, are **characterised by** a fork shape (105) with an internal flaring (24) on the end and are provided laterally with aligned and opposite bores (25) in which can be snap inserted opposite and aligned flute spout shaped pins (4) with the free end and integral laterally to flat and inclined appendices (3), at their turn integral to nearby fins (A) of the corresponding portion of the grating.

25. Grating according to claim 24), in which the foot of the fork (105) of the rod (5) or of the corresponding bow structure with the anchorage spring (6) for the installation of the grating (G), is characterise by a bow shape and by the fact that the same presents lateral and projecting bow runners (26) which co-operate with a rib (27) parallel to the fins (A) of the same grating and which is connected to this one, also with reinforcement ties (28, 102).

26. Grating according to claim 24), in which on the internal face of the two wings of said fork foot (105), are provided projections (205) which co-operate with the function of end of stroke with an end tooth (103) of the flat appendix (3) to which is articulated the same fork foot (105) when the rod (5) with the anchorage spring (6) is oriented perpendicularly to the portion of the grating (1) to which is restrained.

Patentansprüche

1. Gitter für die Anwendung auf der äußeren Frontseite von in der Regel aus Kunststoff hergestellten Luftschächten, **dadurch gekennzeichnet, dass** es aus mindestens zwei Teilen (1, 101) gebildet ist, die unter sich derart gelenkig verbunden sind, dass sie übereinander bringbar sind und einen Aufbau mit einer Breite bilden, die in Bezug auf die gesamte Breite derselben Teile mindestens im Wesentlichen um die Hälfte so reduziert ist, dass der in Abmessungen reduzierte Aufbau von der Innenseite her in einen Luftschacht (C) einsetzbar ist, denselben vollständig durchquert und auf der Außenseite herauskommt, wobei Einrichtungen vorgesehen sind zum leichten Zurückbringen und zum Festhalten der gleichen Teile des Gitters in der umgekehrten koplanaren Position, zum Umordnen desselben Gitters und zum Anordnen desselben senkrecht zum Schacht, wobei Einrichtungen zur einfachen und sicheren Unterstützung des Gitters während der oben genannten Phasen des Einsetzens und in den darauf folgenden Phasen vorgesehen sind, und wobei Einrichtungen zur Verankerung des Gitters an dem Schacht für eine Aufrechterhaltung seiner Einbaulage vorgesehen sind.

2. Gitter nach Anspruch 1, wobei die Teile (1, 101), welche dasselbe Gitter bilden, durch ein oder mehrere Scharniere jeder geeigneten Art (2, 2') gelenkig verbunden sind, welche vorzugsweise auf der inneren Vorderseite der Teile so angeordnet sind, dass sie in wechselseitiger Annäherung an diese Vorderseite verdrehbar sind, wobei sie dort vorgesehen sind, dass , wenn dieselben auf der gleichen Ebene angeordnet sind, dieselben Teile in umgekehrten Kontakt kommen, um eine strukturelle und ästhetische Kontinuität für das Gitter zu gewährleisten und auf der gleichen Ebene zwischen ihnen zu verbleiben, wenn das Gitter eingebaut ist.

3. Gitter nach Anspruch 1, in der Ausführung mit einer vollständig externen Anordnung an dem Luftschacht, **dadurch gekennzeichnet, dass** eines der Teile, welche dasselbe Gitter bilden, in einem im Wesentlichen zentralen Bereich desselben Gitters eine gelenkig angebrachte Stange (5) mit einer geeigneten Länge aufweist, welche auf das Gitter zur Reduktion der Gesamtabmessungen während der Installation absenkbar ist, und welche dann senkrecht zum selben Gitter positionierbar ist, nachdem sie den Luftschacht durchquert hat, wobei die Stange an dem anderen Ende mindestens eine Bogenfeder (6) mit spitzen Enden (106) aufweist, welche zur transversalen Anordnung mit einer korrekten Biegung und innerhalb des Luftschachtes und zur festen Verankerung in diesem und zur korrekten und festen Rückhaltung des Gitters auf der Frontseite des Luftschachtes (C) geeignet ist.

4. Gitter nach Anspruch 3, wobei die Stange (5) mit der Verankerungsfeder (6) an einem Teil (1) desselben Gitters mit der Möglichkeit auf einer Achse (4) zu oszillieren bzw. sich hin- und herzubewegen gelenkig angebracht ist, welche orthogonal zu der Mittellinie der Gelenkscharniere (2, 2') für die gelenkige Verbindung der Teile, die dasselbe Gitter bilden, angeordnet ist.

5. Gitter nach Anspruch 4, wobei die Stange (5) mit der Verankerungsfeder (6) aus zwei Teilen (105, 205) gebildet ist, welche auf einer Mittellinie (9) zwischen ihnen gelenkig verbunden ist, die orthogonal zu der einen (4) für die gelenkige Verbindung der Stange zum Gitter so angeordnet ist, dass bei Absenkung des Hauptteils (105) auf das Gitter und bei der Anordnung des anderen Teils senkrecht zu dem ersten die Ankerfedem gemäß der Längsachse des Luftschachtes ausgerichtet sind, wenn das Gitter mit reduzierten Gesamtabmessungen innerhalb dieses Luftschachtes eingesetzt ist.

6. Gitter nach Anspruch 3, wobei die Stange (5) mit der Verankerungsfeder (6) auf einem Teil (1) des Gitters mit der Möglichkeit auf einer Achse (4) zu oszillieren bzw. sich hin- und herzubewegen gelenkig angebracht ist, welche parallel zu der einen der Gelenkscharniere (2, 2') für die gelenkige Verbindung der Teile (1, 101), die dasselbe Gitter bilden, angeordnet ist, damit diese Feder gemäß der Längsachse des Luftschachtes ausgerichtet ist, wenn das Gitter mit reduzierten Gesamtabmessungen innerhalb dieses Luftschachtes eingesetzt ist.

7. Gitter nach Anspruch 6, **dadurch gekennzeichnet, dass**, wenn seine Rippen (A) zur Achse der gelenkigen Verbindung der Scharniere der dasselbe Gitter bildenden Teile (2, 2'), parallel sind, das Teil des Gitters, das bei der Installation in der unteren Position verbleibt, innerhalb und im Zusammenhang mit dem umfänglichen Rand mit hervorstehenden Verlängerungen (11) versehen ist, welche auf den unteren Abschnitt des Luftschachtes drücken, um dasselbe Gitter richtig und fest vor dem Luftschacht zu halten.

8. Gitter nach Anspruch 6, **dadurch gekennzeichnet, dass** die Rippen (A) zur Achse der Scharniere (2, 2') für die gelenkige Verbindung der Teile (1, 101) orthogonal angeordnet sind, die das Gitter bilden.

9. Gitter nach den vorhergehenden Ansprüchen, **dadurch gekennzeichnet, dass** die Stange (5), die die Verankerungsfeder (6) für die Installation desselben Gitters stützt, in zwei Punkten (4, 4') zu einem Teil (1) des Gitters symmetrisch gelenkig verbunden ist, und im Wesentlichen wie ein Portal geformt ist.

10. Gitter nach Anspruch 9, wobei die Stange (5), die eine Form wie ein Portal hat, in zwei Teile (105, 205) aufgeteilt ist, die durch ihren Fuß gelenkig zu den jeweiligen Teilen (1, 101), die das Gitter bilden, verbunden sind, wobei die gelenkige Verbindungsachse (4, 4') orthogonal zur Achse der Scharniere (2, 2') für die gelenkige Verbindung der gleichen Teile zum Gitter ist, wobei die anderen Enden der beiden Teile der Stange für eine Einrastkupplung (21, 121) vorgesehen und mit jeweiligen Abschnitten von Blattfedern (6, 6') so versehen sind, dass sie getrennt und auf das jeweilige Teil des Gitters absenkbar sind, wenn dieses letztere in seinen Abmessungen für den Zusammenbau im Luftschacht verringert werden muss.

11. Gitter nach Anspruch 3, **dadurch gekennzeichnet, dass** es aus drei Teilen mit dem zentralen Teil (201) gebildet ist, welches die anderen zwei Teile (1, 101) auf den gegenüberliegenden Seiten gelenkig verbunden trägt, und welches die Verankerungsfedereinrichtungen zur Befestigung innerhalb des Luftschachtes aufweist.

12. Gitter nach Anspruch 3, **dadurch gekennzeichnet, dass** das Ende der Stange (5), das die Verankerungsfeder (6) trägt, für die gelenkige Verbindung (12, 13) an das Ende einer Stange (14) vorbereitet ist, geeignet als Verlängerung für den Fall, in welchem die Hand und/oder der Arm des Monteurs zur Installation desselben Gitters am Durchgang des Luftschachts (C) behindert ist.

13. Gitter nach Anspruch 2, wobei das Scharnier oder die Scharniere (2, 2') der wechselseitigen Verbindung der Teile, die dasselbe Gitter bilden, aus Teilen bestehen, welche einstückig mit den beiden Teilen ausgebildet sind, die dasselbe Gitter bilden, und gegenseitig mit einer Einrastkupplung oder mit anderer

Technik versehen sind, die die wechselseitige Verdrehung des Abschnitts des Scharniers erlaubt.

14. Gitter nach Anspruch 2, wobei die wechselseitigen gelenkigen Scharniere (2, 2') der Teile, die dasselbe Gitter bilden, aus irgendeinem sonstigem Material hergestellt sind, das unterschiedlich zu jenem des Gitters ist, und am Inneren der Teile ausgebildet und befestigt sind, die dasselbe Gitter bilden.

15. Gitter nach Anspruch 1, wobei die wechselseitigen gelenkigen Scharniere (2, 2') der Teile, die dasselbe Gitter bilden, aus weichem Kunststoff hergestellt und mit einem biegsamen geschwächten Bereich versehen sind, wobei solche Scharniere auf dem Gitter angebracht oder einstückig mit diesem in Spritzgusstechnik oder Multipritzgusstechnik aus unterschiedlichen Materialien gebildet sind.

16. Gitter nach Anspruch 3, **dadurch gekennzeichnet, dass** anstelle der Stange (5) mit den Verankerungsfedern (6) eins der Teile, die dasselbe Gitter bilden, in einer im Wesentlichen zentralen Position zu demselben Gitter eine Verlängerung (16) vorgesehen ist, an der eine Schnur bzw. ein Zug (17) befestigt ist, der mit dem anderen Ende an den Körper (18) eines Ankers mit drei oder mehr Punkten verbunden ist, die aus Blattfedern (6) für die Verankerung innerhalb des Luftschachtes gebildet sind.

17. Gitter nach Anspruch 16, wobei die Verlängerungen (16, 118), die die Schnur (17) an dem Gitter und an dem Körper (18) des Ankers mit den Federn (6) befestigen, eher für eine Schnapp- bzw. Einrastverbindung als mit der Schnur (17) an einer Stange (19) vorgesehen sind, welche den Zusammenbau des Gitters an der Frontseite direkt zugänglich vom Luftschacht wie mit einem konventionellen Gitter ermöglicht.

18. Gitter nach Anspruch 3, **dadurch gekennzeichnet, dass** es aus Kupfer oder aus sonstigem metallischen Material hergestellt ist, und dass die zwei oder mehr Teile, welche dasselbe bilden, mittels Biegung ihrer umfänglichen Ränder (20) auf Scharniere oder auf die Peripherie von Rahmen (1, 101') aus Kunststoff hergestellt sind, wie ein Buch untereinander gelenkig verbunden und mit Mitteln für die Verankerung an die interne Oberfläche des Luftschachtes wie in den vorherigen Gittern ausgestattet versehen sind.

19. Gitter nach Anspruch 3, **dadurch gekennzeichnet, dass** es mit einer Schnur bzw. einen Zug (7) ausgestattet ist, die in dem passend gemachten Ende der Stange mit den Verankerungsfedern (6) anbringbar ist, wobei diese für die Handhabung und/oder für die Bergung des Gitters in dem Fall geeignet ist, wenn dies aus der Hand des Monteurs fällt, der dasselbe in dem Luftschacht installiert.

20. Gitter nach Anspruch 1, insbesondere für den Einbau am Ende eines Luftschachtes (C), **dadurch gekennzeichnet, dass** die gelenkigen Scharniere (2, 2') der Teile, die dasselbe Gitter bilden, zur Verbindung des Halses des Gitters angeordnet sind, welches mit Druck in den Luftschacht einsetzbar ist, wobei das Gitter für die Installation mit einer gelenkigen Stange (23) oder mit einer Schnur (7) versehen ist, die in einer dauerhaften oder entfembaren Weise in einer Buchse oder in einer anderen Verlängerung (22, 22') verankert ist, die einstückig mit dem Inneren eines der Teile ausgebildet ist, die das Gitter bilden.

21. Gitter nach Anspruch 2, wobei die wechselseitigen gelenkigen Scharniere (2, 2') der zwei Teile (1, 101), die dasselbe Gitter (G) bilden, im Zusammenhang mit der Verbindungsseite der zwei Teile geneigte und flache Ansätze bzw. Verlängerungen (102) aufweisen, die einstükkig zu einer Seite (1) des Gitters ausgebildet und einstückig auf dem Ende mit seitlichen und gegenüberliegenden Stiften ausgestattet sind, die zwischen ihnen ausgerichtet sind, wobei die Teile das freie Ende so geformt wie eine Ausgusstülle aufweisen, während auf dem anderen Teil (101) des Gitters ein Paar von flachen und geneigten Verlängerungen parallel zwischen ihnen (202) mit einem Abstand zwischen ihnen vorgesehen ist, der im Wesentlichen gleich der Stärke der Verlängerungen (102) ist, und die mit ausgerichteten Ausbohrungen (30) ausgestattet sind, in welche die Stifte (29) von diesen Verlängerungen (102) einrastbar sind, wenn in dieselben die intern erweiterten Enden der Paare der parallelen Verlängerungen (202) zur Einrastung eingedrückt sind.

22. Gitter nach Anspruch 21, wobei die geneigten Flächen, die aus den Ausgusstülleenden der Stifte (4) der flachen Verlängerungen (102) der Scharniere (2, 2') gebildet sind, in Richtung des freien Endes der Verlängerungen (102) konvergieren.

23. Gitter nach Anspruch 21, wobei die Verlängerungen (102, 202) der gelenkigen Scharniere (2, 2') der zwei Teile (1, 101), die das Gitter (G) bilden, von der Innenseite desselben Gitters hervorragend einstückig mit Paaren von benachbarten Rippen (A) der Gitterteile ausgebildet und in Zwischenseiten zum Eingriff mit dem Luftschacht (C) angeordnet sind, auf dessen Ende dasselbe Gitter aufgebracht ist.

24. Gitter nach Anspruch 9, wobei der Fuß der Stange (5) mit der Verankerungsfeder (6) oder die Füße des entsprechenden Bogens oder Portalaufbaus durch eine Gabelform (105) durch eine innere Aufweitung (24) **gekennzeichnet** sind und seitlich mit ausgerichteten und gegenüberliegenden Bohrungen (25)

ausgestattet sind, in welche gegenüberliegende und ausgerichtete in Gestalt einer Ausgusstülle geformte Stifte (4) mit dem freien Ende und seitlich einstückig mit flachen und geneigten Verlängerungen (3) einrastbar sind, welche ihrerseits einstükkig mit benachbarten Rippen (A) des entsprechenden Teils des Gitters ausgebildet sind.

25. Gitter laut Anspruch 24, wobei der Fuß der Gabel (105) der Stange (5) oder der entsprechenden Bogenstruktur mit der Verankerungsfeder (6) für die Installation des Gitters (G) **dadurch gekennzeichnet ist, dass** er eine Bogenform aufweist, welche seitliche und hervorstehende Bogenrippen (26) aufweist, welche mit einer Rippe (27) parallel zu den Rippen (A) desselben Gitters zusammenwirken und welche mit dieser einen auch über Verstärkungsteile (28, 102) verbunden ist.

26. Gitter nach Anspruch 24, bei welchem Vorsprünge (205) auf der internen Seite der zwei Flügel des Gabelfußes (105) vorgesehen sind, die mit der Funktion des Endes des Verstellwegs mit einem Endzahn bzw. Anschlag (103) der flachen Verlängerung (3) zusammenwirken, mit dem der gleiche Gabelfuß (105) gelenkig verbunden ist, wenn die Stange (5) mit der Verankerungsfeder (6) senkrecht zu dem Teil des Gitters (1) ausgerichtet ist, zu der es zurückgehalten ist.

Revendications

1. Une grille qui s'emploie à l'extérieur des conduit d'aération, normalement en plastique, formée d'au moins deux parties (1, 101) articulés entre eux de façon à réussir à les superposer pour donner lieu à une structure large de la moitié au moins par rapport à la largeur totale. La structure réduite de moitié peut donc être introduite de l'intérieur dans un conduit d'aération (C) et être passée à travers le conduit jusqu'à arriver à l'autre bout. Des moyens sont fournis pour l'enlever facilement, maintenir les parties de la grille en position coplanaire, replacer la grille et pour la disposer perpendiculairement par rapport au conduit. D'autres moyens faciles et en toute sûreté servent à soutenir la grille pendant les phases d'introduction mentionnées plus haut et pendant les phases suivantes, et des moyens d'ancrage sont fournis pour bien la maintenir en place.

2. Une grille selon la revendication 1), dans laquelle les parties (1, 101) qui la composent sont articulées au moyen d'une ou plusieurs charnières du type le plus indiqué (2, 2') placées de préférence sur la face interne de ces parties pour que celles-ci puissent pivoter de façon réciproque à la face en question, c'est-à-dire que quand les parties sont dans le même plan, ils entrent en contact réciproque pour assurer une continuité structurelle et esthétique avec la grille et pour se trouver au même niveau quand la grille est installée.

3. Une grille selon les revendications précédentes, surtout si elle se trouve à l'extérieur du conduit d'aération, **caractérisée par le fait qu'**un des parties qui la composent a, plus ou moins au centre de la grille, une barre (5), de la bonne longueur, qui peut être abaissée sur la grille pour en réduire la dimension totale pendant l'installation, et qui peut ensuite être placée perpendiculairement à la grille après avoir passé à travers le conduit d'aération ; la barre en question a de l'autre coté au moins un ressort à lames (6) dont les extrémités sont pointues (106), bien courbées et en position transversale à l'intérieur du conduit d'aération, pour permettre un bon ancrage et pour bien et solidement fixer la grillé sur la face du conduit d'aération (C).

4. Une grille selon la revendication 3), dans laquelle la barre (5) et son ressort pour ancrage (6) sont articulés à une partie (1) de la grille, avec la possibilité de la faire osciller sur un axe (4) orthogonal à l'axe des charnières (2, 2') d'articulation, pour favoriser l'articulation des parties qui composent la grille.

5. Une grille selon la revendication 4), dans laquelle la barre (5) et son ressort pour ancrage (6) sont formés de deux parties (105, 205) articulées entre elles sur un axe (9) orthogonal à celui (4) qui permet l'articulation de la dite barre. En abaissant la partie principale (105) sur la grille et en disposant l'autre partie perpendiculairement à la première, les ressorts d'ancrage seront orientés selon l'axe longitudinal du conduit d'aération, quand la grille aux dimensions totales réduites y est introduite.

6. Une grille selon la revendication 3), dans laquelle la barre (5) et son ressort d'ancrage (6) sont articulés à une partie (1) de la grille, qui leur permet d'osciller sur un axe (4) parallèle à celui des charnières (2, 2'), d'articulation des parties (1, 101) qui composent la grille, afin que le ressort soit orienté selon l'axe longitudinal du conduit, quand la grille aux dimensions totales réduites y est introduite.

7. Une grille selon la revendication 6), **caractérisée par le fait que** ses ailettes (A) sont parallèles aux axes des charnières (2, 2') d'articulation des parties qui la composent. La partie de la grille qui pendant l'installation reste en bas a, à l'intérieur et en correspondance du bord du pourtour, des appendices en saillie (11) qui reposent sur la partie intérieure du bord du conduit d'aération, pour bien maintenir en place la grille.

8. Une grille selon la revendication 6), **caractérisée par le fait qu'**elle a des ailettes (A) en position orthogonale par rapport à l'axe des charnières (2, 2') d'articulation des parties (1, 101) qui composent la grille.

9. Une grille selon les revendications précédentes, **caractérisée par le fait que** la barre (5), qui supporte le ressort d'ancrage (6) pour son installation, est symétriquement articulée en deux points (4, 4') à une partie (1) de la grille et elle a essentiellement la forme d'un portail.

10. Une grille selon la revendication 9), dans laquelle la barre (5) ayant la forme d'un portail est divisée en deux parties (105, 205) articulées à la base aux parties correspondants (1, 101) qui composent la grille et dont les axes d'articulation (4, 4') sont orthogonaux par rapport à ceux des charnières (2, 2'), pour permettre l'articulation des parties de la grille. De l'autre coté les deux parties de la barre sont prédisposées pour un couplage par emboîtement (21, 121) et pourvus de ressorts à lames (6, 6') pour qu'ils puissent être séparés et abaissés sur la partie respectif de la grille, quand la dimension de celle-ci doit être réduite pour pouvoir l'assembler dans le conduit d'aération.

11. Une grille selon la revendication 3), **caractérisée par le fait qu'**elle est constituée de trois parties ; la partie central (201) portant aux autres deux (1, 101) de chaque coté, et disposant de moyens d'ancrage à ressort pour la fixer à l'intérieur du conduit d'aération.

12. Une grille selon la revendication 3), **caractérisée par le fait que** l'extrémité de la barre (5), sur laquelle se trouve: le ressort d'ancrage (6), peut être prévue pour l'assemblage de l'articulation (12, 13) à l'extrémité de la barre (14), utile comme rallonge quand l'opérateur n'arrive pas à insérer la main et/ou le bras à travers le conduit d'aération (C) pour installer la grille.

13. Une grille selon la revendication 2), dans laquelle la ou les charnières (2, 2') d'articulation réciproque des parties qui la composent sont constituées de portions intégralement obtenues grâce aux deux parties qui la composent, et réciproquement couplées par emboîtement ou par tout autre technique qui permette la rotation réciproque des parties de la charnière.

14. Une grille selon la revendication 2), dans laquelle les charnières d'articulation réciproque (2, 2') des parties qui la composent, sont réalisées en tout autre matériau que celui de la grille, et sont appliquées et fixées à l'intérieur des parties qui composent la grille.

15. Une grille selon la revendication 1), dans laquelle les charnières d'articulation réciproque (2, 2') des parties qui la composent, réalisées en plastique souple, sont pourvues d'une zone de faible courbure et elles sont appliquées à la grille ou forment un seul élément grâce à la technique de l'injection ou de l'injection de plusieurs matériaux différents.

16. Une grille selon la revendication 3), **caractérisé par le fait que**, au lieu de la barre (5) et de ses ressorts d'ancrage (6), un des parties qui la composent se trouve fondamentalement au centre de la grille avec un appendice (16) auquel est ancrée une ficelle (17) qui est reliée à l'autre bout du corps (18) par un ancrage ayant trois ou plusieurs pointes formées de ressorts à lames (6) qui favorisent l'ancrage à l'intérieur du conduit d'aération.

17. Une grille selon la revendication 16), dans laquelle les appendices (16, 118) qui fixent la ficelle (17) à la grille et au corps (18) de l'ancrage avec des ressorts (6), sont prédisposés à être enclenchées par détente, au lieu qu'à la ficelle, à une barre (19) qui permet l'assemblage de la grille sur la face directement accessible du conduit d'aération, comme tout autre grille conventionnelle.

18. Une grille selon la revendication 3), **caractérisée par le fait qu'**elle est en cuivre, ou en un autre matériau métallique, et que les deux ou plusieurs parties qui la composent sont fixées grâce à la courbure de leurs bords de pourtour (20) sur des charnières ou sur la circonférence des structures (1, 101') en plastique, se refermant comme un livre et étant pourvues de moyens d'ancrage à la surface interne du conduit d'aération comme les grilles précédentes.

19. Une grille selon la revendication 3), **caractérisée par le fait qu'**elle a une ficelle (7), qui peut être ancrée à l'extrémité prédisposée de la barre avec les ressorts d'ancrage (6), qui en facilitent la manipulation et/ou qui permettent de récupérer la grille quand elle s'échappe des mains de l'opérateur qui l'installe dans le conduit.

20. Une grille selon la revendication 1), en particulier si on a l'intention de la monter par emboîtement à l'extrémité d'un conduit d'aération (C), **caractérisée par le fait que** les charnières d'articulation (2, 2') des parties qui la composent, ont été prévues pour relier l'embase de la grille qui est pressée à l'intérieur du conduit, en étant pourvue, pour l'installation, d'une barre articulée (23) ou d'une ficelle (7), ancrée de façon permanente ou pas, à une gaine ou à un autre appendice (22, 22') intégral à l'intérieur d'un des parties qui la composent.

21. Une grille selon la revendication 2), dans laquelle

les charnières d'articulation réciproque (2, 2') des deux parties (1, 101) qui composent la grille (G) comprennent, en correspondance du coté de conjonction des deux parties, des appendices inclinés et aplatis (102) intégrales à un coté (1) de la grille et pourvues, sur toute l'extrémité, d'une rangée de chevilles latérales et opposées, ayant l'extrémité libre à forme de bec de flûte. Sur l'autre portion (101) de la grille il y a deux appendices inclinés et aplatis parallèles l'un à l'autre (202) ayant une distance l'un de l'autre en principe égal à l'épaisseur des appendices (102) avec des trous alignés (30), dans lesquels peuvent être introduites les chevilles (29) des appendices (102), quand les extrémités des deux appendices parallèles (202) y sont introduits à force.

22. Une grille selon la revendication 21), dans laquelle les plans inclinés formés grâce aux extrémités à forme de bec de flûte des chevilles (4) des appendices aplatis (102) des charnières (2, 2 ') convergent vers l'extrémité libre des appendices (102).

23. Une grille selon la revendication 21), dans laquelle les appendices (102, 202) des charnières d'articulation (2, 2') des deux parties (1, 101) qui composent la grille (G), font saillie de l'intérieur de la grille, sont intégrés aux paires d'ailettes (A) juste à coté des portions de la grille et ils sont placés dans des zones intermédiaires de telle façon qu'ils occupent le conduit d'aération (C) avec l'extrémité qui permet l'assemblage de la grille.

24. Une grille selon la revendication 9), dans laquelle la base de la barre (5) et son ressort d'ancrage (6) ou les bases de l'arc correspondant, ou de la structure à portail, sont **caractérisées**, en considération de leur forme à fourchette (105), par un évasement interne (24) à l'extrémité et sont pourvues latéralement de trous alignés et parallèles (25) dans lesquels peuvent être introduites des chevilles à bec de flûte (4) opposées et alignées à l'extrémité libre, qui s'intègrent littéralement aux appendices aplatis et inclinés (3), intégrés eux aussi aux chevilles juste à coté (A) de la portion correspondante de la grille.

25. Une grille selon la revendication 24), dans laquelle la base de la fourchette (105) de la barre (5) ou de la structure à arc correspondante, avec sa charnière d'ancrage (6) pour l'installation de la grille (G), est **caractérisée par** sa forme à arc et par le fait qu'elle présente des rainures à arc (26) latérales et en saillie qui coopèrent avec un bourrelet (27) parallèle aux ailettes (A) de la grille qui est relié à celle-ci par des liens de renforcement (28, 102).

26. Une grille selon la revendication 24), dans laquelle la face interne des deux dents de la base à forme de fourchette (105) sont des saillies (205), qui coopèrent avec la fonction du fond de la barre avec une extrémité à forme de dent (103) de l'appendice aplati (3). La base à forme de fourchette (105) est articulée à l'appendice quand la barre (5) et son ressort d'ancrage (6) sont orientés perpendiculairement à la portion de la grille (1) à laquelle ils sont accrochés.

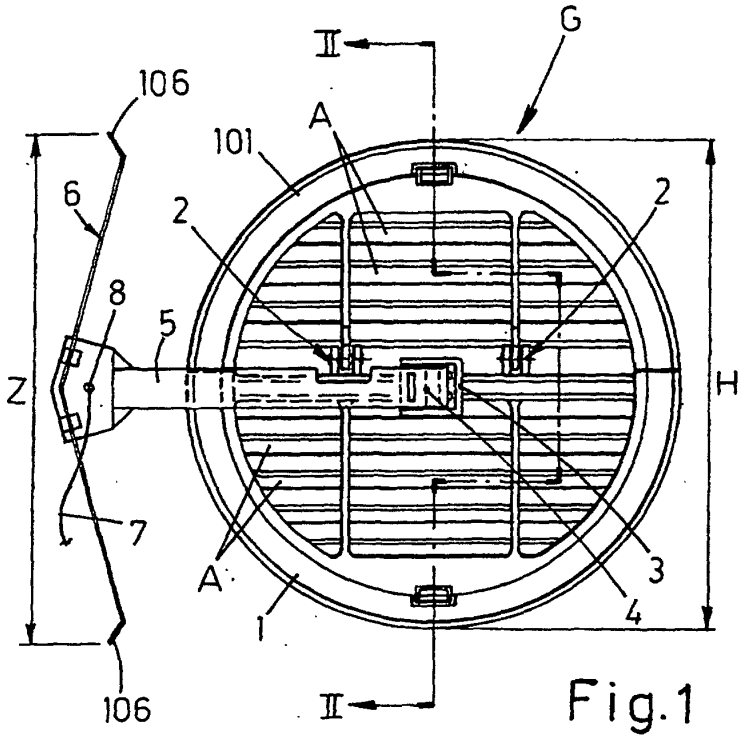


Fig.1

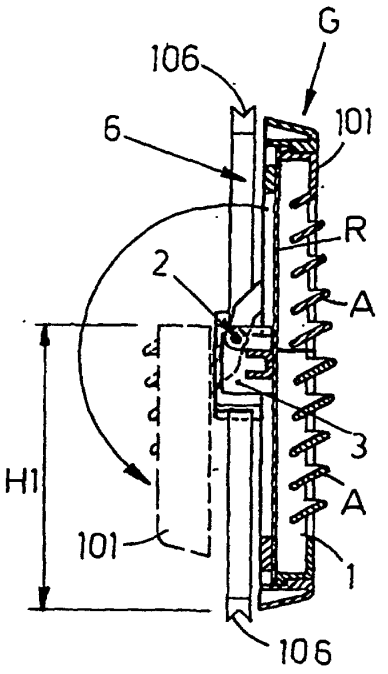


Fig.2

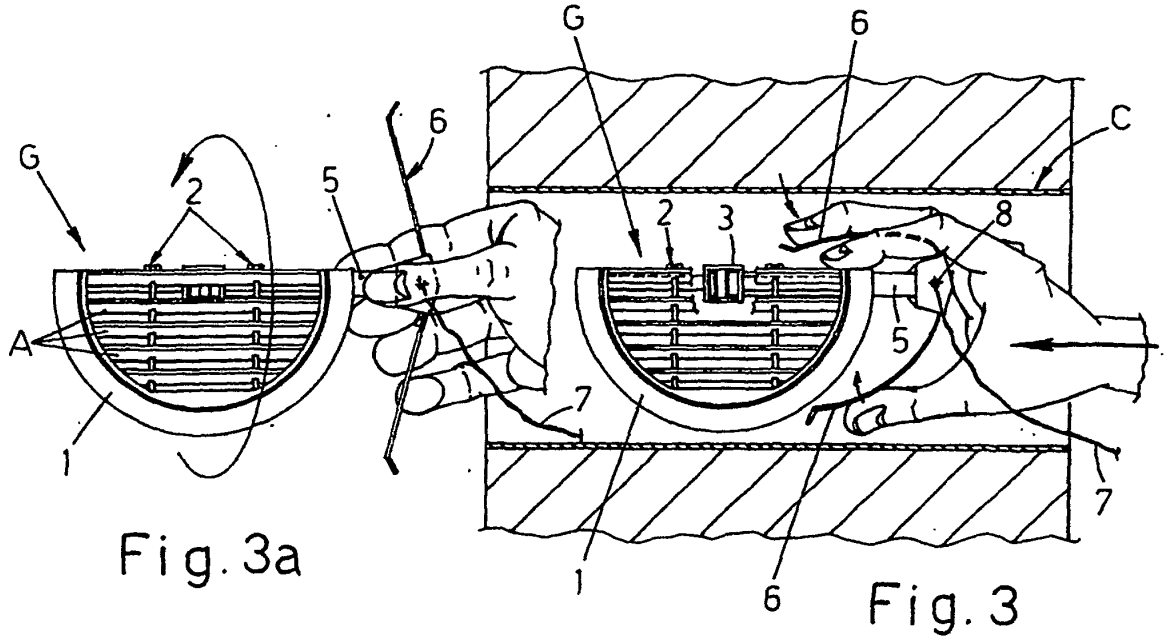


Fig.3a

Fig.3

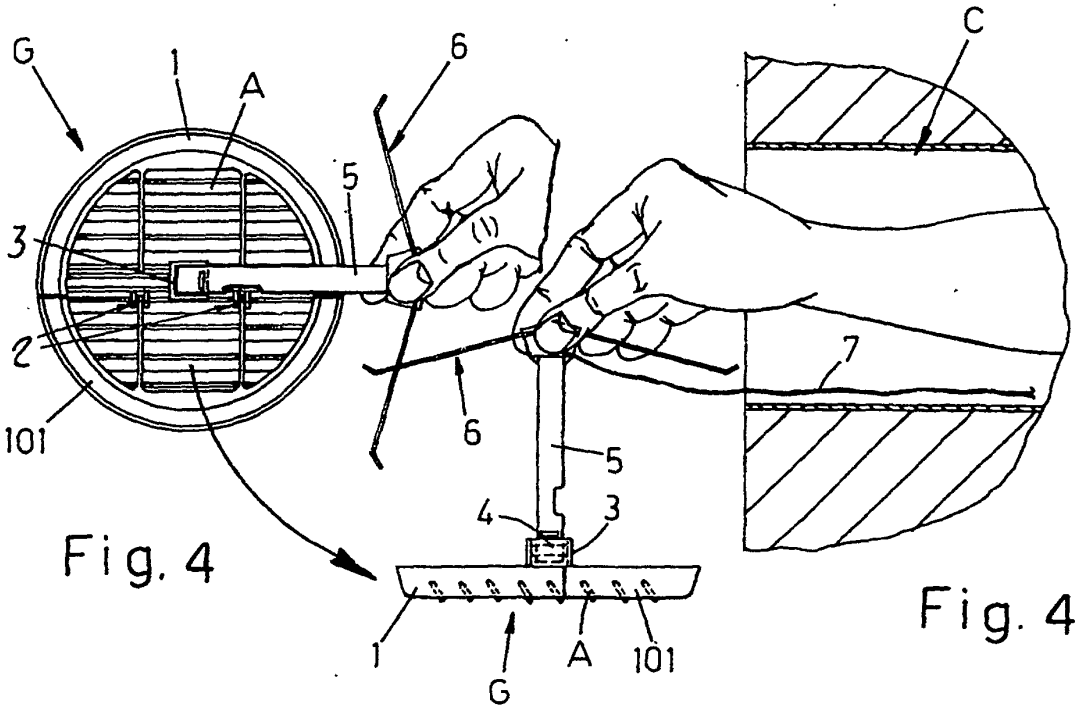


Fig. 4

Fig. 4a

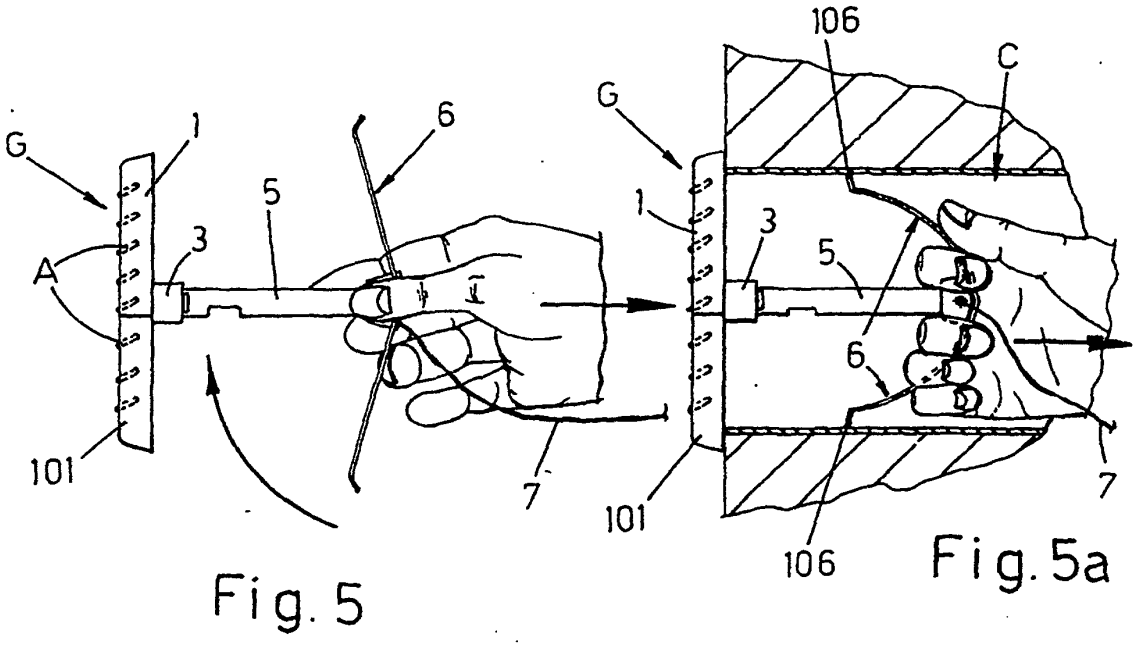


Fig. 5

Fig. 5a

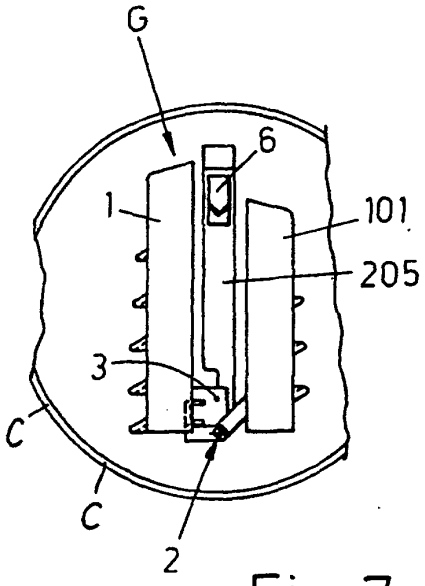


Fig.7

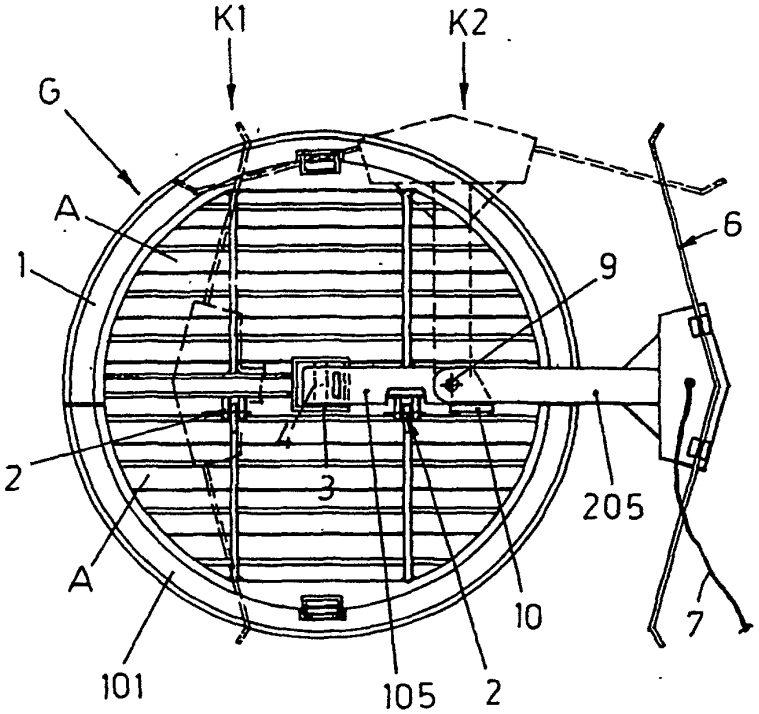


Fig.6

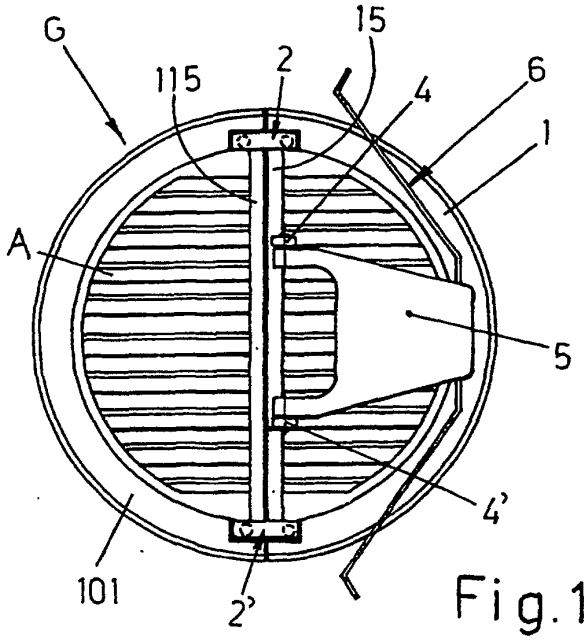


Fig.11

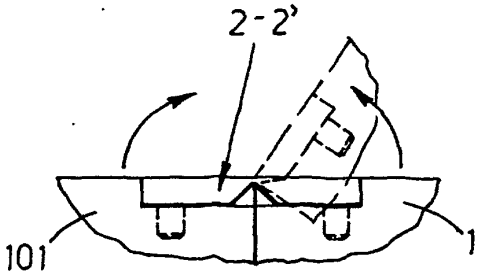


Fig.12

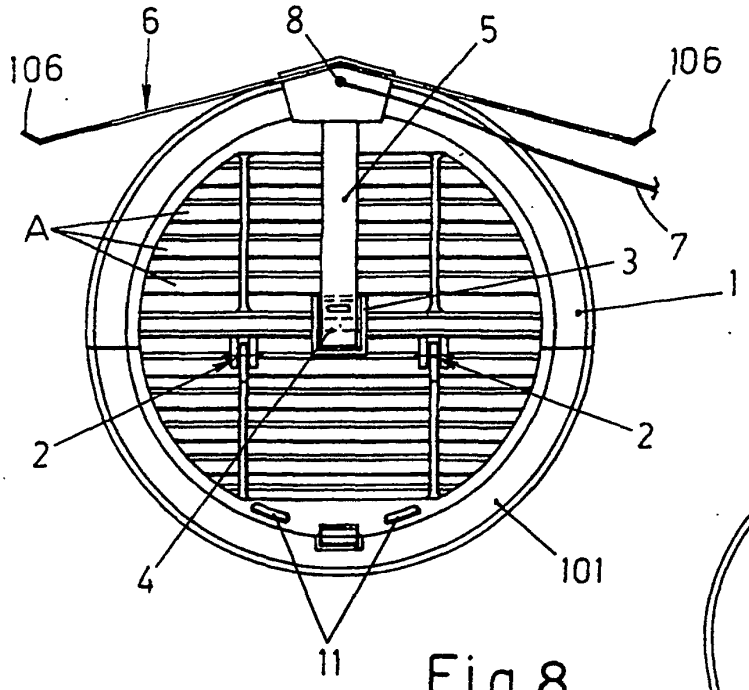


Fig.8

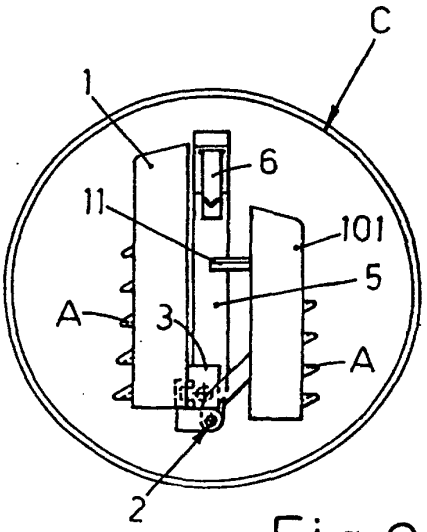


Fig.9

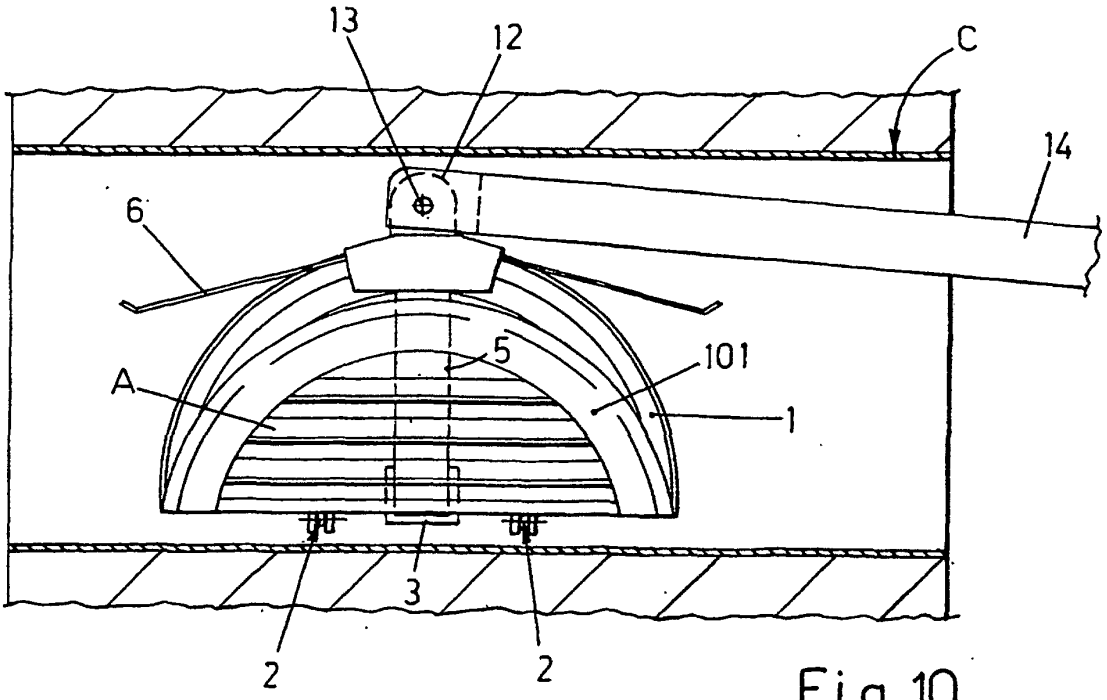


Fig.10

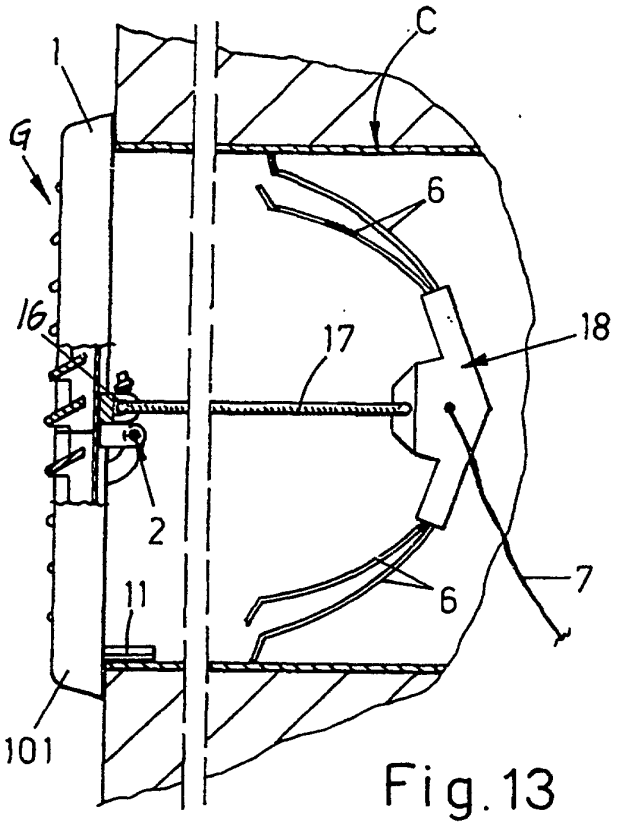


Fig.13

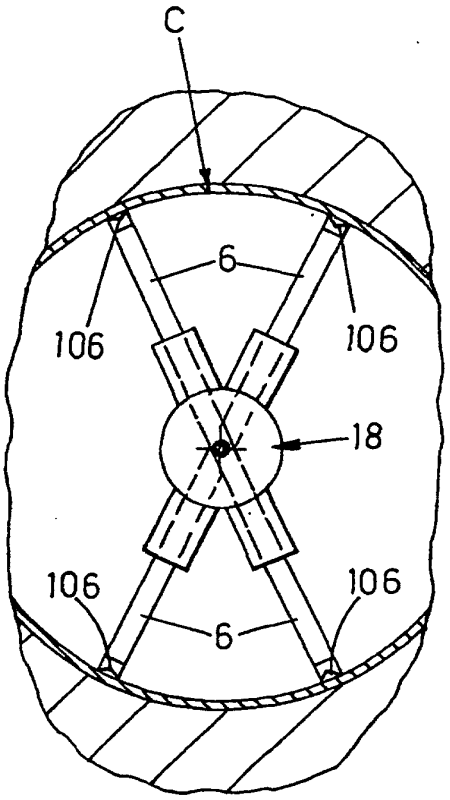


Fig.14

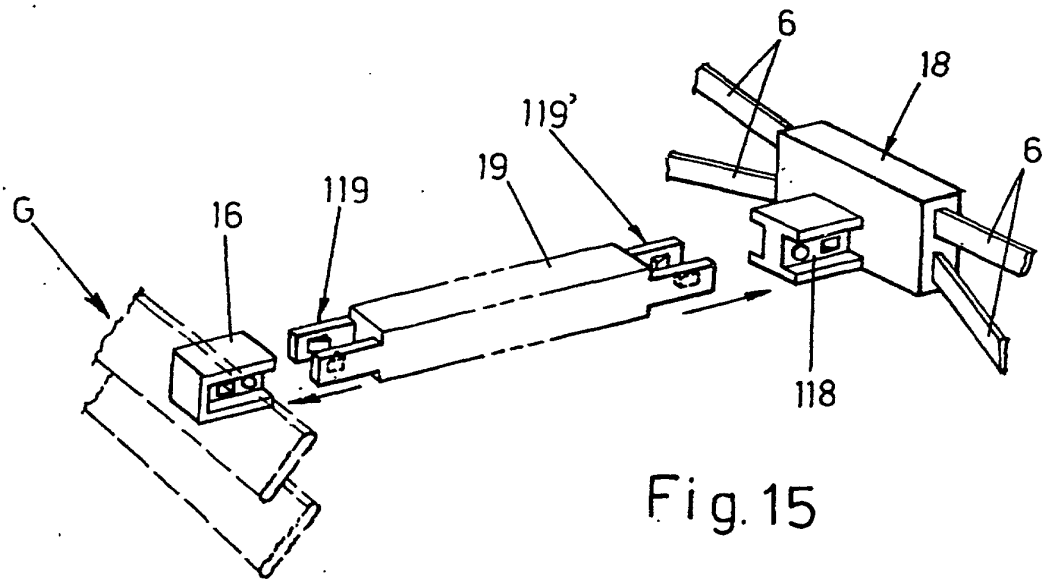


Fig.15

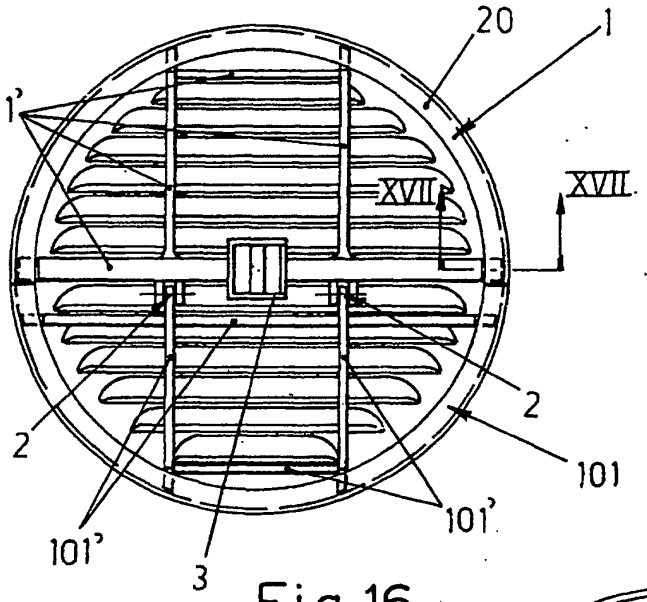


Fig.16

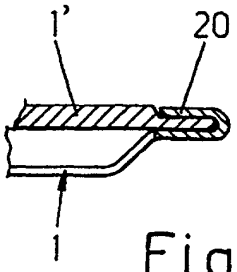


Fig.17

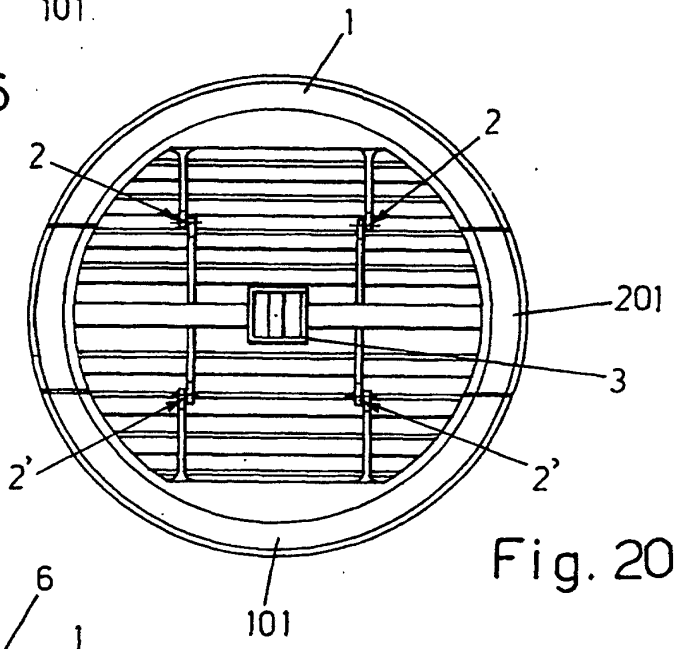


Fig. 20

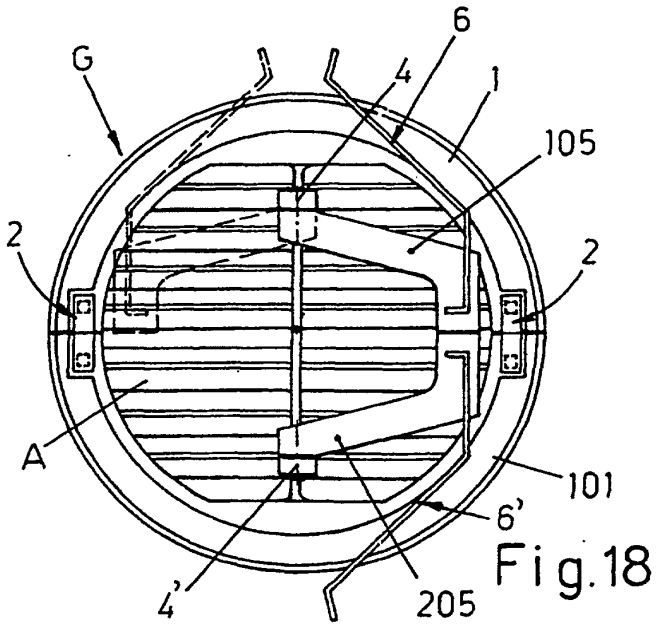


Fig.18

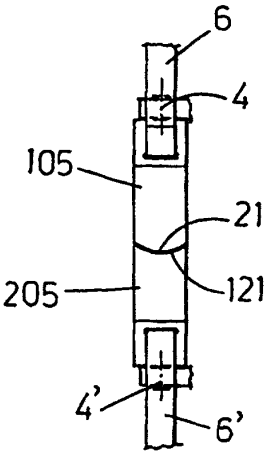


Fig. 19

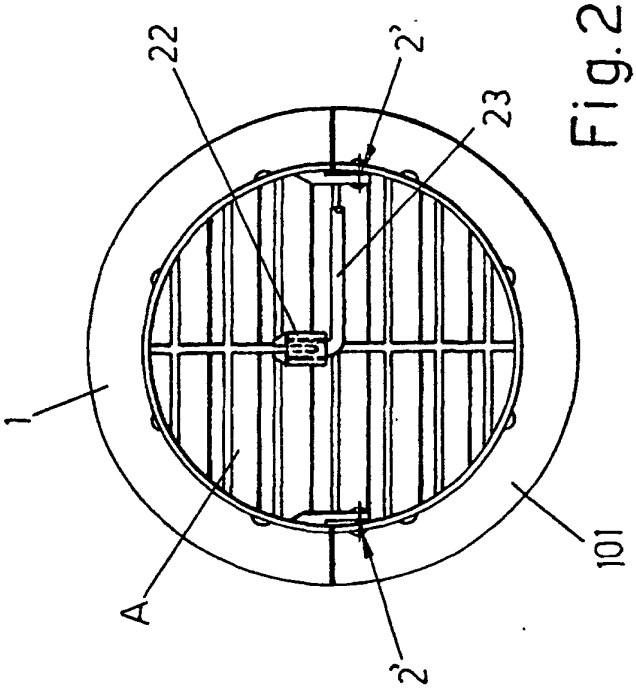


Fig.21

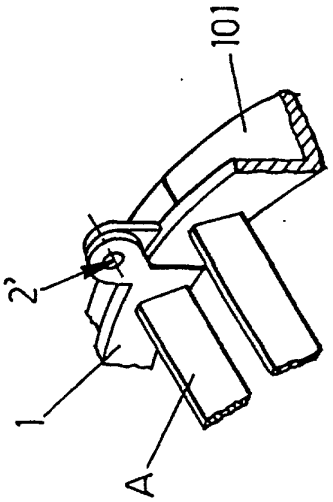


Fig.22

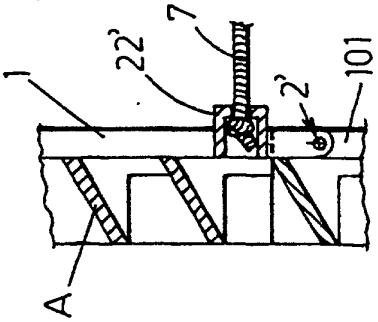


Fig.24a

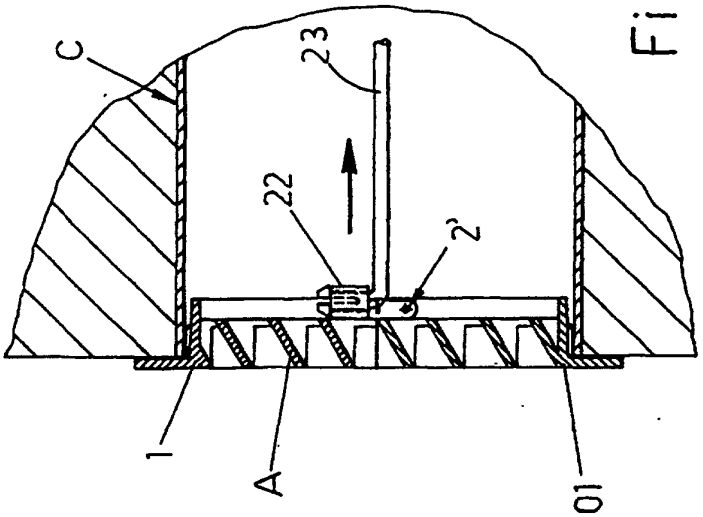


Fig.24

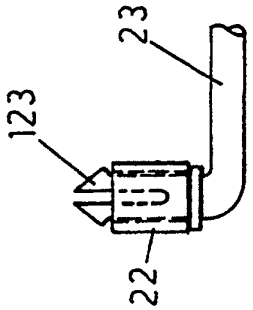


Fig.23

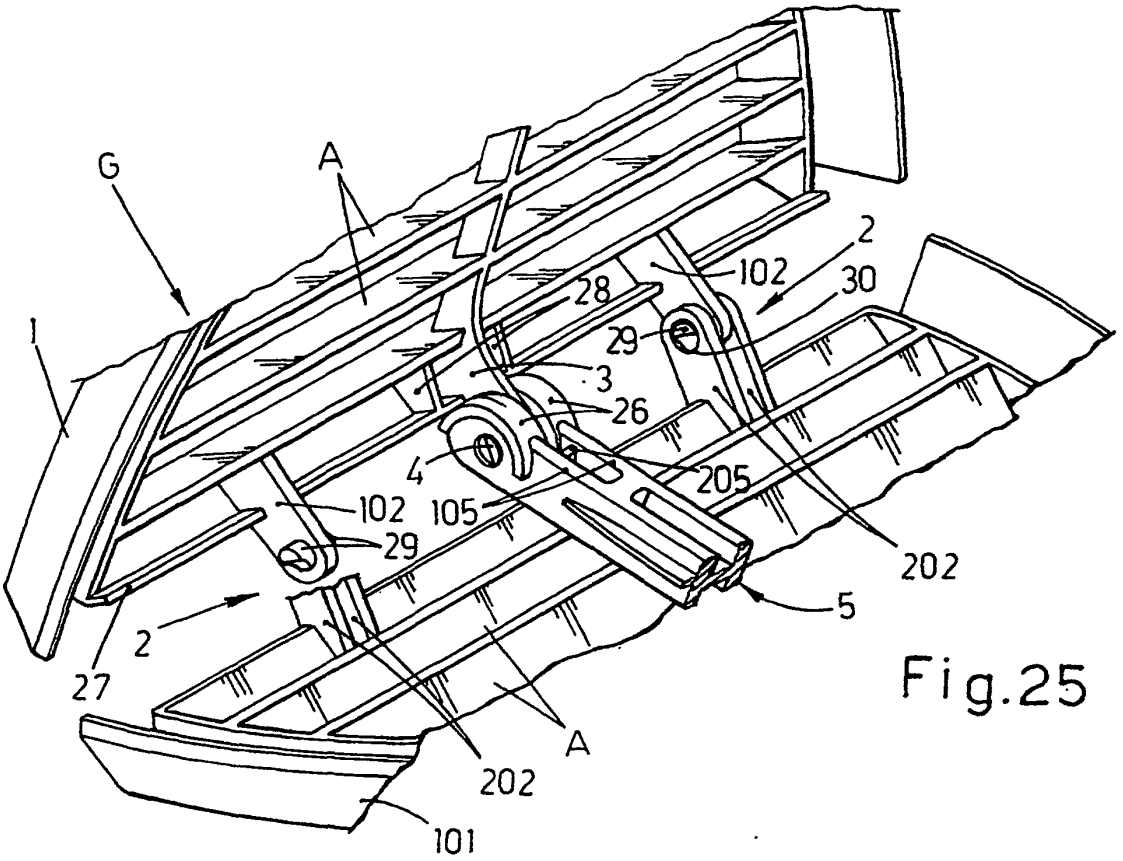


Fig.25

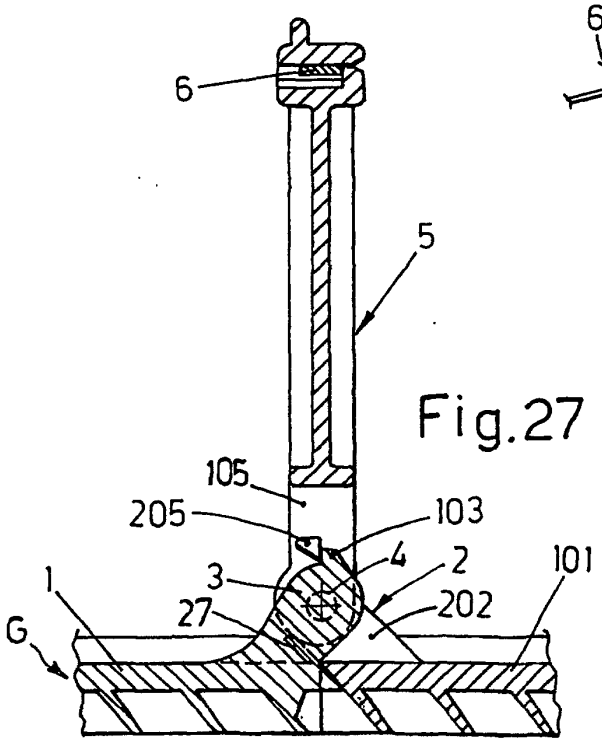


Fig.27

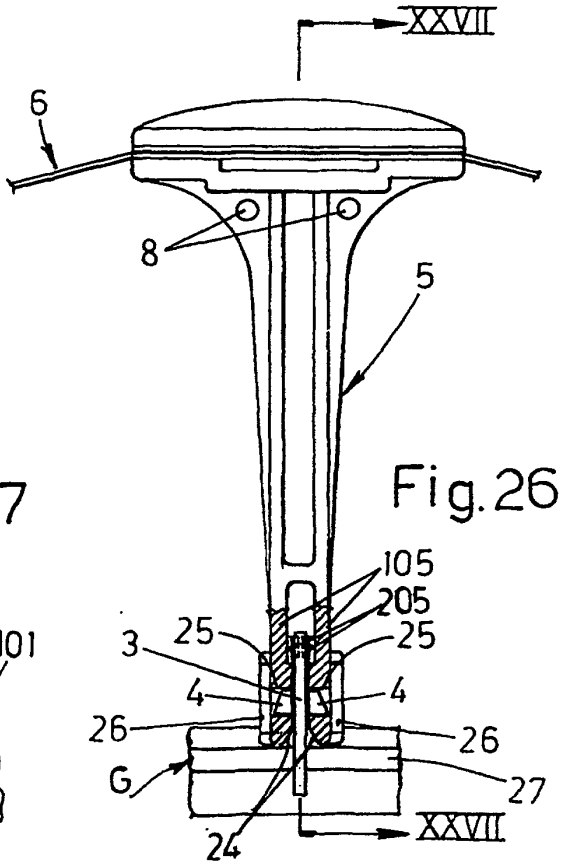


Fig.26