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(54) **Rail fence or enclosure in general highly easy to produce and install**

Zaun oder Umschliessung, die leicht herzustellen und zu montieren ist

Clôture ou enceinte pouvant être produite et installée facilement

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Description

BACKGROUND OF THE INVENTION

[0001] The present invention relates to a rail fence or enclosure which can be easily made and installed.

[0002] As is known, prior rail fences conventionally comprise cross-members which are coupled, at their longitudinal end portions, to uprights and which support a plurality of rods having a lot of different shapes, depending on requirements.

[0003] These prior rail fences are usually made of surface-processed steel, such as galvanized or painted steel, in order to prevent the rail fences from being quickly corroded.

[0004] On the other hand, a galvanizing process, while providing a very good protection against corrosion, is affected by the drawback that it does not provide a satisfactory aesthetic finishing of the rail fence and, moreover, that said galvanizing method hinders a subsequent painting of the rail fence, if a painting finishing is required for aesthetic reasons.

[0005] In this connection it should be pointed out that a protection from corrosion obtained by a simple application of paints would not provide a high duration of the painted rail fence and, moreover, would frequently require maintenance operations and further painting operations.

[0006] To use stainless materials for making rail fences, on the other hand, would bring to great difficulties in making connections of the several portions forming the rail fence as well as would involve a very high assembling expense.

[0007] The document US-A-2 218 953 discloses a rail fence according to the preamble of claim 1.

SUMMARY OF THE INVENTION

[0008] Accordingly, the aim of the present invention is to overcome the above mentioned drawbacks, by providing a rail fence or enclosure in general which can be made by easily constructed and assembled elements.

[0009] Within the scope of the above aim, a main object of the present invention is to provide such a rail fence or enclosure which is very competitive from a mere economic standpoint, even if it is made starting from comparatively highly expensive materials, such as, for example, stainless steel.

[0010] Another object of the present invention is to provide such a rail fence or enclosure which features a good mechanical strength.

[0011] Yet another object of the present invention is to provide such a rail fence or enclosure which does not present any thermal expansion problems.

[0012] According to one aspect of the present invention, the above mentioned aim and objects, as well as yet other objects, which will become more apparent hereinafter, are achieved by a rail fence or enclosure, according to claim 1.

BRIEF DESCRIPTION OF THE DRAWINGS

[0013] Further characteristics and advantages of the rail fence according to the present invention will become more apparent hereinafter from the following detailed disclosure of an embodiment thereof which is illustrated, by way of an indicative, but not limitative example, in the figures of the accompanying drawings, where:

Figure 1 is a perspective view illustrating a portion of the rail fence according to the embodiment of the present invention, some component elements of said rail fence being shown in an exploded form;
Figure 2 is a side elevation partially cross-sectioned view illustrating a portion of the rail fence according to the embodiment of the invention;
Figure 3 illustrates a detail of the subject rail fence, related to the connection of the rod elements and cross-members;
and
Figures 4 and 5 are further schematic views illustrating two rail fences according to the embodiment of the present invention.

DESCRIPTION OF THE PREFERRED EMBODIMENT

[0014] With reference to the number references of the above mentioned figures, the rail fence or enclosure according to the embodiment of the present invention, and which has been generally indicated by the reference number 1, comprises cross-members 2, the longitudinal end portions of which are coupled to upright members 3.

[0015] More specifically, the cross-members 2 are made of a bent sheet metal material, so as to provide a substantial omega-shaped cross-section.

[0016] The cross-members 2 are provided with a middle portion 4, therethrough are formed throughgoing holes of passages 5 for receiving corresponding rod elements 16.

[0017] From the mentioned middle portion 4, two legs 6a and 6b laterally extend, said legs or wings being laterally coupled to the rod elements 16, for example by screws, rivets 7, or other known coupling means.

[0018] The rod elements 16 are preferably constituted by extruded metal material tubular elements.

[0019] As is clearly shown in figure 4, two adjoining rod elements 16 can comprise separated bodies or they can be constituted, in pairs, by a same tubular body, of U bent-shape, as clearly shown in figure 5.

[0020] The upright elements 3 are also formed, preferably, by extruded metal material tubular bodies, on the side surfaces of which are coupled blocks 8 defining connection regions for the longitudinal end portions of the cross members 2.

[0021] More specifically, the mentioned coupling blocks 8 can be engaged in the longitudinal end portions

of the cross-members 2 and are provided, at the top thereof, with a throughgoing seat 9 for receiving a coupling screw 10, to be used for connecting the cross-members 2.

[0022] As shown, the screw 10 passes through a slot 11, formed through the middle portion 4 of the cross-members 2, and having an elongated shape which extends longitudinally of the cross-members, so as to allow the cross-members 2 to longitudinal slide with respect to the upright members 3, upon thermal expansion.

[0023] At the longitudinal end portions of the cross-members 2 provided for laterally contacting the upright members 3, easily deformable regions 12 are provided.

[0024] The mentioned easily deformable regions 12 are made by punching operations on the longitudinal end portions of the cross-members 2.

[0025] Such a punching operation is specifically designed for edging the material forming the cross-members 2, at the mentioned longitudinal end portions of said cross-members 2.

[0026] These edgings will absorb, by plastically deforming by contact against the upright members 3, possible thermal expansions affecting the cross-members 2.

[0027] The uprights 3 and rod elements 16, which, as stated, are formed by tubular elements, could have a circular cross-section, or a rectangular, square cross-section, depending on requirements.

[0028] The rail fence according to the embodiment of the present invention is formed by elements, such as the cross-members 2, rod elements 16 and upright members 3, which have a very simple construction, which can be made at a very low cost, even if a comparatively expensive material such as, for example, stainless steel is used therefor.

[0029] The rail fence according to the embodiment of the invention, moreover, can be quickly and easily assembled since it would be sufficient to engage the rod elements 16 through the holes or passages 5, and affix said rod elements 16 to the cross-members 2 by rivets 7 or any other known coupling means, as already stated.

[0030] Then, the cross-members 3 with the rod elements 16 will be connected to the coupling blocks 8 of the upright members 3, thereby providing a finished rail fence.

[0031] From the above disclosure and from the figures of the accompanying drawings, it should be apparent that the rail fence according to the present invention fully achieves the intended aim and objects.

[0032] In particular, it is to be pointed out that, owing to its specifically designed construction, the subject rail fence can be made at a very low cost, even if it comprises comparatively expensive materials, such as stainless steel, which materials do not require any further maintenance operations.

[0033] Yet another advantage of the rail fence according to the present invention is that it is not practically affected by possible thermal expansions.

Claims

1. An easily made and installed rail fence or enclosure (1), comprising:
   cross-members (2), rod elements (16) and upright members (3), each cross-members (2) being made from bent sheet metal such that a middle portion (4) and two legs (6a, 6b) extending laterally from said middle portion (4) are provided, the longitudinal direction of the middle portion (4) and the legs (6a, 6b) being parallel to the longitudinal direction of the cross member (2), said middle portion (4) being provided with through going holes (5) receiving the rod elements (16) in a direction perpendicular to the longitudinal direction of the cross-member (2), said legs (6a, 6b) being coupled to the rod elements (16), and the upright members (3) having coupling regions for supporting said cross-members (2) at the longitudinal end portions of the cross-members (2), characterized in that the longitudinal end portions of the cross-members (2) are provided with easily deformable regions (12) for contacting the upright members (3), such that said end portions will absorb, by plastically deforming by contact against the upright members (3), thermal expansions affecting the cross-members (2).

2. A rail fence, according to Claim 1, characterized in that said rod elements (16) comprise extruded tubular elements.

3. A rail fence, according to Claims 1 and 2, characterized in that said upright members (3) comprise tubular bodies.

4. A rail fence, according to one or more of the preceding claims, characterized in that said legs (6a, 6b) of said cross-members are coupled to said rod elements by screws or rivets.

5. A rail fence, according to one or more of the preceding claims, characterized in that said coupling regions comprise coupling blocks (8) which are laterally coupled to said upright members (3) and provided for engagement in end portions of said cross-members (2), said cross-members (2) being adapted to be longitudinally slidably coupled to said blocks (8).

6. A rail fence, according to one or more of the preceding claims, characterized in that said easily deformable regions (12) are made by punching the longitudinal end portions of said cross-members (2).

7. A rail fence, according to one or more of the preceding claims, characterized in that said upright members (3), cross-members (2) and rod elements (16) are made of a stainless steel material.

8. A rail fence, according to one or more of the preceding claims, characterized in that said cross-members (2) have an omega-shaped cross-section.

Patentansprüche

1. Zaun oder Umschließung (1), die leicht herzustellen und zu montieren ist und folgendes aufweist: Querverbindungsstücke (2), Stangenelemente (16), die aus gebogenem Stahlblech hergestellt sind, so daß ein mittleres Teilstück (4) und zwei Verlängerungsabschnitte (6a,6b), die sich seitlich von dem mittleren Teilstück (4) erstreckend, vorgesehen sind, wobei die Längsrichtung des mittleren Teilstückes (4) und der Verlängerungsabschnitte (6a, 6b) parallel zur Längsrichtung des Querverbindungsstückes (2) verlaufen, wobei das mittlere Teilstück (4) Durchgangslöcher (5) aufweist, die die Stangenelemente (16) in einer Richtung aufnehmen, die sich senkrecht zur Längsrichtung des Querverbindungsstükkes (2) befindet, wobei die Verlängerungsabschnitte (6a,6b) mit den Stangenelementen (16) gekoppelt sind und die aufrecht stehenden Teile (3) Koppelungsbereiche aufweisen, um die Querverbindungsstücke (2) an den Längsrichtungs-Endteilstücken der Querverbindungsstücke (2) zu tragen, **dadurch gekennzeichnet**, daß
die Längsrichtungs-Endteilstücke der Querverbindungsstücke (2) leicht verformbare Bereiche (12) aufweisen, um mit den aufrecht stehenden Teilen (3) so in Kontakt zu gehen, daß die Endteilstücke Wärmeausdehnungen der Querverbindungsstücke (2) durch plastische Verformungen durch Druck gegen die aufrecht stehenden Teile (3) aufnehmen.

2. Zaun nach Anspruch 1,
dadurch gekennzeichnet, daß
die Stangenelemente (16) Extrusionsrohrelemente umfassen.

3. Zaun nach den Ansprüchen 1 und 2,
dadurch gekennzeichnet, daß
die aufrecht stehenden Teile (3) rohrförmige Körper umfassen.

4. Zaun nach einem oder mehreren der vorstehenden Ansprüche,
dadurch gekennzeichnet, daß
die Verlängerungsabschnitte (6a, 6b) der Querverbindungsstücke durch Schrauben oder Nieten an die Stangenelemente gekoppelt sind.

5. Zaun nach einem oder mehreren der vorstehenden Ansprüche,
dadurch gekennzeichnet, daß
die Koppelungsbereiche Koppelungsblöcke (8) aufweisen, die seitlich an die aufrecht stehenden Teile (3) gekoppelt und zum Eingriff in Endteilstücke der Querverbindungsstücke (2) vorgesehen und so angepaßt sind, daß sie in Längsrichtung gleitbar an die Blöcke (8) koppelbar sind.

6. Zaun nach einem oder mehreren der vorstehenden Ansprüche,
dadurch gekennzeichnet, daß
die leicht verformbaren Bereiche (12) durch Lochen der Längsrichtungs-Endteilstücke der Querverbindungsstücke (2) hergestellt sind.

7. Zaun nach einem oder mehreren der vorstehenden Ansprüche,
dadurch gekennzeichnet, daß
die aufrecht stehenden Teile (3), Querverbindungsstücke (2) und Stangenelemente (16) aus rostfreiem Stahl hergestellt sind.

8. Zaun nach einem oder mehreren der vorstehenden Ansprüche,
dadurch gekennzeichnet, daß
die Querverbindungsstücke (2) einen omegaförmigen Querschnitt aufweisen.

Revendications

1. Clôture ou enceinte (1) pouvant être installée et fabriquée facilement, comprenant :
Des membres formant traverses (2), des éléments formant tiges (16) et des membres verticaux (3), chaque membre formant traverses (2) étant constitué de tôles coudées (« bent sheet métal »), comprenant une partie centrale (4) et deux bras (6a, 6b) s'étendant latéralement à partir de ladite partie centrale (4), la direction longitudinale de la partie centrale (4) et les bras (6a ,6b) étant parallèles à la direction longitudinale du membre formant traverse (2), ladite partie centrale (4) étant munie d'orifices (5) traversant ladite partie et recevant les éléments formant tiges (16) dans une direction perpendiculaire à la direction longitudinale du membre formant traverses (2), lesdits bras (6a, 6b) étant couplés aux éléments formant tiges (16), et les membres verticaux (3) présentant des régions de couplage pour soutenir lesdits membres formant traverses (2) aux extrémités longitudinales des membres formant traverses (2), caractérisées en ce que les extrémités longitudinales des membres formant traverses (2) sont munies de régions facilement déformables (12) pour être en contact avec les membres verticaux (3), telles que les lesdites extrémités absorbe-

ront, par déformation plastique par contact contre les membres verticaux (3), les expansions thermiques affectant les membres formant traverses (2).

2. Clôture selon la revendication 1 caractérisée en ce que lesdits éléments formant tiges (16) comprennent des éléments tubulaires extrudés.

3. Clôture selon les revendications 1 et 2, caractérisée en ce que lesdits membres verticaux (3) comprennent des corps tubulaires.

4. Clôture selon l'une quelconque des revendications précédentes, caractérisée en ce que lesdits bras (6a, 6b) desdits membres formant traverses sont couplés aux dits éléments formant tiges par des vis ou des rivets.

5. Clôture selon l'une quelconque des revendications précédentes, caractérisée en ce que lesdites régions de couplage comprennent des blocs de couplage (8) («coupling blocks») qui sont couplés latéralement aux dits membres verticaux (3) et assurent une prise aux extrémités desdits membres formant traverses (2), lesdits membres formant traverses (2) étant adaptés pour être liés longitudinalement par glissement (« slidably ») aux dits blocs (8).

6. Clôture selon l'une quelconque des revendications précédentes, caractérisée en ce que lesdites régions facilement déformables (12) sont obtenues par estampage (« punching ») des extrémités longitudinales desdits membres formant traverses (2).

7. Clôture selon l'une quelconque des revendications précédentes, caractérisée en ce que lesdits membres verticaux (3), lesdits membres formant traverses (2) et les éléments formant tiges (16) sont constitués d'un matériau de type acier inoxydable.

8. Clôture selon l'une quelconque des revendications précédentes, caractérisée en ce que lesdits membres formant traverses (2) ont une section efficace de forme oméga ("omega-shaped cross-section")

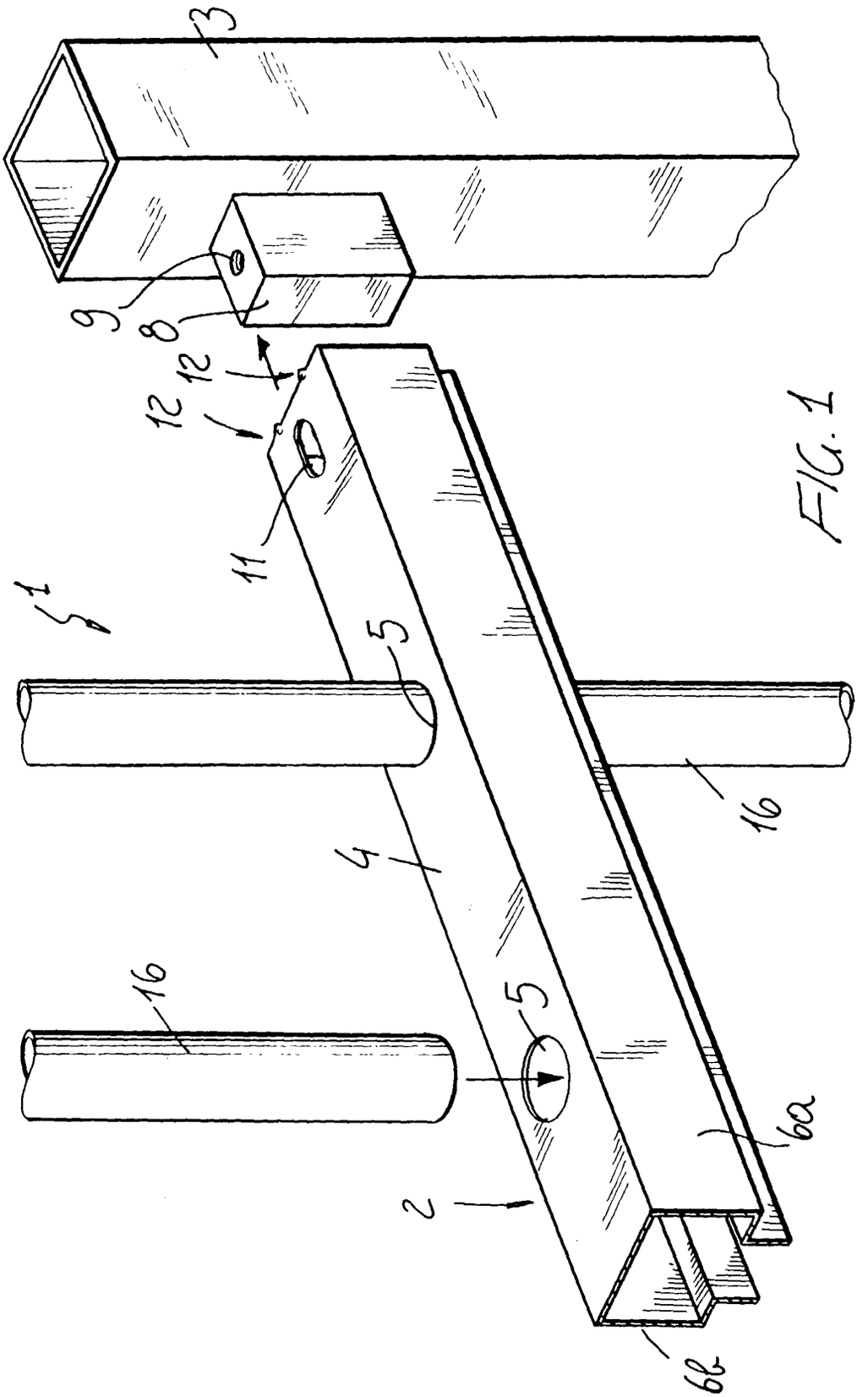

FIG. 1

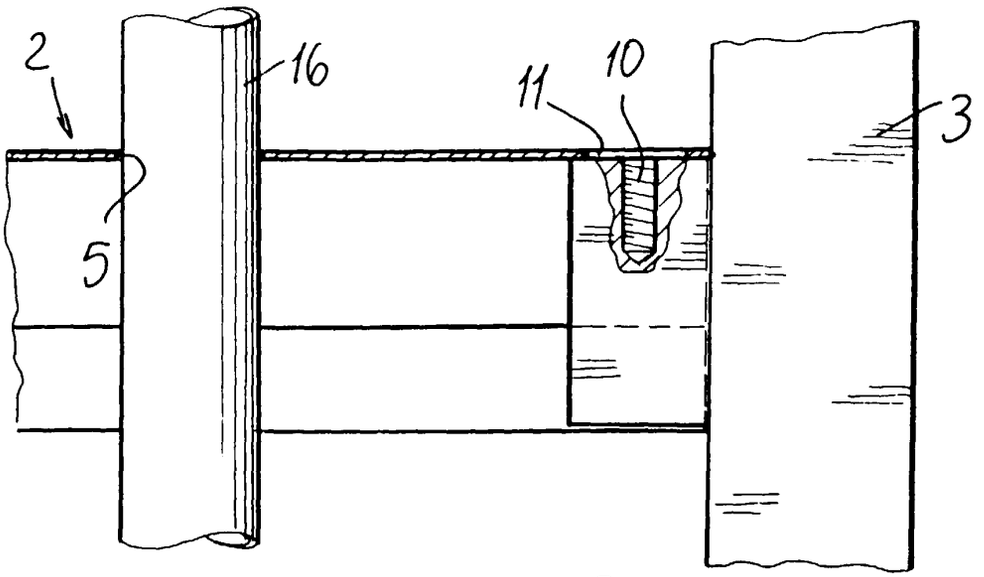

FIG. 2

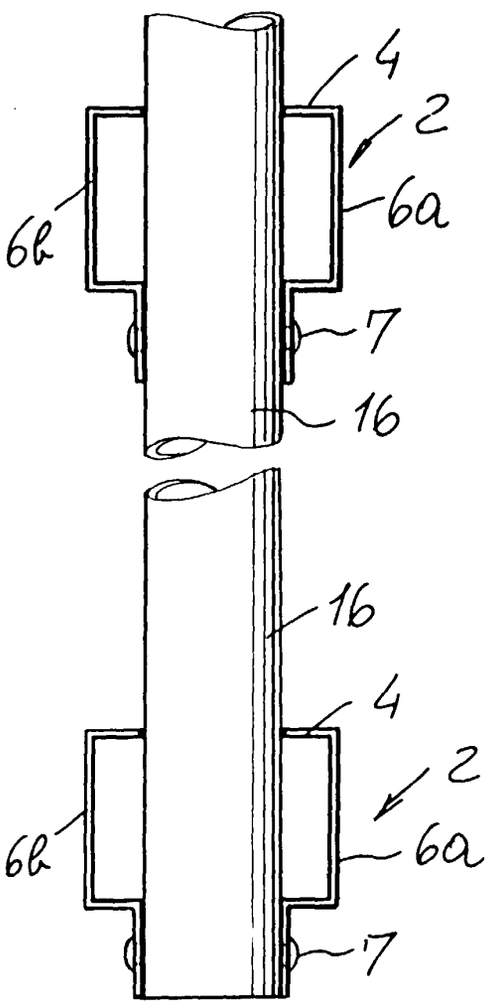

FIG. 3

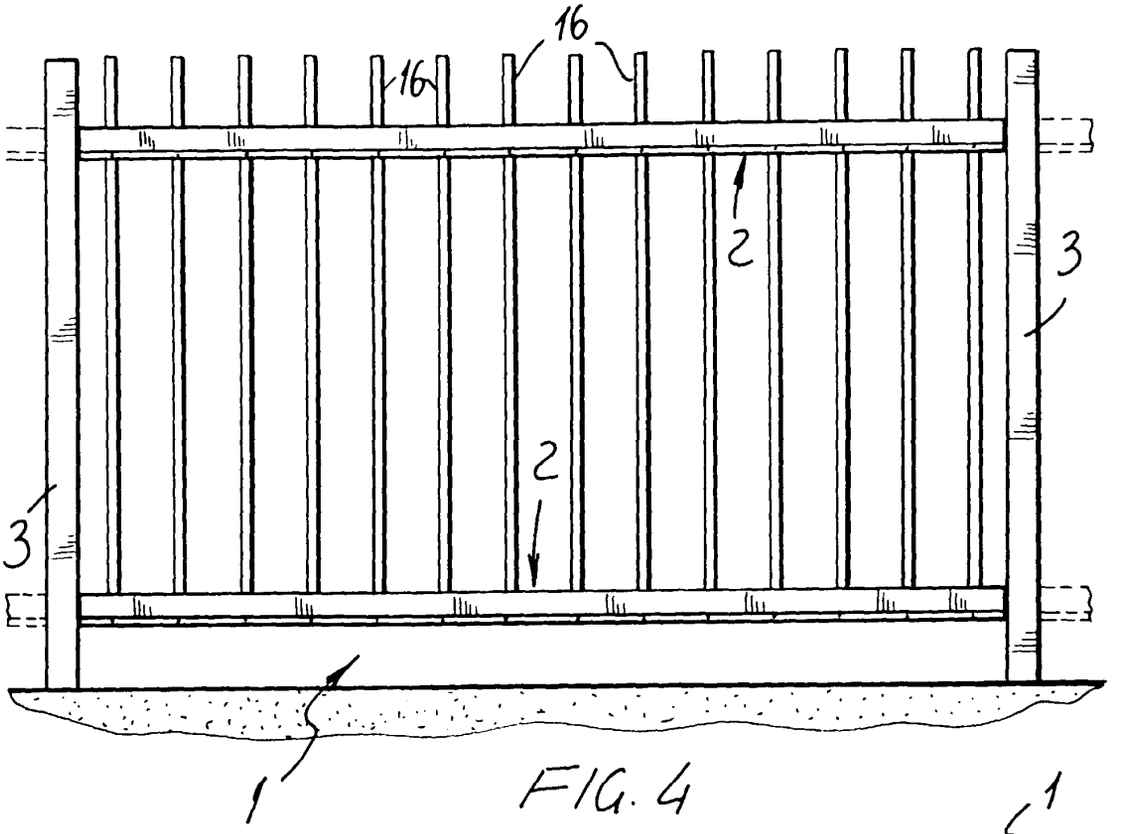

FIG. 4

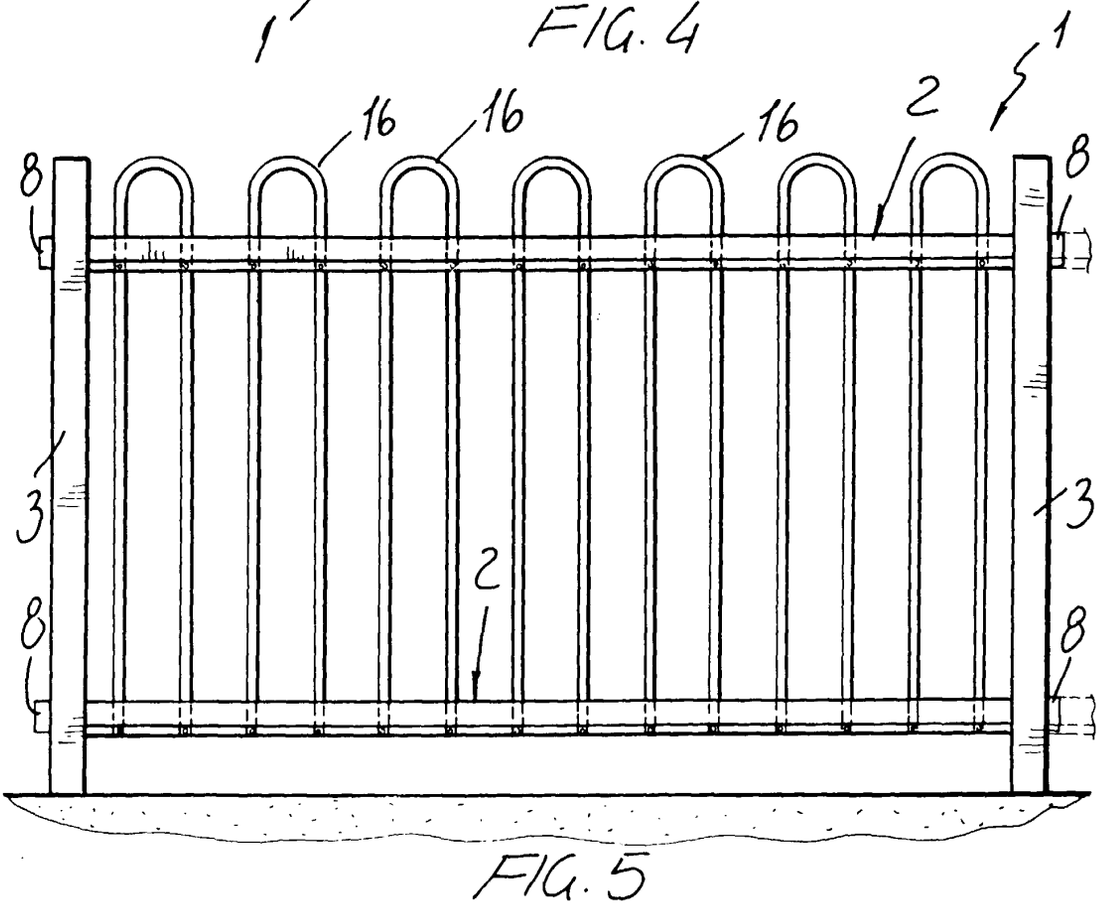

FIG. 5