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## (54) Roll-up safety grating.

(57) The safety grid comprises a number of mutually parallel track profiles (1), which are held in a definite mutual distance by bridge elements (4), which are swingably suspended in tracks (3) in the track profiles (1). The bridge elements (4) have the same width and are positioned in a definite mutual distance.

Inserted between the bridge elements (4) there are other bridge elements ($4^1$) joining up to and resting against the bridge elements (4) along the edges (7).

The bridge elements (4) and ($4^1$) combine to form a closed rim (9), which at its ends are taken a distance into the guide rails (2) between the track profiles (1). The bridge elements ($4^1$) are made of a glass-clear transparent plastics material, preferably a polycarbonate.

The outer side of the bridge element ($4^1$) has a convex centre portion (10) and concave outer portions (11) which at the transition into a bead (5) have a tangent ($t_1$) common with it.

The inclination of the tangent ($t_1$) in the vertical position of the safety grid is less than or equal to the inclination ($v_2$) of the tangent ($t_2$) to the circular cross section in the tracks (3) at the outer edge (12) of the tracks (3).

The safety grid is difficult of access to attacks from the outside with tools in case of burglary. The track profiles (1) can therefore have a small cross section, they need no reinforcement, and they can consequently be made narrow. The transparent area of the safety grid can consequently be made correspondingly larger.

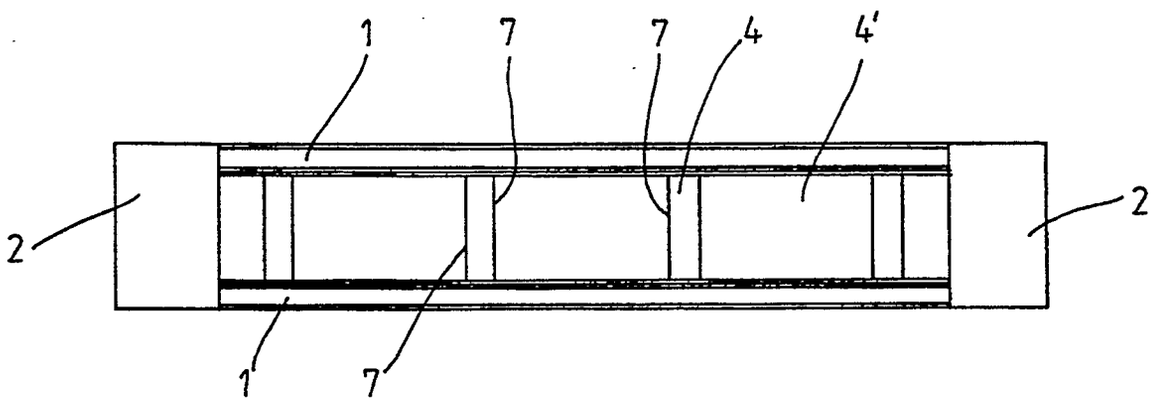


FIG 3

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# ROLL-UP SAFETY GRID

The present invention relates to a safety grid of the kind described in the introduction to Claim 1.

Such safety grids are by way of example mounted behind the glazing in the display windows of shops, e.g. goldsmith's, and they are intended to prevent thieves from getting access to the displayed articles after the pane has been smashed.

The safety grid is normally rolled up on a cylindrical core in the daytime and rolled down after closing time. The safety grid is locked in the rolled-down position by a motor brake, so that it cannot be lifted from the outside. The glazing in front of it can be connected to an alarm system so that the alarm is set off and the police or a safety guard is called if the pane is smashed. Therefore the safety grid must be transparent and at the same time obstruct access to the displayed articles for as long as possible after the pane has been smashed.

It is the purpose of the present invention to describe a safety grid which offers the best possible protection against penetration at the same time as the transparent area is as large as possible.

By embodying the safety grid as described in the characterizing part of Claim 1 it is achieved that the safety grid is completely closed and thus has no openings whatsoever through which the displayed items can be fished out and through which it is possible to insert tools in order to attack either the track profiles or the bridge elements. Consequently, it is possible that the safety grid according to the invention also makes it possible to use track profiles with a smaller cross-sectional area than those used in the known safety grids.

The track profile can therefore be made smaller whereby the distance between the track profiles and consequently also the transparent area can be made correspondingly larger. Furthermore, it will not be necessary to reinforce the track profiles.

By what is described in Claim 2 it is achieved that the whole field of vision between the two track profiles becomes transparent and that there will be no light-refracting effects around the joint between two bridge elements.

Claim 3 describes an embodiment of a safety grid according to the invention.

By what is described in Claim 4 it is achieved that it is not possible to force a tool into the joint between two bridge elements.

The embodiment described in Claim 5 ensures that a bridge element made of a glass-clear transparent material, such as polycarbonate, can have a long length and at the same time be impact-proof, which gives a free choice with regard to the length of the individual bridge ele-ments, and that the safety grid is foldable in one direction, from the inside and outwards, so that it can be rolled up on a roll, but not in the opposite direction.

The invention will be described in detail below with reference to the accompanying drawing in which

fig. 1 shows a front view of a section of a known safety grid,

fig. 2 shows a section after the line I-I in fig. 1.

fig. 3 shows a front view of a section of a safety grid according to an embodiment of the invention,

fig. 4 shows a front view of a safety grid according to another embodiment of the invention,

fig. 5 shows a front view of a section of a safety grid according to a third embodiment of the invention,

fig. 6 shows a large-scale section after the line V-V in fig. 5,

fig. 7 shows an end view of two bridge elements according to the invention mounted in a track profile.

fig.8 shows a cross-section through a track profile.

As shown in fig. 1 a known roll-up safety grid consists of a number of mutually parallel track profiles 1, which at their ends are inserted into and can slide in guide rails 2 so that the grid can be moved in the vertical direction, up or down, by a not shown cylindrical roll by a tube motor in the top of the safety grid.

At their top and bottom the track profiles 1 are on their interior side embodied with cylindrical tracks 3 in the full length of the track profile 1. As shown in fig 7 the tracks 3 have a number of swingably embedded bridge elements 4 which at their ends are embodied with hinge pins in the shape of beads 5 (gripping rims). The bridge elements 4 connect the track profiles 1 to form a coherent grid. The bridge elements 4 have a uniform width and are held by cylindrical distance pieces, which are inserted into the tracks 3 with a definite mutual distance.

The track profiles 1 are made of aluminium, and the bridge elements 4 may also be made of aluminium. Between the bridge elements 4 there are openings 6 through which the exhibited objects behind the safety grid can be viewed.

According to the invention and as shown in fig. 3 bridge elements $4_1$ are inserted between the bridge elements 4. They are made from a glass-clear transparent material, preferably of a polycarbonate, which fills out the openings 6 and rest against and join up to a preceding or following bridge element 4 along the edge 7 along the full length of the edge. As shown in fig 6 the bridge elements are held in position against each other by cylindrical lock pins 8. The bridge elements 4 and $4^1$ thus combine to form a closed rim 9 between the track profiles. This rim 9 is at both ends, as shown in fig. 6, taken a distance into the guide rails

2. The bridge elements 4 and $4^1$ preferably have the same cross-sectional profile and they can be made of the same type of material.

As shown in fig. 4 the bridge elements 4 have the same length as the bridge elements $4^1$.

As shown in fig. 7 a bridge element $4^1$ according to the invention is on the outside embodied with a convex centre portion 10 and with a concave outer portions 11 which, where they transform into a bead 5, have a mutual tangent $t_1$. The inclination of this tangent $v_1$ is less than or equal to the inclination $v_2$ of the tangent $t_2$ to the circular cross section in the tracks 3 at the outer edge 12 of the tracks. In the full length of the cross section between the beads 5, the bridge elements $4^1$ preferably have a uniform thickness t, which is less than the diameter of a bead 5.

A bridge element $4^1$ with such a cross-sectional profile and produced from a transparent polycarbonate can have a great length and at the same time be impact proof. It can, for instance, as shown in fig. 5 have approximately the same length as a track profile 1.

## Claims

1. Roll-up safety grid consisting of a number of mutually parallel track profiles (1) made of a light metal and with their ends inserted into guide rails (2), and of a number of bridge elements (4), which are of uniform width and are arranged with the same mutual distance, and which at their ends have hinge pins in the shape of beads (5) on which they are swingably hinged in longitudinal cylindrically shaped tracks (3) inwardly open towards the safety grid's interior side. The tracks (3) are positioned above and below at a track profile's (1) interior side and extend in the whole length of the track profile (1) **characterized** by the fact that between the bridge elements (4) there is inserted bridge elements ($4^1$), joining up to and resting against the bridge elements (4) - edge (7) against edge - in the whole length of the edge (7), so that the bridge elements (4, $4^1$) in combination form a closed rim (9) between the track profiles (1), the said rim having a length so that it continues a distance into the guide rails (2) in both sides, and that the bridge elements ($4^1$) are produced from a glass-clear transparent material, preferably a polycarbonate.

2. Roll-up safety grid according to Claim 1 **characterized** in that the bridge elements (4) are made of the same material and have the same cross-sectional profile as the bridge elements ($4^1$).

3. Roll-up safety grid according to Claim 1 **characterized** in that all bridge elements (4, $4^1$) have the same length.

4. Roll-up safety grid according to Claims 1-3 **characterized** by the fact that the bridge elements (4) and ($4^1$) are held in a squeezed position against each other by two lock pins (8).

5. Roll-up safety grid according to Claim 1 **characterized** by the fact that a transparent bridge element ($4^1$) on its outer side against the outside of the safety grid has a convex centre portion (10) and concave outer portions (11), which at their transition into the bead (5) has a common tangent ($t_1$) with the bead (5), that the inclination ($v_1$) of the tangent ($t_1$), when the safety grid is in its vertical position, is smaller than or equal to the inclination ($v_2$) of the tangent ($t_2$) to the circular cross section in the tracks (3) at the outermost edge (12) of the tracks, and that the bridge elements ($4^1$) in the full extent of the cross section between the beads (5) preferably have a uniform thickness (t) which is less than the diameter of a bead (5).

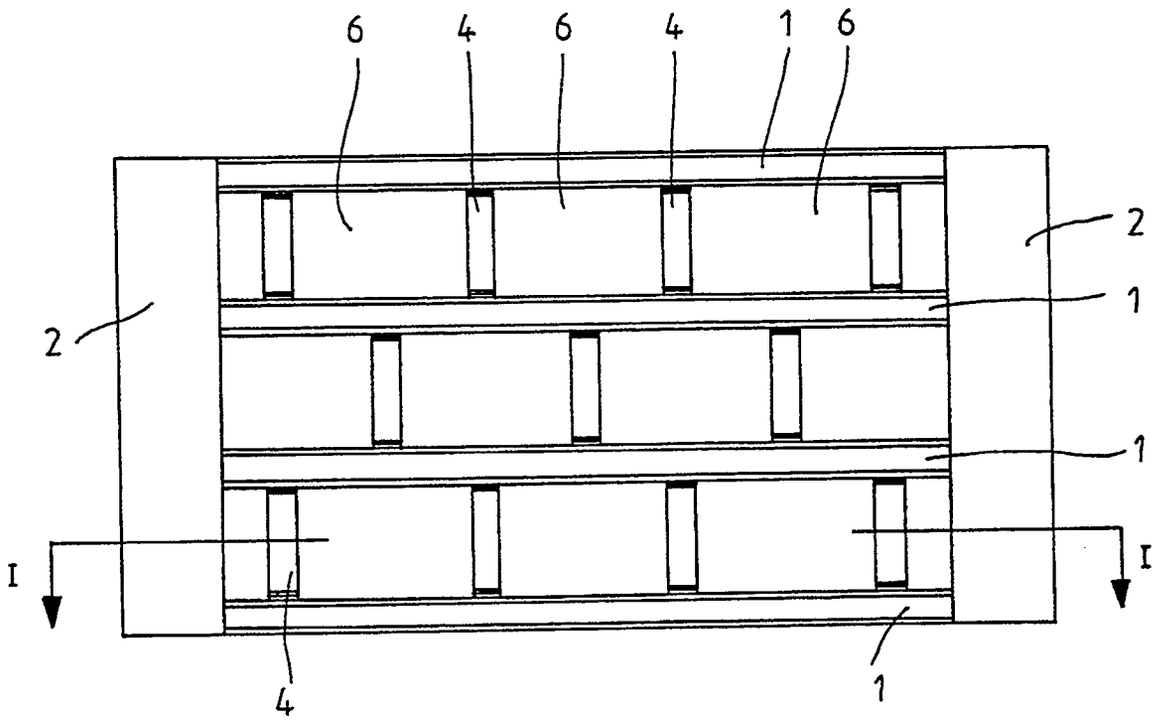


FIG 1

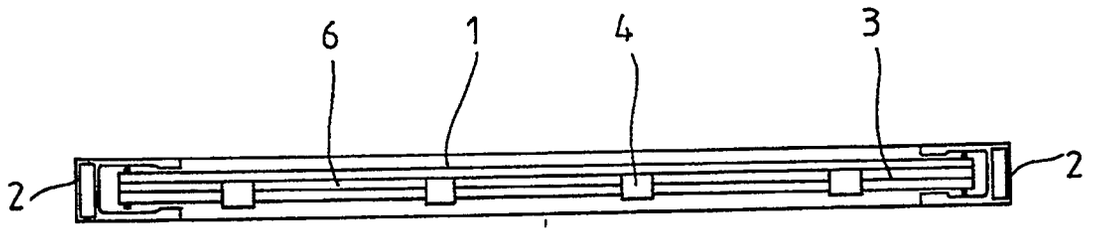


FIG 2

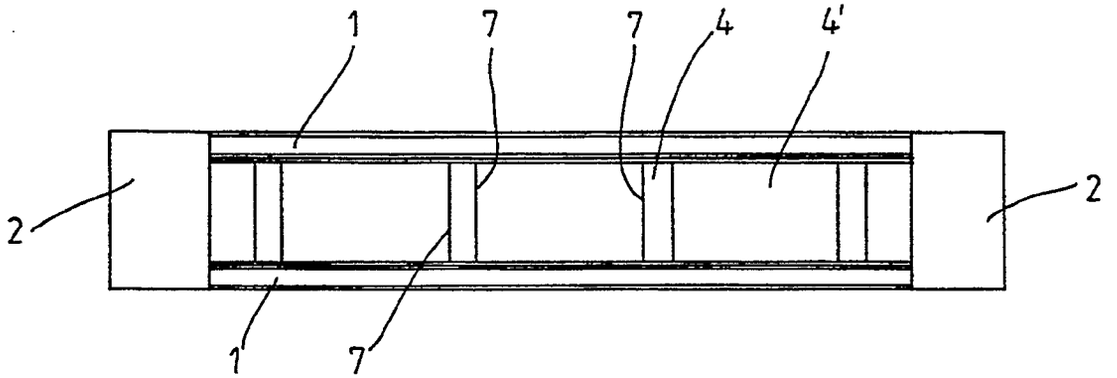


FIG 3

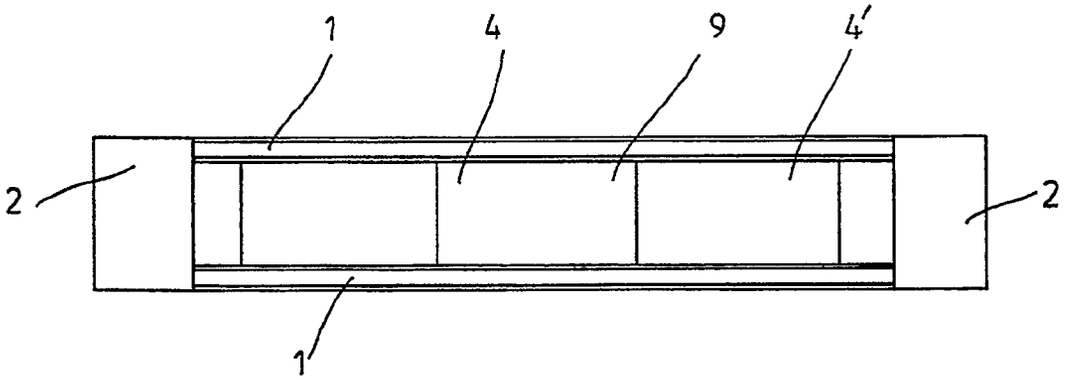


FIG 4

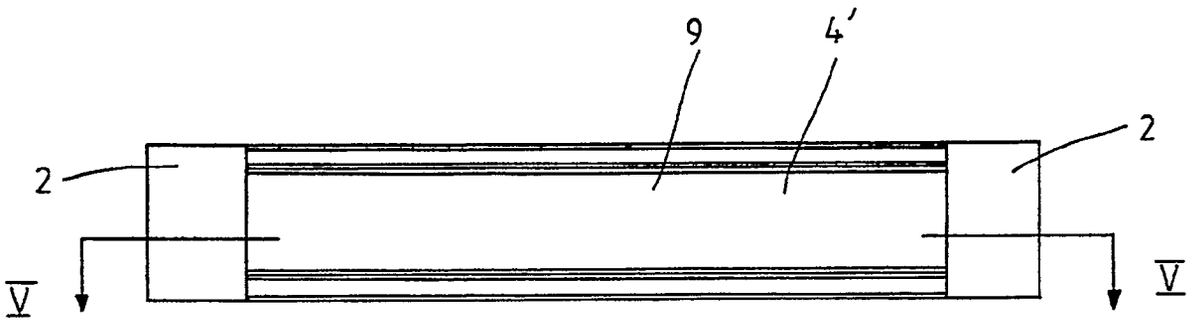


FIG 5

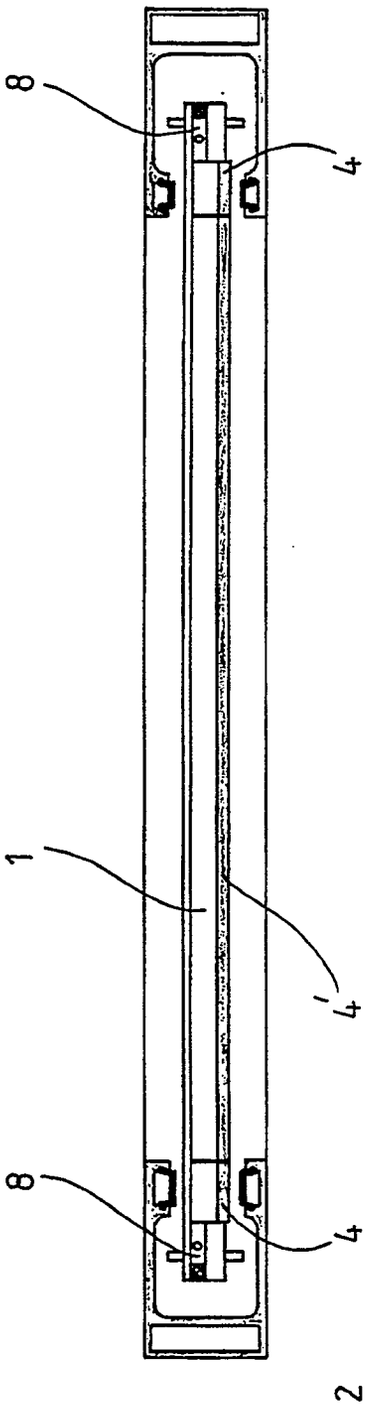


FIG 6

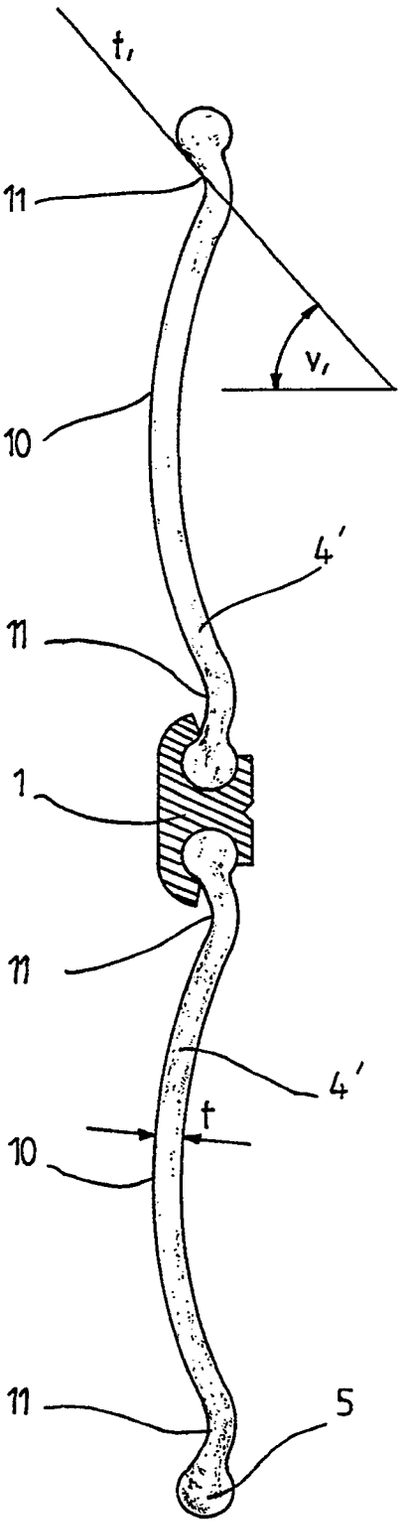


FIG 7

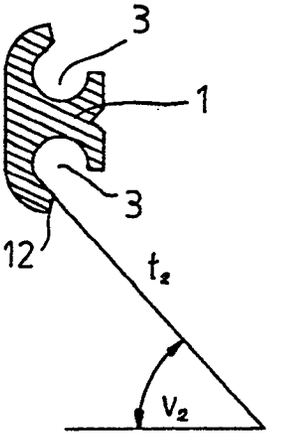


FIG 8