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(54) Title of the Invention: **Temporary barrier**
Abstract Title: **Temporary barrier.**

(57) A temporary barrier 10 comprises a barrier panel formed from a plurality of barrier panel components 16, 18 arranged side-by-side. The panel components are secured to one another by an upper reinforcing member 20 at a panel edge opposite the barrier feet 14. The panel components are formed from a plastics material. The reinforcing member may extend over at least half the width of the barrier panel and may be fibre reinforced. A lower reinforcing member 22 may also be provided. The panel components may comprise upper and lower rails 24, 26 with uprights extending between them. The upper and lower rails may be hollow and may include windows through which the hollow interior is exposed. The reinforcing members may be located within the upper and lower rails. Reinforcing members 36, 38 may also be provided within the uprights of the panel components, and the feet may be mounted to projecting ends of the members.

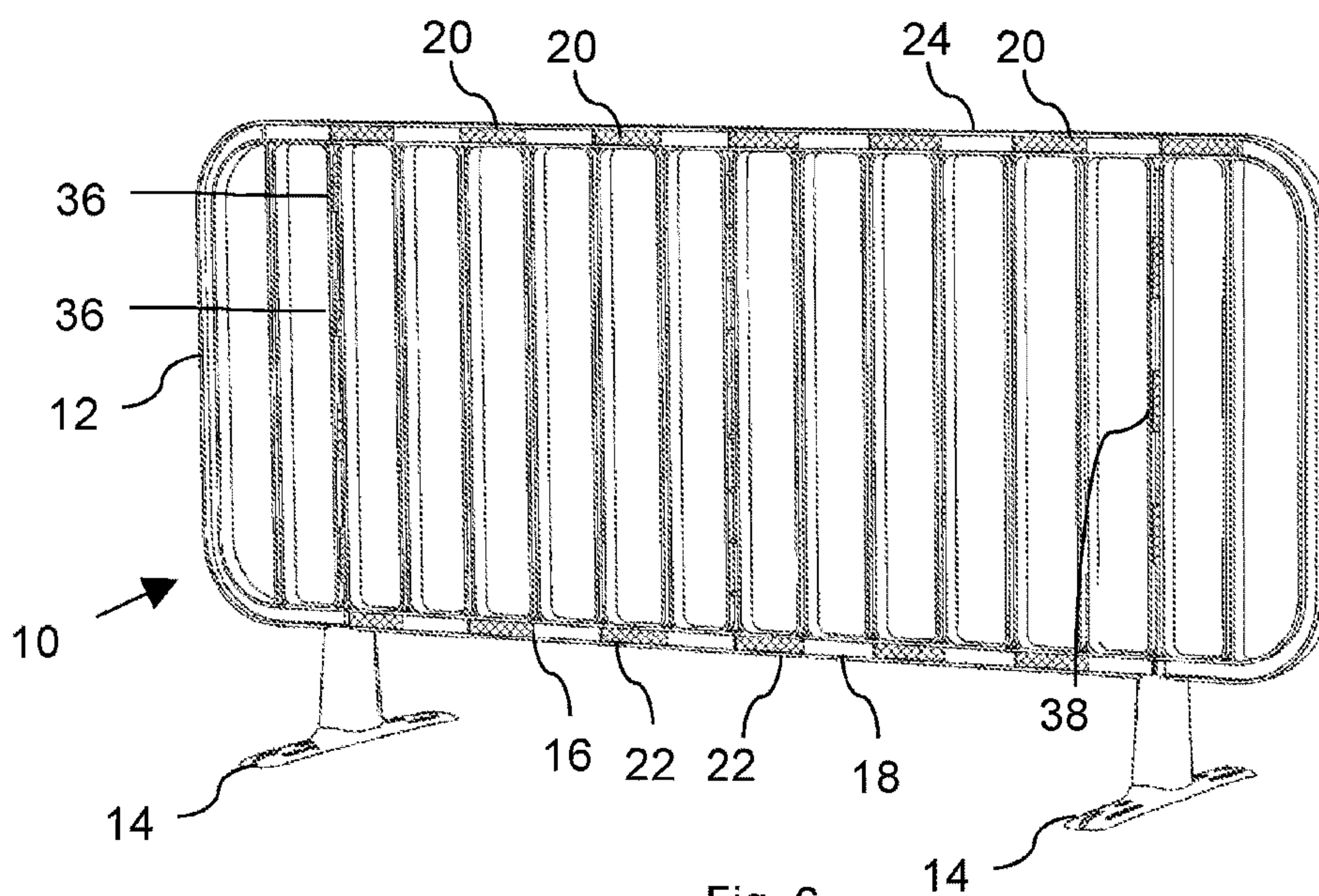
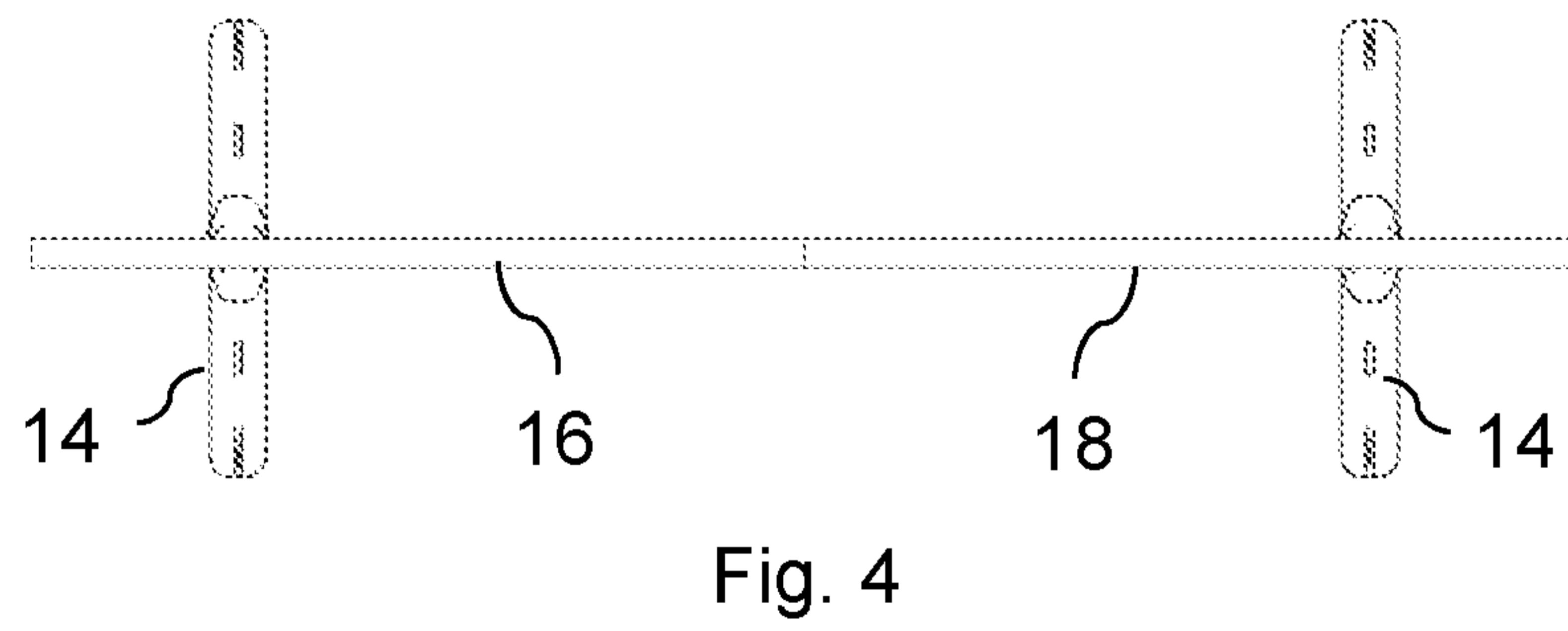
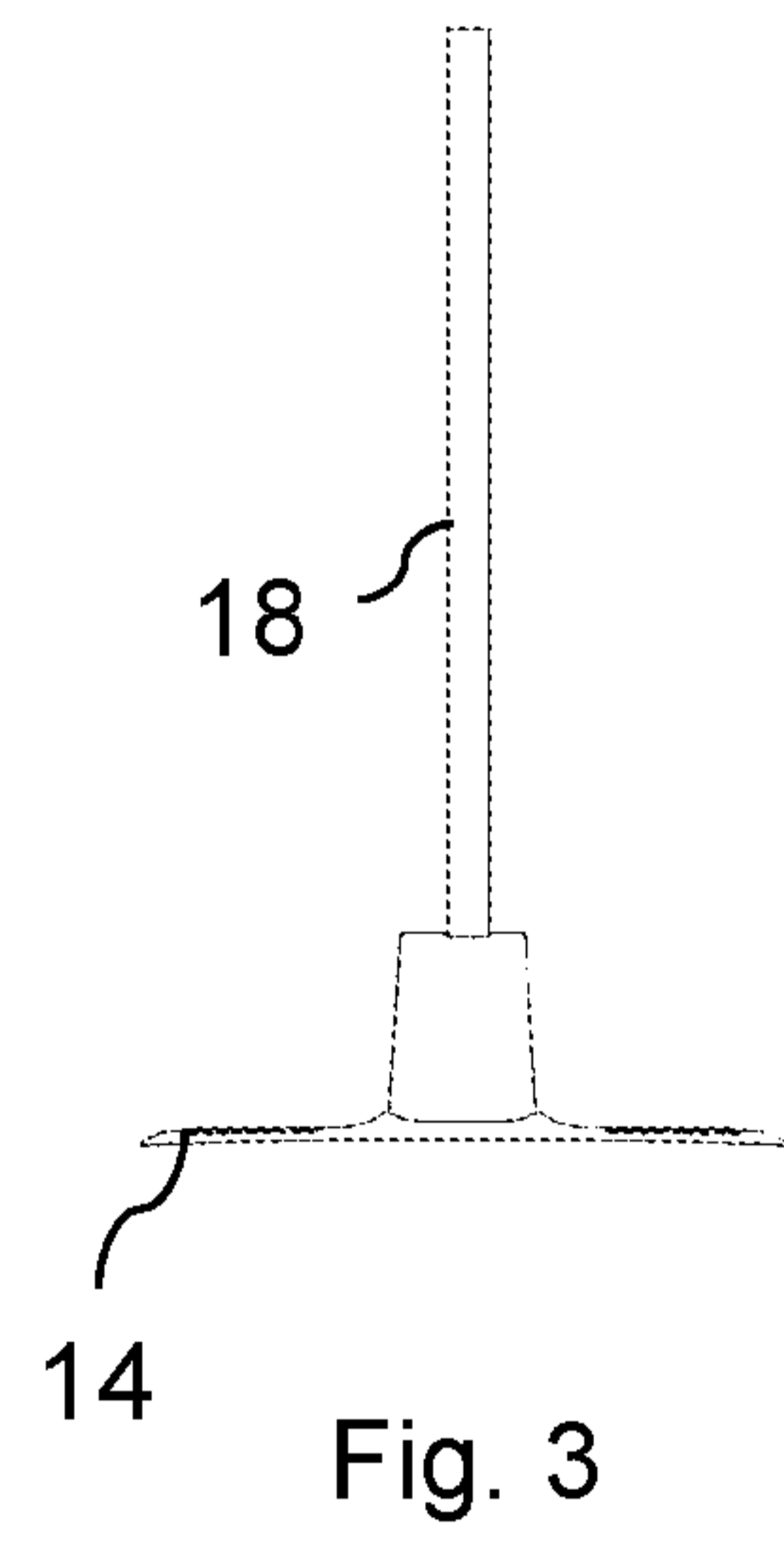
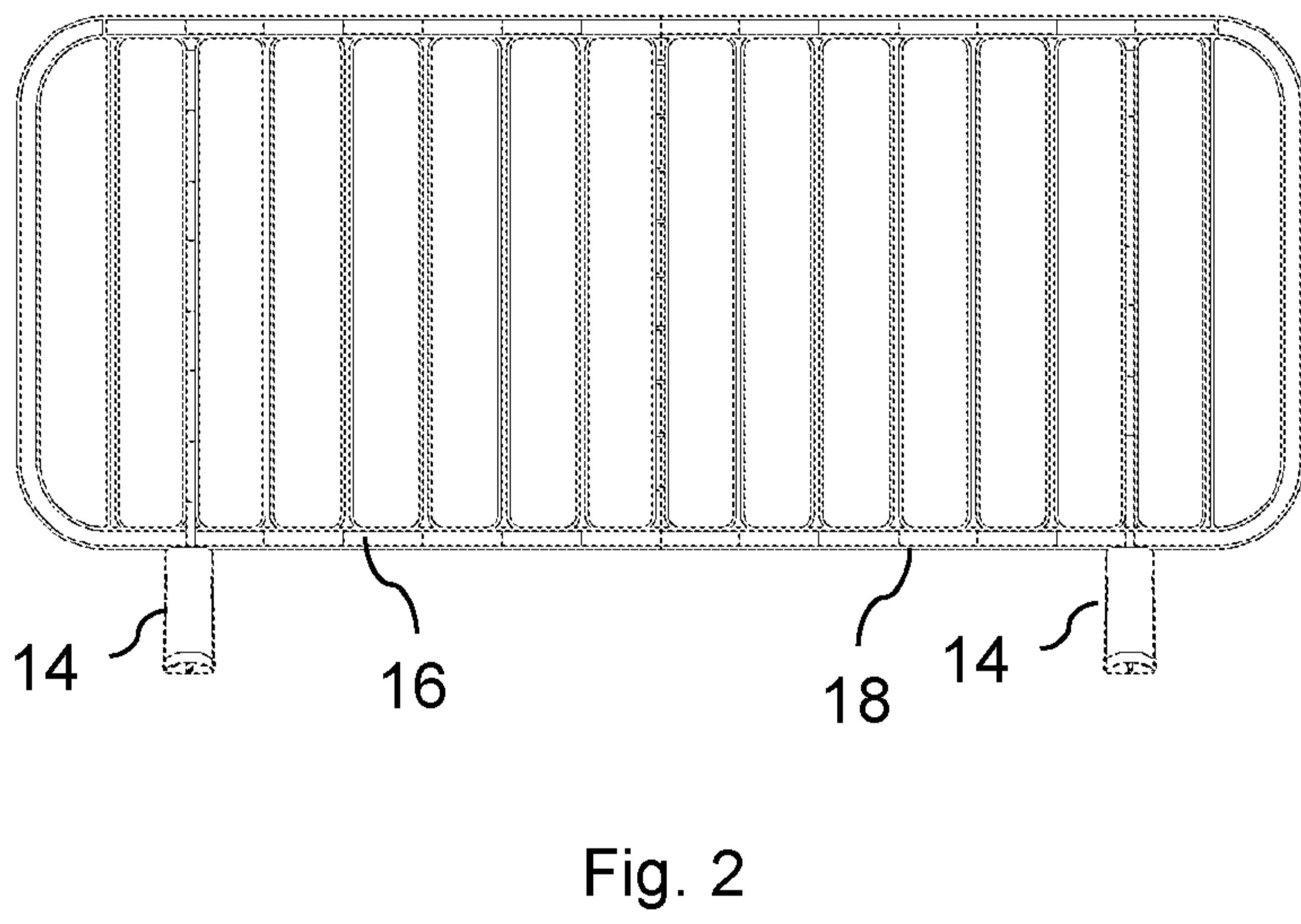
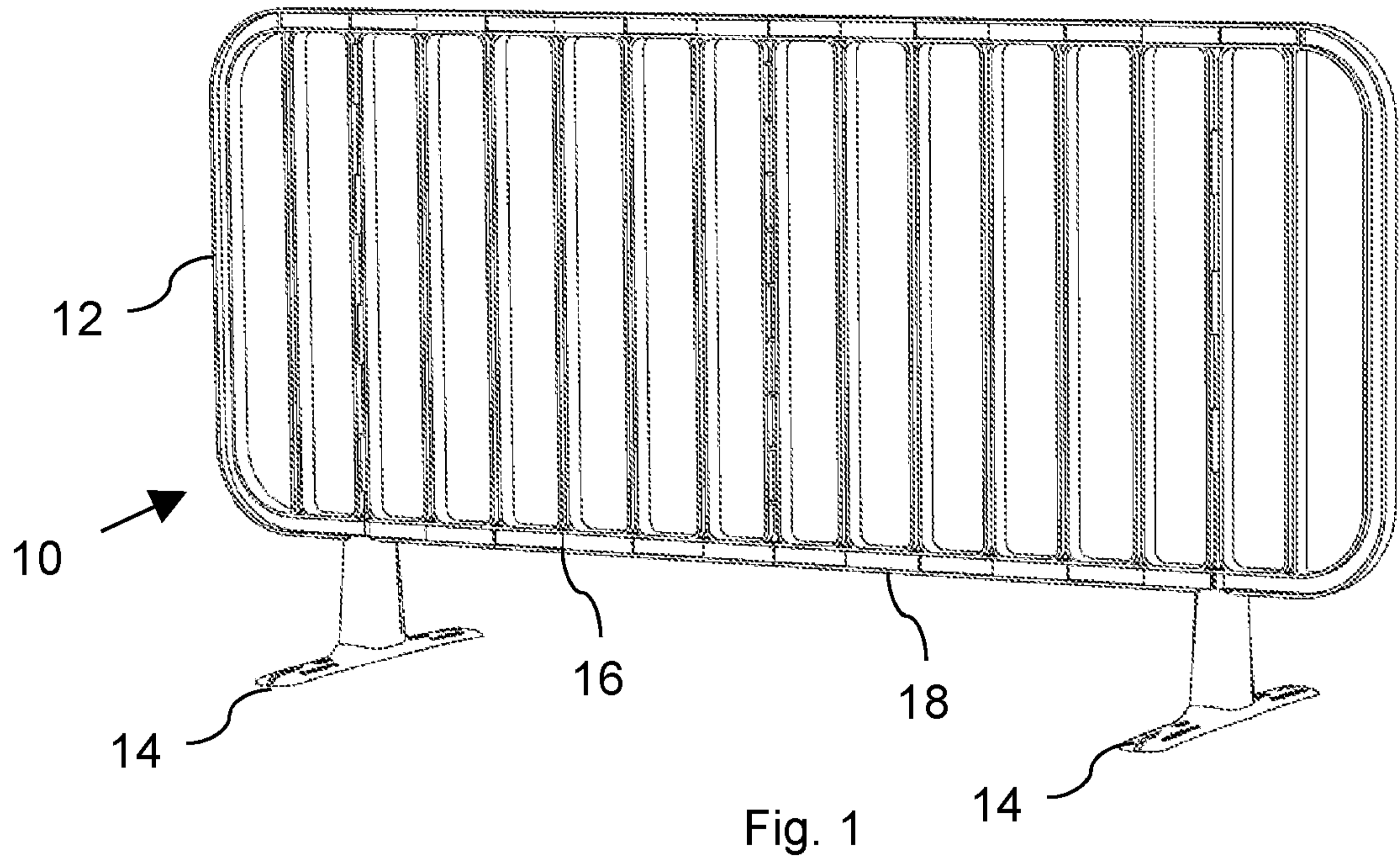


Fig. 6

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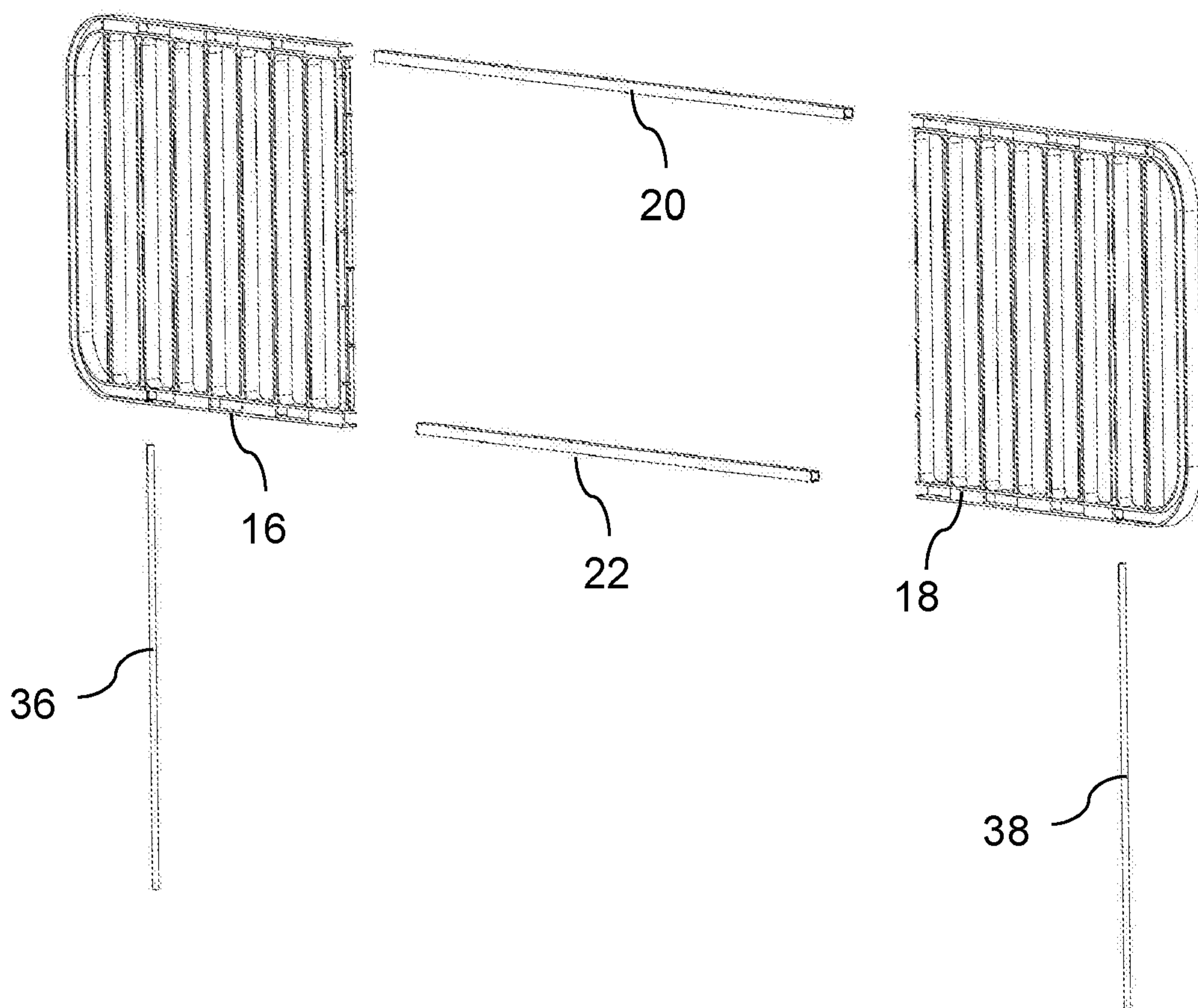


Fig. 5

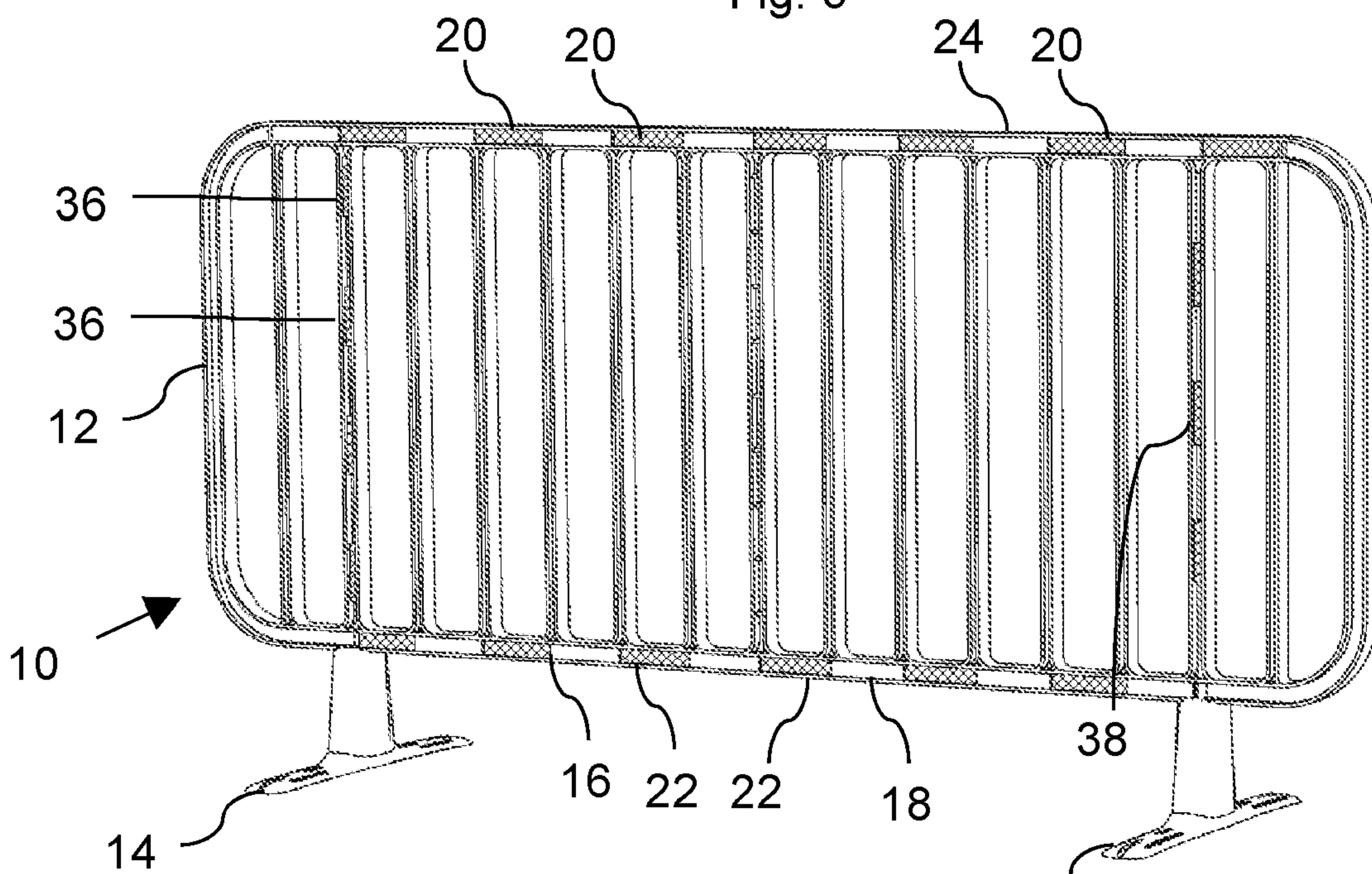


Fig. 6

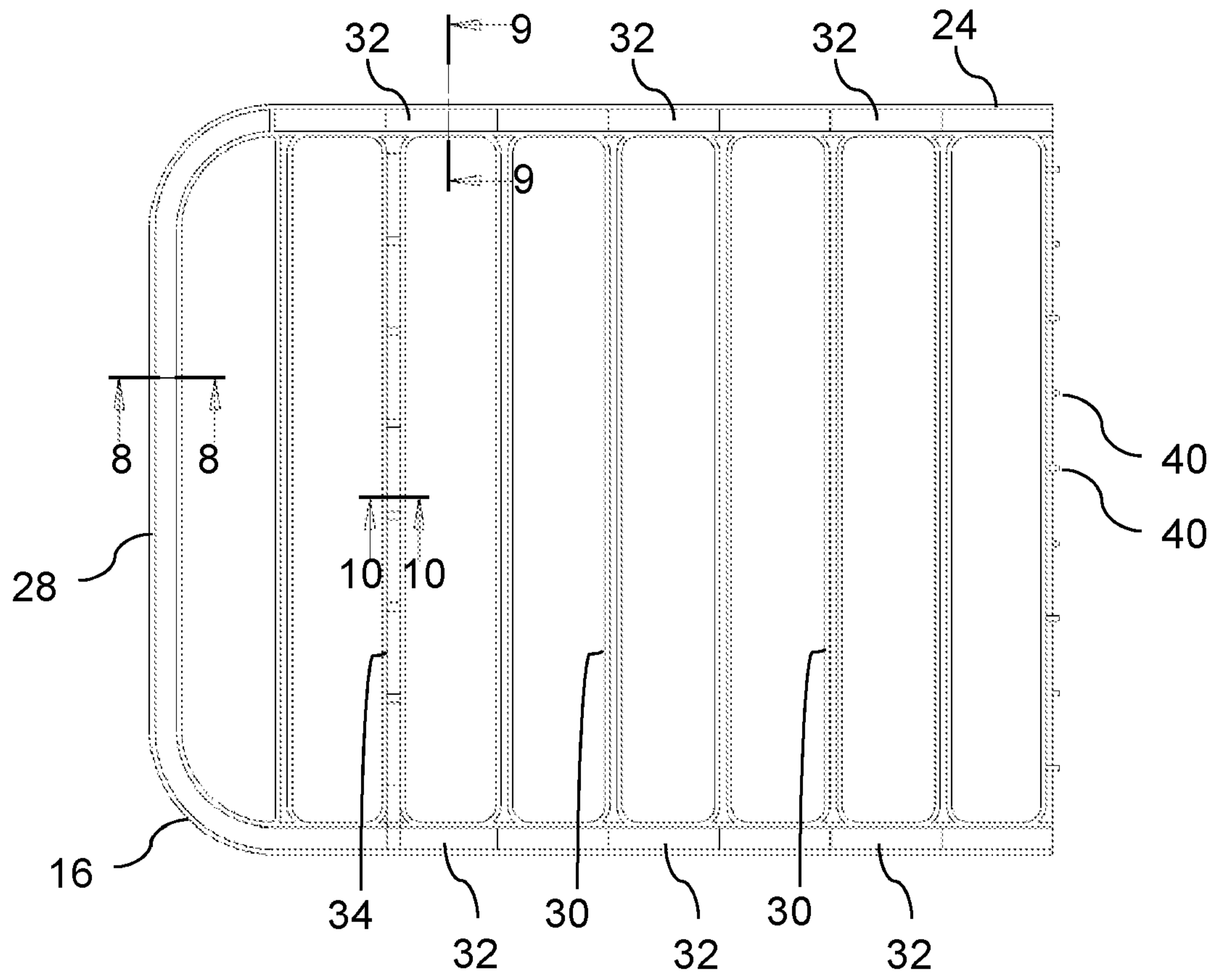


Fig. 7

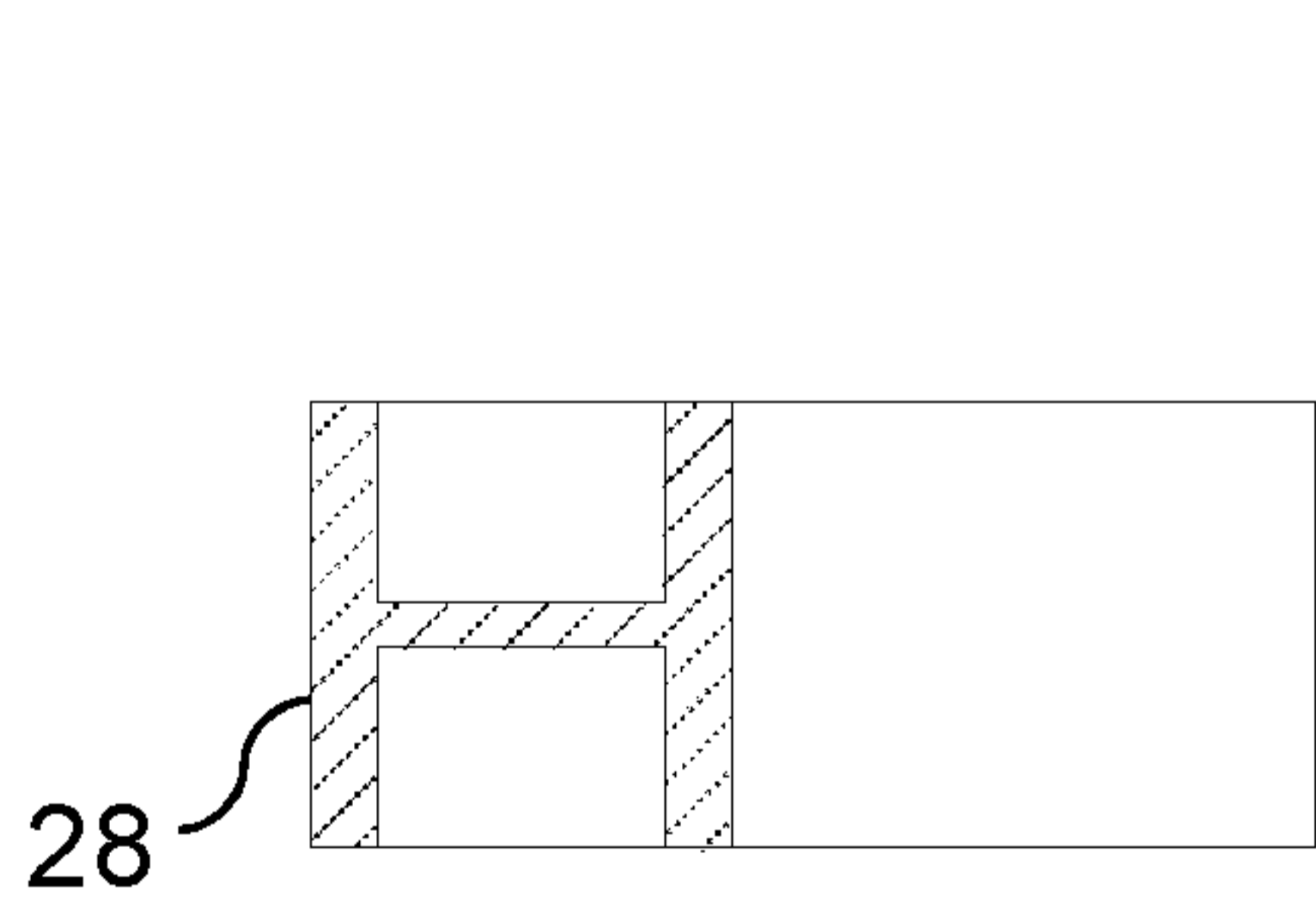


Fig. 8

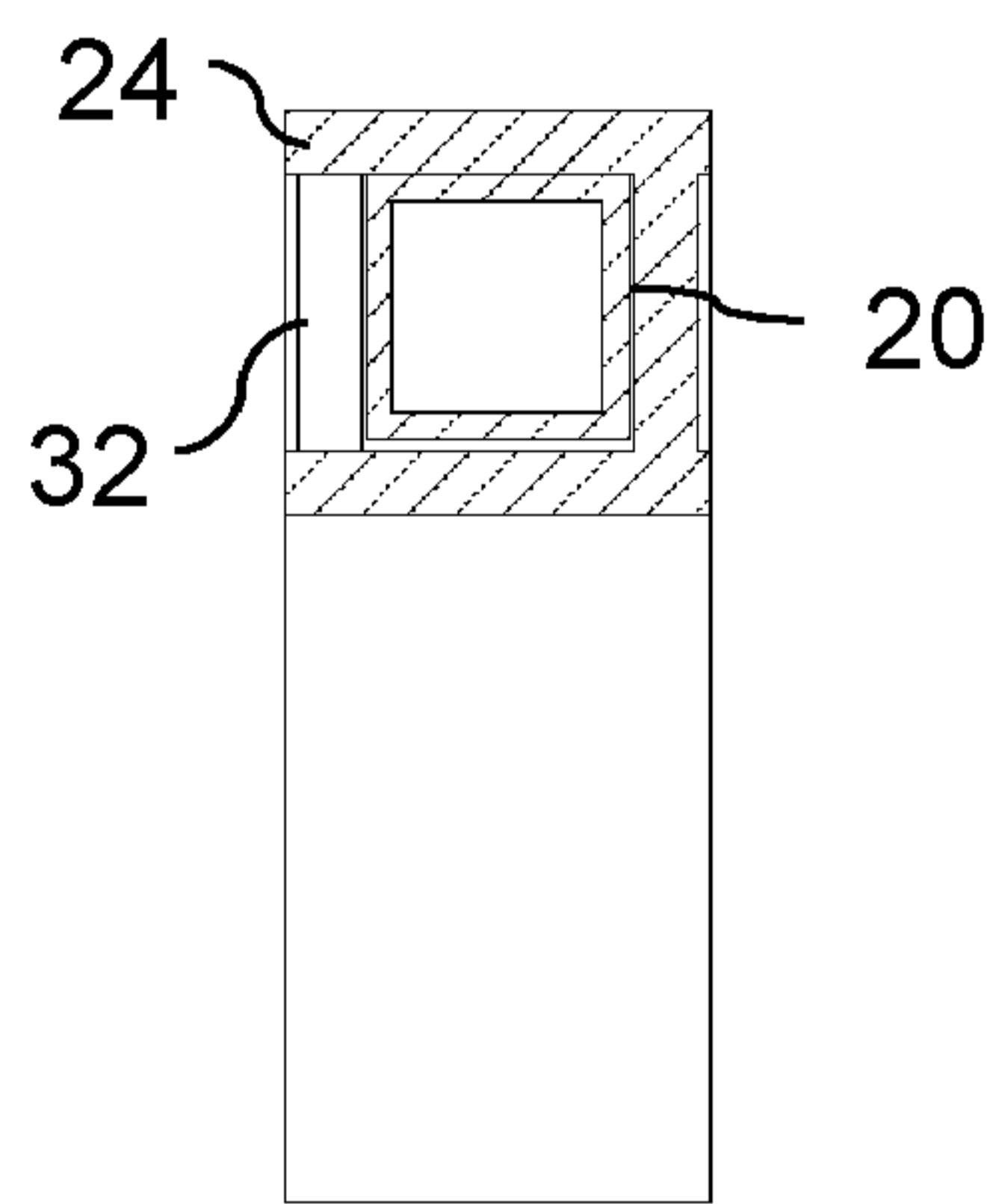


Fig. 9

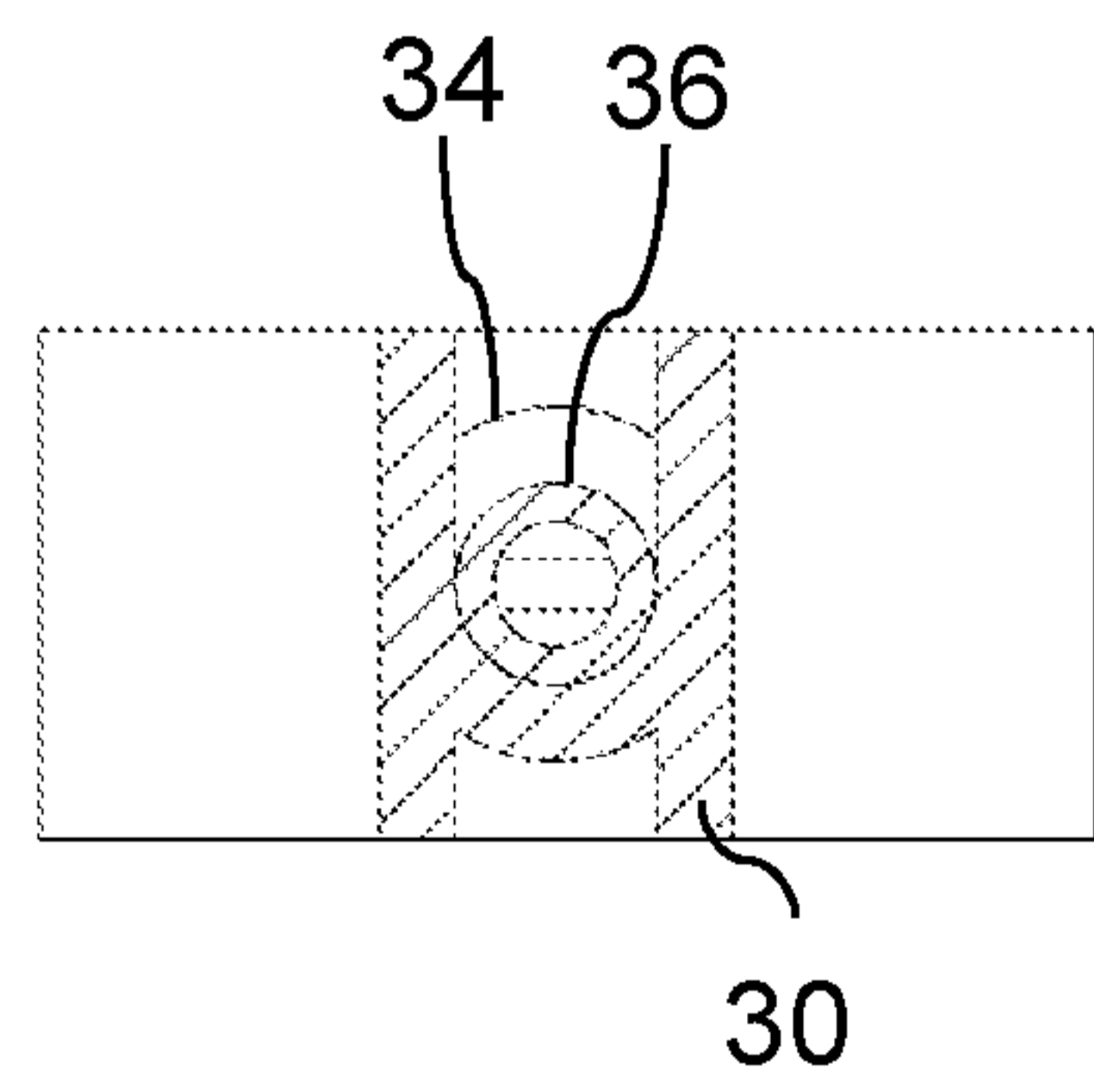
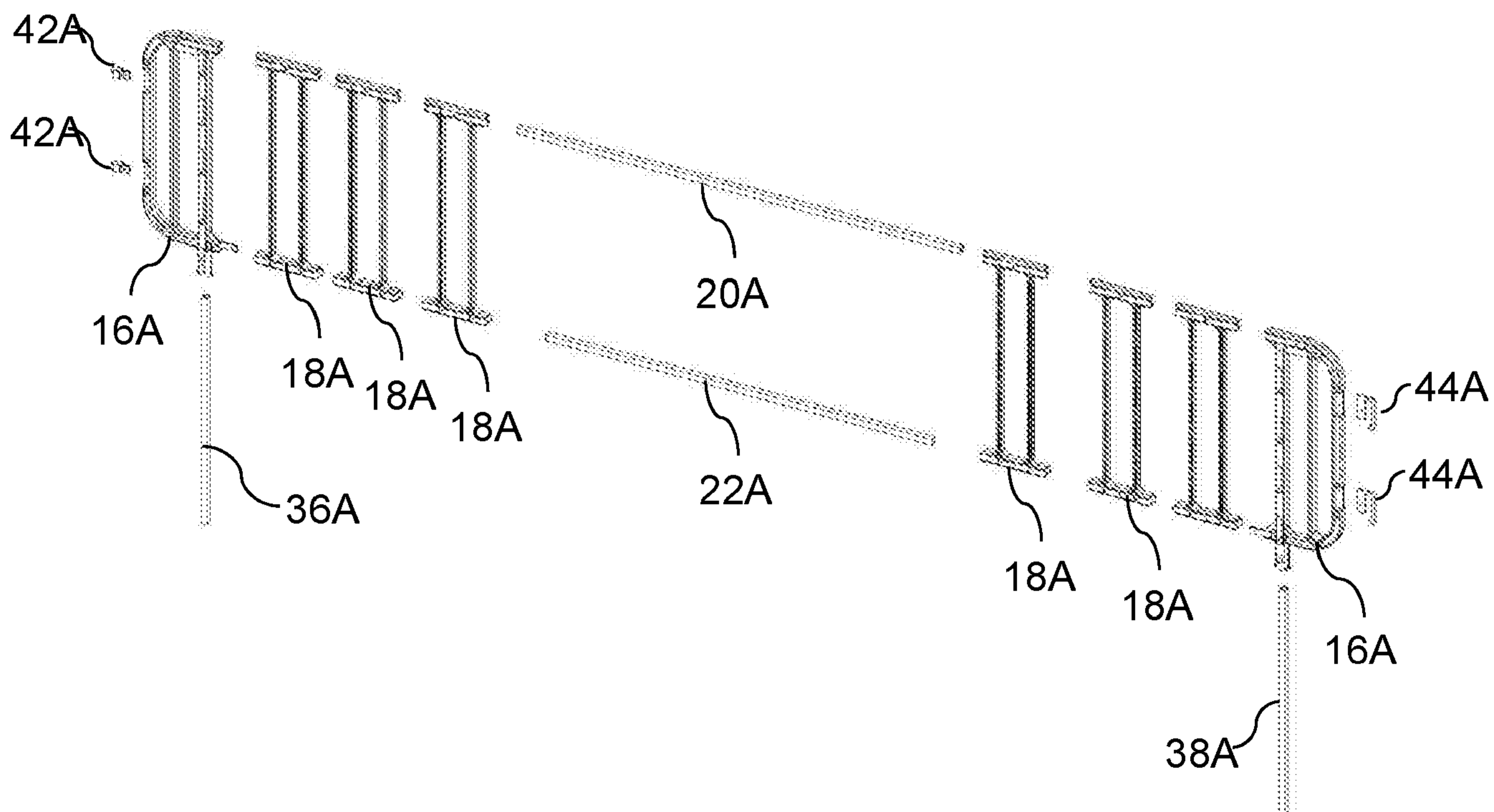
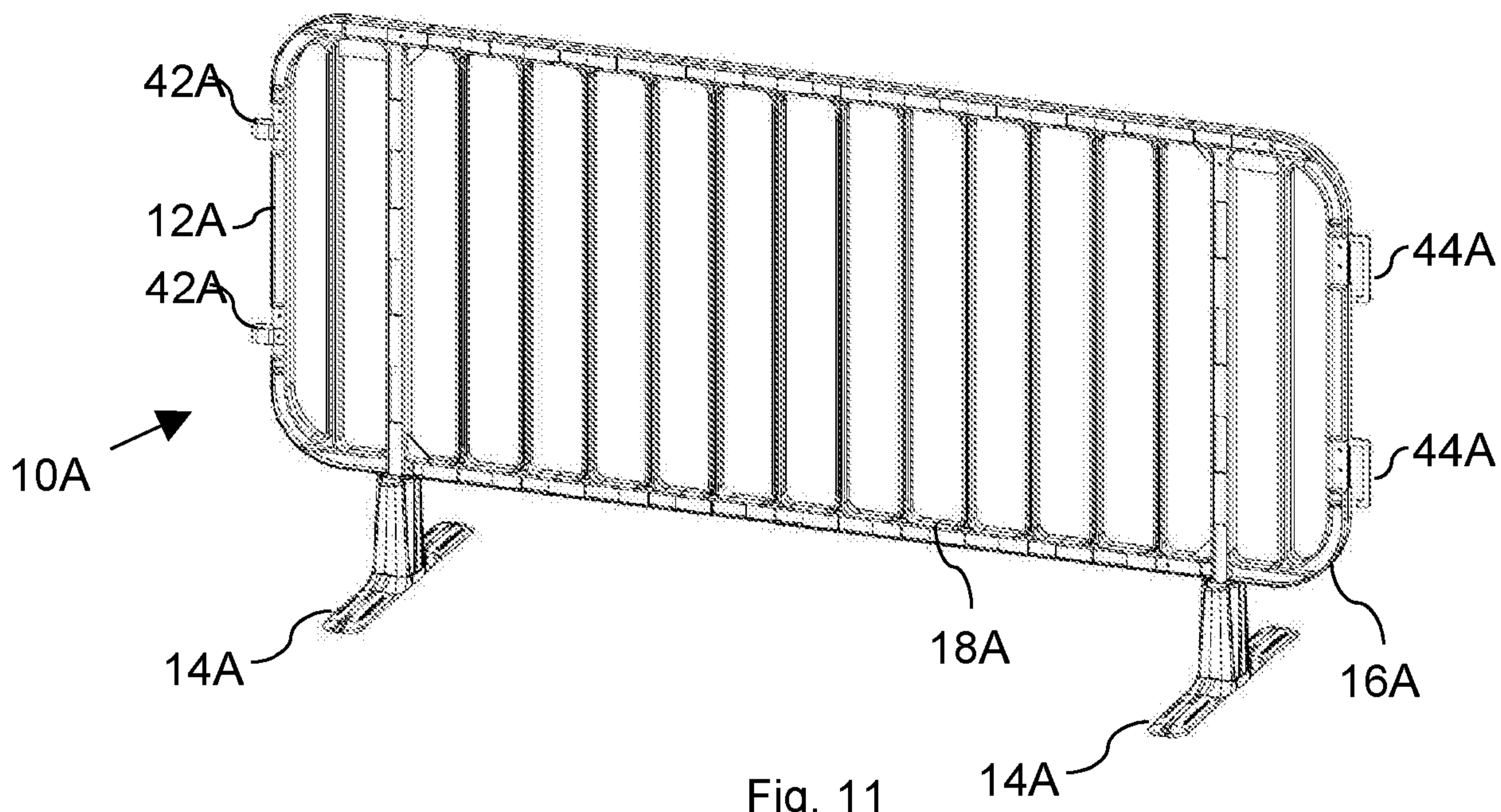


Fig. 10



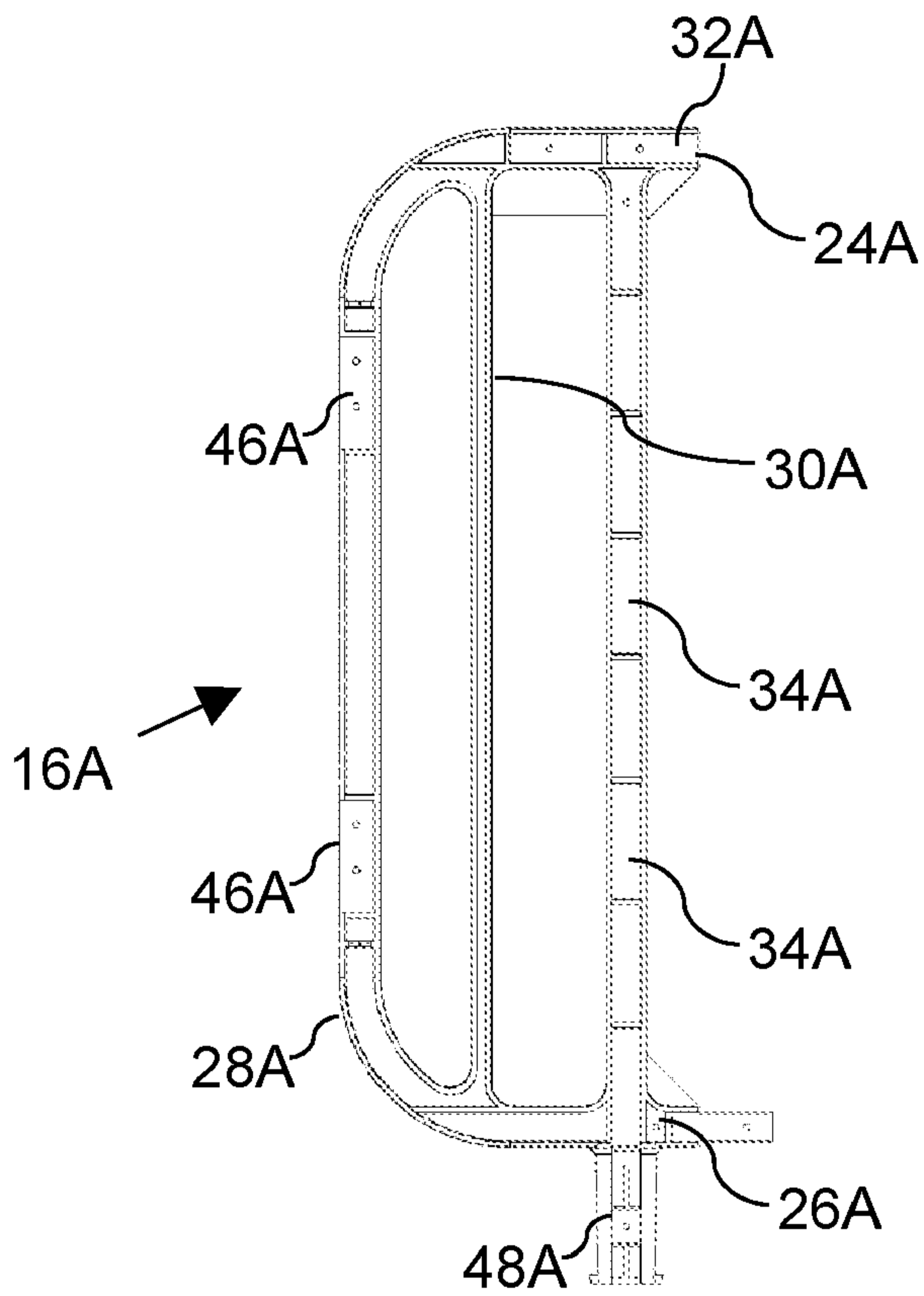


Fig. 13

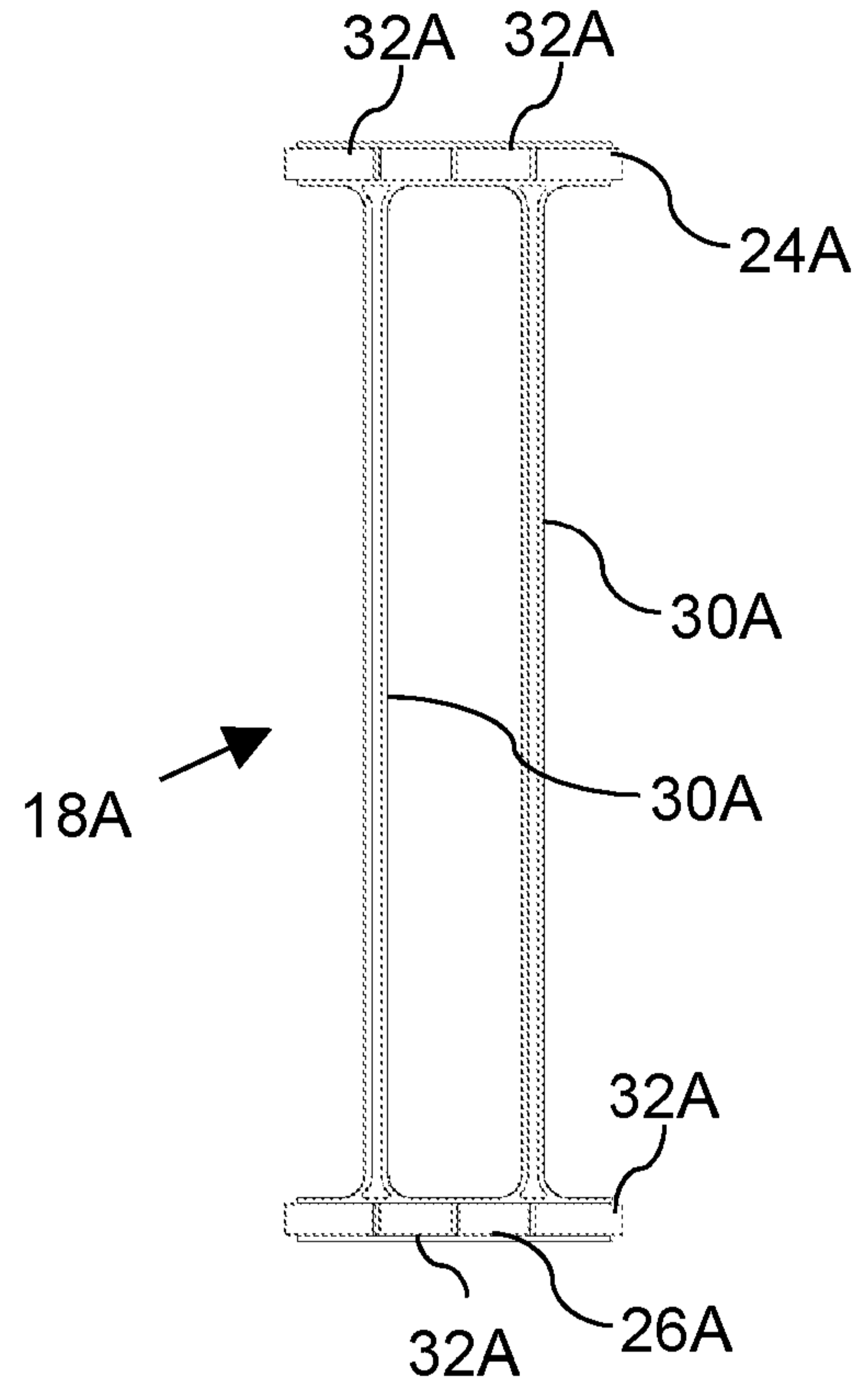


Fig. 14

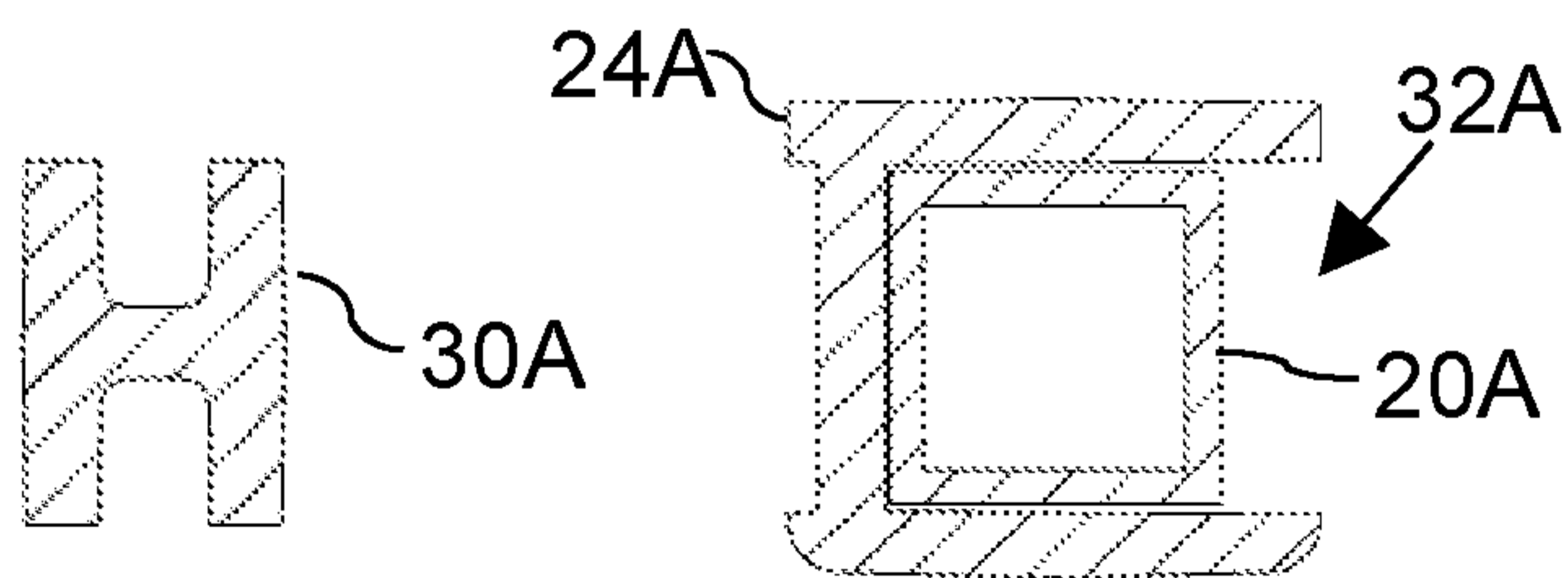


Fig. 15

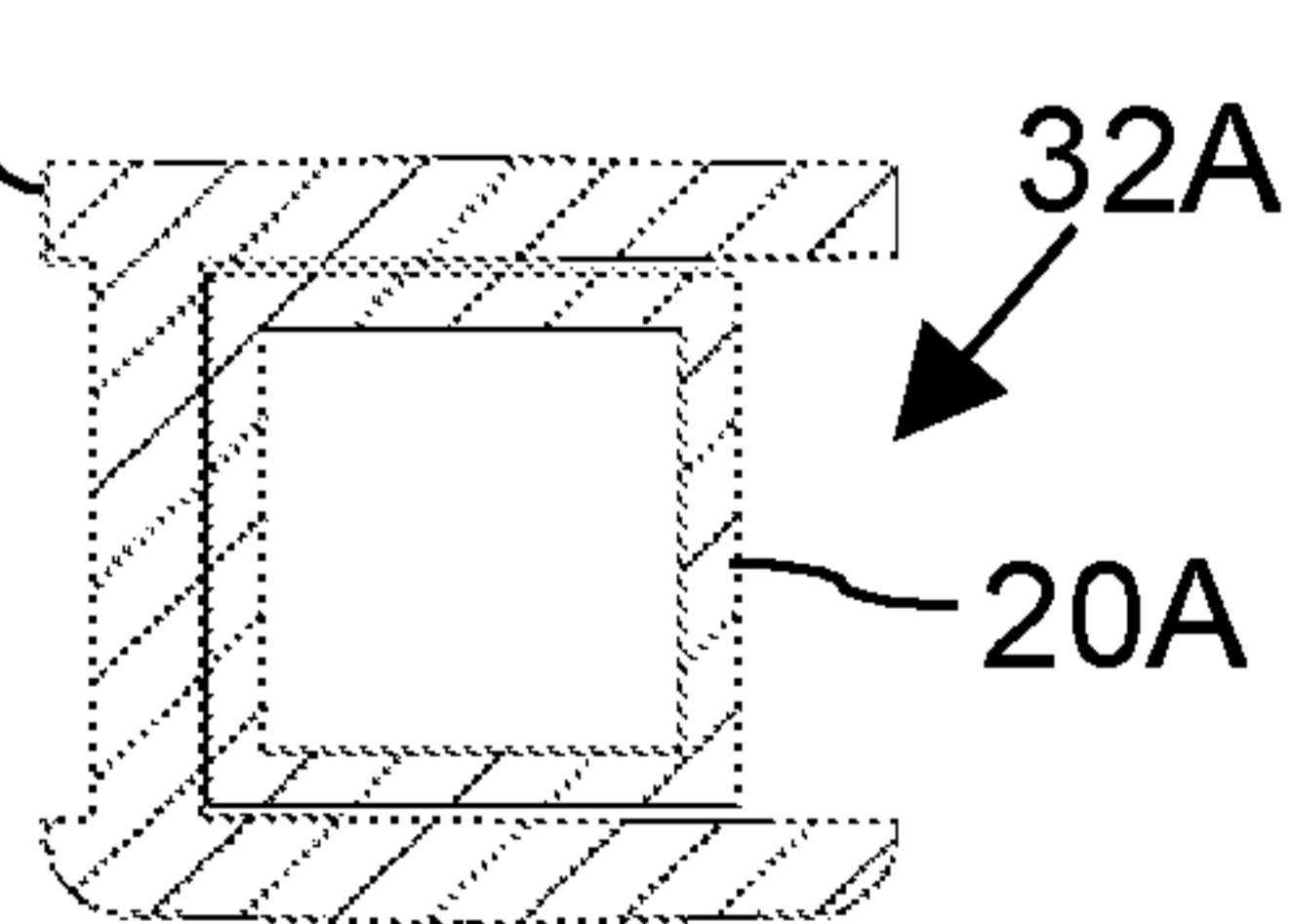


Fig. 16

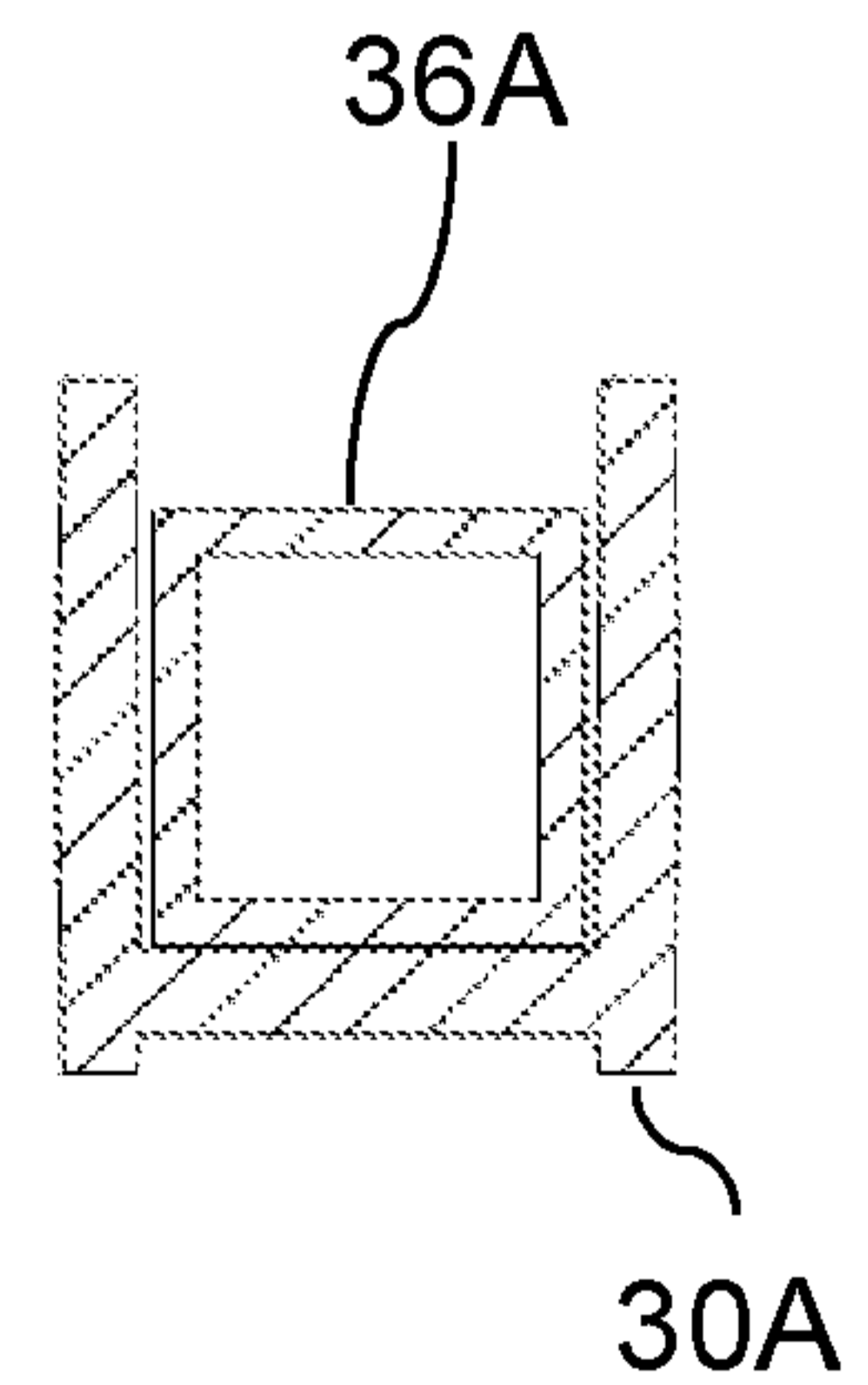


Fig. 17

Temporary Barrier

This invention relates to a temporary barrier, and in particular to a temporary barrier intended to restrict pedestrian access to predetermined areas.

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There are a number of applications in which it is desired to restrict pedestrian access to areas. By way of example, temporary barriers are commonly used in crowd control and management applications, to restrict access to areas in which works are being undertaken or in which equipment is being stored, or for other purposes. In such applications, one form of temporary barrier in common use takes the form of a steel barrier panel supported upon a pair of feet. Each foot takes the form of an inverted V-shaped tubular steel element, the apex of which is welded or otherwise secured to the panel. The panel takes the form of a length of steel tube bent to take on a substantially rectangular form defining upper and lower rails, and end posts. A series of uprights are welded between the upper and lower rails, the uprights each extending substantially parallel to the end posts.

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Such temporary barriers are relatively expensive and heavy, being fabricated from steel. Furthermore, if excessive loadings are applied to parts thereof, for example if the feet thereof are run over by a vehicle, they tend to become permanently bent which can lead to the barriers becoming difficult to nest or stack for efficient transportation and storage, and may also result in the barriers having sharp projecting parts that could present a hazard to pedestrians close to the barrier.

20

One option for reducing the weight and cost of the barrier may be to fabricate it from plastics materials. However, the barrier panel is typically of sufficiently large dimensions that manufacture thereof by injection moulding or the like is not practical.

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It is an object of the invention to provide a temporary barrier in which at least some of the disadvantages associated with known arrangements are overcome or are of reduced effect.

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According to the present invention there is provided a temporary barrier comprising a barrier panel supported upon feet, wherein the barrier panel comprises a plurality of panel barrier components, the barrier panel components being arranged side-by-side

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and being secured to one another using an upper elongate reinforcing members at a panel edge opposite the feet, the panel components being of plastics material form.

5 The upper reinforcing member is preferably of a length sufficient that it extends over at least half the width of the barrier panel. More preferably, it extends over at least three quarters of the width of the barrier panel. The upper reinforcing member is preferably of pultruded or extruded form. It is preferably of a fibre reinforced plastics material.

10 The barrier panel may comprise a first barrier panel component and a second barrier panel component. The barrier panel may comprise more than two barrier panel components.

15 It will be appreciated that by fabricating the barrier panel in the form of two or more panel components arranged side-by-side, fabrication using a moulding process is simplified as the size of each component to be moulded is much reduced compared to a single-panel mould for a barrier panel of the same size as the combined assembled barrier panel components. Using a reinforcing member at or close to the panel edge opposite the feet, i.e. the upper edge of the panel when the panel is supported on its feet, to secure the panel components to one another results in the panel being of good strength, resistant to bending as a result of the application of side loadings thereto.

20 The reinforcing members provide a strong connection between the components and resist bending at the joint between the panel components and bending of each individual panel component. An upper reinforcing member, ie a reinforcing member at the upper edge, provides a structural support at the location of the panel that is subjected to the relatively frequent loads, in particular persons leaning on the panel and/or staff carrying the panel.

25 In some embodiments, the barrier panel components are further secured to one another using a lower reinforcing member.

30 The lower reinforcing member is preferably provided at or near a lower panel edge, i.e. the edge on which the feet are located. The provision of a lower reinforcing member in addition to the upper reinforcing member increases the stability of the barrier further.

In some embodiments, one or more panel components comprise an upper rail, a lower rail and a series of two or more uprights extending between the upper and lower rails and extending substantially parallel to the end post.

5 The uprights are spaced apart to provide, in use, vertical barrier elements.

In some embodiments, one or more panel components comprise an end post. In a two-panel-component barrier, each panel component may comprise an end post.

10 The upper rail is preferably of hollow form and may have windows formed therein through which the hollow interior thereof is exposed. The windows opening to one face of the panel component are preferably arranged to alternate with those opening to the opposite face of the panel component with the result that the upper rail is of shut through form. Such a form is relatively simple to manufacture using moulding
15 techniques.

The upper reinforcing member is preferably located within the hollow interiors of the upper rail.

20 Similarly, the lower rail is preferably of hollow form, having windows formed therein arranged in an alternating fashion. The lower rail may be provided with engaging features configured to allow adjacent barrier panel components to mutually engage each other at the lower rail. By way of example, they may be secured in position using screws, nuts and bolts or other threaded fasteners, rivets, or adhesives.

25 If present, the lower reinforcing member is preferably located within the hollow interiors of the lower rail.

30 The, or both, reinforcing members may be secured in position using any suitable technique. By way of example, they may be secured in position using screws, nuts and bolts or other threaded fasteners, rivets, or adhesives.

35 The reinforcing members are preferably positioned at or near the upper and lower edges of the barrier panel. In use, horizontal features may be used as stepping features, in the manner of ladder rungs that could be used to climb the barrier. By

providing the reinforcing members vertically spaced apart as much as possible, for instance with a distance of around 70-100 cm between the upper and lower edges, they are less suitable for climbing.

5 Certain of the uprights are preferably of hollow, tubular form. They may be provided with alternating windows in a manner similar to the upper and lower rails. Preferably, upright reinforcing members are located within the hollow interiors of these ones of the uprights. The feet may be mounted upon projecting lower ends of the upright reinforcing members. The upright reinforcing members are conveniently of circular
10 cross-section, received in such a manner as to be rotatable relative to the panel components. Rotation or angular movement of the reinforcing members may allow rotation or angular movement of the feet to occur, for example to allow the feet to be moved to a stowed position for transportation or storage.

15 The panel components are conveniently of moulded plastics material form. In one embodiment, the temporary barrier comprises two panel components that are identical to one another, allowing these panel components to be fabricated using a single mould. In one embodiment, the temporary barrier comprises two types of panel components wherein the panels of each type are identical, allowing the panel components to be
20 fabricated using two mould types. For instance, a panel may comprise two end-barrier panel components and one or more mid-barrier panel components. In that case, the two end barrier panel components may be identical and the mid-barrier panel components may be identical to each other. However, this need not always be the case.

25

In some embodiments, two or more panel components are self-complementary to each other.

Barrier panel components, for instance if made from the same mould, may be identical
30 in shape. In that case, it is preferable if they are or comprise self-complementary portions. Such self-complementary portions may be, preferably, in the component-to-component engaging surfaces, such that a component of the same shape can engage with another component of the same shape. Having panel components of the same shape facilitates assembly, as a barrier panel can be assembled from any of the
35 identical components, without having to check that the correct corresponding

components were selected, because complementary components correspond to each other.

5 In some embodiments, one or more panel components have C2 rotational symmetry about an axis extending perpendicular to the upper and lower edges of the panel component.

It will be understood that the upper and lower edges are those edges of a panel that, after assembly, are facing up or down when the barrier panel is supported on its feet.

10

This facilitates assembly because a panel component does not need to be oriented with a particular side to the left or right.

15 In some embodiments, one or more panel components have C2 rotational symmetry about an axis midway between the upper and lower edges of the panel component.

This facilitates assembly because a panel component does not need to be oriented with a particular side facing up.

20 In embodiments, the end most ones of the uprights are moulded with engaging features that, in use, cooperate with the end most upright of the other of the panel components.

25 Preferably, if integrally moulded, the engaging features are self-complementary to allow an end panel component to interact with a 180-degree rotated end panel component of identical shape. In some embodiments, engaging features may be fixed to a panel component after moulding. This facilitates the use of the same mould type while allowing differing engagement features (such as hook and latch type engagements).

30 The invention will further be described, by way of example, with reference to the accompanying drawings, in which:

Figure 1 is a perspective view illustrating a temporary barrier in accordance with an embodiment of the invention;

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Figures 2, 3 and 4 are front, side and top views of the barrier of Figure 1;

Figure 5 is an exploded view illustrating the Figure 1 barrier;

5 Figure 6 is a further illustration of the Figure 1 barrier;

Figure 7 is a front view illustrating part of the Figure 1 barrier;

10 Figures 8, 9 and 10 are sectional views illustrating elements of the part of the barrier shown in Figure 7 along the sections 8-8, 9-9, and 10-10 indicated in Figure 7;

Figure 11 is a perspective view illustrating a temporary barrier in accordance with another embodiment of the invention;

15 Figure 12 is an exploded view of the Figure 11 barrier;

Figure 13 is a front view illustrating a panel component of the Figure 11 barrier;

20 Figure 14 is a front view illustrating another panel component of the Figure 11 barrier; and

Figures 15, 16 and 17 are sectional views illustrating elements of the part of the barrier shown in Figures 11-14.

25 Referring to Figures 1 to 6, a temporary barrier 10 is illustrated, the barrier 10 being intended for use in applications in which it is required to restrict pedestrian access to certain areas. By way of example, it may be used in crowd management or control applications, to restrict pedestrian access to areas in which access is restricted for safety reasons, for example because works are being undertaken in those regions, or
30 in a range of other applications. The barrier 10 comprises a barrier panel 12 supported upon a pair of feet 14. The expressions "upper" and "lower" are understood with reference to the panel in its intended in-use configuration, standing on its feet 14, corresponding to the reading orientation of Figure 1.

The panel 12 is of multi-part form, comprising a first panel component 16 and a second panel component 18 arranged in a side-by-side configuration and secured to one another using an upper elongate reinforcing member 20. Optionally, the first and second panel components may be further secured to one another using, as shown
5 herein, a lower elongate reinforcing member 22. The panel components 16, 18 are of moulded plastics material form manufactured by, for example, injection moulding. It will be appreciated that, as the panel 12 is of multi-part form, and in particular as it is made up of first and second panel components 16, 18, the components of the panel 12 are each of sufficiently small dimensions that they can readily be manufactured using
10 injection moulding or compression moulding techniques, for example.

The panel components 16, 18 are substantially identical to one another, and so only one of them will be described herein in further detail with reference to Figures 7 to 10.

15 As shown in Figures 7 to 10, the panel component 16 comprises an upper rail 24, a lower rail 26 and an end post 28. A series of uprights 30 extends between the upper and lower rails 24, 26, the uprights 30 extending substantially parallel to the end post 28.

20 The upper and lower rails 24, 26 are of substantially square cross-section, hollow form, as shown in Figure 9 (showing a section of the upper rail 24), and are formed with a series of windows 32 spaced apart along the length of the respect rail 24, 26. The windows 32 are formed so that some of them open to one face of the component 16, and others of them open to the other face of the component 16. The windows 32 are
25 arranged in an alternating fashion. The rails 24, 26 are thus of a shut through form, lending themselves to manufacture using plastics material moulding techniques in a relatively simple and convenient manner. Figure 9 also illustrates in section the upper elongate reinforcing member 20 extending through the hollow upper rail 24, one side (the left-hand side in the reading orientation of Figure 9) of the hollow upper rail 24
30 showing in section a window 32 through which the elongate reinforcing member 20 is visible.

The end post 28 is of H-shaped cross-sectional form, as shown in Figure 8. Most of the uprights 30 are similarly of H-shaped cross-sectional form, but are of smaller
35 dimensions than the end posts 28 (see also Figure 15 described below). H-shaped

cross sections are suited for injection moulding. The H-shaped cross section is symmetric and therefore provides the same appearance at either side of the panel when assembled. Other cross-sections may be used.

5 As illustrated in Figure 10, the upright 30 aligned with the associated foot 14 is of a different design to the remainder of the uprights 30 in that it is of hollow tubular form formed with windows 34 arranged in an alternating fashion similar to the windows 30.

10 The reinforcing members 20, 22 are of hollow, substantially square cross-sectional shape, of dimensions allowing them to be fitted within the hollow rails 24, 26. Conveniently, they are of pultruded or extruded form, preferably of a fibre reinforced plastics material. The material is conveniently brightly coloured. It will be appreciated that with the reinforcing members 20, 22 positioned within the hollow rails 24, 26, parts of the reinforcing members 20, 22 will be exposed, to be visible through the windows 15 32, as illustrated in Figure 6. Figure 6 corresponds to Figure 1 and shows the upper and lower elongate reinforcing members 20, 22 and upright reinforcing members 36, 38 (for more detail on the reinforcing members, see additional description with reference to Figures 7 to 10) with cross-hatching; the cross-hatching is intended to illustrate their visibility through alternating windows 20 in the barrier panel components, but it will be 20 understood that the reinforcing members may not necessarily exhibit a visible cross-hatching pattern, and may be of a single colour. One or more of the reinforcing members may be of a contrasting colour relative to the colour of the barrier panel component to provide improved visibility. For instance, the reinforcing members may be of a bright colour, and/or have light-reflecting properties. To provide illustrative 25 examples, the barrier panel components may be of any suitable colour such as orange, dark grey or black, or any colour desired by an customer, and the reinforcing members may be of bright yellow or white reflective colour. By being recessed within the rails, the reinforcing members are somewhat better protected than paint, coating or stickers applied directly to the surface of the barrier panel, while still providing good visibility.

30

As shown in Figures 1 to 6, the reinforcing members 20, 22 are of a relatively great length, extending over at least half of the width of the panel 12, and preferably extending over significantly more of the width than this. Each of the reinforcing members 20, 22 is thus located partly within the respective rail of the first panel 35 component 16, and partly within the respective rail of the second panel component 18.

By way of example, the reinforcing members 20, 22 may extend over three quarters, or more, of the width of the panel 12. The reinforcing members 20, 22 are secured within the rails 24, 26 using any suitable technique. By way of example, screws or nuts and bolts or other threaded fasteners may be used, extending through appropriately positioned openings formed therein. Alternatively, rivets could be used, or suitable adhesives may be used. It will be appreciated that these techniques represent examples of suitable securing techniques and that other techniques may be used without departing from the scope of the invention. The substantially square cross-section prevents rotation of the reinforcing members 20, 22. Furthermore, a reinforcing member may be inserted with any of the flat surfaces up. This reduces the need for an alignment step during assembly. However, other cross-sections may be used. In embodiments, the reinforcing members 20, 22 are hollow, solid, or of H-section profile.

It will be appreciated that with the reinforcing members 20, 22 secured in position, the reinforcing members 20, 22 serve to secure the panel components 16, 18 to one another. Furthermore, they provide reinforcement or strengthening to the panel 12, resisting bending or deformation of parts thereof. The position of the reinforcing members 20, 22 near the upper and lower edges, respectively, provides a climb-impeding configuration because of the absence of stepping surfaces between the upper and lower rail.

Upright reinforcing members 36, 38 are located within the hollow uprights 30, and have the feet 14 fitted to the lower ends thereof. The upright reinforcing members 36, 38 are of circular cross-sectional shape and are free to rotate relative to the associated uprights 30. Consequently, the feet 14 attached thereto may be rotated between in use and stowed positions. The upright reinforcing members may have other suitable profiles, for instance a square profile.

Turning to Figures 11 to 17, another embodiment of a temporary barrier 10A is illustrated. The temporary barrier 10A is similar to the above-described temporary barrier 10. The temporary barrier 10A comprises two types of barrier panel components. In Figures 11 to 17, numerals with a suffix -A and same numeral as in Figures 1-10 are used to identify similar components.

The temporary barrier 10A comprises a barrier panel 12A supported on two feet 14A. The barrier panel 12A comprises two end panel components 16A which are identical to each other and constitute a first type of panel component, and a plurality (here: six) of mid panel components 18A that are identical to each other and constitute a second type of panel component. The panel components 16A and 18A are arranged in side-by-side configuration and secured in succession by an upper reinforcement member 20A and a lower reinforcement member 22A, although it will be understood that the lower reinforcement member 22A may be optional. The end panel components 16A are reinforced by upright reinforcing members 36A and 38A, respectively. The panel components 16A and 18A are of moulded plastics material form manufactured, for instance, by injection moulding or compression moulding. Each of the panels is of smaller construction than the entire barrier panel 10, rendering it more readily suitable for manufacture by moulding.

As can be imagined, any number of mid-panel components, or no mid-panel component, may be used to manufacture a barrier panel of varying length. The Figure 11 embodiment comprises eight panel components each about one eighth of the width of the barrier panel width of known metal temporary barriers, namely six mid-panel components and two end-panel components.

Figures 11 and 12 show two connector rings 42A on one end panel component and two connector hooks 44A on the opposite end panel component. The connector rings and connector hooks constitute connectors for end-to-end engagement of a series of panels. The connectors may correspond to those of known metal barriers such that the temporary barrier of the invention is compatible in size and end-to-end connection with known metal temporary barriers.

By providing the hooks and loops as attachable components, this allows the same mould to be used for both end barrier panel components and configuring one end panel component as hooked end and another end panel component as loop end. Preferably, each end panel component is provided with at least two connectors, e.g. two hooks and two loops, to provide a relatively stable quasi-hinged end-to-end connection. Preferably the hooks and loops are engagable with a reasonable degree of play to allow adjacent connected panels to tilt relative to each other while connected. This facilitates the provision of a series of connected barrier panels on uneven terrain.

Figure 13 illustrates a front view of an end panel component 16A, and Figure 14 illustrates a front view of a mid-panel component 18A. Each component comprises an upper rail 24A and a lower rail 26A. The upper and lower rails 24A and 26A are similar to the rails described in relation to Figures 7 to 10, in that they are formed with windows arranged on alternating sides of the fence panel component such that the rails 24A, 26A are of shut-through form suitable for moulding techniques. Figure 16 shows a section through an upper rail 24A illustrating at the right-hand side (in the reading orientation of Figure 16) a window 32A. The end-panel component 18A comprises an end rail 28A with an H-profile, as described above in relation to Figure 7. Partway along the length of the end rail 28A one or more (here: two on either side of the panel) seating surfaces 46A are provided to facilitate the mounting of panel-to-panel connectors such as connector hooks 44A (see Figure 12) or connector rings 42A (see Figure 12). The end panel component 16A comprises a foot adapter 48A extending from the lower rail 26A in extension of one of the uprights 30A that is aligned with the associated foot 14A. The foot adapter 48A is hollow, of a shape to receive a reinforcing member 36, 38. The exterior silhouette of the foot adapter 48A may be round or otherwise dimensioned to engage a socket in a foot 14A. The foot adapter 48 may include abutment surfaces that limit axial rotation of a foot 14A. For instance, the axial rotation may be limited to a 90 degree range or to a 180 degree range such that a foot 14A may be rotated into a stowed position in which it lies flat with the barrier panel or into an extended position in which it extends practically perpendicular to the barrier panel. A 90 degree rotation range may be suitable for a symmetrical foot and will help ensure that a foot is correctly aligned in either a stowed or extended position when the abutment surface is hit. A 180 degree rotation may be appropriate for asymmetrical feet.

The adapter 48A may be integral with a barrier panel component, e.g. integrally moulded. The adapter 48A may be fitted to the barrier panel component after moulding. In that case, the barrier panel component may have rotational symmetry about the horizontal axis, as it may be imagined, such that the end panel barrier components and any mid panel barrier components may be assembled with any side up and the foot adapters 48A are fitted post assembly.

The mid panel component 18A illustrated in Figure 14 comprises two uprights 30 and so exhibits sufficient stiffness or handling during manufacture of the barrier panel. By providing fewer uprights 30A per panel component, e.g. two uprights 30A as shown in Figure 14, the manufacturing process is more resilient against an occasional manufacturing error in one of the uprights 30, in that a manufacturing error in one upright affects only one easily replaceable component of the entire barrier panel. However, mid-barrier panels with different numbers of uprights may be used in the invention. The uprights 30A are of H-shaped cross-section as illustrated in Figure 15, but may have other suitable cross-sections.

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The mid panel component 18A has two-fold symmetry in the vertical and horizontal direction. This facilitates the assembly of a barrier panel 10A because the mid panel component 18A will be appropriately orientated with either side up or down and with either side left or right.

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In embodiments, the upright reinforcing members 36, 38 are of box or H-profile cross-section and may be of rectangular or square profile. The upright reinforcing members 36, 38 may be solid or hollow. If the hollow channel of the upright 30 is generally rectangular, a corresponding rectangular and square profile of the upright reinforcing member provides a closer location of the reinforcing members 36, 38 at the windows 34. This improves visibility of contrasting colours, particularly if it is considered that the reinforcing member may already, by virtue of it being located in a channel, be recessed from the outer upright surface. The closer location of surfaces of the reinforcing members 36, 38 reduces the gaps that may otherwise be present with round reinforcing members, which reduces the risk of entrapment or the gaps being filled with litter. If the feet 14 are provided with round profile sockets to receive the reinforcing members, the feet are still rotatable even with non-round reinforcing members. Alternatively, the channel and upright reinforcing members 36, 38 may have a round profile.

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The presence of the upright reinforcing members 36, 38 further strengthens or reinforces the panel 12.

The upright reinforcing members 36, 38, like the reinforcing members 20, 22, are preferably of fibre reinforced plastics material form, for example manufactured by pultrusion or extrusion.

5 In embodiments, the reinforcing members 20, 22 are of a length no longer than the distance between the upright reinforcing members 36, 38, so that the upright reinforcing members 36, 38 can be fitted before or after assembly of the two panel components 16, 18.

10 In embodiments, the upper reinforcing member 20A is longer than the lower reinforcing member 22A. For instance, the upper reinforcing member 20A may be longer than the distance between the upright reinforcing members 36A, 38A to provide increased stability of the upper rail 24A.

15 As illustrated in Figure 7, the end most upright 30 may be formed with projecting features 40 arranged to cooperate with the end most upright 30 of the other of the panel components, in use. The arrangement of projecting features 40 may be self-complementary. Alternatively, as illustrated in Figure 14, the end most uprights 30A are arranged such that they need not come into abutment with those of adjacent barrier
20 panel components.

The temporary barrier 10 described hereinbefore is advantageous in that, as it is of plastics material form, it is of relatively low weight and is of relatively low cost form. In the arrangement shown, the feet 14 are of low profile form and so do not present a
25 significant trip hazard to pedestrians in the vicinity of the barrier. The plastics material of the barrier is of relatively good resilience, and so if subject to relatively low magnitude impacts will tend to deflect and subsequently return to substantially its original form. The manner in which it is fabricated lends itself to the use of injection moulding techniques through each component part being of relatively small
30 dimensions.

Whilst selected forms of barrier are described and illustrated hereinbefore, a number of modifications and alterations may be made thereto without departing from the scope of the invention. By way of example, the rails could be of H-shaped section, with the
35 reinforcing members attached to faces thereof rather than located within the hollow

interior of the rails as illustrated. The reinforcing members, rails and uprights may be of other cross-sectional shapes to those illustrated. For instance, the rails and/or uprights may be of round cross-section to receive round reinforcing members. The reinforcing members may be solid or hollow. The reinforcing members may comprise hollow channels to receive additional reinforcing structures. The reinforcing members, i.e. the upper reinforcing member, one or both upright reinforcing members, and, if present, the lower reinforcing member may be made from or comprise metal.

If desired, the feet could be fitted to the lower rail rather than to the upright reinforcing members. The barrier panel may be provided with any number of feet. A panel with two feet allows for a configuration with the feet connected at the end panels.

Features described in relation to the Figure 11 barrier panel may be used in the Figure 1 barrier panel, and vice versa.

For instance, although not shown in Figures 1 to 10, once the barrier panel components are assembled, the barrier panel may be provided with connectors such as hooks and loops for end-to-end engagement of a series of barrier panels.

A number of other modifications may be made without departing from the scope of the invention as defined by the appended claims.

CLAIMS:

1. A temporary barrier comprising a barrier panel supported upon feet, wherein the barrier panel comprises a plurality of barrier panel components, the barrier panel components being arranged side-by-side and being secured to one another using an upper reinforcing member at a panel edge opposite the feet, the panel components being of plastics material form.
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2. A barrier according to Claim 1, wherein the upper reinforcing member is of a length sufficient that it extends over at least half the width of the barrier panel.
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3. A barrier according to Claim 2, wherein the upper reinforcing member is of a length sufficient that it extends over at least three quarters of the width of the barrier panel.
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4. A barrier according to any one of the preceding claims, wherein the upper reinforcing member is of pultruded form.
5. A barrier according to any one of the preceding claims, wherein the upper reinforcing member is of a fibre reinforced plastics material.
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6. A barrier according to any one of the preceding claims, wherein the barrier panel components are further secured to one another using a lower reinforcing member.
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7. A barrier according to any one of the preceding claims, wherein one or more panel components comprise an upper rail, a lower rail, and a series of uprights extending between the upper and lower rails and extending substantially parallel to the end post.
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8. A barrier according to any one of the preceding claims, wherein one or more panel components comprise and end post.
9. A barrier according to any one of Claims 7 or 8, wherein the upper rail is of hollow form.
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10. A barrier according to any one of Claims 7 to 9, wherein the upper rail has windows formed therein through which the hollow interior thereof is exposed.

5 11. A barrier according to Claim 10, wherein the upper rail includes windows opening to one face of the panel component which are arranged to alternate with windows opening to the opposite face of the panel component.

10 12. A barrier according to any of Claims 7 to 11, wherein the lower rail is of hollow form having windows formed therein through which the hollow interior thereof is exposed, and/or wherein the lower rail includes windows opening to one face of the panel component which are arranged to alternate with windows opening to the opposite face of the panel component.

15 13. A barrier according to any of Claims 7 to 12, wherein the upper reinforcing member is located within the hollow interior of the upper rail, and/or wherein the lower reinforcing member is located within the hollow interior of the lower rail.

20 14. A barrier according to any of Claims 7 to 13, wherein certain of the uprights are of hollow, tubular form provided with alternating windows.

15. A barrier according to any of Claims 7 to 14, wherein upright reinforcing members are located within hollow interiors of certain ones of the uprights.

25 16. A barrier according to Claim 15, wherein the feet are mounted upon projecting lower ends of the upright reinforcing members.

17. A barrier according to any one of the preceding claims, wherein two or more panel components are self-complementary to each other.

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18. A barrier according to any one of the preceding claims, wherein one or more panel components have C2 rotational symmetry about an axis extending perpendicular to the upper and lower edges of the panel component, and/or wherein one or more panel components have C2 rotational symmetry about an axis midway between the upper and lower edges of the panel component.

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19. A barrier according to any of the preceding claims, wherein the reinforcing members are secured in position using screws, nuts and bolts or other threaded fasteners, rivets, or adhesives.

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20. A barrier according to any of the preceding claims, wherein the panel components are of moulded plastics material form, and wherein at least two panel components are identical to one another.



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Claims searched: 1-20

Date of search: 15 March 2019

Patents Act 1977: Search Report under Section 17

Documents considered to be relevant:

Category	Relevant to claims	Identity of document and passage or figure of particular relevance
X	1, 4-6, 8, 9, 17, 19 and 20	FR2750147 A1 (REVEL) See Figures and Abstract, noting modular barrier comprising panel components 1 joined by connecting member 2.
X	1, 6-9, 17 and 19	CN107605238 A (ZHANG) See Figures and Abstract, noting barrier comprising a pair of panel components magnetically joined via upper and lower connecting members.
X	1-3, 6, 8, 9, 17 and 19	GB2063956 A (TUBULAR BARRIERS LTD) See Figures, noting barrier formed from panel components 24, 25 joined by upper and lower members 11, 13.

Categories:

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.

Field of Search:

Search of GB, EP, WO & US patent documents classified in the following areas of the UKC^X :

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Worldwide search of patent documents classified in the following areas of the IPC

E01F; E04H

The following online and other databases have been used in the preparation of this search report

EPODOC, WPI, Patent Fulltext

International Classification:

Subclass	Subgroup	Valid From
E01F	0013/02	01/01/2006
E04H	0017/16	01/01/2006