



PATENT SPECIFICATION

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COMPLETE SPECIFICATION.

Improvements in or relating to Barriers and like Guards.

We, TUBULAR CONSTRUCTION SYSTEMS LIMITED, a British Company, of 135, Battersea High Street, Battersea, London, S.W.11, WILLIAM EDWARD APPLEBY, of 46, Silversea Drive, Westcliffe-on-Sea, in the County of Essex, and THOMAS HARRY, of 68 Ealing Village, London, W.5, both British Subjects, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to barriers and like guards.

It is an object of the invention to provide an improved and completely portable barrier or guard which is simple in construction and can be easily moved from one location to another as desired.

A further object of the invention is to provide portable barrier units which can be easily and quickly assembled one to another to form a continuous barrier structure.

A still further object of the invention is to provide a portable barrier construction which allows the units to be easily stacked whereby a large number of units can be quickly transported to a desired location for the immediate assembly of a barrier structure.

According therefore, to the present invention there is provided a portable barrier unit comprising a substantially vertical portion forming a guard, and a horizontal or foot portion extending therefrom at least on one side thereof, wherein the foot portion on said one side is so arranged that a pressure applied to the guard portion from the other side thereof will tend to lift one end of said unit.

In the preferred construction the foot portion on said one side of the guard is substantially triangular, the two sides of the foot portion extending from the guard portion to form an apex, which apex is positioned nearer to said one end of the unit.

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The third side of said foot portion may be located in the plane of the guard portion, or it may be substantially parallel with said guard portion and located on the other side of said guard portion.

The foot portion may further be provided with ground engaging members, while the guard portion is preferably substantially rectangular.

In one construction of the unit, both the foot portion and guard portion are built up in metal tubing. The foot portion and the frame of the guard portion may be formed from a single length of metal tubing, or they may be formed separately, the two parts being welded together to form a single unit. The guard portion may include two horizontal tubes for supporting a mesh or other panel.

Preferably the ends of the guard portion of the unit are provided with members for connecting same to adjacent units to form a continuous barrier structure. To this end the unit is provided with one or more staples on said one end of the unit, and one or more corresponding hook members on the other end of the unit. Conveniently at least one of said hook members is provided with means for positively retaining said hook member in position in a corresponding staple, while the staples are elongated along the longitudinal axis of the unit so as to allow connected units to pivot relatively to each other in the vertical plane.

The top part of the guard portion may be bent outwardly in the same direction as the foot portion.

A continuous barrier structure may be formed by connecting two or more of the above units together, the units being so arranged that the tendency of said one end of one unit to lift due to application of pressure to the guard portion, will be resisted by the weight of the adjacent unit or units connected to that end. The structure may include a gate therein, which

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gate includes a pair of upright members connected respectively with the units adjacent the gate and mounted in a sole plate extending across the width of the gate.

5 The preferred embodiments of the invention will now be described by way of example with reference to the accompanying drawings in which:—

10 Figure 1 is a perspective view of a portable barrier unit according to the invention and showing the method of connection to adjacent units during the assembly of a continuous barrier structure;

15 Figure 2 is a plan view of the barrier unit;

Figure 3 is an end view of the barrier unit in the direction of the arrow A of Figure 2;

20 Figure 4 is an enlarged perspective view of the top connection between two adjacent units;

25 Figure 5 is a section on the line V—V of Figure 2 and shows a ground engaging member and its connection to the tube of the foot portion of the unit;

Figure 6 is a front view of a gate structure for use in a continuous barrier structure;

30 Figure 7 is a front view of a modified form of portable barrier unit; and

Figure 8 is a plan view of the embodiment of Figure 7.

35 Referring now to the drawings and in particular to Figures 1 and 2 it will be seen that each barrier unit 10 includes a horizontal or foot portion 11 and a vertical or guard portion 12 formed separately one from the other. The two portions are constructed largely of metal rod or tubular members and are welded together as shown at 13, 14.

40 The guard portion 12 is formed from a single tube bent to substantially rectangular shape with its two ends connected to the foot portion. The guard portion further includes two horizontal tubes 15, 16 welded at their ends to the upright parts 17, 18 of the guard and adapted to support a wire mesh or like panel 19 therebetween. The mesh panel 19 is of rectangular form and is conveniently secured to the upright portions 17, 18 and the tubes 15, 16 by welding of the individual wires thereto.

45 The guard portion is bent outwardly at its upper end (see also Figure 3), while the lower tube 16 is positioned a short distance above the foot portion. The purpose of such an arrangement will be described hereinafter.

50 The foot portion 11 is formed also from a single tube, the tube being bent into substantially triangular shape with its ends welded one to the other (see particularly Figure 2). The foot portion is so connected to the guard portion that the greater

majority of the foot portion is located on the outward side of the guard portion; a part of the foot portion is however located on the other side of the foot portion and this part includes the side 20 which is disposed substantially parallel to the plane of the guard portion. The other two sides 21, 22 of the foot portion extend approximately from the welds 13, 14 outwardly to form an apex 23. The essential feature of the invention, as will be hereinafter described, lies in the positioning of the apex 23 with respect to the guard portion 12. To this end it is necessary to position the apex 23 closer to one end of the unit than the other and this is attained by locating the sides 21, 22 of the tube at angles of approximately 30° and 60° to the plane of the guard portion.

85 The arrangement is such that a lateral force, as shown by the arrow B, applied to the crowd or inside surface of the guard portion will (assuming no slip) tend to tilt the unit about the long side 21 of the foot portion and will therefore lift the corner C of the unit. Generally no slip will take place during its normal use as part of a barrier structure; on certain surfaces slip may however occur, and it is preferred therefore to provide the foot portion 11 with three ground engaging members 24 in the form of spikes located one adjacent each corner of the foot portion. The construction of the spikes 24 is shown in greater detail in Figure 5, the spikes being of tool hardened steel and being welded to the tube of the foot portion. If desired, the spikes 24 can be welded to the tube at an angle to the vertical, for example, they may point in the outward direction at an angle of about 15° to the vertical.

95 The upper part of the guard portion is bent outwardly so that spectators leaning thereon will be standing close to the inner surface of the guard portion. The lower tube 16 is located so that the feet of the spectators can pass thereunder and it will be seen that by suitably positioning the part 20 of the foot tube, the spectators will be forced to stand thereon (if they wish to lean on the top of the barrier) and will therefore further stabilize the unit.

100 The upright sides 17 and 18 of the guard portion are provided with connecting members for joining the units 10 one to another to form a continuous barrier structure.

105 The connecting members conveniently comprise two downwardly directed hooks 25 on one side of the unit and two corresponding staples 26 on the other side. These members 25 and 26 are welded to the unit and are such that the adjacent units can be located at angles to each other; the use of the triangular foot portion above

described allows an angle of up to 90° to be obtained.

An important feature of the invention lies in securing the staples 26 to that end of unit closer to the apex 23. The staples 26 are therefore connected to the upright part 17. It will be seen therefore that when the unit is connected as part of a continuous barrier structure, the tendency of the end C to rise will be resisted by the weight of the next adjacent unit 27, which will be applied through its hooks 25 onto the staples 26 of the unit 10 receiving the force B. This action in effect, makes the units more or less immovable.

The staples 26 are each elongated along the longitudinal axis of the unit to about three times the diameter of the hooks 25. This allows adjacent units to pivot relatively one to the other in the vertical plane when a continuous structure is assembled across an undulating surface. An enlarged view of a top coupling between two units is shown in Figure 4, the hook 25 engaging an elongated slot 28 in the staple 26. The top coupling also includes a positive connection in the form of a washer 29 held in position on the hook 25 by a split pin 30 below the staple 26.

In Figure 6, there is shown a gate arrangement which may be included in a continuous assembly of barrier units. To this end, the barrier units 10, adjacent the gate engage with upright tubular members 31, 32, which members form the posts of the gate. Each upright tube 31, 32, is provided with a pair of staples 33 for connection with the adjacent barrier unit. Usually, however, one of the barrier units has its subject 26 adjacent the gate tube, say 32, and in such a case it is preferred to connect each pair of staples 26, 33, together by a nut and bolt 34.

The upright tubes 31, 32 each fit into a socket 35 in a sole plate 36 extending across the width of the gate. The sole plate 36 connects the two parts of the barrier structure together and thus prevents any relative movement therebetween.

The gates 37 are conveniently of rectangular shape and of tubular metal construction having a diagonal tube 38 welded thereto for strengthening. Panels 39, 40 of wire mesh may be attached to the gate by welding as before, or as shown may be connected by clips 41. The gate 37 is mounted on one of the upright tubes, in the embodiment shown, the tube 32, by means of a pair of double leaf spring hinges 42.

The barrier unit described above is extremely simple in construction and completely portable in use. They can be easily stacked in great numbers for transportation and storage and when assembled as a continuous barrier is of pleasing

appearance and has a great resistance to lateral forces.

A modified form of barrier unit is shown in Figures 7 and 8. In this form of the invention the foot portion and the frame of the guard portion are built up from a single tube 45. The tube 45 is bent to form the upright parts 17a, 18a and the top horizontal part 46 of the frame of the substantially rectangular vertical or guard portion 12a. The ends of the tube 45 are bent outwardly from the guard portion at angles of approximately 70° and 20° to form a foot portion 11a integral with the guard portion 12a. The part 21a extending at 20° is welded at its end to the other part of the tube, as shown at 47, while the other part of the tube 22a which extends at 70° is continued past the weld and is then bent back and welded to the other part 21a of the tube. The apex of the substantially triangular foot portion 11a may be considered as the bent portion 23a of the tube and as before this will be located closer to the end 17a of the guard portion of the unit. The unit will tend therefore, to tilt about the points 23a and the bottom of the upright 18a when the force B is applied to the inner surface of the unit.

The guard portion 12a is provided as before with two horizontal tubes 15a and 16a welded to the parts 17a and 18a. The tube 16a is however located at the bottom of the upright portion, but as before the tubes 15a and 16a increase the rigidity of the unit and support a wire mesh panel 19 therebetween. Instead of welding the wire mesh panel to the unit it may be secured as shown by connecting members, such as nut and bolt, which engage fixed lugs 48 welded to the adjacent tubes.

If desired the lower lugs 48 may extend outwardly some distance from the unit so that the panel 19 will be held at an angle thus giving a more pleasing appearance to the unit and preventing damage to the lower part of the panel by kicking.

If desired a tray or shelf could be detachably secured to the top horizontal strengthening tube 15 or 15a of each barrier unit.

What we claim is:—

1. A portable barrier unit comprising a substantially vertical portion forming a guard, and a horizontal or foot portion extending therefrom at least on one side thereof, wherein the foot portion on said one side is so arranged that a pressure applied to the guard portion from the other side thereof will tend to lift one end of said unit.

2. A unit as claimed in Claim 1, wherein the foot portion on said one side of the guard is substantially triangular, and

- wherein two sides of said foot portion extend from the guard portion to form an apex, which apex is positioned nearer to said one end of the unit.
- 5 3. A unit as claimed in Claim 2, wherein the third side of said foot portion is located in the plane of the guard portion.
- 10 4. A unit as claimed in Claim 2, wherein the third side of said foot portion is substantially parallel with said guard portion and is located on the other side of said guard portion.
- 15 5. A unit as claimed in any preceding claim, wherein the foot portion is provided with ground engaging members.
- 20 6. A unit as claimed in any preceding claim, wherein the guard portion is substantially rectangular.
- 25 7. A unit as claimed in any preceding claim, wherein both the foot portion and guard portion are built up in metal tubing.
- 30 8. A unit as claimed in Claim 7, wherein the foot portion and the frame of the guard portion are formed from a single length of metal tubing.
- 35 9. A unit as claimed in Claim 7, wherein the foot portion is formed separately from the guard portion and the two parts are welded together to form a single unit.
- 40 10. A unit as claimed in Claim 8 or 9, wherein the guard portion includes two horizontal tubes for supporting a mesh or other panel.
11. A unit as claimed in any preceding claim, wherein the ends of the guard portion of the unit are provided with members for connecting same to adjacent units to form a continuous barrier structure.
12. A unit as claimed in Claim 11, wherein the unit is provided with one or more staples on said one end of the unit, and one or more corresponding hook members on the other end of the unit.
13. A unit as claimed in Claim 12, wherein at least one of said hook members is provided with means for positively retaining said hook member in position in a corresponding staple.
14. A unit as claimed in Claim 12 or 13, wherein the staples are elongated along the longitudinal axis of the unit so as to allow connected units to pivot relatively to each other in the vertical plane.
15. A unit as claimed in any preceding claim, wherein the top part of the guard portion is bent outwardly in the same direction as said foot portion.
16. A portable barrier unit substantially as described and as shown in Figures 1 to 5 of the accompanying drawings.
17. A portable barrier unit substantially as described and as shown in Figures 7 and 8 of the accompanying drawings.
18. A continuous barrier structure comprising two or more units as claimed in any preceding claim, which units are so arranged that the tendency of said one end of one unit to lift due to application of pressure to the guard portion, will be resisted by the weight of the adjacent unit or units connected to that end.
19. A barrier structure as claimed in Claim 18, having a gate therein, which gate includes a pair of upright members connected respectively with the units adjacent the gate and mounted in a sole plate extending across the width of the gate.
20. Continuous barrier structures substantially as described with reference to the accompanying drawings.

Dated this 1st day of June, 1951.

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PROVISIONAL SPECIFICATION.

Improvements in or relating to Barriers and like Guards.

We, TUBULAR CONSTRUCTION SYSTEMS LIMITED, a British Company, of 135, Battersea High Street, Battersea, London, S.W.11, WILLIAM EDWARD APPLEBY, of 46, Silversea Drive, Westcliffe-on-Sea, in the County of Essex, and THOMAS HARRY, of 68 Ealing Village, London, W.5, both British Subjects, do hereby declare this invention to be described in the following statement:—

This invention relates to barriers and like guards.

It is an object of the invention to provide an improved barrier or guard which is

simple in construction and is easily movable from one location to another as desired.

A further object of the invention is to provide portable barrier units which can be easily and quickly assembled one to another to form a continuous structure.

According to the present invention there is provided a portable barrier unit comprising a substantially vertical portion forming a guard, and a horizontal or foot portion extending from said vertical portion to maintain the guard portion substantially vertical.

In the preferred construction the vertical or guard portion of the barrier and the horizontal or foot portion are formed integral one with another. Conveniently the barrier

5 is formed of a single rod or tubular element, which is suitably bent to form a substantially rectangular guard portion and a substantially triangular foot portion extending horizontally therefrom.

10 Preferably the upright parts of the guard portion are provided respectively with a hook and an eye member so that a continuous barrier structure can be formed. In such an arrangement it is preferred to position the apex of the triangular foot portion

15 nearer that end of the barrier unit provided with the eye member, so that pressure applied to the barrier unit will tend to raise that end of the barrier unit, which movement will be prevented by the weight of the next adjacent barrier unit acting through its hook member.

According to a further aspect of the invention there is provided a clip member for

25 adjustably attaching an open-work guard such as a mesh panel to a tubular or like framework, said clip comprising a strip of flexible material, the ends of which pass respectively around a portion of the framework and the panel and are connected with the intermediate portion of said strip. Preferably the ends of the strip are connected with said intermediate portion by a single connecting member.

30 The preferred embodiment of the invention will now be described, but it will, of course, be understood that this is given by way of example only and that various modifications can be made to suit individual requirements.

40 The barrier unit is built largely of metal tubing welded together and comprises a tube bent to form the upright parts and top horizontal part of a substantially rectangular vertical or guard portion. The ends of the tube are bent outwardly away from the guard portion at angles of approximately 70° and 20° and form a substantially triangular foot portion. That part

45 of the tube extending at 20° is welded at its end to the other part of the tube, while said other part of the tube which extends at 70° is continued past said weld and is then bent back and welded to the other part of the tube. The apex of the substantially triangular foot portion may be considered as the bent portion of the tube extending at 70° and it will be appreciated that this will be located closer to one end of the vertical portion of the barrier. The purpose of such an arrangement will be described hereinafter.

50 The vertical portion of the barrier is provided with two horizontal tubes welded

55 to the upright parts of the frame and

located at the bottom of the frame and near the top respectively. These tubes increase the rigidity of the unit and also support an open-mesh wire panel as will be described in detail hereinafter.

Three metal spikes are welded to the unit at the apex of the triangular foot and the bottom of each to the upright parts of the frame respectively. These act to prevent sliding movement of the barrier once it has been positioned and may even engage certain surfaces such as grass.

The upright parts of the frame are provided one with a pair of downwardly directed hooks welded thereto and the other with a pair of corresponding staples or eye member also welded thereto. The arrangement is such that the barrier units can be connected one to the other to form a continuous structure, and can also be arranged at angles one to the other as required. Adjacent units can be positioned at angles up to 90° to each other, such an arrangement being obtained by the use of the triangular foot portion hereinbefore described.

The shape or eye members of the frame are each elongated along the longitudinal axis of the unit to about three times the diameter of the corresponding hook-member, so that adjacent units can pivot relatively one to the other in the vertical plane when a continuous structure is assembled across an undulating surface.

The staple or eye members are welded to that upright part of the unit closest to the apex of the foot portion. The advantage of this arrangement is that a lateral force applied to a barrier unit of a continuous assembly will always tend to lift that part of the unit. It will be appreciated, however, that such movement will then be resisted by the weight of the next adjacent unit, which will be applied through its hook members onto the eye members of the unit receiving the force.

The horizontal tubes of the vertical frame are each provided with three lugs welded thereto. The open mesh wire panel is located against the lugs and is secured in position by connecting members which pass through the panel and also engage a lug and a plate member located at the other side of the panel. If desired the lower lugs may extend outwardly some distance from the unit so that the panel is held at an angle thus giving a more pleasing appearance and preventing damage to the lower part of the panel by kicking.

In another arrangement the panel may be connected to the tubes by a strip of aluminium or other suitable material, the strip being drilled adjacent one end and

also intermediate its ends so that the drilled end may pass around a tube of the unit and be connected to itself by a nut and bolt. The other end of the strip is adapted to pass through the mesh panel and is then also connected to itself preferably by the same nut and bolt, a suitable hold being made as required to maintain the panel in a desired position.

- 10 In an arrangement in which a tube is located between two mesh panels the drilled portion of each strip may only extend half way around the tube, the end of the strip being connected to the intermediate portion of a corresponding strip extending around the other half of the tube and supporting a panel at the other side of the tube.

- 20 A gate may be included in a continuous assembly of barrier units and to this end the barrier units adjacent the gate each engage with an upright tubular member, which members form the posts of the gate. Each upright tube is provided with a pair of staples or eye-members for connection with the adjacent barrier unit. Usually one of the barrier units has its eye members adjacent the gate tube and in such a case it is preferred to connect each pair of eye members together by a nut and bolt.

30 Each upright gate tube fits into a socket attached to a sole plate extending across the width of the gate. The sole plate connects the two parts of the barrier

structure together and also prevents any relative movement therebetween. 35

The gates are conveniently of rectangular shape and are of tubular metal construction having a diagonal tube welded thereto for strengthening. Panels of wire mesh are attached as before to the gate by means of the clips or fixed lugs and the gate is mounted on one of the upright tubes by means of a pair of double leaf spring hinges. 40 45

It will thus be seen that the barrier structure above described is simple in construction and completely portable in use. Owing to its particular construction it has a great resistance to lateral forces and when assembled is of pleasing appearance. 50

If desired a tray or shelf could be detachably secured to the top horizontal strengthening bar of each barrier unit, while an angle bar or concrete blocks may be laid along the structure across the apexes of the foot portions to give a more pleasing effect and to indicate more clearly the extent of the projection of the foot portion. 55 60

Dated this 20th day of June, 1950.

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