REINFORCED POST

The following statement is a full description of this invention, including the best method of performing it, known to the applicants.

TECHNICAL FIELD

[0001] This invention relates to a reinforced post comprising a ground-anchorable steel post and a steel reinforcing member connected to the post that is capable of increasing the bending resistance of the post at ground level. The invention also concerns a method of manufacturing the steel reinforced post.

BACKGROUND ART

[0002] Ground-anchored Y-shaped steel posts (pickets) as typically used in agricultural fencing have a longitudinal body and three arms extending radially from the body. In some instances, when a lateral force is applied to the Y-shaped post above ground level, the two radial arms that form the back of the Y-shape can splay or fold under compressive stress. This can result in the post bending out of shape.

[0003] Such Y-shaped steel posts are usually produced by a hot rolling process. Normally to attain further strength for a hot-rolled Y-shaped post, the manufacturer must add steel to the entire length of the post section. Due to the nature of hot rolling, it is not possible to thicken only a region of the post section. Consequently, to strengthen a Y-shaped post, there is a lot of steel used in a top region of the post that is not effectively or efficiently used.

[0004] The present inventors have now developed a steel reinforced post (and method of manufacturing it) that provides a post with additional bending moment strength at ground level, yet utilises less steel than in the hot rolling process.

SUMMARY OF INVENTION

[0005] According to a first aspect of the present invention there is provided a reinforced post comprising a ground-anchorable steel post and a steel reinforcing member connected to the post that is capable of increasing the bending resistance of the post at ground level.

[0005A] In an embodiment of the first aspect, there is provided a reinforced post comprising:

a ground-anchorable steel post, wherein the post is a Y-shaped post having a longitudinal

body and three arms extending radially from the longitudinal body, or a T-shaped post having a longitudinal body and arms extending from the longitudinal body; and

a steel reinforcing member welded at or near longitudinal ends of at least two said arms of the post such that the reinforcing member is substantially not co-planar with any of the at least two said arms of the post, the steel reinforcing member being capable of increasing the bending resistance of the post at ground level.

[0006] According to a second aspect of the present invention there is provided a method of manufacturing a reinforced post, said method comprising the step of connecting to a ground-anchorable steel post a steel reinforcing member so as to form a reinforced post, wherein the reinforcing member is capable of increasing the bending resistance of the post at ground level. In one embodiment, the method comprises the step of welding to a ground-anchorable steel post a steel reinforcing member so as to form a reinforced post.

[0006A] In an embodiment of the second aspect, there is provided a method of manufacturing a reinforced post, said reinforced post comprising:

a ground-anchorable steel post, wherein the post is a Y-shaped post having a longitudinal body and three arms extending radially from the longitudinal body, or a T-shaped post having a longitudinal body and arms extending from the longitudinal body; and

a steel reinforcing member welded at or near longitudinal ends of at least two said arms of the post such that the reinforcing member is substantially not co-planar with any of the at least two said arms of the post, the steel reinforcing member being capable of increasing the bending resistance of the post at ground level;

said method comprising the step of welding the steel reinforcing member between the at least two said arms of the post.

[0007] According to a third aspect of the present invention there is provided a steel post when used in the manufacture of a reinforced post according to the first aspect of the invention.

[0008] According to a fourth aspect of the present invention there is provided a steel reinforcing member when used in the manufacture of a reinforced post according to the first aspect of the invention.

[0009] To avoid all doubt, the term "at ground level" refers to a region of the post that is located at or adjacent the ground surface, after the post has been anchored to the ground.

[0010] The steel post may be of any suitable size, shape and construction, and may be made of any suitable material or materials. The post may be, for example, a pipe, a beam, a stake or a picket. The post may be made of galvanised or coated steel, for example.

[0011] The post will typically comprise a longitudinal body. The ground-anchoring end of the post may be pointed for more effective penetration into the ground. That is, a lower end of the longitudinal body of the post may be pointed or otherwise tapered. The post may have one or more openings located along a length of the post for receiving one or more fencing members such as wires, insulators, keepers or other types of fencing members as described in PCT/AU2008/000857.

[0012] The reinforcing member may be of any suitable size, shape and construction, and may be made of any suitable material or materials. For example, the reinforcing member may be in the form of a stiffening strip, plate, mesh, grill, ring, collar, half ring or half collar. If a strip or plate, it may be of any suitable length, width and thickness. If a ring, collar, half ring or half collar, it may be of any suitable length, diameter and thickness. A half ring or half collar would be connected to a side of the post where a lateral load was predominantly going to be applied from one direction. The reinforcing member may be made of galvanised or coated steel, for example.

[0013] The reinforcing member may extend part way along the longitudinal body of the post. When the reinforced post is anchored to the ground, the reinforcing member may extend about 40 mm below ground level and at least about 100 mm above ground level, although it may be more or less depending on the firmness of the ground, the weight of the post as well as the application to which the post is put and the expected lateral forces to which the post may be subjected.

[0014] The reinforcing member may be connected to the post in any suitable way. A preferred method of connection entails welding or otherwise rigidly affixing the reinforcing member to the post.

[0015] In a first embodiment, the post is a Y-shaped post (picket) having a longitudinal body and three arms extending radially from the longitudinal body. The Y-shaped post may have a pointed ground-anchoring end. The Y-shaped post may be manufactured by a hot rolling process

and may be made of galvanised or coated steel. The reinforcing member may be a steel strip or plate that is welded to and extends between any two arms of the post. It is possible that one or more additional steel strips or plates may extend between those same two arms or between other arms of the post.

[0016] In a second embodiment, the post is a T-shaped post (picket) having a longitudinal body and arms extending from the longitudinal body. The T-shaped post may be made of galvanised or coated steel. The reinforcing member may be a steel strip or plate that is welded to and extends between at least any two arms of the post. It is possible that one or more additional steel strips or plates may extend between those same two arms or between other arms of the post.

[0017] In a third embodiment, the post has a longitudinal tubular body, having a cross section of any suitable shape, size and diameter. Preferably the tubular body has a circular cross section. The tubular post may be made of galvanised or coated steel. The reinforcing member may be a steel ring or collar that is welded to and extends around and part way along the longitudinal tubular body.

[0018] In a fourth embodiment, the post has a longitudinal body having upturned longitudinal sides that form a channel extending a length of the body. The body may have a cross section of any suitable shape and size. Preferably the cross section is C- or U-shaped. The post may be made of galvanised or coated steel. The reinforcing member may be a steel strip or plate that extends across the channel of the post, being welded to opposing longitudinal sides of the body. It is possible that one or more additional steel strips or plates may extend across the channel.

[0019] Preferred embodiments of the invention will now be described, by way of example, with reference to the accompanying figures.

BRIEF DESCRIPTION OF FIGURES

[0020] Figure 1 is a perspective view of part of a steel reinforced Y-shaped post of indefinite length but not showing a pointed ground-anchoring end of the post, according to an embodiment of the present invention.

[0021] Figure 2 is an end view of the reinforced Y-shaped post shown in figure 1.

[0022] Figure 3 is side elevation view of the reinforced Y-shaped post shown in figure 1.

[0023] Figure 4 is a perspective view of part of a steel reinforced C-shaped post (of indefinite length).

[0024] Figure 5 is an end view of the reinforced C-shaped post shown in figure 4.

[0025] Figure 6 is side elevation view of the reinforced C-shaped post shown in figure 4.

[0026] Figure 7 is a perspective view of part of a steel reinforced tubular post (of indefinite length).

[0027] Figure 8 is an end view of the reinforced tubular post shown in figure 7.

[0028] Figure 9 is side elevation view of the reinforced tubular post shown in figure 8.

[0029] Figure 10 relates to pictures of steel reinforced Y-shaped posts like that shown in figure 1, according to embodiments of the present invention.

DESCRIPTION OF EMBODIMENTS

[0030] In the figures like reference numerals refer to like features.

[0031] Figures 1 to 3 show part of a reinforced post 1 comprising a ground-anchorable Y-shaped steel post 2 and a steel reinforcing member 3 connected to the post 2. The post 2 is like one typically used in agricultural fencing.

[0032] The Y-shaped post 2 has a longitudinal body 4 and three arms 5, 6, 7 extending radially from the longitudinal body 4. Although not illustrated, the Y-shaped post 2 has a pointed ground-anchoring end.

[0033] The reinforcing member 3 is in the form of a steel strengthening strip or plate that is welded to and extends between arms 6 and 7 of the post 2. The strip or plate 3 is usually welded at a position on the post 2 corresponding to about 40 mm below ground level (to allow for soils being soft at the very upper surface) and extends up above ground level for at least approximately 100 mm. However, the reinforcing member 3 may be lengthened or shortened as required for different applications and post weights.

[0034] It is possible that one or more additional steel strips or plates like 3 could extend between those same two arms 6, 7 or between other arms 5, 6, 7 of the post 2.

[0035] The strip or plate 3 is capable of increasing the bending resistance of the post 2 at

ground level. The strip or plate 3 stops post arms 6 and 7 from splaying or folding under compressive stress due to force being applied to the Y-shaped post 2 above ground level.

[0036] Pictures of actual reinforced posts like reinforced post 1 comprising a ground-anchorable Y-shaped steel post and a steel reinforcing member are shown in figure 10.

[0037] Figures 4 to 6 show part of a reinforced post 10 comprising a ground-anchorable C-shaped steel post 12 and a steel reinforcing member 13 connected to the post 12.

[0038] The post 12 has a longitudinal body having upturned longitudinal sides 14, 15 that form a channel 16 extending the length of the body. The body has a C-shaped cross section, as seen in figure 5.

[0039] The reinforcing member 13 is in the form of a steel strengthening strip or plate 13 that is welded to and extends between the upturned longitudinal sides 14, 15 of the post 12. The strip or plate 13 is usually welded at a position on the post 12 about 40 mm below ground level and extends up above ground level for at least approximately 100 mm. However, the reinforcing member 13 may be lengthened or shortened as required for different applications and post weights.

[0040] It is possible that one or more additional steel strips or plates like 3 could extend between those same upturned longitudinal sides 14, 15.

[0041] The strip or plate 13 is capable of increasing the bending resistance of the post 12 at ground level. The strip or plate 13 stops the upturned longitudinal sides 14, 15 from splaying or folding under compressive stress due to any lateral force being applied to the post 12 above ground level.

[0042] Figures 7 to 9 show part of a reinforced post 20 comprising a ground-anchorable tubular steel post 22 and a steel reinforcing member 23 connected to the post 22.

[0043] The post 22 has a longitudinal tubular body 24 of circular cross section, as seen in figure 8.

[0044] The reinforcing member 23 is in the form of a steel stiffening ring or collar 23 that is welded to and extends part way along the longitudinal tubular body 24 of the post 22. The ring or collar 23 is usually welded at a position on the post 22 about 40 mm below ground level and extends up above ground level for at least approximately 100 mm. However, the reinforcing

member 23 may be lengthened or shortened as required for different applications and post weights.

[0045] The ring or collar 23 is capable of increasing the bending resistance of the post 22 at ground level.

[0046] In the present specification, the word "comprising" and its derivatives including "comprises" and "comprise" include each of the stated integers but does not exclude the inclusion of one or more further integers.

[0047] In compliance with the statute, the invention has been described in language more or less specific to structural or methodical features. It is to be understood that the invention is not limited to specific features shown or described since the means herein described comprises preferred forms of putting the invention into effect. The invention is, therefore, claimed in any of its forms or modifications within the proper scope of the appended claims appropriately interpreted by those skilled in the art.

WHAT WE CLAIM IS:

1. A reinforced post comprising:

a ground-anchorable steel post, wherein the post is a Y-shaped post having a longitudinal body and three arms extending radially from the longitudinal body, or a T-shaped post having a longitudinal body and arms extending from the longitudinal body; and

a steel reinforcing member welded at or near longitudinal ends of at least two said arms of the post such that the reinforcing member is substantially not co-planar with any of the at least two said arms of the post, the steel reinforcing member being capable of increasing the bending resistance of the post at ground level.

2. The reinforced post of claim 1, wherein the reinforcing member is in the form of a stiffening strip, plate, mesh, grill, ring, collar, half ring or half collar.

3. The reinforced post of claim 1 or 2, wherein the reinforcing member extends between the longitudinal ends of the at least two said arms of the post.

4. The reinforced post of claim 3, wherein the reinforcing member extends between the longitudinal ends of two said arms of the post.

5. The reinforced post of claim 4, wherein the reinforcing member is a steel strip or plate.

6. The reinforced post of claim 5, wherein the steel strip or plate is substantially planar.

7. The reinforced post of claim 6, wherein the steel strip or plate is substantially rectangular.

8. The reinforced post of any one of claims 5 to 7, wherein the steel strip or plate comprises two opposite longitudinal ends, and each said opposite longitudinal end is welded to one of the longitudinal ends of the two said arms of the post.

9. The reinforced post of any one of claims 5 to 8, wherein the post is a Y-shaped post having a longitudinal body and three arms extending radially from the longitudinal body.

10. The reinforced post of any one of claims 5 to 8, wherein the post is a T-shaped post having a longitudinal body and arms extending from the longitudinal body.

11. The reinforced post of any one of claims 1 to 10, wherein the post is galvanised.

12. The reinforced post of any one of claims 1 to 11, wherein when the reinforced post is

anchored to the ground, the reinforcing member extends about 40 mm below ground level and at least about 100 mm above ground level.

13. The reinforced post of any one of claims 1 to 12, wherein the ground-anchoring end of the post is pointed for penetration into the ground.

14. The reinforced post of any one of claims 1 to 13, wherein the post has one or more openings located along a length of the post for receiving one or more fencing members.

15. The reinforced post of claim 14, wherein the one or more fencing members are selected from the group consisting of: a wire, an insulator, or a keeper.

16. A method of manufacturing a reinforced post, said reinforced post comprising:

> a ground-anchorable steel post, wherein the post is a Y-shaped post having a longitudinal body and three arms extending radially from the longitudinal body, or a T-shaped post having a longitudinal body and arms extending from the longitudinal body; and
>
> a steel reinforcing member welded at or near longitudinal ends of at least two said arms of the post such that the reinforcing member is substantially not co-planar with any of the at least two said arms of the post, the steel reinforcing member being capable of increasing the bending resistance of the post at ground level;

said method comprising the step of welding the steel reinforcing member between the at least two said arms of the post.

17. The method of claim 16, wherein the reinforcing member is in the form of a stiffening strip, plate, mesh, grill, ring, collar, half ring or half collar.

18. The method of claim 16 or 17, wherein the method comprises the step of welding the reinforcing member between the longitudinal ends of the at least two said arms of the post.

19. The method of claim 18, wherein the the method comprises the step of welding the reinforcing member between the longitudinal ends of two said arms of the post.

20. The method of claim 19, wherein the reinforcing member is a steel strip or plate.

21. The method of claim 20, wherein the steel strip or plate is substantially planar.

22. The method of claim 21, wherein the steel strip or plate is substantially rectangular.

23. The method of any one of claims 20 to 22, wherein the steel strip or plate comprises two opposite longitudinal ends, and the method comprises the step of welding each said opposite longitudinal end to one of the longitudinal ends of the two said arms of the post.

24. The method of any one of claims 20 to 23, wherein the post is a Y-shaped post having a longitudinal body and three arms extending radially from the longitudinal body.

25. The method of any one of claims 20 to 23, wherein the post is a T-shaped post having a longitudinal body and arms extending from the longitudinal body.

26. The method of any one of claims 16 to 25, wherein when the reinforced post is anchored to the ground, the reinforcing member extends about 40 mm below ground level and at least about 100 mm above ground level.

27. The method of any one of claims 16 to 26, wherein the ground-anchoring end of the post is pointed for penetration into the ground.

28. The method of any one of claims 16 to 27, wherein the post has one or more openings located along a length of the post for receiving one or more fencing members.

29. The method of claim 28, wherein the one or more fencing members are selected from the group consisting of: a wire, an insulator, or a keeper.

30. A steel post when used in the manufacture of a reinforced post according to any one of claims 1 to 15.

31. A steel reinforcing member when used in the manufacture of a reinforced post according to any one of claims 1 to 15.

32. A reinforced post substantially as hereinbefore described with reference to figures 1-3 or 10.

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By the patent attorneys for the applicants

CULLENS

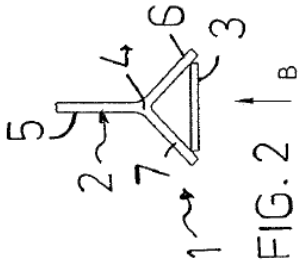

FIG. 2

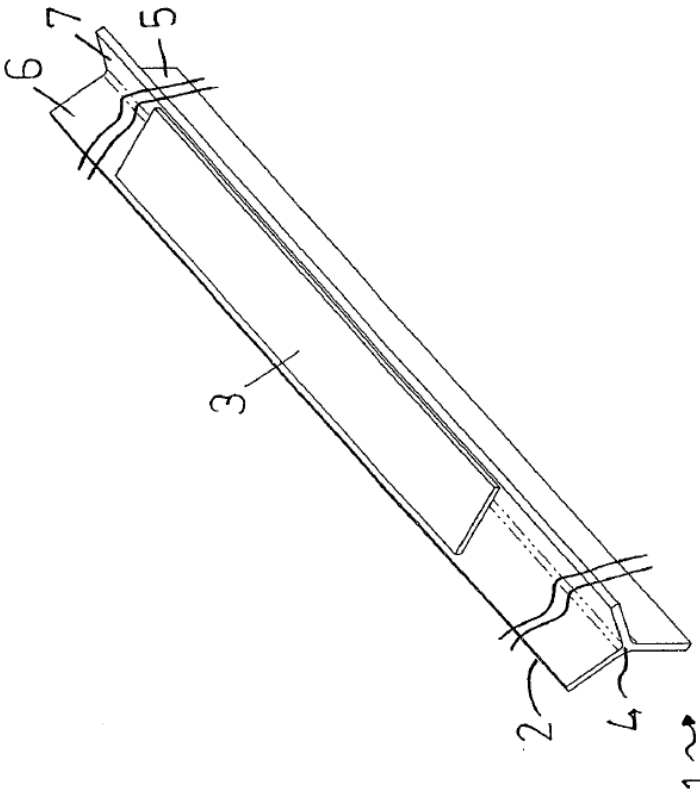

FIG.1

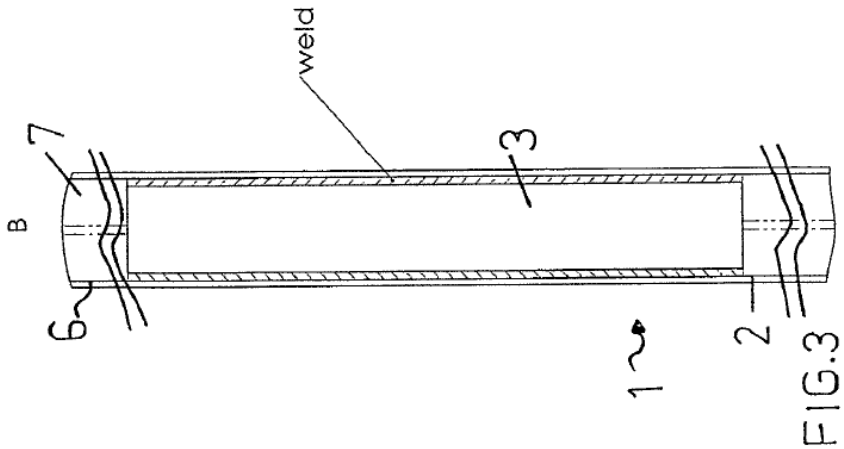

FIG.3

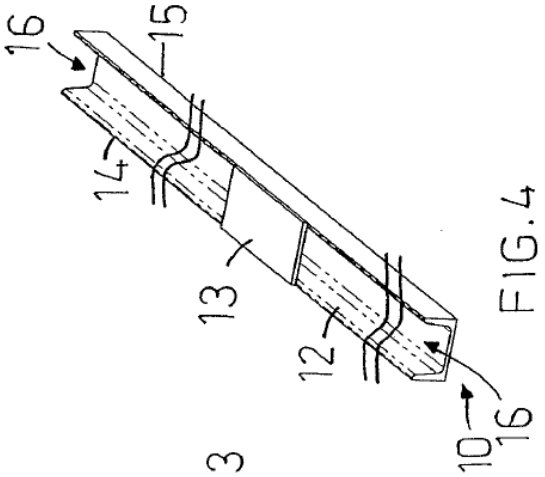

FIG.4

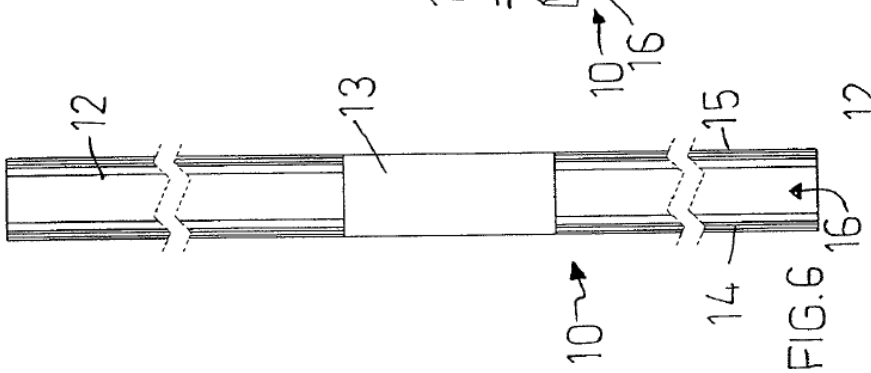

FIG.6

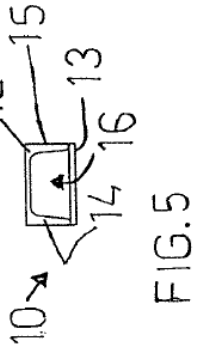

FIG.5

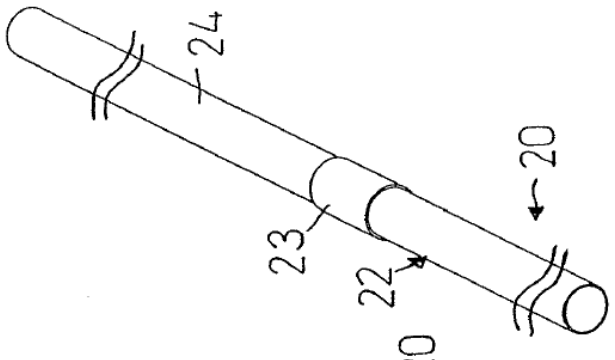

FIG.7

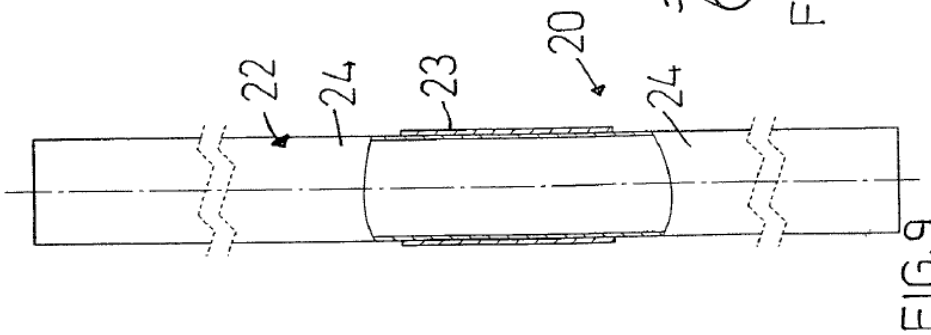

FIG.9

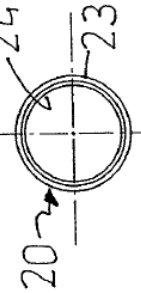

FIG.8

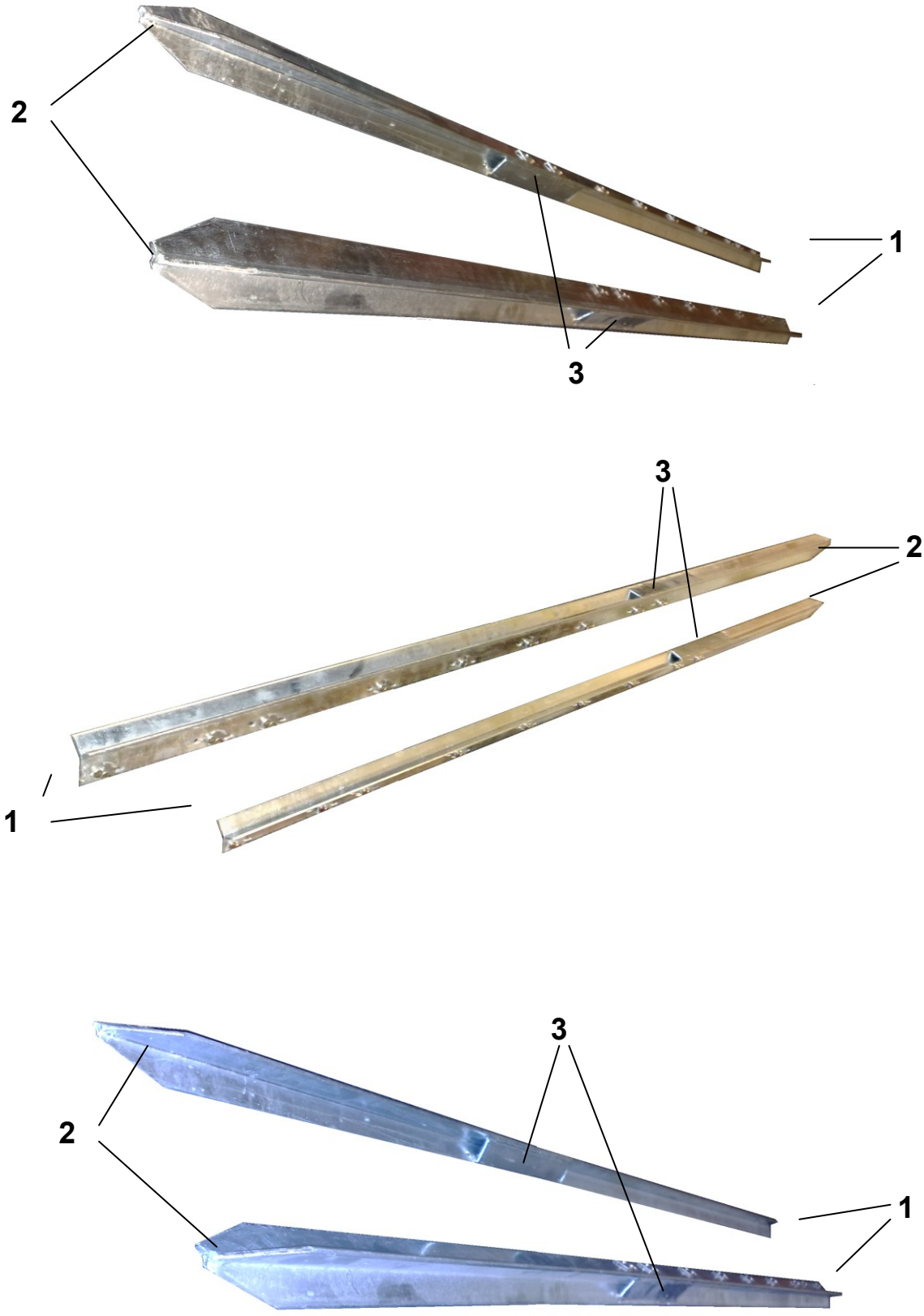

FIG. 10