

PATENT SPECIFICATION

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DRAWINGS ATTACHED



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(54) POSTS WITH ARMS

(71) We, SWISS ALUMINIUM LTD., a company organized under the laws of Switzerland, of Chippis (Canton of Valais), Switzerland, 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 posts that carry arms formed by one or more bars perpendicular to the post. Such posts and arms may be used in the construction of stands or racks, shelves, temporary partition walls and advertisement panels, and also in tables and similar pieces of furniture. Each end of an arm may be supported by a post, or the arm may be a cantilever.

In our Specification No. 1,167,238 we have described and claimed such a post in which the end of the bar is formed as a neck and a head, and part of the post is formed by a member slotted at one end to receive the neck of the bar and having a hollow centre to accommodate the head of the bar and threaded at its slotted end to engage a complementary thread on a second part of the post, so that on screwing the two parts of the post together the bar is trapped and held between the base of the slot and the second part of the post.

In practice such posts and bars are most advantageously made of aluminium alloys. These are comparatively soft materials, and it is found that the component parts made of them tend in time to become worn and deformed, in particular at the areas of contact, through frequent screwing together and unscrewing, so that they are no longer immovably fixed in relation to one another, but rather have a certain play. While this disadvantage might be avoided by the use of steel or other comparatively hard material for the whole construction, this would considerably increase both the cost and the weight.

In the invention, which is applicable to any post comprising tubular sections of an aluminium alloy or other relatively soft ma-

terial and an arm formed by a bar perpendicular to the post and having a neck and head, the neck being received by a slot extending axially from one end of one section and the head being accommodated in the hollow centre of this section, the end is externally threaded and is engaged by an internally threaded member of steel or other relatively hard material inserted in or secured to an adjacent second section of the post, the bar being trapped and held between the base of the slot and either the second section or the internally threaded member when the slotted section and this internally threaded member are screwed together to the maximum extent permitted by the arm.

Preferably the internally threaded member is a bush pushed into the end of the second section, but it may be a tubular member carried by but projecting from the second section.

Some constructions according to the invention will now be described by way of example with reference to the accompanying drawings, in which:—

Figure 1 is an exploded perspective view of parts of a post and two arms; and

Figures 2, 3 and 4 are axial sections through three different constructions according to the invention.

The parts of the post shown in Figure 1 are substantially the same as those shown in Figure 2 of Specification No. 1,167,238, but the arms differ slightly. The post is built up from tubular sections 1 and 2, the sections 1 serving to retain arms 6, and the sections 2 serving as spacers. The lowermost spacer 2 may be formed with or fit in to a base plate. The post comprises as many tiers of arms and retaining sections 1 as are required, and its upper end may consist of a retaining section closed at the top. In some cases the upper end may be fixed to a ceiling.

The retaining section 1 is a thick-walled length of tubing with an external thread 3 at each end (unless as indicated above it is a top section), and it is formed with radial

slots 4 which extend axially from the upper end to the inner end of the lower external thread. The arms 6 are bars with heads 5 and necks 7, the necks being of width such that they can fit into the slots 4, while the rest of each bar is wider than the slots. In assembly the neck of each bar is moved downwards through a slot, and when it comes to rest on the base of the slot the upper thread 3 is left clear for engagement by a spacer. In the constructions shown in Specification No. 1,167,238 the spacer is internally threaded to engage the thread 3, and when screwed home to the maximum extent permitted by the arm traps the arm and holds it in position. At the lower end of the retaining section 1 another spacer 2 is screwed over the lower thread 3. Preferably though not necessarily all the sections of the post are the same external diameter, and accordingly shoulders 9 are formed at the ends of the main body 8 of the retaining section 1, that is to say at the inner ends of the threads 3, to mate with the ends of the spacers 2.

All the parts so far described are normally made of an aluminium alloy, and the post and arms formed from them suffer from the disadvantages explained above.

Referring now to Figure 2, the construction differs in that, according to the invention, the ends of the spacers 2 are internally plain and receive steel bushes 11 with internal threads 10 which engage the external threads 3. Each bush is preferably of the same axial length as the part of the retaining section 1 which is threaded at 3, and is pushed into the end of the spacer 2 until its outer end is flush with that of the spacer.

If there are only a few slots 4, say no more than four, the simple bush shown in Figure 2 is usually adequate, and in any case is an improvement on the use of threaded aluminium spacers. However, posts with six or eight bars are provided as standard types, and of course as the number of slots increases so the width of the metal between them decreases. The slotted end of a section with four or more slots then consists of a number of narrow and rather weak lugs, which may bend under certain conditions of loading. Specifically, an arm that is a cantilever may project from a post fixed at both ends, and when the arm is loaded the retaining section 8 will be subjected to bending stresses. These may be resisted by the spacer at the upper end, but the upper part of the main body 8 may bend slightly, and then there may be inadequate engagement of the threads 3 and 10 on the side of the post opposite the loaded bar. This results in distortion of the post, and may even lead to its collapse.

To avoid this risk the form of bush 11 shown in Figure 3 may be used. This has an

internal annular projection 12 at its inner end with an annular groove 13 which receives and confines the end of the slotted retaining section 1 when this section and the bush are screwed together to the maximum extent permitted by the arm. The groove 13 is of such a depth that the end of the slotted section stops short of the base of the groove. This end of the slotted section is internally chamfered as shown at 14, and the groove 13 has a complementary sloping wall 15 engaged by the chamfered end 14. As a result the lugs between the slots are so supported that they are not deflected and do not bend inwards under the action of a loaded arm. The end of the retaining section 1 may indeed be regarded as acting as a wedge in the groove 13.

The provision of the internal projection 12 is of course necessary only at that end of the retaining section into which the slots open. However it is highly desirable, both for economy of manufacture and ease of assembly, to provide the minimum number of standard parts. Accordingly all the threaded bushes 11 may advantageously have the same internal projection 12, and both ends of the retaining sections 1 must then be chamfered.

In large-scale manufacture of the component parts it is impossible to avoid some variation in dimensions. For example, the width of the neck 7 of the bar may not be exactly the same as the width of the slot. Accordingly the bar may have some play in the slot, and if it is a cantilever may slope downwards instead of being horizontal. This disadvantage can be avoided by the construction shown in Figure 4, which is in fact also illustrated in Figure 1.

In Figure 4 a threaded bush 11 is no longer flush with the end of the spacer 2, but rather projects from it to enter a notch formed in the bar, and thus to engage the bar firmly. To accommodate the projecting end of the bush at points where it is not in engagement with a notch in a bar, an annular groove 17 is made around the shoulder at the inner end of the thread 3. As shown in Figure 4, the end of the bush 11 is wedge-shaped in cross-section, and the notch 18 in the bar, which is of aluminium alloy or other relatively soft material, is V-shaped but slightly smaller than the wedge-shaped end. In consequence, when the sections are screwed together, the notch 18 is indented by the wedge-shaped end 16 of the bush.

It is not necessary for the end 16 of the bush to make contact with any part of the groove 17.

As Figure 4 shows, the bushes in each of the spacers between which the bar fits are made the same, and the bar is correspondingly notched, so that when the sections are screwed together the bar is firmly clamped

between the two bushes, with the result that there is practically no risk of it dropping out of the horizontal position.

The features illustrated by Figures 3 and 4 may be combined, in that bushes having internal annular projections 12 may also have wedge-shaped ends 16.

WHAT WE CLAIM IS:—

1. A post comprising tubular sections of an aluminium alloy or other relatively soft material and an arm formed by a bar perpendicular to the post and having a neck and head, the neck being received by a slot extending axially from one end of one section and the head being accommodated in the hollow centre of this section, in which this end is externally threaded and is engaged by an internally threaded member of steel or other relatively hard material inserted in or secured to an adjacent second section of the post, the bar being trapped and held between the base of the slot and either the second section or the internally threaded member when the slotted section and this internally threaded member are screwed together to the maximum extent permitted by the arm.

2. A post according to claim 1 in which the internally threaded member is a bush pushed into the end of the second section.

3. A post according to claim 2 in which the bush is of the same axial length as the externally threaded part of the slotted section and its outer end is flush with that of the second section.

4. A post according to claim 1 or 2 in which the slotted section has four or more slots and the internally threaded member has

an internal annular projection at its inner end with an annular groove which receives and confines the end of the slotted section when this section and the internally threaded member are screwed together to the maximum extent permitted by the arm.

5. A post according to claim 4 in which the end of the slotted section is internally chamfered and the groove has a complementary sloping wall engaged by the chamfered end.

6. A post according to claim 4 or 5 in which the end of the slotted section stops short of the base of the groove when this section and the internally threaded member are screwed together to the maximum extent permitted by the arm.

7. A post according to any of claims 1, 2, 4 and 5 in which the slotted section is formed with an annularly grooved shoulder at the inner end of the thread on it, the bar is formed with a notch, and the outer end of the internally threaded member enters the groove and notch.

8. A post according to claim 7 in which the outer end of the internally threaded member is wedge-shaped in cross-section and the bar is of aluminium alloy or relatively soft material and the notch in it is V-shaped but slightly smaller than the wedge-shaped end, so that it is indented by the wedge-shaped end when the sections are screwed together.

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between the two bushes, with the result that there is practically no risk of it dropping out of the horizontal position.

- 5 The features illustrated by Figures 3 and 4 may be combined, in that bushes having internal annular projections 12 may also have wedge-shaped ends 16.

WHAT WE CLAIM IS:—

- 10 1. A post comprising tubular sections of an aluminium alloy or other relatively soft material and an arm formed by a bar perpendicular to the post and having a neck and head, the neck being received by a slot extending axially from one end of one section and the head being accommodated in the hollow centre of this section, in which this end is externally threaded and is engaged by an internally threaded member of steel or other relatively hard material inserted in or secured to an adjacent second section of the post, the bar being trapped and held between the base of the slot and either the second section or the internally threaded member when the slotted section and this internally threaded member are screwed together to the maximum extent permitted by the arm.

- 25 2. A post according to claim 1 in which the internally threaded member is a bush pushed into the end of the second section.

- 30 3. A post according to claim 2 in which the bush is of the same axial length as the externally threaded part of the slotted section and its outer end is flush with that of the second section.

- 35 4. A post according to claim 1 or 2 in which the slotted section has four or more slots and the internally threaded member has

an internal annular projection at its inner end with an annular groove which receives and confines the end of the slotted section when this section and the internally threaded member are screwed together to the maximum extent permitted by the arm.

5. A post according to claim 4 in which the end of the slotted section is internally chamfered and the groove has a complementary sloping wall engaged by the chamfered end.

6. A post according to claim 4 or 5 in which the end of the slotted section stops short of the base of the groove when this section and the internally threaded member are screwed together to the maximum extent permitted by the arm.

7. A post according to any of claims 1, 2, 4 and 5 in which the slotted section is formed with an annularly grooved shoulder at the inner end of the thread on it, the bar is formed with a notch, and the outer end of the internally threaded member enters the groove and notch.

8. A post according to claim 7 in which the outer end of the internally threaded member is wedge-shaped in cross-section and the bar is of aluminium alloy or relatively soft material and the notch in it is V-shaped but slightly smaller than the wedge-shaped end, so that it is indented by the wedge-shaped end when the sections are screwed together.

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