

Frame for a Switchgear Cabinet

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The invention relates to a frame for a switchgear cabinet made up of frame members and corner joints, the corner joints being introduced with plug-in rods into sockets and being connected to the frame members.

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In known frames, hollow sections are frequently used as frame members, which form a closed socket for the plug-in rods of the corner joints. Thus the cross-section of the sockets and of the plug-in rods can be square,

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rectangular or triangular. The closed hollow sections are however expensive to produce.

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Frames are also known which are made up of open frame members. The corner joints of the frame however in this case require specially-designed connector parts, a plurality of special parts being usually necessary in order to connect the three frame members abutting in the region of a corner. The advantage of the simpler manufacture of the frame members is achieved at the expense of the increased outlay on parts and assembly for building the frame.

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The object of the invention is to provide a frame of the type already mentioned, in which corner joints with sockets are also used with frame members designed as hollow sections, and thus the outlay on parts and assembly can be kept low.

This object is achieved according to the invention in that the frame members are designed as open hollow sections that are bent several times, are symmetrical to their diagonals and open in the area of their inner sides, in that the frame members, continuing from their section sides forming the outer sides standing perpendicular to one another, are bent inwards several times to form sockets for the plug-in rods of a corner joint, and in that the sockets, thus bent, contact the inserted plug-in rods at least at two points distributed over more than 180° .

The open hollow section is for example provided by means of bending alone with two sockets, into which two plug-in rods of the corner joint may be inserted. The hollow section is symmetrical to its diagonal, so that it can be used in any position for any frame member of the frame. The only essential point is that the bent-over sockets form at least three contact points for the plug-in rods, which extend over more than 180° of the periphery of the

plug-in rods. This ensures that the plug-in rod is held laterally immovably in the socket.

5 If according to one development it is provided that the plug-in rods are round in cross-section, that the sockets are formed from three portions bent inwards at right angles, continuing into an inwardly-bent end portion, that the portions standing parallel to one another of the
10 sockets are adapted to the diameter of the round plug-in rods, and that the end sections form a further contact point for the plug-in rods, then corner joints with plug-in rods may be used which are cut to length from a commercially-available bar material, and are introduced
15 into receiving means in the corner joint base portion and are secured therein.

If the design is such that the plug-in rods have a square cross-section, and that the sockets comprise four
20 portions inwardly bent at right angles, whereby the end sections do not close the sockets, then the same advantages can be achieved.

An opportunity of attachment over the entire length of
25 the frame members is provided in that the inner portions of the sockets, extending parallel to the section sides

forming the outer sides standing perpendicularly to one another, are provided with rows of attachment apertures.

If it is provided that the sections forming the outer
5 sides standing perpendicularly to one another have, in
the region of the sockets, inwardly-offset portions of a
receiving means for a seal member, and that the
inwardly-offset portions form part of the socket, then
seal members may be attached to the frame member without
10 thereby impairing the formation of the sockets.

According to one development for securing the plug-in
rods in the sockets, it is provided that the plug-in rods
are held in the sockets of the frame members by means of
15 a snug or press fit.

The hold can be further improved in that the plug-in rods
are in addition screwed to the frame members, bores in
the frame members being usable for this purpose.

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The invention will be explained in more detail with
reference to an embodiment given by way of example and
shown in exploded view in the drawing.

25 As the drawing shows, only one connection is shown
between a corner joint 30 and a frame member 10. After
provision of the rows of bores 23 and 24 in a sheet metal

strip of appropriate width, the frame member 10 is produced, for example by bending. The section sides 11 and 12 form the outer sides of the frame member 10 standing perpendicularly to one another. The outer edge is bevelled and the section sides 11 and 12 are bent inwards, in order to form receiving grooves for seal members. The portions 13 and 13 of these receiving grooves form portions of the sockets 17 and 22. The sockets 17 and 22 are completed by the respectively inwardly bent portions 14, 15, 16 or 19, 20 and 21. The spacing between the portions 13 and 15 or 18 and 20 is adapted to the diameter of the round plug-in rods 32 to 37 at the base portion 31 of the corner joint 30. The end portions 16 and 21 are bent inwards so far that they form a further, fourth contact point for the round plug-in rods 32 to 37. Each of the two plug-in rods 32 and 33 therefore abuts on all four portions 13 to 16 or 18 to 21 of the sockets 17 or 22. These four contact points are distributed over more than 180° of the periphery of the plug-in rods 32 or 33, so that these latter are positively secured laterally.

If the end portions 16 and 21 are bent in at right angles, then also square or rectangular plug-in rods can be secured in the sockets.

The portions 15 and 20 of the sockets 17 and 22 extending parallel to the section sides 11 and 12 are provided with rows of bores 23 and 24, in order to provide opportunities of attachment over the entire length of the
5 frame member 10.

The frame member 10 is open in the region of the inner side and designed to be symmetrical to its diagonal, so that it can be used at any point of the frame member. In
10 this respect only the alignment of the section sides 11 and 12 need be considered.

The corner joint 30 comprises a base portion 31, which respectively carries on three sides two plug-in rods 32, 15 33 or 34, 35 or 36, 37, in order to connect together the three frame members 10 abutting perpendicularly on one another in the corner area of a frame. The arrangement of the plug-in rods 32 to 37 is in this respect such that connection of the frame member 10 is only possible in the
20 correct alignment with the section sides 11 and 12 aligned outwards. The pairs of plug-in rods are separated by a spacing adapted to the spacing between the sockets 17 and 22 in the frame member 10.

25 The cross-section of the plug-in rods can be optional as long as care is taken that the bent-over portions of the frame member form a socket which has at least three

contact points for the plug-in rod, and which are distributed over the periphery of the socket by over more than 180°.

5 The plug-in rods 32 to 37 can be cut to length also from commercially-available bar members and may be inserted in receiving means in the base portion 31 of the corner joint. Thus the length of the plug-in rods 32 to 37 can be variable, and adapted to the desired torsion-resisting
10 rigidity of the frame.

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Claims

1. Frame for a switchgear cabinet made up of frame members and corner joints, the corner joints being
5 introduced with plug-in rods into sockets and being connected to the frame members, characterised in that the frame members (10) are designed as open hollow sections that are bent several times, are symmetrical to
10 their diagonals and open in the area of their inner sides, in that the frame members (10), continuing from their section sides (11,12), form by means of portions (13,14, 15,16, or 18,19, 20,21), sockets (17,22) for two plug-in
15 rods (32,33; 34,35; 36,37) in each case of a corner joint (30), and in that the sockets (17,22), thus bent, contact the inserted plug-in rods (32,33; 34,35; 36,37) at least at two points distributed over more than 180°.

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2. Frame according to claim 1, characterised in that the plug-in rods (32,33; 34,35; 36,37) are round in cross-section,
25 in that the sockets (17,22) are formed from three portions (13,14,15; 18,19,20) bent inwards at right

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angles, to which there connects an inwardly-bent end portion (16,21),

in that the portions (13,15; 16,20) standing parallel to one another of the sockets (17,22) are adapted to the diameter of the round plug-in rods (32 to 37), and in that the end portions (16,21) form a further contact point for the plug-in rods (32 to 37).

3. Frame according to claim 1,

10 characterised in that the plug-in rods (32 to 37) have a square cross-section, and that the sockets comprise four portions inwardly bent at right angles, whereby the end sections do not close the sockets, and in that the sockets (17,22) comprise four portions (13 to 15; 16 to 21) inwardly bent at right angles, whereby the end sections (16,21) do not close the sockets (17,22).

4. Frame according to one of claims 1 to 3,

20 characterised in that the inner portions (15,20) of the sockets (17,22), extending parallel to the section sides (11,12) forming the outer sides standing perpendicularly to one another, are provided with rows of attachment apertures (23,24).

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5. Frame according to one of claims 1 to 4, characterised in that



the sections (11,12) forming the outer sides standing perpendicularly to one another have, in the region of the sockets (17,22), inwardly-offset portions (13,18) of a receiving means for a seal member, and

5 in that the inwardly-offset portions (13,18) form part of the sockets (17,22).

6. Frame according to one of claims 1 to 5, characterised in that

10 the plug-in rods (32 to 37) are held in the sockets (17,22) of the frame members (10) by means of a snug or press fit.

7. Frame according to claim 6,

15 characterised in that

the plug-in rods (32 to 37) are in addition screwed to the frame members (10).