

The present invention relates to a hinge assembly, equipped with a pin hinge, allowing the pivoting about an axis, generally a vertical axis, of an opening part with respect to a stationary part or to another opening part and it applies more particularly to such a hinge designed to be fitted to hollow or tubular sections forming part of a metal framework.

5 The mechanism of a pin hinge including two complementary cylindrical bodies respectively fastened to the opening part and to the stationary part of a structure to be hinged together, for example of the door, window or some similar sort, is known, especially from CH-A-436,020, which corresponds to the prior art to which the preamble of the appended Claim 1 refers, and from 10 FR-A-2,397,508, these bodies being located one above the other with a lateral offset so that in the same vertical extension they exhibit two cylindrical elements taking a pin or hinge pin about which the opening part pivots with respect to the stationary part. Each body moreover 15 includes, secured to the cylindrical element, a fastening tab which is usually pierced with holes for the fitting of screws which press and immobilize the body with respect to the surface of the corresponding opening part or stationary part. 20

25 This conventional solution, which is extremely widespread in the field in question, is not, however, completely appropriate when the opening part and the stationary part consist of tubular metal sections, requiring the latter to be drilled beforehand, for 30 fitting fastening screws, these generally furthermore having to interact with locking nuts located inside the hollow section behind the surface against which the tab of the bodies of the hinge bears, which may in certain cases present difficulties in production and in assembly. 35 Moreover, with this system, the heads of the screws are directly accessible on the visible part of the tabs of the bodies, which makes the structure vulnerable and does not preserve its tamperproof nature.

The present invention is concerned with a pin

hinge which avoids this drawback, by preventing the possibility of it being dismantled in an unauthorized manner, particularly when the opening part is closed on the stationary part, once it has been installed and is
5 connecting the opening part and the stationary part, the fasteners used being accessible only from inside the gap or clearance between the opening part and the stationary part.

Its objective is therefore to render the hinge
10 tamperproof, owing to the fact that it has no weak spot on the outside of the structure formed by the opening part and the stationary part.

Another objective is to produce an assembly which is simple, robust, easy to fit and has a limited cost
15 price, furthermore making it possible to refine the contour of its various parts which can thus better be incorporated into an elegant and functional structure.

To this end, the hinge assembly in question for a structure made of tubular metal sections, including a
20 hinge formed of two complementary bodies, respectively fastened to an opening part (3) and to a stationary part or another opening part which are to be hinged together, these bodies each including a cylindrical element taking a hinge pin about which the opening part pivots with
25 respect to the stationary part or to the other opening part, each body further including a tab for fastening against the surface of the corresponding opening part or stationary part, each fastening tab being applied against the surface of a tubular section of the opening part or
30 of the stationary part and including at least one tapped blind housing, the latter taking the threaded body of a stud passing through a passage provided in this surface and engaging in a receiving bore formed in an insert piece mounted with sliding inside the tubular section, is
35 characterized in that each of the fastening tabs includes two superposed tapped blind housings respectively taking one stud, the two studs each exhibiting at least one inclined face intended to interact with the tip of a binding screw extending perpendicularly to the direction

of these studs in their receiving bores so as to lock these studs relative to the insert piece and to immobilize the body against the section.

5 Preferably, each tubular section of the opening part or of the stationary part includes an internal region which of a cross-section which is compatible with the insert piece, of which the face which points towards the gap or clearance between the opening part and the stationary part includes a hole for the passage of the
10 locking binding screw.

 According to a particular characteristic of the hinge in question, the insert piece includes longitudinal extensions which are bent over so as to form a bearing zone interacting with slideways provided in the section
15 taking this piece.

 Advantageously, and in a preferred embodiment of the invention, one of the cylindrical elements of one body takes an internal sleeve in which the hinge pin swivels, the cylindrical element of the other body also
20 taking a sleeve but one located in a housing which is slightly off-centred relative to the pin so as to allow the alignment of the two sleeves and the verticality of the passage taking a rod for connecting the two bodies together, to be adjusted.

25 According to another particular characteristic, at least one of the sleeves is associated with a set screw fitted into a tapped hole of the cylindrical element taking this sleeve and allowing it to be locked in position about the pin.

30 Other characteristics of an improved hinge, designed in accordance with the invention, will further emerge from the description which follows of one embodiment given by way of non-limiting indication, with reference to the appended drawings in which:

35 - Figures 1 and 2 are respectively views in transverse section and in elevation with partial cut-away of a hinge according to the invention.

 - Figure 3 is an exploded perspective view of the main elements forming the hinge of Figures 1 and 2.

As represented in these figures, the hinge in question, denoted overall by the reference 1, is designed to hinge together a stationary part 2 and an opening part 3 of a door or the like, each part being made up by means of a hollow metal section of a type which is in itself known and the embodiment detail of which is not directly relevant to the invention. The stationary part 2 is immobilized by any conventional means (not represented) with respect to a wall 4 or a similar support structure, whereas the opening part 3 in the example represented supports a glazed panel 5, fitted into the corresponding section with interposition of a seal 6 and of a positioning block 7.

In accordance with an arrangement which is also well known in any conventional embodiment of a hinge of this sort, the latter includes two complementary bodies respectively 8 and 9 which are intended to be fastened, one to the opening part and the other to the stationary part, the two bodies being hinged together and in the extension of one another about a pin or hinge pin 10.

The body 8 is composed of a cylindrical element 11 inside which the hinge pin 10 engages, this element being extended by a bearing tab 12 designed to press against a lateral face of the metal section constituting the stationary part 2, immobilizing the body against this face in the manner described later. In the same way, the body 9 includes a cylindrical element 13 located in the extension of the element 11 and also taking the pin 10, this element 13 likewise comprising a tab 14 for bearing and immobilization against the section of the opening part 3.

The bodies 8 and 9 are preferably identical, especially as regards the means employed for immobilizing them with respect to the sections against which their bearing tabs 12 and 14 are pressed. Thus, and in the embodiment represented, each tab includes, facing the corresponding section, an internally tapped blind housing 15, this housing thus being invisible from the outside of the hinge when the latter is fastened to the

opening part and the stationary part.

In accordance with the invention, immobilization of the two bodies 8 and 9 of the hinge is achieved by locating inside the tubular sections of the stationary part and of the opening part respectively, an insert piece 16 designed to slide freely in the internal region 17 of these sections. Advantageously, each piece 16 includes extensions or lateral edges 16a, suitably bent over towards the outside so as to allow the piece to be guided inside the section, especially along ribs 17a provided in the region 17 and forming longitudinal slideways.

Each piece 16 includes two superposed transverse bores respectively 18 and 19, each one intended to receive a stud 20 or 21 as shown more particularly in the exploded perspective view of Figure 3. Each of these studs includes a threaded body 22 and an inclined face 23 ending in an extension 24 preferably equipped with a slot 24a, making it possible to rotate the stud in its receiving bore so that its threaded body 22 interacts with the tapped hole 15 formed in the bearing and immobilization tabs 12 and 14 of the bodies 8 and 9, thus securing them to the studs and consequently to the piece 16 which supports them.

The studs 20 and 21 are then themselves locked in their receiving bores 18 and 19 by virtue of a transverse binding screw 25, fitted into a passage hole 25a provided in the face of each section pointing towards the gap or clearance 39 provided between the opening part and the stationary part, this screw 25 comprising an end with a tip 26 and a threaded middle portion 27 designed to screw into a tapped passage 28 passing through the piece 16, communicating with the bores 18 and 19 of this piece. Under these conditions, the screw 25 engages its tip 26 in contact with the inclined faces 23 of the studs 20 and 21, locking them progressively and immobilizing them with respect to the piece 16.

The equipping of the hinge is completed by forming the hinge pin 10 so that it can tolerate a slight

transverse positional adjustment of the two bodies 8 and 9 when these are being fitted and immobilized against the opening part and the stationary part. To this end, the hinge includes a cylindrical sleeve 29 designed to engage
5 in the housing 30 of the same shape provided in the element 11 of the piece 8, this sleeve comprising a stop collar 31 at one of its ends. The sleeve 29 has an axis which is slightly off-centred with respect to that of the housing 30 and is designed to take a cylindrical connecting rod 32. The cylindrical element 13 of the piece 8
10 in turn interacts with a second sleeve 33 fitted into a housing 34 of the cylindrical element, this second sleeve itself having a housing 35 taking the end of the rod 32 although the axis of which is exactly aligned with that
15 of the housing 34. The sleeve 33 externally includes a rib 36 designed to interact with a slot 37 provided in this housing 34.

On assembly, the second sleeve 33 is immobilized in the housing 34 via its rib 36. The axis of the
20 connecting rod 32 under these conditions is fixed in terms of position. In contrast, owing to its slight eccentricity, a rotation of the sleeve 29 in its housing 30 results in an axial offsetting of the piece 8, allowing suitable final adjustment of the two parts of
25 the hinge. Once this alignment has been achieved, the sleeve 29 is locked in position by a set screw 38 screwed into a tapped hole in the cylindrical element 11.

Thus a hinge is produced which is particularly well suited to being fitted to hollow sections of a metal
30 framework in order to hinge together an opening part and a stationary part. The member for locking the two parts of the hinge in position, consisting of a transverse binding screw, is placed in the clearance of the door or the like, that is to say in a location which is inaccessible
35 when the opening part is pressed against the stationary part. The hinge therefore exhibits no weak spot on the outside of the tubular structure of the door. Furthermore, the absence of external connecting means makes it possible to refine its contour and better

incorporate it into an appropriate functional assembly.



CLAIMS

1. Hinge assembly for a structure made of tubular metal sections, including a hinge formed of two complementary bodies (8, 9), respectively fastened to an opening part (3) and to a stationary part (2) or another opening part which are to be hinged together, these bodies (8, 9) each including a cylindrical element (11, 13) taking a hinge pin (10) about which the opening part pivots with respect to the stationary part or to the other opening part, each body (8, 9) further including a tab (12, 14) for fastening against the surface of the corresponding opening part or stationary part, each fastening tab (12, 14) being applied against the surface of a tubular section of the opening part or of the stationary part and including at least one tapped blind housing (15), the latter taking the threaded body (22) of a stud (20, 21) passing through a passage provided in this surface and engaging in a receiving bore (18, 19) formed in an insert piece (16) mounted with sliding inside the tubular section, characterized in that each of the fastening tabs (12, 14) includes two superposed tapped blind housings (18, 19) respectively taking one stud (20, 21), the two studs (20, 21) each exhibiting at least one inclined face (23) intended to interact with the tip (26) of a binding screw (25) extending perpendicularly to the direction of these studs (20, 21) in their receiving bores (18, 19) so as to lock these studs (20, 21) relative to the insert piece (16) and to immobilize the body against the section.
2. Assembly according to Claim 1, characterized in that each tubular section of the opening part or of the stationary part includes an internal region (17) which has the same cross-section as the insert piece, of which the face which points towards the gap or clearance (39) between the opening part and the stationary part includes a hole (25a) for the passage of the locking binding screw.
3. Assembly according to Claim 2, characterized in



that the insert piece includes longitudinal extensions (16a) which are bent over so as to form a bearing zone interacting with slideways (17a) provided in the section taking this piece.

- 5 4. Assembly according to any one of Claims 1 to 3, characterized in that one of the cylindrical elements (13) of one body (9) takes an internal sleeve (33) in which the hinge pin (10) swivels, the
- 10 including a sleeve but one located in a housing (30) which is slightly off-centred so as to allow the alignment of the two sleeves and the verticality of the passage taking a rod (32) for joining the two bodies together, to be adjusted.
- 15 5. Assembly according to Claim 4, characterized in that at least one of the sleeves (29) is associated with a set screw (38) fitted into a tapped hole of the cylindrical element (11) taking this sleeve and allowing it to be locked in position about the pin.