

TITLE OF INVENTION: HEIGHT-ADJUSTABLE BAR CHAIR

CROSS REFERENCE TO RELATED APPLICATION

The present application claims priority to Korean Patent Application No. 10-2024-0133975, filed October 2, 2024, the entire contents of which are incorporated herein for all purposes by this reference.

BACKGROUND OF THE INVENTION

Field of the Invention

The present disclosure relates to a height-adjustable bar chair and, more particularly, to a height-adjustable bar chair provided with a height-adjusting bracket that allows for easy multi-stage height adjustment according to the conditions of the site floor, thereby enabling the multi-stage adjustment of the height of upper reinforcing bars arranged on the foundation.

Description of the Related Art

In general, foundation work for constructing buildings involves the installation of lower and upper reinforcing bars within the foundation. Recently, as high-rise buildings have become more common, the depth of foundations has increased,

resulting in the upper reinforcement bars being installed at a higher position above a blinding concrete layer cast on the ground surface of the foundation. Consequently, the amount of reinforcing bars required for the foundation work has also increased. Therefore, there has been a need for the installation of a reinforcing bar support structure that can prevent the sagging of the upper reinforcing bars, allow for easy adjustment of the installation height of the upper reinforcing bars, and securely support the upper reinforcing bars.

Conventionally, in cases where the foundation thickness is within 2.5 meters, a hat-shaped bar chair, commonly referred to as a "Uma" and made by bending reinforcing bars into a C-shape, has been widely used to support upper reinforcing bars arranged within the foundation. However, reinforcing bar support structures for upper reinforcing bars do not allow for height adjustment, making it difficult to ensure structural stability. Furthermore, due to their vulnerability to buckling under upper loads, the reinforcing bar support structures are required to be installed at narrow intervals to prevent buckling, which leads to poor economic efficiency and an extended construction period.

To address these problems, the present applicant previously filed and obtained registration for Korean Patent No. 10-2218166, which relates to a reinforcing bar support

structure. In the prior invention, a vertical structural part composed of a vertical member and multiple horizontal members is provided, and a reinforcing bar height adjustment part is configured such that a reinforcing bar height adjustment rod is directly welded to the upper end part of the vertical member to support the upper reinforcing bars while adjusting the height of a connecting support member. However, the reinforcing bar height adjustment rod is threaded and height adjustment nut must be inserted therein, and the height must be adjusted by turning the nut at the installation site, resulting in increased work time. Furthermore, when the threads are damaged during manufacturing or installation, the reinforcing bar support structure cannot be used. Additionally, the present applicant filed Korean Patent No. 10-2720013 for a reinforcing bar support structure in which height is adjusted by overlapping individual pipes on diagonal corner angles. However, this method of adjusting height by overlapping the pipes required additional devices to secure horizontal rebar support bar, causing difficulties during installation.

Documents of Related Art

(Patent Document 1) Korean Patent No. 10-2218166
(registered on February 16, 2021)

(Patent Document 2) Korean Patent No. 10-2720013
(registered on October 16, 2024)

SUMMARY OF THE INVENTION

Accordingly, the present disclosure has been made keeping in mind the above problems occurring in the related art, and the present disclosure is intended to propose a height-adjustable bar chair provided with a height-adjusting bracket, which allows for an easy multi-stage height adjustment according to the conditions of the site floor to overcome height differences that may occur in mat foundations, thereby shortening a construction period, and improving cost efficiency by simplifying manufacturing.

In addition, the present disclosure is intended to propose a height-adjustable bar chair in which one side of a fitting support lower plate part of a hat-shaped yoke member is fitted and supported in a fitting slot which is a slit groove formed for fitting on an upper portion of each of corner angles located at respective corners of a quadrilateral as a set of four corner angles, and thus the installed hat-shaped yoke member is not simply placed on the height-adjustable bar chair, but is supported on the height-adjustable bar chair such that opposite end portions of the hat-shaped yoke member function as fixed ends, so that bending moment acting on the hat-shaped yoke member is significantly reduced, thereby reducing the size of the member and enabling rapid construction.

In order to achieve the objectives of the present disclosure, there is provided a height-adjustable bar chair including: an upper reinforcing bar support structure having a set of four corner angles arranged vertically on corners of a quadrilateral, a horizontal connecting member composed of a bearing horizontal connecting member connecting the corner angles to each other and located at an uppermost part of the set of four corner angles and supporting horizontal connecting members located under the bearing horizontal connecting member, and protruding corner angle parts protruding upward from the bearing horizontal connecting member; a yoke member installed on a height-adjusting bracket mounted on each of two or more consecutive upper reinforcing bar support structures included in the upper reinforcing bar support structure, with an upper reinforcing bar placed on the yoke member; and the height-adjusting bracket having a horizontal length to be fitted and accommodated between the protruding corner angle parts having a first-side inner width at one side for height adjustment of the yoke member, and including: a pair of outer height-adjusting plates, each having a predetermined height, installed to be adjacent to the protruding corner angle parts on opposite sides facing each other, and a pair of inner height-adjusting plates located respectively at predetermined distances inward between the pair of outer height-adjusting plates and installed vertically starting from predetermined height positions of the

outer height-adjusting plates by being welded thereto, so that the height-adjusting bracket has an overall “ $\overline{\text{H}}$ ” shape when viewed from above, and has a “ $\perp$ ” shape or a “ T ” shape depending on an installation stage for height adjustment when viewed from a side or front.

In addition, the bearing horizontal connecting member and the supporting horizontal connecting members, which constitute the horizontal connecting member, may be composed of reinforcing bars, steel pieces, or angles, and are installed on the corner angles by being welded thereto.

In addition, the bearing horizontal connecting member may have L-shaped angles welded and installed on the corner angles, with the horizontal surfaces of the L-shaped angles facing each other located at upper portions of the L-shaped angles, and vertical surfaces thereof connected to the horizontal surfaces to face downward, and reinforcing bars on opposite sides, on which the L-shaped angles are not installed, welded and installed on the corner angles, respectively.

In addition, diagonal reinforcing members may be welded and installed from opposite side portions of the bearing horizontal connecting member, which converge toward the corner angles, to portions of the corner angles under the bearing horizontal connecting member, or a horizontal bracing member may be diagonally welded to the corner angles on a horizontal plane formed by each of the supporting horizontal connecting

members, or one or more vertical bracing members may be diagonally welded to and installed on the corner angles between the bearing horizontal connecting member and one of the supporting horizontal connecting members, or between one of the supporting horizontal connecting members and another of the supporting horizontal connecting members.

In addition, a height of each of the inner height-adjusting plates may be equal to a height of each of the outer height-adjusting plates.

In addition, cases in which the height-adjusting bracket is installed to further raise an installation height of the yoke member from a first-stage height in which the yoke member is installed on the bearing horizontal connecting member to support the upper reinforcing bar thereon may include: a case in which the height-adjusting bracket has a “ π ” shape when viewed from a side, wherein the outer height-adjusting plates are mounted on the bearing horizontal connecting member and the yoke member is installed on upper ends of the inner height-adjusting plates to support the upper reinforcing bar thereon at a second-stage height; a case in which the height-adjusting bracket has a “ $\perp$ ” shape when viewed from a front, wherein the outer height-adjusting plates are mounted on the bearing horizontal connecting member and the yoke member is installed on lower ends of the outer height-adjusting plates to support the upper reinforcing bar thereon at a third-stage height; and

a case in which the height-adjusting bracket has a “⊥” shape when viewed from the side, wherein the outer height-adjusting plates are mounted on the bearing horizontal connecting member and the yoke member is installed on lower ends of the inner height-adjusting plates to support the upper reinforcing bar thereon at a fourth-stage height, so that the height adjustment of the yoke member is performed.

In addition, the yoke member may be formed by using one or more reinforcing bars, and the yoke member may be formed by using a reinforcing bar, omega-shaped steel, C-shaped steel, or H-shaped steel.

In addition, the height-adjustable bar chair may further include: fitting slots formed horizontally in each angle side in a direction in which the protruding corner angle part and the protruding corner angle part face each other; and a hat-shaped yoke member including: a fitting support lower plate part having a first side fitting support lower plate part, which is bent in a form of a lower brim of a hat, fitted into each of the fitting slots facing each other, and a second side fitting support lower plate part supported by the height-adjusting bracket; a side plate part constituting a side portion thereof by bending upward from each of opposite ends of the fitting support lower plate part; and a reinforcing bar support upper plate part bent horizontally from the side plate part and connected thereto so as to support the upper

reinforcing bar.

In addition, the side plate part may be formed to be inclined inward with respect to a center of the hat-shaped yoke member, and air holes may be formed in the upper end portions of the side plate part or the reinforcing bar support upper plate part to discharge air without the formation of an air pocket when concrete is poured.

In addition, the height-adjusting bracket may be mounted on the upper reinforcing bar support structure and a hat-shaped yoke member may be placed on upper ends of the inner height-adjusting plates, so that a first side fitting support lower plate part may be fitted and installed into a second fitting slot located at a second height position, the height-adjusting bracket, which is fitted into the second fitting slot, may be rotated by 90 degrees, turned upside down by 180 degrees, and then mounted on the upper reinforcing bar support structure, and the hat-shaped yoke member may be placed on lower ends of the outer height-adjusting plates, so that the first side fitting support lower plate part may be fitted and installed into a third fitting slot located at a third height position, and the height-adjusting bracket, which is fitted into the second fitting slot, may be turned upside down by 180 degrees and mounted on the upper reinforcing bar support structure, and the hat-shaped yoke member may be placed on lower ends of the inner height-adjusting plates, so that the first side fitting

support lower plate part may be fitted and installed into a fourth fitting slot located at a fourth height position.

In addition, depending on a state in which the height-adjusting bracket is placed on the upper reinforcing bar support structure, a first side fitting support lower plate part of a hat-shaped yoke member may be fitted and installed into one of multiple fitting slots formed in each of the corner angles of the upper reinforcing bar support structure.

In addition, when two hat-shaped yoke members are installed in a parallel and overlapping arrangement on the upper reinforcing bar support structure, a first side fitting support lower plate part of one hat-shaped yoke member may be fitted and installed into any one of multiple fitting slots formed in each of first-side corner angles of the upper reinforcing bar support structure, and a first side fitting support lower plate part of a remaining one hat-shaped yoke member may be fitted and installed into any one of multiple fitting slots formed in each of second-side corner angles of the upper reinforcing bar support structure.

In addition, the corner angles of the upper reinforcing bar support structure may protrude downward from the horizontal connecting member located at a lowermost end and be supported on the blinding concrete.

In addition, lower reinforcing bar rests facing each other in parallel may be welded and fixed on lower ends of the corner

angles so that the upper reinforcing bar support structure is placed on lower reinforcing bars.

According to the present disclosure, the height-adjustable bar chair provided with the height-adjusting bracket, which is a single height-adjusting member, is applied to enable multi-stage height adjustment without installing a separate height-adjusting device, thereby easily overcoming height differences that may occur in a mat foundation.

In addition, according to the present disclosure, manufacturing is simplified to improve economic efficiency and facilitate work, thereby shortening the construction period.

According to the present disclosure, one side of the fitting support lower plate part of the hat-shaped yoke member is fitted and supported in a fitting slot which is a slit groove formed for fitting on an upper portion of each of the corner angles located at respective corners of a quadrilateral as a set of four corner angles, and thus the installed hat-shaped yoke member is not simply placed on the height-adjustable bar chair, but is supported on the height-adjustable bar chair such that opposite end portions of the hat-shaped yoke member function as fixed ends, so that bending moment acting on the hat-shaped yoke member is significantly reduced, thereby reducing the size of the member.

In addition, according to the present disclosure, the hat-shaped yoke member, which is a steel plate bent into a hat

shape, is applied, thereby improving bending performance.

In addition, the hat-shaped yoke member of the present disclosure maintains stability without any risk of overturning even without being secured by a separate device.

In addition, the hat-shaped yoke member of the present disclosure has the side plate part formed to be inclined inward as the side plate part extends upward, thereby preventing lateral deformation when the hat-shaped yoke member is subjected to a static load unlike a case where the side plate part is formed vertically.

In addition, in the hat-shaped yoke member of the present disclosure, the side plate part or the reinforcing bar support upper plate part is provided with multiple holes so as to discharge air without the formation of an air pocket when concrete is poured, thereby allowing the concrete to be densely and completely filled.

BRIEF DESCRIPTION OF THE DRAWINGS

The above and other objectives, features, and other advantages of the present disclosure will be more clearly understood from the following detailed description when taken in conjunction with the accompanying drawings, in which:

FIG. 1 is a partial perspective view showing a state in which yoke members are installed on an upper reinforcing bar

support structure;

FIG. 2A is a partial perspective view showing a state in which yoke members are installed on the height-adjusting bracket mounted on the upper reinforcing bar support structure for a second-stage height adjustment in the present disclosure, and FIG. 2B is a perspective view of the height-adjusting bracket as applied in the state shown in FIG. 2A;

FIG. 3A is a partial perspective view showing a state in which yoke members are installed on the height-adjusting bracket mounted on the upper reinforcing bar support structure for a third-stage height adjustment in the present disclosure, and FIG. 3B is a perspective view of the height-adjusting bracket as applied in the state shown in FIG. 3A.

FIG. 4A is a partial perspective view showing a state in which yoke members are installed on the height-adjusting bracket mounted on the upper reinforcing bar support structure for a fourth-stage height adjustment in the present disclosure, and

FIG. 4B is a perspective view of the height-adjusting bracket as applied in the state shown in FIG. 4A;

FIGS. 5A and 5B are perspective views showing states in which bearing horizontal connecting members of the upper reinforcing bar support structure in the present disclosure are formed as angles and reinforcing bars, and reinforcing bars, respectively, and FIG. 5C is a perspective view showing a state

in which diagonal reinforcing members are installed on the upper reinforcing bar support structure in the present disclosure;

FIGS. 6A to 6D are partial perspective views showing states in which a reinforcing bar, omega-shaped steel, C-shaped steel, and H-shaped steel, respectively, are installed on the height-adjusting bracket mounted on the upper reinforcing bar support structure for height adjustment in the present disclosure;

FIG. 7A is a partial perspective view showing a state in which a hat-shaped yoke member is installed on the upper reinforcing bar support structure in the present disclosure, FIG. 7B is an enlarged partial perspective view of FIG. 7A, and FIG. 7C is a partial elevation view showing a state in which an upper reinforcing bar is arranged in the state of FIG. 7B;

FIGS. 8A and 8B are perspective views showing a side plate part and a reinforcing bar support upper plate part of the hat-shaped yoke member respectively having air holes formed therein in the present disclosure;

FIGS. 9A, 9B, and 9C are partial perspective views respectively showing a state in which the hat-shaped yoke member is fitted into and installed in second to fourth fitting slots on the height-adjusting bracket mounted on the upper reinforcing bar support structure for second- to fourth-stage height adjustments in the present disclosure, and FIG. 9D is a

partial perspective view showing a state in which two hat-shaped yoke members are installed in a parallel and overlapping arrangement on a single upper reinforcing bar support structure in the present disclosure; and

FIG. 10A is a partial perspective view showing a state in which lower reinforcing bar rests are installed on the lower ends of corner angles of the upper reinforcing bar support structure in the present disclosure, FIG. 10B is a partial elevation view showing the upper reinforcing bar support structure of FIG. 10A installed on blinding concrete, and FIG. 10C is a partial elevation view showing a state in which the lower ends of the corner angles of the upper reinforcing bar support structure in the present disclosure are installed to be in contact with blinding concrete.

DETAILED DESCRIPTION OF THE INVENTION

Hereinafter, an embodiment of the present disclosure will be described in detail with reference to the accompanying drawings.

FIG. 1 is a partial perspective view showing a state in which yoke members are installed on an upper reinforcing bar support structure. According to the present disclosure, in an upper reinforcing bar support structure 10 including a set of four corner angles 11 arranged vertically on the corners of a

quadrilateral, a horizontal connecting member 12 composed of a bearing horizontal connecting member 121 connecting the corner angles 11 to each other and located at the uppermost part of the set of four corner angles 11 and multiple supporting horizontal connecting members 122 located under the bearing horizontal connecting member 121, and protruding corner angle parts 111 protruding upward from the bearing horizontal connecting member 121, yoke members 20 are placed and installed on the bearing horizontal connecting member 121 to have a first-stage height, wherein the yoke members 20 are mounted on a height-adjusting bracket 30 mounted on two or more consecutive upper reinforcing bar support structures 10, and an upper reinforcing bar 1 is placed on the upper portion of each of the yoke members 20. Accordingly, the height-adjustable bar chair of the present disclosure allows for multi-stage height adjustment according to the conditions of the site floor so as to easily overcome height differences that may occur in mat foundations, thereby shortening the construction period, and improving economic efficiency through simplified manufacturing.

FIG. 2A is a partial perspective view showing a state in which yoke members are installed on the height-adjusting bracket mounted on the upper reinforcing bar support structure for a second-stage height adjustment in the present disclosure, and FIG. 2B is a perspective view of the height-adjusting bracket as applied in the state shown in FIG. 2A.

In the present disclosure, the yoke members 20 are installed on the bearing horizontal connecting member 121 to support the upper reinforcing bar 1 on each of the yoke members 20 at the first-stage height. To increase the installation height of the yoke member 20 from the first-stage height, the height-adjusting bracket 30 is mounted on the upper reinforcing bar support structure 10. To adjust the installation height of the yoke member 20, on which the upper reinforcing bar 1 is placed, in multiple stages, the height-adjusting bracket 30 is mounted on the upper reinforcing bar support structure 10. Accordingly, the height of the yoke member 20 may be adjusted from the second to the fourth stage depending on a manner in which the height-adjusting bracket 30 is mounted on the upper reinforcing bar support structure 10. FIGS. 2A and 2B illustrate the case where the installation height of the yoke member 20 is adjusted to the second stage.

A reinforcing bar with a larger diameter than a reinforcing bar typically arranged in a slab or a column is generally used as the yoke member 20, and depending on the site conditions, omega-shaped steel, C-shaped steel, H-shaped steel, etc., may be used as the yoke member 20. In FIG. 2A, a reinforcing bar is used as the yoke member 20, which is installed on the height-adjusting bracket 30 mounted on the upper reinforcing bar support structure 10. The height-adjusting bracket 30 consists of four steel plates, a pair of

outer height-adjusting plates 31 and a pair of inner height-adjusting plates 32. Each of the pair of outer height-adjusting plates 31 has a horizontal length L that allows the outer height-adjusting plate 31 to be fitted and accommodated between the protruding corner angle parts 111 with a first-side inner width e of the upper reinforcing bar support structure 10 for the height adjustment of the yoke member 20. The pair of outer height-adjusting plates 31, each having a predetermined height H , are mounted to be adjacent to the protruding corner angle parts 111 on opposite sides facing each other. It is structurally more stable that the height H of each of the outer height-adjusting plates 31 is smaller than the inner width e . Each of the pair of outer height-adjusting plates 31 faces each other by having a distance that allows the outer height-adjusting plate 31 to be fitted and accommodated between the protruding corner angle parts 111 with a second-side inner width e' . In order to facilitate the multi-stage mounting of the height-adjusting bracket 30 while ensuring structural stability, it is preferable that the first-side inner width e is identical to the second-side inner width e' .

In addition, each of the pair of inner height-adjusting plates 32 is positioned at a predetermined distance inward between the pair of outer height-adjusting plates 31, and is installed vertically starting from predetermined height positions of the outer height-adjusting plates 31, and fixed

thereto by welding.

As described above, the height-adjusting bracket 30, which is composed of the pair of outer height-adjusting plates 31 and the inner height-adjusting plates 32, has an overall shape resembling the Korean character “ㅅ” when viewed from above, and has a shape resembling the Korean characters “ㄱ” or “ㅍ”, depending on the installation stage for height adjustment when viewed from the side or front.

That is, as shown in FIGS. 2A and 2B, when the yoke members 20 are installed at a second-stage height, the height-adjusting bracket 30 takes on a “ㅍ”-shaped form when viewed from the side. In this state, the outer height-adjusting plates 31 are mounted on the bearing horizontal connecting member 121, and the yoke members 20 are installed on the upper ends 32a of the inner height-adjusting plates 32, thereby supporting the upper reinforcing bar 1 thereon.

It is preferable, in terms of enabling a stable and consistent height adjustment by stages, that each of the inner height-adjusting plates 32 configured as another pair of steel plates having the same heights as the outer height-adjusting plates 31 is positioned inward at a predetermined distance from each of the pair of outer height-adjusting plates 31 facing each other, with the upper ends 32a of the inner height-adjusting plates 32 located at the intermediate heights of the outer height-adjusting plates 31 and fixed thereto by welding.

In the present disclosure, the bearing horizontal connecting member 121 located at the uppermost part of the horizontal connecting member 12 connecting the corner angles 11 to each other preferably includes "L" shaped angles having horizontal surfaces 121a installed to face each other located at an upper portion and vertical surfaces 121b connected thereto so as to face downward. To integrate the bearing horizontal connecting member 121 with the corner angles 11, each of the "L" shaped angles increases a welding surface therebetween. The upper portions of the horizontal surfaces 121a of the bearing horizontal connecting member 121 installed at the uppermost part to face each other are flat so that the height-adjusting bracket 30 may be mounted more stably.

In addition, the bearing horizontal connecting member 121 and each of the supporting horizontal connecting members 122, which constitute the horizontal connecting member 12, are composed of reinforcing bars, steel pieces, or angles, and are welded to the corner angles 11 to support the corner angles 11.

In addition, the horizontal connecting member 12 may be formed into a single piece by bending one of the above materials into a "□" shape by using a commonly used bending machine, and then installed by welding it to each of the corner angles 11.

FIG. 3A is a partial perspective view showing a state in which yoke members are installed on the height-adjusting

bracket mounted on the upper reinforcing bar support structure for a third-stage height adjustment in the present disclosure, and FIG. 3B is a perspective view of the height-adjusting bracket as applied in the state shown in FIG. 3A. As shown in FIGS. 2A and 2B, after rotating the height-adjusting bracket 30, which is mounted on the upper reinforcing bar support structure 10, by 90 degrees and then flipping the height-adjusting bracket 30 by 180 degrees, the height-adjusting bracket 30 is mounted on the upper reinforcing bar support structure 10, and the yoke members 20 are placed on the lower ends 31b of the outer height-adjusting plates 31, so that the height of each of the yoke members 20, on which the upper reinforcing bar 1 is placed, is adjusted in three stages by the height-adjusting bracket 30.

That is, as shown in FIGS. 3A and 3B, when the yoke members 20 are installed at a third-stage height, the height-adjusting bracket 30 takes on a "⌒"-shaped form when viewed from the front. In this state, the outer height-adjusting plates 31 are mounted on the bearing horizontal connecting member 121, the yoke members 20 are placed on the lower ends 31a of the outer height-adjusting plates 31, and the upper reinforcing bar 1 is supported thereon.

FIG. 4A is a partial perspective view showing a state in which yoke members are installed on the height-adjusting bracket mounted on the upper reinforcing bar support structure

for a fourth-stage height adjustment in the present disclosure, and

FIG. 4B is a perspective view of the height-adjusting bracket as applied in the state shown in FIG. 4A. By flipping the height-adjusting bracket 30 which is mounted on the upper reinforcing bar support structure 10 as shown in FIG. 2A and 2B by 180 degrees, or by rotating the height-adjusting bracket 30 mounted on the upper reinforcing bar support structure 10 as shown in FIGS. 3A and 3B by 90 degrees, the height-adjusting bracket 30 is mounted on the upper reinforcing bar support structure 10, and the yoke members 20 are placed on the lower ends 32b of the inner height-adjusting plates 32, so that the height of each of the yoke members 20, on which the upper reinforcing bar 1 is placed, is adjusted to a fourth-stage height by the height-adjusting bracket 30.

That is, as shown in FIGS. 4A and 4B, when the yoke members 20 are installed at the fourth-stage height, the height-adjusting bracket 30 takes on a "⌒"-shaped form when viewed from the side. In this state, the outer height-adjusting plates 31 are mounted on the bearing horizontal connecting member 121, the yoke members 20 are installed on the lower ends 32b of the inner height-adjusting plates 32, and the upper reinforcing bar 1 is supported thereon.

As described above, since the installation height of the yoke members 20 can be easily adjusted in stages depending on

the state in which the height-adjusting bracket 30 of the present disclosure is placed and installed on the upper reinforcing bar support structure 10, the present disclosure enables a flexible multi-stage height adjustment of the yoke members 20 even with a single height-adjustable bar chair depending on the conditions of the site floor. In addition, according to the present disclosure, economic efficiency may be improved by simplifying manufacturing, and a construction period may be significantly decreased by enabling easy work.

FIGS. 5A and 5B are perspective views showing states in which bearing horizontal connecting members of the upper reinforcing bar support structure in the present disclosure are formed as angles and reinforcing bars, and reinforcing bars, respectively, and FIG. 5C is a perspective view showing a state in which diagonal reinforcing members are installed on the upper reinforcing bar support structure in the present disclosure. As shown in FIG. 5A, the bearing horizontal connecting member 121, which is located at the uppermost part of the horizontal connecting members 12, has L-shaped angles A welded and installed on the corner angles 11, with the horizontal surfaces 121a of the L-shaped angles A facing each other located at upper portions of the L-shaped angles A, and the vertical surfaces 121b thereof connected to the horizontal surfaces 121a to face downward, and reinforcing bars on opposite sides, on which the L-shaped angles A are not

installed, welded and installed on the corner angles 11, respectively.

In addition, a horizontal bracing member 130 may be welded diagonally to the corner angles 11 on a horizontal surface formed by the supporting horizontal connecting member 122. Alternatively, the horizontal bracing member 130 may be diagonally connected and welded to the supporting horizontal connecting member 122, which is formed integrally by bending it into an "□" shape, to form a single body, which is then installed on each of the corner angles 11.

One or more vertical bracing members 140 may be diagonally welded to and installed on the corner angles 11 between the bearing horizontal connecting member 121 and the supporting horizontal connecting member 122, or between the supporting horizontal connecting member 122 and the supporting horizontal connecting member 122, to reinforce structural stress. Although not specifically illustrated in the present disclosure, the vertical bracing members 140 may be welded diagonally between the bearing horizontal connecting member 121 and the supporting horizontal connecting member 122, which are formed integrally by bending into an "□" shape as described above, or between the supporting horizontal connecting member 122 and the supporting horizontal connecting member 122, to form a single body, which is then installed on each of the corner angles 11.

In addition, as shown in FIG. 5C, diagonal reinforcing members 13 are welded and installed from the opposite side portions of the bearing horizontal connecting member 121, which converge toward the corner angles 11, to portions of the corner angles 11 under the bearing horizontal connecting member 121, thereby enhancing compressive and bending strength against external forces applied from above.

In addition, the bearing horizontal connecting member 121 and the supporting horizontal connecting member 122, which constitute the horizontal connecting member 12, are composed of reinforcing bars, angles, steel pieces, or the like, and are installed by being welded to the corner angles 11.

FIGS. 6A to 6D are partial perspective views showing states in which a reinforcing bar, omega-shaped steel, C-shaped steel, and H-shaped steel, respectively, are installed on the height-adjusting bracket mounted on the upper reinforcing bar support structure for height adjustment in the present disclosure. The yoke members 20, which are installed on the height-adjusting bracket 30 mounted on the upper reinforcing bar support structure 10, may be composed of various members such as reinforcing bars, omega-shaped steel, C-shaped steel, or H-shaped steel, as shown in the drawings. Generally, one reinforcing bar is used for the yoke member 20, but when significant external force is applied from above, one or more reinforcing bars may be used.

FIG. 7A is a partial perspective view showing a state in which a hat-shaped yoke member is installed on the upper reinforcing bar support structure in the present disclosure, FIG. 7B is an enlarged partial perspective view of FIG. 7A, FIG. 7C is a partial elevation view showing a state in which an upper reinforcing bar is arranged in the state of FIG. 7B, and FIGS. 8A and 8B are perspective views showing a side plate part and a reinforcing bar support upper plate part of the hat-shaped yoke member respectively having air holes formed therein in the present disclosure.

The height-adjustable bar chair of the present disclosure includes the upper reinforcing bar support structure 10 having a set of four corner angles 11, which are formed in "L"-shaped forms. In the upper reinforcing bar support structure 10, a first side of a hat-shaped yoke member 20-1 is fitted into and supported in each of multiple fitting slots 112 for fitting formed in the protruding corner angle part 111 protruding upward from each of the corner angles 11 which are vertical structures. As a result, the mounted hat-shaped yoke member 20-1 is not merely placed on the height-adjustable bar chair, but the opposite end portions thereof supported by the height-adjustable bar chair serve as fixed ends. This significantly reduces bending moment acting on the cap-shaped yoke member 20-1, thereby allowing the size of the member to be decreased. Furthermore, by applying a single height-adjustable bar chair,

multi-stage height adjustment is possible, making it possible to overcome height differences that may occur in a mat foundation that forms a base structure.

As shown in FIGS. 7A to 7C, in the present disclosure, in the upper reinforcing bar support structure 10, a set of four corner angles 11 are vertically arranged on the corners of a quadrilateral, and the multiple fitting slots 112 formed horizontally on each corner angle side 11a in a direction in which the protruding corner angle part 111 and the protruding corner angle part 111 face each other are formed vertically above the uppermost part horizontal connecting member 12 connecting the corner angles 11 to each other. The fitting slots 112 are formed vertically along the protruding corner angle parts 111, with multiple slots provided in the vertical direction. Each of the fitting slots 112 includes a first fitting slot 112-1 to a fourth fitting slot 112-4 formed sequentially upward from a lowermost portion. Depending on the flatness of the site floor, the number of the fitting slots 112 may be flexibly adjusted to be increased or decreased.

In the present disclosure, the hat-shaped yoke member 20-1 is mounted on two or more consecutive upper reinforcing bar support structure 10 to support the upper reinforcing bar 1 arranged in the foundation. The fitting slot 112 is formed horizontally in each angle side 11a in a direction in which the protruding corner angle part 111 and the protruding corner

angle part 111 face each other. The hat-shaped yoke member 20-1 includes a fitting support lower plate part 21-1 having a first side fitting support lower plate part 21a-1, which is bent in the form of a lower brim of a hat, fitted into each of the fitting slots 112 facing each other, and a second side fitting support lower plate part 21b-1 supported by the bearing horizontal connecting member 121 or the height-adjusting bracket 30; a side plate part 22-1 constituting a side portion thereof by bending upward from each of the opposite ends of the fitting support lower plate part 21-1 and formed to be inclined inward with respect to the center c of the hat-shaped yoke member 20-1; and a reinforcing bar support upper plate part 23-1 bent horizontally from the side plate part 22-1 and connected thereto so as to support the upper reinforcing bar 1.

In addition, as shown in FIGS. 8A and 8B, air holes 20h-1 are formed in the upper end portion of the side plate part 22-1 of the hat-shaped yoke member 20-1 or the reinforcing bar support upper plate part 23-1 to discharge air without the formation of an air pocket when concrete is poured, so that when the poured concrete is filled to form a foundation, the air is discharged without forming an air pocket, thereby allowing the concrete to be filled airtight.

In the present disclosure, a load test was conducted to measure change in the magnitude of maximum moment and a maximum deflection state, both when the hat-shaped yoke member 20-1 was

fitted into the fitting slots 112 of the upper reinforcing bar support structure 10 manufactured for testing purposes, and when the hat-shaped yoke member 20-1 was installed without being fitted into the fitting slots 112. As a result, under the simply-placed condition where the hat-shaped yoke member 20-1 was installed without being fitted into the fitting slots 112 of the upper reinforcing bar support structure 10, a maximum positive moment reached 2.3kN/m. However, when the hat-shaped yoke member 20-1 was fitted into the fitting slots 112 of the upper reinforcing bar support structure 10 manufactured for testing purposes, the maximum positive moment was significantly reduced by 61% to 0.9kN/m, while a maximum negative moment of -1.5kN/m occurred at the fitting slots 112. This indicates that the moment is dispersed rather than concentrated at a single point, demonstrating that the member stress of the hat-shaped yoke member 20-1 in response to external loads is significantly enhanced.

In addition, in the simply-placed condition where the hat-shaped yoke member 20-1 was installed without being fitted into the fitting slots 112, the maximum deflection of the hat-shaped yoke member 20-1 was measured at 9.7mm. However, when the hat-shaped yoke member 20-1 was fitted into the fitting slots 112 of the upper reinforcing bar support structure 10 manufactured for testing purposes, the maximum deflection of the hat-shaped yoke member 20-1 was significantly reduced by 74% to 2.5mm,

indicating that the member stress with respect to deflection is increased. Furthermore, under the same conditions, the maximum deflection of C-shaped steel was 4.7mm, showing that the hat-shaped yoke member 20-1 reduced the maximum deflection by 53% compared to the C-shaped steel, thereby demonstrating that the hat-shaped yoke member 20-1 provides greater member stress in response to external loads.

As described above, the height-adjustable bar chair of the present disclosure significantly improves bending performance by applying the hat-shaped yoke member 20-1, which is formed by bending a steel plate into a hat shape. In addition, when the upper reinforcing bar 1 is mounted on the generally used yoke member 20, which is C-shaped steel, there is a risk of overturning, requiring separate fixing means. In contrast, the hat-shaped yoke member 20-1 maintains stability thereof without risk of overturning even when the hat-shaped yoke member 20-1 is not fixed by a separate device. Furthermore, since the side plate part 22-1 is formed to be inclined inward with respect to the center of the hat-shaped yoke member 20-1, unlike the conventional C-shaped steel where the side plates are vertical, the proposed structure effectively prevents lateral deformation when subjected to external loads.

FIGS. 9A, 9B, and 9C are partial perspective views respectively showing a state in which the hat-shaped yoke member is fitted into and installed in the second to the fourth

fitting slots on the height-adjusting bracket mounted on the upper reinforcing bar support structure for second- to fourth-stage height adjustments in the present disclosure, and FIG. 9D is a partial perspective view showing a state in which two hat-shaped yoke members are installed in a parallel and overlapping arrangement on a single upper reinforcing bar support structure in the present disclosure.

As described above, the height-adjustable bar chair of the present disclosure is installed on the upper reinforcing bar support structure 10, which allows multi-stage adjustment of the installation height of the yoke member 20. As shown in FIGS. 9A to 9C, the height-adjusting bracket 30 supports the second side fitting support lower plate part 21b-1 of the hat-shaped yoke member 20-1 when the first side fitting support lower plate part 21a-1 of the hat-shaped yoke member 20-1 is fitted into and installed in any one of the fitting slots 112.

FIG. 9A shows a state in which, in the present disclosure, the hat-shaped yoke member 20-1 is fitted into and installed in a second fitting slot 112-2 on the height-adjusting bracket 30 mounted on the upper reinforcing bar support structure 10 for the second-stage height adjustment. In order for the hat-shaped yoke member 20-1 to be fitted into and installed in the second fitting slot 112-2, the height-adjusting bracket 30, as mounted on the upper reinforcing bar support structure 10 as shown in FIG. 2B, is mounted on the upper reinforcing bar

support structure 10, and then the hat-shaped yoke member 20-1 is installed thereon. That is, after the height-adjusting bracket 30 is mounted on the upper reinforcing bar support structure 10, the hat-shaped yoke member 20-1 is placed on the upper ends 32a of the inner height-adjusting plates 32, and the first side fitting support lower plate part 21a-1 is fitted into the second fitting slot 112-2 located at a position corresponding to the second height, thereby being installed.

In the height-adjustable bar chair of the present disclosure, the bearing horizontal connecting member 121 located at the uppermost part of the horizontal connecting member 12 connecting the corner angles 11 to each other preferably includes L-shaped angles in which the horizontal surfaces 121a are installed at the uppermost part so as to face each other, and the vertical surfaces 121b are connected thereto to face downward. The bearing horizontal connecting member 121 including the L-shaped angles increases the welding surface thereof with the corner angles 11 to be integrated therewith, and the upper portions of the horizontal surfaces 121a of the bearing horizontal connecting member 121 installed at the uppermost part to face each other are flat, and accordingly, the height-adjusting bracket 30 may be mounted more stably.

FIG. 9B is a partial perspective view showing a state in which the hat-shaped yoke member is fitted into and installed

in the third fitting slot on the height-adjusting bracket mounted on the upper reinforcing bar support structure for the third-stage height adjustment in the present disclosure. In order for the hat-shaped yoke member 20-1 to be fitted into and installed in the third fitting slot 112-3, the height-adjusting bracket 30 is mounted on the upper reinforcing bar support structure 10 as shown in FIG. 3B, and then the hat-shaped yoke member 20-1 is installed thereon. As shown in FIG. 9A, the height-adjusting bracket 30, which is fitted into and installed in the second fitting slot 112-2 of the upper reinforcing bar support structure 10, is rotated by 90 degrees, turned upside down by 180 degrees, and then mounted again on the upper reinforcing bar support structure 10. In this state, the hat-shaped yoke member 20-1 is placed on the lower ends 31b of the outer height-adjusting plates 31, and the first side fitting support lower plate part 21a-1 is fitted into and installed in the third fitting slot 112-3 located at a third height position.

FIG. 9C is a partial perspective view showing a state in which the hat-shaped yoke member is fitted into and installed in the fourth fitting slot on the height-adjusting bracket mounted on the upper reinforcing bar support structure for the fourth-stage height adjustment in the present disclosure. In order for the hat-shaped yoke member 20-1 to be fitted into and installed in the fourth fitting slot 112-4, the height-

adjusting bracket 30 is mounted on the upper reinforcing bar support structure 10 as shown in FIG. 4B, and then the hat-shaped yoke member 20-1 is installed thereon. As shown in FIG. 9A, the height-adjusting bracket 30, which is fitted into the second fitting slot 112-2 of the upper reinforcing bar support structure 10, is turned upside down by 180 degrees and mounted again on the upper reinforcing bar support structure 10. In this state, the hat-shaped yoke member 20-1 is placed on the lower ends 32b of the inner height-adjusting plates 32, and the first side fitting support lower plate part 21a-1 is fitted into and installed in the fourth fitting slot 112-4 corresponding to a fourth height position.

As described above, depending on the state in which the height-adjusting bracket 30 of the present disclosure is placed on the upper reinforcing bar support structure 10, the first side fitting support lower plate part 21a-1 of the hat-shaped yoke member 20-1 is fitted into and installed in any one of the multiple fitting slots 112-2, 112-3, and 112-4 formed on each of the corner angles 11 of the upper reinforcing bar support structure 10, thereby allowing the installation height of the hat-shaped yoke member 20-1 to be easily adjusted. Although the present disclosure describes adjusting the installation height of the hat-shaped yoke member 20-1 in four stages, the number of installation height adjustment stages may be increased or decreased together with changes in the

specifications of the height-adjusting bracket 30 depending on the site conditions. In addition, spacing between the fitting slots 112 may be uniform or non-uniform. That is, as described above, according to the present disclosure, it is possible to perform flexible multi-stage height adjustment with a single height-adjustable bar chair depending on the floor conditions at the site, thereby simplifying manufacturing to improve economic efficiency, and allowing easy work to significantly decrease a construction period.

FIG. 9D is a partial perspective view showing a state in which two hat-shaped yoke members are installed in a parallel and overlapping arrangement on a single upper reinforcing bar support structure in the present disclosure. In order to arrange lower foundation reinforcing bars 1, upper reinforcing bar support structures 10 are continuously installed at regular intervals, and then hat-shaped yoke members 20-1 are installed on the upper reinforcing bar support structures 10. Since the length of each of the hat-shaped yoke members 20-1 transported to the site is limited, there are cases where two hat-shaped yoke members 20-1 are continuously installed in a parallel and overlapping arrangement on a single upper reinforcing bar support structure 10. As described above, the first side fitting support lower plate part 21a-1 of one hat-shaped yoke member 20-1 installed on the upper reinforcing bar support structure 10 is fitted and installed into any one of the

multiple fitting slots 112 formed on each of first-side corner angles 11 of the upper reinforcing bar support structure 10, and the first side fitting support lower plate part 21a-1 of a remaining hat-shaped yoke member 20-1 is fitted and installed into any one of multiple fitting slots 112 formed on each of second-side corner angles 11 of the upper reinforcing bar support structure 10. Accordingly, the two hat-shaped yoke members 20-1 may be continuously installed in a parallel and overlapping arrangement on the single upper reinforcing bar support structure 10.

FIG. 10A is a partial perspective view showing a state in which lower reinforcing bar rests are installed on the lower ends of corner angles of the upper reinforcing bar support structure in the present disclosure, FIG. 10B is a partial elevation view showing the upper reinforcing bar support structure of FIG. 10A installed on blinding concrete, and FIG. 10C is a partial elevation view showing a state in which the lower ends of the corner angles of the upper reinforcing bar support structure in the present disclosure are installed to be in contact with blinding concrete.

As shown in FIGS. 10A and 10B, lower reinforcing bar rests 40 are installed at the lower end of the upper reinforcing bar support structure 10 so that the upper reinforcing bar support structure 10 is placed on lower reinforcing bars 2 of a foundation by the lower reinforcing bar rests 40 without

passing through the lower reinforcing bars 2, thereby enabling the upper reinforcing bar support structure 10 to be erected upright regardless of the slope of the floor surface on which the blinding concrete 3 is poured. The lower reinforcing bar rests 40 facing each other in parallel are welded and fixed on the lower ends of the corner angles 11 so that the upper reinforcing bar support structure 10 is placed on the lower reinforcing bars 2. As the lower reinforcing bar rests 40 are provided in this manner, the upper reinforcing bar support structure 10 may be installed on the lower reinforcing bars 2 simply and quickly. Alternatively, as shown in FIG. 10C, the lower ends of the corner angles 11 of the upper reinforcing bar support structure 10 may protrude downward from the horizontal connecting member 12 located at the lowermost end, pass through the lower reinforcing bars 2 supported by spacers S placed on the blinding concrete 3, and be supported on the blinding concrete 3 located under the lower reinforcing bars 2.

As described above, according to the present disclosure, it is possible to perform the multi-stage height adjustment of the height-adjustable bar chair, thereby overcoming height differences that may occur in a mat foundation where, following the arrangement of the lower reinforcing bars 2, the upper reinforcing bars 1 are arranged at a predetermined height. In addition, by fitting and supporting the first side of the fitting support lower plate part 21-1 of the hat-shaped yoke

member 20-1 into the fitting slots 112, which are slit-shaped grooves formed for fitting in the upper portions of the corner angles 11 constituting the vertical members of the upper reinforcing bar support structure 10, the hat-shaped yoke member 20-1 is not simply placed on the height-adjustable bar chair, but the opposite end portions of the hat-shaped yoke member 20-1 supported by the height-adjustable bar chair serve as fixed ends, so that bending moment and deflection acting on the hat-shaped yoke member 20-1 may be significantly reduced, thereby reducing the size of the member and enabling rapid construction.

As described above, although the present disclosure has been described by limited embodiments and drawings, the terms or words used in this specification and claims should not be interpreted as limited to their usual or dictionary meanings, but should be interpreted as having meanings and concepts consistent with the technical spirit of the present disclosure.

Therefore, the embodiments described in this specification and the configurations depicted in the drawings are only examples of the present disclosure and do not represent all of the technical ideas of the present disclosure. Therefore, it should be understood that there may be various equivalents and modifications within the scope of the claims of the present disclosure.

WHAT IS CLAIMED IS:

[Claim 1] A height-adjustable bar chair comprising:
an upper reinforcing bar support structure (10) having a set of four corner angles (11) arranged vertically on corners of a quadrilateral, a horizontal connecting member (12) composed of a bearing horizontal connecting member (121) connecting the corner angles (11) to each other and located at an uppermost part of the set of four corner angles (11) and supporting horizontal connecting members (122) located under the bearing horizontal connecting member (121), and protruding corner angle parts (111) protruding upward from the bearing horizontal connecting member (121);

a yoke member (20) installed on a height-adjusting bracket (30) mounted on each of two or more consecutive upper reinforcing bar support structures (10) included in the upper reinforcing bar support structure (10), with an upper reinforcing bar (1) placed on the yoke member (20); and

the height-adjusting bracket (30) having a horizontal length (L) to be fitted and accommodated between the protruding corner angle parts (111) having a first-side inner width (e) at one side for height adjustment of the yoke member (20), and including: a pair of outer height-adjusting plates (31), each having a predetermined height (H), installed to be adjacent to the protruding corner angle parts (111) on opposite sides

facing each other, and a pair of inner height-adjusting plates (32) located respectively at predetermined distances inward between the pair of outer height-adjusting plates (31) and installed vertically starting from predetermined height positions of the outer height-adjusting plates (31) by being welded thereto, so that the height-adjusting bracket (30) has an overall "⌵" shape when viewed from above, and has a "⌞" shape or a "⌟" shape depending on an installation stage for height adjustment when viewed from a side or front.

[Claim 2] The height-adjustable bar chair of claim 1, wherein the bearing horizontal connecting member (121) and the supporting horizontal connecting members (122), which constitute the horizontal connecting member (12), are composed of reinforcing bars, steel pieces, or angles, and are installed on the corner angles (11) by being welded thereto.

[Claim 3] The height-adjustable bar chair of claim 2, wherein diagonal reinforcing members (13) are welded and installed from opposite side portions of the bearing horizontal connecting member (121), which converge toward the corner angles (11), to portions of the corner angles (11) under the bearing horizontal connecting member (121).

[Claim 4] The height-adjustable bar chair of claim 1,

wherein the bearing horizontal connecting member (121) has L-shaped angles (A) welded and installed on the corner angles (11), with the horizontal surfaces (121a) of the L-shaped angles (A) facing each other located at upper portions of the L-shaped angles (A), and vertical surfaces (121b) thereof connected to the horizontal surfaces (121a) to face downward, and reinforcing bars on opposite sides, on which the L-shaped angles (A) are not installed, welded and installed on the corner angles (11), respectively.

[Claim 5] The height-adjustable bar chair of claim 1, wherein a horizontal bracing member (130) is diagonally welded to the corner angles (11) on a horizontal plane formed by each of the supporting horizontal connecting members (122).

[Claim 6] The height-adjustable bar chair of claim 1, wherein one or more vertical bracing members (140) are diagonally welded to and installed on the corner angles (11) between the bearing horizontal connecting member (121) and one of the supporting horizontal connecting members (122), or between one of the supporting horizontal connecting members (122) and another of the supporting horizontal connecting members (122).

[Claim 7] The height-adjustable bar chair of claim 1,

wherein a height of each of the inner height-adjusting plates (32) is equal to a height of each of the outer height-adjusting plates (31).

[Claim 8] The height-adjustable bar chair of claim 1, wherein cases in which the height-adjusting bracket (30) is installed to further raise an installation height of the yoke member (20) from a first-stage height in which the yoke member (20) is installed on the bearing horizontal connecting member (121) to support the upper reinforcing bar (1) thereon include:

a case in which the height-adjusting bracket (30) has a “Π” shape when viewed from a side, wherein the outer height-adjusting plates (31) are mounted on the bearing horizontal connecting member (121) and the yoke member (20) is installed on upper ends (32a) of the inner height-adjusting plates (32) to support the upper reinforcing bar (1) thereon at a second-stage height;

a case in which the height-adjusting bracket (30) has a “⊥” shape when viewed from a front, wherein the outer height-adjusting plates (31) are mounted on the bearing horizontal connecting member (121) and the yoke member (20) is installed on lower ends (31b) of the outer height-adjusting plates (31) to support the upper reinforcing bar (1) thereon at a third-stage height; and

a case in which the height-adjusting bracket (30) has a

"⌒" shape when viewed from the side, wherein the outer height-adjusting plates (31) are mounted on the bearing horizontal connecting member (121) and the yoke member (20) is installed on lower ends (32b) of the inner height-adjusting plates (32) to support the upper reinforcing bar (1) thereon at a fourth-stage height, so that the height adjustment of the yoke member (20) is performed.

[Claim 9] The height-adjustable bar chair of claim 1, wherein the yoke member (20) is formed by using one or more reinforcing bars.

[Claim 10] The height-adjustable bar chair of claim 1, wherein the yoke member (20) is formed by using a reinforcing bar, omega-shaped steel, C-shaped steel, or H-shaped steel.

[Claim 11] The height-adjustable bar chair of claim 1, further comprising:

fitting slots (112) formed horizontally in each angle side (11a) in a direction in which the protruding corner angle part (111) and the protruding corner angle part (111) face each other; and

a hat-shaped yoke member (20-1) including: a fitting support lower plate part (21-1) having a first side fitting support lower plate part (21a-1), which is bent in a form of a

lower brim of a hat, fitted into each of the fitting slots (112) facing each other, and a second side fitting support lower plate part (21b-1) supported by the height-adjusting bracket (30); a side plate part (22-1) constituting a side portion thereof by bending upward from each of opposite ends of the fitting support lower plate part (21-1); and a reinforcing bar support upper plate part (23-1) bent horizontally from the side plate part (22-1) and connected thereto so as to support the upper reinforcing bar (1).

[Claim 12] The height-adjustable bar chair of claim 11, wherein the side plate part (22-1) is formed to be inclined inward with respect to a center (c) of the hat-shaped yoke member (20-1).

[Claim 13] The height-adjustable bar chair of claim 1, wherein the height-adjusting bracket (30) is mounted on the upper reinforcing bar support structure (10) and a hat-shaped yoke member (20-1) is placed on upper ends (32a) of the inner height-adjusting plates (32), so that a first side fitting support lower plate part (21a-1) is fitted and installed into a second fitting slot (112-2) located at a second height position,

the height-adjusting bracket (30), which is fitted into the second fitting slot (112-2), is rotated by 90 degrees,

turned upside down by 180 degrees, and then mounted on the upper reinforcing bar support structure (10), and the hat-shaped yoke member (20-1) is placed on lower ends (31b) of the outer height-adjusting plates (31), so that the first side fitting support lower plate part (21a-1) is fitted and installed into a third fitting slot (112-3) located at a third height position, and

the height-adjusting bracket (30), which is fitted into the second fitting slot (112-2), is turned upside down by 180 degrees and mounted on the upper reinforcing bar support structure (10), and the hat-shaped yoke member (20-1) is placed on lower ends (32b) of the inner height-adjusting plates (32), so that the first side fitting support lower plate part (21a-1) is fitted and installed into a fourth fitting slot (112-4) located at a fourth height position.

[Claim 14] The height-adjustable bar chair of any one of claims 1 and 13, wherein depending on a state in which the height-adjusting bracket (30) is placed on the upper reinforcing bar support structure (10), a first side fitting support lower plate part (21a-1) of a hat-shaped yoke member (20-1) is fitted and installed into one of multiple fitting slots (112-2, 112-3, 112-4) formed in each of the corner angles (11) of the upper reinforcing bar support structure (10).

[Claim 15] The height-adjustable bar chair of any one of claims 1 and 13, wherein when two hat-shaped yoke members (20-1) are installed in a parallel and overlapping arrangement on the upper reinforcing bar support structure (10), a first side fitting support lower plate part (21a-1) of one hat-shaped yoke member (20-1) is fitted and installed into any one of multiple fitting slots (112) formed in each of first-side corner angles (11) of the upper reinforcing bar support structure (10), and a first side fitting support lower plate part (21a-1) of a remaining one hat-shaped yoke member (20-1) is fitted and installed into any one of multiple fitting slots (112) formed in each of second-side corner angles (11) of the upper reinforcing bar support structure (10).

[Claim 16] The height-adjustable bar chair of claim 11, wherein air holes (20h-1) are formed in an upper end portion of the side plate part (22-1) or the reinforcing bar support upper plate part (23-1) so as to discharge air without formation of an air pocket when concrete is poured.

[Claim 17] The height-adjustable bar chair of claim 1, wherein the corner angles (11) of the upper reinforcing bar support structure (10) protrude downward from the horizontal connecting member (12) located at a lowermost end and are supported on the blinding concrete (3).

[Claim 18] The height-adjustable bar chair of claim 1, wherein lower reinforcing bar rests (40) facing each other in parallel are welded and fixed on lower ends of the corner angles (11) so that the upper reinforcing bar support structure (10) is placed on lower reinforcing bars (2).