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(54) **IMPROVED STAGE**

VERBESSERTE BÜHNE

SCENE AMELIOREE

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Description

OBJECT OF THE INVENTION

[0001] The present invention relates to an improved stage, of the type which are set up out of doors for concrete events such as musical concerts or the like. The stage has a structure formed from tubular elements, which supports the floor and vertical turrets which support the roof and other components.

[0002] The object of the invention is to provide a stage in which both the floor support structure and the floor boards have special characteristics which allow said floor boards to be perfectly stabilized and fixed in their horizontal position. A further object of the invention is to provide a novel turret assembly system which links these to the floor support structure, providing a great stability and a simple raising process.

BACKGROUND OF THE INVENTION

[0003] Stages set up out of doors for certain events such as musical concerts or the like comprise a support structure, generally consisting of a metal pipe framework, on top of which is placed a floor consisting of a number of wooden boards. This floor structure is complemented by a number of turrets which support the roof for the stage and the light and sound equipment, etc.

[0004] The turrets are independent from the stage and consist of a tubular structure mounted on-site, by assembling all the structural components of each turret on the ground and raising these to their vertical position after they are fully assembled. The raising operation is performed by several persons or by cranes.

[0005] The drawback of this type of turrets is that a large space is required for both assembling them on the ground due to their length and for their support, as once raised they require a large base for support and stabilization which often requires the use of counterweights to secure them.

[0006] As regards stage floor which are formed with the support structure and the wooden floor boards, these have the drawback of consisting of independent planks which are placed resting on the tubular support structure, so that a board could come up if it is not properly secured when weight is placed on one of its ends, which can constitute a hazard.

[0007] In addition, EP-A-0623716 corresponding to ES-A-2068136 and to the Spanish Invention Patent P 9300941 is cited, which describes a scaffolding comprising a number of vertical struts attached to corresponding horizontal cross bars and diagonal bars to form a three dimensional framework which can be disassembled, so that the longitudinal posts, the crossbars and the diagonal tie rods are attached to the struts by anchoring jutting parts in orifices which are provided in rings joined to the struts and placed at regular intervals. For this purpose the posts, cross bars and tie rods and provided with end support elements which incorporate vertical projections in the form of fingers, and with passage orifices for tightening wedges which achieve a perfect union of the strut and the posts, cross bars or tie rods.

DESCRIPTION OF THE INVENTION

[0008] The stage of the invention presents a number of novel characteristics. Firstly, the turrets are jointed to the floor support structure, so that their assembly and raising operation is simplified and the space required for supporting the turrets is reduced, as they use the horizontal stage support structure as a counterweight. Also eliminated is the need for large amounts of space to assemble the turrets as they are assembled on the stage floor.

[0009] The floor support structure is based on the one described for constructing scaffolding in EP-A-0623716, cited in the previous section.

[0010] The turret structure comprises a number of modular components which are assembled on each other until the required height is reached. The base of the tower is mounted on a swiveling support which is in turn hinged to a frame that is mounted on the floor support struts.

[0011] Said swiveling support comprises a tubular bracket with joints on its top end meant for attaching it to the hinged frame that is mounted on the floor support struts. On its lower end the swiveling support is provided with lugs which together with pins locks the swiveling support to the hinged frame when the turret is raised to a vertical position.

[0012] A further novel characteristic of the invention is that the aforementioned swiveling support is provided on its front end and on its bottom with screw studs which allow the adjustment of the support base to ensure a perfect vertical position of the turret, so that the loads are all transmitted to the ground.

[0013] As regards the union of the hinged frame connected to the swiveling support and the struts which support the floor, this is achieved by securing elements in the form of fingers which jut out of the hinged frame and insert in one of the orifices of the ring provided on each strut of the floor base. In addition, a tightening wedge is provided for this securing finger. All of this allows the use of standard struts of the type employed in the scaffolding of the aforementioned EP-A-0623716.

[0014] With the above described characteristics, the turrets are assembled on the stage floor and thus large spaces are not required for this process; additionally, the turrets can be raised in a simple manner by as few as two people, one on the stage floor pushing the turret upwards and one which is pushing the swiveling support on which the turret is mounted, which acts as a counterweight and simplifies the raising operation. Preferably, however, a motor will be employed mounted on the swiveling support and which raises the turrets by means

of an attached cable, winch or chain. This motor can be the one used to raise the sliding carriage used to place in position the light and sound equipment and the stage roof.

[0015] As relates to the construction of the stage floor itself, in addition to the structure described in the aforementioned EP-A-0623716 it comprises a number of horizontal beams on which the floor boards rest and are attached. Each horizontal beam consists of a horizontal body provided with end elements for anchoring to the struts, with a longitudinal inverted U section having the middle segment placed on the top and provided with evenly spaced opening in which insert attachment elements provided in the floor boards.

[0016] The floor boards are made of wood and present a pair of tubular frames on their bottom, which in turn are provided on their end with supports joined to transverse fingers which slightly jut out and which are meant to insert in the openings of the U-bar of the horizontal beam. Thus, the boards are secured in place and cannot move nor swivel.

DESCRIPTION OF THE DRAWINGS

[0017] The characteristics of the present invention will be better understood in view of the accompanying drawings of a preferred embodiment, where for purposes of illustration only the following is shown:

Figure 1 shows the stage of the invention with its novel characteristics, revealing the manner in which the turrets are supported and assembled and their relation to the floor support structure.

Figure 2 shows a side elevation view of the relation between a turret and the floor structure, as well as the raising operation of the turret from a horizontal to a vertical position.

Figure 3 shows a detail of the turret raising operation which employs a driving motor which acts on a chain secured to the hinged frame.

Figure 4 shows a detail of the turret assembly on the corresponding swiveling support and the latter's relation to the struts that support the floor.

Figure 5 shows a detail of the assembly of the hinged frame on the floor support.

Figure 6 shows a perspective view of the assembly of a turret on the swiveling support associated to two hinged frames with their corresponding elements for simultaneous attachment to two struts of the floor support structure.

Figures 7, 8 and 9 respectively show a longitudinal top plan view. A longitudinal side view and an end view of the horizontal beam used to assemble the floor.

Figures 10, 11 and 12 respectively show a plan view, a longitudinal elevation view and a side elevation view of the board used for the floor.

Figure 13 shows, finally, a perspective enlarged view of the system that attaches the floor boards to the U-bars, which are secured longitudinally and on their top to the corresponding beam of the floor.

PREFERRED EMBODIMENT OF THE INVENTION

[0018] As can be seen in the above described figures, the stage of the invention comprises a lower support structure (1) for the floor (2) and a number of turrets (3), which in the rectangular shaped example of figure 1 are four, one on each corner of the stage. These turrets are meant to support a roof (4) and equipment for lighting, sound, etc., with each turret (3) provided with a sliding carriage (5) used to raise these light or sound equipments and the roof, etc.

[0019] As the structure of the lower support (1) and the structure of the turrets (3) are both tubular, and with the structure (1) incorporating a number of struts (6) which support all the tubular bars, the novelty of the invention lies in the method of assembly for the turrets (3) and in the method of assembly for the floor (2).

[0020] Each turret is mounted on a swiveling support (7) formed by tubular bars, with a bracket-like configuration, as seen clearly in figure 6, and provided with stiffening bars (7'). Said swiveling support (7) is further provided with screw studs (8) on its outermost area, that is, the area farthest from the support (1) of the floor (2). The screw stud or screw studs (8) are meant to adjust and level the swiveling support (7) so that the turret (3) is placed fully vertical and the loads are transmitted to the ground.

[0021] Said swiveling support is provided with a base (9) on which is placed the turret (3), as shown in figure 4. This swiveling support (7) which supports and anchors the turret (3) is hinged to a hinged frame (10), which is in turn mounted on and attached to the vertical struts (6) of the support (1) by attachment elements (11) consisting of support elements with a wedge (12) and a lower finger (11') which is inserted in one of the orifices provided for it in a disc that is joined to the struts (11). That is, said struts (11) incorporate the discs (13) at certain positions, shown by the discontinuous line of figures 7 and 8. These discs have orifices (14) in which insert said downwards-projecting fingers (11') of the attachments (11). The wedge (12) provides the final immobilization which attaches the frame (10) to the strut (6) and preferably to the two struts (6) of the support structure (1), as shown in Figure 5.

[0022] The swiveling support (7) is attached to the frame (10) by means of the hinges (15) provided on the

top ends of said swiveling support (7), with which this support is connected to the frame (10), as previously described. The bottom end of the swiveling support (7) is provided with lugs (16) used to lock in place the frame (10) after the turret (3) has been raised and placed vertically.

[0023] In addition, the floor (2) consists of a number of horizontal beams (17) placed on the support structure (1). Each beam (17) is longitudinally welded to the side segments of a U-bar (18). This U-bar (18) is placed inverted with openings (19) on its top, middle segment, the purpose of which will be described below.

[0024] On these horizontal beams (17), and more specifically on the bars (18) joined to the beams, are placed the wood boards (20). As shown in figure 10, these are rectangular planks provided with a pair of longitudinal bars (21), on the ends of which are supports (22) with transverse fingers. These fingers are jutting out slightly so that the boards (20) rest on the top of the bars (18) with the fingers (23) inserted in the bar openings (19) . After the board (20) is set it is pushed to place the fingers (23) under the edges of the openings (19), thereby securing in place the boards (20) so that it cannot swivel even when its corners are stepped upon and preventing their extraction.

[0025] The turrets (3) are mounted on the floor constructed in this manner. Thus, once these turrets are mounted they are raised to a vertical position, as shown in Figure 2. This can be performed by as few as two people, one standing on the floor (2) and pushing upwards on the turret (3) and another on the ground, pulling on the swiveling support (7) which acts as a counterweight. The screw studs (8) are used to adjust the vertical position of the turret (3) once it has been raised.

[0026] The turrets are preferably raised automatically by a motor (25) mounted on the swiveling support (7), which pulls on a cable or chain (25) attached to the hinged frame (10), so that it can raise the turret (3) on its own and in an automated manner as shown in Figure 3. This motor will preferably be the one used to drive the carriage (5) mounted on the turret (3) which is meant to raise the lights and sound equipment, as well as the roof stage (4).

[0027] It is important to note that in this case, and in accordance with the structure described, the turrets (3) are not independent of the structure (1) which supports the floor but instead are joined to this structure (1). Therefore, the space which these turrets (3) occupy is reduced, as they are stabilized by their attachment to said support structure (1).

[0028] The beams (17) are provided on their ends with support elements (17') which are similar to the attachment elements of the frame (10) and which attach to corresponding discs provided on the struts (6) by insertion of the bottom fingers of the elements (17) in the orifices (14) of said discs (13), as shown clearly in figures 7 and 8.

Claims

1. Improved stage, of the type which are mounted out of doors for musical concerts and the like, comprising a support structure (1) for a floor (2) and a number of turrets (3) which support a roof (4) and lighting and sound equipment and the like, wherein the support structure (1) is provided with vertical struts (6) complemented by beams, cross bars and tie rods made of tubular bars, while the floor (2) consists of a number of wooden boards (20) placed on corresponding supports, essentially **characterized in that** the turrets (3) are hinged to the structure of the support (1) by an intermediate swiveling support (7) on which the turret is mounted; this swiveling support (7) is hinged to a frame (10) which is attached to struts (6) of the support structure (1), while the floor (2) consists of horizontal beams (17) attached to the struts (6), which beams (17) are longitudinally attached to U-bars (18) which are provided with attachment means that are complementary to those provided in the wooden boards (20) which define the surface of the floor (2) .

2. Improved stage as claimed in claim 1, **characterized in that** the swiveling support (7) is made of tubular bars and has a bracket configuration, with attachment rods (7') and one or more screw studs (8) to adjust the vertical position of the turret (3) when it is raised, so that the loads are transmitted to the ground; with said swiveling support (7) being provided with hinges (15) so that it may pivot about the frame (10), which is attached to the struts (6) by attachment elements (11) provided with lower fingers (11') and wedges (12); in addition, the swiveling support (7) is provided on its bottom with lugs (16) which with the aid of pins immobilize the swiveling support on the frame (10) in the vertical position of the turret (3).

3. Improved stage, as claimed in previous claims, **characterized in that** a motor (7) is mounted on the swiveling support (7), the action of which effects the raising of the turret (3) mounted on the floor (2). This motor is connected to a cable or chain (25) connected to the hinged frame (10). This motor can be the one employed to drive the carriage (5) along the turret (3) in order to raise diverse objects, such as components of the roof (4) of light and sound equipment.

4. Improved stage, as claimed in claim 1, **characterized in that** the horizontal beams (17) which are part of the floor (2) are provided on their ends with elements (17') for attaching said beams (17) to the discs (13) provided on the struts (6) of the support structure (1), and with the U-bar (18) that is longitudinally joined to the beam (17) being provided with

evenly spaced openings (19) in which inserts a finger (25), which is housed in and partially juts out of a support (22) provided opposite the ends of a pair of beams (21) placed on the bottom surface of the corresponding board (20).

Patentansprüche

1. Verbesserte Bühne, der Art, die im Freien für musikalische Veranstaltungen und ähnliches aufgebaut werden, und die aus einem Tragwerk (1) für einen Bretterboden (2) bestehen, einer Reihe von Masten (3), als Auflage für eine Überdachung oder ein Dach (4), sowie für die Geräte für Licht, Ton, und sonstiges, wobei das Tragwerk (1) mit senkrechten Stützen (6) ausgestattet ist, die mit Längsträgern, Querträgern und Zugträgern ergänzt sind, die alle in Form von Rohren ausgeführt sind, während der Bretterboden (2) aus einer Reihe von Holzplatten (20) besteht, die auf entsprechenden Auflagern angeordnet sind, im wesentlichen **dadurch gekennzeichnet, dass** die Masten (3) schwenkbar mit dem Tragwerk (1) verbunden sind, wobei ein Wendeträger (7) dazwischen montiert ist, an dem der Mast (3) selbst angeordnet ist, wobei der genannte Wendeträger (7) schwenkbar mit einem auf Stützen (6) des Tragwerks (1) befestigten Rahmen (10) verbunden ist, mit der Besonderheit, dass der Bretterboden (2) aus an den Stützen (6) befestigten waagerechten Balken (17) besteht, mit denen einstükkig in Längsrichtung U-förmige Profile (18) verbunden sind, mit Rastmitteln für komplementäre Befestigungselemente, die zu diesem Zweck an den Holzplatten (20) vorgesehen sind, die die Fläche des Bretterbodens (2) bilden.

2. Verbesserte Bühne nach Anspruch 1, **dadurch gekennzeichnet, dass** der Wendeträger (7) als Rohr ausgeführt ist und winkelförmig ausgestaltet ist, mit Befestigungszugträgern (7') und mit einer oder mehr Spindeln (8), um die senkrechte Ausrichtung des Masten (3) in der senkrechten Anordnung desselben einzustellen und die Lasten auf das Gelände zu übertragen, wobei vorgesehen ist, dass der Wendeträger (2) mit Gelenkmitteln (15) versehen ist, für seine schwenkbare Verbindung mit dem Rahmen (10), der über mit unteren Stiften (11') und Keilen (12) versehene Verankerungsmittel (11) an den Stützen (6) befestigt wird, wobei weiterhin vorgesehen ist, dass der Wendeträger (7) unten Befestigungsaugen (16) aufweist, die zusammen mit Bolzen den genannten Wendeträger (7) in der senkrechten Position des Masten (3) auf dem Rahmen (10) befestigt.

3. Verbesserte Bühne nach den vorhergehenden Ansprüchen, **dadurch gekennzeichnet, dass** auf dem Wendeträger (7) ein Motor (25) moniert ist, dessen Antrieb das Hochziehen des Masten (3) mit sich bringt, der auf der oben liegenden Oberfläche des Bretterbodens (2) montiert wird, wobei der genannte Motor mit einem an dem Kipprahmen (10) verankerten Kabel oder Kette (25) verbunden ist, wobei vorgesehen ist, dass als Antriebsmotor ein Motor eingesetzt werden kann, der die Laufkatze (5) für das Hochziehen verschiedener Gegenstände, von Elementen der Abdeckung bzw. des Dachs (4) der Bühne bis zu Komponenten und Geräten für Licht und Ton den Mast (3) entlang bewegt.

4. Verbesserte Bühne nach Anspruch 1, **dadurch gekennzeichnet, dass** die waagerechten Balken (17), aus denen der Bretterboden (2) besteht, an ihren Enden mit Befestigungselementen (17') für diese Balken (17) auf Scheiben (13) versehen sind, wobei diese Scheiben an den Stützen (6) des Tragwerks (1) vorgesehen sind, wobei vorgesehen ist, dass das in Längsrichtung einstückig mit dem Balken (17) verbundene U-förmige Profil (18) in regelmäßigen Abständen mit Fenstern (19) versehen ist, in denen ein Stift (23) aufgenommen ist, der teilweise auskragend an einem Träger (22) befestigt ist, der entsprechend den Enden eines Längsträgerpaars (21) ausgeführt ist, die auf der unteren Seite der entsprechenden Platte (20) vorgesehen sind.

Revendications

1. Scène perfectionnée, du type monté à l'air libre pour les spectacles musicaux et assimilés, construit à partir d'une structure d'appui (1) pour plancher (2) et une série de pylônes (3) pour supporter une toiture (4), ainsi que des équipements d'éclairage, de sonorisation et autres, où la structure d'appui (1) dispose d'étais verticaux (6) complétés par des longerons, des traverses et des entretoises, tous tubulaires, alors que le plancher (2) est formé d'une série de panneaux en bois (20) disposés sur les appuis correspondants, essentiellement **caractérisée en ce que** les pylônes (3) sont associées de manière pivotante à la structure d'appui (1) au moyen d'un support tournant (7) sur lequel est disposé le propre pylône (3), ledit support tournant (7) étant associé de manière à un châssis (10) fixé à des étais (6) de la structure d'appui (1); en particulier, le plancher (2) est constitué de poutres horizontales (17) fixées aux étais (6) sur lesquels sont solidarisés longitudinalement des profils en « U » (18) à l'aide de moyens de retenue pour éléments de fixation complémentaires prévus à cet effet sur les panneaux en bois (20) qui déterminent la surface du plancher (2).

2. Scène perfectionnée, selon la revendication 1, **ca-**

ractérisée en ce que le support tournant (7) est tubulaire et configuré en équerre, avec des entretoises de fixation (7') et avec une ou plusieurs broches (8) pour régler la verticalité du pylône (3) dans la disposition verticale de celle-ci et transmettre les charges au terrain; il a été également prévu que ledit support tournant (2) dispose de moyens d'articulation (15) pour être associés de manière pivotante au châssis (10) qui est fixé aux étais (6) à l'aide de moyens d'attache (11) munis de doigts inférieurs (11') et de cales (12), alors que le support tournant (7) intègre sur sa partie basse des oreillettes (16) qui, à l'aide de goupilles, immobilise ledit support tournant (7) sur le châssis (10) sur la position verticale du pylône (3).

3. Scène perfectionnée, selon les revendications précédentes, **caractérisée en ce que** le support tournant (7) intègre un moteur (25) dont l'actionnement entraîne la montée du pylône (3) qui est monté sur la surface supérieure du plancher (2), ce moteur étant associé à un câble ou chaîne (25) amarré au châssis basculant (10), ayant prévu d'utiliser comme moteur d'actionnement un moteur qui déplace le long du pylône (3) le chariot glissant (5) d'élévation d'objets divers, depuis des éléments de toiture (4) de la scène, jusqu'à des composants et des équipements d'éclairage et sonorisation.

4. Scène perfectionnée, selon la revendication 1, **caractérisée en ce que** les poutres horizontales (17), à partir desquelles est construit le plancher (2), disposent sur leurs extrémités d'éléments (17') de fixation de ces poutres (17) sur des disques (13) prévus sur les étais (6) de la structure d'appui (1), étant prévu que le profil en « U » (18), solidarisé longitudinalement sur la poutre (17), est percé de baies (19), à intervalles réguliers, dans lesquelles est logé un doigt (23) fixé partiellement en saillie à un support (22), établi face aux extrémités d'une paire de longerons (21) prévus sur la face inférieure du panneau (20) correspondant.

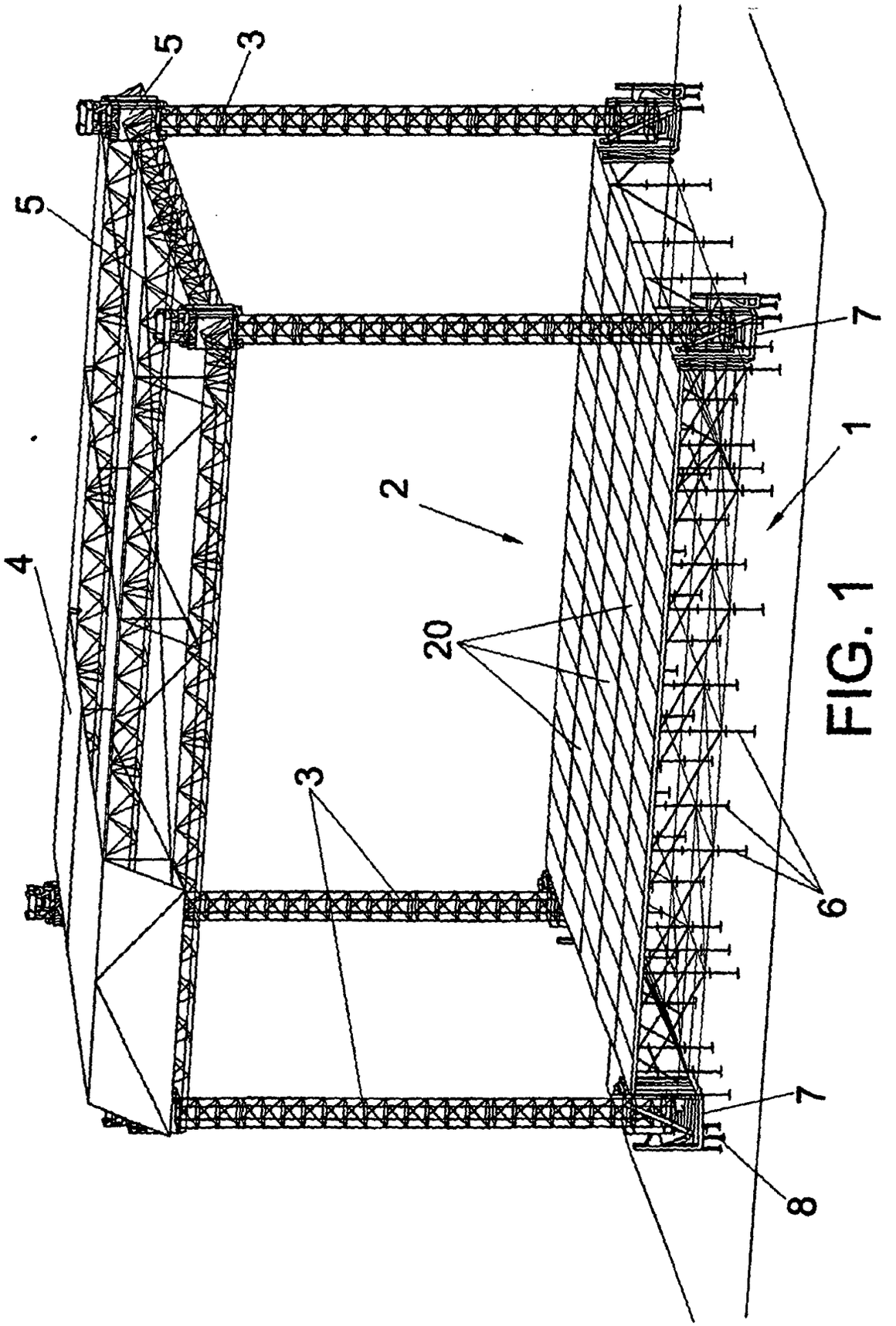


FIG. 1

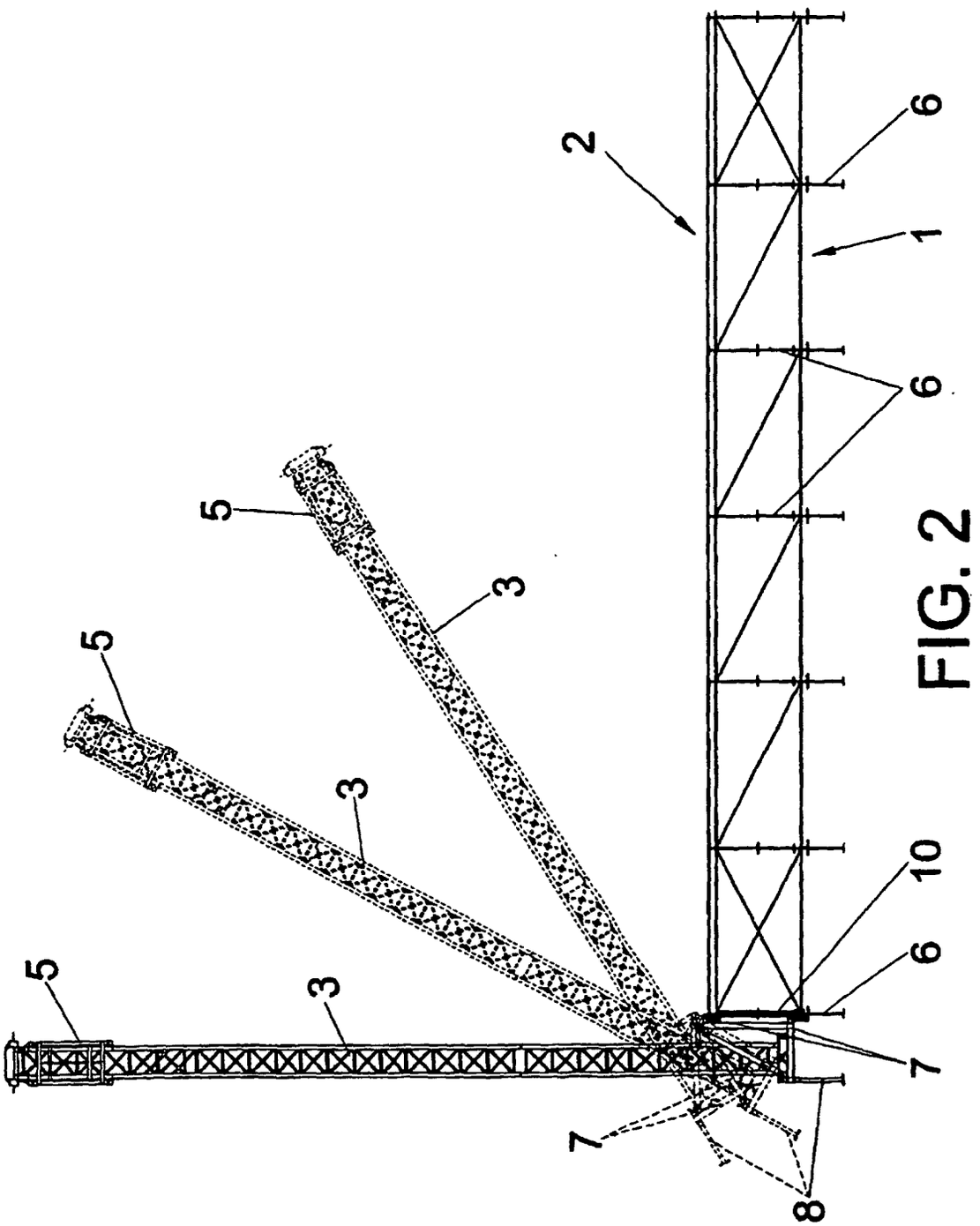


FIG. 2

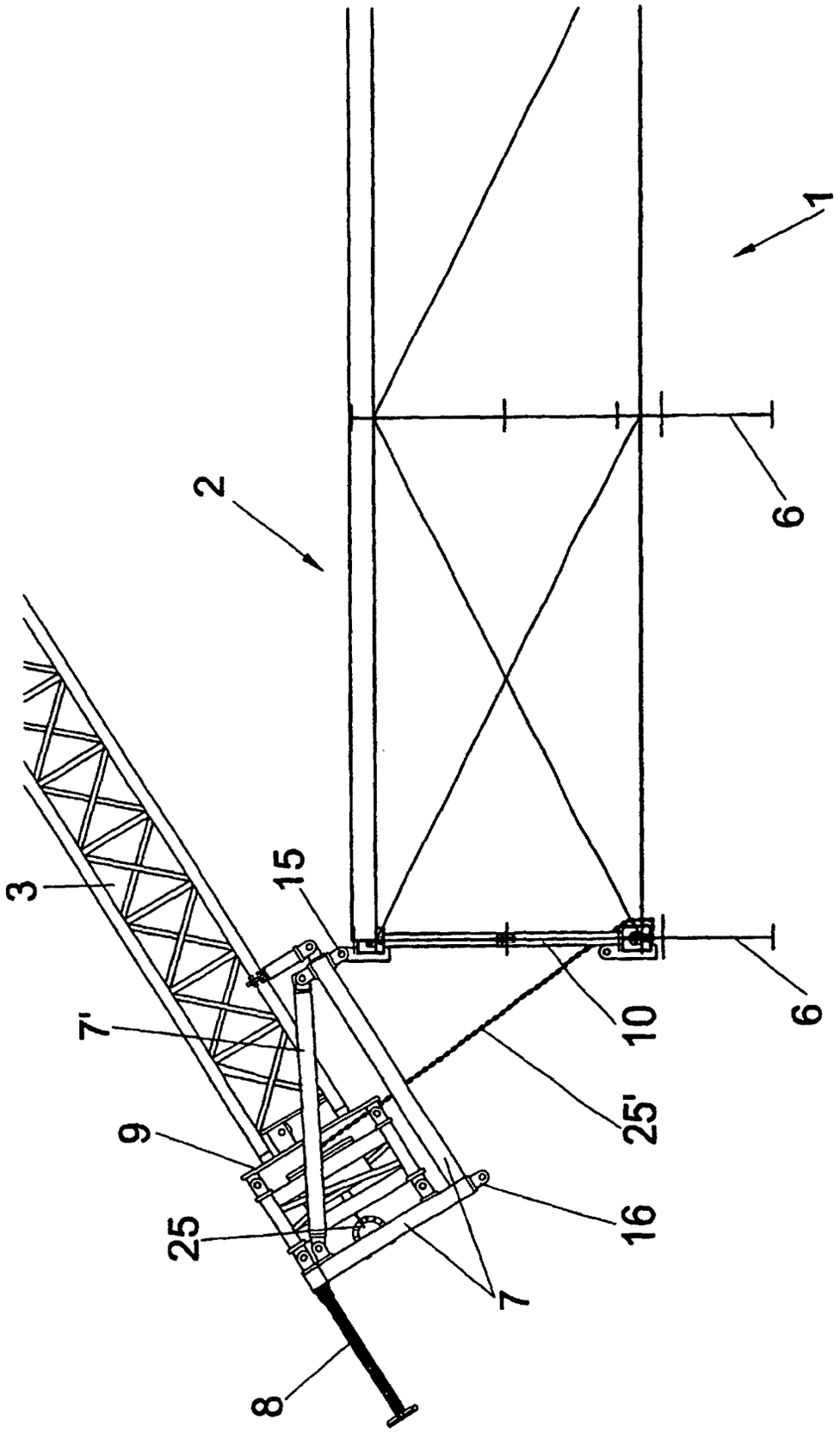


FIG. 3

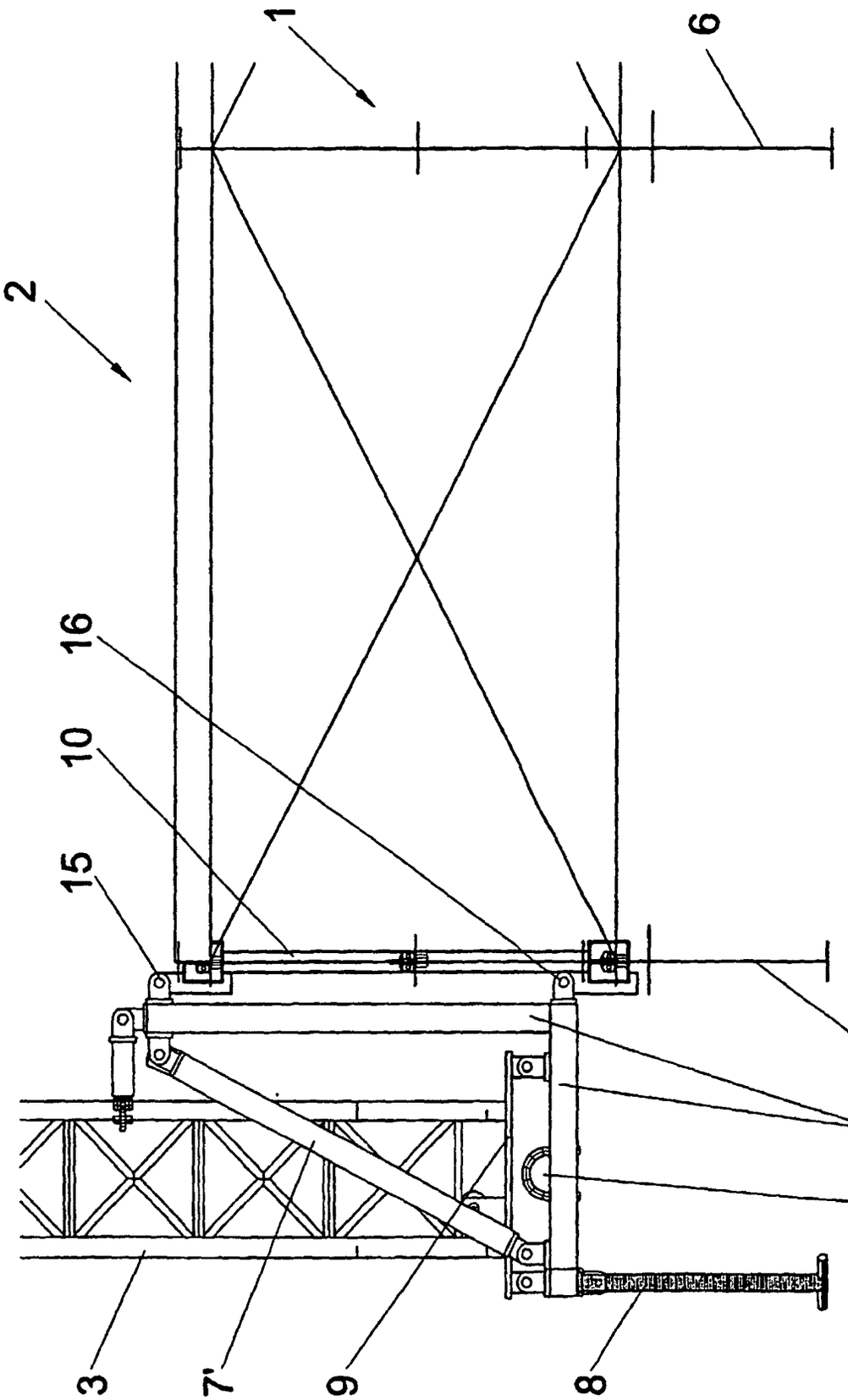


FIG. 4

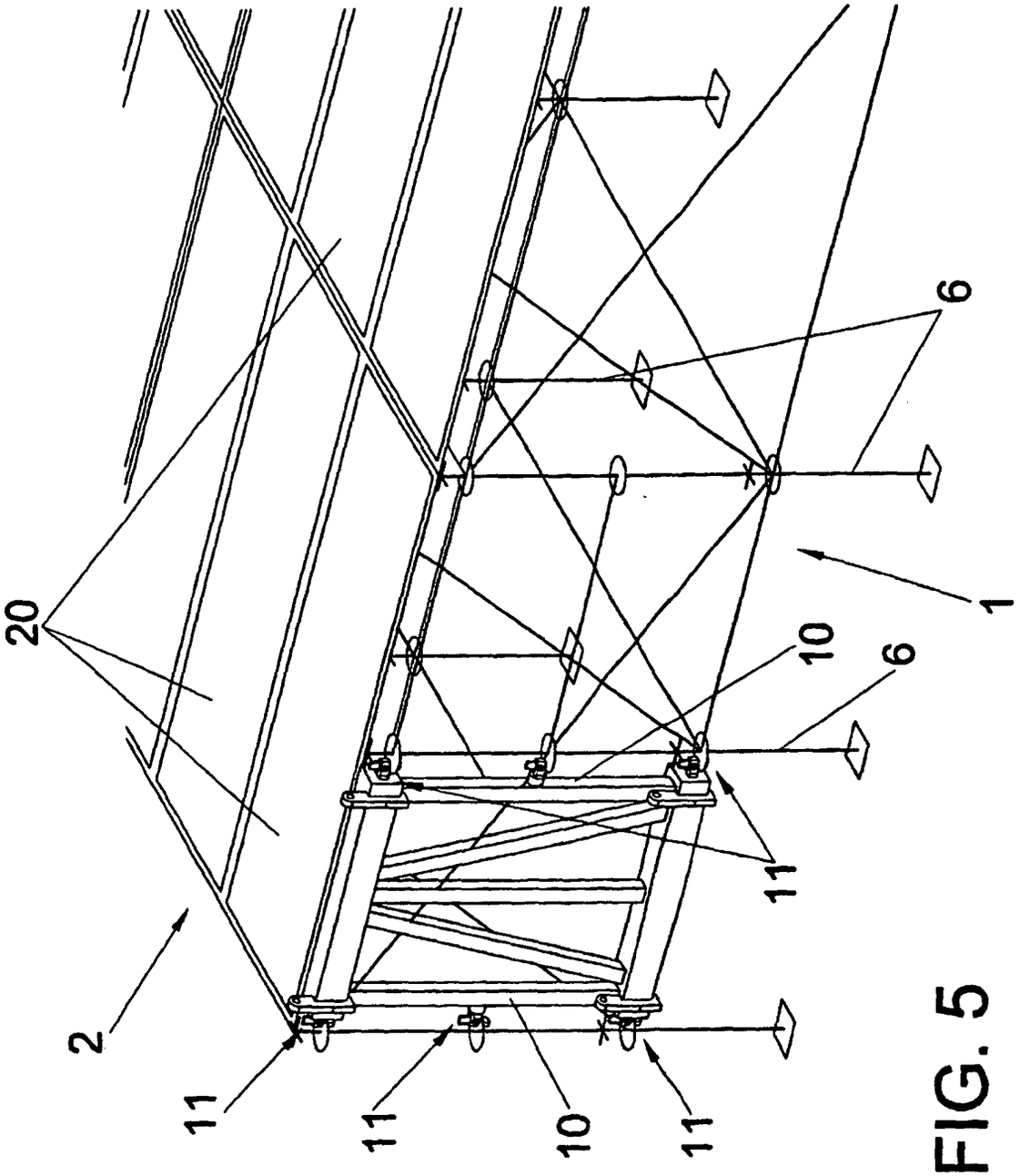


FIG. 5

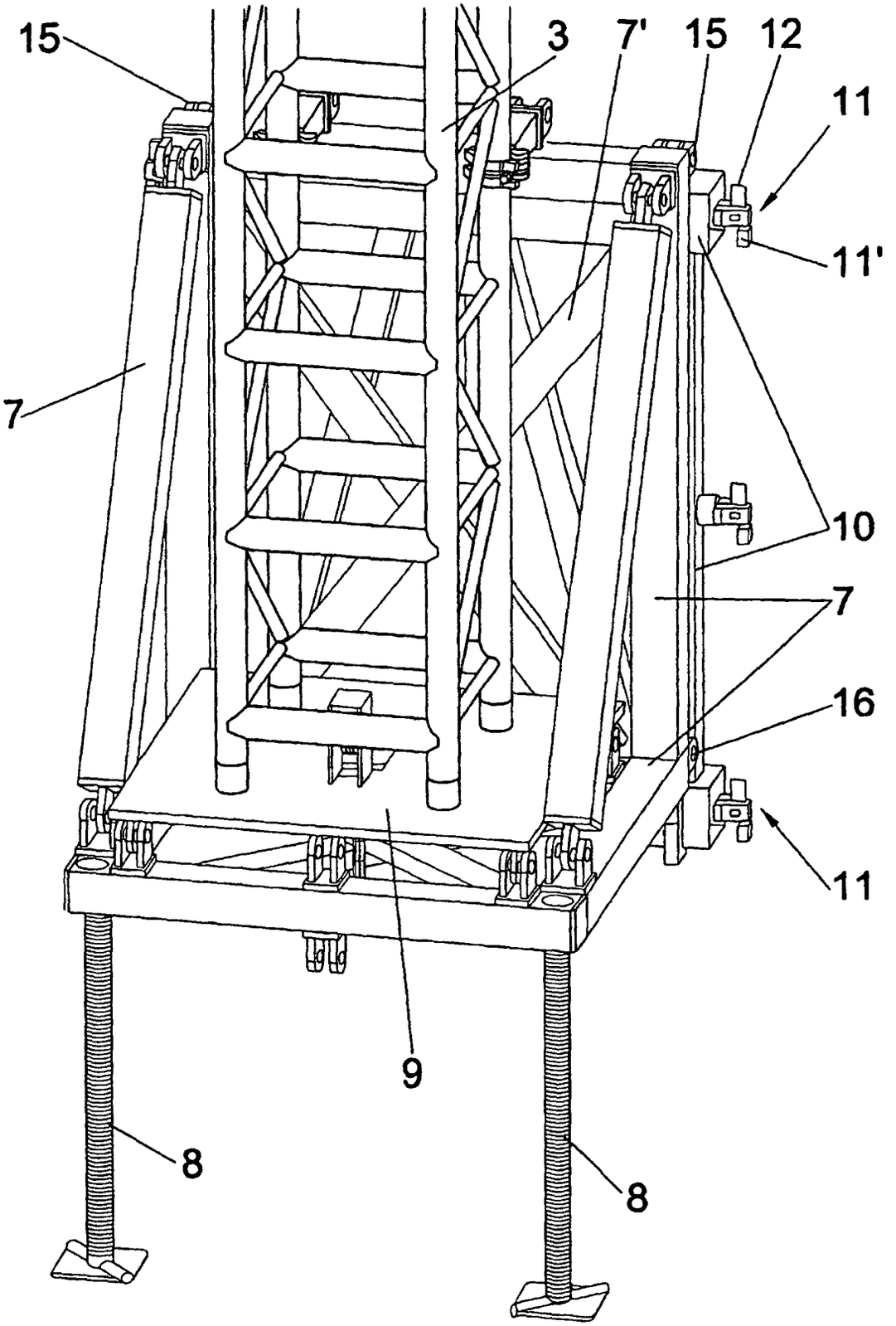


FIG. 6

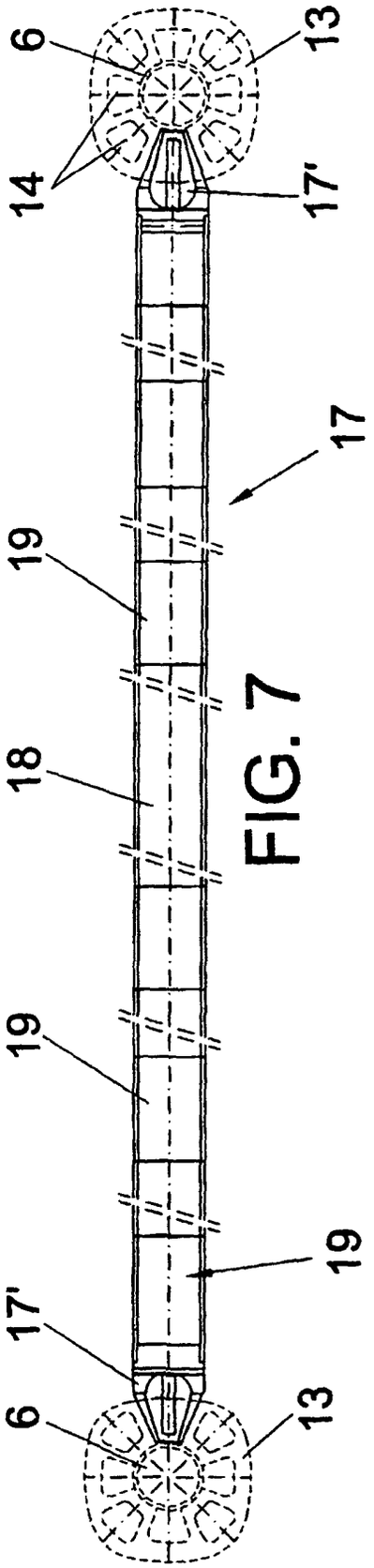


FIG. 7

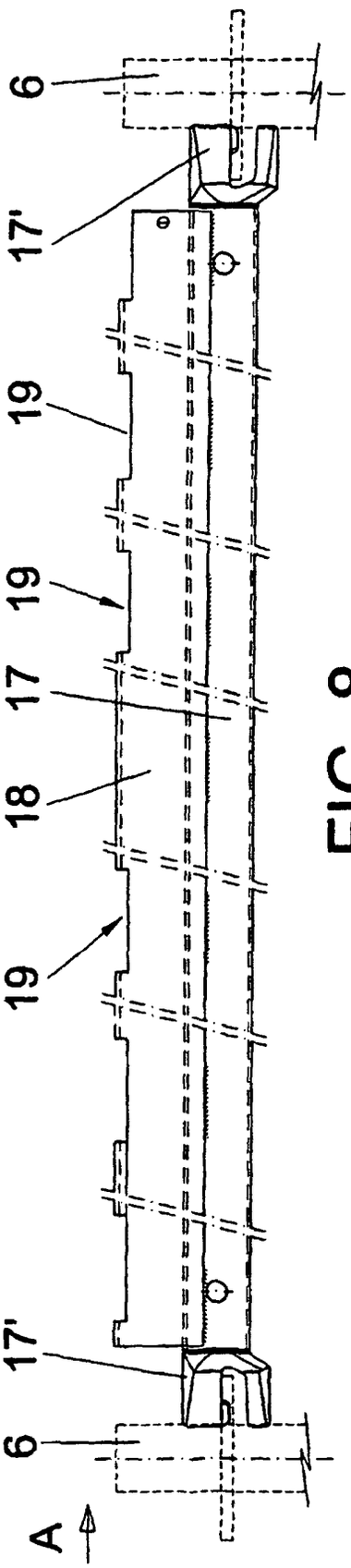


FIG. 8

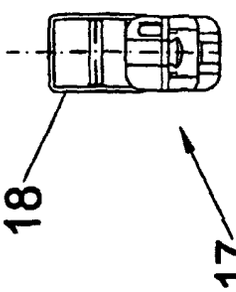


FIG. 9

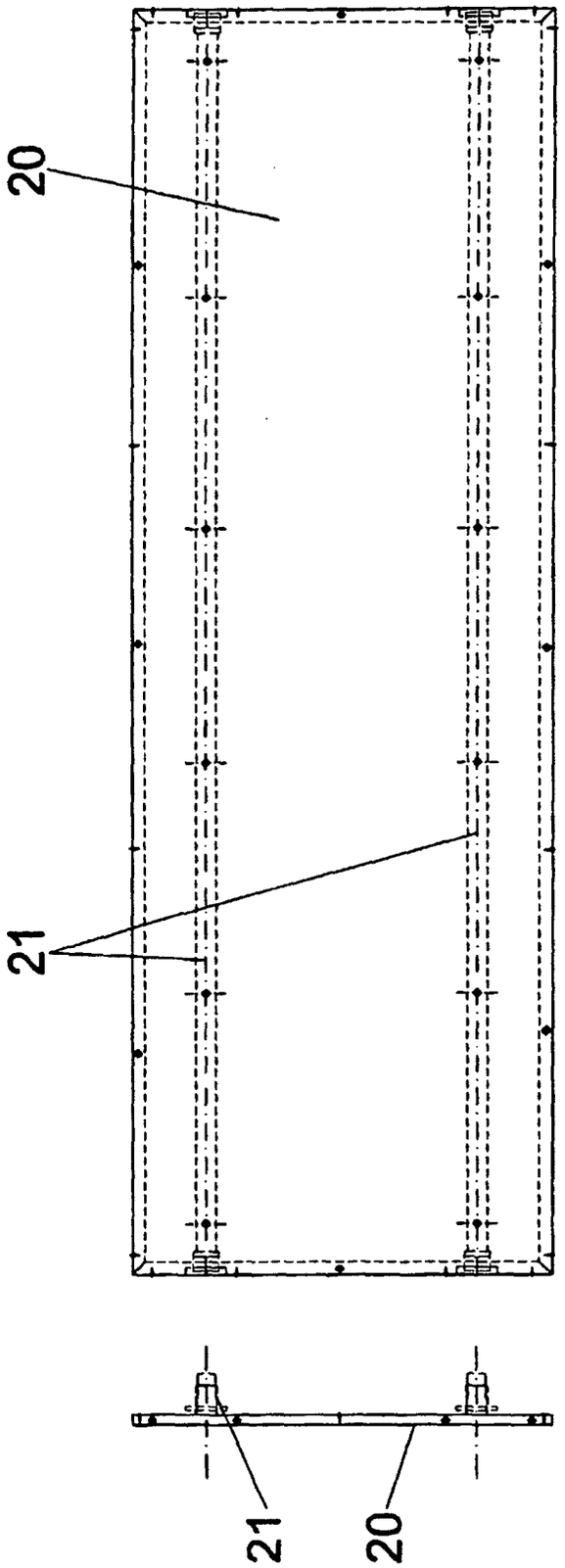


FIG. 10

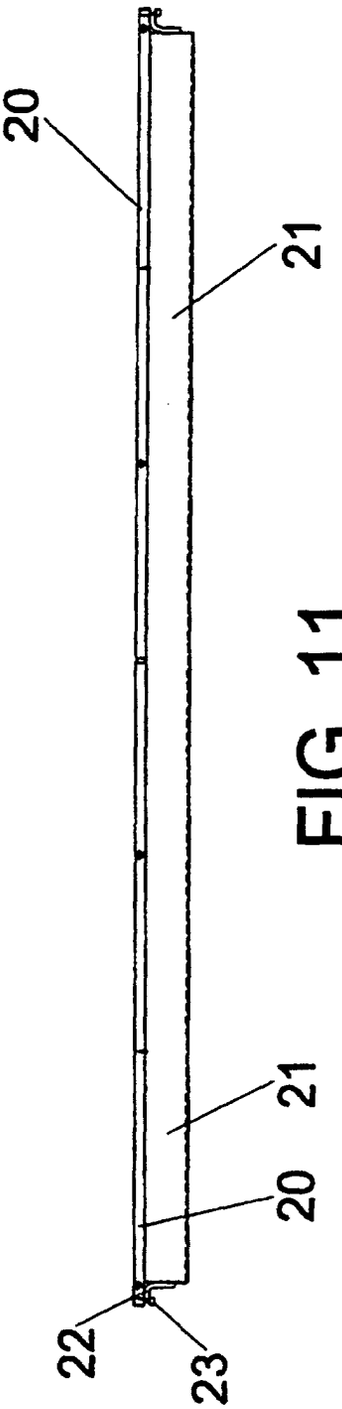


FIG. 11

FIG. 12

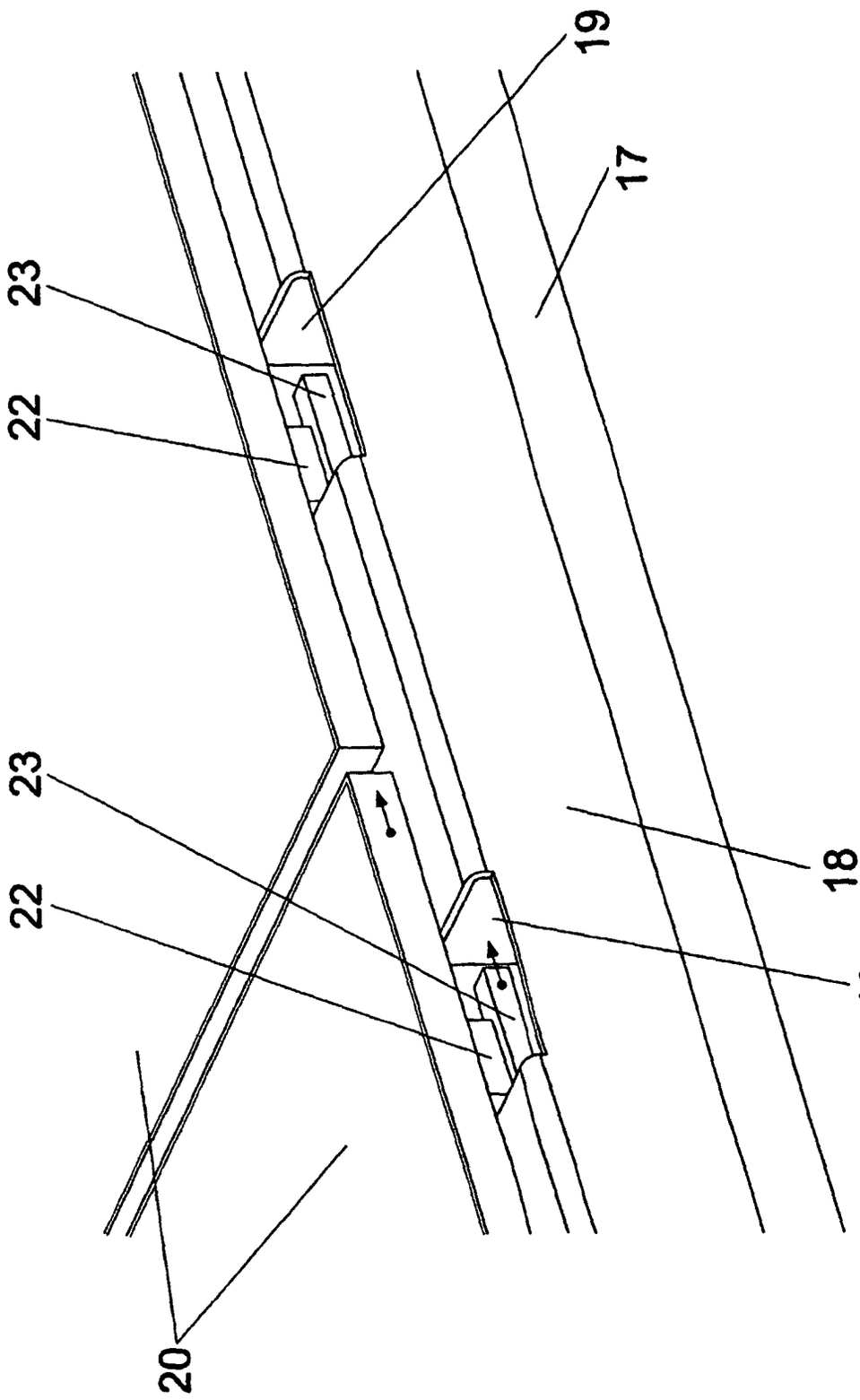


FIG.13