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(54) **MOVEMENT STRUCTURE FOR SLIDING GATES**

(57) A movement structure for sliding gates, characterised in that it comprises a sliding gate movable between a closed position and an open position at a passage delimited by at least one column; said column supporting guiding means consisting of at least one oscillating carriage adapted to guide an upper beam element of the gate; said upper beam element is a non-horizontal

element with variable inclination, said oscillating carriage being associated with said column in a fixed position and being adapted to follow the trend of said upper beam element, in a substantially vertical direction, during the sliding of the gate between said open and closed positions, maintaining contact with said upper beam element and supporting said gate.

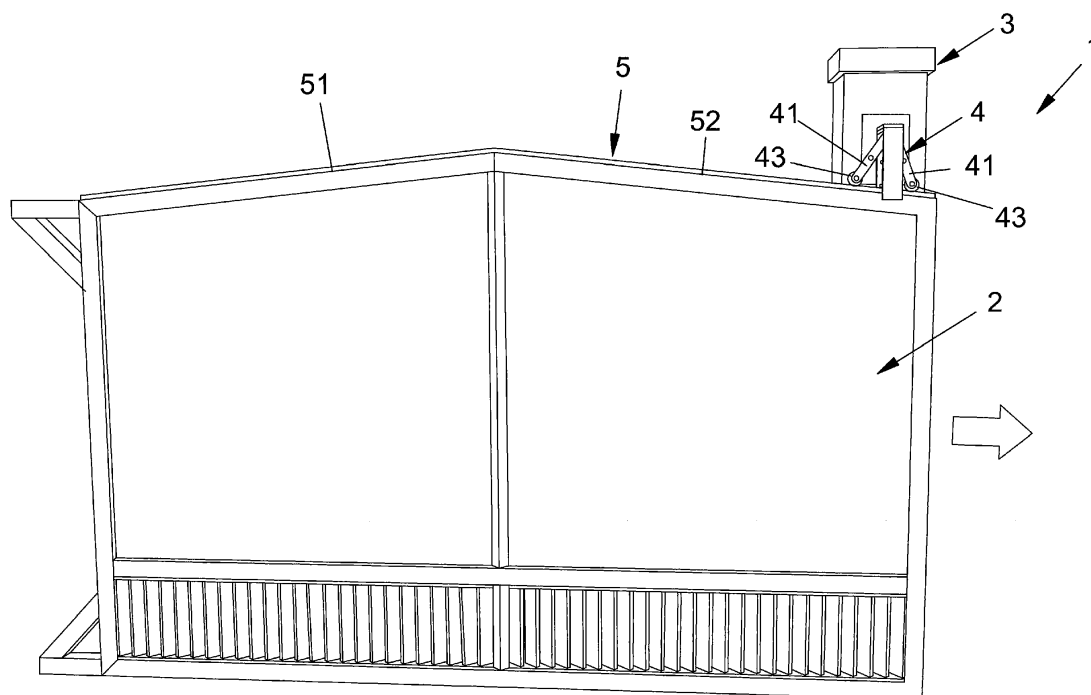


FIG.1

Description

BACKGROUND OF THE INVENTION

[0001] The present invention concerns a movement structure for sliding gates.

[0002] As is known, sliding gates rest on a track laid on the ground and/or on roller guides installed on a support plate fixed to one of the columns located at the sides of the passage obstructed by the gate.

[0003] A sliding gate with the upper side not composed of a horizontal beam but a beam having other shapes, for example triangular, arc of a circle or otherwise curved, presents a problem compared to a gate with straight upper side.

[0004] When the upper side of the gate is composed of a straight horizontal beam, the sliding and upper support of the gate are ensured by simple roller guides, generally made of Teflon, installed on the support plate fixed to one of the columns.

[0005] When the gate does not have a straight horizontal upper portion, in order to ensure sliding and support of the upper part, it is necessary to add a straight beam arranged horizontally between the two vertical uprights of the gate.

[0006] The beam, positioned just below the irregular upper side, has the purpose of acting as a guide for sliding and support of the gate.

[0007] The above solution has the drawback of being an element extraneous to the shape and style of the gate, yet it is necessary to allow the movement of the gate.

[0008] The above-mentioned beam is mounted on the inner side of the gate and is therefore not visible from the outside, but this applies only to gates with a closed structure, for example formed of continuous panels; in the case of a gate with open structure, for example of the railing bar type, the beam for guiding and sliding the gate is visually exposed and ruins the aesthetics of the gate.

SUMMARY OF THE INVENTION

[0009] The aim of the present invention is to provide a movement structure designed in particular for sliding gates having a non-straight non-horizontal upper part.

[0010] Within this aim, one object of the present invention is to provide a movement structure that allows a precise guiding of the gate, with an adequate support, without altering the appearance of the gate.

[0011] A further object of the present invention is to provide a structure that can be produced by using elements and materials commonly available on sale and which is also competitive in economic terms.

[0012] The present structure, due to its particular construction characteristics, is able to ensure the widest guarantees of reliability and safety in use.

[0013] These and other objects, which will become more apparent hereinafter, are achieved by a movement structure for sliding gates, characterised in that it comprises

a sliding gate movable between a closed position and an open position at a passage delimited by at least one column; said column supporting guiding means consisting of at least one oscillating carriage adapted to guide an upper beam element of the gate; said upper beam element is a non-horizontal element with variable inclination, said oscillating carriage being associated with said column in a fixed position and being adapted to follow the trend of said upper beam element, in a substantially vertical direction, during the sliding of the gate between said open and closed positions, maintaining the contact with said upper beam element and supporting said gate.

BRIEF DESCRIPTION OF THE DRAWINGS

[0014] Further characteristics and advantages of the subject of the present invention will become more apparent through an examination of the description of a preferred but not exclusive embodiment of the invention, illustrated for indicative and non-limiting purposes in the accompanying drawings, in which:

figure 1 is a perspective view illustrating a sliding gate with two upper flaps, fitted with the movement structure of the present invention and illustrated in the open position;

figure 2 is a perspective view illustrating the gate of the preceding figure in the position halfway through its closing stroke;

figure 3 is a perspective view illustrating the gate of the preceding figure in the closed position;

figure 4 is a perspective view illustrating a sliding gate with two upper flaps with greater inclination, fitted with the movement structure of the present invention and illustrated in the open position;

figure 5 is a perspective view illustrating the gate of the preceding figure from the opposite side, in the position halfway through its closing stroke;

figure 6 is a perspective view illustrating the gate of the preceding figure in the closed position;

figure 7 is a perspective view illustrating the gate of the preceding figure in an intermediate position of the closing or opening stroke;

figure 8 is a perspective view illustrating a sliding gate with railing bars, fitted with the movement structure of the present invention and illustrated in the open position;

figure 9 is a perspective view, illustrating the gate of the preceding figure in the position halfway through the closing stroke;

figure 10 is an enlarged perspective view illustrating in detail the guiding carriage of the gate of the preceding figure;

figure 11 is a perspective view illustrating a sliding gate with railing bars with wave-shaped upper beam element, fitted with the movement structure of the present invention and illustrated in an intermediate

position of the closing or opening stroke;
 figure 12 is a perspective view illustrating the gate of the preceding figure in the closed position;
 figure 13 is a perspective view illustrating a tall oscillating guiding carriage;
 figure 14 is a perspective view illustrating an oscillating guiding carriage;
 figure 15 is a perspective view illustrating a guiding carriage with twin wheels;
 figure 16 is another perspective view illustrating the guiding carriage with twin wheels;
 figure 17 is a perspective side view illustrating a guiding carriage with single arm;
 figure 18 is a perspective view illustrating the guiding carriage with single arm.

DISCLOSURE OF PREFERRED EMBODIMENTS

[0015] With particular reference to the numerical symbols of the above-mentioned figures, the movement structure for sliding gates, according to the present invention, generally indicated by the reference number 1, comprises a sliding gate 2 movable between a closed position and an open position at a passage delimited by at least one column 3.

[0016] The column 3 supports guiding means consisting of at least one oscillating carriage 4 adapted to guide an upper beam element 5 of the gate 2.

[0017] The upper beam element 5 is a non-horizontal element with variable inclination and the oscillating carriage 4, associated with the column 3 in a fixed position, follows the trend of the upper beam element 5, in a vertical direction, during the sliding of the gate 2 between the open and closed positions, maintaining contact with the upper beam element 5 and supporting the gate.

[0018] The oscillating carriage 4 comprises at least one oscillating arm 41 having one end hinged in a support body 42 adapted to be fixed to the column 3.

[0019] The free end of each oscillating arm 41 supports at least one wheel 43 provided with groove 44 which engages a guide 53 having the same shape as the upper beam element of the gate and being fixed thereto.

[0020] Each oscillating arm 41 is movable, countering at least one elastic element 45 which pushes the wheel 43 against the guide 53 of the beam element.

[0021] In the embodiment illustrated in figures 1-3, the upper beam element 5 comprises two inclined flaps 51 and 52.

[0022] In the embodiment illustrated in figures 4-7, the upper beam element, indicated by the reference number 105, comprises two inclined flaps 151 and 152 having a more pronounced inclination relative to the inclination of the upper beam element 5.

[0023] As can be seen in figure 5, the oscillating carriage 4 is able to manage the greater elevation of the central part of the beam element 105 by means of the wide oscillation of its arms 41.

[0024] In the embodiment illustrated in figures 8-10,

the gate, indicated by the reference number 202, consists of a series of vertical railing bars 221 and comprises at least one upper beam element 205 with a curvilinear trend.

[0025] In the embodiment illustrated in figures 11-12, the gate, indicated by the reference number 302, consists of a series of vertical railing bars 321 and comprises at least one upper beam element 305 with wavy curvilinear trend, i.e. with different portions having different radius and direction of curvature.

[0026] Figures 13-18 illustrate some embodiments of the oscillating carriage 4.

[0027] The tall oscillating carriage illustrated in figure 13 can be used instead of the standard carriage, shown in figure 14, for some applications.

[0028] In practice it has been found that the invention achieves the intended aim and objects.

[0029] In fact, a movement structure is provided which can be applied to gates with the upper side having an irregular shape allowing to eliminate the horizontal sliding guide mounted at the base of the upper side having irregular shape.

[0030] It should be noted that the movement structure of the present invention can also be advantageously used for gates with straight upper side.

[0031] The guide 53 of the structure of the present invention advantageously has the same shape as the upper beam element of the gate, therefore not altering the aesthetics thereof, and is appropriately fixed to the upper beam element to allow sliding of the guide wheels.

[0032] Advantageously, the carriage is composed of two oscillating arms fixed at one end to the pivot point and having at the other end at least one wheel with variable-shaped groove.

[0033] The arms are kept in position by an elastic element.

[0034] In the figures guides with different shapes are illustrated, with flaps inclined to a greater or lesser extent, curvilinear or wave-shaped; naturally it should be understood that other shapes can be used such as, for example, flaps, either straight or curvilinear, either concave or convex, etc.

[0035] The movement structure of the present invention can also be advantageously used in an existing conventional gate, by appropriately modifying the gate to adapt it to the oscillating carriage of the present invention. The conventional gate is modified by adding a guide according to the present invention and by eliminating the horizontal guide of the original gate.

[0036] Naturally, the materials used as well as their sizes can be any, according to requirements.

Claims

1. A movement structure for sliding gates, **characterised in that** it comprises a sliding gate (2, 202, 302) movable between a closed position and an open po-

sition at a passage delimited by at least one column (3); said column (3) supporting guiding means consisting of at least one oscillating carriage (4) adapted to guide an upper beam element (5, 105, 205, 305) of the gate (2, 202, 302); said upper beam element (5, 105, 205, 305) is a non-horizontal element with variable inclination, said oscillating carriage (4) being associated with said column (3) in a fixed position and being adapted to follow the trend of said upper beam element (5, 105, 205, 305), in a substantially vertical direction, during the sliding of the gate (2, 202, 302) between said open and closed positions, maintaining contact with said upper beam element (5, 105, 205, 305) and supporting said gate.

2. The structure, according to claim 1, **characterised in that** said oscillating carriage (4) comprises at least one oscillating arm (41) having one end hinged in a support body (42) adapted to be fixed to said column (3); the free end of each oscillating arm (41) supporting at least one wheel (43) adapted to follow said upper beam element (5, 105, 205, 305).
3. The structure, according to claim 2, **characterised in that** said wheel (43) is fitted with a groove (44) which engages a guide (53) that has the same shape as the upper beam element (5, 105, 205, 305) of the gate and is fixed to said upper beam element (5, 105, 205, 305).
4. The structure, according to claim 2, **characterised in that** each oscillating arm (41) is movable countering at least one elastic element (45).
5. The structure, according to claim 1, **characterised in that** said upper beam element (5, 105) comprises two inclined flaps (51, 52, 151, 152).
6. The structure, according to claim 1, **characterised in that** said gate (202, 302) consists of a series of vertical railing bars (221, 321) and comprises at least one upper beam element (205, 305) with a curvilinear trend.
7. The structure, according to claim 6, **characterised in that** said upper beam element (305) has a wavy curvilinear trend, namely with different portions having different radius and direction of curvature.

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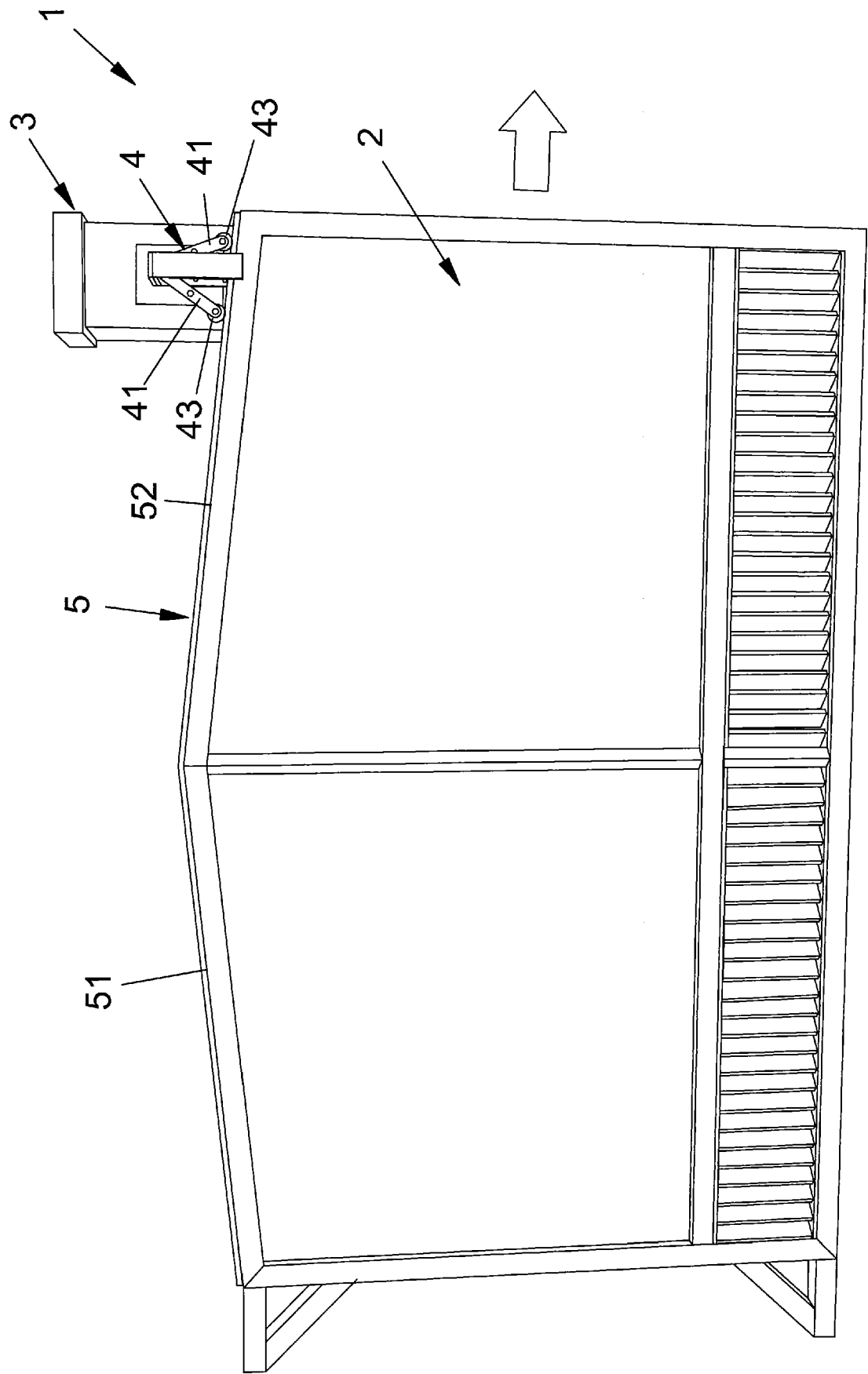


FIG.1

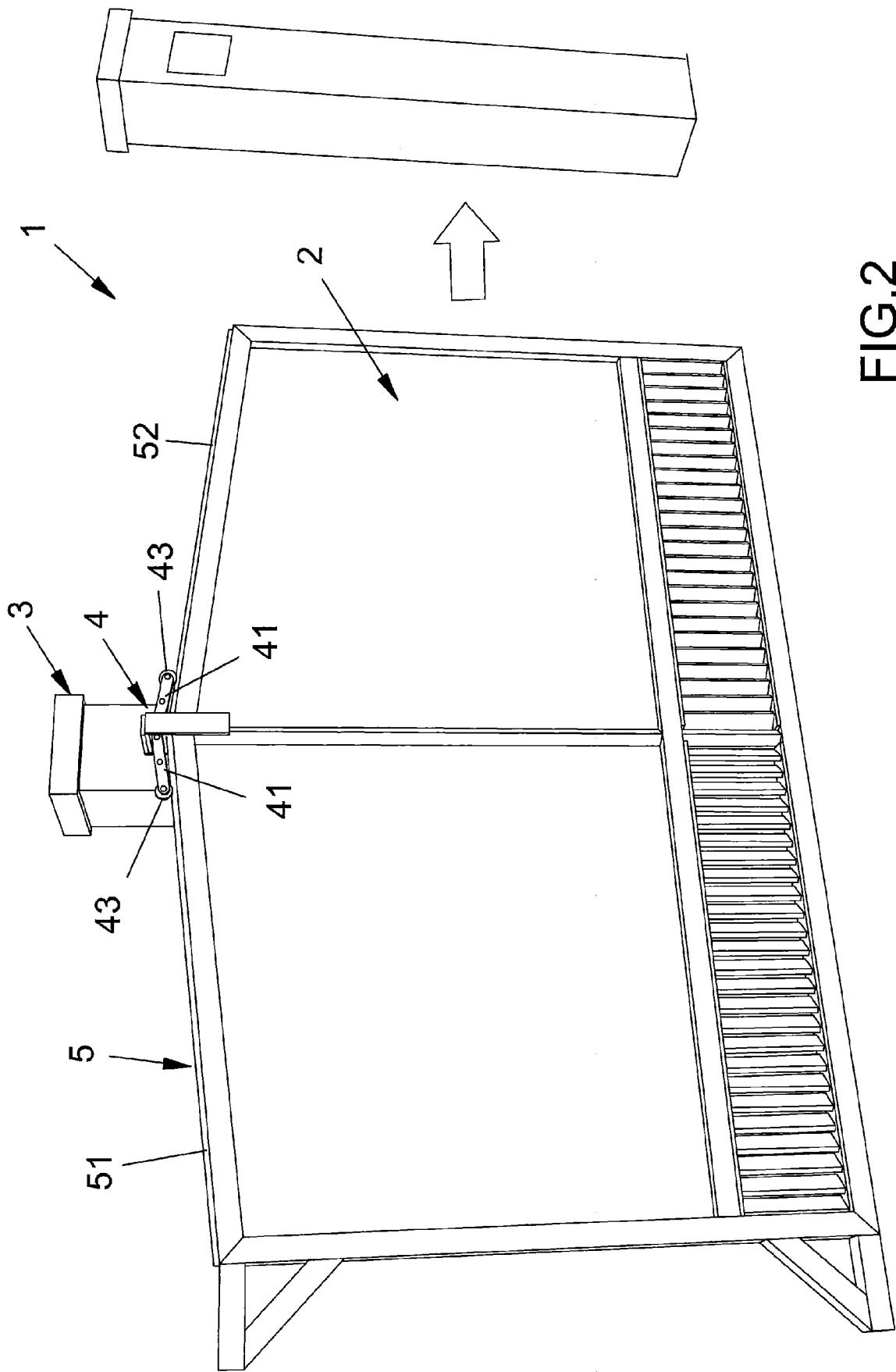
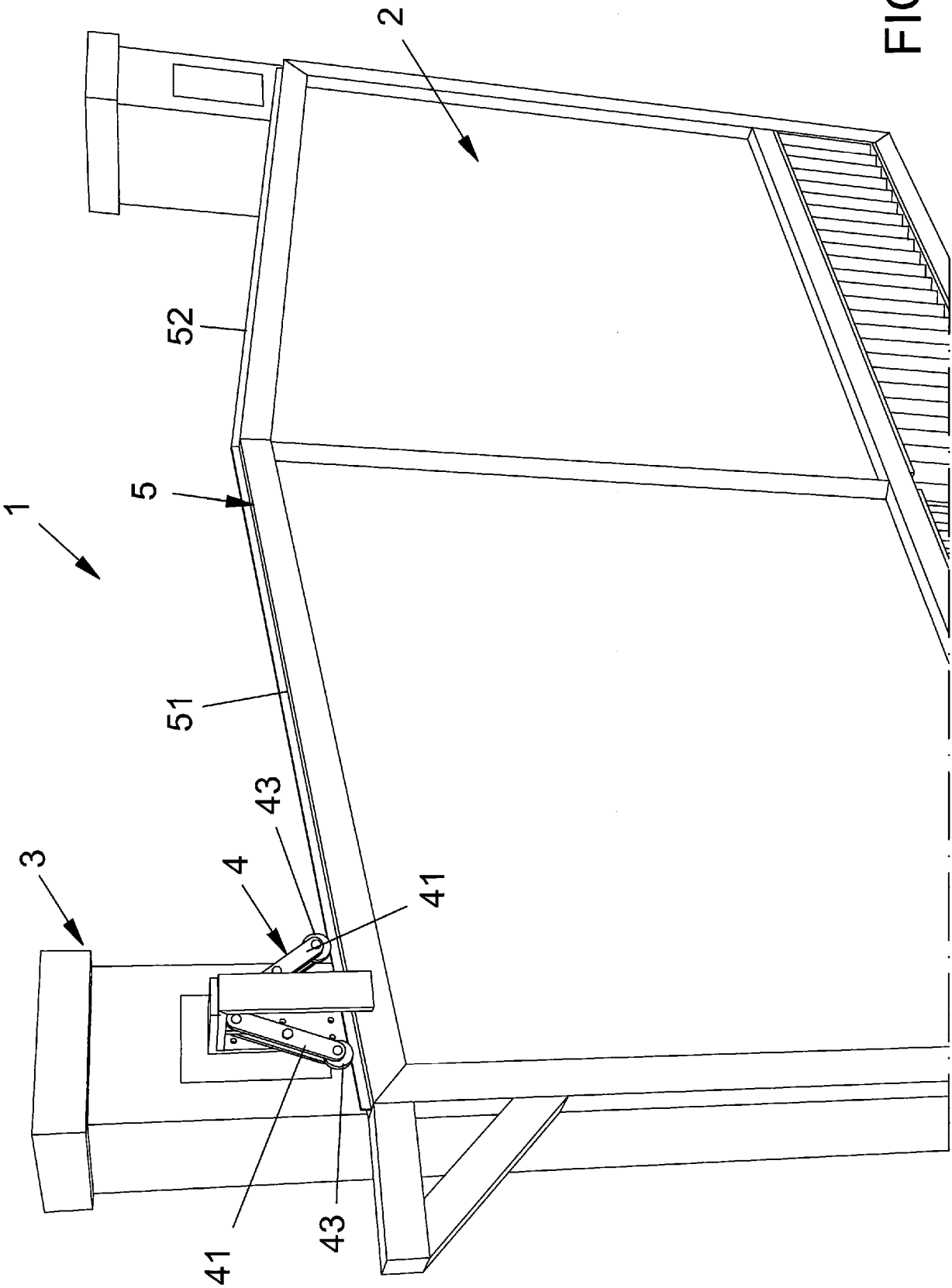
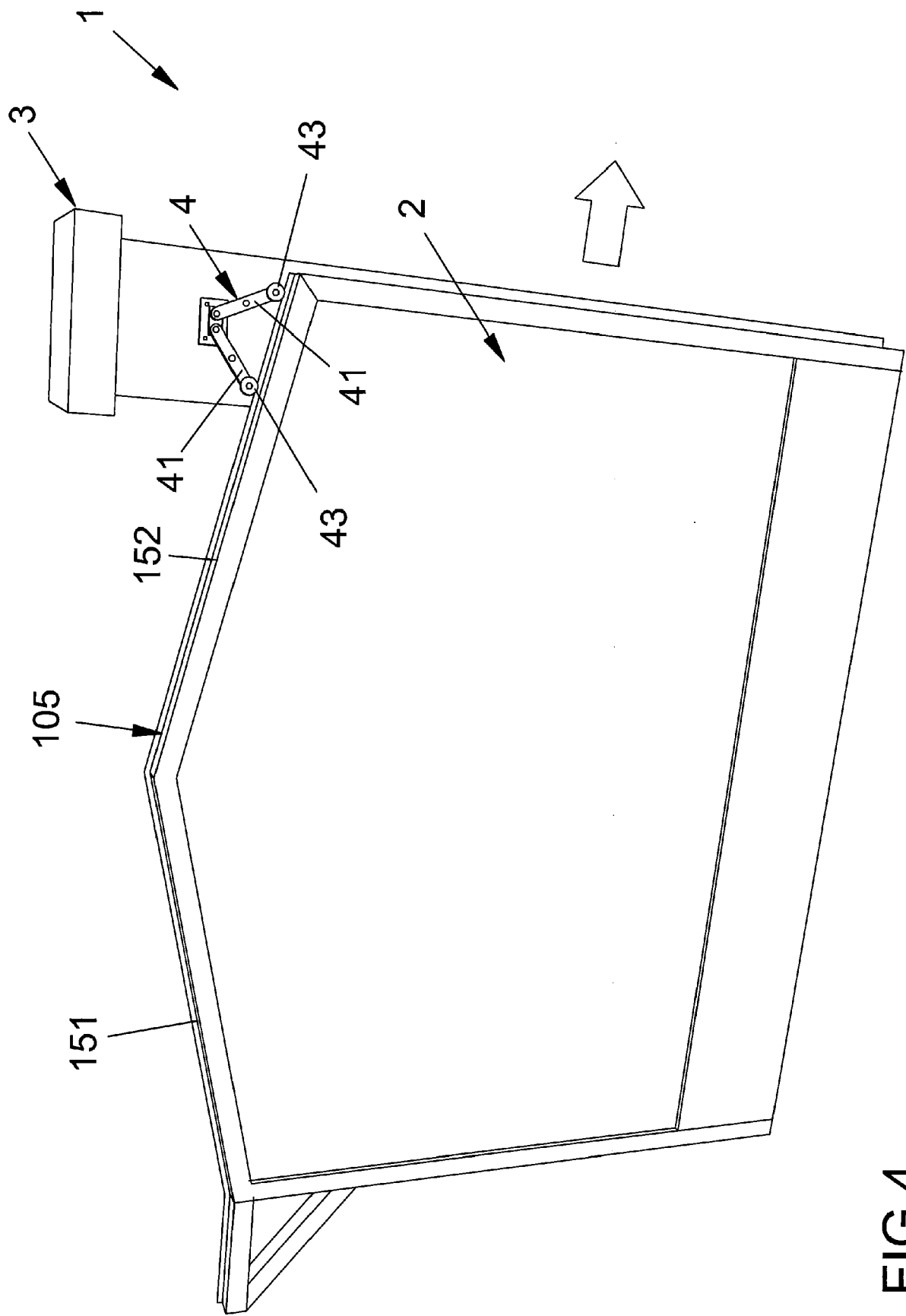


FIG. 2

FIG.3





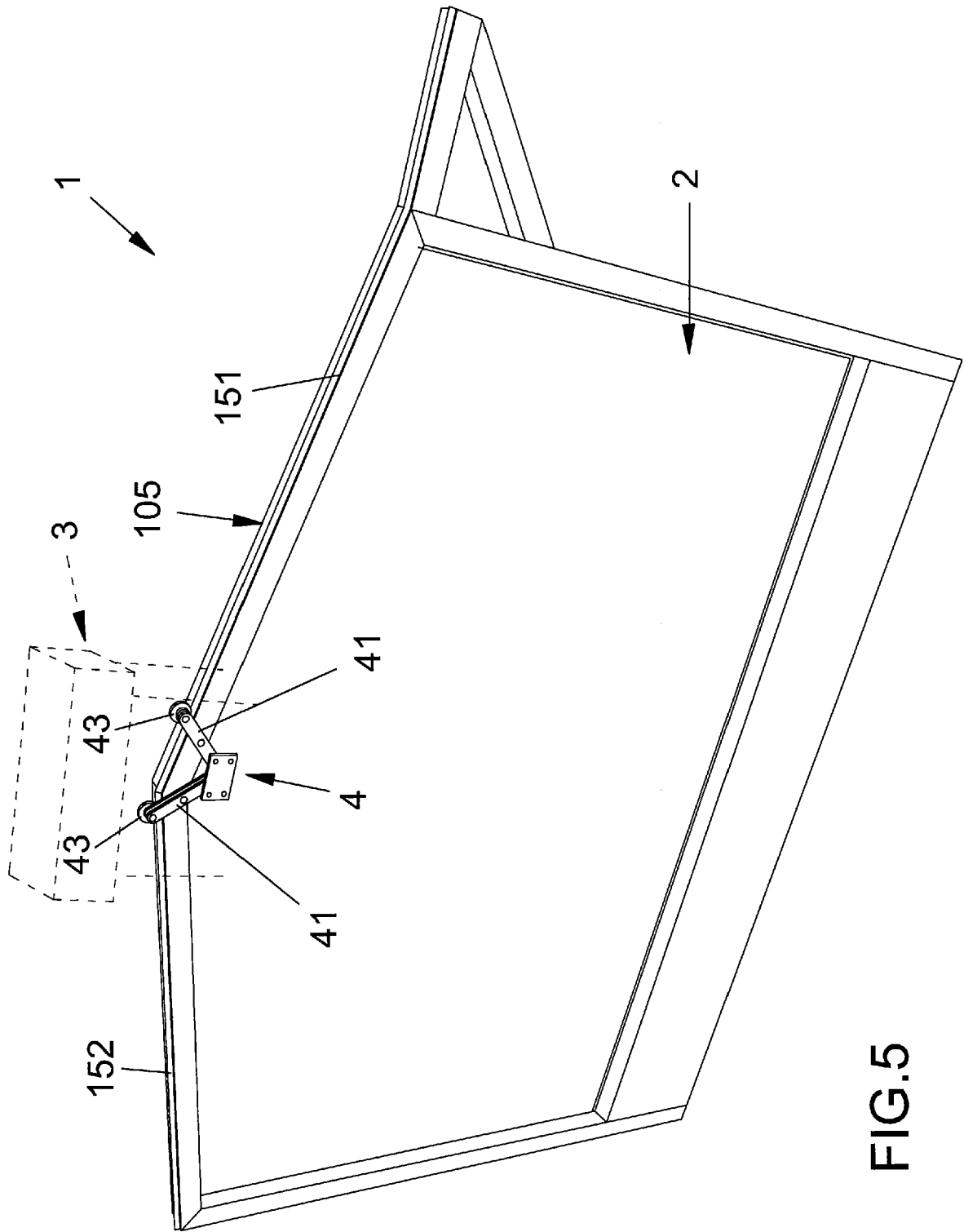


FIG.5

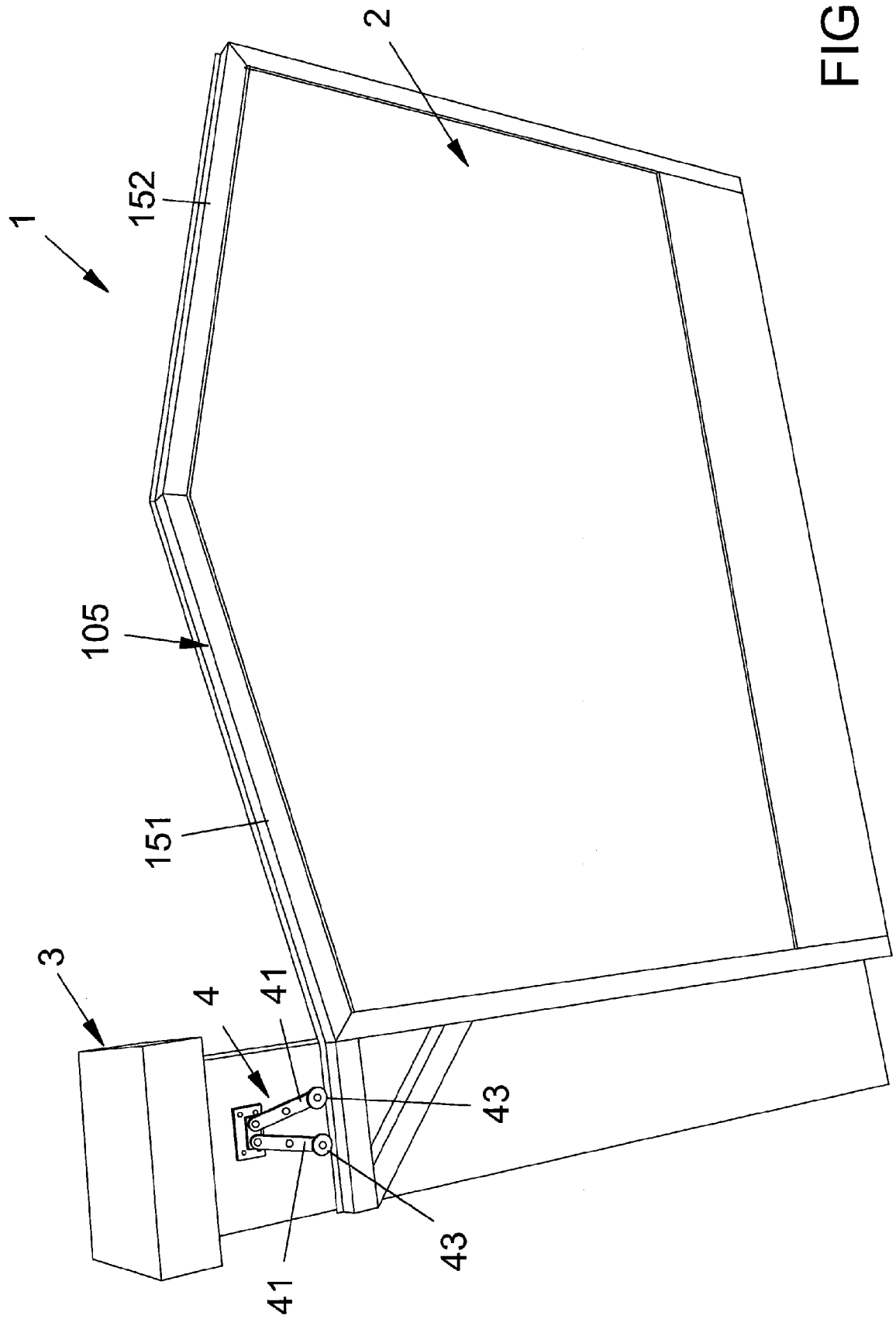


FIG.6

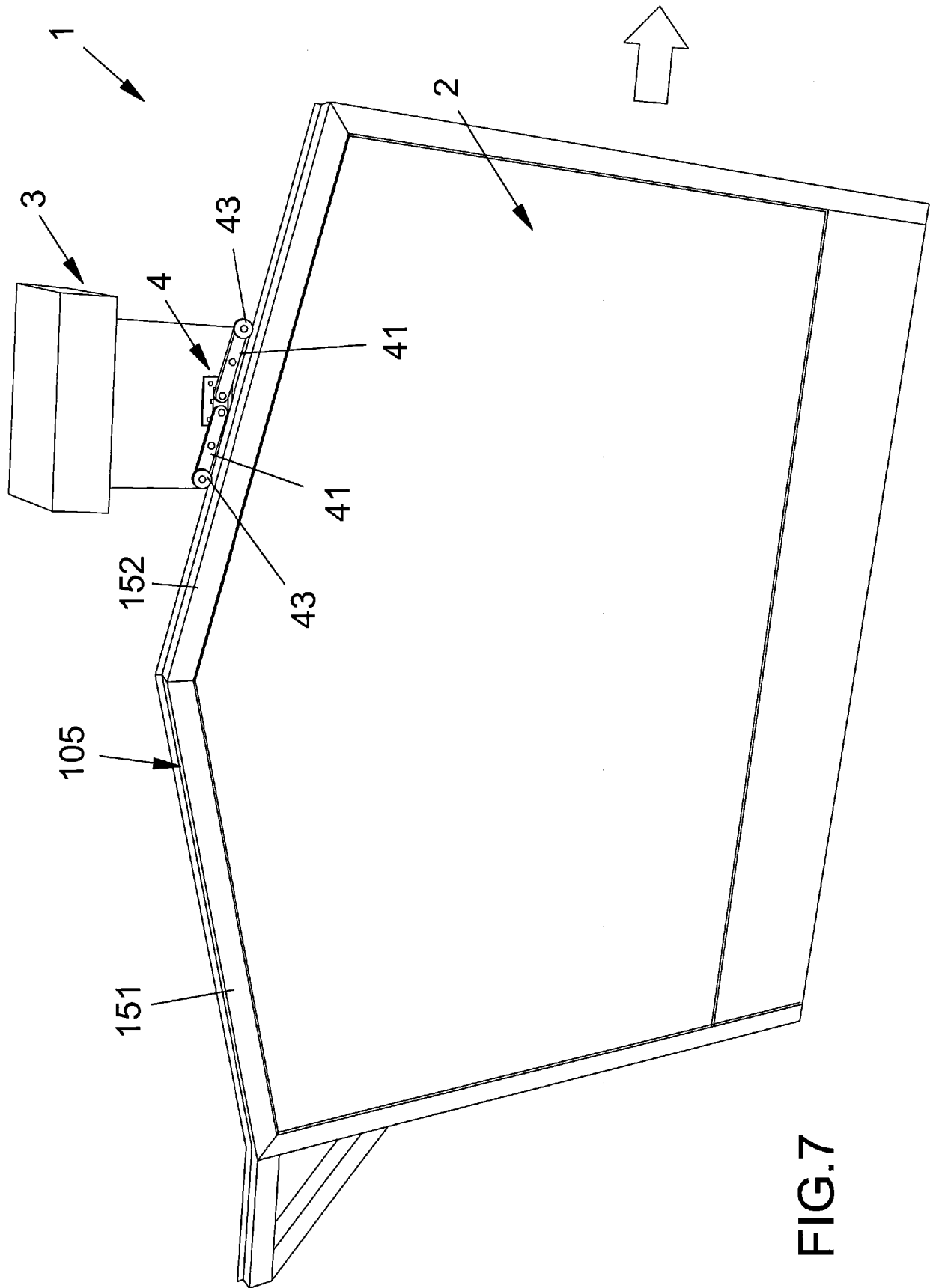
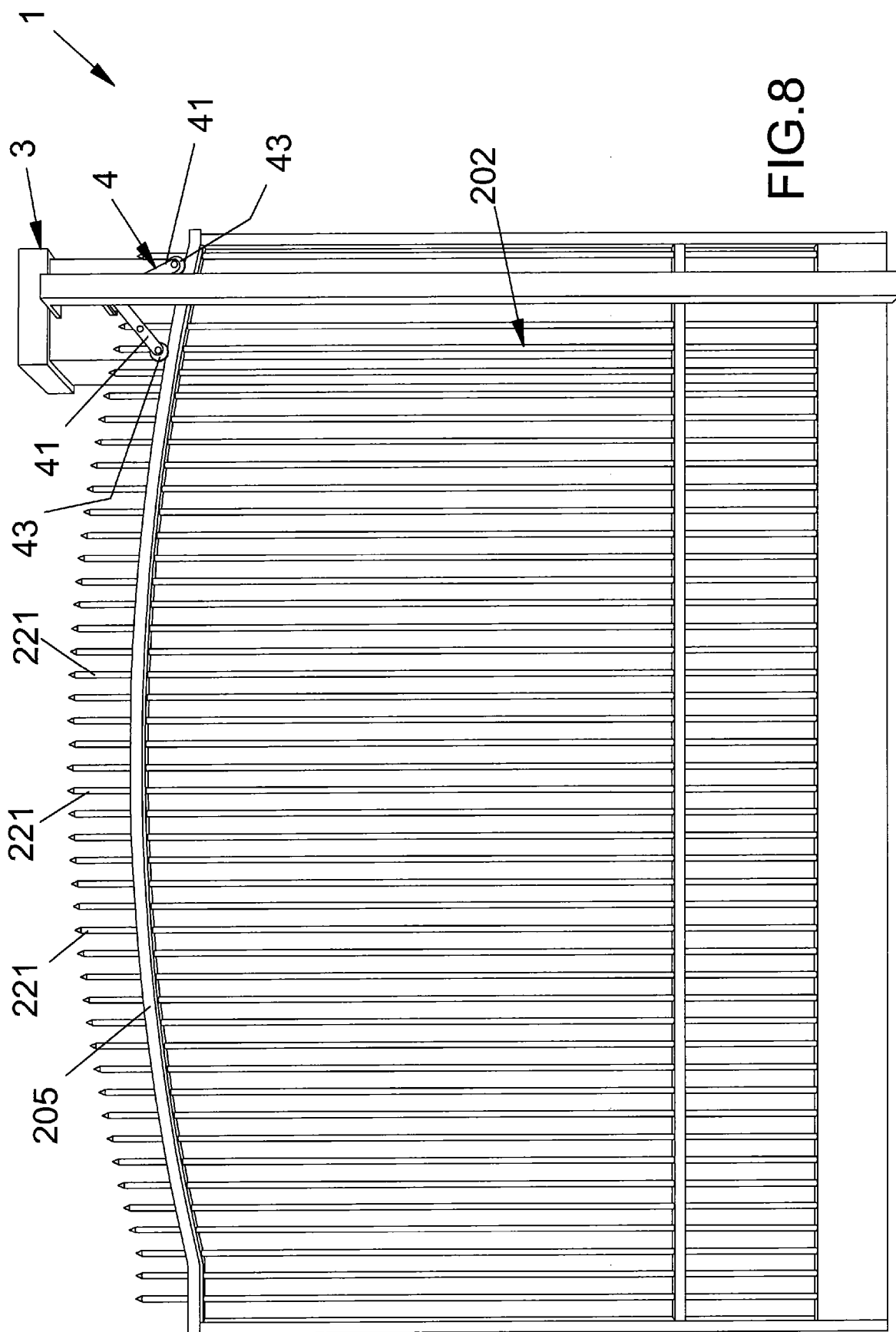


FIG. 7



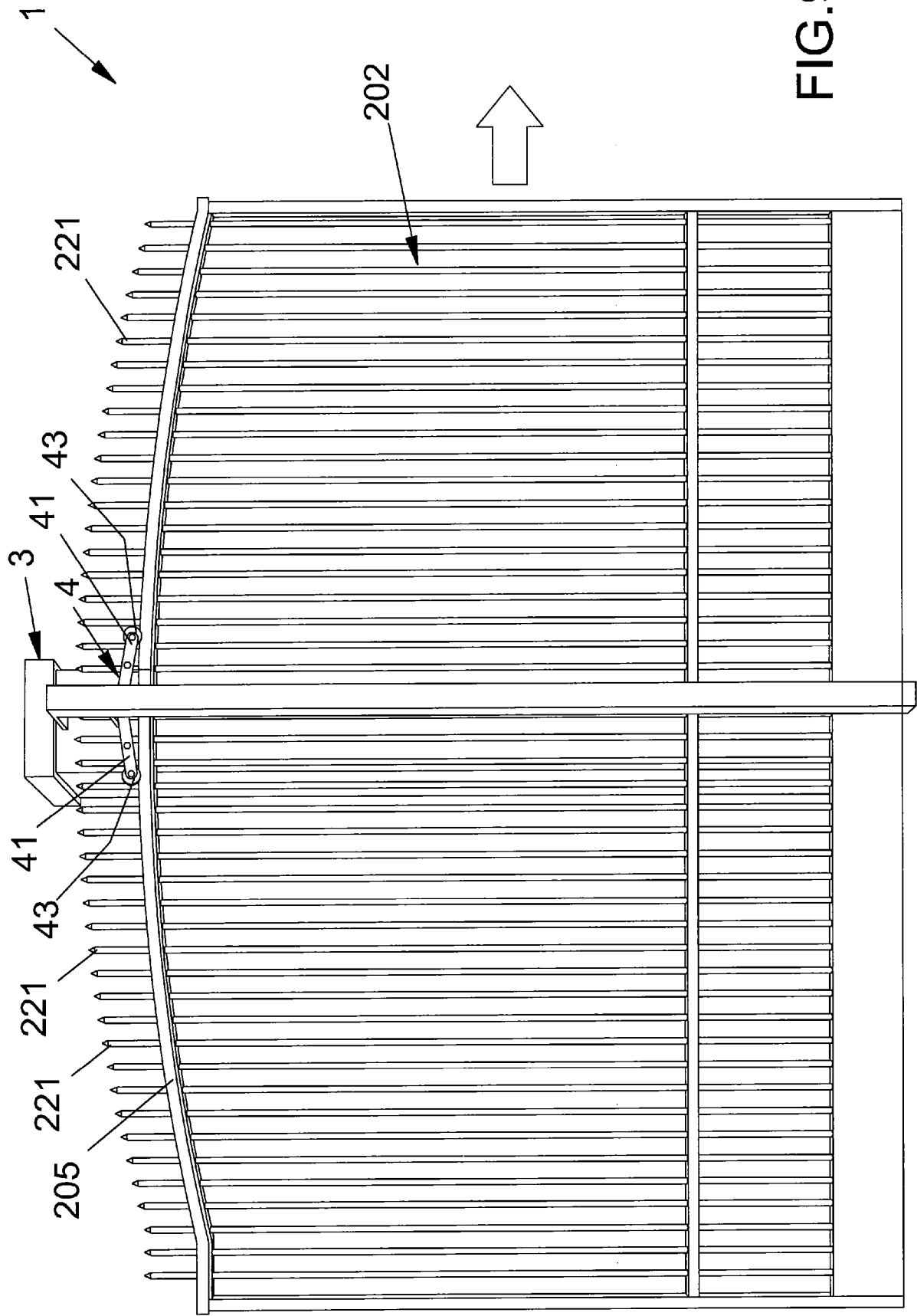
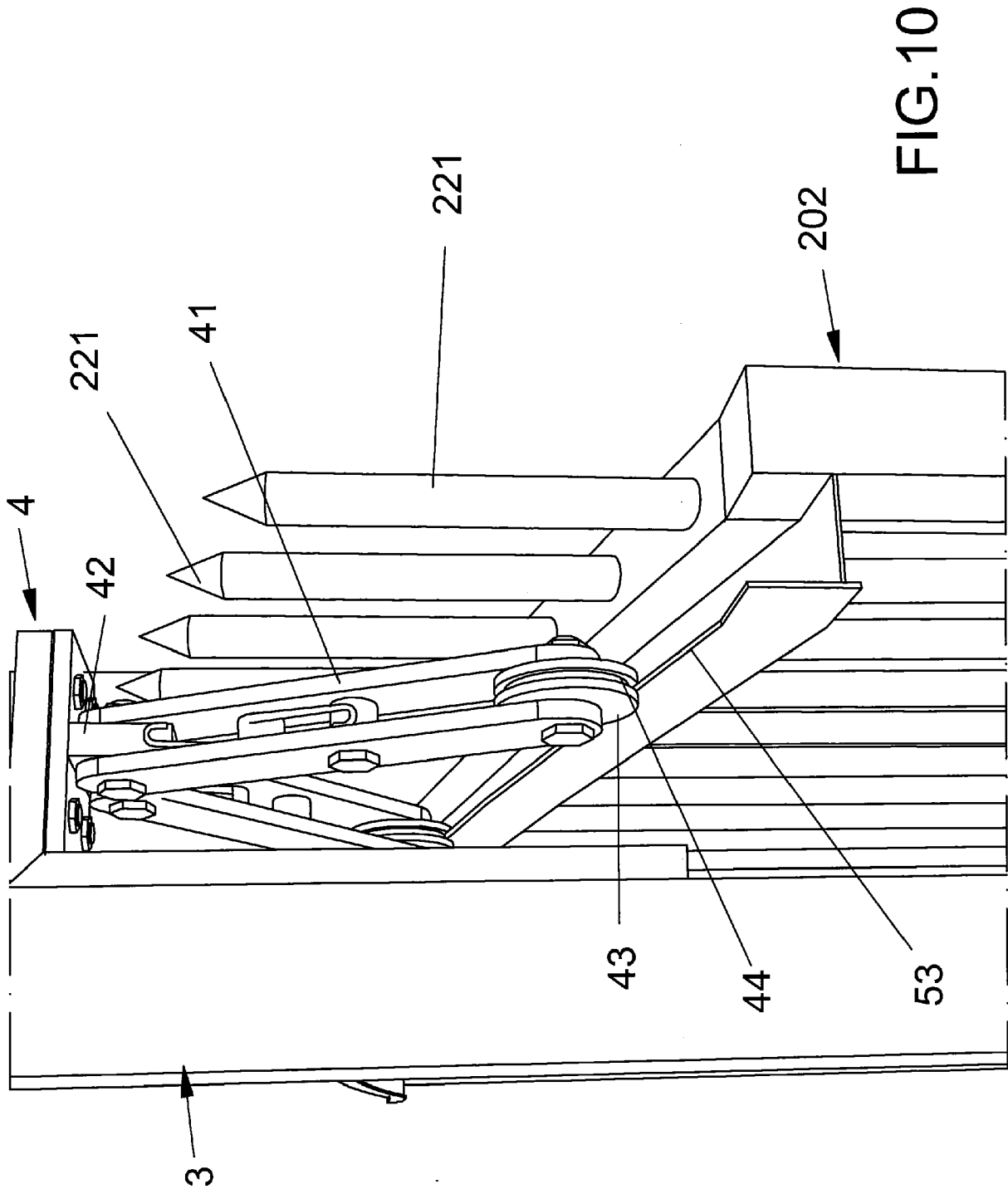


FIG.9



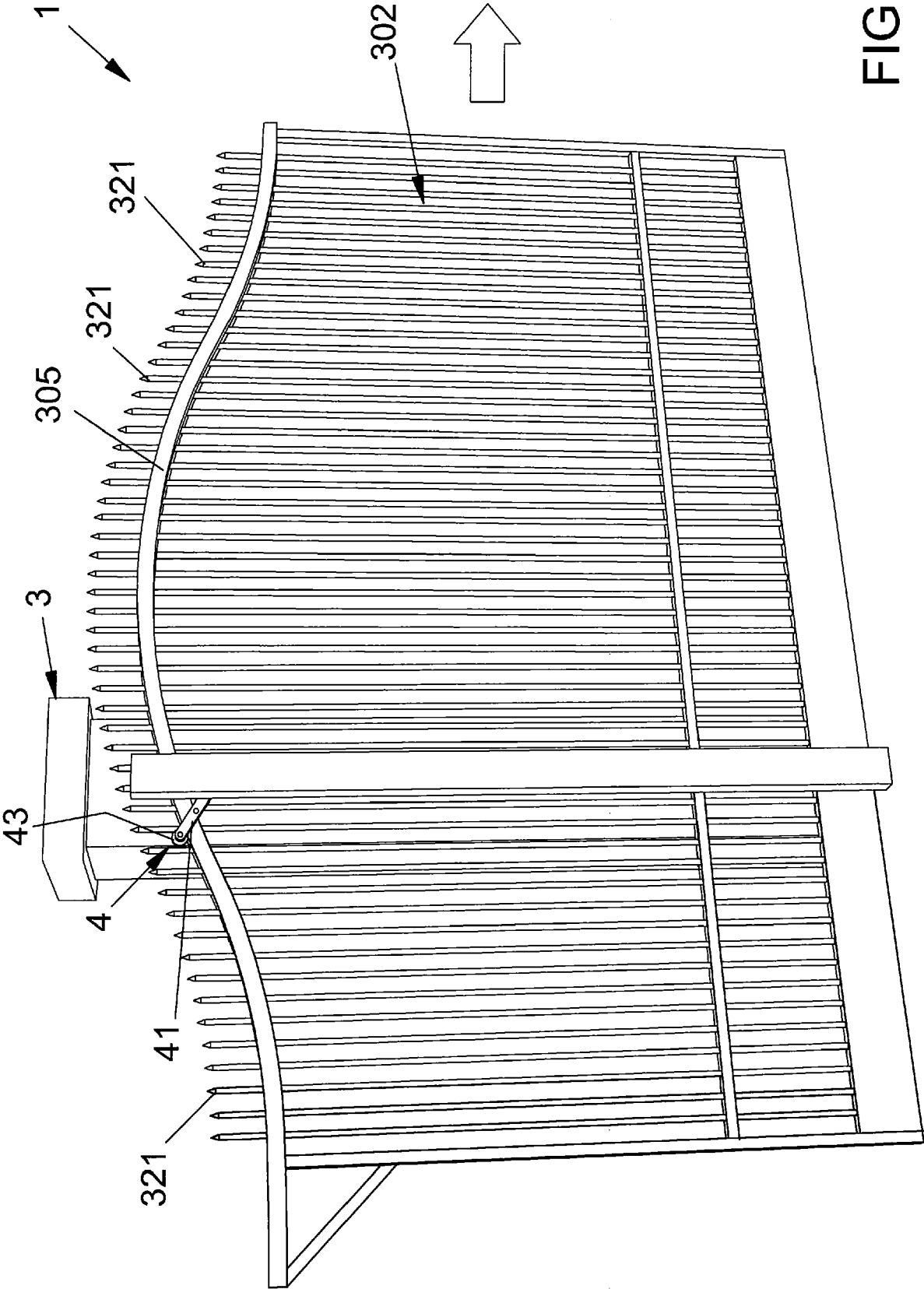


FIG.11

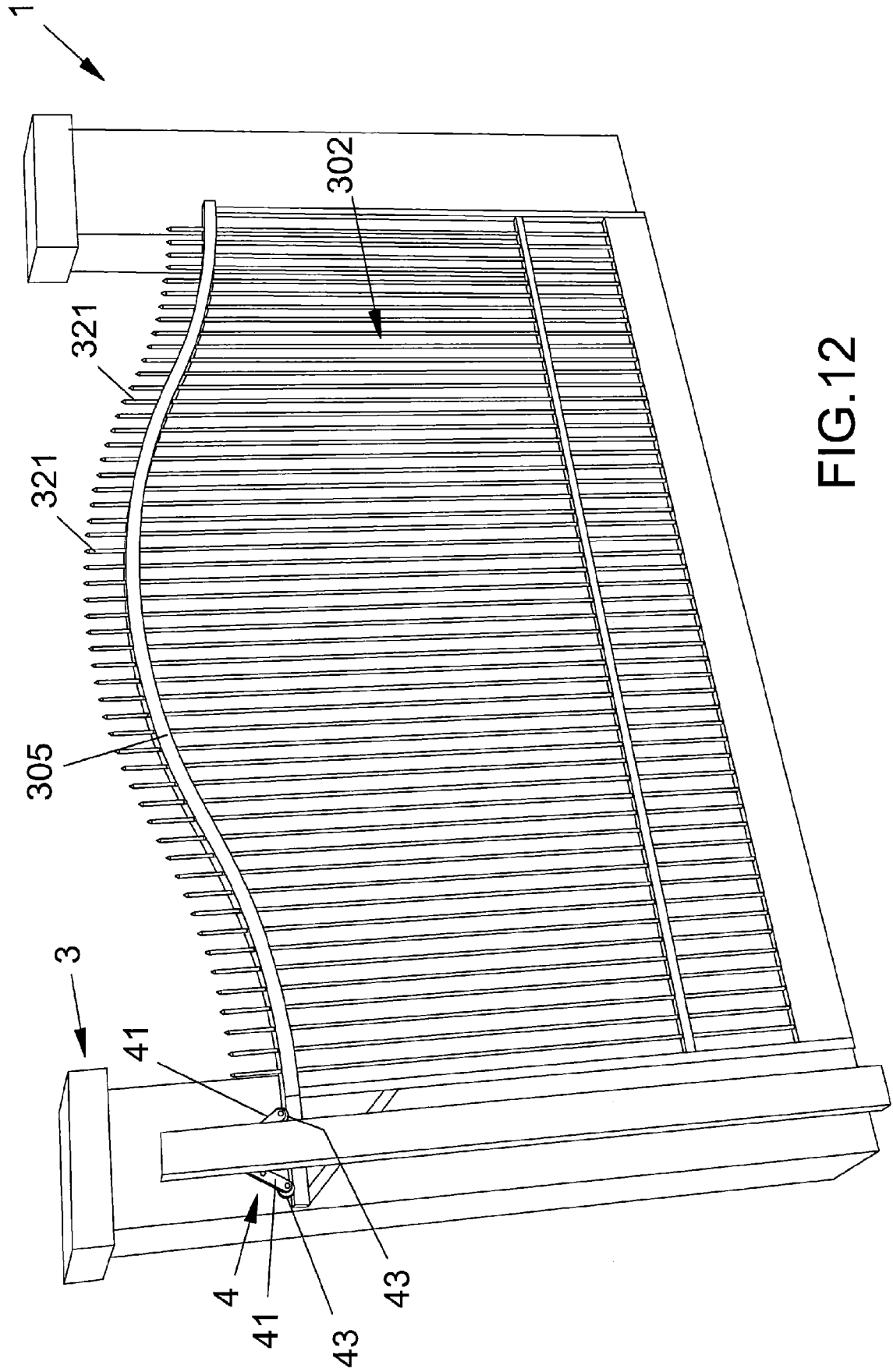
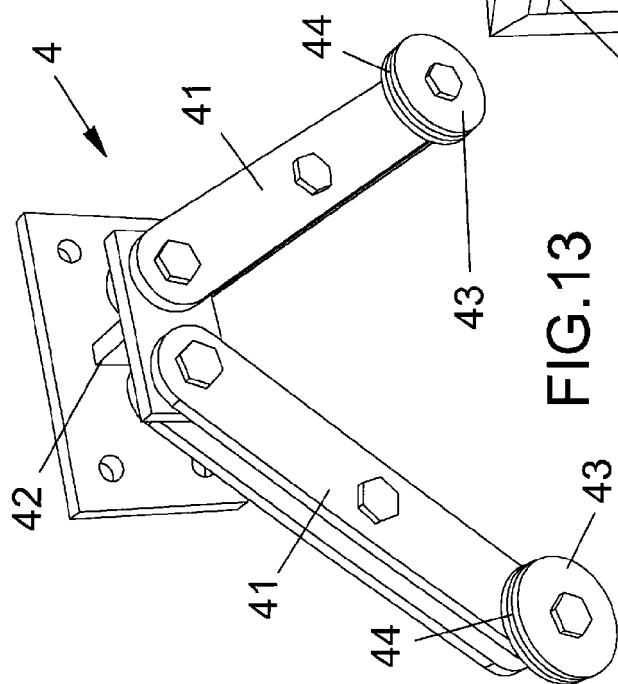
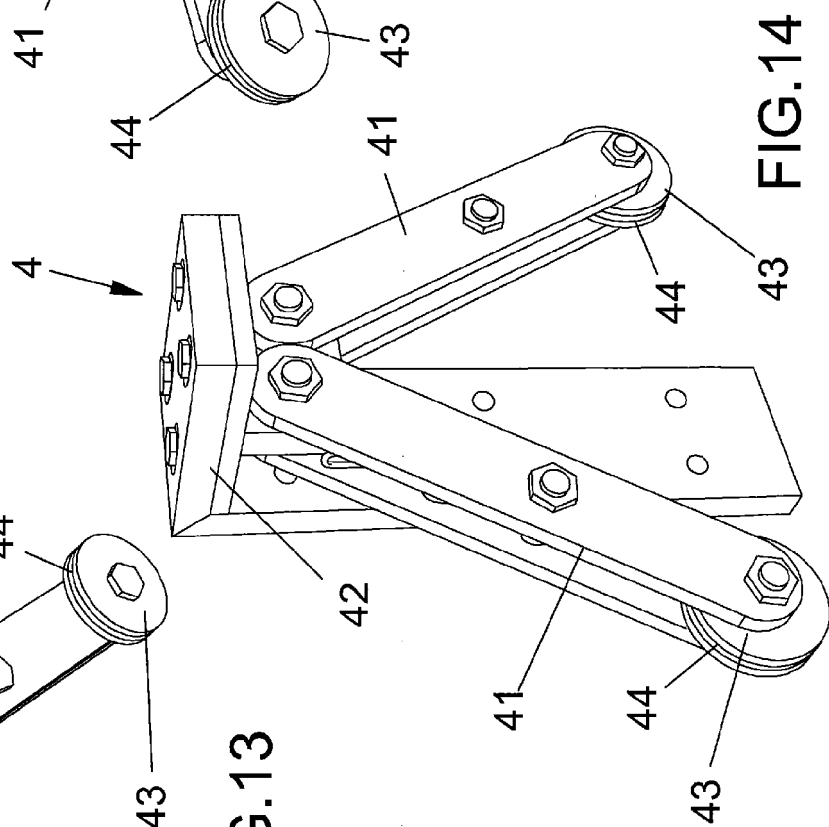
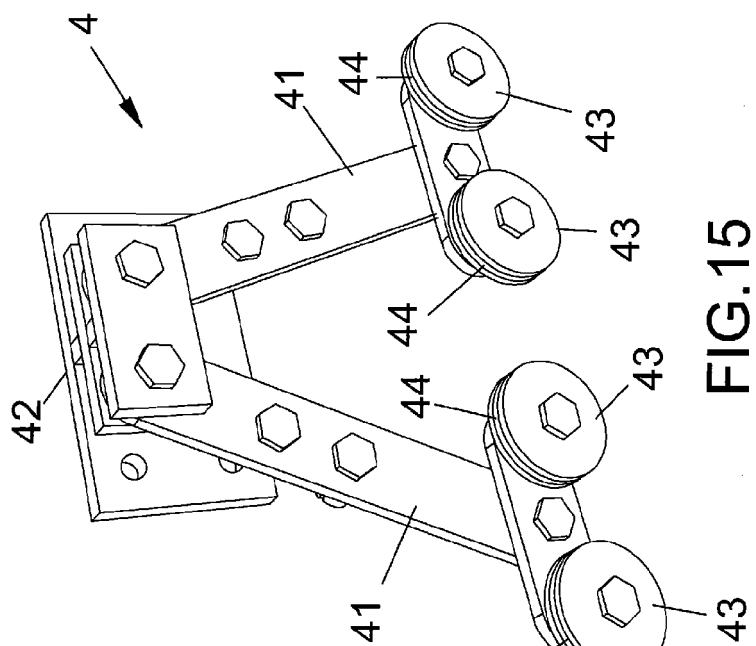
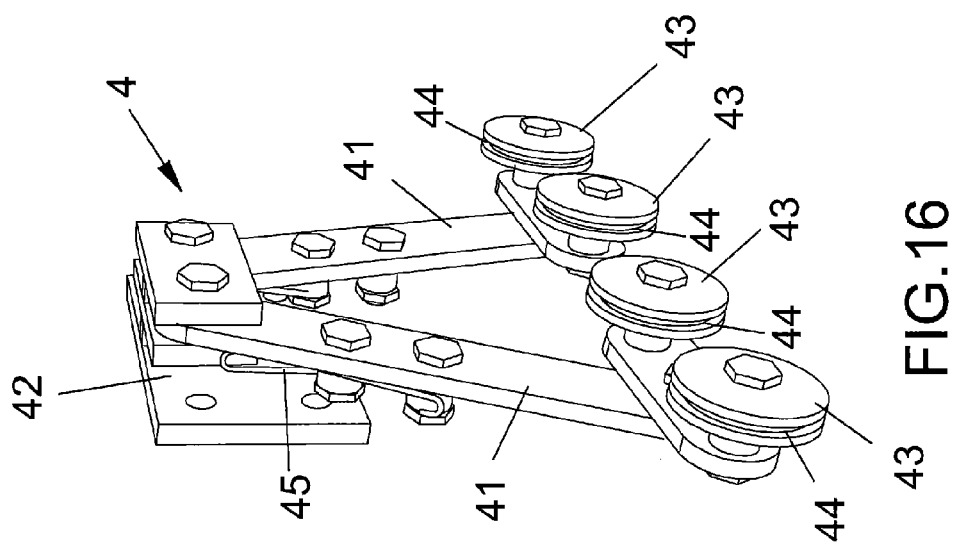
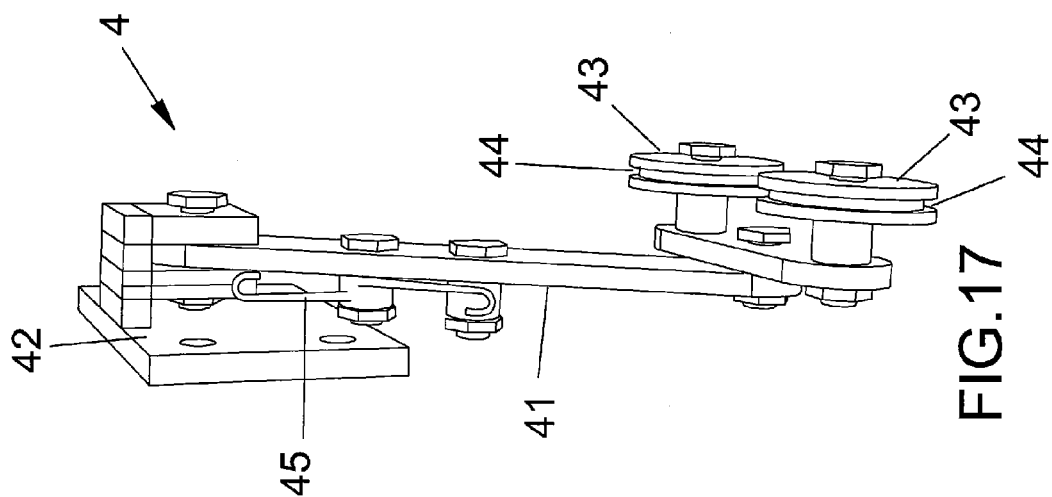
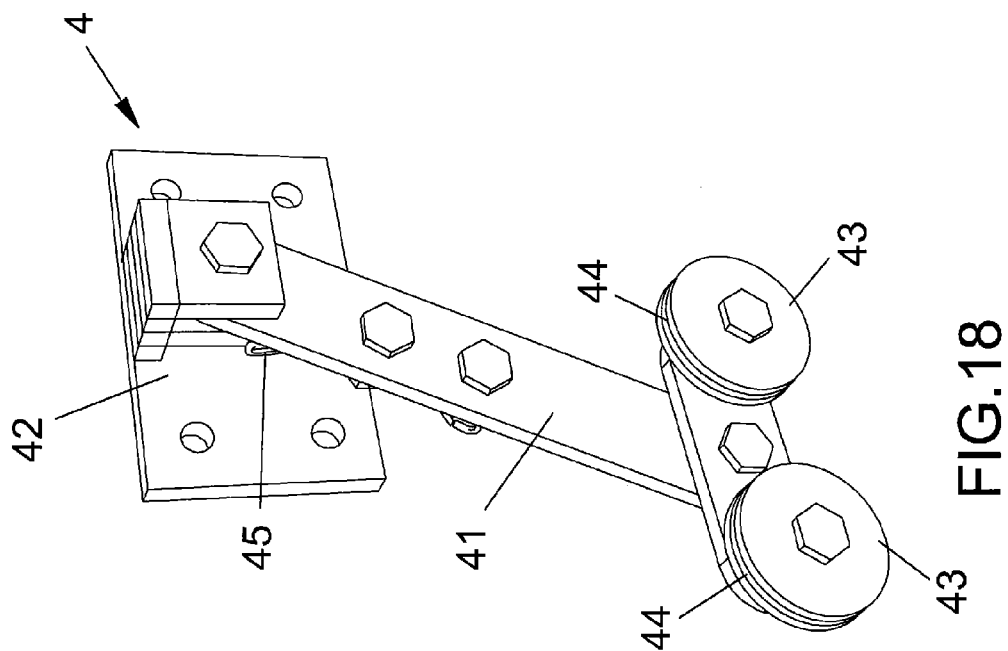


FIG.12







EUROPEAN SEARCH REPORT

Application Number
EP 18 20 2971

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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	DE 17 08 250 A1 (MALKMUS DOERNEMANN CAROLA) 19 May 1971 (1971-05-19) * page 6, paragraph 4 - page 8; figures 1,2 *	1-7	INV. E06B11/04 E05D15/06
A	US 2010/251622 A1 (HELPER KENNETH JOHN [US]) 7 October 2010 (2010-10-07) * paragraphs [0015] - [0021]; figures 1-5 *	1-7	
A	US 8 468 749 B1 (DUFRESNE PETER [US]) 25 June 2013 (2013-06-25) * column 4, line 47 - column 7, line 57; figures 1,2 *	1-7	
			TECHNICAL FIELDS SEARCHED (IPC)
			E06B E05D
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 10 December 2018	Examiner Hellberg, Jan
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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US 2010251622	A1	07-10-2010	NONE
US 8468749	B1	25-06-2013	NONE

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