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(54) **Machine compensating the weight of sectional gates**

(57) The present invention refers to a machine to compensate the weight of sectional gates. It has a chassis (9) where two shafts (1,5) operate, two cogged wheels (2,3), a reel (4) which when turning moves the steel cable (8) which supports the weights (10,11,12,13), these when moving downwards will successively stop on the steps (14,15,16) no longer exerting pressure on the steel cable (8), except the weight (13) which always remains suspended, in the opposite direction when the steel cable (8) moves upwards, the weights (10,11,12) will leave the steps (14,15,16) once again exerting pressure on the steel cable (8) and should the steel cable (8) break, the weights (10,11,12,13) fall and press the lever (17) which moves the shaft (7), which will slot into the cogged wheel (6) and oblige the shaft (1) to stop for safety reasons, finally the front covers are fitted to seal the interior of the machine.

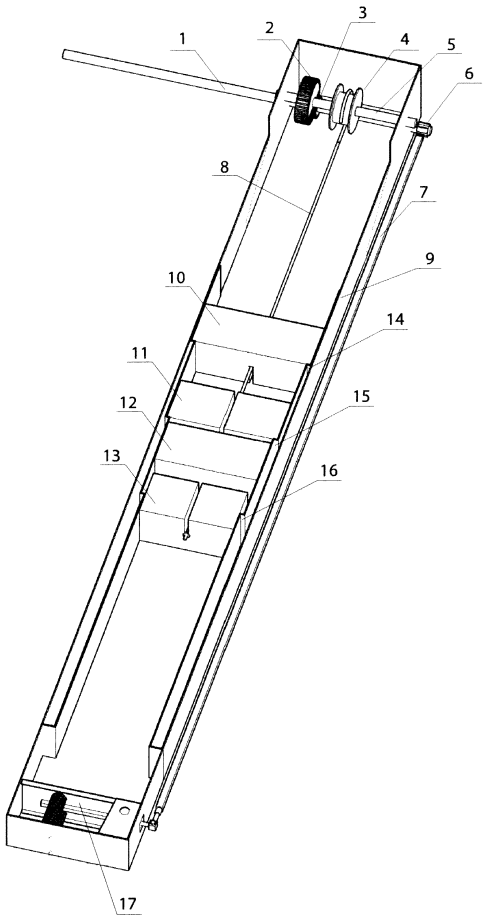

Fig.1

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Description

Technical field of the invention

[0001] This invention is aimed at the area of domestic and industrial vertical and horizontal-opening and high-opening Sectional Gates.

Status of the Technique

[0002] Currently, to compensate the weight of Sectional Gates, steel torsion springs are used, which have different sizes, depending on the weight exerted by the gate. Those springs have a life measured in work cycles, and manufacturers do not give a lifetime guarantee for them as they are considered to be material subject to wear and tear, as there is not usually a way of controlling the number of times the sectional gates are opened, when the springs break, their owners have to acquire new springs to balance the gate and for the latter to be able to operate properly and safely. In some situations, that operation of replacing the springs causes disruptions due to the time it takes to order, receive and fit the new springs, the gate remaining out of motion until that occurs.

[0003] To give an example of wear and tear, in a condominium of 50 users, the gate most probably opens and closes on average 100 times a day, multiplied by 365 days of the year which would mean it opens and closes 36500 times per year, if 15000 cycle springs are fitted, it means that on average springs will have to be replaced every 6 months.

Summary of the Invention

[0004] Thus, the machine that is the object of the present invention, is characterised as being a mechanical piece of equipment, conceived specially to compensate the weight of Sectional Gates, whether they have low, high or vertical opening, as well as if they are for domestic or industrial use.

[0005] The present invention is described in detail below, given solely for illustrative purposes and which is in no way limitative, represented in the attached drawings in which:

- Figures 1/7 and 2/7 are frontal perspective representations of a characterisation of the machine according to the invention.

- Figures 3/7 to 7/7 are representations of details found in the machine according to the invention.

Detailed description of the invention

[0006] With reference to figures 1/7 to 7/7, a detailed description will now be given of the machine that is the object of the present invention, which is comprised of a set of embodiments represented in figures 1/7 to 7/7 and fitted as described below.

[0007] The structure is comprised of a five-sided, metal plate chassis (9), on the upper side of the chassis, firstly a shaft (1) is applied which supports a cogged wheel (3), then a second shaft (5) is applied which supports the cogged wheel (2) which will always have double the number of cogs than the cogged wheel (3) and a reel (4) for the steel cable (8), both shafts (1,5) are fitted horizontally and parallel to the chassis (9), the cogged wheels (2,3) must be aligned and slotted into one another, the reel (4) will be fitted in the centre of the shaft (5). Following this, two metallic pieces bent at 90 degrees must be fixed to the chassis (9) and which look similar to a ladder with a minimum of three horizontal steps (14,15,16). After the said steps (14,15,16) have been fixed to the vertical and lateral sides of the chassis (9), the weights (10,11,12,13) must be fitted to the steel cable (8), to start placing the weights on the steel cable (8) we must start with weight (13) which is the narrowest of all the weights, then weight (12) is placed on top of weight (13), followed by weight (11) and finally, weight (10) which is the widest, weights (10,11,12,13) having been placed, the machine will then be tested to confirm that weights (10,11,12,13) work perfectly, to do so, the shaft (1) will be coupled to the shaft of the gate and the gate will be moved upwards, manually (not illustrated in the figures), in a complete opening cycle, simultaneously weights (10,11,12,13) move downwards and when weight (10) approaches the step (14) weight (10) stops on top of the said step (14), the remaining weights (11,12,13) continue suspended and moving downwards, then weight (11) will stop on top of the step (15) and next weight (12) will also stop on top of the step (16), only weight (13) always remaining suspended, being the only weight (13) to complete the entire downward path. Having completed the test described above and confirmed the proper mechanical functioning of the invention, the safety system must be set up, which is situated on the lower end of the chassis (9), to do so a lever (17) will be fitted that looks more like a pedal, that lever (17) is joined to a bar (7) and whenever the lever (17) is pressed, the bar (7) moves upward and as its upper side ends in the shape of a tooth, it will slot into the cogged wheel (6) which is fitted on the shaft (1) on the upper end of the chassis, i.e. should the steel cable (8) break, the weights (10,11,12,13) fall and press the lever (17), thus the bar (7) will engage the cogged wheel (6) which in turn stops the shaft (1), immediately stopping all the embodiments in the present machine, finally the front covers (18/19) are fitted, sealing the entire interior of the present machine.

Description of the Invention

[0008] The structure of the machine which is the object of the present invention is comprised of a chassis with a five-sided metallic plate, on the top end of the chassis two metallic shafts are fitted, on the first shaft a cogged wheel with a smaller diameter will be fitted, on the second

shaft a cogged wheel with a larger diameter will be fitted and a steel cable reel, both shafts are situated horizontally and parallel, both cogged wheels must be aligned and engaged and the steel cable reel centred in relation to the machine's chassis. Next, bent metallic plate pieces are fitted to each of the side walls of the chassis, said metallic plate pieces having vertical sides and horizontal sides, looking similarto a ladder with small horizontal steps, the minimum number of horizontal steps to be applied will be three steps on each side of the machine's chassis. After concluding the fitting of the above-mentioned bent metallic pieces, four weights of different widths will be fitted on the steel cable, the first weight to be installed on the steel cable will always be the narrowest one, then the next widest to the one already fitted and so on successively, when all the weights have been fitted the invention will have to be tested to confirm if the narrowest weight carries out the entire path that the steel cable must make without touching any horizontal step and if the remaining three, wider weights duly stop on the existing respective three horizontal steps. After checking the correct functioning of all the embodiments described above, a lever will be fitted on the lower end of the chassis, which when pressed by the weights transmits an upward movement to the bar fitted on the outer side of the chassis, the bar in question ends at the upper end in the form of a tooth and whenever the lever is pressed the tooth existing on the upper end of the bar will slot into a cogged wheel fitted on the first shaft on the upper end of the chassis, whenever that occurs, all the embodiments present will be immediately immobilised for safety reasons, finally the front covers will be fitted, sealing the entire interior of the machine that is the object of the present invention.

Index of the figures

[0009]

1/7-Front perspective

2/7 - Front perspective

3/7 - Front perspective

4/7 - Front perspective

5/7 - Upper end perspective

6/7 - View from the top of the upper end

7/7 -View from the top of the lower end

Description of the figures

[0010]

Figure 1

This is a front perspective showing all the components of the present invention duly identified by numbers in order to better identify them. This figure aims to demonstrate the positioning of the components duly fitted on the chassis of the machine that is the object of the present invention.

Figure 2

This is a Front perspective of the duly sealed machine that is the objective of the present invention, this figure aims to demonstrate the aspect of the machine after placing the front covers duly identified by numbers.

Figure 3

This is a front perspective of the machine that is the object of the present invention where the aspect of the front covers is highlighted and the way they are placed on the machine's chassis.

Figure 4

This is a front perspective of the machine that is the object of the present invention which aims to give relevance to the details related to the metal pieces bent in the shape of steps. We can see how the pieces are placed on the chassis, and also how the steps that are on the said pieces are positioned in relation to the weights. We can also see details releted to the safety lever situated on the lower end of the machine.

Figure 5

This is an Upper end perspective of the machine that is the object of the present invention, which aims to show the way the shafts and all their components operate.

Figure 6

This is a view from the top of the upper end of the machine that is the object of the present invention, which aims to show the functioning of the steel cable and also the details situated on the outside of the chassis, which shows how the bar engages the cogged wheel which exists on one of the shafts.

Figure 7

This is a view from the top of the upper end of the machine that is the object of the present invention, which aims to show details related to the safety lever.

Claims

1. Machine for compensating the weight of sectional gates, **characterised in that** said machine has a chassis (19), which supports the shaft (1) where a cogged wheel (3) is situated, which operates in parallel with the shaft (5) that supports the cogged wheel

(2) and a reel (4) which winds and unwinds the steel cable (8), which supports and moves the weights (10,11,12,13) upwards and downwards, when moving downwards, the weights (10,11,12) stop successively on the respective steps (14,15,16), weight (13) being the only one that never stops at any step, but is always suspended between the walls of the chassis (9), when moving upwards weights (10,11,12) successively leave the respective steps (14,15,16) until they are once again suspended by the steel cable (8), which should it rupture or break will let the weights (10,11,12,13) fall and action the lever (17) which when being moved downwards, actions the bar (7), which will move upwards and will slot the tooth that is on its upper end into the cogged wheel (6), which will cause the shaft (1) to stop as a safety measure, the machine will have two front covers (18,19), to seal its interior.

2. Machine according to claim 1, **characterised in that** said weights (10,11,12,13) carry out a downward movement and when the weight (10) approaches the step (14) the weight (10) stops on top of said step (14), the remaining weights (11,12,13) continue to be suspended and to move downwards, following which it will be weight (11) that stops on top of the step (15) and then also weight (12) will stop on top of the step (16), only weight (13) always remaining suspended, being the only weight (13) to complete the entire downward path.

3. Machine according to claim 1, **characterised in that** said cogged wheel (2) always has double the number of cogs of cogged wheel (3).

4. Machine according to claim 1, **characterised in that** shafts (1,5) are fitted horizontally and parallel to the chassis (9).

5. Machine according to claims 1,3 and 4 **characterised in that** said cogged wheels (2,3) must be aligned and slotted into with one another.

6. Machine according to claims 1 and 4, **characterised in that** said reel (4) is fitted in the centre of the shaft (5).

8. Machine according to claims 1 and 2, **characterised in that** in case of rupture or breakage of the steel cable (8) the lever (17) is actioned by weights (10,11,12,13) falling.

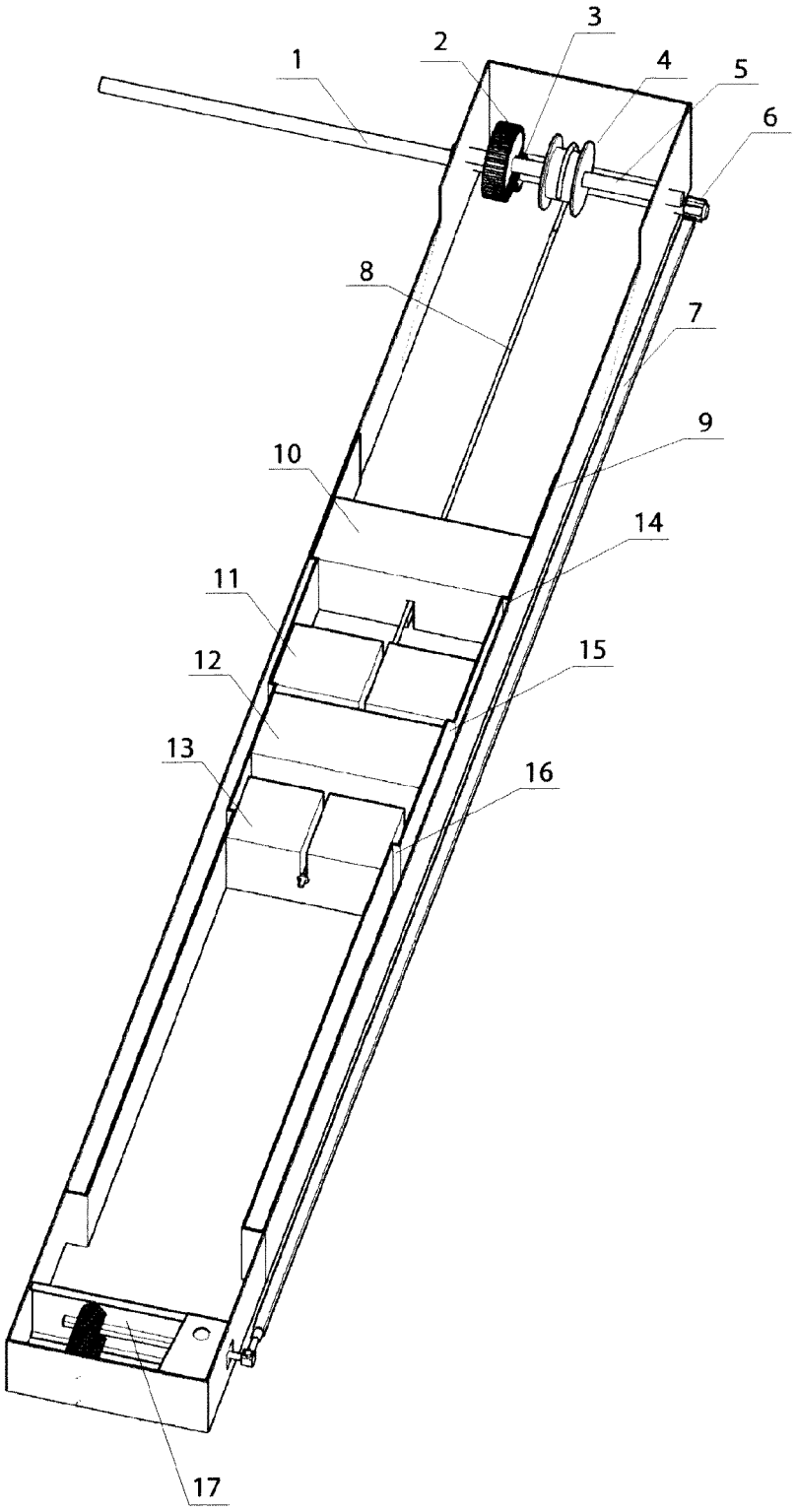

Fig.1

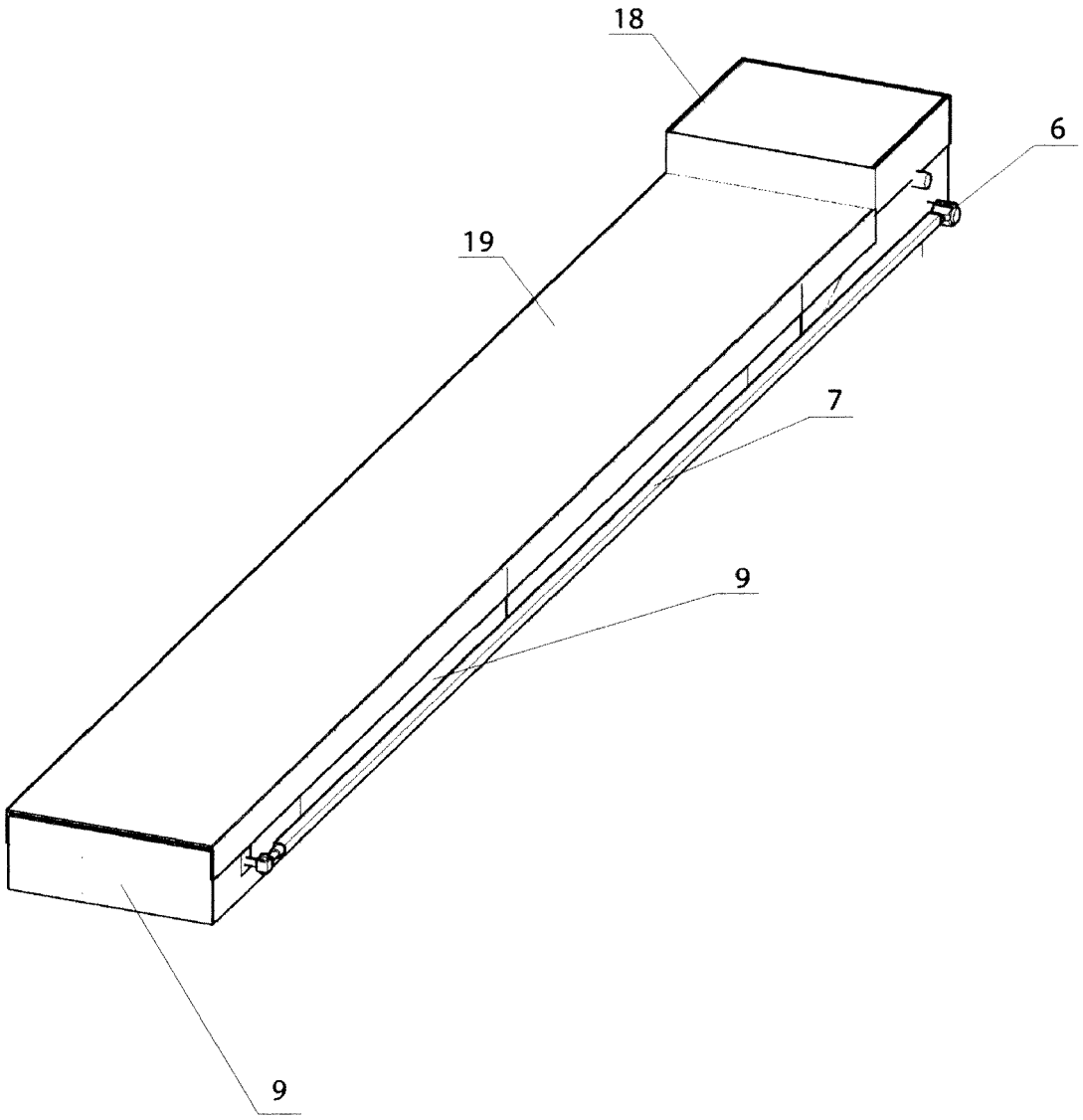

Fig.2

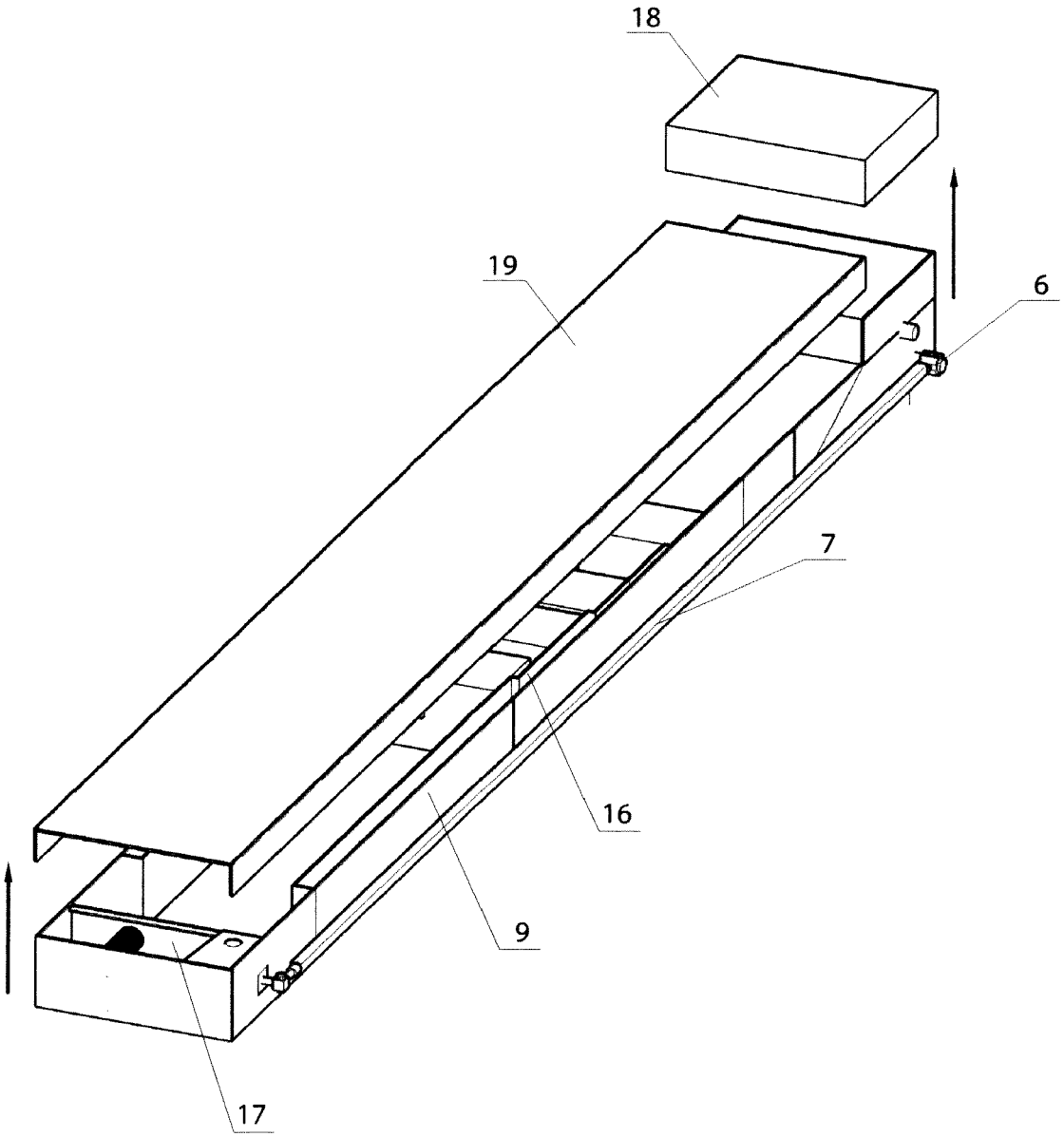

Fig.3

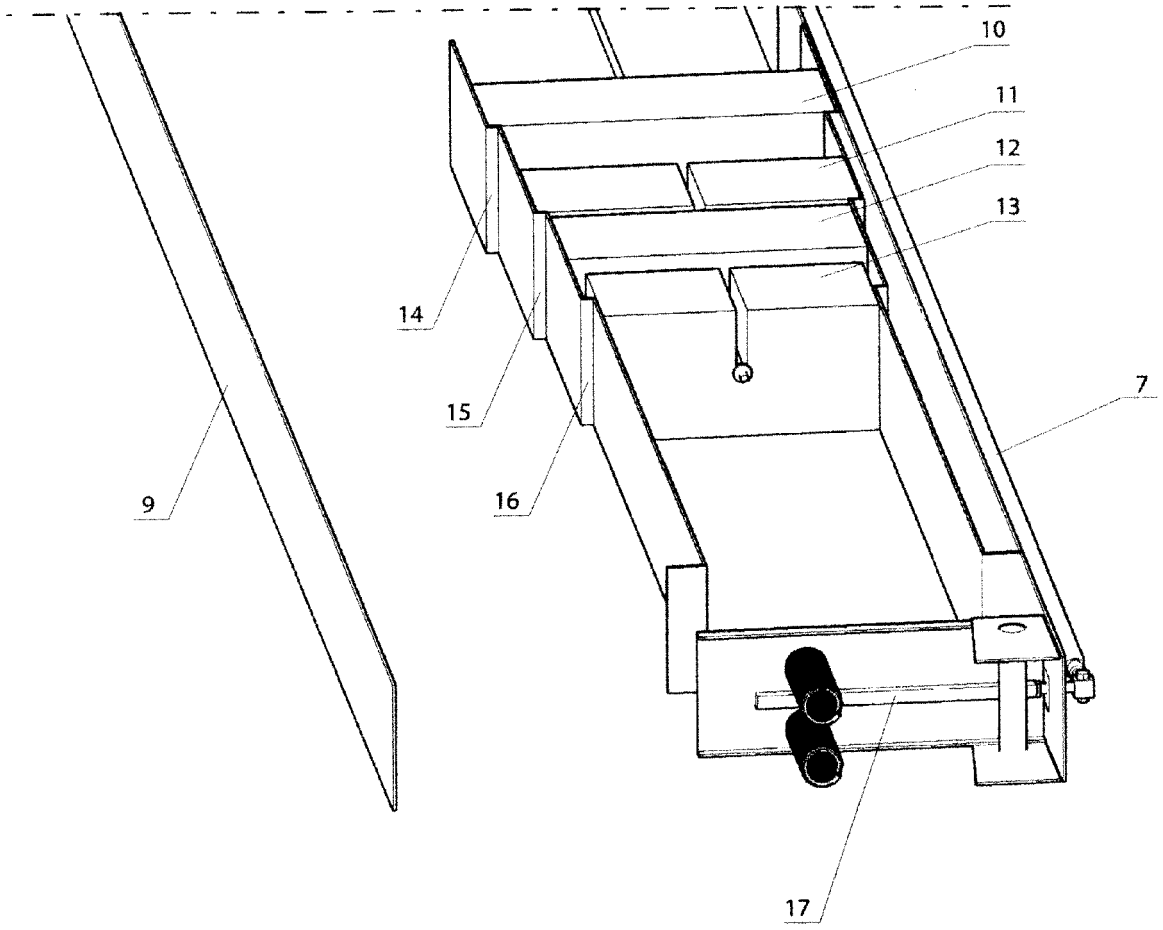

Fig.4

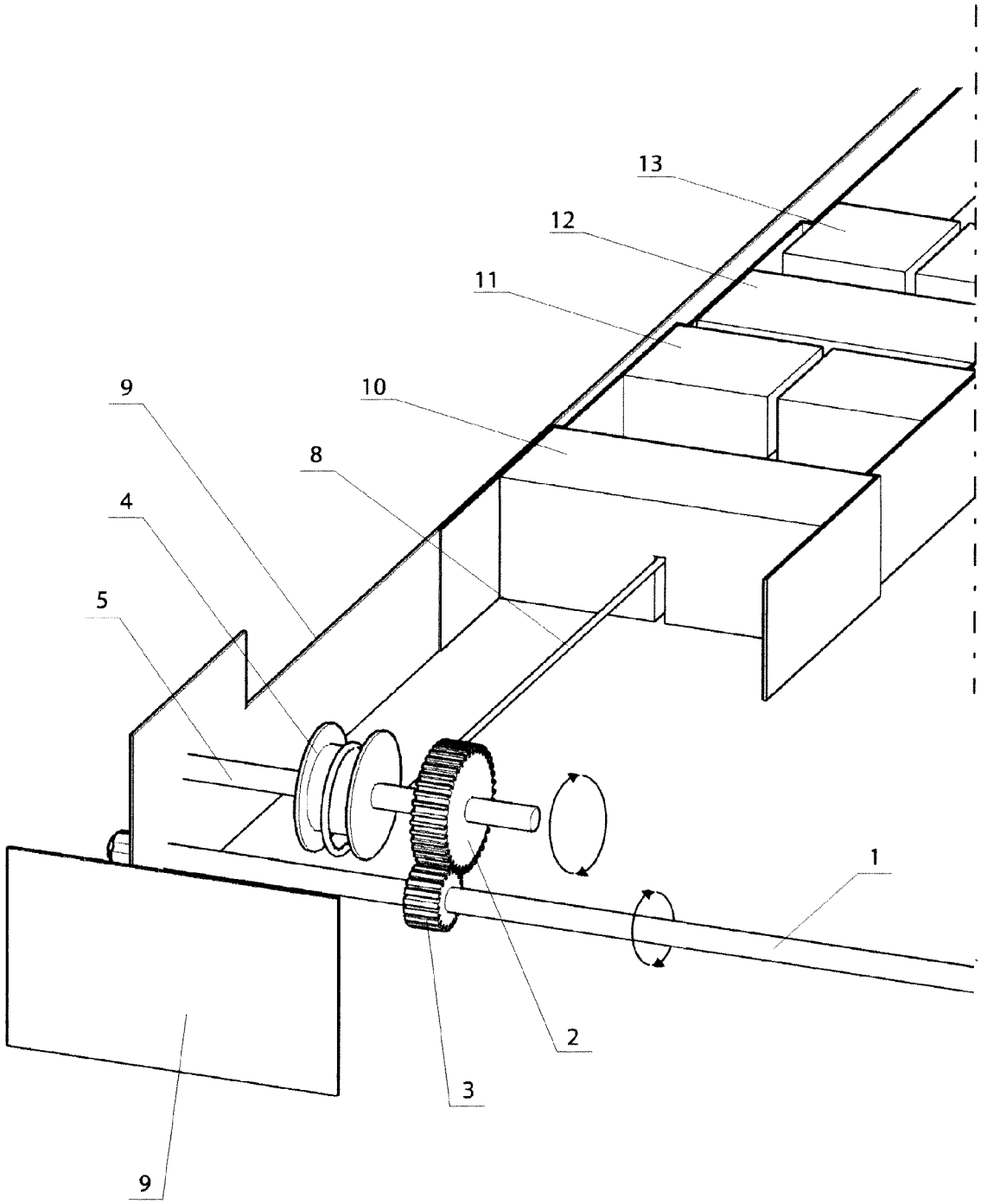

Fig.5

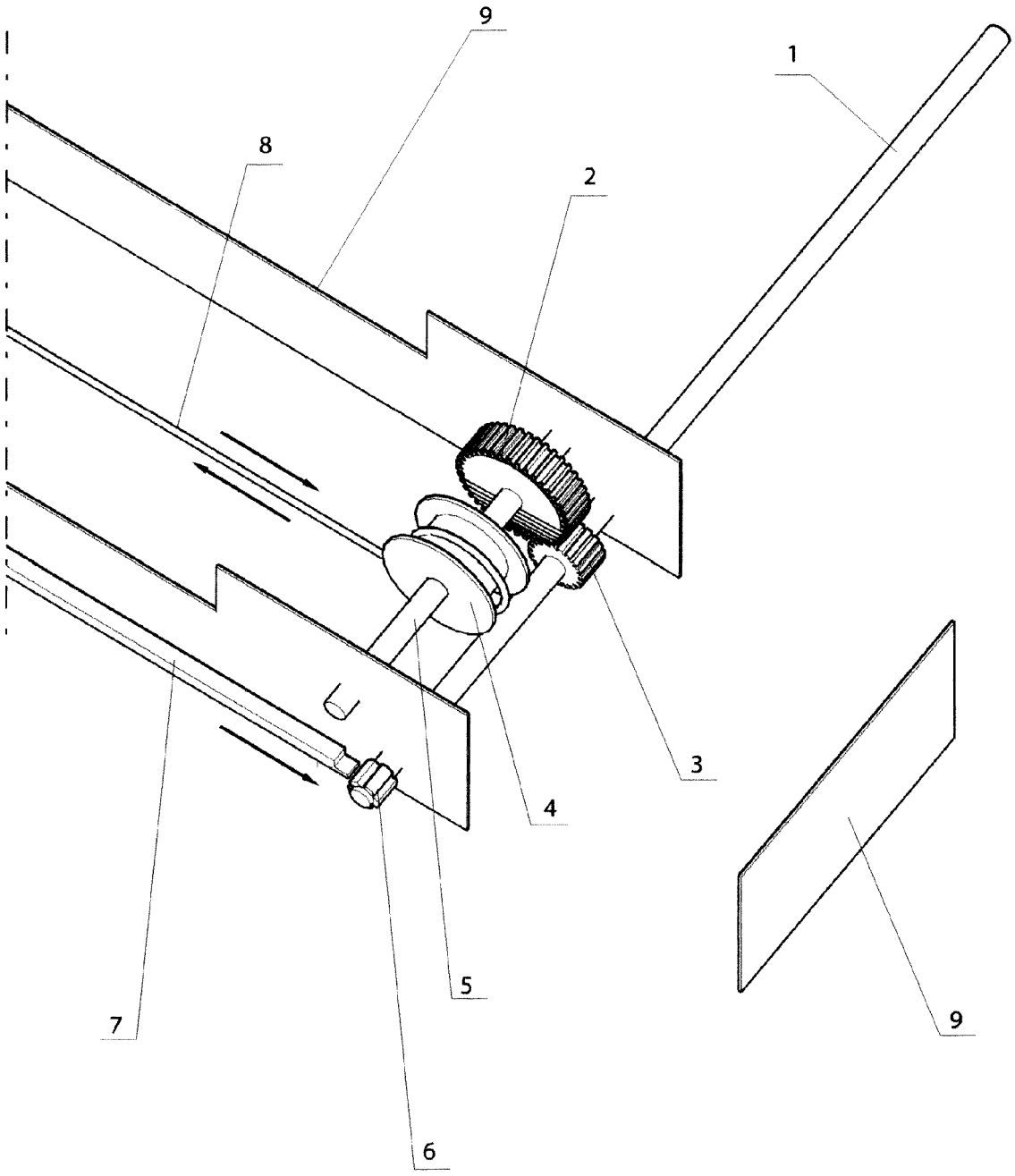

Fig.6

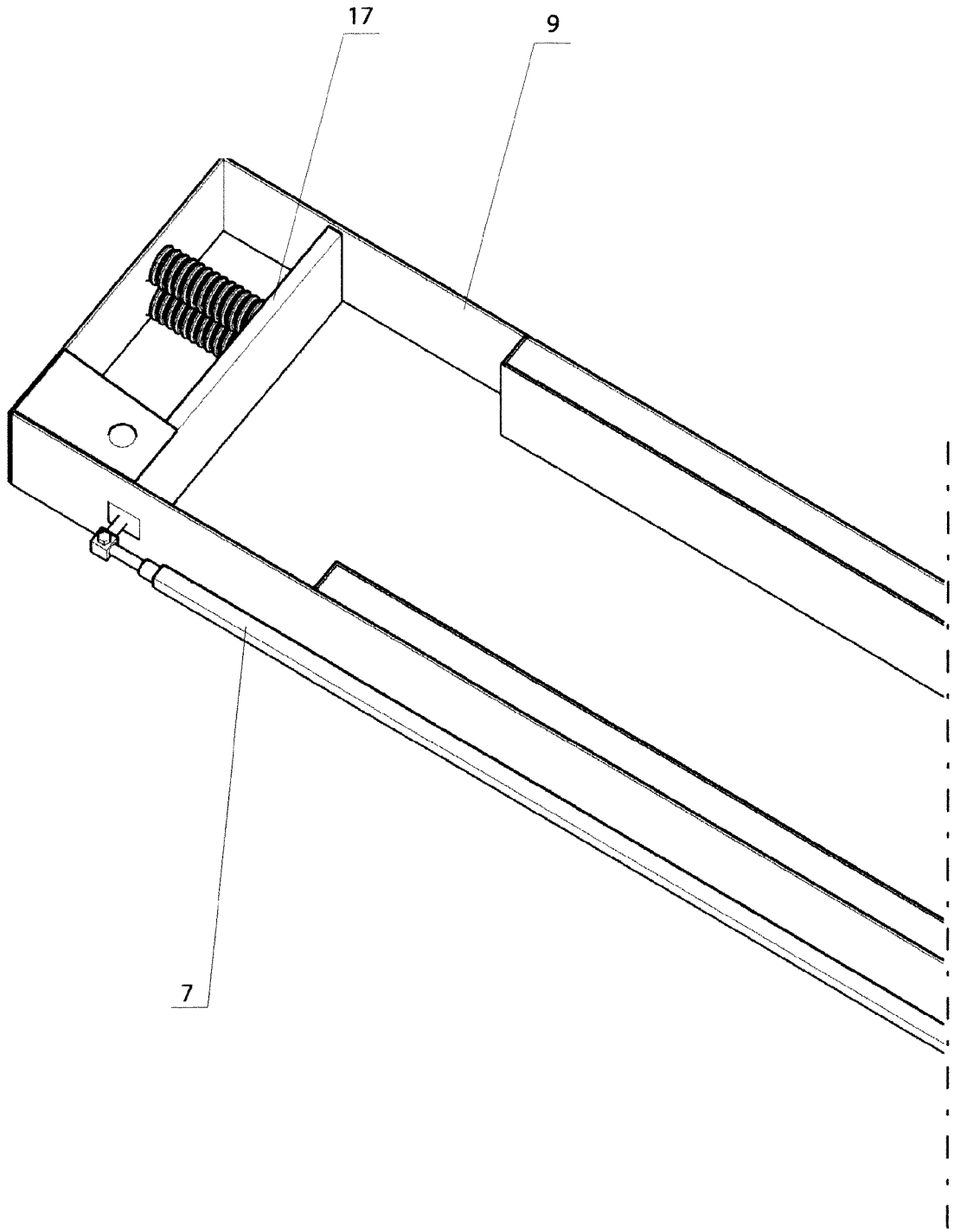

Fig.7

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EUROPEAN SEARCH REPORT

Application Number
EP 14 39 8014

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	CH 671 953 A5 (INVENTIO AG) 13 October 1989 (1989-10-13) * figures 3-6 * -----	1-7	INV. E05D13/00
A	US 1 863 961 A (BALL HALLECK C ET AL) 21 June 1932 (1932-06-21) * figures 1, 2 * -----	1-7	
			TECHNICAL FIELDS SEARCHED (IPC)
			E05D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	25 June 2015	Cobusneanu, D

CATEGORY OF CITED DOCUMENTS

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
CH 671953 A5	13-10-1989	NONE	
US 1863961 A	21-06-1932	NONE	

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82