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(54) **Workshop crane**

(57) The present invention relates to a workshop crane of the type which is used in machine workshops, warehouses, etc., for lifting heavy objects and which can be transported by the user, basically comprising a base (1), a column (2) rising from the base (1) to a certain height, an arm (3) connected in an articulated manner to said column (2) having an operating system (4) and at the free end (5) of which there is located a load securing element (6), a pair of legs (7) attached at one of their ends to the front face of the base (1) and comprising at their free ends front rolling elements (8), rear rolling elements (9) located on the rear face of the base (1) and intermediate wheels (10) located between the front rolling elements (8) and the rear rolling elements (9) such that they allow improving the maneuverability of the workshop crane object of the invention.

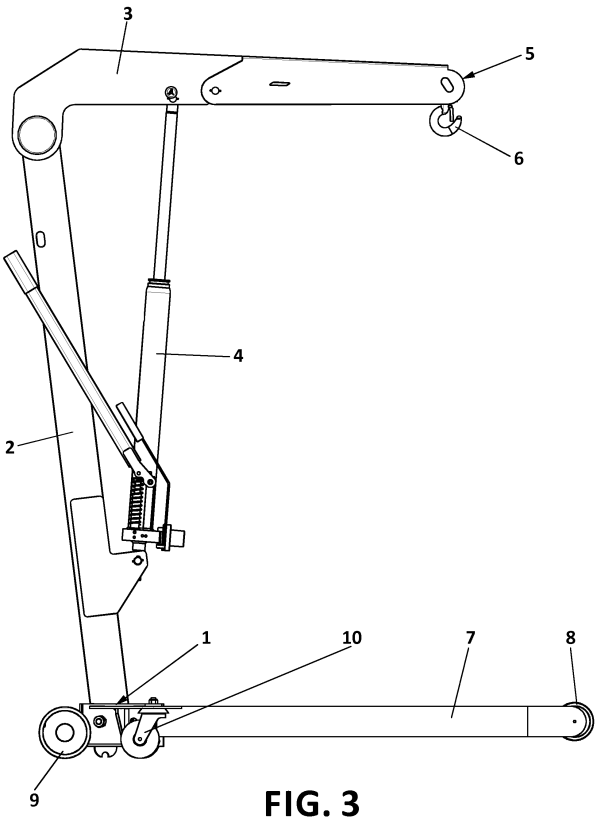

FIG. 3

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Description

Technical Field of the Invention

[0001] The invention relates to a crane of the type used in machine workshops, warehouses, etc. for lifting heavy objects.

[0002] Specifically, the crane of the invention is of the type which can be transported by the user and which position can be easily changed for operating in locations where it is most needed as a result of having wheels or rolling elements.

Background of the Invention

[0003] Workshop cranes are apparatus that are widely known and used, for example, in vehicle workshops or other places where mechanical works are performed, where they are used for lifting heavy objects safely and without the operator having to make any effort.

[0004] Said cranes, an example of which can be seen in Spanish patent P201100368 belonging to the same owner, comprise a base provided with wheels or rolling elements whereby the crane is moved to the places where it is needed, a column rising from the base to a certain height and an arm connected in an articulated manner to said column which is capable of moving up or down operated by a hydraulic system. Finally, at the free end of the articulated arm there is located a hook or an element intended for securing or receiving all or part of the object to be lifted.

[0005] As mentioned, one of the main functionalities of such cranes is that they can be easily transported by the user. Their mobile nature makes them an ideal alternative with respect to another type of cranes that are heavier or structurally more complex, such as overhead traveling cranes, for example, in those working environments where the parts to be transported do not exceed certain volume or weight.

[0006] More specifically and as can be seen in the example of the state of the art mentioned above, such cranes have in their base a pair of legs of a considerable size providing stability to the crane when it is operating, i.e., when it is supporting certain load. In that case, the center of gravity of the assembly will be located virtually in the vertical of the free end of the articulated arm where the hook or the like securing said load is located. Therefore, to achieve mobility, the cranes comprise respective pairs of wheels or rolling elements, a first pair at the end of said legs and a second pair located either in other small legs or directly on the base, slightly shifted towards the outside of the vertical projection of said column and in the direction opposite the first pair of wheels. Although said wheel arrangement allows such cranes to be transported by the user, the maneuverability achieved is reduced, requiring a large amount of space to be able to perform turning movements.

[0007] However, given that the loads to be moved can be rather bulky, the free end of the articulated arm must be significantly separated from the column, leaving sufficient space to prevent the load and said column from hitting one another. For this reason, the legs of the base must also be extended in a length such that, as mentioned, they assure stability, which means that they must be extended substantially beyond the vertical projection of the free end of the articulated arm.

[0008] This means that said legs are of a considerable length, so they obstruct human and machinery passage as well as prevent storing the crane when it is not in use.

[0009] To solve this problem, some of these cranes have extendable or deployable legs having one or several sections that can be fitted to one another, being attached to one another in a simple and fast manner by means of pins, bolts, etc.

[0010] This solution, however, has the drawback that when the operator needs to modify the length of the legs either for extending or retracting them, he/she needs a second operator who tilts the crane from the back so that the weight thereof does not prevent the insertion or removal of the bolt or pin with which the sections thereof are attached to one another.

[0011] More specifically, when the operator wants to disengage the legs, the weight of the crane itself causes the bolt or pin to be pressed, in the two sections of the legs to be disengaged, by the edges of the opposing holes with the bolt or pin going through them transversely, so the removal thereof will be complicated if there is no one to lift the crane such that said pressure and the pin or bolt are released.

[0012] In contrast, if the operator wants to engage two sections of said legs to one another, it would be impossible for him/her to make the mentioned holes, through which the pin or bolt is to be inserted, line up with or face one another if a second operator does not lift the crane enough so that said sections can be suitably "fitted".

[0013] Another known solution of the state of the art is that shown in said document P201100368, which consists of providing the mentioned legs with an articulation or point for lowering on the base of the crane, therefore, instead of having to remove or retract sections of the legs, these legs can be lowered on the column, no longer taking up any floor space.

[0014] Nevertheless, in said solution, there is still a need to secure the legs by means of a bolt or pin both in the folded position and the unfolded position thereof, so the operator will still need the help of a second operator in a manner similar to the foregoing, i.e., lifting the crane slightly from the rear portion so that the first operator can make the holes, through which there are inserted the pins or bolts structurally securing the legs and preventing unwanted relative movements that may destabilize the crane when it is under load, line up with one another.

Description of the Invention

[0015] The workshop crane object of the present in-

vention solves the drawbacks of the state of the art mentioned above insofar as it allows the operations of extending, shortening or lowering the legs of the crane to be performed in a safe and comfortable manner by a single operator, which results in time and cost savings.

[0016] To that end, the workshop crane object of the present invention comprises the conventional elements, i.e.:

- a base;
- a column rising from the base to a certain height;
- an arm connected in an articulated manner to said column which is capable of moving up or down operated by an operating system and at the free end of which there is located an element for securing the load to be lifted;
- at least one pair of legs which are located on both sides of the vertical projection of the column, attached at one of their ends to the front face of the base and extending beyond the vertical projection of the free end of the articulated arm;
- front rolling elements located at the free ends of the legs; and
- rear rolling elements located on the rear face of the base and on both sides of the vertical projection of the column.

[0017] But furthermore, in order to facilitate maneuverability and as will be explained below, the crane additionally comprises at least two intermediate wheels located on the front face of the base, on both sides of the vertical projection of the arm and between the front rolling elements and the rear rolling elements such that when the crane is without load it is supported on the rear rolling elements and the intermediate wheels.

[0018] In this manner, since it is supported on the rear rolling elements and on the intermediate wheels, located very close to one another, this results in improved maneuverability of the crane and, therefore, in faster, safer and more comfortable handling for the operator.

[0019] In contrast, when the crane is in the operative phase, i.e., with load, the center of gravity will shift substantially forward, so the crane will be supported on the front rolling elements located at the ends of the legs and on the intermediate wheels, obtaining maneuverability similar to that obtained conventionally in the state of the art, where said intermediate wheels do not exist.

[0020] Last but not least, the structure of the crane of the invention significantly improves the operations of extending-folding or lowering the legs, since it will no longer require the intervention of a second operator lifting the crane slightly from the rear portion so that the first operator can make the holes, through which there are inserted the pins or bolts whereby said legs are secured to the base, line up with one another.

[0021] As described above, said help will no longer be necessary because, when the crane is in a non-operative position, it is supported on the rear rolling elements and on the intermediate wheels and not on the front rolling elements located at the ends of the legs. The operator can thus operate the bolt with one hand and the leg of the crane with the other hand, given that said leg is in a raised position, facilitating the operations of removing and placing the bolt.

Description of the Drawings

[0022] To complement the description that is being made and for the purpose of aiding to better understand the features of the invention according to a preferred practical embodiment thereof, a set of drawings is attached as an integral part of said description in which the following is depicted with an illustrative and non-limiting character:

Figure 1 shows a front elevational view of the workshop crane of the present invention.

Figure 2 shows a rear elevational view of the crane of Figure 1.

Figure 3 shows a profile view of the crane of the preceding figures.

Figure 4 shows a top plan view of the crane of the preceding figures.

Figure 5 shows, finally, a perspective view of the crane of the invention shown in Figures 1 to 4.

Preferred Embodiment of the Invention

[0023] In view of the described drawings, it can be seen how the crane of the present invention is formed such that it comprises:

- a base (1) having a front face and a rear face;
- a column (2) rising from the base (1) to a certain height;
- an arm (3) connected in an articulated manner to said column (2) which is capable of moving up or down operated by a hydraulic operating system (4) or the like and at the free end (5) of which there is located a load securing element (6) such as a hook or the like;
- at least one pair of legs (7) which are located on both sides of the vertical projection of the column (2), attached at one of their ends to the front face of the base (1) and extending beyond the vertical projection of the free end (5) of the articulated arm;
- front rolling elements (8) located at the free ends of the legs (7); and
- at least one rear rolling element (9) located on the rear face of the base (1).

[0024] Furthermore, as seen in the drawings, particularly in Figures 3 to 5, the crane additionally comprises at least two intermediate wheels (10) located on the front face of the base (1) on both sides of the vertical projection of the arm (3), and between the front rolling elements (8)

and the rear rolling element or elements (9) such that when the crane is without load it is supported on the rear rolling element or elements (9) and the intermediate wheels (10).

[0025] According to the preferred embodiment shown in the drawings, the intermediate wheels (10) will be those referred to as swivel or "idler" wheels, such that when they are in operation they allow the user to follow non-rectilinear paths, making turns, etc.

[0026] On the other hand, said intermediate wheels (10) will preferably be located on the outer sides of the legs (7) in order to increase stability, although possible embodiments (not shown) in which they are located on the inner side thereof are not dismissed.

[0027] Likewise, the rear rolling element or elements (9) can be assembled either directly on the rear portion of the base (1), as shown in the drawings, or through small legs or intermediate protrusions (not depicted) provided that they are still located close to the base. In other words, in the case in which there are two rolling elements, these elements will be located on both sides of the vertical projection of the column (2) such that the imaginary or real axis joining them intersects or is under the vertical projection of the column (2). Likewise, if there were only one rolling element, not depicted, this rolling element will be located under the vertical projection of said column (2) to assure stability.

[0028] Finally, it is possible to see, particularly in Figure 4, the bolts (11), pins or the like used for fixing the legs (7) either in the extended position thereof such as that shown or in the position in which they are lowered on the column (2) when the crane is in the non-operative phase.

Claims

1. Workshop crane comprising:

- a base (1) with a front face and a rear face;
- a column (2) rising from the base (1) to a certain height;
- an arm (3) connected in an articulated manner to said column (2) having an operating system (4) and at the free end (5) of which there is located a load securing element (6);
- at least one pair of legs (7) which are located on both sides of the vertical projection of the column (2) and attached at one of their ends to the front face of the base (1) comprising at their free ends front rolling elements (8); and
- at least one rear rolling element (9) located on the rear face of the base (1).

characterized in that it additionally comprises at least two intermediate wheels (10) located between the front rolling elements (8) and the rear rolling element or elements (9) such that when the crane is without load it is supported on the rear rolling element or elements (9) and the intermediate wheels (10)

2. Workshop crane according to claim 1, **characterized in that** the intermediate wheels (10) are swivel wheels.

3. Workshop crane according to any of claims 1 or 2, **characterized in that** the intermediate wheels (10) are located on the outer sides of the legs (7).

4. Workshop crane according to any of the preceding claims, **characterized in that** the intermediate wheels (10) are located on the front face of the base (1) on both sides of the vertical projection of the arm (3).

5. Workshop crane according to claim 1, **characterized in that** the rear rolling element or elements (9) are directly assembled on the rear portion of the base (1).

6. Workshop crane according to claim 1, **characterized in that** the rear rolling element or elements (9) are assembled on the rear portion of the base (1) through intermediate protrusions.

7. Workshop crane according to any of claims 1, 5 or 6, **characterized in that** it comprises two rear rolling elements (9) which are located on both sides of the vertical projection of the column (2) such that the imaginary or real axis joining them intersects with the vertical projection of the column (2).

8. Workshop crane according to any of claims 1, 5 or 6, **characterized in that** it comprises a single rear rolling element (9) which is located under the vertical projection of the column (2).

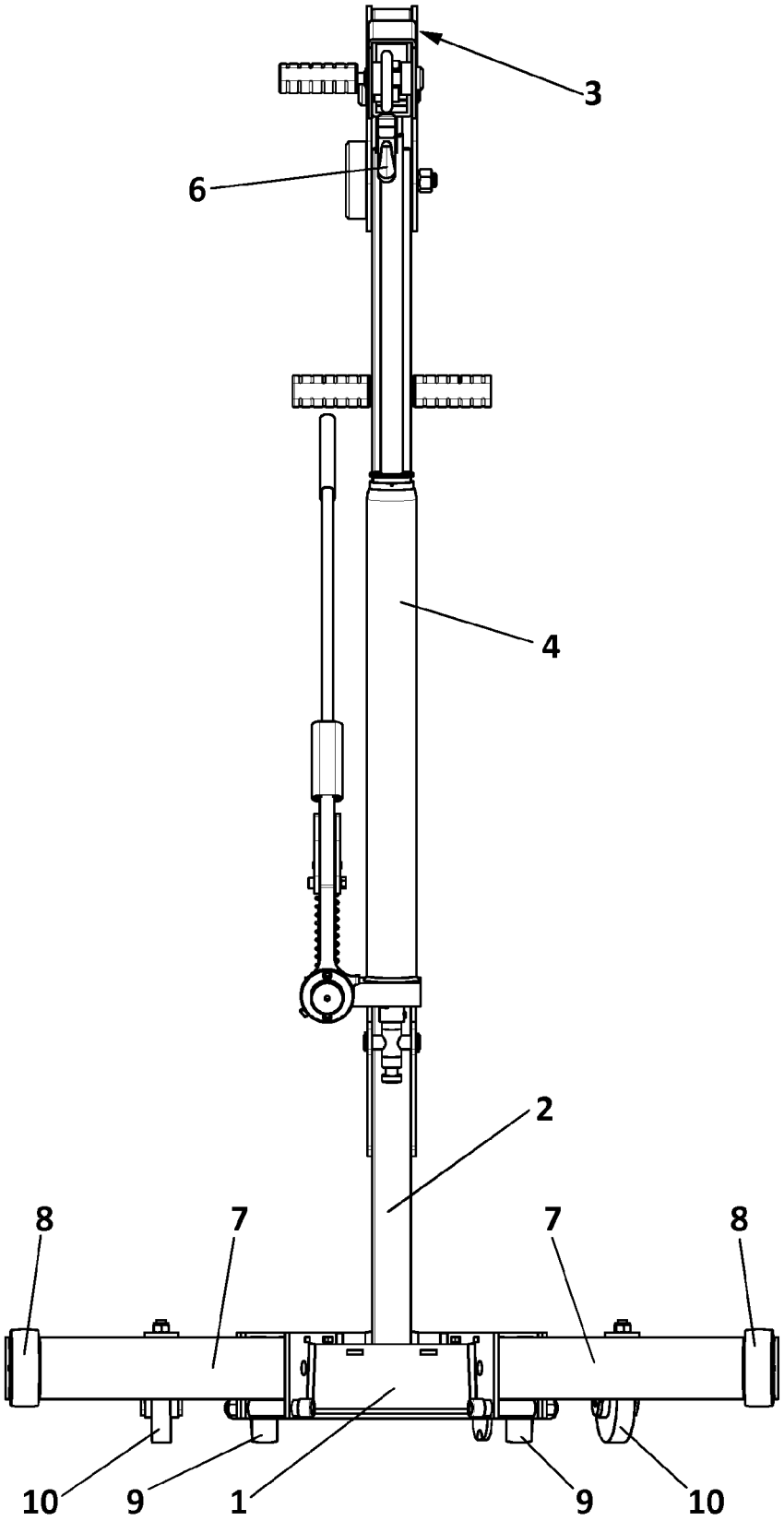

FIG. 1

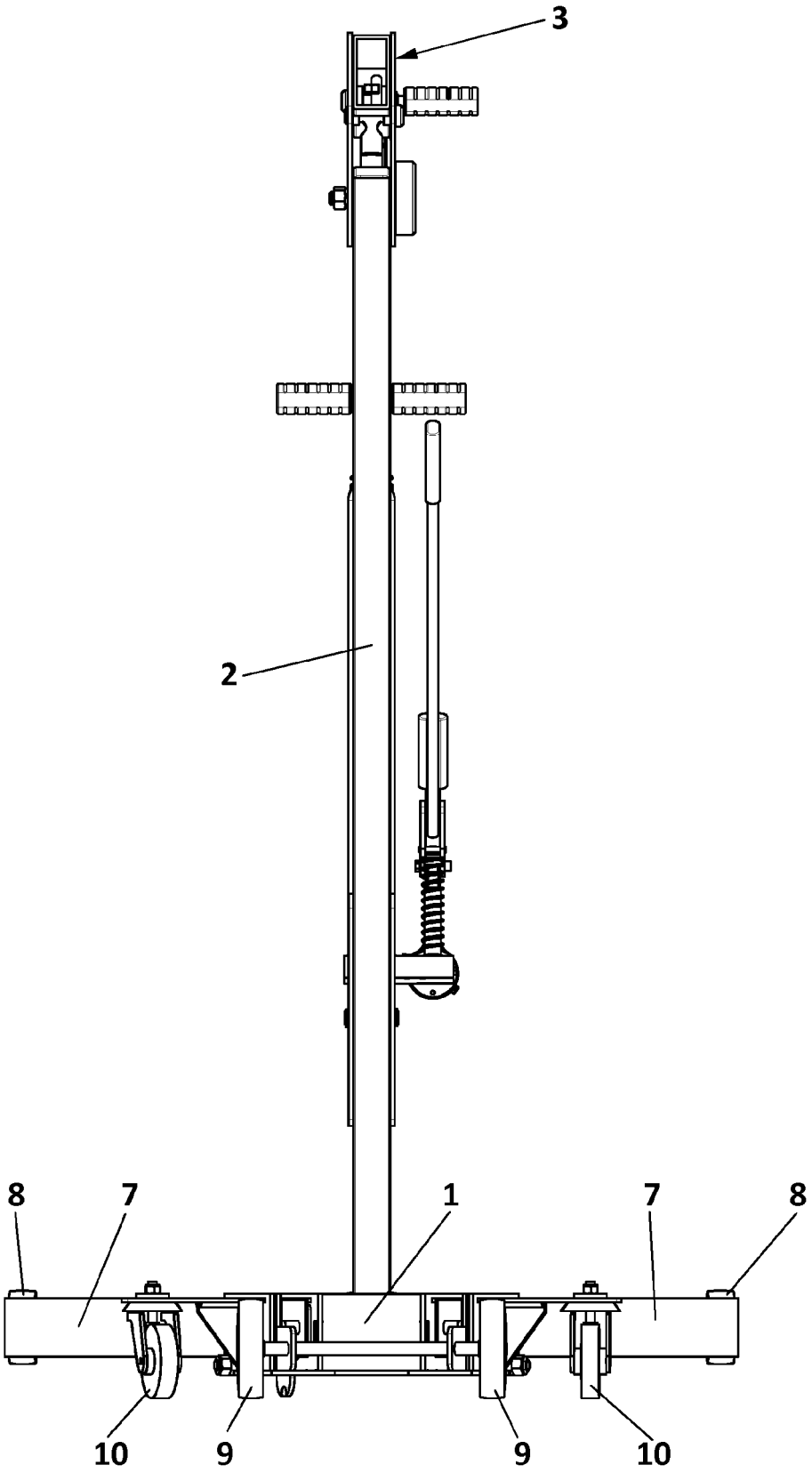

FIG. 2

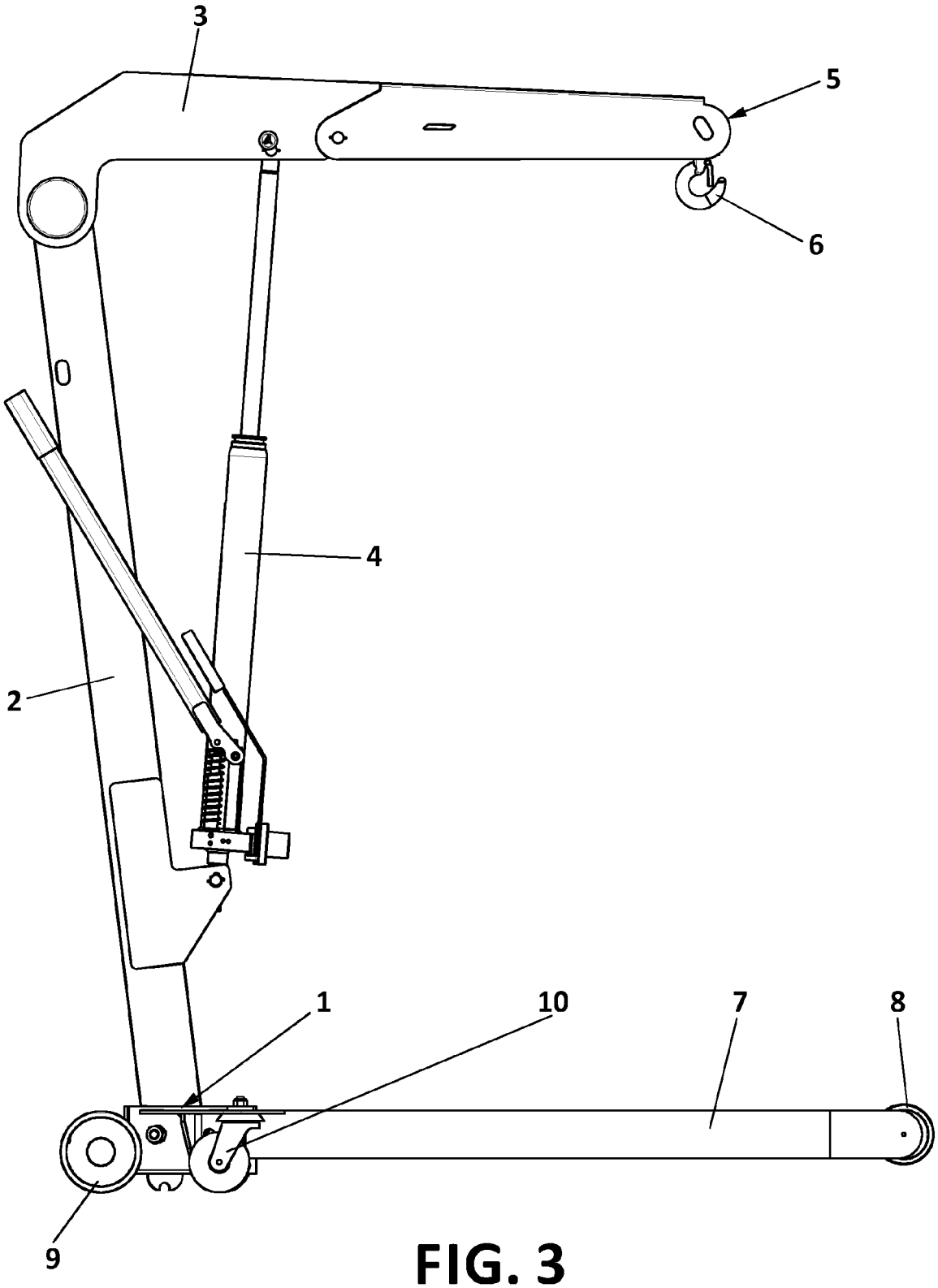

FIG. 3

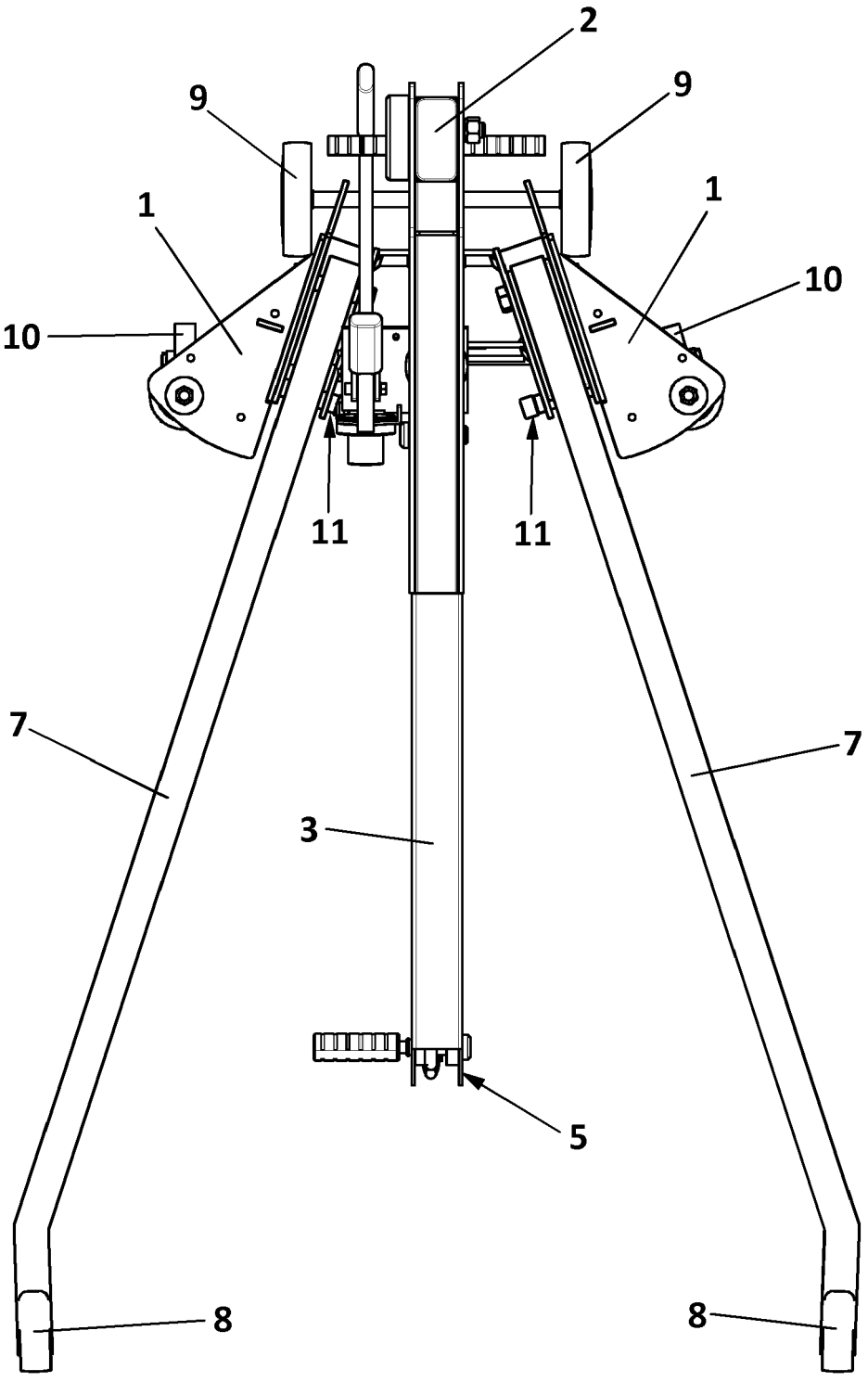

FIG. 4

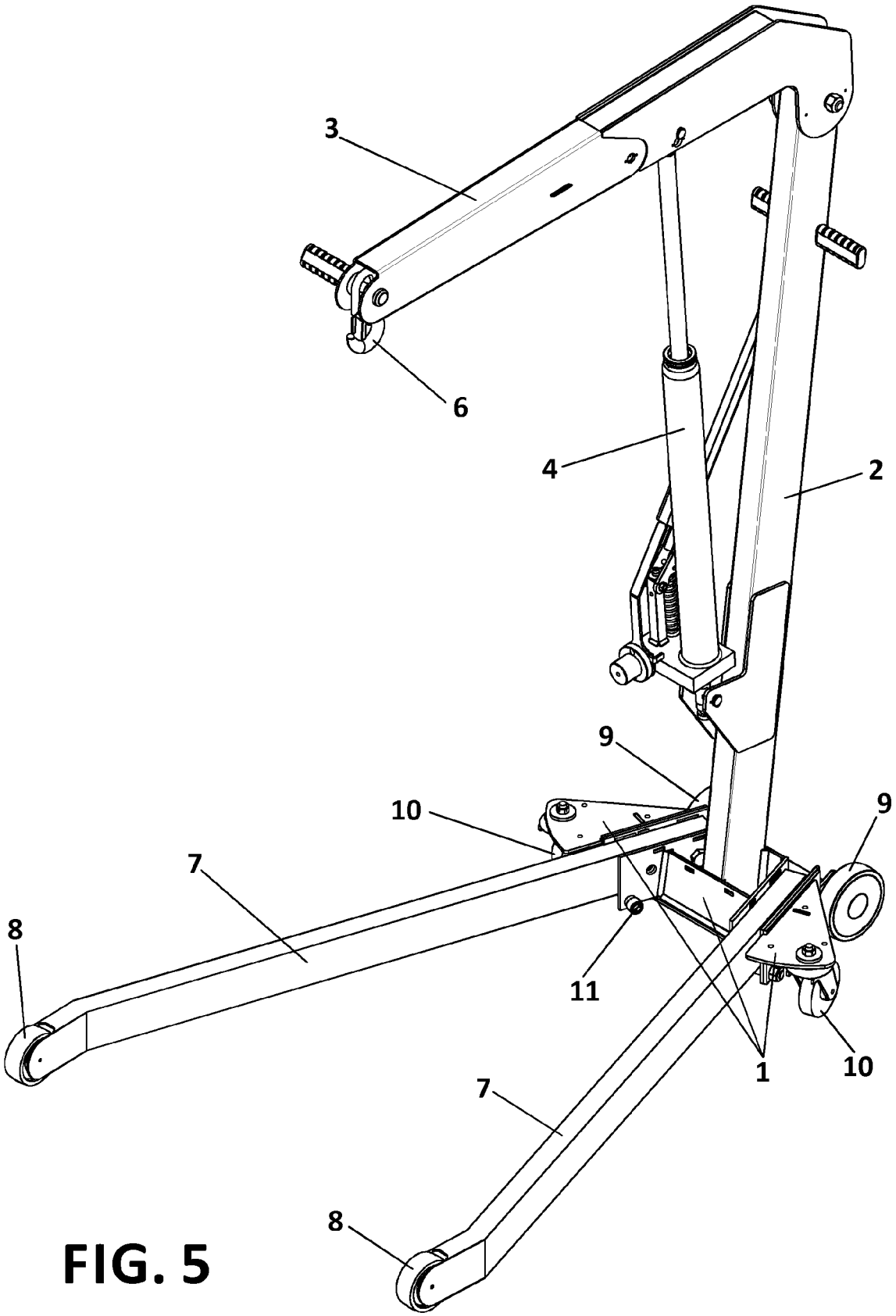

FIG. 5

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EUROPEAN SEARCH REPORT

Application Number
EP 14 38 2364

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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	5 February 2015	Guthmuller, Jacques

CATEGORY OF CITED DOCUMENTS

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EUROPEAN SEARCH REPORT

Application Number
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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	5 February 2015	Guthmuller, Jacques

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