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(54) **Workshop crane**

Werkstättenkran

Grue d'atelier

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(73) Proprietor: **Melchor Gabilondo, S.A.**

48240 Berriz (BIZKAIA) (ES)

(72) Inventor: **Gonzalez De Arriba, Saul**

48240 Berriz (Vizcaya) (ES)

(74) Representative: **Carpintero Lopez, Francisco et al
Herrero & Asociados, S.L.**

**Cedaceros 1
28014 Madrid (ES)**

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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.

[0015] Finally, other examples are shown in US4190233, WO2008/090221, JP2014159331, US2012/319064, US2003/071003 or US7866332. Whereby, WO2008/090221 discloses a workshop crane

according to the preamble of independent claim 1.

Description of the Invention

[0016] The workshop crane object of the present invention 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.

[0017] To that end, there is proposed a workshop crane having all the technical features as defined in independent claim 1.

[0018] The workshop crane comprises the conventional elements:

- 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.

[0019] 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.

[0020] 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.

[0021] 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.

[0022] 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.

[0023] 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

[0024] 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 nonlimiting 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

[0025] 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).

[0026] 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).

[0027] 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.

[0028] 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.

[0029] 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.

[0030] 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), where the legs (7) can either be fixed in the extended po-

sition in the operative phase or lowered on the column (2) when the crane is in the non-operative phase;

- at least one rear rolling element (9) located on the rear face of the base (1) and
- 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);

characterized in that the crane is supported both with load or without load on 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 claim 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).

Patentansprüche

1. Werkstattkran umfassend:

- eine Basis (1) mit einer Vorderseite und einer

Rückseite;

- eine Säule (2), die von der Basis (1) auf eine gewisse Höhe ansteigt;

- einen Arm (3), der auf eine gelenkige Weise mit der Säule (2) verbunden ist und ein Betriebssystem (4) aufweist und an dessen freiem Ende (5) ein Lastsicherungselement (6) angeordnet ist;

- zumindest ein Paar von Schenkeln (7), die auf beiden Seiten der vertikalen Verlängerung der Säule (2) angeordnet und an einem ihrer Enden an der Vorderseite der Basis (1) befestigt ist, die an ihren freien Enden vordere Rollelemente (8) umfasst, wobei die Schenkel (7) entweder in der ausgefahrenen Position in der Betriebsphase oder an der Säule (2) abgesenkt fixiert sein können, wenn der Kran in der Nicht-Betriebsphase ist;

- zumindest ein rückwärtiges Rollelement (9), das an der Rückseite der Basis (1) angeordnet ist, und

- zumindest zwei Zwischenräder (10), die zwischen den vorderen Rollelementen (8) und dem rückwärtigen Rollelementen (9) oder den rückwärtigen Rollelementen (9) angeordnet sind, so dass, wenn der Kran ohne Last ist, er an dem rückwärtigen Rollelement oder den Elementen (9) und den Zwischenrädern (10) gestützt ist; **dadurch gekennzeichnet, dass** der Kran mit der Last oder ohne Last an den Zwischenrädern (10) gestützt ist.

2. Werkstattkran nach Anspruch 1, **dadurch gekennzeichnet, dass** die Zwischenräder (10) Drehräder sind.

3. Werkstattkran nach einem der Ansprüche 1 oder 2, **dadurch gekennzeichnet, dass** die Zwischenräder (10) an den Außenseiten der Schenkel (7) angeordnet sind.

4. Werkstattkran nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** die Zwischenräder (10) an der Vorderseite der Basis (1) auf beiden Seiten der vertikalen Verlängerung des Armes (3) angeordnet sind.

5. Werkstattkran nach Anspruch 1, **dadurch gekennzeichnet, dass** das rückwärtige Rollelement oder die rückwärtigen Rollelemente (9) direkt an den rückwärtigen Abschnitt der Basis (1) angebaut sind.

6. Werkstattkran nach Anspruch 1, **dadurch gekennzeichnet, dass** das rückwärtige Rollelement oder die rückwärtigen Rollelemente (9) an dem rückwärtigen Abschnitt der Basis (1) durch Zwischenvorsprünge angebaut sind.

7. Werkstattkran nach einem der Ansprüche 1, 5 oder 6, **dadurch gekennzeichnet, dass** er zwei rückwärtige Rollelemente (9) umfasst, die an beiden Seiten der vertikalen Verlängerung der Säule (2) angeordnet sind, so dass die imaginäre oder reale Achse, die diese verbindet, sich mit der vertikalen Verlängerung der Säule (2) schneidet.

8. Werkstattkran nach einem der Ansprüche 1, 5 oder 6, **dadurch gekennzeichnet, dass** er ein einzelnes rückwärtiges Rollelement (9) umfasst, das unterhalb der vertikalen Verlängerung der Säule (2) angeordnet ist.

Revendications

1. Grue d'atelier comprenant :

- une base (1) avec une face avant et une face arrière ;

- une colonne (2) montant de la base (1) à une certaine hauteur ;

- un bras (3) raccordé de manière articulée à ladite colonne (2) présentant un système de commande (4) et sur l'extrémité libre (5) duquel est situé un élément de fixation de charge (6) ;

- au moins une paire de jambes (7) qui sont situées sur les deux côtés de la projection verticale de la colonne (2) et attachées au niveau d'une de leurs extrémités à la face avant de la base (1) comprenant à leurs extrémités libres des éléments roulants avant (8), où les jambes (7) peuvent être fixées dans la position étendue dans la phase opérationnelle ou abaissées sur la colonne (2) lorsque la grue est dans la phase non opérationnelle ;

- au moins un élément roulant arrière (9) situé sur la face arrière de la base (1) et

- au moins deux roues intermédiaires (10) situées entre les éléments roulants avant (8) et le ou les éléments roulants arrière (9) de sorte que lorsque la grue est sans charge elle est supportée sur le ou les éléments roulants arrière (9) et les roues intermédiaires (10) ;

caractérisée en ce que la grue est supportée à la fois avec charge ou sans charge sur les roues intermédiaires (10).

2. Grue d'atelier selon la revendication 1, **caractérisée en ce que** les roues intermédiaires (10) sont des roues pivotantes.

3. Grue d'atelier selon la revendication 1 ou 2, **caractérisée en ce que** les roues intermédiaires (10) sont situées sur les côtés extérieurs des jambes (7).

4. Grue d'atelier selon l'une quelconque des revendications précédentes, **caractérisée en ce que** les roues intermédiaires (10) sont situées sur la face avant de la base (1) sur les deux côtés de la projection verticale du bras (3). 5
5. Grue d'atelier selon la revendication 1, **caractérisée en ce que** le ou les éléments roulants arrière (9) sont directement assemblés sur la portion arrière de la base (1). 10
6. Grue d'atelier selon la revendication 1, **caractérisée en ce que** le ou les éléments roulants arrière (9) sont assemblés sur la portion arrière de la base (1) à travers de saillies intermédiaires. 15
7. Grue d'atelier selon l'une quelconque des revendications 1, 5 ou 6, **caractérisée en ce qu'elle** comprend deux éléments roulants arrière (9) qui sont situés sur les deux côtés de la projection verticale de la colonne (2) de sorte que l'axe imaginaire ou réel les joignant croise la projection verticale de la colonne (2). 20
8. Grue d'atelier selon l'une quelconque des revendications 1, 5 ou 6, **caractérisée en ce qu'elle** comprend un seul élément roulant arrière (9) qui est situé sous la projection verticale de la colonne (2). 25

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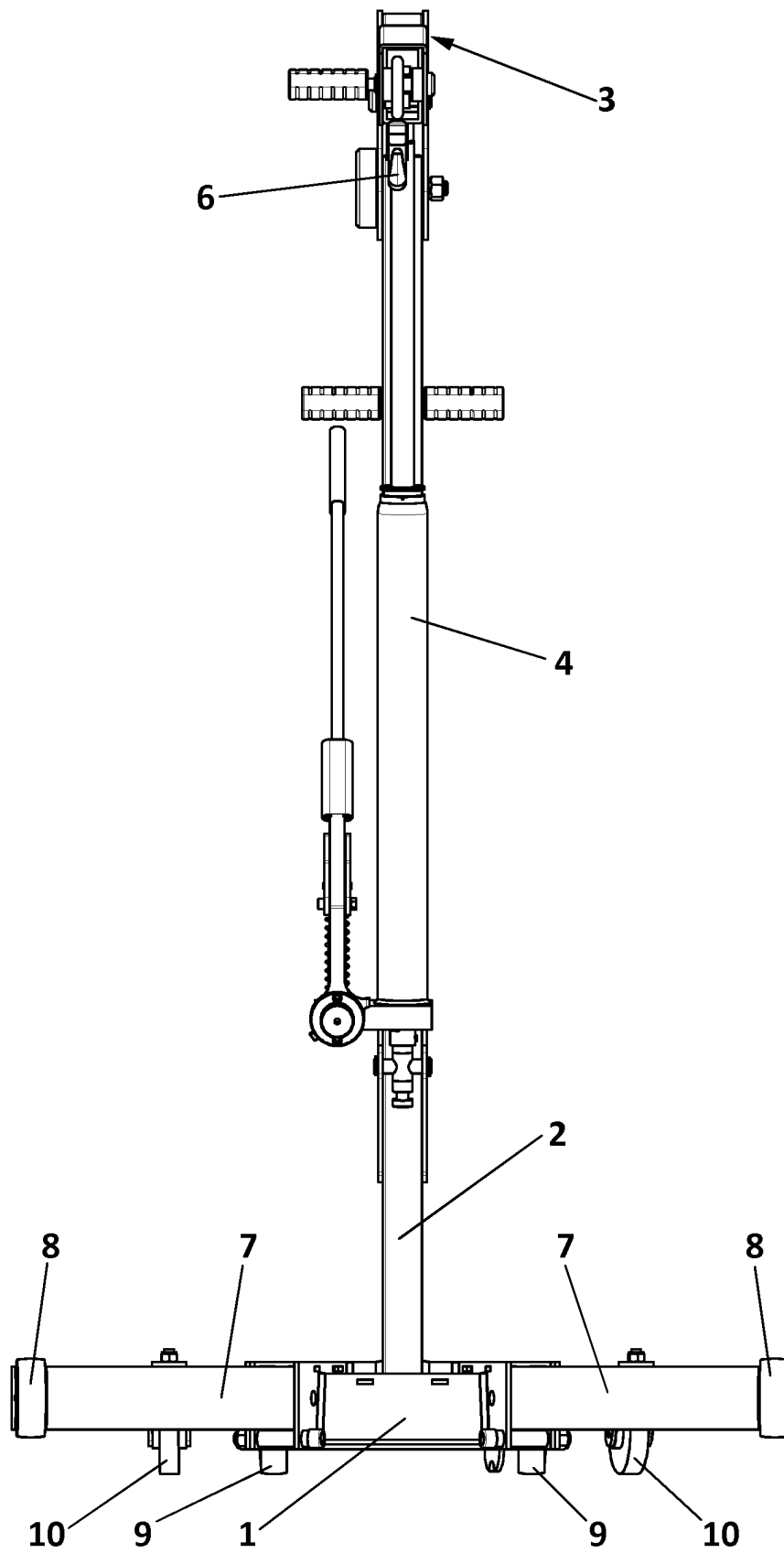


FIG. 1

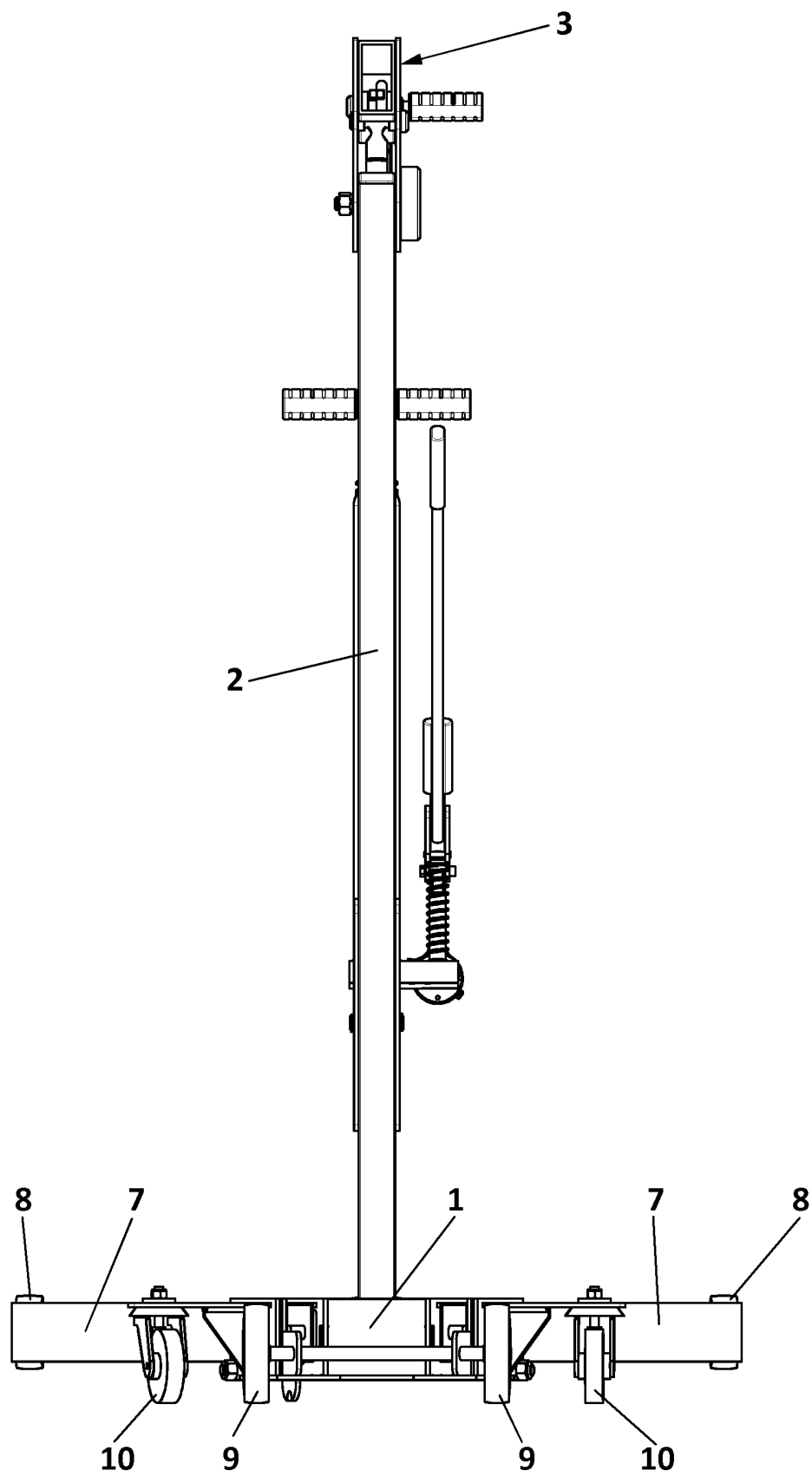


FIG. 2

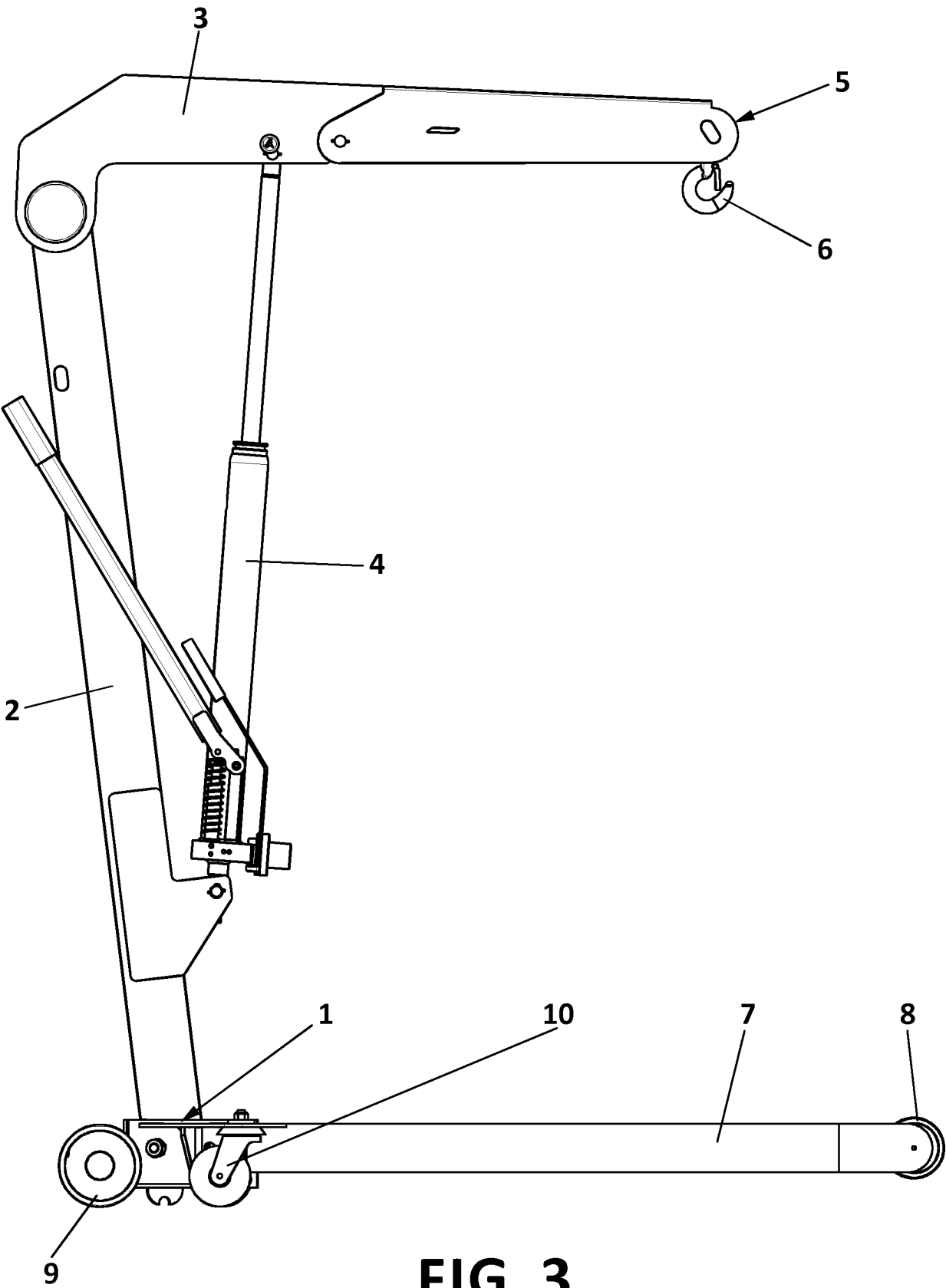


FIG. 3

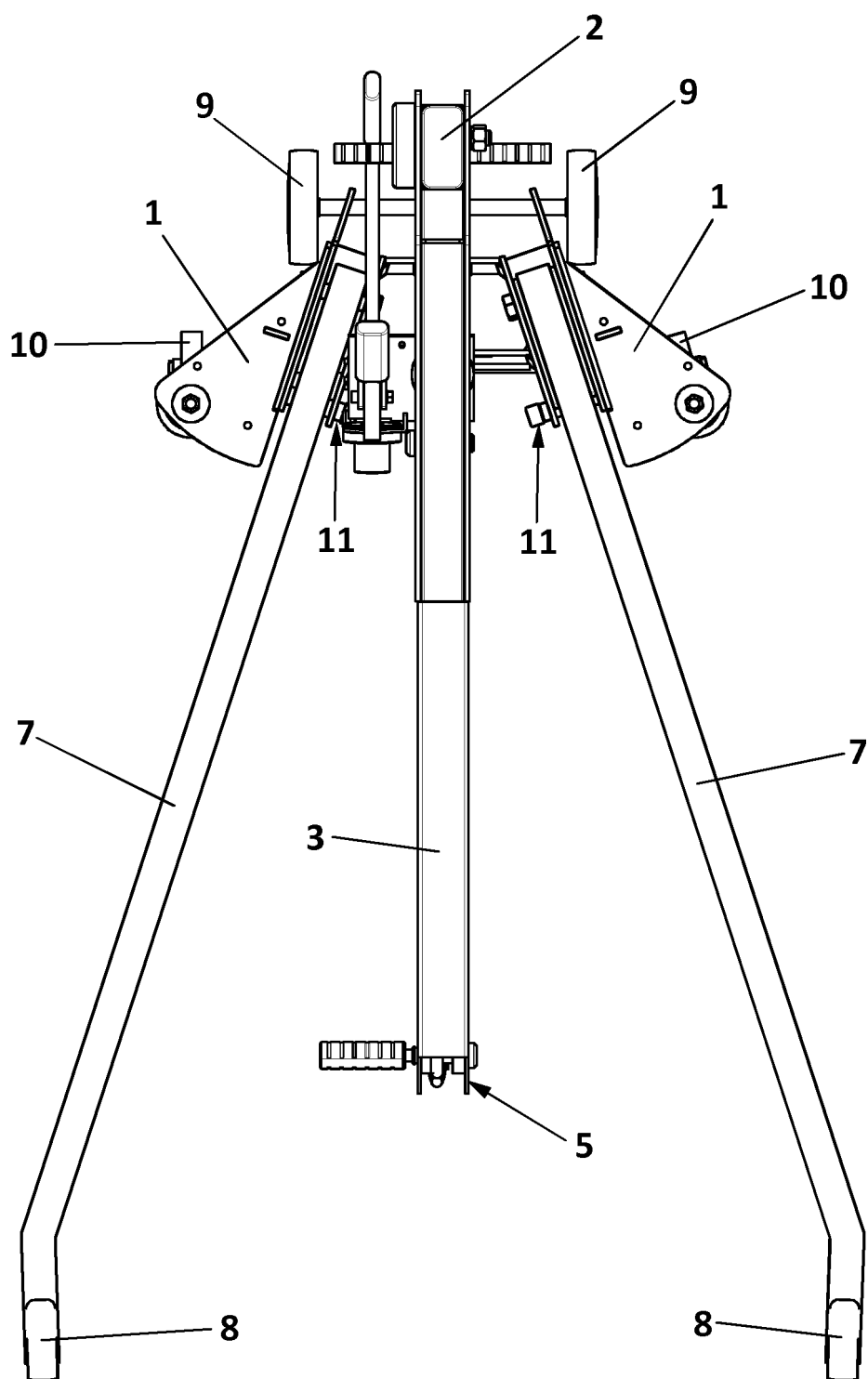


FIG. 4

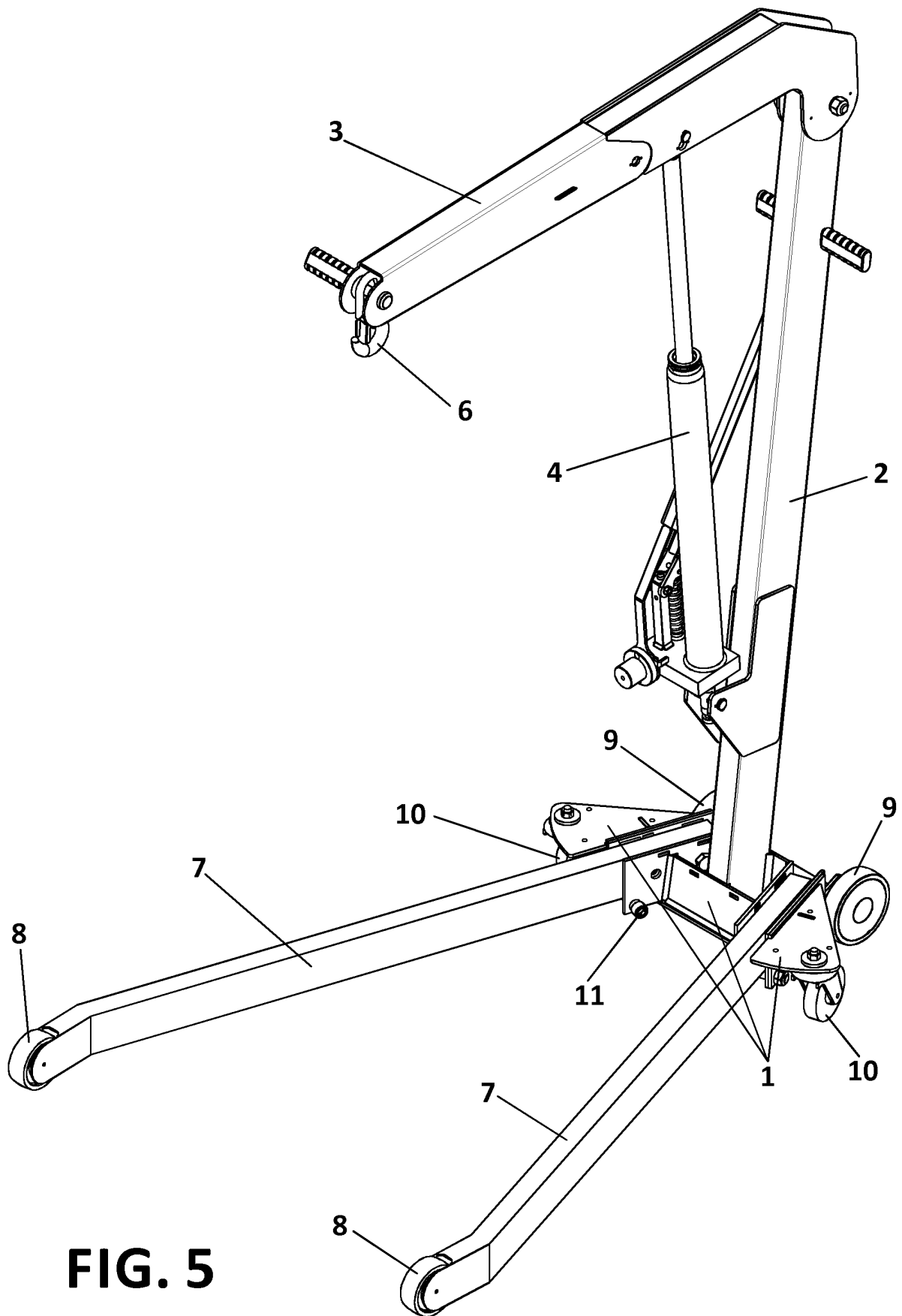


FIG. 5

REFERENCES CITED IN THE DESCRIPTION

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