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(54) Title: A freestanding self-righting frame

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"A freestanding self-righting frame"

Introduction

This invention relates to a freestanding self-righting frame. The invention is particularly concerned with temporary barriers and with signs.

Various designs of free-standing self-righting signs have been proposed previously. For example, US 1,420,603 discloses a sign with a weighted base which causes the sign to automatically right itself when knocked over. A self-righting warning marker with a weighted base is disclosed in US 5,487,619. Another self-righting display stand having a weighted base is disclosed in GB 2 320 358.

It is an object of the present invention to provide an improved self-righting frame for use as a temporary barrier or a sign.

Summary of the Invention

According to the invention, there is provided a freestanding self-righting frame including a ground-engaging base, an upstanding frame pivotally mounted on the base for pivotal movement about a substantially horizontal pivot axis, said frame having a counterweight below the pivot axis. The counterweight retains the frame in a normal upright operating position in use. It also resists movement of the frame away from said normal upright operating position and returns the frame to said normal upright operating position when the frame pivots out of said normal upright operating position on the base.

The term horizontal axis as used herein in reference to the frame pivot axis refers to when the free standing self-righting frame is standing on a horizontal support surface, such as the ground, as it typically will be in normal use. However, it will be appreciated that the ground may not always be level, in which case the frame pivot axis may be at an angle to the horizontal.

In one embodiment of the invention, the freestanding self-righting frame is portable.

In another embodiment, the freestanding self-righting frame is mobile.

In a further embodiment, the frame is pivotally connected to a pair of base support elements forming the base, a lower end of the frame being connected to each base support element by a pivot mount at each side of the frame.

In another embodiment, the base comprises a pair of ground-engaging wheels upon which the frame is pivotally mounted.

In another embodiment, locking means is provided for releasably locking the wheels.

In another embodiment, at least one of the wheels is connected to the frame by a swivel mount such that the wheel can swivel relative to the frame between a position substantially parallel to a side of the frame, and a position substantially perpendicular to the side of the frame.

In another embodiment, the swivel mount comprises a swivel arm, an inner end of the swivel arm being pivotally mounted on the frame and an outer end of the swivel arm rotatably supporting the wheel.

In another embodiment, the swivel arm is pivotable between a normal operating position alongside a side of the frame and a transport position in line with a bottom of the frame or substantially parallel to a bottom of the frame.

In a further embodiment, a stop flange is mounted at an inner end of the swivel arm and projects perpendicularly outwardly therefrom for engagement with an end of the counterweight, or support arm carrying the counterweight when the swivel arm is in the transport position.

In another embodiment, the base comprises a ground-engaging stand.

In a further embodiment, the stand comprises a pair of triangular supports, one of said supports being mounted at each side of the frame.

In another embodiment, the counterweight is carried on arms extending outwardly

from each pivot mount on the base.

In another embodiment, the counterweight is integrally formed with the frame.

In a further embodiment, the counterweight forms a bottom cross member of the frame.

In another embodiment, the counterweight comprises a tubular cross member on the frame. Conveniently, the counterweight may be formed by a length of pipe.

In another embodiment, the counterweight is adapted to retain ballast therein. For example, the tubular cross member forming the counterweight may be filled with concrete. Alternatively, the tubular cross member forming the counterweight may be adapted to receive water or other liquid ballast.

In another embodiment, the frame includes a pair of upright stanchions extending upwardly from each pivot mount with one or more rail members extending between the stanchions.

In another embodiment, a plurality of spaced-apart rail members extend between the stanchions.

In another embodiment, each rail member comprises a wire rope.

In another embodiment, a rigid upper cross member extends between the stanchions at an upper end of the stanchions.

In another embodiment, each stanchion is cranked at its lower end for reception of the base support element at a bottom of each stanchion.

In another embodiment each wheel locates in a recess formed by a cranked lower end of the stanchion.

In another embodiment, the frame forms a gate or fence panel.

In another embodiment, the frame forms a sign mounting frame.

Brief Description of the Drawings

The invention will be more clearly understood by the following description of some embodiments thereof, given by way of example only, with reference to the accompanying drawings, in which:

Fig. 1 is an elevational view of a freestanding self-righting frame according to the invention;

Figs. 2 to 9 are various perspective views illustrating a freestanding self-righting frame according to a second embodiment of the invention;

Fig. 10 is an elevational view of another freestanding self-righting frame according to a third embodiment of the invention; and

Fig. 11 is a side elevational view of the freestanding self-righting frame shown in Fig. 10.

Detailed Description of the Preferred Embodiments

Referring to the drawings, and initially to Fig. 1 thereof, there is illustrated a freestanding self-righting frame according to the invention, indicated generally by the reference numeral 1. The freestanding self-righting frame 1 has a ground engaging base 2 which, in this case, is formed by a pair of ground-engaging wheels 3. An upstanding frame 4 is pivotally mounted on the base 2 by pivot mounts 5, 6 for pivotal movement about a substantially horizontal axis A. That is to say, when the freestanding self-righting frame 1 is standing on a horizontal support such as the ground 8, said axis A is substantially horizontal. A counterweight 9 is mounted on the frame 4 below the pivot axis A. Thus, the frame 4 can pivot on the wheels 3 forming the base 2. The counterweight 9 retains the frame 4 in a normal upright operating position and will resist pivotal movement of the frame 4 on the wheels 3 away from said upright normal operating position. Also, should the frame 4 be deflected out of the normal upright operating position, the counterweight 9 will return the frame 4 to

said normal upright operation position.

The frame 4 is pivotally connected to the wheels 3 by the pivot mounts 5, 6 which extend between a lower end of the frame 4 and each of the wheels 3. The wheels 3 are rotatably mounted on the frame 4 and thus conveniently the frame 4 can be wheeled along the ground 8 for positioning the frame 1 in use.

In this case, the counterweight 9 is formed by a steel pipe which forms a bottom cross member of the frame 4. Arms 10, 11 extend outwardly and normally downwardly from each pivot mount 5, 6, the counterweight 9 extending between outer free ends 12 of the arms 10, 11.

The frame 4 includes a pair of upright stanchions 14, 15 of aluminium material extending upwardly from each pivot mount 5, 6 at inner ends 13 of the arms 10, 11. A number of spaced-apart rail members 16, in this case formed by wire rope, extend between the stanchions 14, 15.

Each stanchion 14, 15 has a cranked lower end 17, 18 forming a recess 19 for reception of each wheel 3 at a bottom of each stanchion 14, 15. Thus, a number of the freestanding self-righting frames 1 may be joined edge to edge with stanchions 14, 15 of the frames 4 abutting to form a continuous freestanding frame. If desired these could be temporarily joined by ties or connectors between the abutting stanchions 14, 15.

In this case, the freestanding self-righting frame 1 forms a gate, or a fence panel, which is mobile and can be easily manoeuvred to temporarily block an opening, for example. A number of the freestanding self-righting frames 1 can be assembled to form a temporary pen or the like for temporarily holding livestock, or arranged to define a passageway for directing animals.

It will be appreciated that the freestanding self-righting frame 1 is relatively lightweight and easily manoeuvrable and can be readily easily used as a temporary gate, fence or guiderail for directing animals in a particular direction. Should an animal hit against the frame 4, it will deflect to avoid damage to the frame 4, the counterweight 9 bringing the frame 4 back into the upright position.

The wire rope rail members 16 may optionally be electrified to aid in controlling livestock.

Referring now to Figs. 2 to 9, there is illustrated another freestanding self-righting frame according to a second embodiment of the invention, indicated generally by the reference numeral 20. This is largely similar to the freestanding self-righting frame described previously and like parts are assigned the same reference numerals. In this case, one of the wheels 3 is mounted on the frame 4 by a swivel mount, indicated generally by the reference numeral 22. The swivel mount 22 comprises a swivel arm 23 mounted at a lower end of the frame 4 at one side of the frame 4. An inner end 24 of the swivel arm 23 is pivotally mounted by a pivot 25 on mounting brackets 26 at a bottom of the side of the frame 4. An outer end 27 of the swivel arm 23 rotatably supports a wheel 3 in a bushing 29. It will be noted that the swivel arm 23 is pivotable through 90° between a normal operating position alongside one of the arms 10, 11 at a bottom of the frame 4, in which the swivel arm 23 is substantially parallel to the arm 10, 11 upon which it is mounted as shown in Fig. 4, and a transport position in line with a bottom of the frame 4 formed by the counterweight 9, as shown in Figs. 7 and 8 and substantially perpendicular to the arm 10, 11 upon which it is pivotally mounted.

Referring in particular to Fig. 6 and Fig. 7, a stop flange 32 projects outwardly at the inner end 24 of the swivel arm 23 on an outer face 33 of the swivel arm 23 and is substantially perpendicular to said outer face 33. A side edge 34 of the flange 32, which is perpendicular to the outer face 33, is engagable against an outer end 35 of the arm 10, on the opposite side to the counterweight 9, to limit outward movement of the swivel arm 23 and align the swivel arm 23 with the counterweight 9.

Referring in particular to Fig. 2, a number of spaced-apart eyelets 37 are provided on an outer edge of each stanchion 14, 15 which facilitate tying adjacent frames 4 together if desired.

In use, for transporting the frame 20, the sequence for moving the frame 20 into the transport position is shown in Figs. 3 to 9. The frame 4 is pivoted into a generally horizontal position, as shown in Figs. 3 and 4. Then the swivel arm 23 is moved outwardly through about 90°, as shown in Figs. 5 to 7. In the extended position, the

swivel arm 23 essentially forms an extension of the counterweight 9, as shown in Fig. 7. The stanchion 15, at an opposite side of the frame 4, and a handgrip 31, also at the opposite side of the frame 4, can be gripped by the user, as shown in Figs. 8 and 9, to lift one side of the frame 4 and wheel the frame 4 on the wheel 3 which is in alignment with the counterweight 9 in the manner of a wheelbarrow. This facilitates transporting and manoeuvring the self-righting frame 20. Once in position, the operator lets the side they are holding down again and the self-righting frame 20 automatically rights itself in a vertical direction due to the action of the counterweight 9 and the wheel 3 flips back into place.

Instead of the wheel 3 swivelling downwardly as described above it could be arranged to swivel to one side of the frame 4 about a vertical pivot axis.

Referring now to Figs. 10 and 11, there is illustrated another freestanding self-righting frame according to another embodiment of the invention, which in this case forms a self-righting sign 40. Parts similar to those described previously are assigned the same reference numerals. In this case, the base 2 comprises a ground-engaging stand formed by a pair of triangular supports 41, one of said supports 41 being mounted at each side of the frame 4. A lower end of the frame 4, at each side of the frame 4, connects to one of the supports 41 by means of a pivot mount 42, 43. Spokes 44 extend inwardly from each apex 47 of the support 41 to centrally mount a bushing 45 rotatably supporting a pivot pin 46 which is connected to an upper inner end 13 of each of the arms 10, 11. In this case, a single rigid upper cross member 48 extends between upper ends of the stanchions 14, 15. The stanchions 14, 15 and cross member 48 are all of aluminium material.

In use, a display sign or panel may be mounted on the frame 4 within an opening 50 defined by the stanchions 14, 15 at each side and the upper cross member 48 and counterweight 9 at top and bottom respectively of the frame 4. In some cases the sign might extend outside the frame 4. The frame 4 will deflect in windy conditions, pivoting on the base 2 by means of the pivot mounts 42, 43 to avoid the sign 40 overturning. The counterweight 9 will bring the frame 4 back into the upright position when deflected away therefrom.

While the base 2 in the embodiment shown in Fig. 10 and Fig. 11 shows a support 41

in the form of an equilateral triangle, other triangular supports 41 and indeed supports 41 in other configurations, such as rectangular, semi-circular or T-shaped configurations for example, may be provided. Indeed, as with the other embodiments the supports 41 could be provided by wheels if desired.

It is also envisaged that a transparent sleeve or pocket for reception of an advertising poster could be mounted on the frame 4 to facilitate mounting advertising posters or the like on the sign 40.

The counterweight 9 illustrated in the embodiments described herein is shown as a hollow cylindrical tube or pipe which is cheap and convenient from a manufacturing point of view. Tubes of other section may alternatively be used as indeed could other solid construction counterweights. It is also envisaged that the counterweight 9 when of tubular construction could be filled with a ballast such as concrete or water.

The invention is not limited to the embodiments hereinbefore described which may be varied in both construction and detail within the scope of the appended claims.

CLAIMS

1. A freestanding self-righting frame including a ground-engaging base, an upstanding frame pivotally mounted on the base for pivotal movement about a substantially horizontal pivot axis, said frame having a counterweight below the pivot axis.

2. The freestanding self-righting frame as claimed in claim 1, wherein the frame is pivotally connected to a pair of base support elements forming the base, a lower end of the frame being connected to each base support element by a pivot mount at each side of the frame.

3. The freestanding self-righting frame as claimed in any preceding claim, wherein the base comprises a pair of ground-engaging wheels upon which the frame is pivotally mounted, at least one of the wheels being connected to the frame by a swivel mount such that the wheel can swivel relative to the frame between a position substantially parallel to a side of the frame, and a position substantially perpendicular to the side of the frame.

4. The freestanding self-righting frame as claimed in claim 1 or claim 2, wherein the base comprises a ground-engaging stand, the stand comprising a pair of triangular supports, one of said supports being mounted at each side of the frame.

5. A freestanding self-righting frame substantially as hereinbefore described with reference to the accompanying drawings.

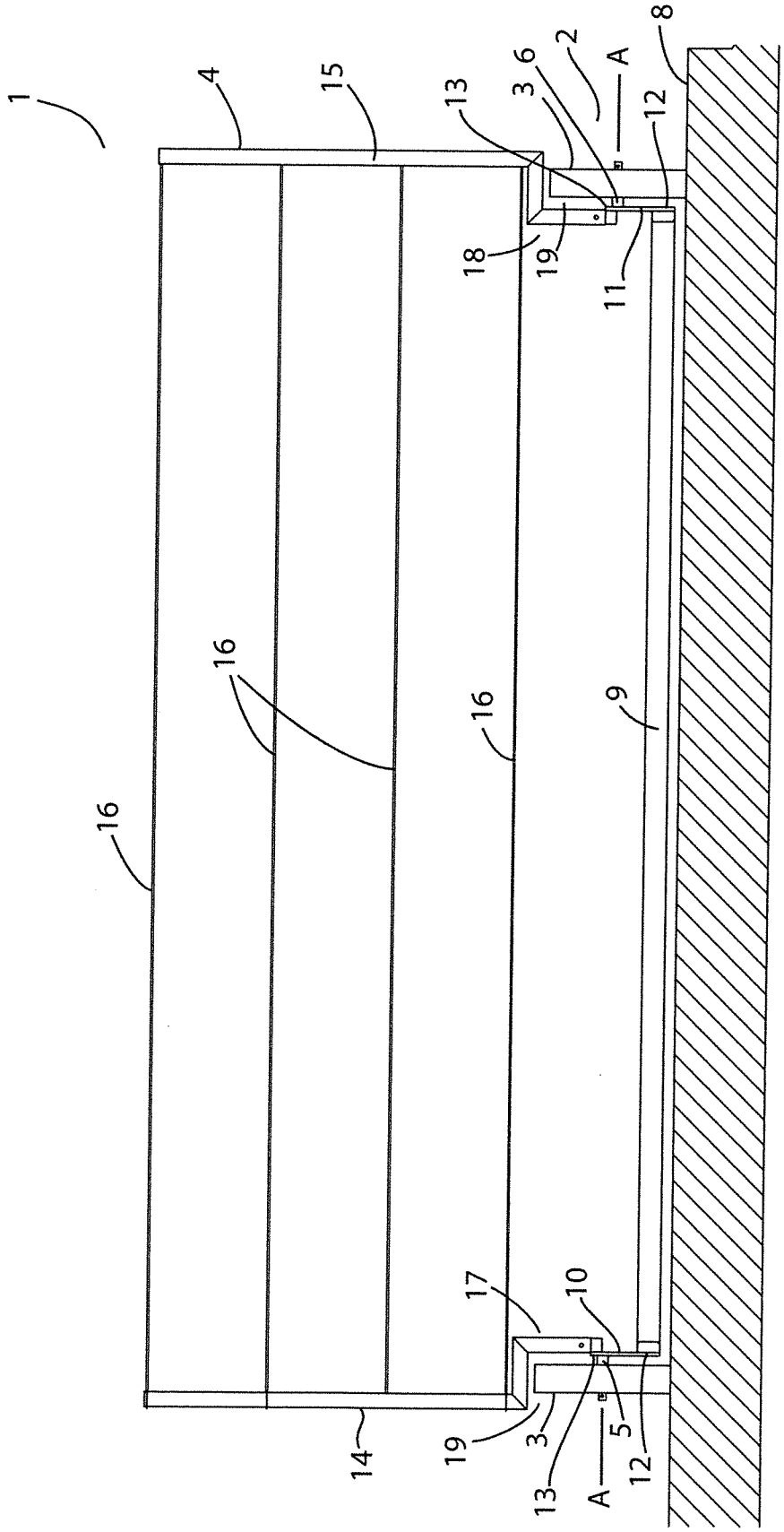

Fig. 1

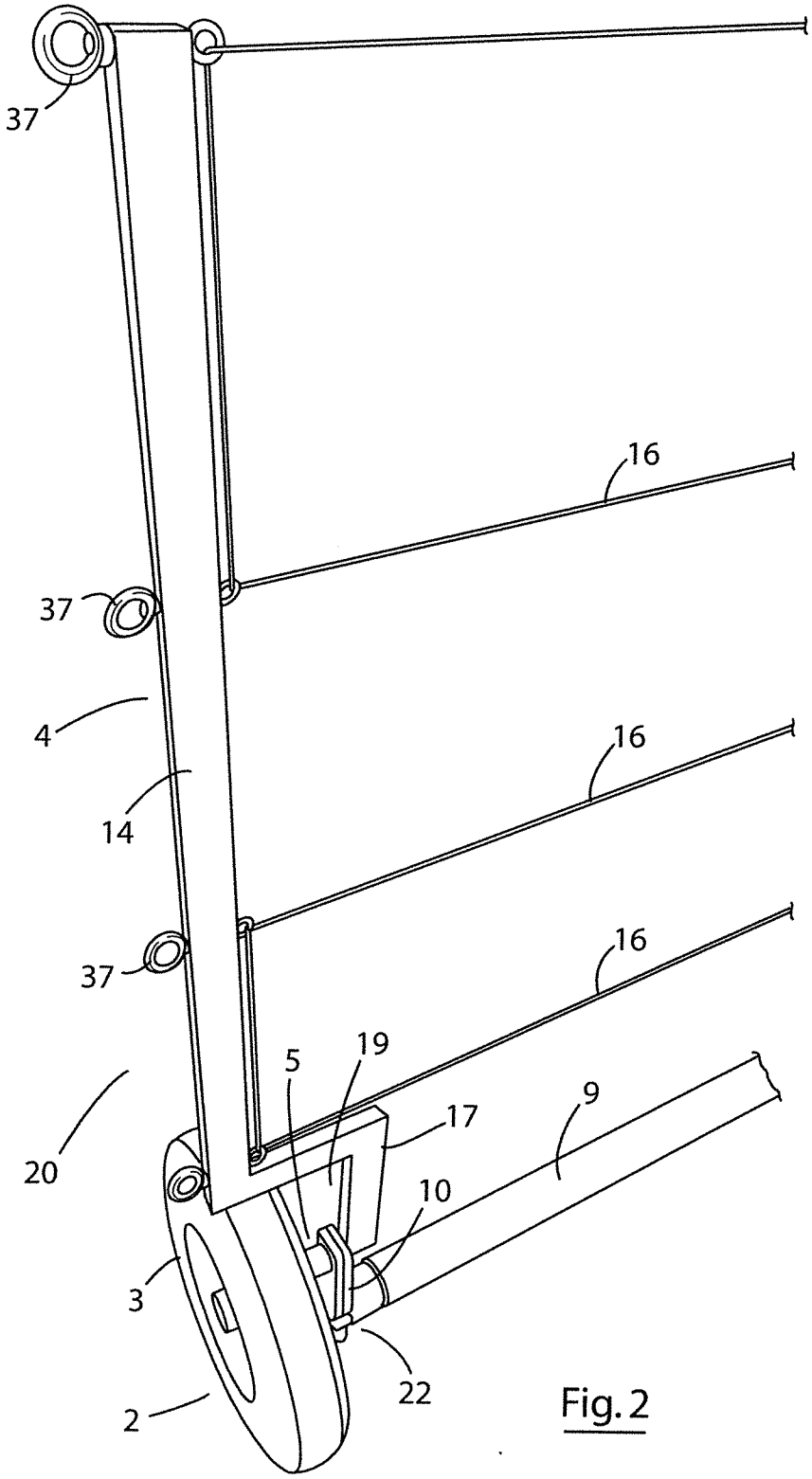

Fig. 2

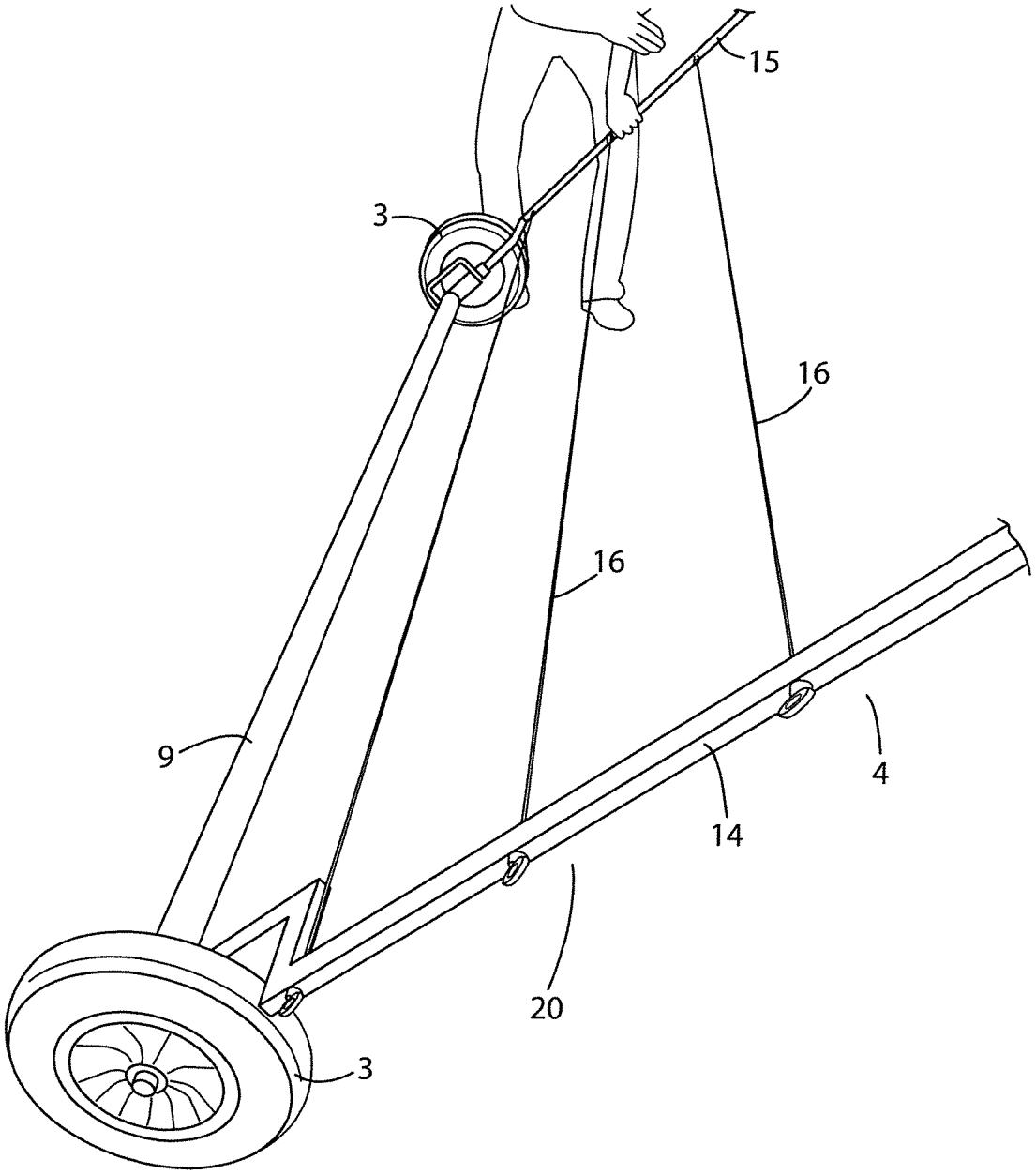

Fig. 3

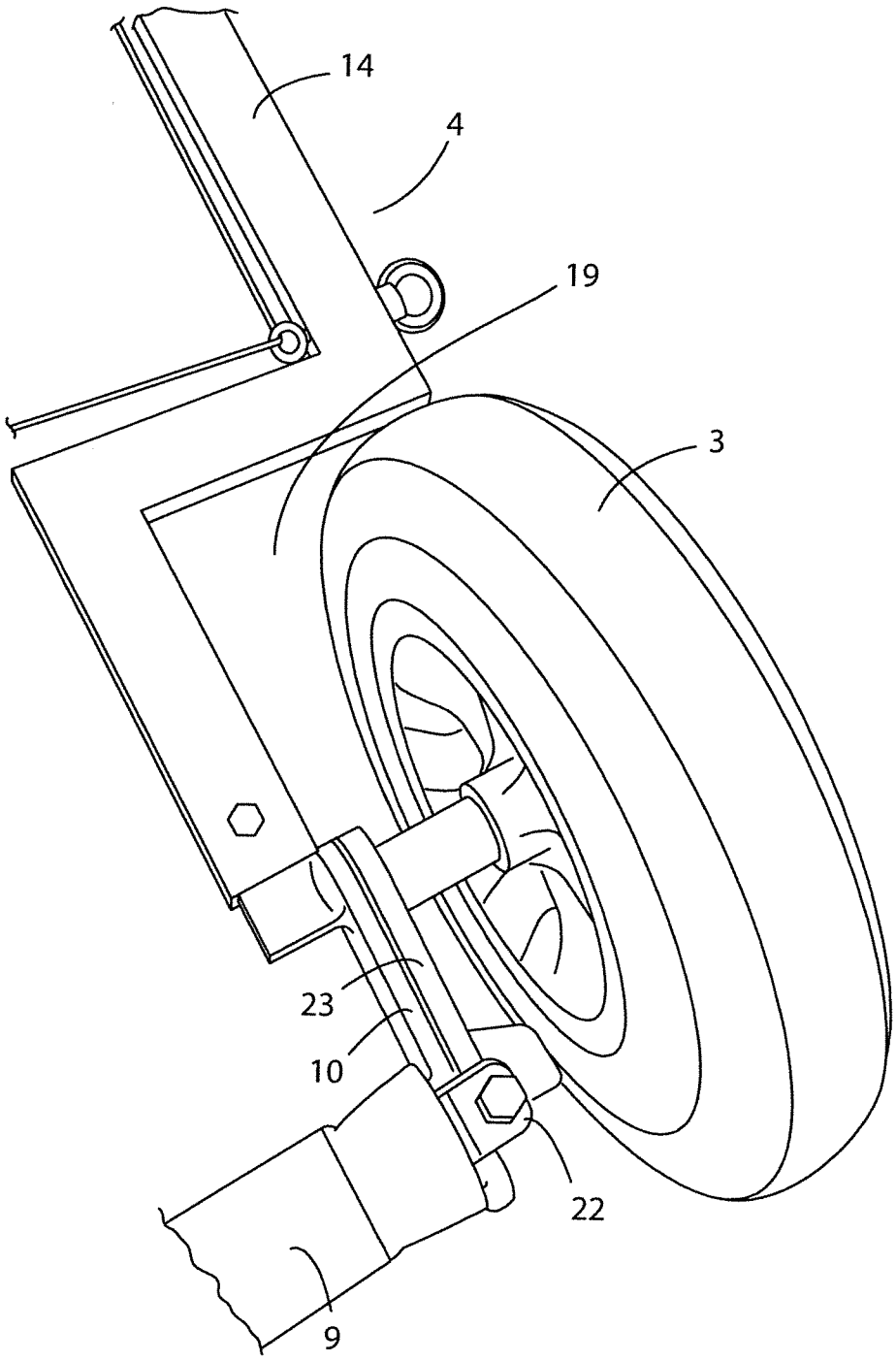

Fig. 4

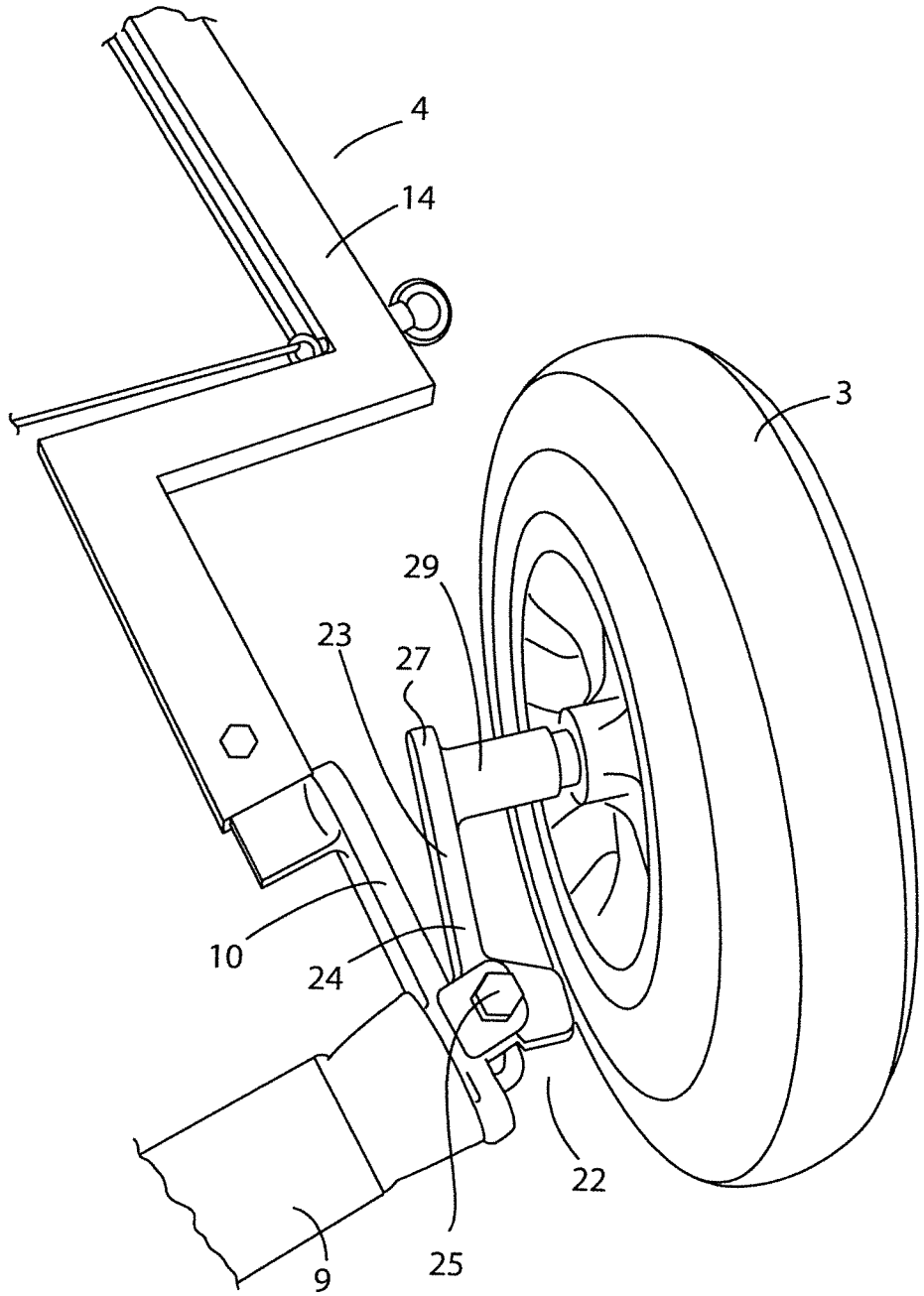

Fig. 5

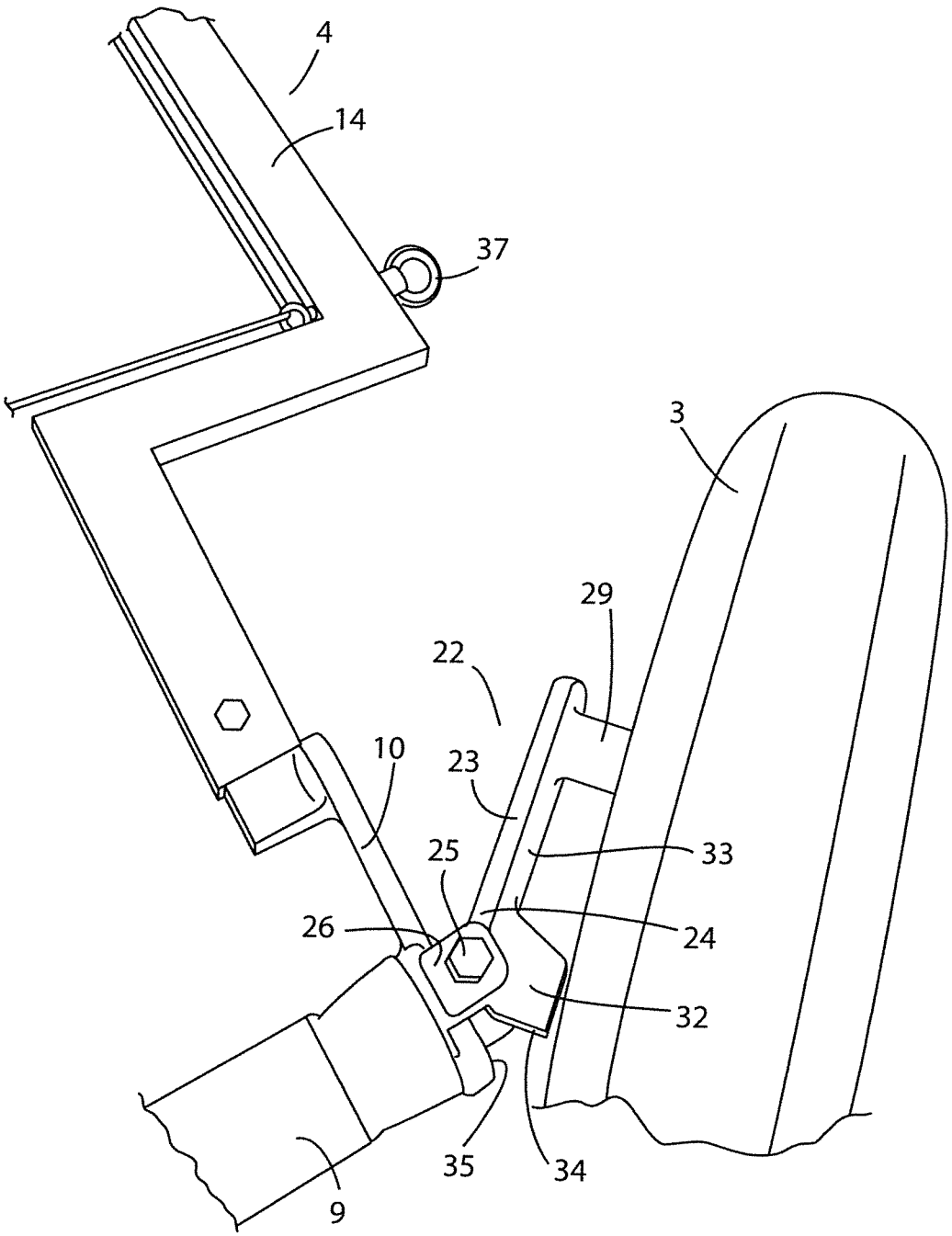

Fig. 6

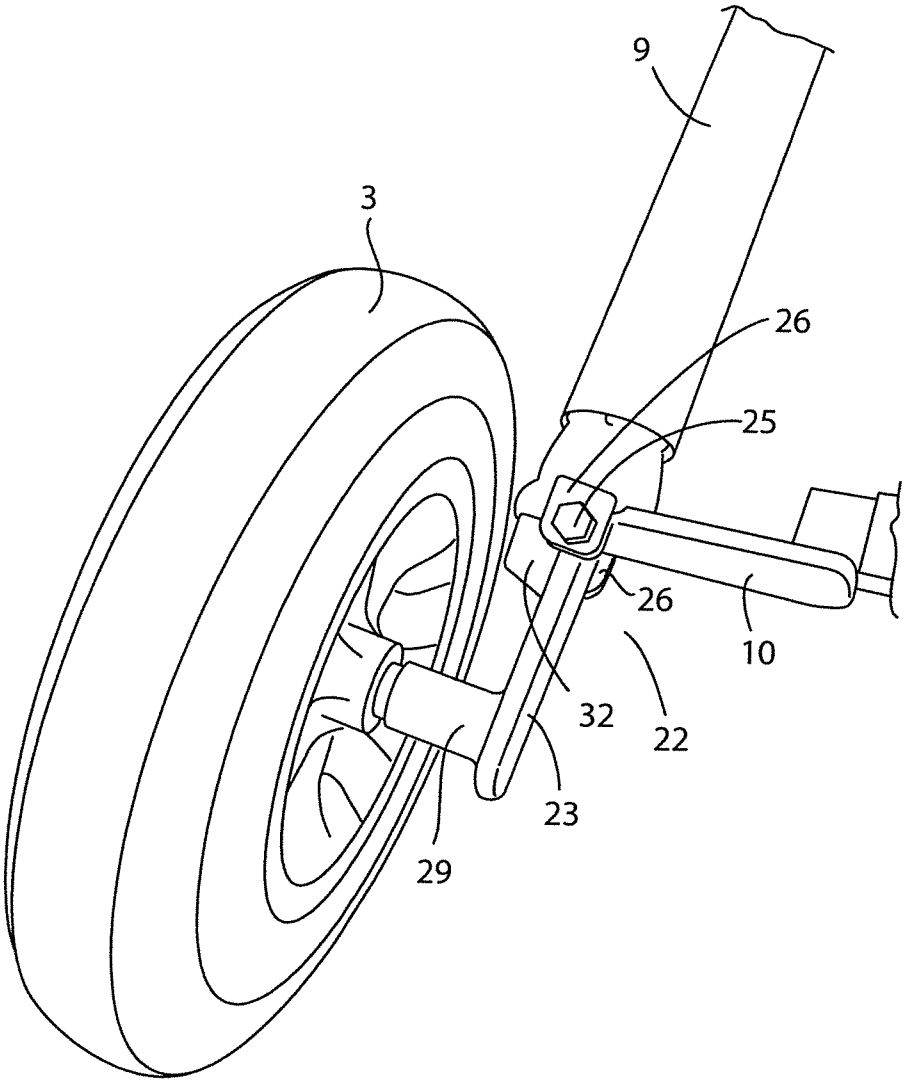

Fig. 7

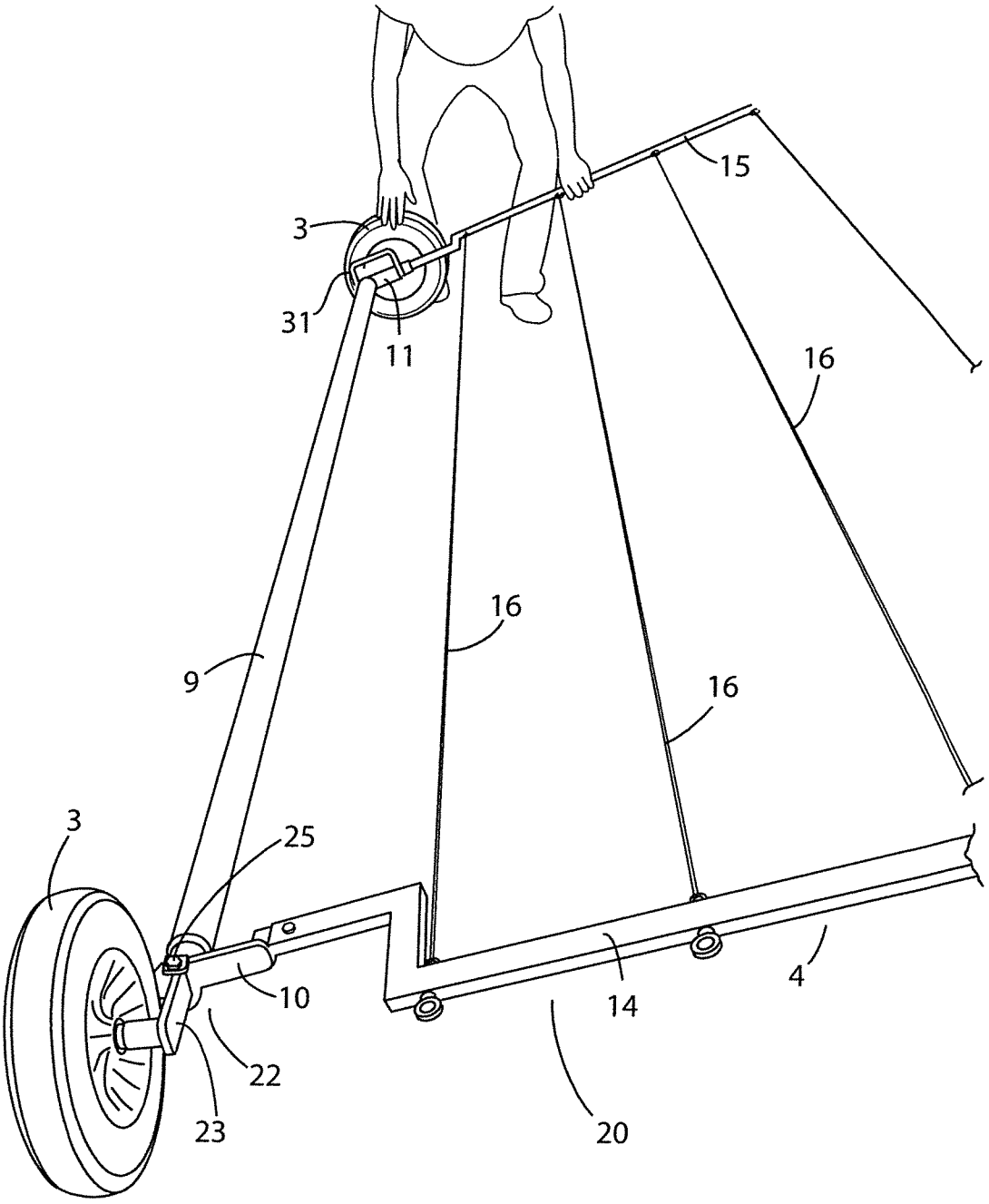

Fig. 8

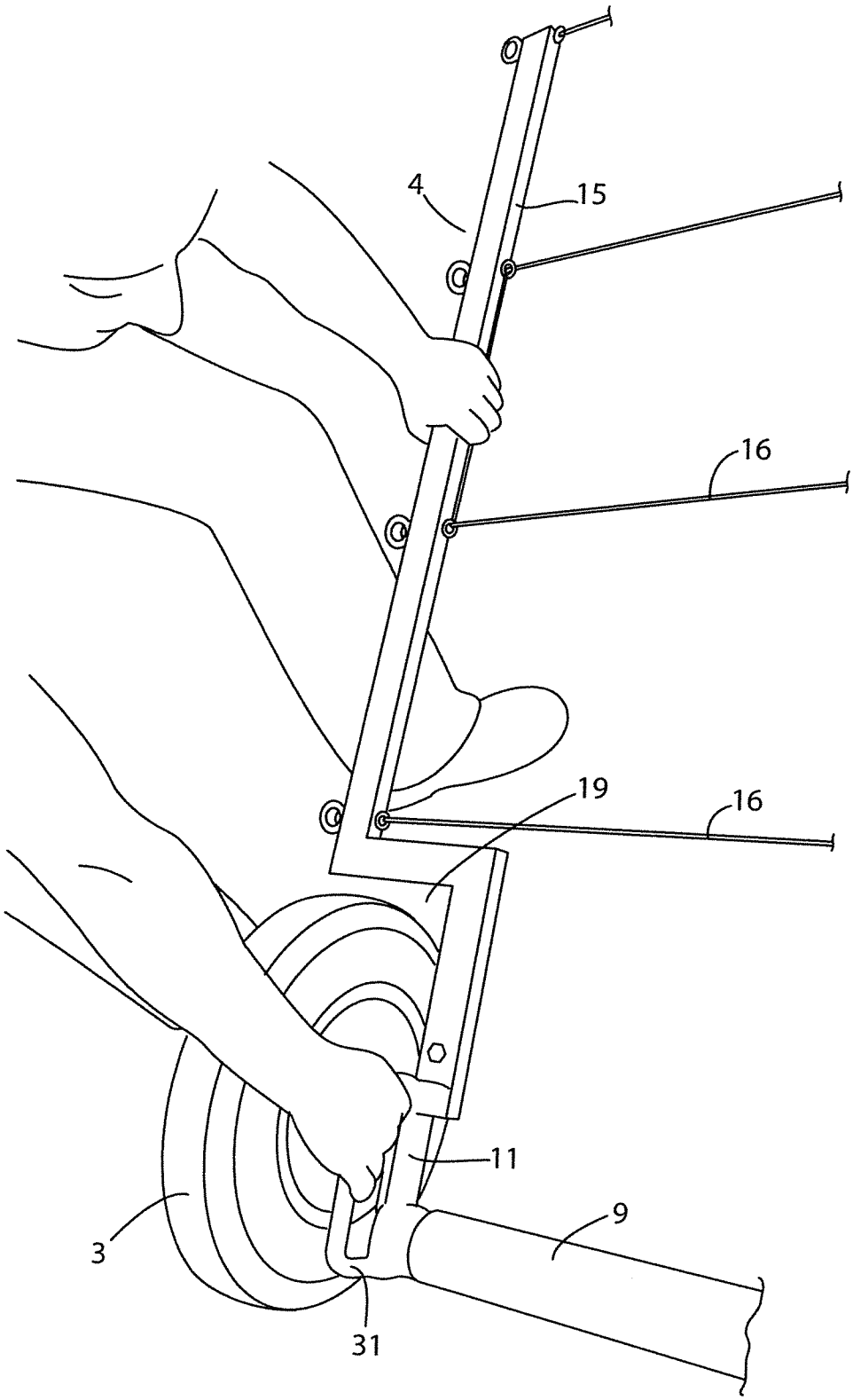

Fig. 9

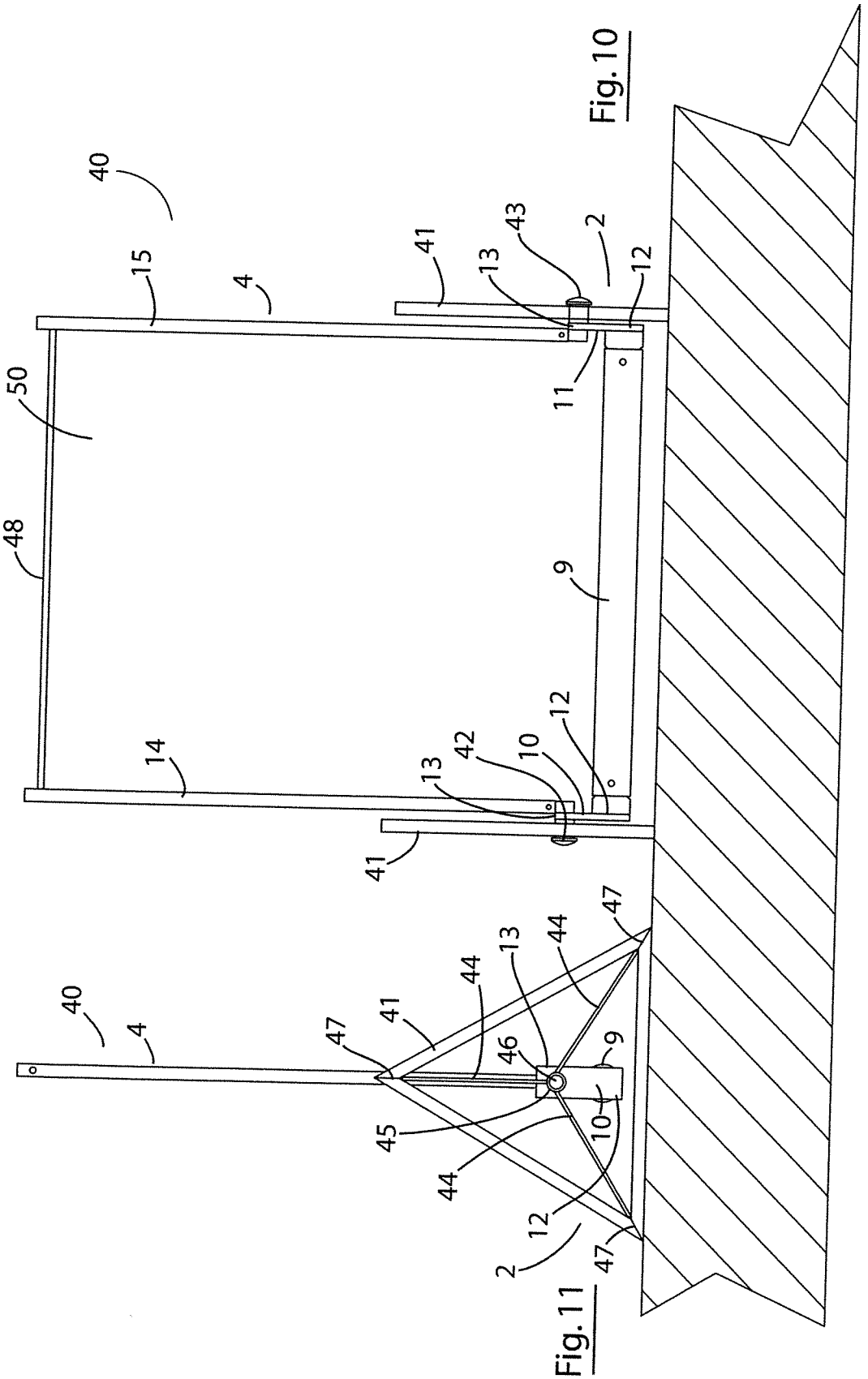
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Fig. 10

Fig. 11