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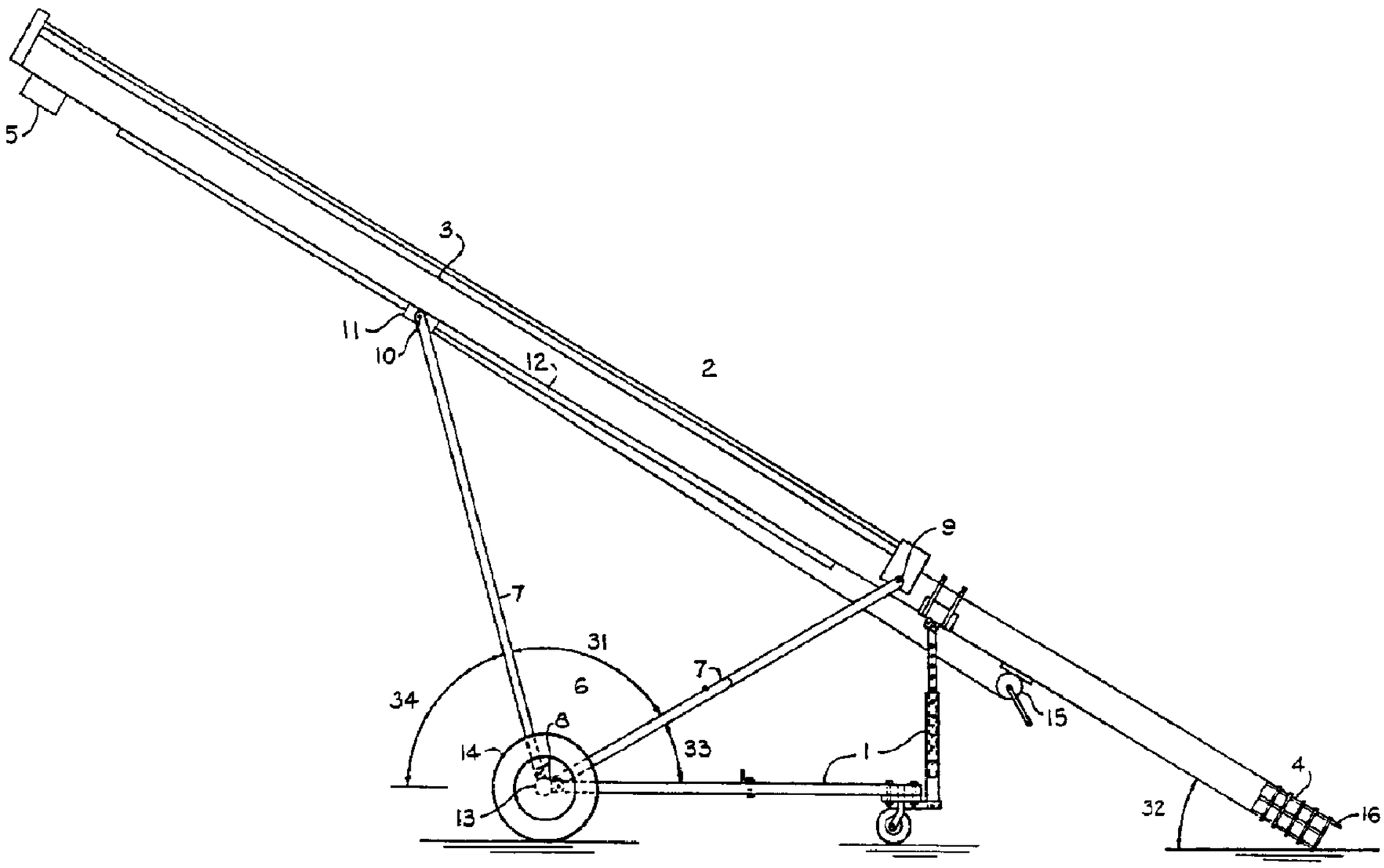
(54) **ACCESSOIRE D'AIDE AU DEPLACEMENT POUR TRANSPORTEUR A VIS**

(54) **AUGER MOVING ASSISTANT**



(57) A dolly for attachment to inclined augers of existing manufacture, which allows the auger intake end to be raised from the ground and supported by a caster wheel, using the winch already present on the auger and a telescoping shaft attached from the dolly to the auger. If the shaft length is locked and the augers upper end is lowered with the winch, the lower end is raised from the ground, and supported on the caster wheel. The operator can then manually move the auger around the work area more easily.

The Abstract

A dolly for attachment to inclined augers of existing manufacture, which allows the auger intake end to be raised from the ground and supported by a caster wheel, using the winch already present on the auger and a telescoping shaft attached from the dolly to the auger.

If the shaft length is locked and the augers upper end is lowered with the winch,, the lower end is raised from the ground, and supported on the caster wheel. The operator can then manually move the auger around the work area more easily.

AUGER MOVING ASSISTANT

This invention deals generally with the field of inclined augers and conveyors, and in particular with an adjustable apparatus to be used to assist in the movement of a grain auger between operational sites or positions.

BACKGROUND:

Inclined auger conveyors are used in numerous applications to convey materials. Of particular interest to the present inventor is the use of inclined auger conveyors in agricultural applications. Having stated that the present invention is spawned out of use in agricultural applications, however, it is intended and foreseen that the present invention could also be practised in conjunction with inclined auger conveyors used in other non-agricultural applications and settings as well. The device could be used on augers, belt conveyors, bale elevators or other similar inclined conveyors with elongate bodies.

Increasing farm sizes and economies of scale in the agricultural production sector have resulted in farmers producing more crop from more land under tillage. Improvements in farming and harvesting equipment have kept up with increasing yields and farm sizes so that there are only marginal increases in the number of people required to run these farms of larger sizes. Cutbacks and changes in the rural grain handling system have resulted in more grain being stored on the farm for periods of time before shipment to market. Coupled with the larger farms and crop yields, the end result of these factors has been the proliferation of grain bins and storage on farms.

Grain bins, of either hopper- or flat-bottomed style, are usually configured around a farm in storage sites, whereby a number of bins will be placed together on a central pad or clearing, thereby lessening the distance between storage bins for the grain truck or the auger to travel. When one grain bin is loaded, the operator needs to manually, or with mechanical assistance,

move the auger a short distance to the next empty bin and set it up in position to load that next bin. The process for unloading grain bins for shipment off of the farm is similar.

Augers or conveyors are used to load and unload grain from on-farm grain storage. It is common with inclined tubular augers and conveyors that only two wheels support the structure and the lower end of the auger or conveyor must be lifted off of the ground, either manually or with a jack, to push or pull the auger between positions. In some cases an auger might also be hitched to a towing unit for moving.

Therefore the problem which the present invention seeks to address is the movement of augers and conveyors between various storage bins at a storage site. Without any mechanical assistance, what would be done would be one or two people manually lifting the lower end of the auger to move it, risking back or other injuries. There are few manual labourers required on today's automated farms. As such it is of paramount concern to the present inventor to come up with an economical and efficient method for one person to move an auger between grain bins at a storage site. The advantages to simplifying this process are two-fold: one person moving an auger more quickly is more economical, and mechanical assistance in the movement of the auger means that the physical stress on the back and other muscles of the labourer is less as well.

Many machines and attachments have been conceived to address this problem and move or assist in the movement of grain augers and conveyors around a storage area. These have had varied success. The majority of devices used at present constitute variants on wheeled jacking systems. Examples of some various forms of wheeled jacking mechanisms are shown in U.S. Patent Numbers 28,268, 2,458,961, 2,638,315, 2,939,679 and 3,022,043. One particular wheeled jacking mechanism intended to be used to move grain augers is disclosed in U.S. Patent 4,265,429 to Formhals. The device disclosed therein showed a screw-type jack and a caster wheel attached to the auger near the lower end, to aid in the manual movement of the auger. This type of system is awkward because it requires a lot of cranking of the screw jack up and down, along with constant vertical adjustment of the jack to keep the jack relatively straight and perpendicular to the ground, in order to provide proper operating conditions for

the caster wheel thereon. As well, the Formhals concept is attached to the body of the auger at a point very near the lower end of the auger which makes it difficult, if not impossible, to extend the end of the auger all of the way into a grain bin to load grain from the bin, with the device in its engaged position.

Other devices have been conceived which use forms of power assist to move these conveyance systems. However, costs have proven prohibitive to many producers, particularly when viewed in light of the initial cost of the conveying equipment itself. For example the cost of some of these more elaborate power assisted systems might be just as much or more than a new auger itself. Therefore, the disadvantages to many of the methods practised at present and in the prior art are that the methods employed are either inefficient or ineffective, or in many cases the devices produced are prohibitively expensive.

Thus it is the object of the present invention to come up with a method for moving a grain auger which will not require the use of a power unit such as a truck or tractor to move the auger short distances.

With the present invention, the need to have two people to move these types of conveyors is reduced, along with the consequent reduction in the possibility of injury. The device is not complicated in its construction, thus allowing manufacturing costs to be considerably lower and allowing for the more widespread economic availability of such a device.

The lifting system already present on most of these standard auger/conveyor systems - i.e. a manual, electric or hydraulic winch used to change the elevational angle of the conveyor - can be used in conjunction with the present invention, thus not requiring the addition of a second different set of lifting equipment to the auger set-up.

SUMMARY OF THE INVENTION:

It is the object of the present invention to provide an economically produced and used

attachment to assist in the movement of an inclined tubular auger conveyor or other inclined conveyors between various operational positions.

There is disclosed in the present invention an auger moving assistant, for attachment to an inclined tubular auger conveyor or other similar inclined conveyor, said conveyor having an upper end and a lower end and having an elongate body, two or more wheels and axle means, and means for raising and lowering the angle of incline of said conveyor, comprising: a mover base frame, hingably attached to and extending rearward from the axle means towards the lower end of the conveyor; one or more mover wheels attached to the bottom of the mover base frame; a shaft, hingably attached to the mover base frame at its end furthest from the axle and hingably attached to the conveyor at a point between the lower end of the conveyor and a point along the elongate body through which a perpendicular axis can be extended to the axle means, said shaft and attachment means of such configuration that the shaft can be locked at various lengths between the mover base frame and the conveyor.

The mover base frame could be manufactured either of a fixed or adjustable length. In either event, one method of producing the mover base frame is to consist of two mover base frame legs hingably attached to and extending rearward from the axle towards the lower end of the conveyor and joined together at their ends furthest from the point of attachment to the axle. A cross brace could also be added extending between the mover base frame legs.

Various means could be employed to attach the shaft to the conveyor, including an adaptable sized collar which can be bolted into place around the body of the conveyor.

A tubular shaft could be used. In the case of either a tubular shaft or some other shape, the shaft could be produced as an inner shaft section attached to the shaft auger attachment means and an outer shaft section attached to the mover base frame, the inner shaft section sliding inside the outer shaft section to create a telescoping effect; and shaft length locking means allowing the shaft to be locked in position at various lengths. Various shaft length locking means could be employed, including in one embodiment comprising a number of inner shaft section holes spaced along and through the inner shaft section, all along parallel axes to each

other and a shaft locking pin which can be placed through the relevant inner shaft section hole and the outer shaft section locking hole when aligned. In such an embodiment, the shaft length locking means could further comprise an outer shaft section locking hole extending through the outer shaft section at the end furthest from the attachment of the shaft to the auger, axis of said outer shaft section locking hole being aligned with the axes of the inner shaft section such that the inner shaft section holes are individually aligned in axis with the outer shaft section locking hole as the inner shaft section is moved into or out of the outer shaft section in its telescoping motion.

Alternatively, the shaft could be of fixed length and slidably attached to the shaft auger attachment means, whereby the length of the shaft between the mover base frame and the shaft auger attachment means is regulated by sliding the shaft up or down through the shaft auger attachment means; and locking means to hold the shaft in the selected position.

One or more mover wheels could be used.

DESCRIPTION OF THE DRAWINGS:

The invention will now be described in conjunction with the following figures:

Figure 1 shows the device attached to a standard inclined tubular auger used for grain handling and other similar applications, with the auger intake in the ground position;

Figure 2 shows the device attached to a standard inclined tubular auger used for grain handling and other similar applications, with the auger intake in a raised position;

Figure 3 is a perspective drawing of the current embodiment of the device itself; and

Figure 4 is a top view of the current embodiment.

DIAGRAM REFERENCE NUMERALS:

1. auger moving assistant;
2. grain auger;
3. auger tube;
4. auger intake;
5. auger delivery;
6. wheel assembly;
7. wheel frame;
8. wheel frame joint;
9. lower wheel frame attachment point;
10. upper wheel frame attachment point;
11. upper wheel frame slide;
12. rail;
13. axle;
14. wheels;
15. winch;
16. hitch;
17. mover base frame;
18. base frame attachment means;
19. base frame attachment point;
20. base frame attachment flanges;
21. cylindrical pin;
22. mover wheel;
23. shaft;
24. outer shaft section;
25. inner shaft section;
26. shaft length locking means;
27. shaft frame attachment means;
28. shaft frame attachment point;
29. shaft auger attachment means;
30. shaft auger attachment point;
31. wheel frame angle;
32. auger incline angle;
33. lower leg angle;
34. upper leg angle;
35. mover frame angle;
36. auger to ground separation distance

DETAILED DESCRIPTION OF THE INVENTION:

An auger moving assistant 1 is disclosed, for attachment to an inclined tubular auger conveyor or other similar inclined conveyor, said conveyor having an upper end and a lower end and having an elongate body, two or more wheels and axle means, and means for raising and lowering the angle of incline of said conveyor, comprising: a mover base frame, hingably attached to and extending rearward from the axle means towards the lower end of the

conveyor; one or more mover wheels attached to the bottom of the mover base frame; a shaft, hingably attached to the mover base frame at its end furthest from the axle and hingably attached to the conveyor at a point between the lower end of the conveyor and a point along the elongate body through which a perpendicular axis can be extended to the axle means, said shaft and attachment means of such configuration that the shaft can be locked at various lengths between the mover base frame and the conveyor.

Figure 1 shows the invention attached to a standard grain auger 2, as used in most agricultural applications. The auger 2 consists of an elongate body being an auger tube 3 with two ends, the lower end being the auger intake 4 and the upper end being the auger delivery 5.

The standard grain auger 2 also has a wheel assembly 6, for moving the auger 2. The wheel assembly 6 shown, characteristic of those in the art, consists of two hinged V-shaped wheel frames 7, an axle 13, and two wheels 14. Each wheel frame 7 consists of two legs coming together at a wheel frame joint 8. The wheel frames 7 are hinged such that the wheel frame angle 31 can be increased or decreased.

Some augers use stub axles, and others use full length axles. The type of axle used on an auger is not material to the operation of the present invention.

Each of the wheel frames 7 are attached at their extreme ends to the auger tube 3. The two wheel frames 7 are angled out from their attachment points 9, 10 such that they are spaced some distance apart at the wheel frame joints 8, so as to create some stable support for the auger tube 3. The wheel frame joints 8 are joined by an axle 13, to which the two wheels 14 are attached. The axle 13 can pass through the hinged wheel frame joints 8, alongside them, or can actually create the hinge of the wheel frame joints 8. The axle 13 provides stability to the wheel frames 7.

The attachment of the wheel frames 7 to the auger tube 3 at the end closer to the auger intake 4 is at a fixed point along the auger tube 3 This is the lower wheel frame attachment point 9. That attachment is hinged, with the use of a pin or the like, such that the leg of the wheel

frame 7 itself attached thereto cannot move anywhere but can hingably swing up and down to a degree.

The upper attachment point 10 of the wheel frames, towards the auger delivery end, is generally hingably and slidably attached by an upper wheel frame slide 11 to a rail 12 or the like on the bottom of the auger tube 3. The upper wheel frame slide 11 can be slid along the rail 12 in either direction, with attendant and consequent mechanical hinge adjustments to the wheel frame angle 31, the auger incline angle 32, the lower leg angle 33 and the upper leg angle 34.

There is a winch 15, a cable from which is attached to the upper wheel frame slide 11.

In operation, the winch 15 can be used to pull the upper wheel frame slide 11 along the rail 12 towards the auger intake 4. By virtue also of the hinged lower wheel frame attachment point 9 and the hinged wheel frame joint 8, this movement of the upper wheel frame slide 11 decreases the wheel frame angle 31, and consequently increases the angle of incline 32 of the auger, along with the upper and lower leg angles 34, 33. As well the auger to ground separation distance 36 is increased as the auger incline angle 32 is increased. This allows for raising the auger 2 to fit onto different grain bins and the like. By releasing the cable outwards from the winch 15, in combination with the force exerted by the weight of the auger 2 on the wheel frames 7 and the various hinged joints, the upper wheel frame slide 11 will move further towards the auger delivery 5 and the angle of incline 32 of the auger is lessened, while the wheel frame angle 31 is increased and the upper and lower leg angles 34, 33 are decreased.

There is also noted present on the auger tube 3 in Figure 1 the drive gear for the auger. The drive gear, either electric, hydraulic or otherwise, is not altered by the present invention and as such is not specifically illustrated. It is to this standard auger system, with wheels, axle and winch, that the present invention is adapted.

The lifting system already present on most of these standard auger/conveyor systems - i.e. a manual, electric or hydraulic winch used to change the elevational angle of the conveyor - can

be used in conjunction with the present invention, thus not requiring the addition of a second different set of lifting equipment to the auger set-up.

To describe the device itself, then, in detail. There is disclosed by the present invention, shown attached to a standard grain auger in Figure 1, an auger moving assistant 1, for attachment to an inclined tubular auger conveyor or other similar inclined conveyor, said conveyor having an upper end and a lower end and having an elongate body, an axle, two or more wheels and means for raising and lowering the angle of incline of said conveyor, comprising: a mover base frame, hingably attached to and extending rearward from the axle towards the lower end of the conveyor; one or more mover wheels attached to the bottom of the mover base frame; a shaft, hingably attached to the mover base frame at its end furthest from the axle; and shaft auger attachment means, whereby the shaft is hingably attached to the conveyor at a point between the lower end of the conveyor and a point on the conveyor through which a perpendicular axis can be extended from the axle to the conveyor.

The mover base frame 17 is hingably attached to the axle 13 by the base frame attachment means 18, such that the auger moving assistant 1 extends back from the axle 13 towards the auger intake 4. The two legs of the mover base frame 17 are made of rectangular steel tubing. The hinged aspect of the base frame attachment means 18 is created in this particular instance by welding two pairs of base frame attachment flanges 20 to the axle 13 on the attachment side, positioned and spaced such that they are on either side of either of the legs of the mover base frame 17 at the base frame attachment points 19. There is a hole through each of the base frame attachment flanges 20, and a corresponding hole through the axle attachment end of each of the legs of the mover base frame 17. Then the holes in the flanges and the legs are aligned, and a removable cylindrical pin 21 is used to fasten them. This creates a hinged base frame attachment means 18, and allows the mover base frame 17 to hinge up and down from its attachment to the axle 13. It will be understood that other various methods of attaching the base frame to the axle means could be employed, such as different brackets or clamps or the like, and that those would be contemplated within the scope of the present invention as well.

Attached to the bottom side of the end of the mover base frame 17 furthest from the axle 13

is a mover wheel 22. This mover wheel 22 is of the pivoting caster wheel variety. It is foreseen that the number of mover wheels could be increased as well and still be contemplated within the scope of the present invention.

Hingably attached to the mover base frame 17 above the mover wheel 22 at the shaft frame attachment point 28 via the shaft frame attachment means 27, is the shaft 23. The shaft frame attachment means 27 again consists of a pair of flanges and a cylindrical pin, similar to the base frame attachment means 18. The shaft 23 then extends upward from the shaft frame attachment point 28 towards the auger tube 3 and the shaft auger attachment point 30.

The shaft 23 is attached to the auger tube 3 at the shaft auger attachment point 30. The shaft auger attachment means 29 consists of a collar or clamp or the like extending around the auger tube 3, and to which the shaft 23 is hingably attached. It is foreseen that an adjustable and removable shaft frame attachment means could be used, such that one type of such means would be adaptable onto any number of different conveyors.

It is also foreseen that the universal fitting nature of the device could be improved by making the legs of the mover base frame adjustable in length, by telescoping manufacture or the like. The adjustable length of the mover base frame legs to make the base frame size variable will be understood to be contemplated within the scope of the present invention.

The shaft 23 in the present embodiment is telescopic. It consists of an inner shaft section 25 attached to the shaft auger attachment means 29 and an outer shaft section 24 attached to the mover base frame 17, the inner shaft section 25 sliding inside the outer shaft section 24 to create a telescoping effect; and shaft length locking means 26 allowing the telescoping shaft 23 to be locked in position at various lengths.

The shaft length locking means 26 consists of a number of inner shaft section holes spaced along and through the inner shaft section 25, all along parallel axes to each other and a shaft locking pin which can be placed through the relevant inner shaft section hole. In simple terms, once the telescopic shaft is adjusted to the desired length, the pin is inserted through the

relevant hole in the inner shaft sections 25 to lock it in position. In the present case, the inner shaft section being manufactured of rectangular tubing, the inner shaft section holes are cut through both opposite walls of the tubing to create a pass-through hole. This describes the configuration of the device in the current embodiment.

An outer shaft section locking hole extends through the outer shaft section 24 at the end furthest from the attachment of the shaft 23 to the auger 2, axis of said outer shaft section locking hole being aligned with the axes of the inner shaft section holes such that the inner shaft section holes are individually aligned in axis with the outer shaft section locking hole as the inner shaft section 25 is moved into or out of the outer shaft section 24 in its telescoping motion.

Now to look at the operation of the device. In operation, the auger moving assistant 1 is used to raise the auger intake off the ground 4 such that it in effect rests on the mover wheel 22, and the individual can then easily steer and push the auger 2 around by virtue of the wheels 14 on the auger and the mover wheel 22. As mentioned above, the auger to ground separation distance 36 is increased as the auger incline angle 32 is increased by operation of the standard winching equipment or the like already present on the auger 2. It is upon this basic principle that the auger moving assistant 1 operates. Reference will be made to a grain bin of an unspecified height to demonstrate the operation of the device.

It is necessary to raise the auger 2 to a certain height to the top of the grain bin and move it into proper position to fill the bin by pouring grain or other bulk material at the auger intake 4, to then be conveyed. It is then generally lowered slightly and the conveyance of material is completed. The auger intake 4 sits on the ground, or typically in a small hopper at ground level, when operated. In order to move the auger 2 to another bin then it is necessary to raise the auger incline angle 32 to lift the auger 2 away from the top of the grain bin and move it to the next bin. With the device the following procedure is followed.

The locking pin from the telescoping shaft 23 is released. As the winch 15 is operated, the auger incline angle 32 is increased by virtue of the sliding operation of the upper wheel frame

slide 11 and the other movements hinged thereon and described in more detail above. Also the length of the hingably attached telescoping shaft 23 would increase as the auger to ground separation distance 36 is increased, the mover wheel 22 and the hingably attached mover base frame 17 remaining at ground level as the shaft 23 extends. Rather than raising the auger 2 only slightly with the winch 15, however, the auger 2 would be raised to a higher height. It would be raised past the necessary bin clearance height by a further distance of approximately the same amount as the operator would like the auger intake 4 to be off of the ground when the device 1 is locked in position.

With the auger 2 raised into this highest position, the telescoping shaft 23 would be locked in position by, in this case, replacing the locking pin. It is contemplated that other types of clamping and locking mechanisms could be used in this capacity as well. The winch 15 would then be reversed and the auger 2 allowed to decline. As the auger 2 declines, the auger intake 4 will lift off of the ground as the weight thereof comes to rest on the mover wheel 22. The auger 2 can then be freely moved around into the next position.

To disengage the auger moving assistant 1 and put the auger intake 4 back to ground level then, the winch 15 is used again to raise the auger 2 and increase the auger incline angle 32 to the point that the auger intake 4 is back on the ground and the mover wheel 22 is slightly off of the ground, or at least the telescoping shaft 23 is in a loose unloaded position whereby the locking pin can be removed. With the locking pin removed the winch 15 is allowed to lower the auger 2 back to the necessary operational height, and the auger intake 4 resting at ground level.

With the locking method shown for locking the shaft 23 at various heights, the device 1 can also be lifted up off of the ground for the higher-speed transport of the auger or conveyor over longer distances behind a power unit. In this way the mover wheel 22 will not be harmed by such high speed movement. The device could be lifted up altogether for the higher speed transport of the auger or conveyor by releasing the shaft locking pin and then moving the mover base frame up so that the wheel et al is lifted considerably off of the ground. Te device could then be locked in this raised position by putting the locking pin through the outer shaft

section locking hole and a corresponding hole on the inner shaft section.

By virtue of the removable nature of the cylindrical pins used in both the base frame attachment means 18 and the shaft auger attachment means 29, the auger moving assistant 1 can be detached from the auger 2 easily. Thus it could be moved from one auger to another, and the augers on a farm could each be equipped with the shaft auger attachment means 29 and the base frame attachment means 18, and the device could then be quickly moved by simply removing the three cylindrical pins in question and proceeding to pin the device onto another auger which already carries a duplicate set of mounting equipment. If an adjustable sized mover base frame was used, that might require slight adjustment when moved between augers.

It is foreseen that there could be various adaptations to parts of the invention without departing from the scope or intent thereof. For example, the method of extending the length of the shaft 23 could be adapted from the telescoping shaft shown in the present embodiment to the use of a fixed length shaft of at least the longest length required, and shifting the shaft auger attachment means 29 such that the shaft was in effect attached alongside the auger tube, and by passing the shaft through a clamp or the like at that point the length of shaft between the auger tube and the mover base frame adjusted in that manner. It will be understood that variations such as this are contemplated within the scope of the invention.

As well, it is foreseen that various changes could be made to the mover base frame 17. Everything from a singular shaft to varied base frame configurations could be used, again with departing from the intent of the inventor.

The height and angle of the auger 2 does not affect the ability of the operator to lock the shaft and raise the auger intake off of the ground, thus avoiding the problem experienced with the Formhals device, above. The auger can be fully placed into a bin without encumbrance, because the auger intake end of the auger tube is not encumbered with any ground -engaging device near its end. As well, this present invention can be used to lift the auger in and out of a bin as easily as to lift the auger off of the ground surface.

The device could be used on augers, belt conveyors, bale elevators or other similar inclined conveyors with elongate bodies, and it will be understood that such applications and any modifications to the configuration of the device thereby are contemplated within the scope of the invention. With the present invention, the need to have two people to move these types of conveyors is reduced, along with the consequent reduction in the possibility of injury. The device is not complicated in its construction, thus allowing manufacturing costs to be considerably lower and allowing for the more widespread economic availability of such a device. The device can be adapted onto existing augers or conveyors, and could be incorporated into the design of newer models of the same types of elevating equipment.

While the term 'shaft' has been used herein to describe that element of the invention, it will be understood that the use of that term is not intended to limit the construction or shape of that element of the invention to a cylindrical shape. It will be understood that other shapes, including rectangular shapes, could be manufactured and still fall within the scope of the claimed invention. As well, dependant on the configuration of the invention, either tubular or solid shafts could be used.

Similarly, while rectangular steel tubing has been used in the construction of various portions of the present embodiment, it will be understood that other types of elongate materials of varying shapes or construction could be used in the place of rectangular steel tubing, without departing from the scope of the invention.

Thus it can be seen that the invention accomplishes all of its stated objectives. The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous changes and modifications will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly, all such suitable changes or modifications in structure or operation which may be resorted to are intended to fall within the scope of the claimed invention.

In The Claims

Claim 1, A dolly for attachment to existing inclined auger assemblies; said auger assemblies generally having an auger tube and flight, two wheels and an axle, a pair of adjustable front braces attached to the auger tube and said axle, a pair of rear braces attached to the auger tube and said axle and a winch to raise and lower the discharge end of the auger tube, said augers having a lower intake end and a higher discharge end; the dolly itself comprising a base frame hingeably attached to said axle of auger assembly and extending towards the lower or intake end of the auger tube, one or more caster wheels attached to said base frame at the end farthest from the said axle, a shaft hingeably attached to the said base frame above or in front of the caster wheel and hingeably attached to said auger tube via a collar or saddle welded or bolted to said auger tube at a point just below where the said rear braces attach to the said auger tube; said shaft is telescopic and can be locked at various lengths between said base frame and said auger tube.

Claim 2, the device of claim 1 wherein the caster wheel is capable of being raised off the ground.

Claim 3, the device of claim 1 wherein the shaft includes an inner shaft section, an outer shaft section, and a shaft length locking means; said inner shaft section is slideable inside said outer shaft section, creating a telescopic effect; said shaft length locking means allows the shaft to be locked at various lengths.

Claim 4, the device of claim 3 wherein the shaft length locking means consists of a number of shaft section holes spaced along and through said inner and outer shaft sections all along parallel axis to each other,and a shaft locking pin which can be placed through the respective shaft section holes for locking of the shaft.

Claim 5, the device of claim 3 wherein the length of the shaft is determined by the operation of the auger winch in lowering or raising the upper or discharge end of the auger.

Claim 6, the device of claim 3 wherein the locking of said shaft in many positions causes the lower intake end to be raised from the ground when the upper end of the auger is lowered using the winch, thus the lower end is supported on said base frame and caster wheel.

END OF CLAIMS

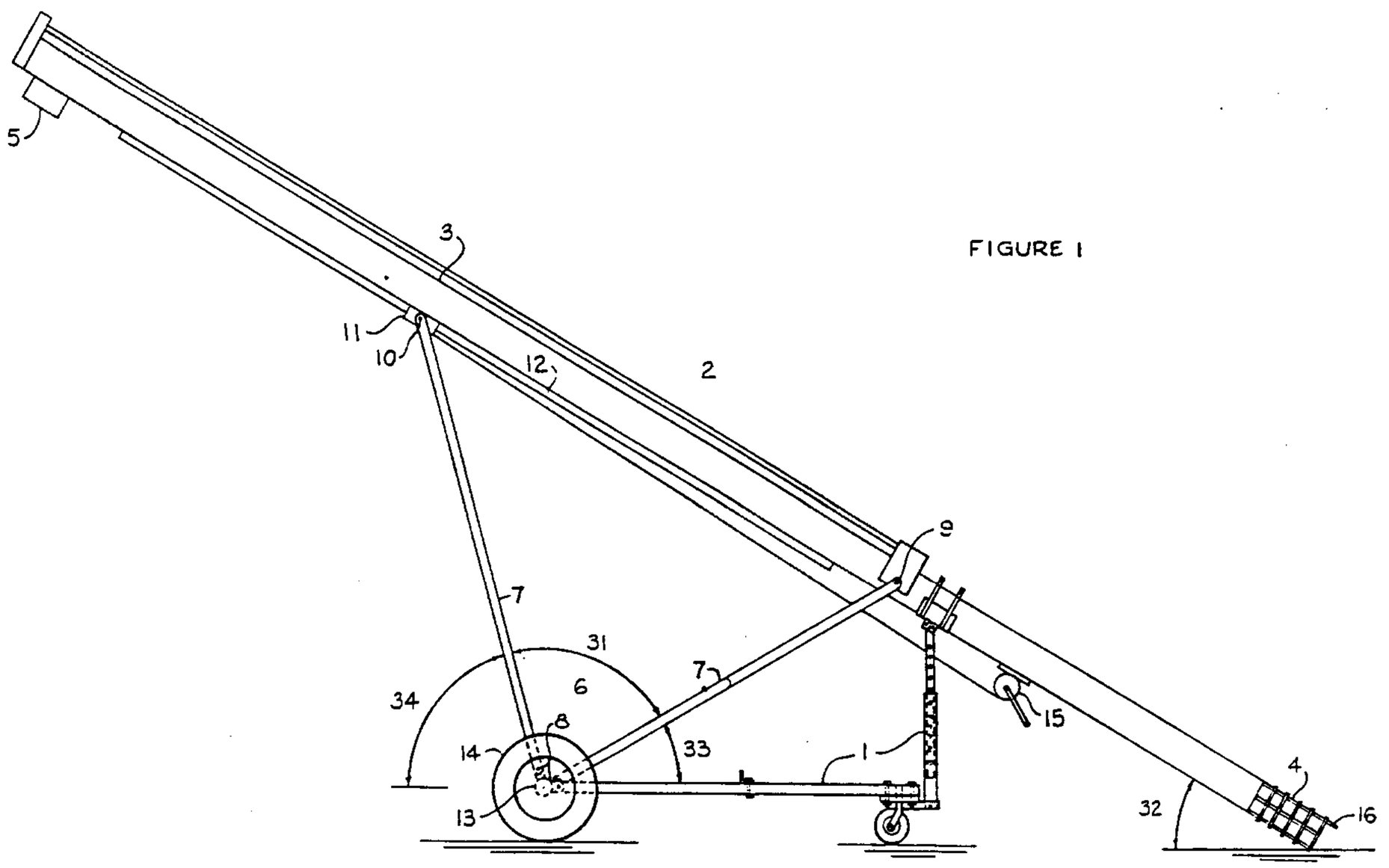


FIGURE 1

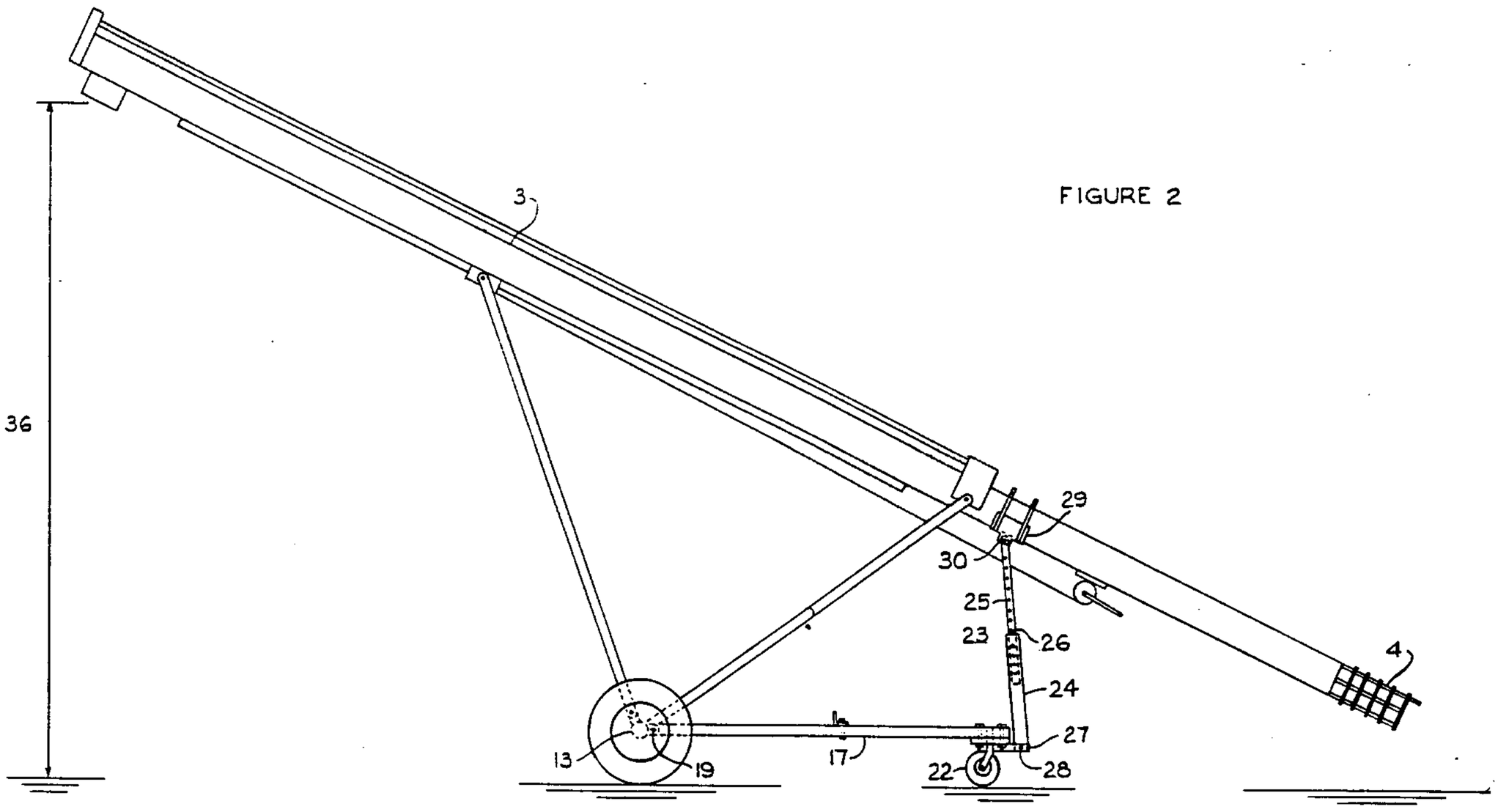


FIGURE 2

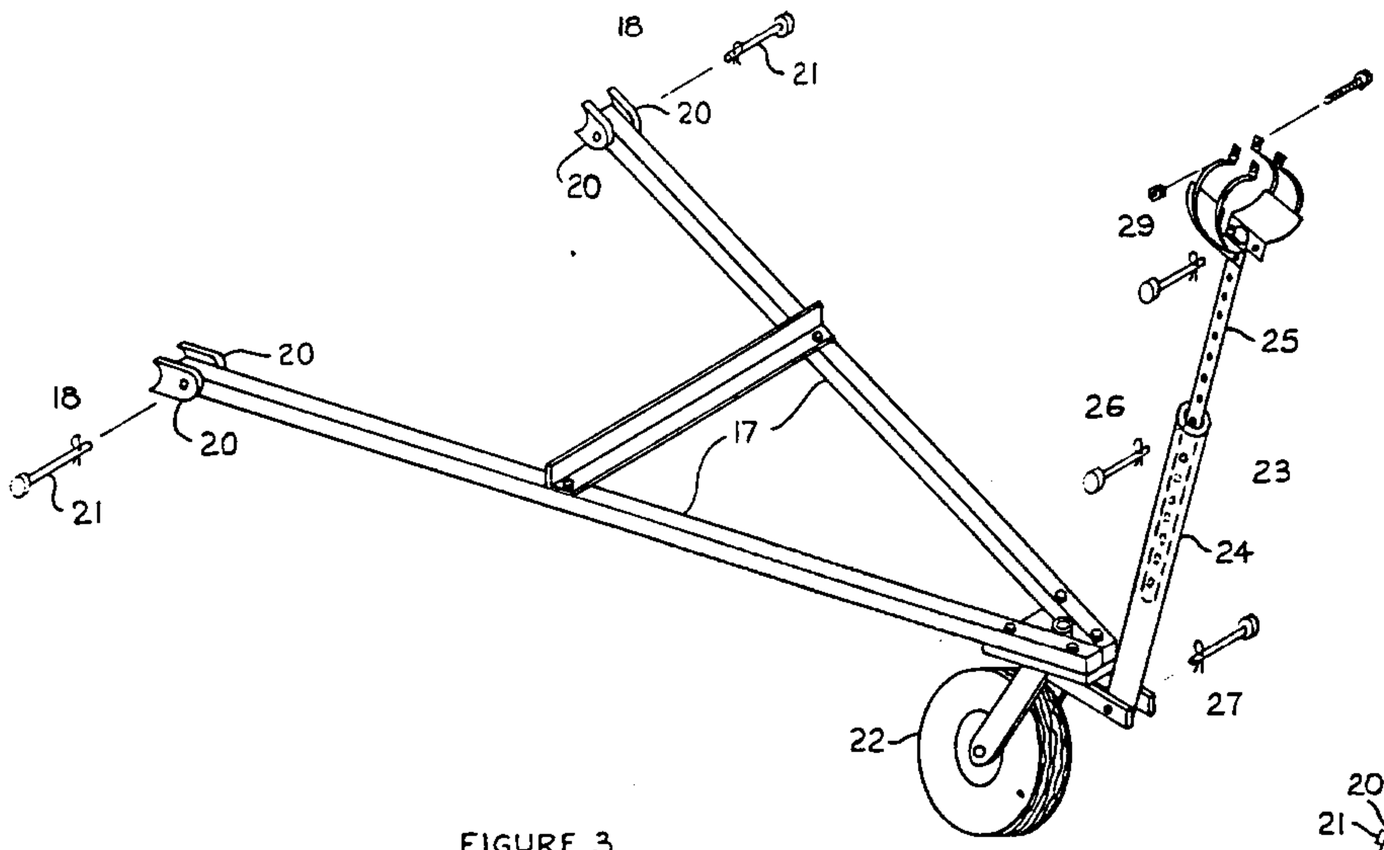


FIGURE 3

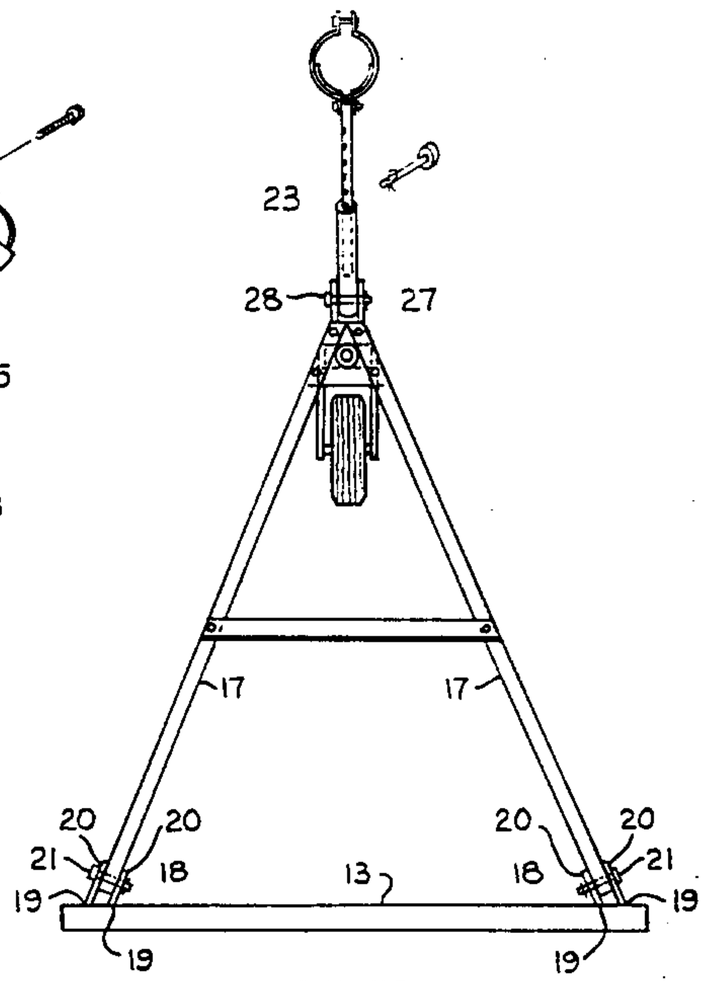
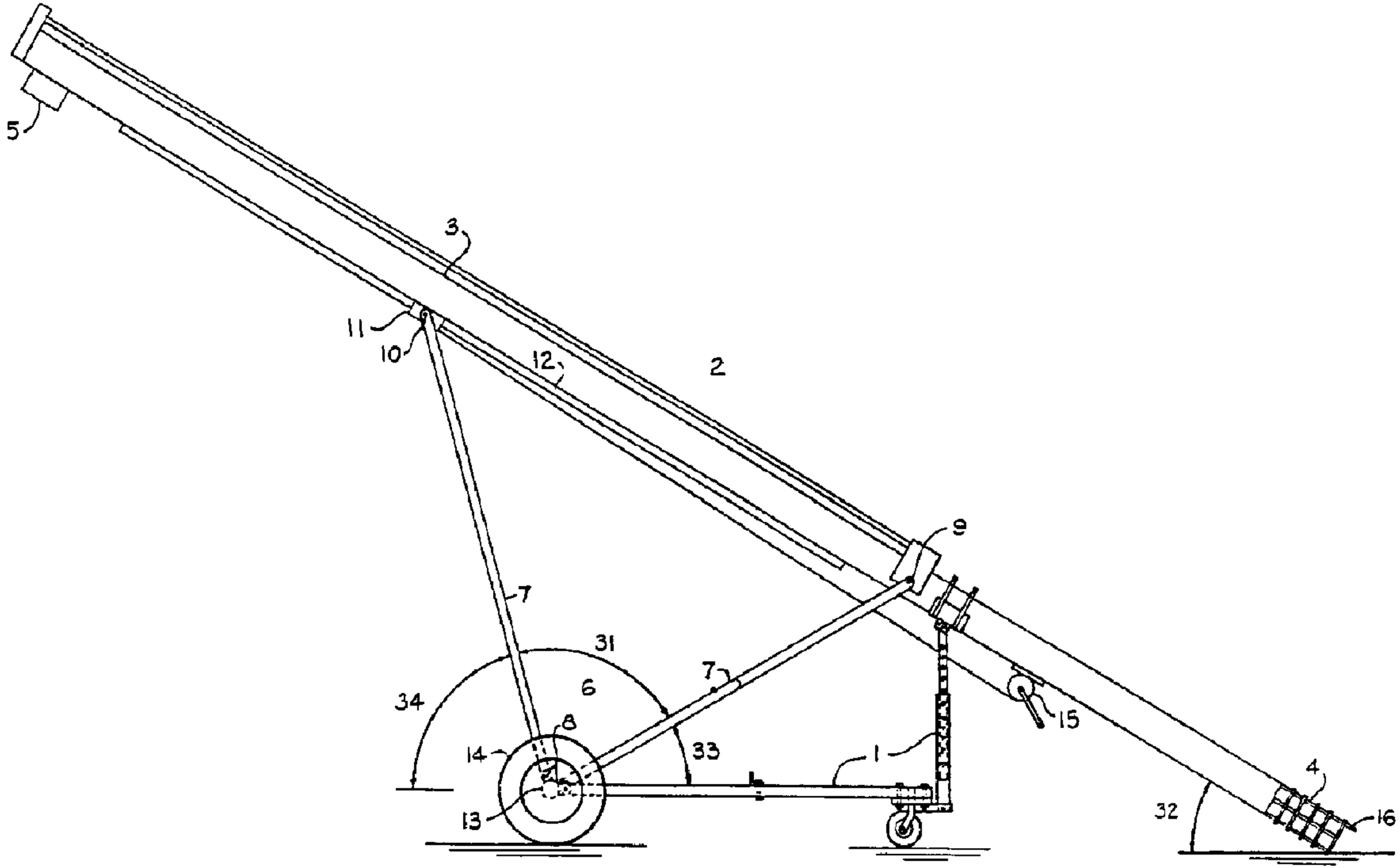


FIGURE 4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