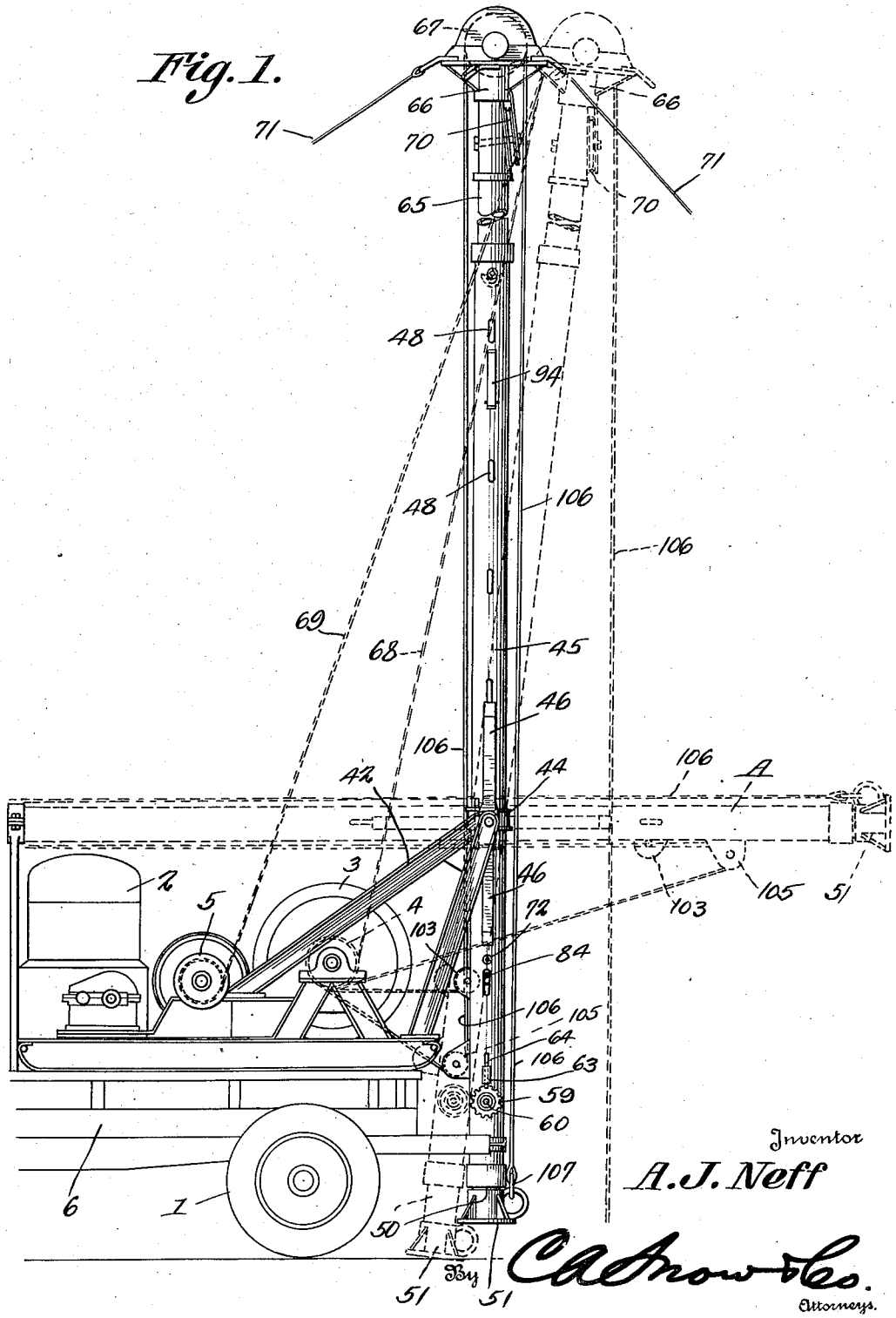
Aug. 30, 1938. A. J. NEFF 2,128,712

PORTABLE GIN POLE

Filed Sept. 22, 1936 6 Sheets-Sheet 1

Fig. 1.



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By C. A. Snow & Co.

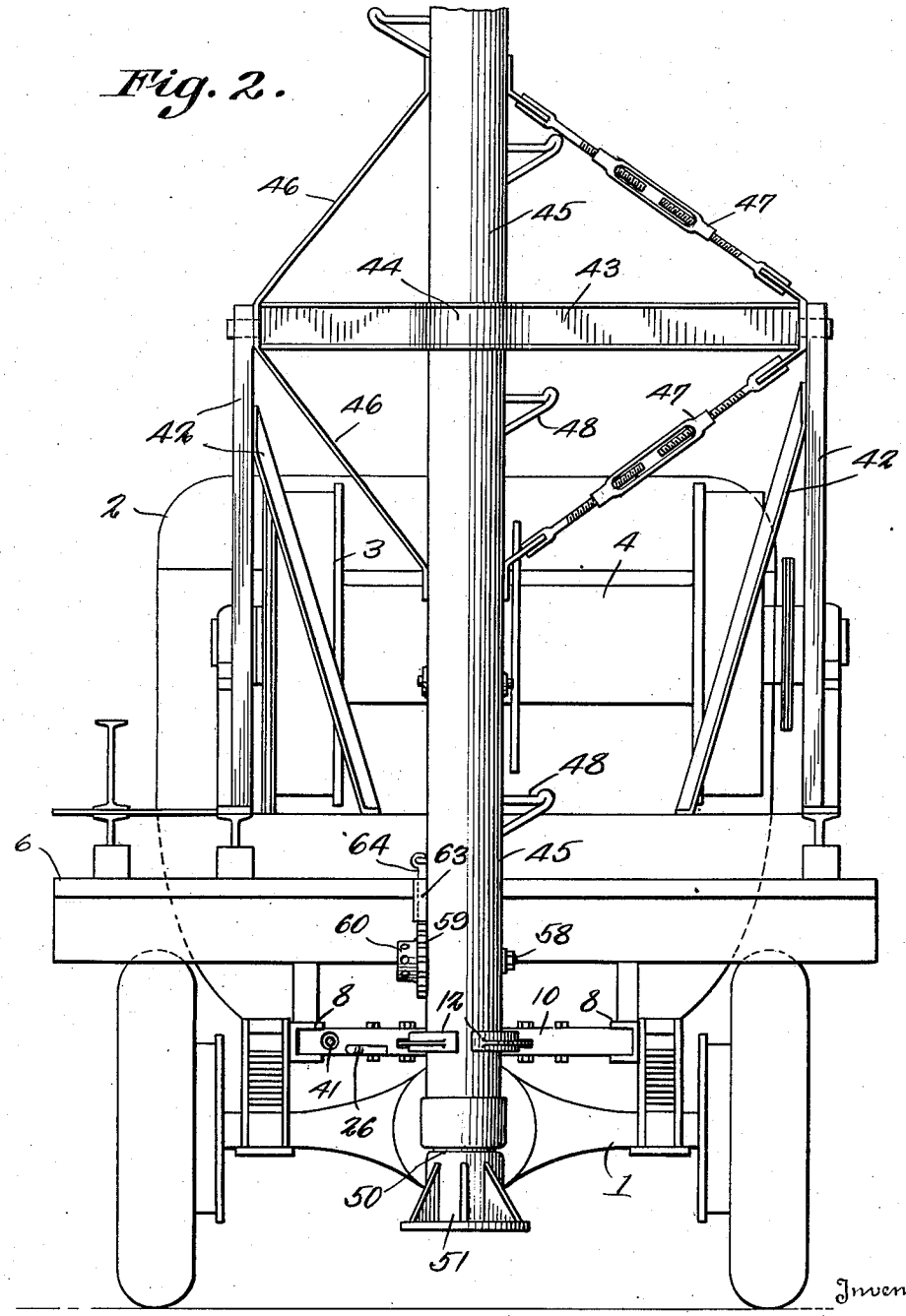
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PORTABLE GIN POLE

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Fig. 2.



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PORTABLE GIN POLE

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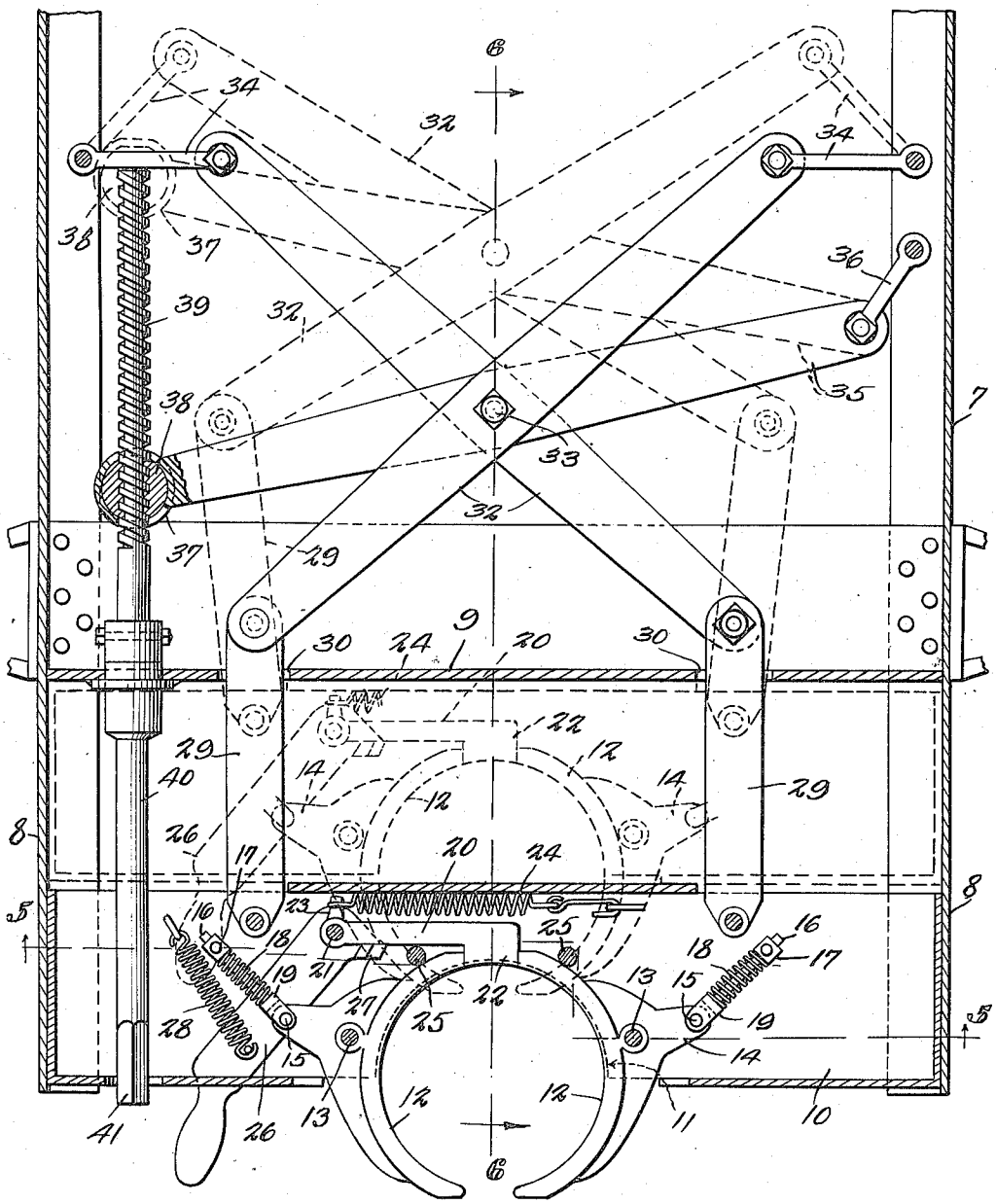


Fig. 3.

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PORTABLE GIN POLE

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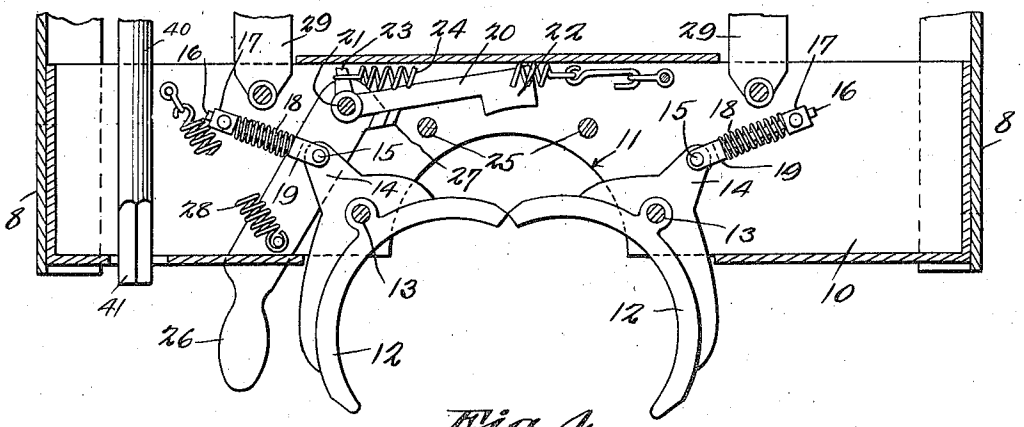


Fig. 4.

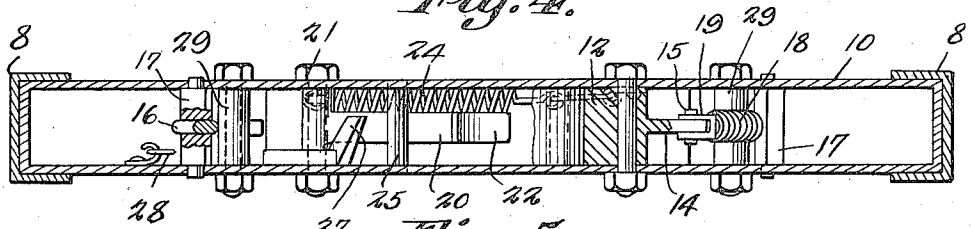


Fig. 5.

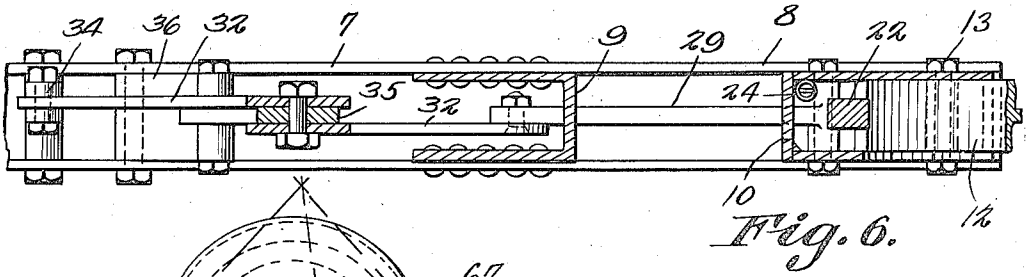


Fig. 6.

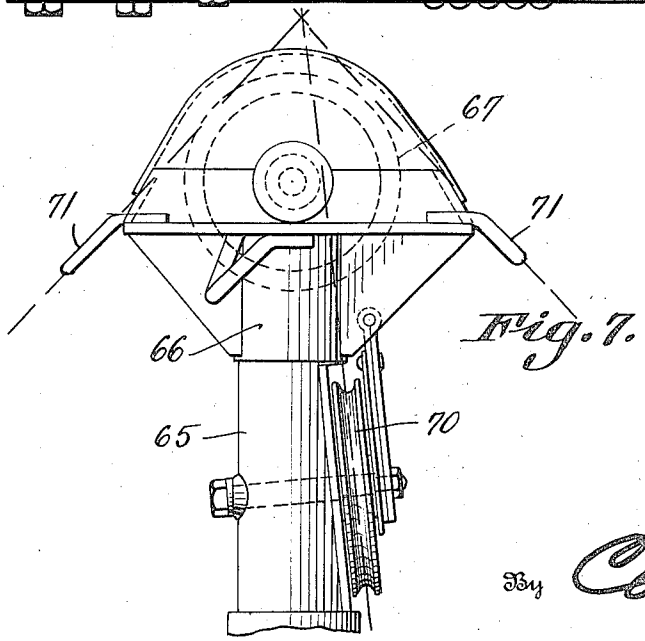


Fig. 7.

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PORTABLE GIN POLE

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Fig. 8.

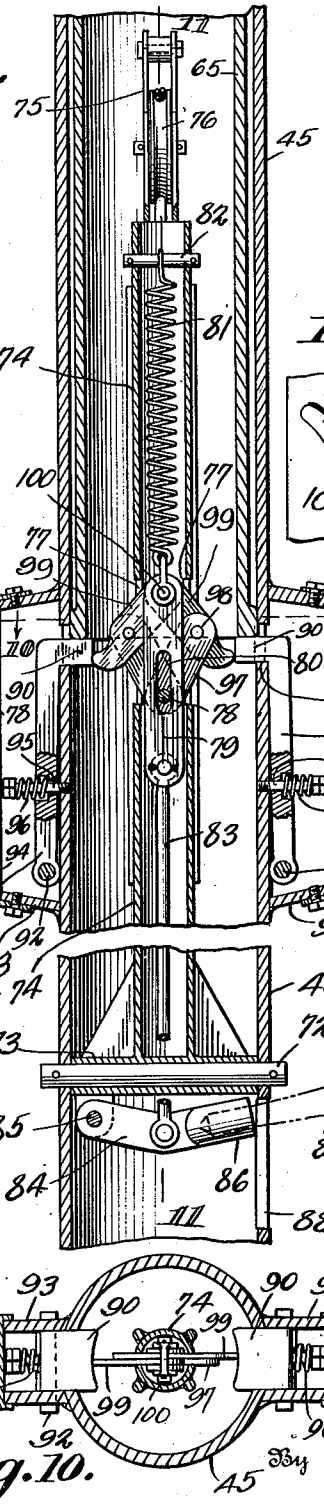


Fig. 9.

Fig. 10.

Fig. 12.

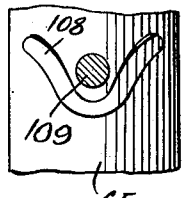


Fig. 11.

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Fig. 13.

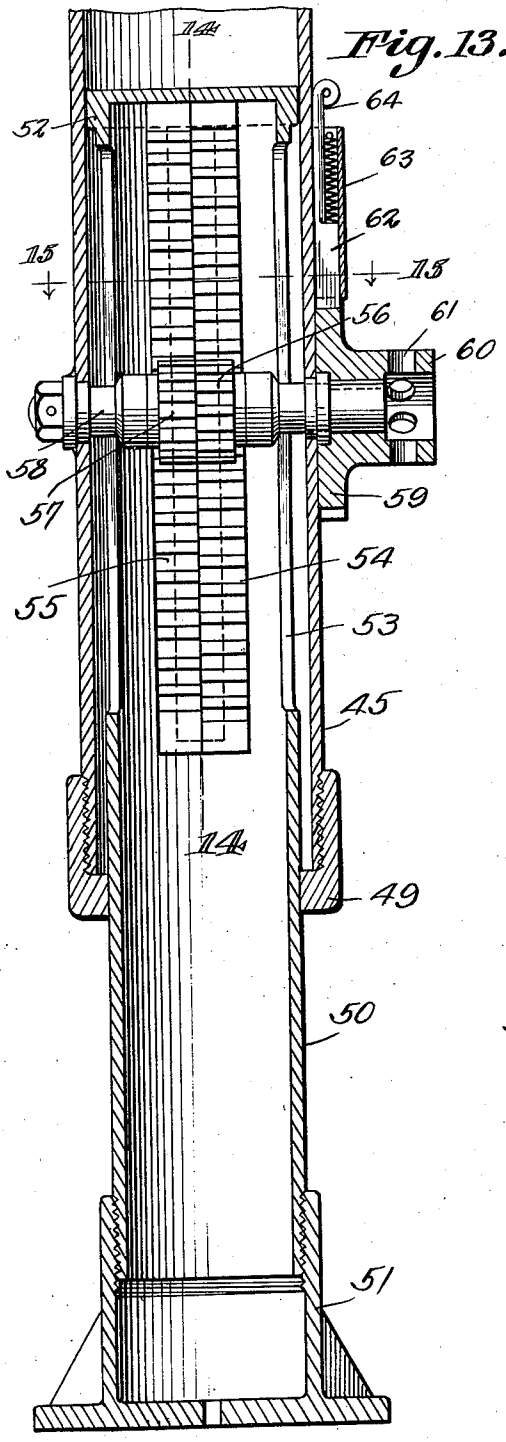
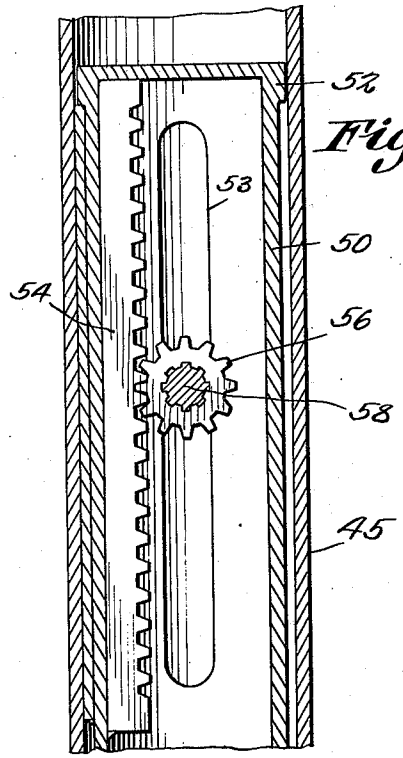


Fig. 14.



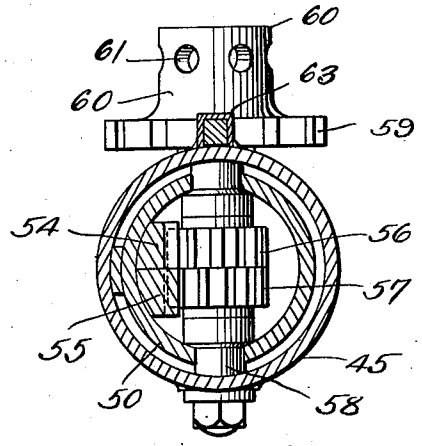


Fig. 15.

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Patented Aug. 30, 1938 2,128,712

UNITED STATES PATENT OFFICE

2,128,712

PORTABLE GIN POLE

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Application September 22, 1936, Serial No. 102,050

14 Claims. (Cl. 254—139)

This invention relates to a portable gin pole adapted to be mounted on a truck with a winch or other suitable operating mechanism whereby it can be used where desired for maintaining production in oil fields, the machine being employed for pulling pump rods and well tubing and for bailing sand out of wells.

An object of the invention is to provide a gin pole which can be easily and quickly erected and taken down with a minimum of hazard to workmen engaged in raising and lowering the same, there being special means for controlling and operating the pole.

A further object is to form the gin pole of a telescopic mast having means whereby it can be locked automatically in extended position without necessitating the usual and dangerous procedure of someone climbing the mast to insert a locking device.

A further object is to provide a means whereby the extended mast can be unlocked and shortened by an operator standing on the ground.

A still further object is to equip the mast with a built-in telescopic jack constituting a base for efficiently and quickly assuming the weight of the mast and its load.

Another object is to provide an automatic anchoring lock for securing the mast while in vertical position during the movement of the truck to the proper point of use, there being means associated with the lock by which the operator can tilt the mast to any angle necessary to cause the pull cable or cables to hang directly over the well.

Another object is to provide a lock and adjusting device for the mast which affords positive control of the mast at all times by the operator and enables him to release and unstring the drum cable used in raising the mast, and in every way to make the necessary adjustments for accurately locating the mast before guying the same in position relative to the well.

A still further object is to equip the mast with a built-in sheave the axis of which is so positioned relative to the main or top sheave that the center of the load line or the center of gravity passes from this sheave through and across the center line of the mast where the lines of force or the load lines from the guys cross the center line of the mast, thereby avoiding eccentric loading of the mast and providing a means for insuring central loading of the mast so that it will not tend to bend under the load.

Another object is to arrange the sheaves so as to allow for quick and easy stringing and unstringing of the cables, the location of the built-in sheave being such as to eliminate head room such as heretofore provided for hooks and shackles used for attaching snatch blocks.

Another object is to arrange a built-in sheave in such position relative to the mast and top sheave as to allow the cable extending to the sheave to remain on the working side of the mast.

A further object is to provide efficient and safe means whereby the winch power can be utilized for raising and lowering the mast, the usual drum brake being used during the lowering operation.

Another object is to utilize a telescopic mast wherein the internal pole or member provides a shielded and protected means for the extension mechanism and also a means for holding an extension lock releasing gear, an extension pull rope or cable being utilized for cooperating with the winch for raising the extensible section of the mast.

With the foregoing and other objects in view which will appear as the description proceeds, the invention consists of certain novel details of construction and combinations of parts hereinafter more fully described and pointed out in the claims, it being understood that changes may be made in the construction and arrangement of parts without departing from the spirit of the invention as claimed.

In the accompanying drawings the preferred form of the invention has been shown.

In said drawings

Figure 1 is a side elevation of a portion of a truck equipped with the present improvements, the mast being shown by full lines locked in vertical position for transportation over short distances while, by broken lines, the mast has been illustrated in two other positions in which it may be supported.

Figure 2 is a front elevation of a truck and a lower portion of the vertically held mast.

Figure 3 is an enlarged horizontal section through a portion of the truck and showing, in plan, the anchoring lock and its adjusting means, the mast being removed and the lock being shown by full lines in one position and by broken lines in another position.

Figure 4 is a plan view of the anchoring lock showing the parts in mast-releasing position, the spacing block being shown pressed back from its normal position.

Figure 5 is a section on line 5—5, Figure 3.

Figure 6 is a section on line 6—6, Figure 3.

Figure 7 is an enlarged side elevation of the top portion of the mast.

Figure 8 is a vertical transverse section through the meeting portions of the top and bottom members of the mast and showing the lock for holding them in extended positions.

Figure 9 is a view through a portion of the lock shown in Figure 8 and illustrating the position of the parts during the unlocking of the upper or slidable member of the mast.

Figure 10 is a section on line 10—10, Figure 8.

Figure 11 is a section on line 11—11, Figure 8.

Figure 12 is a section on line 12—12, Figure 11 showing the extension stop in elevation.

Figure 13 is a vertical transverse section through the telescopic jack.

Figure 14 is a section on line 14—14, Figure 13.

Figure 15 is a section on line 15—15, Figure 13.

Referring to the figures by characters of reference 1 designates a motor truck provided with an engine 2 such as commonly employed for driving a drum 3, spool 4 and reel 5. These parts are common to well working machinery and it is not deemed necessary to describe or show the same in detail.

Supported under the chassis 6 of the truck is a frame 7 comprising channeled side members or guides 8 connected by a cross beam 9. A cross-head 10 is supported by and slidable along the guides 8 and is formed with a central recess 11 at the sides of which are located arcuate jaws 12 mounted to swing on pivot pins 13. These jaws are formed with arms 14 each of which is pivotally connected at 15 to one end of a rod 16 slidable within a pivoted guide block 17. A thrust spring 18 is mounted on each rod 16 and bears at one end against block 17 while its other end thrusts against a fork 19 on the rod and straddling arm 14 so as to be engaged by the pin 15. These springs and rods are so located as to hold the inner ends of jaws 12 pressed against each other when the jaws are open as in Figure 4. However when pressure is exerted against the inner ends of the jaws for the purpose of swinging their outer ends toward each other, the pins 15 will move past their dead centers so that the jaws will thus be held in their new or closed positions.

A latch lever 20 is pivotally mounted at 21 on the cross-head 10 and has a spacing block or extension 22 at one end while its other end is formed with a finger 23 engaged by a spring 24 anchored to the cross-head. This spring serves to hold lever 20 normally pressed forward against a stop pin 25, two of these pins being used for limiting the closing movement of the jaws 12. This position of the jaws has been illustrated in Figure 3 and it will be noted that when the jaws are thus located, the block or extension 22 is seated between the inner ends of the jaws so as to prevent them from opening to the position illustrated in Figure 4.

A hand lever 26 is fulcrumed on pin 21 carrying lever 20 and has a tripping finger 27 extending therefrom in front of lever 20. A spring 28 connected to this lever and to the cross-head serves to hold the lever normally positioned as in Figure 3. However, by pulling lever 26 to the right in Figure 3 its finger 27 will thrust back on lever 20 so as to overcome spring 24 and withdraw block 22 from between the jaws 12. Thus the jaws will be released and free to swing open when an outward force is exerted against their outer or free ends. Consequently the parts can move to the positions shown in Figure 4. After this action has taken place the lever 26 is released and spring 28 will swing it back to the position shown in Figure 3 while spring 24 will move lever 20 and block 22 away from the temporary positions shown in Figure 4 and back to their normal positions against stop 25 at which time block 22 will be located behind the ends of the jaws. Thus when the mast is swung into upstanding position, its lower end will press against the inner meeting ends of the jaws 12 and force them against the spring restrained block 22 back of said ends. This action will continue until the ends of the jaws clear the block whereupon said block will snap outwardly to position between the ends of the jaws and lock them as shown in Figure 3.

The cross-head 10 is mounted to slide within the guides 8, carrying with it the anchor lock formed by the jaws 12 and the parts cooperating therewith. For the purpose of sliding the cross-head, links 29 are pivotally attached thereto at equal distances from the center of the cross-head and extend backwardly through guide openings 30 in the cross-beam 9. The back ends of these links are pivotally attached to the forward ends of crossed floating levers 32 which are pivotally connected at their centers as shown at 33 and are joined at their other ends to the side members 7 by links 34. A shifting lever 35 is connected to one of the side members 7 by one or more links 36 and is joined between its ends to levers 32 by the pivotal connection 33. The other end of lever 35 is provided with a socket 37 in which a nut 38 is rotatably mounted. This nut is engaged by a feed screw 39 extending from one end of a stem 40 journalled in the beam 9 and the other end of this stem has a head 41 for engagement by a suitable wrench. Thus it will be noted that by rotating stem 40 and screw 39, lever 35 can be shifted to transmit motion through the crossed levers 32 which thus will act to thrust or pull on links 29 and move the cross-head in the desired direction along guides 8.

Erected on the truck body is a suitably braced frame 42 in which is fulcrumed a cross-bar 43 provided with a sleeve 44 tightly embracing and suitably secured to the lower tubular member 45 of the mast. Stationary braces 46 connect one end of the cross-bar to the lower mast section while adjustable braces 47 connect the other end of the cross-bar to said section. This section may be equipped with steps 48 such as commonly employed.

Mounted on the lower end of section 45 is an apertured cap 49 constituting the guide for a tubular telescopic jack 50 to the lower end of which is connected a suitably shaped foot 51. The upper end of the jack is closed and has an annular enlargement 52 for slidably engaging the inner surface of mast member 45.

Opposed longitudinal slots 53 are formed in that portion of the jack normally housed in member 45 and secured within the jack between the slots are parallel racks 54 and 55, the teeth of one rack being arranged out of line with the teeth of the other rack. Gears 56 and 57 mesh with the respective racks and both are keyed or otherwise fastened to a shaft 58 extending through slots 53 and journalled in diametrically opposed portions of member 45. A notched wheel 59 is secured to one end of this shaft and has a hub 60 for engagement by any suitable means, such as a bar, not shown, for insertion into openings 61, whereby the wheel can be rotated. A spring pressed dog 62 is mounted in a guide 63 on member 45 and is adapted to

seat in any one of the notches in wheel 59 to hold said wheel against rotation. This dog or latch 62 has an arm 64 whereby it can be lifted readily by the operator standing adjacent to the mast.

When the mast is set up for use the operator pulls the dog or latch to release the wheel 59. The jack 50 promptly drops until its foot 51 reaches the ground whereupon the dog or latch is again dropped into engagement with the wheel. Thus the gears and racks will act to hold the jack and mast against relative movement and the load to which the mast is subjected will be transferred to the jack.

The upper or slidable member of the telescopic mast has been indicated at 65 and is slidable within the member 45. It is provided at its upper end with a cap 66 housing a centrally located sheave 67. The pulling line 68 and the bailing line 69 are both adapted to be mounted on this sheave 67. Below the main sheave 67 is another sheave 70 rotatable in a plane inclined relative to the member 65 and extending longitudinally of the axis of rotation of sheave 67. Guy lines 71 are adapted to be joined to the top of the mast as shown and sheave 70 is so located that the center of gravity therethrough is along a line which crosses the center line of the mast approximately at the point where the lines of the guys cross said center line. Therefore the mast will not tend to bend under a load. The construction and arrangement of sheave 70 provides for a quick and easy means for stringing and unstringing a cable to it and as it is built into the mast close up to the top sheave 67, as shown, head room is eliminated which is ordinarily provided in the form of space used for hooks and shackles required for attaching snatch blocks. The arrangement of sheave 70 also allows the cable running to the sheave to remain on the working side of the mast.

Within the member 45 is a cross pin 72 on which is mounted a diametrical sleeve 73 bearing at its ends against member 45. This sleeve supports an integral tubular standard 74 on the upper end of which is secured a head 75 carrying a sheave 76.

Opposed slots 77 are formed in standard 74 and a guide pin 78 extends diametrically across the standard between and near the lower ends of the slots. An elongated slide 79 is mounted in the standard and has a longitudinal slot 80 through which pins 78 extend. This slide is yieldingly supported by a spring 81 anchored at 82 in standard 74 and the lower end of the slide is connected by a rod 83 to a lever 84 fulcrumed at 85 in the member 45. The other end of this lever has a socket 86 for receiving an operating bar 87 or the like adapted to be inserted through and reciprocated in a short slot 88 formed in the member 45.

Pivotally mounted on member 45 are upwardly extended latch levers 89 which are oppositely disposed. Each of these levers has a head 90 adapted to extend through an opening 91 in member 45 and toward the opposed head 90. The pivot pins 92 on which levers 89 are mounted are supported by the walls of housings 93 on member 45, these housings being provided with removable cover plates 94 affording convenient access to the levers.

Pins 95 are extended outwardly from member 45 and loosely through the respective levers 89. These pins carry springs 96 which thrust against the levers so as to hold the heads 90 normally pressed into position beneath the lower end of mast section 65 when said section is extended as in Figures 8 and 11. When said section is not extended, the heads 90 will be pressed against opposed portions thereof as will be obvious.

Upwardly diverging links 97 are pivoted on the pin 78 and their upper ends are pivotally connected at 98 to intermediate portions of downwardly diverging tripping dogs 99. These dogs are pivotally mounted at their upper ends on the slide 79 as indicated at 100. The lower ends of the dogs are located between heads 90. Thus when lever 84 is pulled downwardly and slide 79 is moved therewith against the action of spring 81, the dogs 99 will be swung downwardly and outwardly so as to press against heads 90 and thrust them outwardly from under member 65 as shown in Figure 9.

A lifting cable 101 is mounted on sheaves 76 and has one end fastened at 102 to the lower portion of member 65. The other portion of this cable is extended downwardly within members 65 and 45 to a guide sheave 103 mounted in a slot 104 near the lower end of member 45. From this sheave the cable 101 can be extended to the spool 4.

Another sheave 105 is carried by the lower portion of mast member 45 and is engaged by drum cable 106 which extends upwardly over sheave 67 and thence downwardly to the bottom of the mast where it is anchored as shown at 107. The other end of this cable is connected to the drum and thus by winding it on the drum the mast can be swung from a horizontal position as indicated at A in Figure 1 to the full line or vertical position shown in said figure. When brought to this latter position the member 45 will swing between the open jaws 12, as shown in Figure 4, and, by pressing against the back ends of the jaws will cause them to snap shut around the mast while at the same time the block 22 will spring forward between the jaws and lock them as in Figure 3. By now coupling cable 101 to spool 4 after the line 106 has been detached, the member 65 can be pulled upwardly relative to member 45 until its lower end moves past the heads 90. At that time these heads will snap under member 65 and support it as in Figure 8. Upward movement of the member 65 will be limited by a substantially V-shaped stop strip 108 fastened on member 65 and movable against a stop pin 109 carried by member 45.

By shifting the truck the line suspended from the mast can be brought into position adjacent to the well and by then adjusting cross-head 10 so as to tilt the mast, the line can be positioned directly over the well. With the parts thus arranged the jack 50 is lowered and locked to receive the load and the structure is then ready for use.

To lower and move the mast the operator raises the jack by means of the gears. He then actuates lever 84 to push the heads 90 from under member 65 and, it being understood that cable 101 has been connected to the brake drum, mast section 65 can then be lowered into section 45. Thereafter line 106, which has been anchored at 107 and joined to the brake drum, can be paid out to allow the mast to swing gradually into horizontal position. It is to be understood, of course, that before the mast can be swung, it is necessary to shift lever 26 so as to withdraw block 22 and release jaws 12.

What is claimed is:

1. The combination with a support and op-

posed anchoring jaws pivoted thereon between their ends, of a mast mounted on the support for up and down swinging movement, said jaws being positioned simultaneously to receive thrust at one end from the mast for actuation thereby when the mast is swung to one extreme position, thereby to close the jaws at their other ends about the mast, and means for locking the jaws automatically when closed.

2. The combination with a support and opposed movable jaws thereon, of a mast mounted on the support and normally removed from between the jaws, said mast being located to swing into position between the jaws and into engagement with both jaws simultaneously to shift them from normal positions, means for automatically closing the jaws about the mast when engaged and shifted by the mast, and means for automatically locking the jaws about the mast.

3. The combination with a support and opposed movable jaws thereon, of a mast pivotally mounted between its ends for up and down swinging movement and movable into engagement with and between the jaws to shift the jaws into mast engaging position, means for locking the jaws in said position, and means for adjusting the jaws relative to the support while in engagement with the mast to adjust the mast angularly about its pivot.

4. The combination with a support including a frame and a cross-head slidable along the frame, of opposed jaws movable on the cross-head, a mast carried by the support and pivotally mounted between its ends for up and down swinging movement relative to the support, said mast when swung into upstanding position being movable into position between and against portions of the jaws to shift the jaws into mast engaging position, means for locking the jaws in said position, and means for shifting the cross-head while the jaws are locked, to adjust the mast angularly about its pivot.

5. The combination with a support including a frame and a cross-head slidable along the frame, of opposed jaws movable on the cross-head, a mast carried by the support and pivotally mounted between its ends for up and down swinging movement relative to the support, said mast when swung into upstanding position being movable into position between and against portions of the jaws to shift the jaws into mast engaging position, means for locking the jaws in said position, and means for shifting the cross-head while the jaws are locked, to adjust the mast angularly about its pivot, said means including crossed pivotally connected levers each movably anchored at one end to the frame, slidable connections between two of the levers and the cross-head, and actuating means engaging the other lever.

6. The combination with a support and a mast mounted to swing thereon about an intermediate transverse axis, of opposed jaws pivotally mounted on the support between their ends, yielding means for holding the jaws normally open and abutting at one end against each other, a locking element movably mounted adjacent to the jaws, said mast being positioned to swing against the jaws to move their abutting ends apart and close the jaws about the mast, said yielding means being shiftable past dead centers by the movement of the jaws to grip the jaws about the mast and release the locking element, and means for automatically shifting the released locking element between the jaws to secure them about the mast.

7. The combination with a support and a pivoted mast thereon, of opposed jaws movably mounted on the support, said jaws being positioned for actuation by the mast when swung to one extreme position, to engage and hold the mast, a locking element movable relative to the jaws, means for automatically shifting said element into engagement with the jaws to lock them in mast holding position, and means under the control of an operator for disengaging said element from the jaws to release the mast when shifted out of said extreme position relative to the jaws.

8. Apparatus of the class described including a portable support, a mast mounted thereon between its ends for swinging movement about a transverse axis, a jack telescopically mounted in one end of the mast, cooperating toothed elements in the jack and mast for shifting the jack relative to the mast, and means for locking one of said elements against movement to hold the jack fixed relative to the mast.

9. Apparatus of the class described including a portable support, a mast mounted thereon between its ends for swinging movement about a transverse axis, a jack telescopically mounted in one end of the mast, a rack in the jack, a gear carried by the mast and meshing with the rack, means for rotating the gear to shift the rack and jack relative to the mast, and means cooperating with said gear rotating means for holding the gear against rotation.

10. Apparatus of the class described including telescoping mast sections, a lifting cable secured to one of the sections, sheaves located in the respective section for engagement by the cable, said cable and sheaves cooperating to raise or lower one of the sections relative to the other by the actuation of the cable, latch levers carried by one of the sections having portions projecting normally into the path of the other section, and means movably mounted within one of the sections and shiftable manually from a point therebelow for actuating the latch levers to remove them from the path of the other section.

11. Apparatus of the class described including a mast having a lower section and a movable upper section slidable therein, a sheave carried by the lower section, another sheave supported by the lower section but within the upper section, a lifting cable secured to the upper section and extending upwardly over the last named sheave and thence downwardly within the sections to the first named sheave, latching means carried by the lower section and movable under the upper section to support it in elevated position, means supported by the lower section for engaging the latching means, and means under the control of an operator for shifting said engaging means to thrust the latching means from under the upper section to release it.

12. Apparatus of the class described including a mast having an upper section and a lower section, said sections telescoping, a standard supported within the lower section and projecting into the upper section, a sheave carried thereby within the upper section, a lifting cable secured to the upper section and extending over said sheave and thence downwardly within the lower section, means on the respective sections and cooperating to limit the upward movement of the upper section, a latch lever carried by the lower section and normally pressed thereinto for movement under the upper section to support it, a yieldingly supported tripping dog within the standard, a slide connected thereto, means ad-

jacent the lower end of the lower section for actuating the slide, thereby to move the tripping dog, and means operated by the movement of the slide for thrusting the dog against the lever to shift said lever out of the path of the upper section.

13. Apparatus of the class described including a portable supporting structure, a telescopic mast carried thereby, a main sheave in the top of the mast, a cap on the mast adjacent to the sheave, guys connected to the cap and extending along lines crossing at a point above the sheave, and a second sheave carried by the mast below the main sheave, said second sheave being rotatable in a plane at right angles to the plane of rotation of the main sheave and extending substantially to the point of crossing of the lines of the guys.

14. Apparatus of the class described including a support, upper and lower mast sections telescopically connected, latch members connected to the lower section and adapted to bear against the upper section, means housed within the two sections for elevating the upper section relative to the lower section and withdrawing the upper section from engagement with the latch members to release said members for movement into position under the upper section to support it, and means housed within said sections for shifting the latch members to release the supported upper section.

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