April 19, 1955 H. J. WOOLSLAYER ET AL 2,706,540

FOLDING GIN POLE FOR OIL WELL MAST

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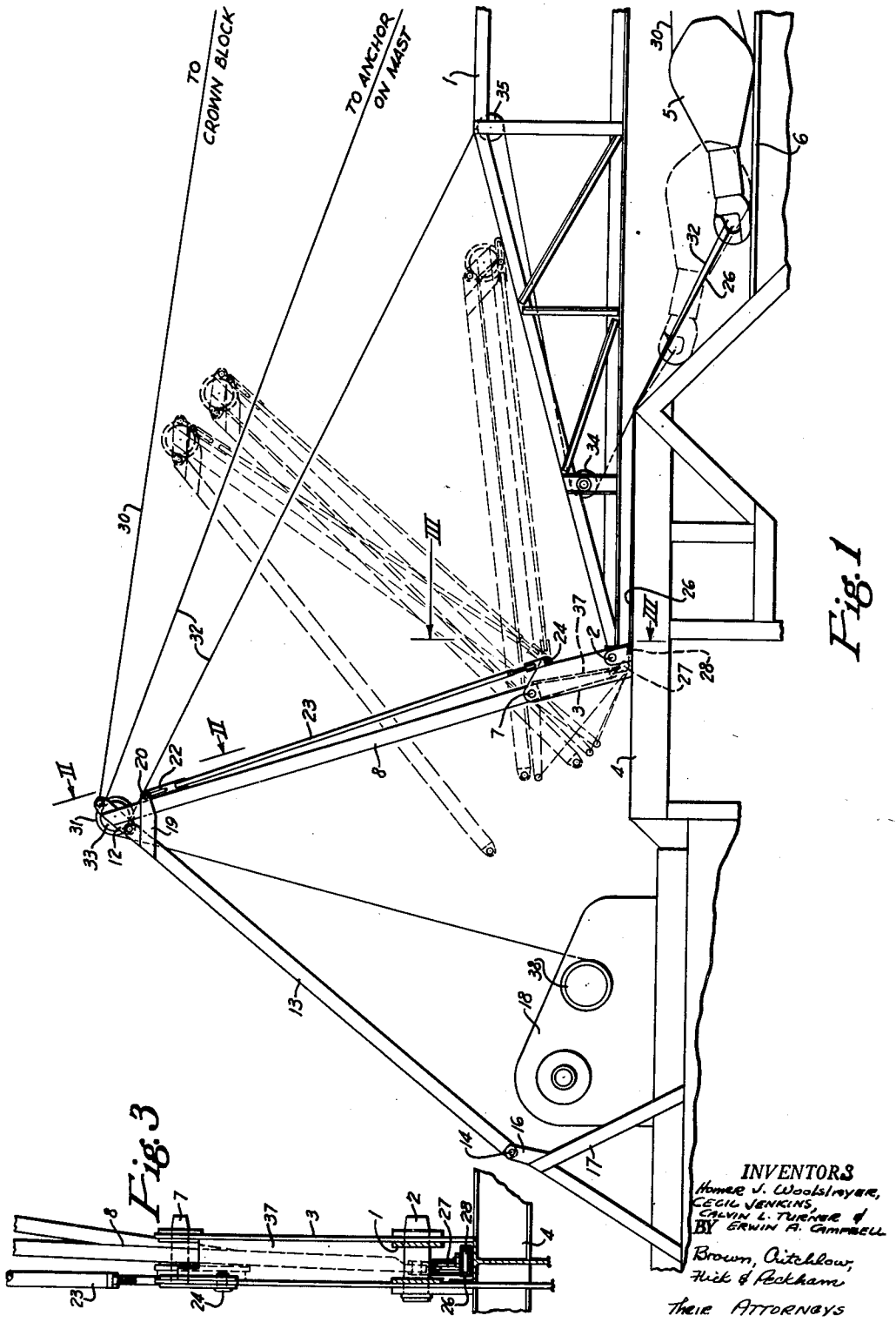


Fig. 1

Fig. 3

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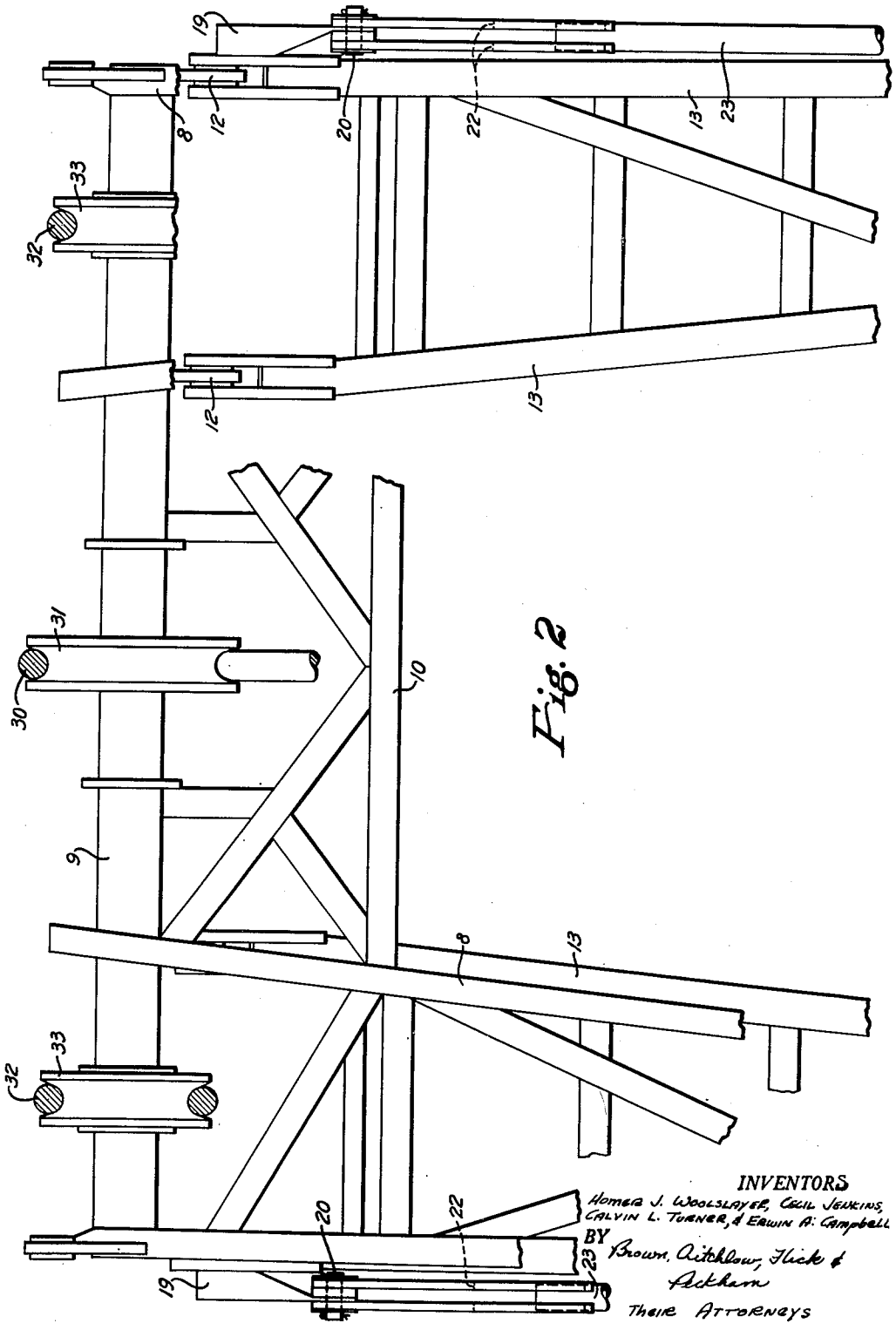


Fig. 2

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FOLDING GIN POLE FOR OIL WELL MAST

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6 Claims. (Cl. 189—15)

This invention relates to oil well mast gin poles, and more particularly to a gin pole that is swung from a reclining folded transportation position up to an erect spread operative position.

It is among the objects of this invention to provide a gin pole which in its folded reclining position extends in the same direction as the reclining mast associated with it, which can be raised to erect operative position by connecting it with the traveling block of the mast, and in which the front and back sides are automatically spread a predetermined distance apart as the gin pole is raised.

In accordance with this invention the front and rear sides of the gin pole are hinged together at the top to permit them to be folded together from spread position. The lower portion of one side of the gin pole is pivotally mounted above the base to permit the pole to be swung from a folded reclining position, in which that side is below the other side, up to erect position. Rigid means extend from the top of the other side of the gin pole across the top of the pivoted side, and tension means are connected to the projecting end of said rigid means and are anchored near the base for automatically spreading the sides of the pole apart as it is swung up to erect position.

The preferred embodiment of the invention is illustrated in the accompanying drawings, in which:

Fig. 1 is a fragmentary side view of a reclining mast and its support, showing the erected gin pole;

Fig. 2 is an enlarged fragmentary front view of the gin pole taken on the line II—II of Fig. 1; and

Fig. 3 is an enlarged detail, taken on the line III—III of Fig. 1.

Referring to Fig. 1 of the drawings, each foot of a reclining mast **1** is pivotally mounted on a pin **2** in the lower part of a tall shoe **3** extending upward from a base **4**. The lower or front side of the mast is open and the traveling block **5** rests on the catwalk **6** below it.

Pivotally mounted on a pin **7** in the upper end of each of the shoes is the lower portion of one of the front legs **8** of a folding gin pole. As shown in Fig. 2 the upper ends of the legs are rigidly connected by a horizontal tubular member **9** and by a truss **10**. Projecting downward at an angle from the tubular member behind the front legs are short plates **12** that are pivotally mounted in the forked upper ends of the rear legs **13** of the gin pole. The lower ends of the rear legs are removably mounted, by means of drive pins **14**, in elevated shoes **16** supported on pedestals **17** behind the drawworks **18**.

Extending forward from the outside of each rear leg across the outside of the leg in front of it is a rigid arm **19**, the front end of which carries a cross pin **20**. Each pin extends through a longitudinal slot **22** in the upper end of a tension link **23** and engages the upper end of the slot. The forked lower end of the link is pivotally connected by a pin **24** to a projection on the front of one side of the underlying shoe **3** near its top.

The lower end of each front leg of the gin pole extends downward a substantial distance beyond its pivot pin **7** to a point behind the adjoining foot of the mast and is connected to one end of a line **26** that extends forward under a small vertical sheave **27** and across a horizontal sheave **28** in the bottom of shoe **3**, as shown in Fig. 3. The line between the two horizontal sheaves extends forward and through the hook of the traveling block **5**.

In the drawings the gin pole is shown just after it has been raised by the traveling block, which has been pulled a short distance toward the head of the mast by the drilling line **30** that extends from the drawworks **18** up and over the center sheave **31** on the gin pole and then forward to the crown block (not shown) and back to the traveling block. The next step will be to disengage line **26** from the traveling block and then continue pulling the block toward the head of the mast. This movement will swing the mast upward, because the traveling block also is connected to a sling **32** which extends back up around a pair of sheaves **33** on the gin pole and forward to anchor points on the top of the reclining mast. In order that the traveling block may be located close to base **4** for transportation, the sling preferably extends from the block back around sheaves **34** in opposite sides of the mast near its feet and then forward and up around another pair of sheaves **35** in the mast. The sling does not become taut until the gin pole has been raised.

The way in which the gin pole was raised will now be described, starting with its reclining position shown in broken lines in Fig. 1. In that position the gin pole is folded and extends forward along the mast, on which it rests. The legs of the gin pole extend backward behind shoes **3**, and the cross pins **20** carried by arms **19** are near the inner or lower ends of link slots **22**. The traveling block is in substantially its broken line position. The drawworks then is started in operation to start pulling the traveling block forward away from the foot of the mast. As it moves forward, the block pulls on line **26** and thereby pulls the rear or lower ends of the front feet of the gin pole down and forward toward the bottom of the shoes. This naturally swings the opposite end or head of the gin pole upward and backward. By the time it has reached about a 45° angle, arm pins **20** will have reached the upper ends of link slots **22** and will not be able to move any farther upward relative to the links. Consequently, further upward movement of the gin pole causes the rear ends of arms **19** to swing downward relative to the front gin pole legs, and in doing so they swing the rear gin pole legs back away from the front legs. The link slots serve the purpose of delaying spreading of the gin pole legs until after the heavy work of raising the gin pole is nearly completed. This spreading of the legs continues until the back feet of the gin pole settle down into elevated shoes **16**. To avoid having those feet possibly slip out of the shoes before they have been pinned in place, the front shoes **3** may be provided with internal transverse plates **37** which the lower portions of the gin pole's front legs engage when they have been swung forward the required distance.

It will be noted that the pressure of drilling line **30** against gin pole sheave **31** tends to oppose raising of the gin pole. Nevertheless, due to the mechanical advantage of the line reeving, the erecting force exerted through line **26** prevails. When the gin pole has been raised far enough for gravity to tend to swing it the rest of the way back, the lower ends of the front gin pole legs will have reached a position where the purchase of line **26** about pivot pins **7** will become relatively small and thence progressively smaller so that the restraining effect of line **30** will be dominant. That line then can be slacked off to control backward and downward swinging of the gin pole to final position, where pins **14** can be driven into place.

To lower the gin pole to reclining transportation position, line **26** is reattached to the traveling block after the mast has been lowered. Then pins **14** are removed and the head of the gin pole is pulled forward by auxiliary means, such as a line (not shown) connected to a truck or extending around a snatch block on the mast and then back to cathead **38**. As soon as the gin pole has been swung forward far enough for gravity to take effect, drilling line **30** is paid out to permit the weight of the gin pole to lower it. The lowering is controlled by the traveling block, which is dragged toward base **4** by line **26** as the lower ends of the front gin pole legs swing backward and upward.

According to the provisions of the patent statutes, we have explained the principle of our invention and have illustrated and described what we now consider

to represent its best embodiment. However, we desire to have it understood that, within the scope of the appended claims, the invention may be practiced otherwise than as specifically illustrated and described.

We claim:

1. A gin pole structure comprising a base, a gin pole provided with front and rear sides hinged together at the top to permit them to be folded together from a spread position, means on the base pivotally supporting the lower portion of one side of the gin pole to permit the pole to be swung from a folded reclining position, in which said side is below the other side, up to erect position, rigid means rigidly connected to and extending from the top of said other side loosely across the top of said pivoted side, and tension means anchored near said lower portion and connected to the projecting end of said rigid means for restraining the latter to automatically spread said sides of the pole apart as it is swung up into erect position.

2. A gin pole structure in which a gin pole is adapted to be swung from a reclining folded position up to upright open position, comprising a base, front and back gin pole legs above the base hinged together at their upper ends and temporarily reclining in superimposed relation to form upper and lower legs having their feet near each other, supporting means mounted on the base pivotally supporting the lower legs near their feet but spaced from those feet to leave short leg portions projecting from one side of said means, the legs being supported above the base far enough to permit said leg portions to be swung down to vertical position, means for pulling the feet of the lower legs down toward said supporting means to swing the hinged ends of the legs upward, rigid means rigidly connected to and extending from the top of the upper legs loosely across the top of the lower legs, and tension means anchored near said short leg portions and connected to the projecting end of said rigid means for swinging the front and back feet of the legs away from each other as the gin pole is raised.

3. A gin pole structure in which a gin pole is adapted to be swung from a reclining folded position up to upright open position, comprising a base, front and back gin pole legs above the base hinged together at their upper ends and temporarily reclining in superimposed relation to form upper and lower legs having their feet near each other, supporting means mounted on the base pivotally supporting the lower legs near their feet but spaced from those feet to leave short leg portions projecting from one side of said means, the legs being supported above the base far enough to permit said leg portions to be swung down to vertical position, means for pulling the feet of the lower legs down toward said supporting means to swing the hinged ends of the legs upward, rigid means extending from the top of the upper legs across the top of the lower legs, a link having one end pivotally connected to the projecting end of said rigid means, and means pivotally supporting the opposite end of the link near said short leg portions, whereby the front and back feet of the legs will be swung away from each other as the gin pole is raised.

4. A gin pole structure in which a gin pole is adapted to be swung from a reclining folded position up to upright open position, comprising a base, front and back gin pole legs above the base hinged together at their

upper ends and temporarily reclining in superimposed relation to form upper and lower legs having their feet near each other, supporting means mounted on the base pivotally supporting the lower legs near their feet but spaced from those feet to leave short leg portions projecting from one side of said means, the legs being supported above the base far enough to permit said leg portions to be swung down to vertical position, means for pulling the feet of the lower legs down toward said supporting means to swing the hinged ends of the legs upward, rigid means extending from the top of the upper legs across the top of the lower legs, a link having a slotted end pivotally and slidably connected to the projecting end of said rigid means, and means pivotally connecting the opposite end of the link to said supporting means.

5. The combination with a base, drawworks mounted on the base, a reclining oil well drilling mast, means hinging the foot of the mast to the base in front of the drawworks, a traveling block near the foot of the mast, and a drilling line connecting the block with the head of the mast and then extending back above the mast to the drawworks; of front and back gin pole legs above said means hinged together at their upper ends and temporarily reclining in superimposed relation on the mast with their feet near each other, a sheave carried by the upper ends of said legs and supporting said line, supporting means mounted on the base pivotally supporting the lower reclining legs near their feet but spaced from those feet to leave short leg portions projecting from the side of said supporting means opposite to the mast, the legs being supported above the base far enough to permit said leg portions to be swung down to vertical position, a line connected to the feet of the lower legs and to said traveling block, whereby when the drawworks causes the drilling line to pull the traveling block toward the head of the mast the last-mentioned feet will be pulled down toward said supporting means to swing the hinged ends of the legs upward, and means automatically swinging the front and back feet of the legs away from each other as the gin pole is raised against the resistance of the drilling line engaging said sheave.

6. A gin pole structure comprising a base, a gin pole provided with front and rear sides hinged together at the top to permit them to be folded together from a spread position, means on the base pivotally supporting the lower portion of one side of the gin pole to permit the pole to be swung from a folded reclining position, in which said side is below the other side, up to erect position, rigid means rigidly connected to the top of said other side and extending from it loosely across the top of said pivoted side, a link having one end pivotally connected to the projecting end of said rigid means, and means pivotally supporting the opposite end of the link near said lower portion, whereby the front and back sides of the gin pole will be swung away from each other as the gin pole is swung up into erect position.

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