May 17, 1955

H. J. WOOLSLAYER ET AL

2,708,565

TRAVELING BLOCK ARRESTER

Filed June 23, 1954

2 Sheets-Sheet 1

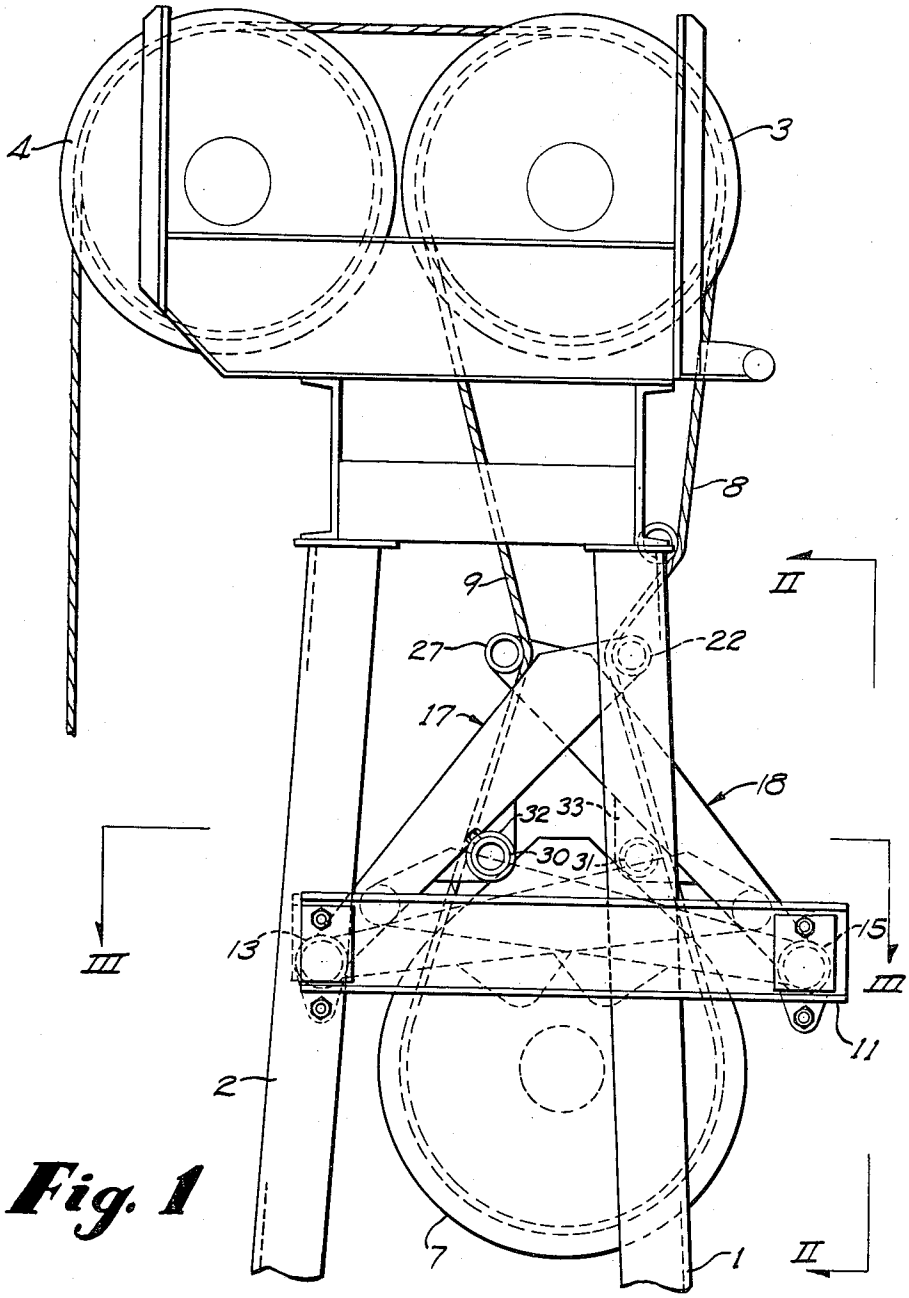


Fig. 1

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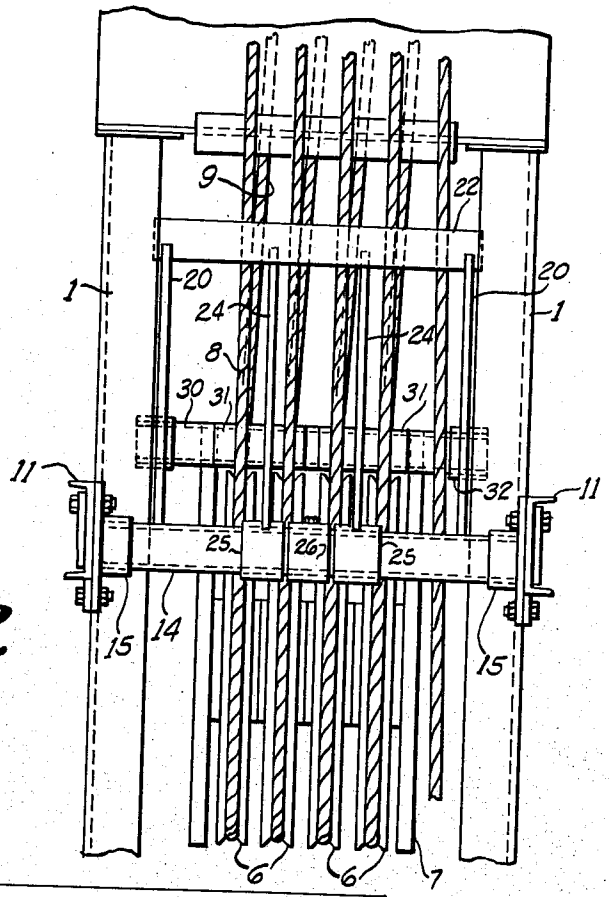


Fig. 2

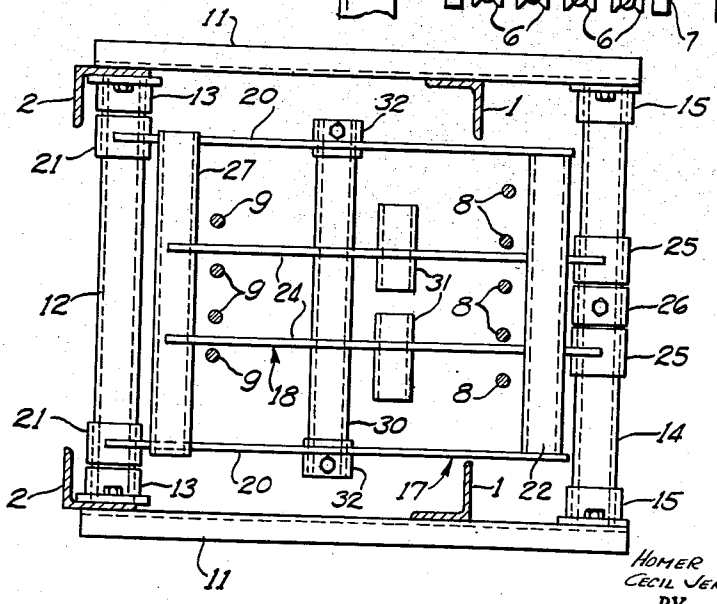


Fig. 3

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TRAVELING BLOCK ARRESTER

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Application June 23, 1954, Serial No. 438,653

5 Claims. (Cl. 254—145)

This invention relates to apparatus for arresting a rising traveling block before it can strike the crown block from which it is suspended in an oil well mast.

Occasionally the operator of the drawworks of an oil well drilling mast miscalculates and allows the traveling block to rise so high in the mast that it strikes the crown block. This may cause considerable damage to the equipment as well as endanger the men at the base of the mast, due to falling parts. It has been proposed to limit the upward travel of the traveling block by having the block trip an electric switch that will warn the drawworks operator, but such apparatus depends for its success on the operator's reaction time. If he does not act quickly enough, the block may strike the crown anyway. Where the traveling block is used to actuate an electrical system that opens the ignition circuit of a drawworks engine that has electrical ignition, the momentum of the engine generally makes the reaction time too long to be safe.

It is among the objects of this invention to provide a traveling block arrester which is entirely mechanical in its operation, which does not depend on the operator's reaction time, which cannot fail to work, which is easily installed on new or existing oil well masts, which requires no maintenance, and which is relatively inexpensive.

In accordance with this invention the traveling block arrester is a short distance below the crown block that supports a traveling block by the usual lines formed by a cable reeved around the sheaves in the two blocks. For convenience of description only, the lines will be referred to herein as front and rear lines, so that the position of the arrester relative to the lines can be described more easily. The arrester includes a pair of normally reclining front and rear arms having the front end of the front arm and the rear end of the rear arm pivotally supported on the mast on parallel horizontal axes. The arms extend from their pivots in opposite directions across all of the lines. A snubbing member is carried by the rear end of the front arm and extends laterally across the back of the rear lines. Another snubbing member, carried by the front end of the rear arm extends laterally across the front of the front lines. Means are carried by the arms which are adapted to be engaged by the rising traveling block to swing the arms upward in order to move the snubbing members inward toward each other and tightly against the lines between them. When this occurs, the upward movement of the traveling block will be retarded and the increased laboring of the drawworks will indicate to the operator that the traveling block is too high in the mast. In effect, the arrester forms a resilient obstacle in the path of the traveling block so that the latter can be stopped before any damage is done.

The preferred embodiment of the invention is illustrated in the accompanying drawings, in which: Fig. 1 is a side view of the upper end of an oil well mast, showing our traveling block arrester in snubbing position;

Fig. 2 is a fragmentary front view of the arrester taken on the line II—II of Fig. 1; and

Fig. 3 is a horizontal section through the mast on the line III—III of Fig. 1, showing the arrester in inoperative or collapsed position.

Referring to the drawings, the legs 1 and 2 of an oil well mast, which are referred to herein for convenience as the front and rear legs, support a crown block provided with the usual row of sheaves 3, behind which there is a fast sheave 4. A cable extends upward from the usual drawworks (not shown), over the fast sheave and then forward over the front sheaves. The cable is reeved around the crown sheaves and the sheaves 6 in the traveling block 7 which it supports in the mast, and then is dead-ended at one lower corner of the mast. The lines connecting the two blocks form two separate groups, a front group 8 and a rear group 9, which are more or less parallel to each other.

Welded or otherwise secured to the opposite sides of the mast are a pair of horizontal channels 11, which extend from the rear legs forward past the front legs. Extending across the space between the two rear legs of the mast is a horizontal hollow shaft 12 which has its ends supported in sockets 13 that are bolted to the rear legs. A similar horizontal shaft 14 has its ends supported in sockets 15 that are bolted to the inner faces of the front ends of the two channels 11. The two shafts are parallel to each other and at the same level. They also are spaced equal distances from the extended center line of the well.

Pivotally mounted on each of these shafts is one end of an arm. One arm 17 extends forward from the rear shaft and the other arm 18 extends backward from the front shaft and they both extend across all of the lines. Preferably, the rear arm 17, which is the one mounted on the rear shaft, is formed from a pair of parallel bars 20. The rear ends of the bars are secured to sleeves 21 pivotally mounted on the rear shaft near its opposite ends. The front ends of the bars are rigidly connected by a tubular snubbing member 22 which may be welded between them. Both groups of lines are between the two bars.

The front arm 18 likewise is formed from a pair of parallel bars 24 having their front ends secured to sleeves 25 journaled on the front shaft at the opposite ends of a central collar 26 which spaces them apart. The rear ends of these bars are rigidly connected by a tubular snubbing member 27, the ends of which overlie and rest on the other pair of bars 20 behind the rear group 9 of lines. The other snubbing member rests on the front bars 24 in front of the front group 8 of lines. The front bars are much closer together than the rear bars, but all four bars are spaced substantially equal distances apart. The front bars pass between some of the lines. The lines normally do not touch any of the elements of the traveling block arrester, so that in normal and proper operation of the mast the arrester serves no purpose whatever.

On the other hand, if the drawworks operator inadvertently allows the traveling block to rise too high in the mast and dangerously close to the crown block, the arrester will come into operation at once. Accordingly, the two arms are provided with means which will be engaged by the rising traveling block to swing the arms upward in order to move the snubbing members inward toward each other and tightly against the lines between them. Thus, a cross member 30 is carried by the bottom of the rear arm behind the center line of the well, and the front arm carries a similar member 31 in front of that center line. The rear cross member has its ends detachably supported in tubular brackets 32 welded to the bottoms of the rear bars 20, while the front cross member 31 is divided into two short pieces. Each piece is rigidly mounted in a bracket 33 (Fig. 1) fastened to the bottom of one of the front bars 24. There is a space or slot between the two front pieces, and their outer ends are spaced from the outer or rear bars. Before the front shaft 14 is inserted in the front sleeves 25 and mounted

between the front ends of channels **11**, the front bars **24** are inserted between the lines from the rear of the mast. The two rear lines between those bars can pass through the slot in the front cross member **31**. Likewise, before the rear shaft **12** is inserted in rear sleeves **21** and fastened to the rear legs of the mast, the rear bars **20** are moved back across the lines from the front of the mast. At that time the rear cross member **30** is removed so that it will not strike the front lines and prevent the rear arm from being moved further back.

It will be seen in Fig. 1 that if the traveling block is allowed to rise too high it will strike the cross members **30** and **31** carried by the arms and swing the arms upward from their dotted line position. This will swing the two snubbing member **22** and **27** inward toward each other and against the front and rear groups of lines. The higher the traveling block rises, the closer the snubbing members will be swung together and the more the lines will resist that movement. The snubbing action will increase the line load materially and cause the drawworks to labor and tend to stall and thereby warn the operator that the traveling block is dangerously high in the mast. The resistance to upward movement of the block exerted by the lines against the snubbing members is more gradual that if a solid member were put in the path of the block, so the situation can be corrected before any damage is done. As soon as the traveling block is lowered again, the arms drop back to their inactive reclining position and leave the block free to operate in the usual way.

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, with the scope of the appended claims, the invention may be practiced otherwise than as specifically illustrated and described.

We claim:

1. The combination with an oil well mast, a crown block thereon, and a traveling block in the mast suspended from the crown block by front and rear lines, of a traveling block arrester near the crown block comprising a pair of normally reclining front and rear arms having the front end of the front arm and the rear end of the rear arm pivotally supported by the mast on parallel horizontal axes, said arms extending from their pivotal supports in opposite directions across all of said lines, a snubbing member carried by the rear end of the front arm extending laterally across the back of the rear lines, a snubbing member carried by the front end of the rear arm extending laterally across the front of the front lines, and means carried by the arms and adapted to be engaged by the rising traveling block to swing the arms upward in order to move said snubbing members inward toward each other and tightly against the lines between them.

2. A traveling block arrester in the combination recited in claim 1, in which each of said arms is formed from a pair of laterally spaced bars connected together at one end by one of snubbing members.

3. The combination with an oil well mast, a crown block thereon, and a traveling block in the mast suspended from the crown block by front and rear lines, of a traveling block arrester near the crown block comprising a pair of normally reclining front and rear arms each formed from a pair of laterally spaced bars, parallel front and rear horizontal shafts rigidly supported by the mast, sleeves secured to the front ends of the front bars and to the rear ends of the rear bars and rotatably mounted on the adjacent shafts, said bars extending from said shafts in opposite directions across all of said lines, a snubbing member connecting the rear ends of the front bars and extending across the back of the rear lines, a snubbing member connecting the front ends of the rear bars and extending across the front of the front lines, and means carried by the bars and adapted to be engaged by the rising traveling block to swing the arms upward in order to move said snubbing members inward toward each other and tightly against the lines between them.

4. The combination with an oil well mast, a crown block thereon, and a traveling block in the mast suspended from the crown block by front and rear lines, of a traveling block arrester near the crown block comprising a pair of normally reclining front and rear arms having the front end of the front arm and the rear end of the rear arm pivotally supported by the mast on parallel horizontal axes, said arms extending from their pivotal supports in opposite directions across all of said lines, a snubbing member carried by the rear end of the front arm extending laterally across the back of the rear lines, a snubbing member carried by the front end of the rear arm extending laterally across the front of the front lines, each of said arms being formed from a pair of laterally spaced bars connected together at one end by one of said snubbing members, one of the arms straddling the other one with each of the snubbing members resting on the reclining pair of bars attached to the other snubbing member, and means carried by the arms and adapted to be engaged by the rising traveling block to swing the arms upward in order to move said snubbing members inward toward each other and tightly against the lines between them.

5. A traveling block arrester in the combination recited in claim 4, in which said means include a longitudinally spaced pair of horizontal elements attached to the inner pair of bars and spaced from the outer pair of bars, and a horizontal member removably connected at its ends to the outer bars.

No references cited.