May 11, 1926. 1,584,704

F. SWAN

ROPE GUIDE AND LUBRICATOR FOR DRILL ROPES

Filed Feb. 12, 1924 2 Sheets-Sheet 1

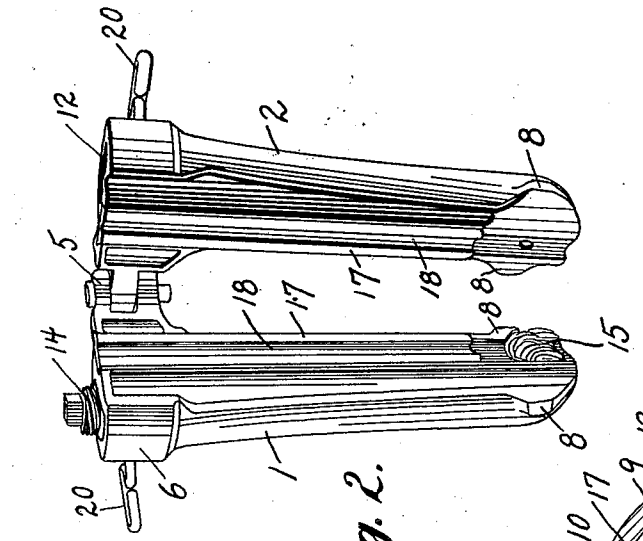


Fig. 1.

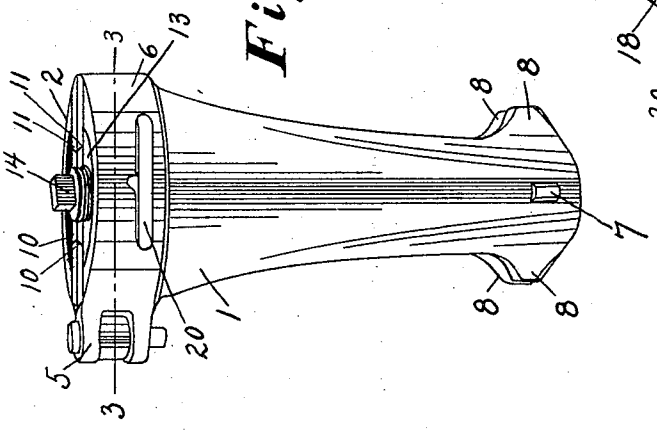


Fig. 2.

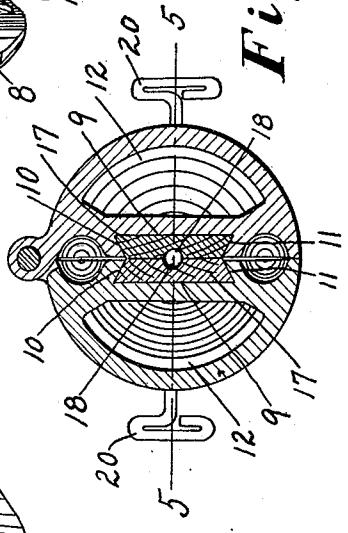


Fig. 3.

Inventor

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By A. P. Greeley.

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ROPE GUIDE AND LUBRICATOR FOR DRILL ROPES

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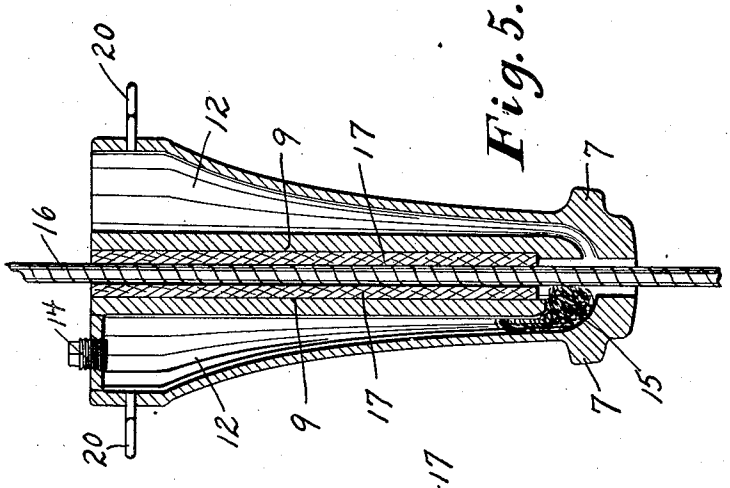


Fig. 5.

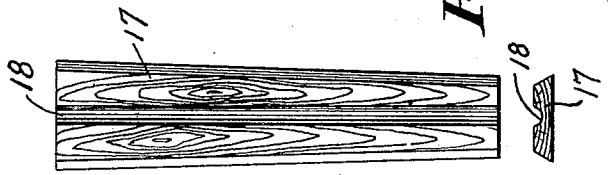


Fig. 6.

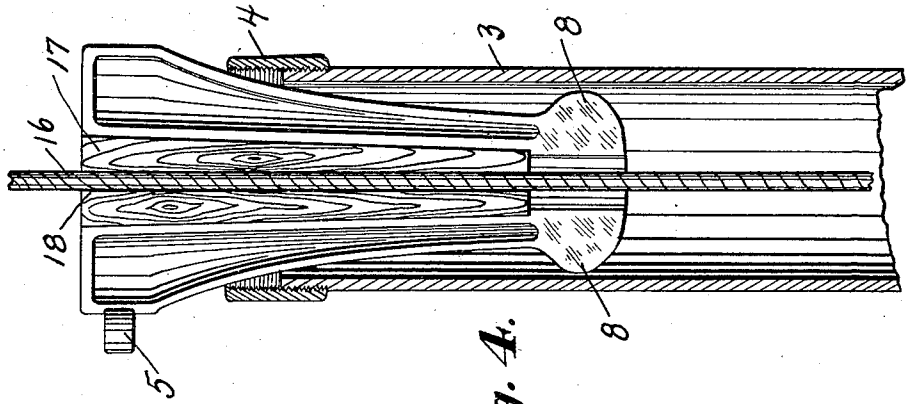


Fig. 4.

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Patented May 11, 1926. 1,584,704

UNITED STATES PATENT OFFICE.

FRED SWAN, OF MARIETTA, OHIO.

ROPE GUIDE AND LUBRICATOR FOR DRILL ROPES.

Application filed February 12, 1924. Serial No. 692,257.

My invention relates to rope guides and lubricators for drill ropes, and has for its object to provide a device adapted to be inserted in the upper end of well casing by which the drill rope will be so guided that it will be prevented from coming in contact with the well casing and will be automatically supplied with lubricant renewable guide blocks.

In the operation of drilling wells for oil or gas or other purpose by the churn drilling method commonly employed, the drill rope as it is drawn upward by the walking beam and drawn downward by gravity swings more or less out of the vertical line of the axis of the well hole and into contact with the well casing. When, as is usual in deep well drilling, the drill rope is of wire, the friction of the metallic rope against the metallic casing appears to set up electrical or magnetic conditions under which the wire rope is so attracted to the casing as to cause it to cling to it and to increase the friction and wear to the damage of the drill rope casing and of the coupling at the upper end of the casing. By the device of my invention the drill rope while free to reciprocate vertically in the drilling operation is held substantially in line with the axis of the well hole and out of contact with the metal thus preventing the setting up of electrical or magnetic conditions and at the same time the rope is supplied with lubricant by which friction is reduced, the lubricant also aiding in preventing the setting up of electrical or magnetic conditions.

With the objects above indicated, and other objects hereafter explained, my invention consists in the construction and combination of elements hereinafter described and claimed.

Referring to the drawings:

Figure 1 is a perspective view of a guiding and lubricating device embodying my invention, ready to be inserted in the upper end of well casing.

Figure 2 is a perspective view of the same showing it open.

Figure 3 is a cross sectional view on line 3—3 of Figure 1.

Figure 4 is a view of the inner face of one of the two sections of the device.

Figure 5 is a vertical sectional view on line 5—5 of Figure 3 and

Figure 6 shows in face and end views one of the removable rope guides.

In the drawing 1 and 2 indicate sections, preferably semi-circular in cross section, constituting a plug adapted to fit into the upper end of well casing 3 and to rest upon the upper edge of the coupling 4 at the upper end of the casing or to wedge in casing on tapered portion. The sections 1 and 2 are preferably connected at their upper ends by a hinge 5. These sections are preferably formed by casting and on their exterior taper from relatively broad and heavy ring sections 6 which together form a ring of substantial width of a diameter substatially greater than the diameter of the coupling 4. From the ring thus formed the sections 1 and 2 taper gradually, preferably on a curve as shown, to the lower end which has its outer diameter substantially less than that of the interior of the well casing 3. At its lower end each of the sections 1 and 2 is provided with spacing lugs 7 and 8 adapted to fit loosely in the casing and to hold the lower end of the device properly spaced from the casing walls.

When in position the tapered outer portions of the sections below the ring 6 bear against the inner edge of the coupling 4 with a slight wedging action which holds the section closed together.

For convenience in lifting the device, each of the sections 1 and 2 is provided near its upper end with a hand hold 20.

Longitudinally of each of the sections 1 and 2 centrally of its inner face is formed a wide dovetail recess having flat bottom face 9 slightly wider at its upper end and tapering towards its lower end and having inclined walls 10—11. This recess terminates at its lower end a substantial distance above the lower ends of the sections 1 and 2. Back of the wall in which is formed the recess 9—10—11, and the exterior wall of each section is a chamber 12 open at its upper end, extending downward below the lower end of the recess 9—10—11 and curved inward at its lower end toward the axis. This chamber 12 in the section 1 is shown as provided with a cover 13 having an opening through it closed by a screw plug 14, and is shown containing in its lower portion fiborous material 15 such as waste or candle wicking so arranged that its lower end will be in contact with the well rope 16. When this chamber 12 is filled with oil or grease the oil or grease will be fed gradually by the fibrous material 15 against the well rope as

it is moved up and down in its operation. It is usually sufficient to make use of the chamber 12 of one of the sections only, for containing lubricant but if desired the chamber 12 of the other section may be also arranged to contain lubricant and supply it to the drill rope.

In the tapered, dove-tail recess 9—10—11 of each of the sections 1 and 2 is arranged a guide block 17 formed preferably of hard wood having a groove 18 centrally of its inner face, the groove of the two guide blocks 17, when brought together by closing the sections 1 and 2 together, form a guide opening for the drill rope. The guide blocks are slightly tapered from their upper ends downward and have their sides inclined to fit the inclined side walls of the recess. The recesses 9—10—11 and the guide blocks are so formed that when the guide blocks are lightly driven into place they will be so held as not to be displaced by the upward movement of the drill rope. When a guide block becomes so worn that the drill rope is liable to come in contact with the metal of the section, then a new guide block should be substituted for the worn one.

When the string of tools is withdrawn from the casing the upper end of the rope socket as it comes against the lower end of the sections 1 and 2 will lift the device out of the upper end of the casing and carry it upward out of the way and as the string of tools is again lowered into the casing the device will resume its position in the upper end of the casing or it may be lifted by hand.

The plug formed by the section 1 and 2 may be made of any diameter desired.

Having thus described my invention, what I claim is:

1. In a rope guide and lubricator for the drill rope of well drilling apparatus adapted to be supported on the upper end of well casing, a plug having its lower portion of less diameter than the interior of the casing and adapted to enter the upper end thereof, having its upper portion of greater diameter than the casing and adapted to rest upon the upper end thereof and having a central longitudinal opening through it for the drill rope and a lining of non-conducting material for the opening through which the rope passes, and means carried by the plug independent of the lining for lubricating the rope.

2. In a rope guide and lubricator for the drill rope of well drilling apparatus adapted to be supported on the upper end of well casing, a plug having its lower portion of less diameter, than the interior of the casing and adapted to enter the upper end thereof, having its upper portion of greater diameter than the casing and adapted to rest upon the upper end thereof and having a central longitudinal opening through it for the drill rope, said plug being formed of sections separable on the plane of its axis so that the opening for the rope is formed partly in one section and partly in an opposite section, and means carried by one of the sections of the plug for supplying lubricant to the drill rope.

3. In a rope guide and lubricator for the drill rope of well drilling apparatus adapted to be supported on the upper end of well casing, a plug having its lower portion of less diameter than the interior of the casing and adapted to enter the upper end thereof and having its upper portion of greater diameter than the casing and adapted to rest upon the upper end thereof and having a central longitudinal opening through it for the drill rope, said plug being of sections separable on the plane of its axis and a lining for the opening through which the rope passes also formed in section each carried by a section of the plug, and means carried by one of the sections of the plug independent of the lining for lubricating the rope.

4. In a rope guide and lubricator for the drill rope of well drilling apparatus, a plug adapted to be supported on the upper end of the well casing formed of sections separable on the plane of its axis and each provided in its inner face with a central longitudinal recess and a lining of non-conducting material in the recess of each section having a longitudinal groove in its face the grooves in the faces of the linings of opposite sections being adapted to together form a passage for the drill rope, and means carried by the plug independent of the lining for lubricating the drill rope.

5. In a rope guide and lubricator for the drill rope of well drilling apparatus, a plug adapted to be supported on the upper end of the well casing formed of sections separable on the plane of its axis and each provided in its inner face with a central longitudinal recess tapering from a greater width at its upper end to a less width at its lower end and a lining of non-conducting material in the recess of each section having a longitudinal groove in its face the grooves in the faces of the linings of opposite sections being adapted to together form a passage for the drill rope, and means carried by one of the sections of the plug independent of the linings for lubricating the drill rope.

6. In a rope guide and lubricator for the drill rope of well drilling apparatus, a plug adapted to be supported on the upper end of the well casing formed of sections separable on the plane of its axis and each provided in its inner face with a central longitudinal recess dovetail in cross section and tapering from a greater width at its upper end to a less width at its lower end

and a lining of nonconducting material in the recess of each section having a longitudinal groove in its face the grooves in the faces of the linings of opposite sections being adapted to together form a passage for the drill rope, and means carried by one of the sections of the plug for lubricating the rope.

7. In a rope guide and lubricator for the drill rope of well drilling apparatus, a plug adapted to be supported on the upper end of the well casing formed of sections separable on the plane of its axis and each provided in its inner face with a central longitudinal recess and a lining of non-conducting material in the recess of each section having a longitudinal groove in its face the grooves in the faces of the linings of opposite sections being adapted to together form a passage for the drill rope, the walls of the recesses being separated from the outer walls of the sections so as to form chambers adapted to contain lubricant and having an outlet at its lower end for the lubricant.

In testimony whereof I hereunto affix my signature.

FRED SWAN.