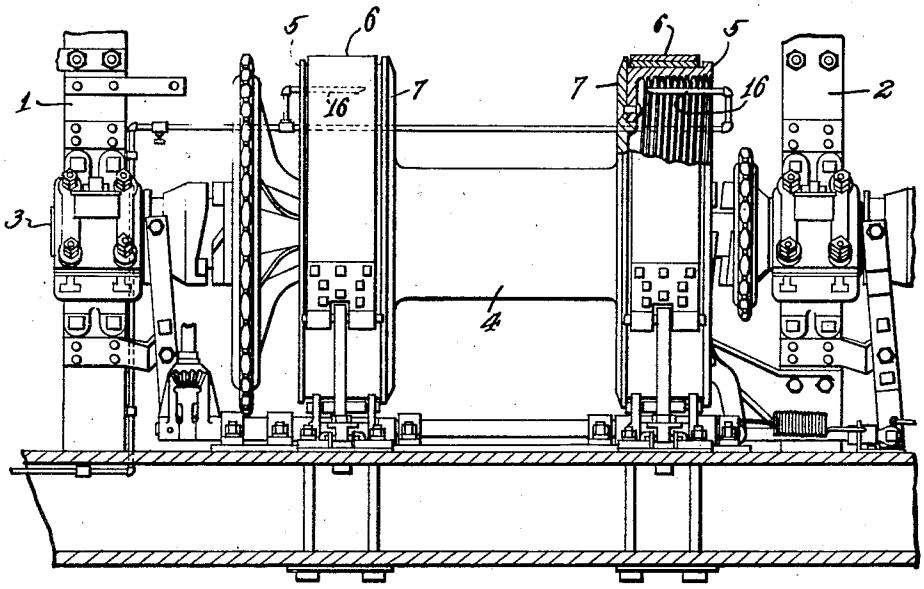
Aug. 30, 1932. A. E. RICE 1,874,625

DRAWWORKS BRAKE RIM CONSTRUCTION

Filed Sept. 6, 1930

Fig. 1.



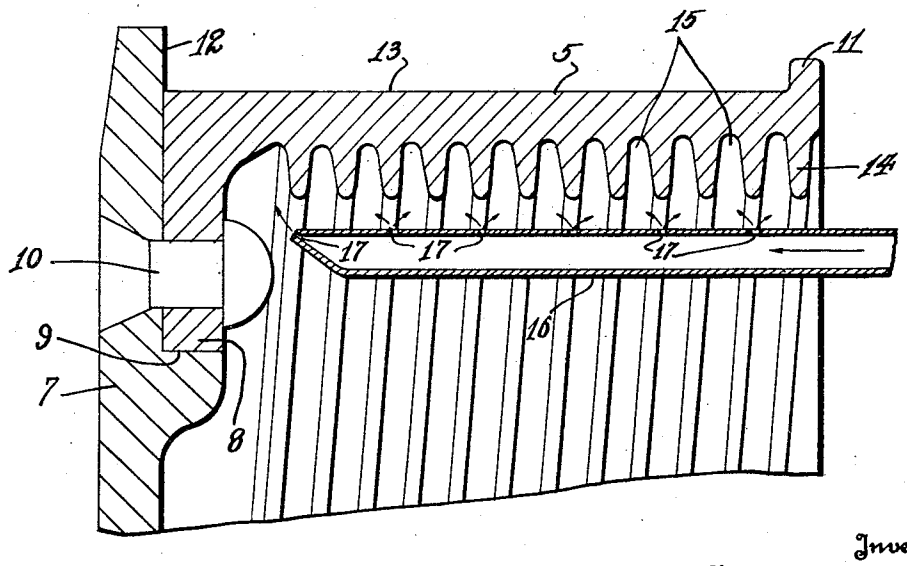




Fig. 2.

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# UNITED STATES PATENT OFFICE

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## DRAWWORKS BRAKE RIM CONSTRUCTION

Application filed September 6, 1930. Serial No. 480,065.

This invention relates to drawworks brake rim construction, and more particularly to the construction of a brake rim for a rotary drawworks to provide a means for cooling the brake rim and for conveying the water along and over the increased heat transfer surface of the brake rim. In the operation of a rotary drawworks as employed in the drilling of wells, such as oil wells, rotary drawworks are provided which include cable spooling drums which are provided generally at their opposed ends with brake rims upon which brake bands are mounted to enable the rotation of the brake drum to be arrested.

Wells as drilled are of relatively great depth and speed is an important factor in the operation of the drilling rigs. It is necessary to draw the drill stems or pipes from the well many times during the drilling of the wells and it is essential that the drum of the drawworks be operated at high speed during both the pulling of the drill stem and the lowering of the drill stem into the well. The brakes used in controlling this operation become very hot and are subjected to most extreme conditions. Different forms of water cooling means have heretofore been provided for absorbing heat developed by the brake rims by the use of cooling water or the like.

It is the principal object of this invention to provide a brake rim which has an increased heat transfer surface and is provided with a means for delivering water to the interior of the brake rims, the brake rims being formed so as to convey over and hold the water on the increased heat transfer surface of the brake rims.

Another object of this invention is to provide a brake rim which is provided with a rib on its inner periphery which is formed integral with the brake rim and is formed to provide a spiral on the interior of the brake rim for conveying the cooling liquid from the outer edge of the brake rim to the inner edge thereof as it is delivered to the brake rim, the spirally-formed rib providing increased heat transfer surface and likewise providing a means for holding and conveying the cooling water along and over the increased heat transfer surface of the brake rim.

Other objects and advantages of this invention it is believed will be apparent from the following detailed description of a preferred embodiment thereof as illustrated in the accompanying drawing.

In the drawing:

Figure 1 illustrates a fragment of a rotary drawworks showing the drum thereof principally in vertical mid-section, the drum having brake rims embodying my invention at its opposed ends.

Figure 2 is a sectional view on an enlarged scale of the brake rim embodying my invention.

The brake rim embodying my invention is adapted for use in connection with any of the numerous forms of drawworks now in use, and the drawworks herein illustrated is shown merely for the purpose of illustration.

The drawworks includes a pair of posts 1 and 2 upon which the drum shaft 3 is supported. Mounted upon the drum shaft 3 is the drawworks drum 4 and having at its opposed ends the brake rims 5 upon which brake bands 6 are mounted. Any suitable or desirable form of means may be employed for actuating the brake bands to tighten the same on the brake rims. Numerous forms of brake actuating means are now common in the art.

The brake rims 5 embodying my invention are secured to the spaced flanges 7 of the drawworks drum 4. The brake rims are formed with inwardly extending annular flanges 8 at their inner and adjacent ends, and the flanges 8 fit annular shoulders 9 formed on the flanges 7 of the drum 4 and are secured in position by means of rivets 10 or like securing means. The brake rims 5 are formed at their outer end with brake retaining flanges 11 which extend outwardly from the rims 5 and with the upwardly extending edge 12 of the flanges 7 define the braking surface 13 upon which the brake bands 6 are mounted.

In order to provide for increased heat transfer surface for the brake rim 5, the inner periphery of the brake rim 5 is formed in-

tegral with a rib 14 which is formed spirally upon the inner periphery of the rim 5 to provide inwardly extending valleys 15, the depth of which decrease from the outer edge of the rim 5 to the inner edge thereof.

The valleys 15 are adapted to receive a cooling liquid which may be delivered to the periphery of the brake rim 5 by any suitable or desirable manner such, for example, as by means of a spray pipe 16 provided with a plurality of spray perforations 17 along its length. The spray pipe 16 is connected in any suitable or desirable manner with the source of water under pressure. As the water from the spray pipe 16 is delivered to the brake rim 5 it fills the valleys 15 formed on the inner periphery of the rim 5. As the water finds its way into the valleys 15 it is caused to travel from the outer of the valleys 15 to the inner of the valleys 15 by the spirally formed rib 14 defining the valleys 15. The water thus delivered along through the valleys 15 is caused to travel over and is maintained in contact with the heat transfer surface formed on the inner periphery of the brake rim 5. The water thus delivered to the inner periphery of the brake rim 5 is held in contact wth the increasing heat transfer surface for a maximum period of time and the water as delivered to the brake rim all flows to the inner edge thereof adjacent the flanges 7 within the valleys or valley 15 formed by the spirally wound rib 14 and then flows back across the top of the rib 14 at the bottom of the drum in passing outwardly from the brake rims 5. The fact that the brake rim 5 is rotated at a relatively high rate acts to maintain the cooling water in contact with the brake rim 5 for the greater portion of each rotation of the brake rim 5 when the water is sprayed into the valleys 15 from the upper point of the rim 5.

Having fully described my invention, it is to be understood that I do not wish to be limited to the details herein set forth, but my invention is of the full scope of the appended claims.

I claim:

1. In a rotary drawworks, the combination of a drum, brake rims at the opposite ends of the drum, spirally formed ribs on the inner peripheries of said brake rims, means for delivering water within the inner peripheries of said brake rims.

2. In a rotary drawworks, the combination of a drum, means rotatably supporting the drum, brake rims mounted at the opposite ends of said drums, means formed on the inner peripheries of said rims for conveying water from the outer edges to the inner edges of said brake rims, and means for delivering cooling water within said brake rims.

3. In a rotary drawworks, the combination of a drum, means rotatably supporting the drum, brake rims at the oposite ends of said drum, alternate ribs and valleys on the inner peripheries of said brake rims, the valley extending spirally around the periphery of said brake rims from the outer edge thereof to the inner edge thereof, and means for delivering water to within said brake rims.

4. In a rotary drawworks, the combination of a drum, means rotatably supporting the drum, brake rims at the opposite ends of said drum, alternate ribs and valleys on the inner peripheries of said brake rims, the valleys extending spirally around the peripheries of said brake rims from the outer edge thereof to the inner edge thereof, and means for spraying cooling water at points along the inner peripheries of said brake rims.

5. In a rotary drawworks, the combination of a drum, means rotatably supporting the drum, a brake rim at one end of said drum, a rib formed spirally on the inner periphery of said rim and forming alternate ribs and a valley extending spirally from the outer edge of the brake rim to the inner edge thereof, the valley being of decreasing depth from the outer periphery to the inner periphery of the brake rim, and means for spraying a cooling liquid against the inner periphery of said brake rim at points spaced along the width of said brake rim.

6. In a hoisting structure, the combination of a drum, a brake rim at one end of the drum, a spirally formed rib on the inner periphery of said brake rim, means for delivering water within the inner periphery of said brake rim.

7. In a hoisting structure, the combination of a drum, means rotatably supporting the drum, a brake rim at one end of the drum, alternate ribs and valleys on the inner periphery of said brake rim, the valleys extending spirally around the periphery of the brake rim from the outer edge thereof to the inner edge thereof, and means for delivering cooling water at points along the inner periphery of said brake rim.

Signed at Torrance this 22nd day of August, 1930.

ALLEN ERWIN RICE.