July 19, 1927. 1,636,040

B. BOYKIN, JR

AIR COOLED HOISTING REEL

Filed March 19, 1927

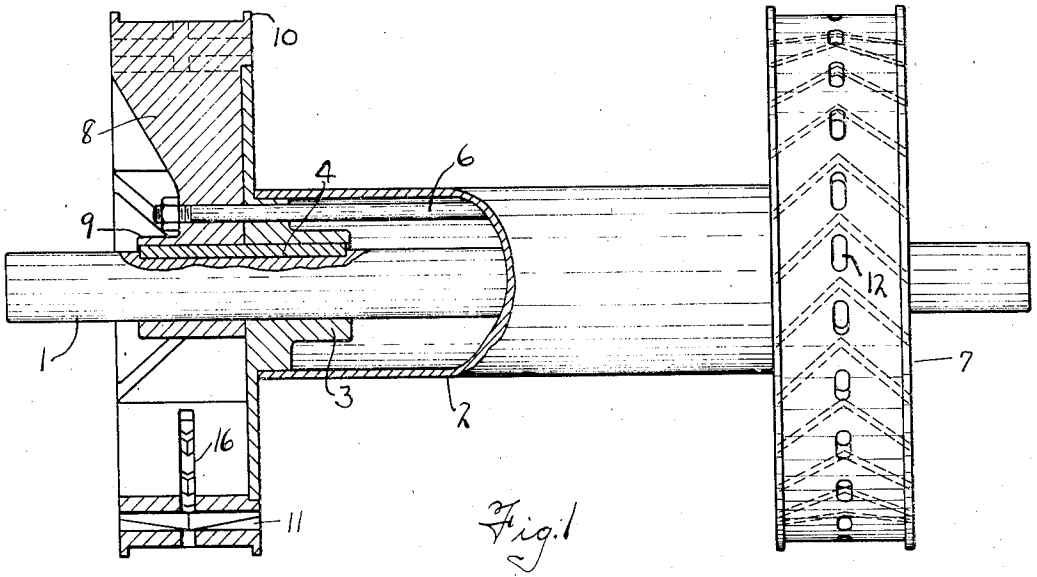


Fig. 1

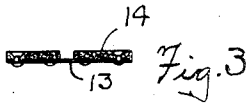


Fig. 3

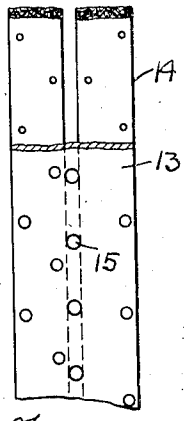


Fig. 4

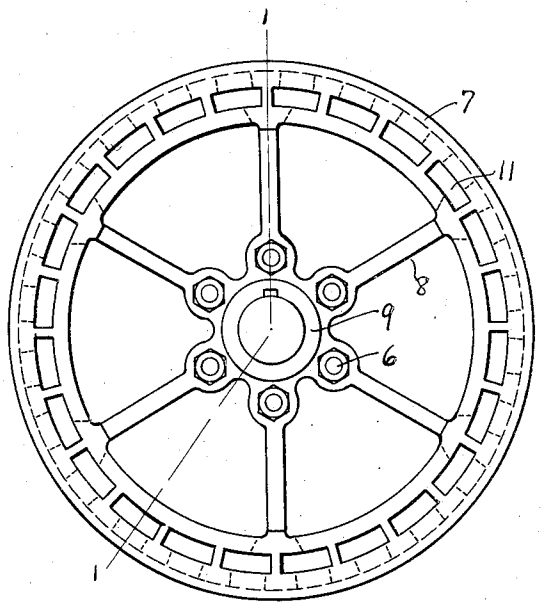


Fig. 2

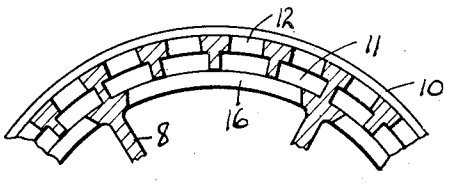


Fig. 5

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By Jesse R. Stone
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UNITED STATES PATENT OFFICE.

BURWELL BOYKIN, JR., OF BEAUMONT, TEXAS.

AIR-COOLED HOISTING REEL.

Application filed March 19, 1927. Serial No. 176,674.

My invention relates to hoisting reels to be employed particularly in raising and lowering tools and pipe in wells, although the invention is capable of more general application.

In drilling and pumping operations on deep wells for oil, water, sulphur and the like, the tools or pipe sometimes have to be lowered by the hoisting apparatus to the bottom of the well. Where great depths are attained in such wells, the brake drum, controlling the lowering devices, becomes highly heated through continued friction, and it is necessary to provide means to cool the brake drum to prevent damage or rapid deterioration of the apparatus.

It is an object of my invention to provide a brake drum construction to be employed with hoisting apparatus of the character set out, which will be automatically cooled in operation through a circulation of air directed through the rim of the drum and about the brake band by the rotation of the drum. The improvement lies particularly in the formation of the brake drum and the brake band employed therewith, whereby the automatic cooling of the braking device may be accomplished.

Referring to the drawing herewith, Fig. 1 is a front view, partly in section on the line 1—1 of Fig. 2, illustrating the application of my invention. Fig. 2 is an end view of the device. Fig. 3 is a transverse section of the brake band and lining. Fig. 4 is a broken plan view of the brake band and lining. Fig. 5 is a broken detail in central section of the brake drum rim. Like numerals are applied to like parts in all the views.

The hoisting reel to which my invention is applied may be of any preferred type. I have shown a spool or reel mounted to rotate with a shaft 1. Said spool comprises a central cylindrical member 2 to receive the cable. Said member 2 is hollow and fits at its ends over a hub member 3 which is keyed to the shaft at 4. The hub member has a radial flange at its outer end adapted to fit within a spider on the brake drum. There are brake drums at each end of the reel and the parts are held in assembled position by tie rods 6 longitudinally of the reel as shown.

The brake drum includes an outer rim 7 connected by radial spokes 8 to a central hub 9 keyed to the shaft 1.

The rim of the drum is of material width to accommodate a brake band and has marginal flanges 10 thereon in the usual manner. The rim has air circulating openings 11 longitudinally of the same, said openings being inclined from the median line of said rim forwardly in the direction of rotation of said drum when it is unreeling the cable. This will be seen from the dotted lines in Fig. 1. These openings 11 connect with a line of radial openings 12, which are slightly elongated circumferentially of the rim.

The brake band 13 is substantially of the same width as the drum and has openings 15 midway of its width to register with the openings 12 in the rim.

The brake lining is formed in two strips 14, one on each side of the openings 15 on the brake band to allow circulation of air about the band.

There may also be openings in the rim, shown at 16, between the spokes and opening inwardly to allow a circulation of some of the air toward the inner portion of the rim.

In the operation of my improved brake drum, the brake will be applied to resist the too rapid downward drop of the tools or other load into the well. The rotation of the drum in this direction will cause air to be circulated from both sides through the openings 11 and outwardly through the radial openings 12 and 16. The air passing through the openings 12 will circulate between the two strips of brake lining 14 and out through the openings 15 in the brake band. The circulation of air will thus cool the rim and also the brake band and particularly the surface upon which friction is strongest. The air will also be circulated inwardly to some extent, although the centrifugal action will carry a large portion of the air outwardly toward the brake band. This circulation will keep the rim of the drum from overheating and thus expanding unduly to exert a strain upon the spokes of the drum. A brake drum of this character may be cheaply constructed and will be comparatively light in weight and not subject to breakage, due to expansion and contraction of the drum during operation. It will, therefore, be able to last for a materially longer period of time than the usual brake drum.

The further advantages of this device will be apparent to those skilled in the art.

Having thus described my invention, what I claim as new and desire to protect by Letters Patent is:

1. In a hoisting device, a frame, a reel mounted to rotate therein, a brake drum on said reel including an outer rim, said rim having lateral air openings therein directed forwardly from the center line thereof in the direction of rotation, there being outlet openings from said air openings leading outwardly, and a brake band on said drum having openings therethrough to allow passage of air.

2. In a hoisting device, a frame, a reel mounted to rotate therein, a brake drum on said reel including an outer rim, said rim having lateral air openings therein directed forwardly from the center line thereof in the direction of rotation, there being outlet openings from said air openings leading outwardly, a brake band on said drum having openings therethrough to allow passage of air, and brake lining strips on said brake band spaced apart on said band to expose said openings.

3. In a hoisting device, a frame, a reel mounted to rotate therein, a brake drum on said reel including an outer rim, said rim having lateral air openings therein directed forwardly from the center line thereof in the direction of rotation, there being outlet openings from said air openings leading outwardly, openings of comparatively larger diameter directed inwardly, and a brake band on said drum having openings therethrough to allow passage of air.

4. In a hoisting device, a rotatable reel, a brake drum therein having an outer rim with openings transversely thereof adapted to permit a circulation of air therethrough, and having radial openings connected with said transverse openings to cause circulation of air outwardly from said transverse openings, and a brake band on said rim formed to allow a circulation of air therethrough from said radial openings for the purpose described.

In testimony whereof I hereunto affix my signature this 14th day of March, A. D. 1927.

BURWELL BOYKIN, Jr.