June 3, 1930. E. E. GREVE 1,761,827

CABLE AND BRAKE DRUM CONSTRUCTION

Filed Feb. 27, 1928

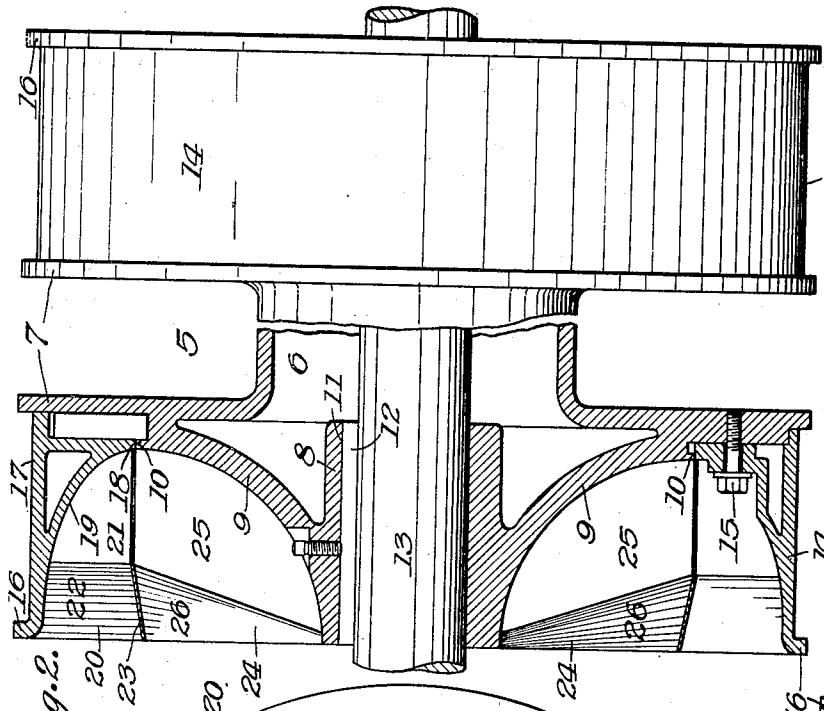

Fig. 2.

Fig. 3.

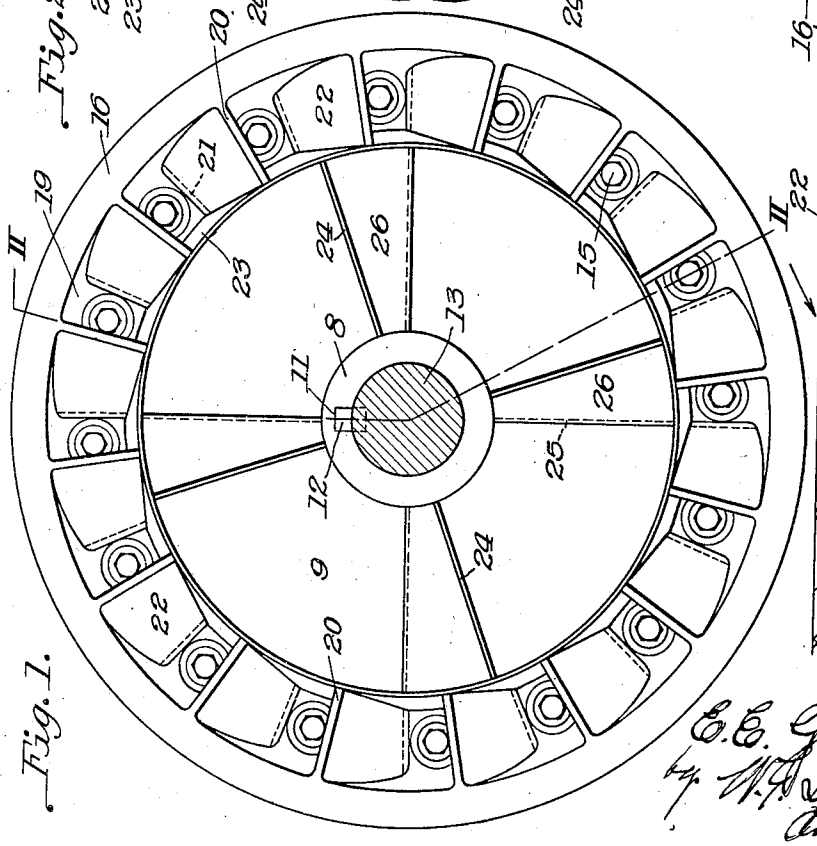

Fig. 1.

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UNITED STATES PATENT OFFICE

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CABLE AND BRAKE-DRUM CONSTRUCTION

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My invention relates to a new and improved cable and brake-drum construction of the character used in rotary hoists or draw-works employed in connection with rotary drilling rigs, and usually designated as the brake flange of the drum.

In the employment of the drums of the usual construction, considerable trouble has been encountered due to heat generated by friction between the brake-bands or brake-lining and the cable-drum flanges or the brake-drums thereof.

One of the prime objects of the present invention is to provide a construction that will prevent this over-heating of the parts mentioned. Another object of the present invention is to provide a simple, strong and durable air-cooled drum construction.

Other objects and advantages of my invention will be pointed out or become apparent from a consideration of the specification taken in connection with the accompanying drawings.

In the drawings, which illustrate an application of my invention:

Fig. 1 is an end elevational view of a drum structure embodying my invention;

Fig. 2, a part elevational and a part sectional view, the section being taken on line II—II of Fig. 1; and

Fig. 3, a fragmentary diagrammatic view illustrating the travel of air currents into and from the drum.

Referring to the drawings and as preferred, the drum construction comprises the cable-drum portion proper, designated generally by the numeral 5, and includes a hollow spool portion 6 terminating in spaced-apart flanges 7, hub members 8 each formed with a radiating curved plate-like member 9 extending from the hub and merging into the flange 7, said member 9 being formed with an annular flange 10. Each of the hubs is formed with a key-way 11 adapted to receive a key 12 for securing the hubs to a shaft 13.

The brake-drum or brake-flange 14, as illustrated, is made as a separate member, and is designed to be attached to the flanges 7 of the cable-drum by means of a series of headed bolts 15 passed through openings formed in the brake-drum and in the flanges 7 of the cable-drum. The brake-drum 14 is formed with an annular flange 16, and when positioned upon the cable-drum, said flange 16 cooperates with the flange 7 of the drum for maintaining a brake band or brake-lining upon the braking surface 17 of the said brake-drum.

Drum 14 is in the form of a hollow cylindrical member having the walls of its opening 18 designed to fit upon the annular flange 10 of the cable-drum, as clearly shown by Fig. 2. The drum 14 is provided with a curved wall 19 and with a series of spaced-apart vanes or radially extending blades 20. Each of said vanes or blades is formed with a portion 21 disposed parallel to the axis of the drum and with a portion 22 inclined approximately 45 degrees to the axis. These blades or vanes 20 constitute the outer series of blades or vanes employed in the air-cooled construction embodied in my invention. The said blades may be formed integrally with the interior of the brake-drum or be welded thereto as desired. Said blades 20 are designed to cooperate with another series of blades or vanes entering into the construction of the cooling means.

The second series of blades above referred to are arranged on a conical ring-shaped member 23 adapted to be arranged concentrically of the brake-drum and be securely attached to the inclined portions 22 of the vanes 20 of the brake-drum. As shown, the blades or vanes 24 carried by the conical ring comprise a portion 25 disposed parallel to the axis of the drum and a portion 26 inclined at approximately 90 degrees to the inclination of portions 22 of vanes 20. Vanes 24 are adapted to be secured to the curved surface of plate portion 9 of the drum by welding or soldering the inner edges thereto.

Referring now to Figs. 1 and 3, and assuming counter-clockwise rotation, it will be understood that the inclined faces or portions 26 of vanes 24 will function to draw air into the interior of the brake-drum or flange, and that this indrawn air will be

conveyed by the portions 25 of said vanes 24 to the curved surface of portion 9 of the hub structure, thus guiding the air and passing it radially and outwardly from the brake-drum, the curvature of the surface 9 being such as to permit a uniform flow of air outwardly.

Owing to the termination of the conical ring member 23 at the inner inclined edges of the inclined portion of the blades or vanes 20, the air drawn into the structure will be passed into contact with the interior curved surface of wall 19 of the brake-drum disposed adjacent the braking surface 17 and, in its passage out of the device, will cool the brake contacting surface. This outward passage is aided by a vacuum created on the under surfaces of inclined portions 22 of vanes 20.

It will, of course, be understood that when a braking force is applied to the brake surface 17 of the brake-drum, the heat generated is conducted by the metal of said brake-flange or drum to the curved surface 19 thereof, and that the outward passage of air along the curved surface produces heat transfer by convexion, and that the heat is passed outwardly with the air currents.

As particularly shown by the arrows in Fig. 3, after the air enters the interior of the brake-drum or flange, its direction is reversed and the air discharged through the outer set or series of vanes carried by the brake-drum, thus producing a continuous circulation of a cooling medium against and adjacent to the brake-band bearing surface of the brake drum.

I claim:

1. A drum of the character described including a cable-drum member, a brake-drum member, and air cooling means carried thereby including an inner and an outer set of concentrically arranged blades and curved walls, the latter respectively carried by the cable and brake-drum members and co-acting with the blades to effect a circulation of air within the drum.

2. A drum of the character described including a cable-drum member, a brake-drum member, and air cooling means carried thereby, said cooling means including an outer and an inner set of concentrically arranged vanes or blades, the blades of each set having portions disposed parallel with the axis of the drum and portions inclined to the said axis.

3. A drum of the character described including a cable-drum member having a hub formed with a curved plate extension, a hollow cylindrical brake-drum member positioned on and secured to the cable-drum member, and air cooling means carried thereby, said cooling means including an outer and an inner set of concentrically arranged vanes or blades, said outer set of blades being carried by the brake-drum member and co-acting with the first set to draw air currents on to the curved plate and pass the currents from the plate in contact with the brake-band bearing of the brake-drum member.

4. A drum of the character described including a cable-drum member, a brake-drum member positioned on and secured to the cable-drum member, and air cooling means carried thereby, said cooling means including an outer and an inner set of concentrically arranged vanes or blades, said outer set of blades being carried by the brake-drum member and said inner set being carried on a ring member secured to the blades of the brake-drum.

5. A drum of the character described including a cable-drum member having a hollow spool portion, a hub, a side flange, and a curved plate-like member extending radially from the hub and merging into the flange, a brake-drum positioned on the cable-drum and having an interior curved portion forming a continuation of the curved plate member, and vanes within the brake-drum for drawing air currents into the brake-drum against said curved surfaces and passing the air currents from the drum in contact with the brake-band bearing of the brake-drum.

6. A drum of the character described including a cable-drum member, a brake-drum member, and air cooling means for effecting cooling of the parts adjacent the brake-band bearing of the brake-drum member including two sets of concentrically arranged blades and curved walls, the latter respectively carried by the cable-drum member and the brake-drum member, whereby air currents are drawn into the drum and discharge adjacent the brake-band bearing.

7. A drum of the character described including a cable-drum member, a brake-drum member, and air cooling means for effecting cooling of the parts adjacent the brake-band bearing of the brake-drum member including two sets of concentrically arranged blades and curved walls, the latter respectively carried by the cable-drum member and the brake-drum member, whereby air currents are drawn into the drum and discharge adjacent the brake-band bearing, the blades of each set having portions disposed parallel with the axis of the drum and portions inclined to the said axis.

In testimony whereof I affix my signature.

EDGAR E. GREVE.