May 2, 1933. B. BOYKIN, JR 1,906,525

FLUID COOLED BRAKE DRUM

Filed Nov. 24, 1930

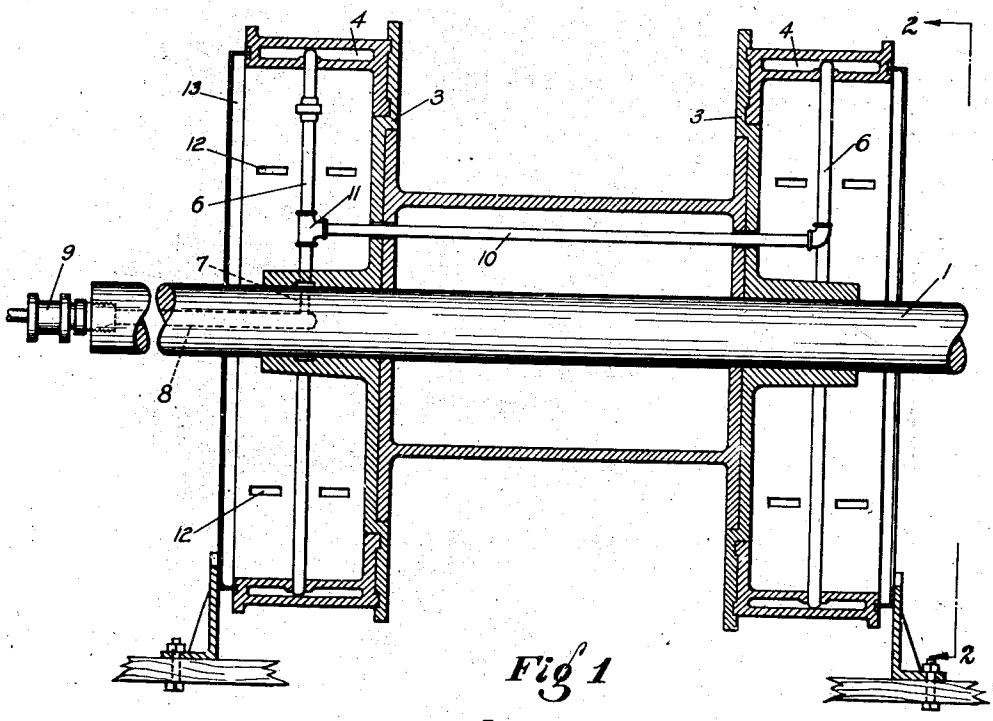


Fig 1

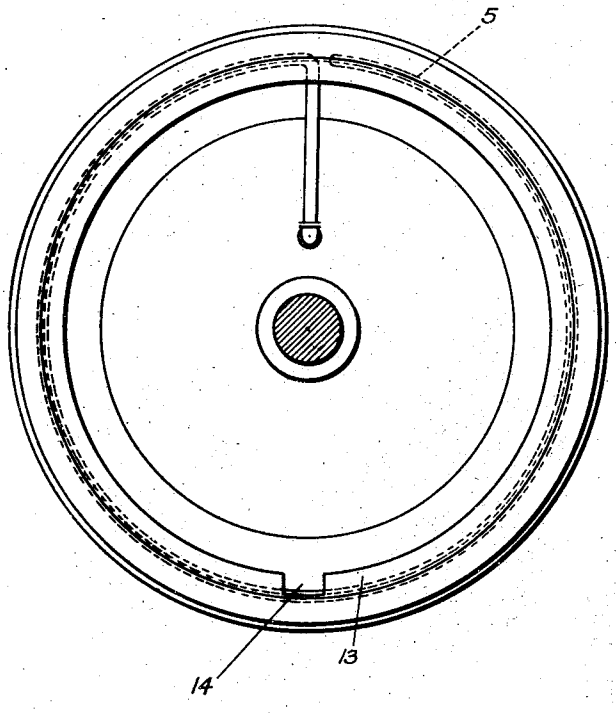


Fig 2

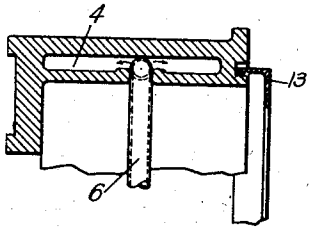


Fig 3



Fig 4.

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UNITED STATES PATENT OFFICE

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FLUID COOLED BRAKE DRUM

Application filed November 24, 1930. Serial No. 497,674.

The invention to be hereinafter described relates to water cooled brake drums.

In the drawing illustrating the invention a single application only has been shown—its use on a rotary draw works for oil well operations. It may equally well be applied to a sand reel, as will be clear. It will at once be obvious that there are many other machines and apparatuses to which the invention is very readily applicable and with which any average skilled mechanic or engineer may easily and quickly combine it. Hoisting drums; cable way drums; drums of logging engines; elevator drums; are a very few of the many applications. On the other hand further illustration by drawings, with an invention as simple as the present, would serve only to defeat the purpose of specifications by beclouding rather than clarifying.

There are a considerable number of cooling systems at present actually in use to a greater or less degree and a much greater number of granted patents relating to or disclosing such systems. And, of course, there is considerable trade literature on the subject. In general, they may all be classed in two large groups—internal and external application of cooling fluid. Those of the internal group are fairly represented by the jacketed constructions in which the flange of the drum is hollow to provide a chamber through which a cooling fluid is passed to conduct away the heat of friction. Those of the external group are fairly represented by constructions in which the cooling fluid is applied from without as by one or more streams, jets or sprays directed against and over the outer face or wall of the inner flange i. e. the surface with which the belt or the like does not contact.

In broad and general terms, the present invention would be classed in the first group. In this group applicant is familiar with disclosures in which there are several brake band rings with a pipe from one ring to the other; others in which each end of a brake drum shaft is provided with a bore, the cooling fluid conducted into and through the bore at one end, piped therefrom to the interior of the flange and piped from the flange to the bore in the opposite end of the shaft; others in which a single shaft carries a plurality of brake drums and is bored out its entire length with dams or plugs at each drum and radial passages or bores at each side of each dam to establish influx and efflux, respectively, to and from the particular drum; and a number of others including a wide variety of those just specifically mentioned.

Among the more serious objections to the constructions heretofore used are the complexity involved in the considerable number of parts in most of them; the difficult construction required in many; the cost in manufacture and maintenance; and the inefficiency in operation.

The main purposes of this invention are to overcome these and many other recognized objections and provide a simple, efficient, compact and economical construction which will have the least practicable number of working parts for production or maintenance cost, while at the same time adequately cooling the brake flange to avoid burning out or overheating.

In order to more clearly disclose the construction, operations, and use of the invention, reference should be had to the accompanying drawing forming part of the present application. Throughout the several figures of the drawing like reference characters designate the same parts in the various views.

In the drawing:—

Fig. 1 is a central vertical cross section, and

Fig. 2 is an end view with bracket omitted;

Fig. 3 is an enlarged fragmentary sectional view showing the spray pipe passage through the brake flange wall; and

Fig. 4 is a fragmentary view of a short section of the pipe 5, removed and showing the spraying perforations.

Referring to the drawing in detail, 1 indicates the shaft of a rotary draw works, or a sand reel or other rotating member. It is suitably supported in adequate journals, not shown, in well known manner. To the shaft is keyed or otherwise secured to rotate therewith the brake flanges 3 of a rotary draw works, each flange being provided with a jacket or chamber 4 for receiving a cooling fluid. Within each chamber is disposed a cir-

cumferentially extending tube 5, preferably of copper and provided with a plurality of spraying perforations. These perforations are so disposed as to continually spray the fluid on all walls of the chamber at the same time, thereby insuring a constant flow of cooling fluid over the entire chamber wall. From one end of this pipe extends a connecting pipe 6 which leads to a radial bore 7 in shaft 1. Preferably pipe 5 and the upper part of pipe 6 are integral, a suitable coupling connecting the parts of pipe 6. This bore, in turn, communicates with a longitudinal bore or passage 8 in the shaft 1. Into the end of this bore may be threaded or otherwise seated a suitable nipple 9 or other connection by and through which the fluid may be supplied to passages 8 and 7 and pipes 6 and 5. Nipple 9 is, of course, freely revolvable relatively to the supply pipe, (not shown) from which it receives the fluid, any well known form of packing gland being used to make a fairly tight joint. The pressure, of course, will be ample to supply the fluid and to spray it throughout chamber 4. In the case illustrated, a branch pipe 10 is connected by a T 11 to pipe 6 and leads through the spool or body of the drum to a second pipe 6 of the other brake flange at the opposite end of the draw works. It, in turn, is connected with a circumferential perforated pipe 5 in that chamber 4. The fluid thus sprayed into the chamber 4 is thrown out centrifugally against the other wall of the chamber to absorb the heat of friction, as will be readily seen. As it continues to be fed in under pressure it steadily builds up until the chamber is overflowing. The excess flows out through a series of openings 12 through the inner face of the chamber wall of the brake flange. This steady flow of fluid, especially, water, is caught by the surface of the flange and spun outwardly in the direction of the length of the shaft as a heavy cylindrical sheet of spray, as will be readily understood. To overcome this trouble, an annular guard or catch plate 13 is provided, suitably supported by a post, bracket, light frame or the like, not shown. It is of substantially right angle construction in cross sections. One edge of one side or wall seats in free running relation in a channel or groove in the adjacent radial wall of the brake flange. The remaining flange extends radially inwardly toward shaft 1 to such extent as to completely intercept all spray. The spray thus intercepted flows around the plate 13 to its lower side where it passes out through a drain opening 14—see Fig. 2. Of course, the drain water is suitably conducted to the pump for recirculation, as usual.

If only one brake drum is used then, of course the connections for the other, beginning with the T 11 are omitted. In a sand reel, for instance, that would be the case.

In the present instance the brake flanges are not shown as expansible. It will be understood that this invention is equally applicable to the expansible type of brake drum flange such as is shown and described in the patent to R. R. Bloss, No. 1,696,664 granted December 25, 1928. Reference is hereby made to said patent for details of such expansible flange and its mounting and, of course, copper tubing with expansion bends would be used between the shaft 1 and such expansible flange. It is thought that the details of such connections and arrangements will be readily understood and need not be illustrated or further described. They are well known in the art.

It is thought that the construction, assembly, operation and use of the inventions will be clear from the preceding detailed description. Changes may be made in the construction, arrangement and dispositions of the various parts of the invention within the scope of the appended claims without departing from the field of the invention and it is meant to include all such within this application wherein only a preferred form has been shown merely by way of illustration and with no intention of limitations.

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

1. In combination in a fluid cooled brake drum, a revoluble shaft, a brake drum carried thereby and revoluble therewith and provided with a fluid receiving cooling chamber, and a spray tube extending circumferentially through said chamber.

2. In combination in a fluid cooled brake drum, a revoluble shaft, a brake drum carried thereby and revoluble therewith and provided with a fluid receiving cooling chamber, and a spray tube extending circumferentially through said chamber and spaced from the radial walls of said chamber to thoroughly spray and cool all interior surfaces of said chamber.

In testimony whereof, I have affixed my signature.

BURWELL BOYKIN, JR.