UNITED STATES PATENT OFFICE.

BARTHOLOMEW JULIEN, OF OMAHA, NEBRASKA, ASSIGNOR TO TRANSPORTATION UTILITIES COMPANY, OF NEW YORK, N. Y., A CORPORATION OF WEST VIRGINIA.

JOURNAL-BOX COOLER.


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To all whom it may concern:

Be it known that I, BARTHOLOMEW JULIEN, a citizen of the United States, and a resident of Omaha, in the county of Douglas and State of Nebraska, have made and invented certain new and useful Improvements in Journal-Box Coolers, of which the following is a specification.

My invention relates to an improvement in journal box coolers, the object thereof being to provide a device of this character provided with a thermostat whereby to automatically regulate the flow of water, or other cooling agent, to the journal box in accordance with the temperature therein, and which will therefore be calculated to economically employ the water and with the result that the journal box will be cooled when necessity demands and maintained in a proper condition throughout a long journey without replenishment of the cooling agent.

With these and other ends in view, the invention consists in certain novel features of construction and combinations of parts as will be hereinafter fully described and pointed out in the claims.

In the accompanying drawings, Figure 1 is a view showing in end elevation a journal-box cooler that constitutes the best practical embodiment of my invention that I have as yet devised. Fig. 2 is a plan of the improved device. Fig. 3 is a front elevation of the device. Fig. 4 is an enlarged, broken view, partly in plan and partly in section, illustrative of the thermostatic means for establishing and cutting off the supply of the cooling agent.

Similar numerals of reference designate corresponding parts in all of the views of the drawings.

The urgent necessity of employing a journal-box cooler that is dependable and requires no attention throughout a long journey will be fully appreciated when it is stated that the heating of a journal due to friction and varying pressure of the brass upon the journal brings about expansion thereof, whereupon its load is unequally distributed instead of being carried upon the entire normal or original bearing surface; also, the pressure is caused to bear upon smaller areas, and in this manner heating of the journal is brought about. The heating having once started, the temperature rapidly increases, and the carbonizing of the lubricant employed due to high temperature increases the friction and the liability of wearing and cutting the brass and journal. The journal in a highly heated state is a menace because of the danger of its breaking off, and the bad condition of the highly heated journal is aggravated in the event that it is suddenly or improperly cooled. Again when the lubricant employed ceases to perform the function for which it is provided because of high temperature, the deposit of carbon has commenced, and for this reason the cooling agent should serve as follows, namely—should be directed against the journal so as to most efficiently assist in removing the scale or carbon. I have demonstrated by experiment that this is best accomplished by spraying the cooling agent against the rising side of the journal at a point that assures the cooling agent passing between the brass and the journal so that the said cooling agent will carry with it the scale and carbon deposits.

The preferred embodiment of my invention is adjustable to permit of its being expeditiously and easily applied to and secured on journal boxes of various sizes. I would have it understood, however, at this point, that while I prefer to apply my novel cooler to, and support it on, a journal box, I do not limit myself to such mode of application and support, since without involving departure from the scope and spirit of my invention, the cooler can be suspended from the car body, or can be supported and maintained in proper position, relative to the journal box to be cooled, in any other manner compatible with the purpose of the cooler.

In order to permit of the cooling agent reservoir 1 being conveniently suspended from a car body, when occasion demands, the said reservoir is provided on its upper side with pivoted links 2 which, when idle, lie down on the reservoir and do not offer any material projection therefrom. When in use the said links are connected through hooks or other suitable elements on any part of a car body. This, however, I have not deemed it necessary to illustrate, inasmuch as I make no claim to the idea per se of
suspending a cooler reservoir from a car body.

At 3 the reservoir 1 is provided with handles by which it can be manually carried, with convenience, and at 4, and preferably at a point adjacent one of its ends, the reservoir is provided with a downwardly tapered annulus that depends within the reservoir, is flanged at its lower end 5, and is provided above said flange with an internal thread 6 for the engagement of a threaded closure plug 7 having a handle 8; the closure plug when in use resting entirely within the cross-sectional outline of the reservoir, so as to be effectually protected against injury. The annulus 4 forms a filling opening, and by reason of its downward taper, it serves the purpose of a funnel and in that way avoids the liability of the cooling agent being spilled during replenishment of the reservoir, and this without the employment of an unduly large closure plug.

At its bottom the reservoir 1 is provided with an eduction orifice 9, over which is a strainer 10 to preclude the passage of grit or any other foreign substance to the journal box, and connected with the reservoir and communicating with the orifice 9, is a cutoff valve 11 which in turn is connected to a hose or other flexible conduit 12. At its end remote from the valve 11 the conduit 12 is connected to a valve casing 13 in which is a seat 14 for a valve body 15 having stems 16 and 17 extending in opposite directions and longitudinally therefrom. The stem 17 extends outward and preferably through a conventional gland 18, and it supports a convolute spring 19, which is weak and is interposed between the valve body 15 and the outer portion of the casing 13 to hold the valve body normally against its seat. Threaded in, or otherwise connected to, the valve casing 13 is a foraminous spraying tube 20 that is designed to extend into the journal box 21, and alongside the rising side of the journal 22, the tube 20 being positioned relative to the journal precedent to the commencement of the run, and the flexibility of the conduit 12 permitting of the tube 20 being placed at either side of the journal according to the direction in which the car is to travel. This will be better understood when it is stated that the tube is provided with a bifurcated support 23, that is, mounted on and depends from the tube and is designed to straddle a screw stem 24 that constitutes a part of my invention as will hereinafter appear. The tube 20 extends throughout the major portion of the length of the journal, to assure uniform cooling of the journal and journal bearing throughout the length thereof, which is desirable for the reason hereinbefore advanced, and the jetting of the cooling agent against the rising side of the journal is desirable, because it assures the water or other cooling agent remaining on the journal during the turning thereof through a large part of a revolution, and also because it assures the carriage of the cooling agent to the brass and the passage of said agent between the journal and the brass and the consequent capacity of the agent to remove and carry with it scale or carbon. The inner end of the tube 20 is closed by a plug 25 or other suitable means, and extending longitudinally within the tube 20 and abutting at one end against the plug 25 or other closure or abutment employed, is a rod 26, composed of a special metal or alloy that is amenable to changes in temperature and is calculated when the temperature in the journal box is raised to expand in the direction of its length, and when the temperature in the journal box is lowered to contract in the direction of its length. The inner stem 16 of the valve body 15 is seated in the outer end of the thermostatic rod 26, and from this it follows that when the journal box becomes heated, the rod 26 will be extended as to length, and hence will open the valve 15 against the action of the weak spring 19, with the result that water or other cooling agent will be let into the tube 20, and will be supplied by the latter and distributed over the rising side of the journal throughout the length of the journal. This will bring about the gradual uniform cooling of the journal and brass, and upon the ensuing lowering of the temperature in the journal box the thermostatic rod will contract as to length, whereupon the weak spring 19 and the head of water back of the valve body 15 will close the said body and keep it closed until the temperature in the journal box is again raised. It will also be noticed in this connection that the extent to which the valve body 15 is opened and the volume of cooling agent supplied to the journal is regulated by, and is always commensurate with, the degree to which the temperature in the journal box is raised. This contributes to economy in the use of the water or other cooling agent, and from the same it follows that replenishment of the supply of cooling agent is not necessary during a long run; and it also follows that the cooler requires no attention during the run, since the thermostatic means described may be depended upon to supply an adequate amount of water or other cooling agent to the journal when occasion demands.

In the actual use of my apparatus, the tube 20 becomes heated to a temperature proportional to the temperature of the journal box. This heat is transmitted throughout the valve 13 and results in the heating of the liquid within the tube 20, the tube itself becoming heated, as does also the liquid within reservoir 1. Thus the cooling agent,
passing through the valve 13, is at a temperature approximating the temperature of the thermostatic rod 26, so that the action of the cooling agent, flowing past the rod, does not in any way prevent the proper operation of the entire device.

As shown by dotted lines in Fig. 3, the reservoir 1 is interiorly provided, at intermediate points in its length, with braces 30 which serve, as their name imports, to lend stiffness and strength to the reservoir.

Fixed to the lower portion of the reservoir 1 and extending at right angles to the length of the reservoir and in a plane below the same are bars 31 and 32; the bar 31 being of inverted channel form, Fig. 3, and the bar 32 being of right angle form in cross-section. The bars 31 and 32 rest upon the horizontal portions of supporting and clamping members 33 and 34; the said horizontal portions of the said members being of right angle form in cross-section. The bars 31 and 32 rest on and extend in the direction of the length of the horizontal portions of the clamping and supporting members 33 and 34. It will also be seen by comparison of the figures of the drawings that the upright portions of the bars 31 and 32, and the upright portions of the members 33 and 34 are provided at intervals in their length with transverse apertures to receive adjustable fixing pins 35 through the medium of which the reservoir may be fixed relative to the members 33 and 34. It will also be observed that when the pins 35 are displaced the reservoir 1 can be laterally adjusted to properly position it relative to a particular journal-box, and then can be securely fixed or locked on the members 33 and 34 and with respect to the box. Manifestly the same end might be attained by providing a single aperture in each of the bars 31 and 32 and a plurality of apertures in each of the members 33 and 34 or vice versa to receive the pins 35, but this suggested modification I regard as a mere mechanical expedient and therefore have not illustrated the same. Each of the pins 35 is integral with a curvilinear bar or arm 36 connected at one end to the adjacent bar 31 or 32, and the said pins are further held by chains 37, connected with the members 33 and 34. As will be noted by reference to Fig. 1, I prefer to employ two pins 35 in combination with each of the bars 31 and 32 and the clamping member below the said bar. In addition to the outwardly extending horizontal portions referred to, the clamping and supporting members 33 and 34 have depending portions 38 and 39, arranged to bear against the open inclined front of the journal box, and terminating in ends that bear against the front of the box below the said opening, and flanges 40 and 41; the flange 40 being extended into the journal box and being designed to bear against the inner side of the adjacent side wall of the journal box, and the flange 41 resting outside the box and being designed to bear against the outer side of the other side wall of the box. The depending portion 38 of the member 33 is provided with an aperture 42 that is screw-tapped, and the depending portion 38 of the member 33 is provided with a smooth bore aperture 43, aligned with the aperture 42.

The shaft 24 is provided with a threaded portion disposed in the aperture 42, and a plain portion disposed in the aperture 43, and is also provided with an abutment 45 at the inner side of the depending portion of the member 33, and a cotter pin 44 at the outer side of the said depending portion. Washers may be, and preferably are, employed between the said abutment and the cotter pin, on the one hand, and the depending portion of the member 33, on the other hand, as clearly appears in Fig. 3. By manipulation of the handle on the shaft 24, the flanges of the members 33 and 34 may be strongly clamped against the journal box so as to securely fix all of the cooler to said box and support it on the same. It will be also manifest that by reason of the combination of the members 33 and 34, which are preferably of steel and possessed of resiliency, and the shaft 24, the members 33 and 34 of the supporting frame of the cooler may be made to fit journal boxes of various sizes.

When the reservoir 1 is suspended from a car body in the manner hereinbefore referred to, the bifurcated support 23 may be made to straddle the lower wall of the opening in the front of the journal box, so that the tube 20 will be maintained in a horizontal position alongside the journal. This, however, I have deemed it unnecessary to illustrate.

In the practical use of my novel cooler, I would have it understood that incidental to the cooling of a journal the flow of the cooling agent supplied to the journal will be diminished in proportion to the cooling until the temperature in the box becomes normal when the valve body 15 will be entirely closed.

While I have shown and described the means for attaching the cooler in position, I would have it understood that I make no claim in this application thereto, such form involving the subject matter of a co-pending application filed by me on the 33rd day of November, 1912, and bearing Serial Number 783,101, my claims in this application being directed more particularly to the thermo-static device for automatically controlling the flow of the cooling agent into the journal box, and hence

What I claim is:

1. In a journal-box cooler the combination
with a journal box, of a reservoir, means connected with the reservoir for attaching the same with, and supporting it on, the journal box, an adjustable delivery tube extending into the journal box, a conduit connecting the reservoir and delivery tube, and thermostatic means contained within said delivery tube whereby to control the flow of the cooling agent from the reservoir into said journal box in accordance with the temperature in the latter.

2. The combination with a journal box, of a journal therein, a source of cooling agent supply, a delivery tube connected with said source of supply and adjustabley arranged in the journal box and alongside of, and adjacent to, the journal, and thermostatic means located within said delivery tube for automatically controlling the passage of the cooling agent from the source of supply to said delivery tube in accordance with the temperature in said journal box.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."

3. A journal box cooler comprising a reservoir, means carried by said reservoir for detachably securing the same to a journal box, a perforated delivery tube adapted to extend into the journal box, thermostatic means contained within said perforated delivery tube for automatically controlling the flow of the cooling agent therefrom into the interior of said journal box in accordance with the temperature in the latter, and a flexible conduit intermediate the reservoir and said perforated tube for continuously delivering the cooling agent from the former to the latter.

Signed at Omaha, in the county of Douglas and State of Nebraska, this 1st day of June A. D. 1914.

BARTHOLOMEW JULIEN.

Witnesses:
Jas. T. Barrett,
J. E. Haney.