(No Model.) 2 Sheets—Sheet 1.

M. P. COOK.

AXLE COOLER.

No. 552,235. Patented Dec. 31, 1895.

Fig. 1.

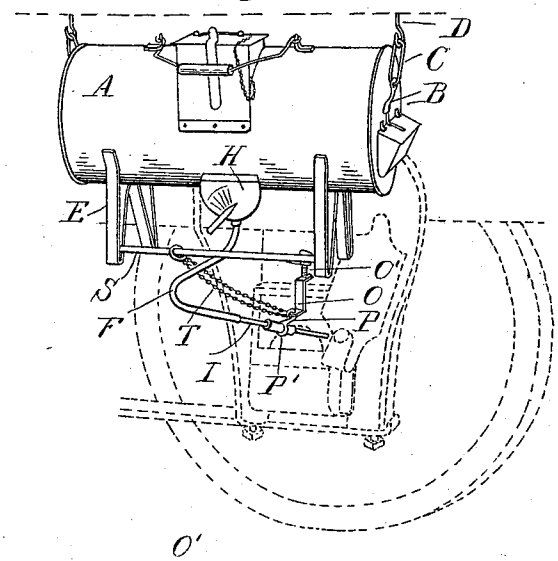


Fig. 2.

Fig. 3.

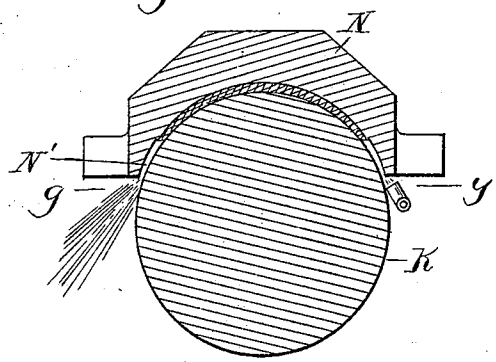
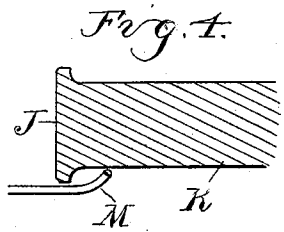


Fig. 4.



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By

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(No Model.) 2 Sheets—Sheet 2.

M. P. COOK.

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Fig. 7.

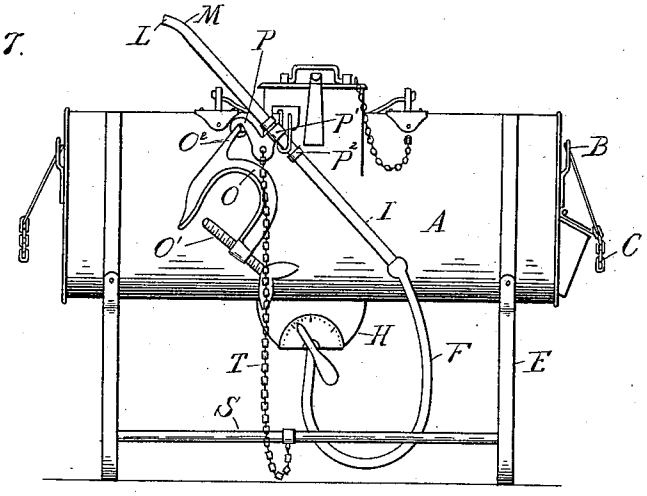


Fig. 5.

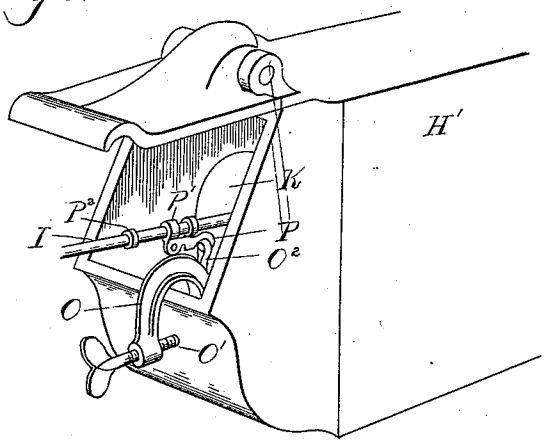
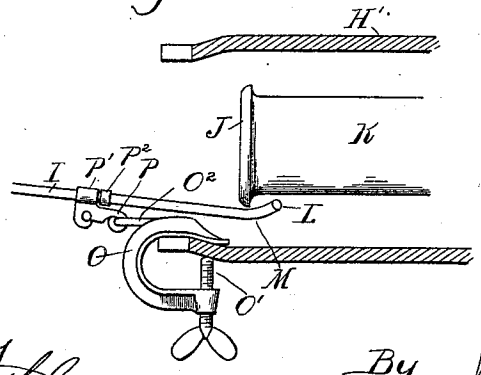


Fig. 6.



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UNITED STATES PATENT OFFICE.

MILES P. COOK, OF FLINT, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, TO THE COOK COOLER COMPANY, LIMITED, OF GENESEE, MICHIGAN.

AXLE-COOLER.

SPECIFICATION forming part of Letters Patent No. 552,235, dated December 31, 1895.

Application filed December 18, 1894. Serial No. 532,166. (No model.)

To all whom it may concern:

Be it known that I, MILES P. COOK, a citizen of the United States, residing at Flint, in the county of Genesee and State of Michigan, have invented certain new and useful Improvements in Axle-Coolers, of which the following is a specification, reference being had therein to the accompanying drawings.

The invention relates to an improvement in axle-cooling apparatus; and it consists, generally speaking, in an apparatus designed and arranged to effect the washing off of the meeting faces of the brass and journal by directing a stream of water on the rear of the journal above the axis thereof, whereby the water is drawn in between the journal and brass during the movement of the journal.

The invention further consists in the construction, arrangement, and combination of the various parts of the apparatus used in cooling the journal-box, all as more fully hereinafter described.

In the drawings, Figure 1 is a perspective view showing my improved device as applied to a railway-car journal. Fig. 2 is a sectional elevation of the device as in use. Fig. 3 is an enlarged cross-section on line *x x* of Fig. 2. Fig. 4 is a horizontal section on line *y y* of Fig. 3. Fig. 5 is a perspective view of a box, showing the nozzle-clamp secured to the front of the box. Fig. 6 is a horizontal section through the box, showing the clamp secured to the side of the box; and Fig. 7 is an elevation of my device as stored when not in use.

At the present time the usual method of cooling a hot car-journal is, when the train has stopped, to pour or dash cold water into the open end of the box. Devices have also been made which embody a detachable tank having a nozzle secured to the box and adapted to direct a stream of water upon the journal, which was intended to cool the journal while the car was in transit.

I have found by a long series of experiments and study that as soon as the journal is heated it and the bearing-faces of the brass become covered with a deposit of carbon from the oil, which, owing to the pressure to which it is subjected, becomes nearly as hard as the metal itself. As long as the carbon remains on the contacting faces of the journal and brass, there will be such friction in running the journal at any considerable speed as to cause heating. For this reason, it is now the practice of railroads, as soon as a bearing has once been heated, to remove the brass as soon as it can conveniently be done, and the brass so removed is thrown in the scrap heap, even though it may be practically as good as new, except for its roughness, before described.

I have found that the proper way to cool the journal is to first wash off this carbon deposit with water applied between the journal and brass while the journal is moving, the water thus applied having three functions—to act as a lubricant, to wash off the meeting faces, and to cool the journal. When once the meeting faces are cleansed and the parts cooled, the brass is in fact as good as new and need not be replaced by a new one. Then by applying oil in the usual manner the brass may be kept in use until it is worn out.

My apparatus is therefore designed to overcome the objections to the apparatus heretofore known and to embody in a single device means for cooling a hot journal while the train is in transit and so cleanse the parts that the ordinary oil-lubricant or packing may be used without danger of heating after the device is once cooled.

A is a tank, preferably cylindrical and provided with means for detachably supporting it in proximity to any journal on a railway-train.

B are ears secured slightly above the center of the tank, in which are short links or chains C adapted to engage with screw-hooks D, which may be detachably secured into the under side of the car-sills opposite the heated journal, as plainly shown in Fig. 1.

With the construction I have shown in the drawings, the point of suspension of the tank is at such a point above the center as will cause the tank to oscillate by the motion of the train, as shown in dotted lines in Fig. 2, transversely the car for the purpose hereinafter set forth. This tank I preferably provide with legs E, so that it may be conven-

iently supported on the ground while the operator is attaching the hooks D. Depending from the under side of the tank is a flexible supply-pipe F, its communication with the tank being controlled by means of a valve G.

H is a dial beside the valve-handle to indicate the degree of opening of the valve. The pipe F is provided at its end with a rigid discharge section or pipe I of sufficient length to extend from the pipe F to the journal-box H′ and to enter the same and project beyond the collar J at the front end of the journal K. This pipe may be provided with one or more inwardly and upwardly directed discharge jets or nozzles L. This nozzle I preferably form as a single jet by making the elbow or bend M at the end of the pipe I.

N is the bearing or brass, which at each side is provided with a recess N′ beneath the overhanging side or lip. When the bearing is on the journal, as shown in Fig. 3, this recess or groove in the brass will form a narrow chamber or recess between the upper face of the journal and the inner face of the edge of the bearing, into which the stream from the nozzle is directed.

I find I obtain the best results by using the elbow-bend in the pipe, as described, so as to bring the discharge end thereof in close proximity to this recess, so that the water from the tank will be discharged directly therein in rear of the collar J. I find it is also desirable to have the jet distributed over as great a length of journal as possible, and to this end I preferably arrange the jet, as described, so that it will move longitudinally forward and back, and thus distribute the water as great a length of the journal as possible. This is effected by forming a slide-support for the pipe I on the box, and when the device is applied, the car being in motion, the tank will swing sidewise, as shown in dotted lines in Fig. 2, which will reciprocate the nozzle over nearly the whole length of the journal, as shown in the dotted lines, Fig. 2.

The support for the pipe I, I have shown consisting of a clamp O having a suitable set-screw O′ for attaching it to the box. This clamp at its lower edge is provided with a lateral extension O^2, which has a vertical aperture therethrough and in which the ring P engages. This ring is formed on an arm at the top of the sleeve P′, which embraces the pipe I between collars P^2. The joint between the ring P and the extension O^2 is substantially a universal joint. This construction not only takes up all the uneven motions of the truck in its relation to the car, but also enables me to attach the clamp to any desired part of the box, as shown in Figs. 2, 5, and 6, as the boxes in use differ greatly in different cars.

I find that if the flexible pipe F is sufficiently stiff it will effect the longitudinal movement of the nozzle when the tank swings, as described; but I may and preferably do employ a guide-rod Q secured to the end of the pipe F and passing through an apertured guide-block Q′, adjustably secured to the bar S, which connects the legs of the tank to guide the nozzle forward and back.

T is a chain connecting some part of the tank with the sleeve P′ to prevent the possibility of undue motion of the tank from drawing the nozzle out of the box or out of its position in the box.

The device thus constructed is applied to a railway-car, as shown in Figs. 1 and 2. When a box becomes heated the valve is opened and the train started. The nozzle is always arranged so that it will be on the rear face of the journal. When the car is in motion, its jet will be directed into the recess on the rear face of the journal, between the journal and its brass, as shown in Fig. 3, and the motion of the journal will draw a large part of the water thus delivered from the jet across the upper face of the journal and beneath the under face of the bearing, washing off those faces and cleansing them of the hardened carbon deposit, at the same time acting as a lubricant and a cooling agent for the parts. After the journal is cooled and has been freed from the scale or carbon deposit, oil is introduced into the box and further trouble is avoided.

What I claim as my invention is—

1. The combination with a journal and its bearing, of a conduit for water having a nozzle arranged to deliver the water against the upper rear portion of the journal below the bearing as and for the purpose described.

2. The combination with a car axle box, brass and journal having a collar at its outer end, of a laterally swinging tank loosely and detachably supported on the car adjacent to the journal and below the frame, a nozzle connected with the tank, means for supporting its end in the box, and a jet on its end directed upward and adapted to direct the stream of water between the upper rear face of the journal and the brass, substantially as described.

3. The combination with a car axle box and a journal, of a brass having recesses along its edges, a detachable swinging tank supported adjacent to the journal on the car, a nozzle connected with the tank, means for supporting the nozzle with the end in the box, and a jet on the nozzle directed upwardly so that its discharge will be directed into the said recess at the rear of the journal, substantially as described.

4. The combination with a car axle box and a journal, of a detachable tank flexibly swung from the under side of the car adjacent to the box, a support on the box, a nozzle or pipe slidingly engaging in said support and having a lateral discharge against the journal, and a connection between the nozzle and tank whereby the swinging of the tank caused by the motion of the car will direct the cooling fluid along the face of the journal, substantially as described.

5. A car axle cooler comprising a tank de-

tachably swung from the car adjacent to the axle, free to oscillate transversely of the car, a nozzle connecting with the tank slidingly supported on the box and discharging against the journal, the parts being so arranged that the oscillation of the tank will reciprocate the nozzle, substantially as described.

6. In a car axle cooler, the combination with a journal box, of a detachable tank, a nozzle, a connection between the nozzle and the tank, the nozzle arranged to discharge onto the journal in the box, and a support on the box for the nozzle comprising a flexible joint, substantially as and for the purpose described.

7. In a car axle cooler, the combination with the journal box, the detachable tank, its nozzle and a clamp on the box, of a ring on the nozzle, and an eye on the clamp with which said ring loosely engages, substantially as and for the purpose described.

8. In a car axle cooler, the combination with the tank, of a flexible discharge pipe therefrom, a rigid nozzle carried by said flexible pipe, a clamp on the box with which said nozzle has a sliding engagement, a guide rod connecting the nozzle, and a support for the rod on the tank, substantially as described.

9. In a journal box cooler, the combination with the journal and brass, of a nozzle having its discharge arranged in close proximity to the edge of the brass and free to move back and forth, and means for reciprocating the nozzle comprising a transversely swinging tank, and a connection between the same and nozzle, substantially as described.

10. In a railway car, the combination with an axle box, the journal and brass, of a longitudinally reciprocating liquid distributing nozzle in the box at one side of the journal, and means for supplying a liquid to the nozzle during its movement, substantially as described.

11. In a railway car, the combination with an axle box, its journal and brass, of a freely swinging tank on the car, a nozzle freely supported to move longitudinally at the side of the journal, a flexible connection between the tank and nozzle whereby the movement of the tank is imparted to the nozzle, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

MILES P. COOK.

Witnesses:
M. B. O'DOGHERTY,
O. F. BARTHEL.