

(No Model.)

A. BACKHAUS.  
ALARM FOR HOT AXLES.

No. 472,688.

Patented Apr. 12, 1892.

Fig. 1.

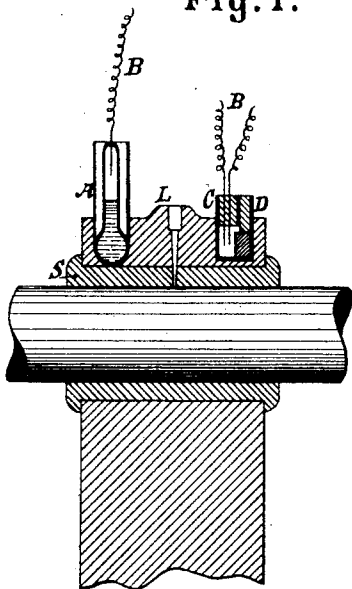


Fig. 2.

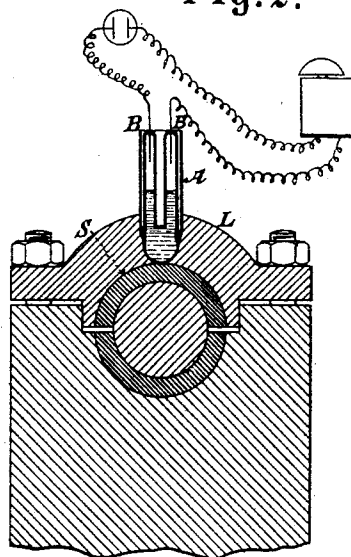
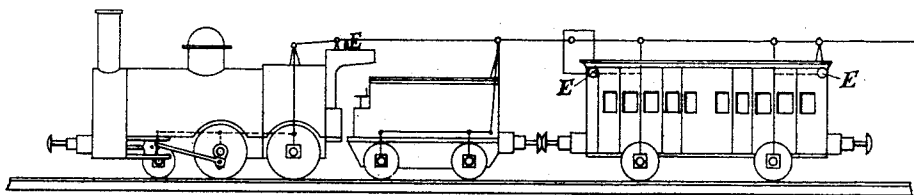


Fig. 3.



Witnesses:

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# UNITED STATES PATENT OFFICE.

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## ALARM FOR HOT AXLES.

SPECIFICATION forming part of Letters Patent No. 472,688, dated April 12, 1892.

Application filed September 4, 1891. Serial No. 404,726. (No model.)

*To all whom it may concern:*

Be it known that I, ANTON BACKHAUS, a subject of the King of Prussia, residing at Altenburg, in the Dukedom of Saxe-Altenburg, German Empire, have invented a new and useful Improvement in Means for Indicating and Preventing Hot Necks of Axles and Shafts, of which the following is a specification.

My present invention relates to an improved arrangement of apparatus by which when the temperature of any revolving axle, more especially the axle of a railway-carriage, exceeds a determined degree an automatic electric signal is given, by which such overheating is indicated, and, if necessary, its cause can be removed.

The invention is applicable to revolving shafts and axles of all kinds.

The dangers which are likely to arise from the overheating of the axles of railway-carriages are so well known that it is unnecessary to point out the importance of any invention providing security against them.

The accompanying drawings are an illustration of the present invention.

Figure 1 is a longitudinal section, and Fig. 2 is a vertical section.

In the axle box or bearing L a thermometer A is inserted, which touches the brass or bush S and is contained in a strong protecting tube or case. This thermometer contains mercury or other suitable fluid which is a conductor of electricity, and from the bulb two branches or tubes rise, in which the quicksilver or other liquid expansible by heat rises when the thermometer is heated. These tubes may be marked with graduated scales, and in each of them is arranged an electrical conducting-wire B, the lower ends of which are at such a height that the rising mercury will touch them when it has become heated to the determined degree. The wires B form the poles of a battery in the circuit of which at one or more points electrical signaling apparatus or bells are inserted. It is evident that as soon as the mercury or other liquid shall have risen to the determined point by its expansion through the heating of the shaft or axle the connection of the two wires B by the fluid completes the electric circuit, so that the signaling apparatus at once

sounds. Brakes put in operation by electromagnets may also be included in the circuit, which come into operation directly the latter is completed by the heating of an axle, so that the revolution of the axle is checked or stopped and the cause of the overheating can be remedied.

Instead of a thermometer, as described, the apparatus may be set in action by the melting of an easily-fusible metal. The conducting-wires B descend into a chamber C, in which a piece of easily-fusible metal or metallic alloy D or other solid body which when melted is a conductor of electricity is fitted. The case C is inserted into the cover of the axle box or bearing, and directly the latter reaches the melting-point of the piece D by reason of the overheating of the axle the melted metal runs to the bottom of the case and effects a connection between the ends of wires B. This arrangement can either be used alone or in combination with the thermometer A. In the latter case the conducting-wires of the thermometer may set in operation the signaling apparatus and those of the case C the brake, the thermometer being arranged to operate at a somewhat lower temperature than the melting apparatus C D, so that the latter only comes into use in the event of the signal not having been noticed. The melting arrangement must be renewed after every time that the melting of the piece D has taken place.

Fig. 3 shows a general view of the application of the apparatus to a railway-train, the device being applied to each of the axle-boxes. The signal-bells E can be arranged in any convenient positions.

Having now particularly described and ascertained the nature of the said invention and in what manner the same is to be performed, I declare that what I claim is—

The combination, with the axle or shaft bearing, of the thermometer having an expansible electrical conducting medium, and circuit-wires normally out of contact with said medium and in circuit with a signaling or alarm apparatus, and a second chamber containing circuit-wires, and a fusible electrical medium making contact with the ends of said wires in the chamber when fused, the expansi-

ble electrical medium being adapted to be brought into action to close the circuit of its wires at a lower temperature than the fusible electrical medium and the latter to be brought  
5 into action after the other medium has established its circuit, substantially as and for the purposes set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ANTON BACKHAUS.

Witnesses:

W. HAUPT,  
OTHMAR LENK.