No. 667,944. Patented Feb. 12, 1901.

# A. KATONA, P. VARGA & J. KROMPECHER.

## AXLE BOX.

(Application filed Mar. 15, 1900.)

(No Model.)

Fig. 1.

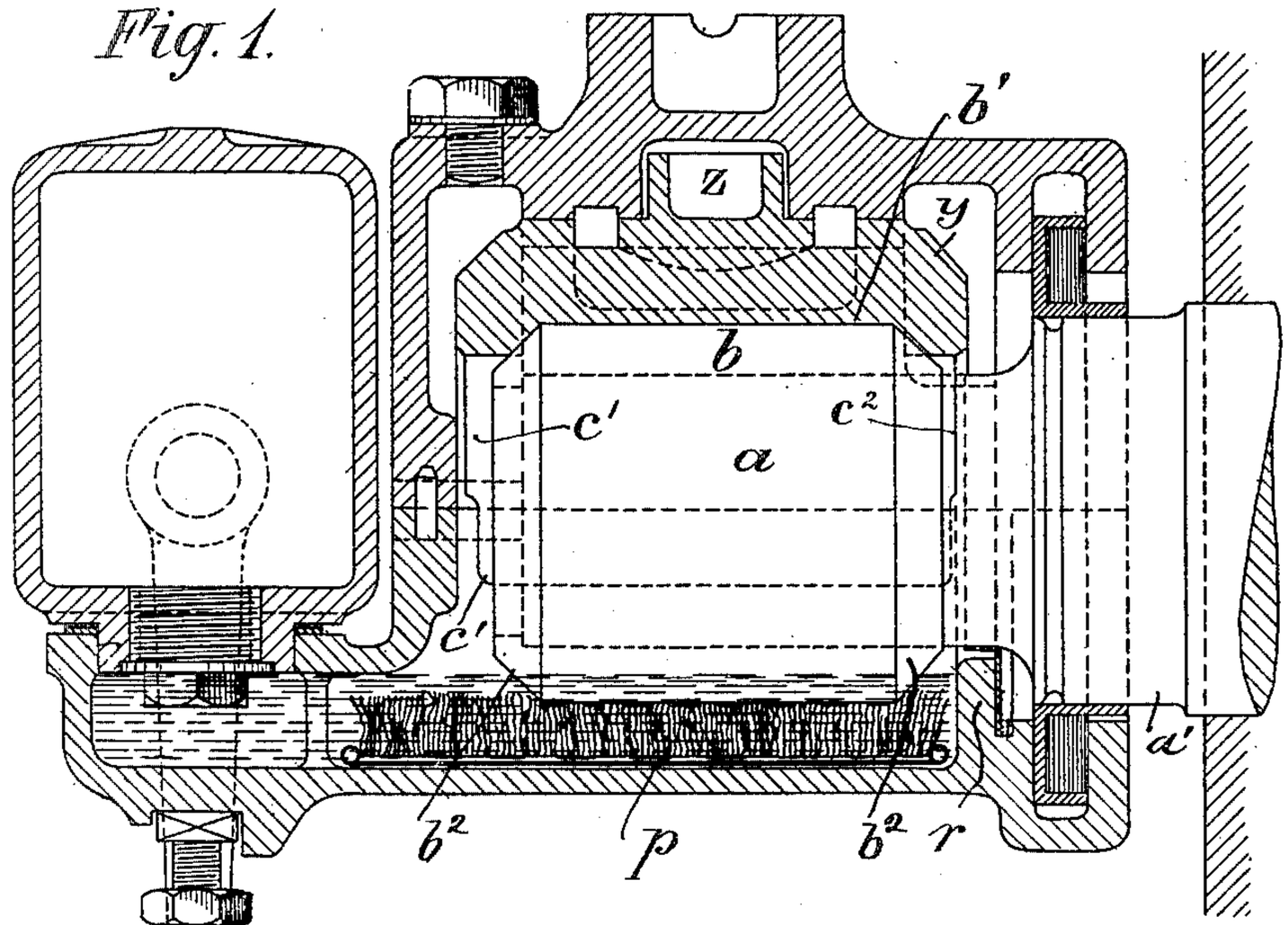


Fig. 2.




Fig. 3.

Witnesses:
Julius Klutz
C. E. Tolson

Inventors.
A. Katona
Paul Varga
J. Krompecher
By Munn & Co.
Attorneys

# UNITED STATES PATENT OFFICE.

ANDREAS KATONA, PAUL VARGA, AND JOHANN KROMPECHER, OF BUDA-PESTH, AUSTRIA-HUNGARY.

## AXLE-BOX.

SPECIFICATION forming part of Letters Patent No. 667,944, dated February 12, 1901.

Application filed March 15, 1900. Serial No. 8,791. (No model.)

*To all whom it may concern:*

Be it known that we, ANDREAS KATONA, PAUL VARGA, and JOHANN KROMPECHER, subjects of the Emperor of Austria-Hungary, residing at Buda-Pesth, in the Empire of Austria-Hungary, have invented certain new and useful Improvements in Axle-Boxes and in Lubricating Axle-Journals, of which the following is a specification.

This invention relates to improvements in bearing and lubrication of axle-journals essentially differing from the usual constructions.

The present constructions are designed, primarily, for axles of railway-carriages; but they may be applied also to other corresponding parts of machines.

The invention is shown in the accompanying drawings.

Figure 1 is a longitudinal section of an axle-box of a railway-carriage. Fig. 2 is a cross-section of the same, and Fig. 3 is a sectional elevation of the journal-sleeve.

By the present invention the usual axle-journal is modified in such a manner that the front disk of the axle-journal hitherto used is removed and a separate sleeve *b* is mounted on the journal *a*, said sleeve for its major portion being of a simple cylindrical shape and giving the axle increased thickness at its bearing-surface. The sleeve consists of a material capable of resisting wearing—that is to say, of hard steel or brass of good quality—and it is placed in a hot condition on the journal, so as to shrink to a tight fit. It does not envelop the journal in its whole length, so that that part of the journal between the axle-shaft and the inner end of the sleeve retains its original minimum thickness. The advantages offered by the journal thickened in this manner are as follows: The mounted sleeve protects the core of the journal, and in consequence also the axle, against wearing, as only the sleeve is subjected to the wear, and it is therefore only necessary to renew the sleeve to provide a new wearing-surface. By the use of journals provided with sleeves the number of renewals of axles is considerably reduced, and by this fact alone a considerable economy is obtained.

Another essential advantage consists in the circumstance that the sleeve may be made of a considerably-harder material, offering a great resistance against wearing and causing less friction than the material of the axle. By this the durability of the journal-surface, as well as that of the metallic bearing, is increased, and, moreover, the shape of the thickened journal is also very advantageous with respect to lubricating, as will be hereinafter explained. In the constructions of some bearings heretofore employed the rear or inner slope of the journal is such as to cause the oil to be drawn away from the bearing-surface. In the present construction of bearing a rib *r* on the lower part or section of the bearing projects upward between the sleeve *b* and the unreduced part *a'* of the axle and extends up close to the core *a* of the journal, the lower section of the axle-box forming thereby a bowl or reservoir, into which dips the sleeve *b*. In this way the lower section of the box can contain always as large a quantity of oil as is required for a permanent and sure lubrication. In this oil "bathes," if one may say so, the lower part of the thickened journal. There takes place therefore an automatic lubrication of the journal during the working.

The end faces of the journal-sleeve are formed with cones or bevels $b^2$ and the journal-boxes are formed to correspond.

The bearing block or brass *y* to be adjusted upon the sleeve *b* of the journal is made of red metal and not filled up or babbitted, as this has been thought unnecessary for reducing wearing if the lubrication is good and sufficient and the sleeve is of sufficient hardness. The costs of its maintenance are, moreover, lower than those of the bearing lined with white or Babbitt metal. The upper trunnion *z* of the brass *y* prevents the latter from being displaced, while the displacement of the journal is limited by the sides *c'* and $c^2$ of the brass extending downward on both sides to a point below the dividing-line of the two sections of the journal-box. This offers the advantage that on the revolution of the axle-journal the oil will not be led or forced into the joint between the upper and lower sections of the box, as the joint being guarded by the downwardly-projecting sides *c' c²* the latter will direct the oil back to the reservoir.

Respecting the rib $r$, it is desirable that it make a close joint with the under side of the core $a$ for the purpose of retaining the oil; but if in close contact the rib would possibly injure the core by pounding against the same. I therefore complete the joint by means of a segment $r'$, of leather or like soft material.

The conical surfaces $b^2$, it will be observed, slope in a direction toward the cylindrical bearing-surface of the journal. The centrifugal force therefore exerted will direct the oil outward on the slope or cone to the bearing-surface and said cones will themselves be well lubricated. The result is that there is an effective lubrication that enables the journal to receive the lateral pressure resulting when the brakes are applied. Further, the cone-like slopes of the two ends of the axle-journal have during the revolution, owing to the velocity of the periphery and centrifugal force, the tendency to press the bearing block or brass $y$ against the larger diameter. In consequence thereof the bearing-block maintains always its normal position above the middle of the journal and insures, therefore, the quiet movement of the carriage.

In the lower section of the axle-box there is provided a plush pad $p$ for the purpose of preventing splashing of the oil in the said lower section. It is therefore desirable that in mounting the lower section of the axle-box the pad is in contact with the journal or that the journal compresses somewhat the pad.

Having thus described our invention, we claim as new and desire to secure by Letters Patent—

1. The combination with the axle having a journal consisting of a reduced spindle forming a core and a separate sleeve on said core, the inner end of the sleeve being spaced from the unreduced part of the axle, of a journal-box forming a reservoir at the bottom into which the sleeve projects at its under side, the box having a rib projecting upward from the lower portion of the box into the space between the sleeve and the unreduced portion of the axle.

2. The combination with the axle having a journal consisting of a reduced spindle forming a core and a separate sleeve on said core, the inner end of the sleeve being spaced from the unreduced part of the axle, of a journal-box forming a reservoir at the bottom into which the sleeve projects at its under side, the box having a rib projecting upward from the lower portion of the box into the space between the sleeve and the unreduced portion of the axle, and a segment of flexible material making a joint with the under side of the axle.

3. The combination with a journal-box having bearing-surfaces consisting of beveled end surfaces and a cylindrical surface, the cylindrical bearing-surface being between the beveled surfaces, and joining the said beveled end surfaces at their points of greatest diameter, of a journal having beveled end surfaces corresponding to the beveled surfaces of the box and an intermediate cylindrical bearing-surface bearing against the cylindrical surface of the box, the said end surfaces of the journal having their bases or widest portions coincident with the bases or ends of the cylindrical bearing-surface of the journal.

4. A journal-box comprising upper and lower sections, the lower section forming an oil-containing reservoir, and a bearing block or brass in interengagement with the upper section of the box and located within the box, said bearing-block having side members projecting downwardly below the joint between the box-sections.

5. A journal-box comprising upper and lower sections, the lower section forming an oil-reservoir, and a bearing-block in the upper portion of the box, the said block having side members extending downward below the joint between the upper and lower box-section.

In witness whereof we have hereunto signed our names in the presence of two subscribing witnesses.

ANDREAS KATONA.
PAUL VARGA.
JOHANN KROMPECHER.

Witnesses:
ALFRED EGAN,
RAYMOND WILLEY.