In a railway truck wherein friction shoes are operatively carried in wedge pockets of the bolster and are urged upwardly and outwardly by one or more springs between the bottom of the friction shoe and the truck side frame, an opening defined by said bolster through which a surface of said friction shoe is viewable thus indicating the extent of wear of said shoe and the amount of useful life remaining for said friction shoe.
RAILWAY TRUCK SNUBBING INDICATION ARRANGEMENT

This invention relates to railway car trucks and more particularly to a type of truck wherein snubbing means is mounted in each end of the bolster for cooperation with friction plates or panels on the adjacent side frame columns.

The present invention contemplates the provision of a visual wear limit indicator in the end portion of the bolster adjacent each of the friction shoes which are operatively disposed in wedge-shaped pockets at opposite sides of the bolster and near each end thereof.

In the prior art various trucks have been proposed and a number have been placed in service wherein bolster oscillations are damped by friction devices usually some form of friction shoe associated with the bolster for developing friction to resist its oscillations. Such arrangements have been generally successful in eliminating harmonic action of the bolster-supporting springs and the resultant harmful effect well known to those skilled in the art. However, it is commonly known that satisfactory results are obtained using the various arrangements only in the event that the friction parts, mainly the friction shoes, are not allowed to develop a condition of excessive wear; because the existence of such a condition will in turn cause the springs associated with the respective friction parts to exert a force which is out of tolerance and thus becomes ineffective in dampening bolster oscillations.

Therefore in an effort to insure that the undesired harmonic action of the bolster-support springs is eliminated, it has become necessary to establish as a part of a regular maintenance program whereby the wear of the friction shoes can be monitored. Since the rate of friction shoe wear is dependent on many factors such as the type of loads carried, the type of terrain in which the car is used and even the climate in which it is used, for this reason of servicing of the friction parts cannot be based on any set standard such as time or distance traveled.

It has thus been determined that the only practical method by which friction shoe wear can be determined is by actually measuring the wear incurred by each individual friction shoe. To accomplish this result, it was necessary that maintenance crews used a yoke-shaped gauge which was usually inserted through an opening in the top of the bolster and engaged the friction shoe thereby measuring the extent of wear.

Considering that most railway cars have two trucks and each truck generally has four friction shoes of the type previously mentioned, one can clearly see that such a maintenance program would be very time consuming and expensive.

Accordingly, a primary object of the present invention is to provide maintenance and service personnel with a wear status indicator which will reveal at a glance the exact condition of the snubbing parts.

A further object of the invention is to provide a novel wear status indicator that will reveal the half worn condition for the snubbing elements and thereby informing maintenance and service personnel of the need to insert a shim between the shoe spring seat and the top of the control spring. This would restore control spring pressure to approximately the level that existed under new conditions.

Another object of the invention resides in the fact that the wear status indicator will clearly show the presence or absence of a shim thus making it easier to make a determination of whether a complete friction shoe must be replaced in order to return control spring pressure within specified limits or whether the mere insertion of a shim will restore the desired control spring pressures.

The foregoing and other objects and advantages of the invention will become apparent from the following specification and the accompanying drawings, wherein:

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a fragmentary side elevational view of a railway car truck embodying the invention.

FIG. 2 is an enlarged view of the end portion of the truck bolster shown in FIG. 1 illustrating in detail the wear status indicator.

FIG. 3 is a fragmentary side view of the railway car truck side frame together with a truck bolster constructed according to the present invention and assembled in their operative positions; portions of the side frame and the bolster being shown in section to better illustrate the improved constructions.

FIG. 4 is a fragmentary sectional view through a railway car truck illustrating a modified form of our invention, the view being in section and comparable to the sectional view of FIG. 1.

FIG. 5 is a perspective view of the friction shoe.

FIG. 6 is a fragmentary sectional view taken on line 6—6 of FIG. 4.

FIG. 7 is a fragmentary sectional view similar to FIG. 6 with the addition of a shim between the lower surface of the friction shoe and the top of the control spring.

Referring now to FIGS. 1 and 3, a portion of a railway truck may be seen which is of conventional construction and includes a pair of spaced side frames, one of which is shown. Each side frame has a compression member 12 and a tension member 14 interconnected by spaced vertical columns 16 the sides of which form a window 18 (FIG. 3) substantially rectangular in shape with the upper portion 18a of the window being slightly narrower than the lower portion 18b.

It should be understood that the railway truck for the purpose of the present disclosure may be considered identical at both sides thereof and for the sake of brevity only that portion shown will be described in detail.

The window formed by the compression member 12, tension member 14 and spaced vertical columns 16 is adapted to receive the end of the bolster, generally indicated at 20. The lower surface 22 at the end of the bolster 20 is supported by a plurality of support spring groups 24 which rest at their lower ends on the side frame tension member 14. In opposite side walls 26 at each end of the bolster 20 are wedge-shaped receiving pockets 28 which open outwardly toward the side frame columns 16 and have an inclined inner wall 30 which has a width corresponding substantially to the width of the wedge-shaped friction shoe 32 positioned therein. The inclined inner wall 30 projects above the plane of the bolster top wall 34.

One wedge-shaped friction shoe 32 is operatively carried in each pocket 28 and includes an inclined sur-
face 36 corresponding to and frictionally engaging the inclined wall 30 of the pocket 28 as well as a vertical surface 38 for frictionally engaging vertical wear plates 40 on the adjacent side frame columns 16. The lower surface 42 of the wedge-shaped friction shoe is engaged by the upper end of a control spring 44 which is disposed between said friction shoe 32 and the tension member 14 of the side frame 10. The inclined inner wall 30 therefore provides an inclined thrust area equal to that of the engaged portion of the inclined surface 36 of the wedge-shaped friction shoe 32.

Located in the end of the bolster 20 and adjacent the outboard side of each respective friction shoe 32 is a wear status indicator shown generally at 46. The wear status indicator provides for the viewing of a portion of the wedge-shaped friction shoe and thus enables one to compare the present position of the friction shoe to a previously established reference. The established reference point can either be a point that reflects the new unworn condition of the friction shoe or in the alternative, reflects a previously established point which indicates a condition of maximum allowable wear for a friction shoe. Thus by comparing either of the established reference points to the present position of the friction shoe one can readily make a determination as to the amount of wear remaining in the friction parts.

Additional reference points can be established on the wear status indicator which correspond to conditions that will exist when other service procedures are to be performed. For example, a reference point could be established to indicate when a shim should be inserted between the lower surface of the friction shoe 42 and the top of the control spring 44 to insure that proper spring pressures are maintained.

It should be understood that the actual construction and arrangement of the wear status indicator could vary considerably depending upon the type of railway truck and the type of car it is to be used with and the conditions which are to be indicated. FIG. 2 shows in detail a preferred embodiment of the wear status indicator shown generally at 46 in FIGS. 1 and 3.

The opening of the wear status indicator 46 is defined by the flat surface of the web 47 located in the end of the bolster 20. The lower portion 48 of the opening is substantially rectangular in shape with three sides of the rectangle being defined by the surface of the web 47 the left side 49 and right side 50 being substantially parallel to each other and perpendicular to the lower side 51. The upper portion 52 of the opening is also substantially rectangular in shape but each of the dimensions of the upper rectangle being less than the respective dimension of the lower portion 48 of the opening. Three sides of the upper portion 52 of the opening are also defined by the web 47 with the left side 53 and right side 54 of the upper portion 52 being substantially parallel to each other and parallel to the vertical sides 49 and 50 of the lower portion 48 of the opening. The upper side 55 of the upper portion 52 forms the top of the wear status indicator 56 which is substantially parallel to the lower side 51 of the lower portion 48 of the opening which also forms the bottom of the wear status indicator 46. The fourth side of both the upper and lower rectangular portions 48 and 52 of the opening are common to one another. However, due to the difference in dimensions of the two rectangles, shoulders 56 are formed at the points of intersection of the two portions 48 and 52 of the opening.

The wear status indicator 46 is to be constructed and positioned in the web 47 of the end wall of the bolster 20 and extends through the wall to the outboard wall 58 of the wedge-shaped bolster pocket 28 thereby providing an unobstructed view of a reference index such as the friction shoe spring seat 42. The lower portion of opening 48 of the wear status indicator is so positioned that alignment of a reference index such as the friction shoe spring seat 42 in said opening would exhibit the unworn or satisfactory condition of the snubbing parts associated with that wear status indicator. The same positioning of the wear status indicator 46 may also reveal other conditions of the associated parts. For example, in the event the friction shoe spring seat 42 is in alignment with the shoulders 56 formed by the intersection of the upper and lower portions 52 and 48 of the opening respectively, the wear status indicator 46 would alert maintenance and service personnel to the fact that the friction shoe 32 should either be replaced or its effectiveness renewed by the insertion of a shim 60 between the lower portion of the friction shoe spring seat 42 and the control spring 44 thereby restoring proper column pressure to the control spring 44.

In the event the spring seat were aligned with the upper side of the upper portion 52 of the opening, this would establish the maximum rise limit for the friction shoe 32 and would indicate a totally worn condition. If a shim had previously been inserted between the lower portion 42 of the friction shoe 32 and the control spring 44, the maximum rise limit would be reached when the lower portion 42 of the friction shoe 32 aligns itself with the upper side 54 of the top portion 52 of the wear status indicator opening.

It should be understood that the term opening is meant to include the use of any translucent material such as glass or plastic which may either be mounted in or cover the perforations in the end of the bolster 20 which constitutes the upper and lower portions 52 and 48 respectively that are part of the wear status indicator opening.

Referring now to FIGS. 4 through 7 there is shown another embodiment of the present invention wherein a protrusion or pointer arm 62 is attached at one end thereof to the friction shoe 32, the other end of said pointer projects or extends through a slit defined by the web 47 in the end of the bolster 20. The slit extends from the outboard wall 58 of the bolster pocket 28 through the end of the bolster 20. Thus, alignment of the pointer arm with previously established indices (not shown) on the end of the bolster will enable service and maintenance personnel to readily determine the condition of the snubbing parts associated with that pointer arm.

As previously mentioned, upon the establishment of a half worn condition for the friction parts, the column pressure of the control springs 44 may be restored by the insertion of a shim 60 between the spring seat 42 of the friction shoe 32 and the top of the control spring 44.

Assuming the pointer arm 62 shown in FIG. 6 indicates the half worn condition of the friction shoe, maintenance crews could insert a shim 60 as shown in FIG. 7 thereby restoring the column pressure of the control spring 44 to its original value.
The maintenance procedure described above would reduce the wide range of spring pressures that would otherwise exist if the friction shoe 32 were allowed to remain in service until totally worn out. By limiting the range through which the column pressures may vary by the utilization of a shim 60, more effective snubbing action may be maintained throughout the life of the friction parts. This improved snubbing action is accomplished without the high cost that would be associated with the complete renewal of the friction shoe 32 and its associated parts; especially when said friction shoe and parts are only in a half worn condition.

The terms and expressions which have been employed are used as terms of description and not of limitation, and there is no intention, in the use of such terms and expressions, of excluding any equivalents of the features shown and described or portions thereof, but recognize that various modifications are possible within the scope of the invention claimed.

We claim:
1. In a railway car truck including a bolster resiliently supported on spring groups in side frames between spaced vertical columns thereof, said bolster defining pockets on both sides thereof, friction shoe means wedgingly interposed between said pockets and said vertical columns, compressed spring means for urging said friction shoe means into wedging frictional engagement with said pockets and said vertical columns, the improvement wherein the bolster defines an opening through which a reference index segment on said friction shoe means is viewable and aligned with said opening only during the useful life of said friction shoe means; said reference index moving vertically across said bolster defining opening in direct proportion to the wear of said friction shoe means.

2. The invention according to claim 1 wherein said bolster opening comprises distinguishable first and second portions, said reference index segment on said friction shoe means being viewable through and alignable with either of said portions throughout the useful life of said friction shoe means.

3. In the invention according to claim 2, wherein viewable alignment of said reference surface of said friction shoe means between said first and second portions indicates wear and the requiring of service for said friction shoe means.

4. In the invention according to claim 1 wherein said bolster defined opening comprises a upwardly extending slot.

5. In the invention according to claim 4 wherein said friction shoe means including pointer means extending through said slot.

* * * *.
UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,805,707 Dated April 23, 1974

Inventor(s) Otto Walter Neumann and Frank Joseph Korpics

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

In the Abstract:
In Line 2, after "wedge" insert --shaped--.

In the Claims:
In Column 6, Line 6, after "index" insert --segment--;
In Column 6, Line 7, delete "defining";
In Column 6, Line 16, delete "surface" and insert
--index segment--;
In Column 6, Line 21, delete "defined";
In Column 6, Line 24, delete "including" and insert
--index segment comprises--.

Signed and sealed this 8th day of October 1974.

(SEAL)
Attest:

McCoy M. Gibson Jr.                              C. Marshall Dann
Attesting Officer                                Commissioner of Patents