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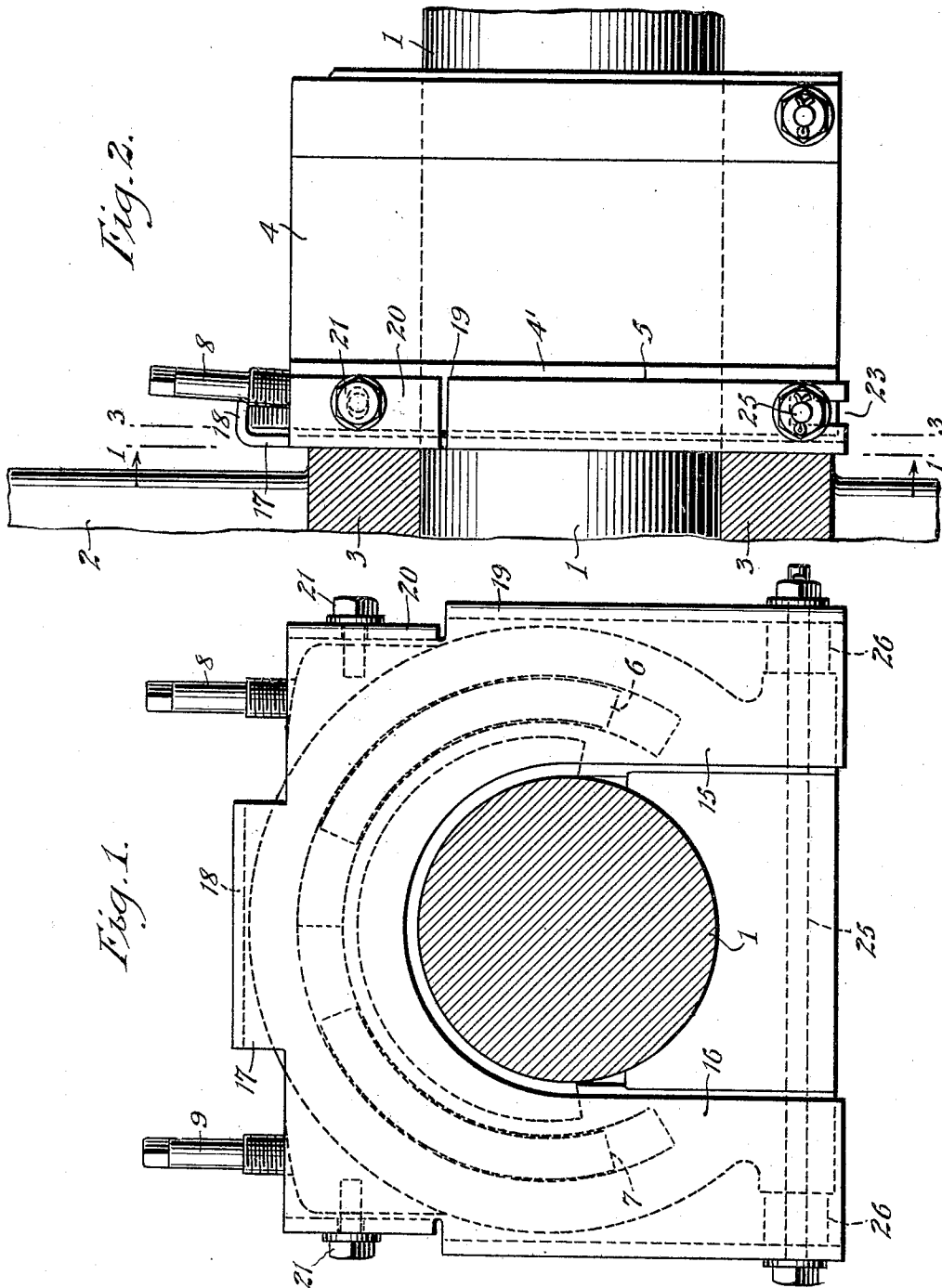
H. O. HAVEMEYER, JR., ET AL

1,871,518

END PLAY LINER FOR LOCOMOTIVE DRIVING BOXES

Filed Sept. 13, 1929

3 Sheets-Sheet 1



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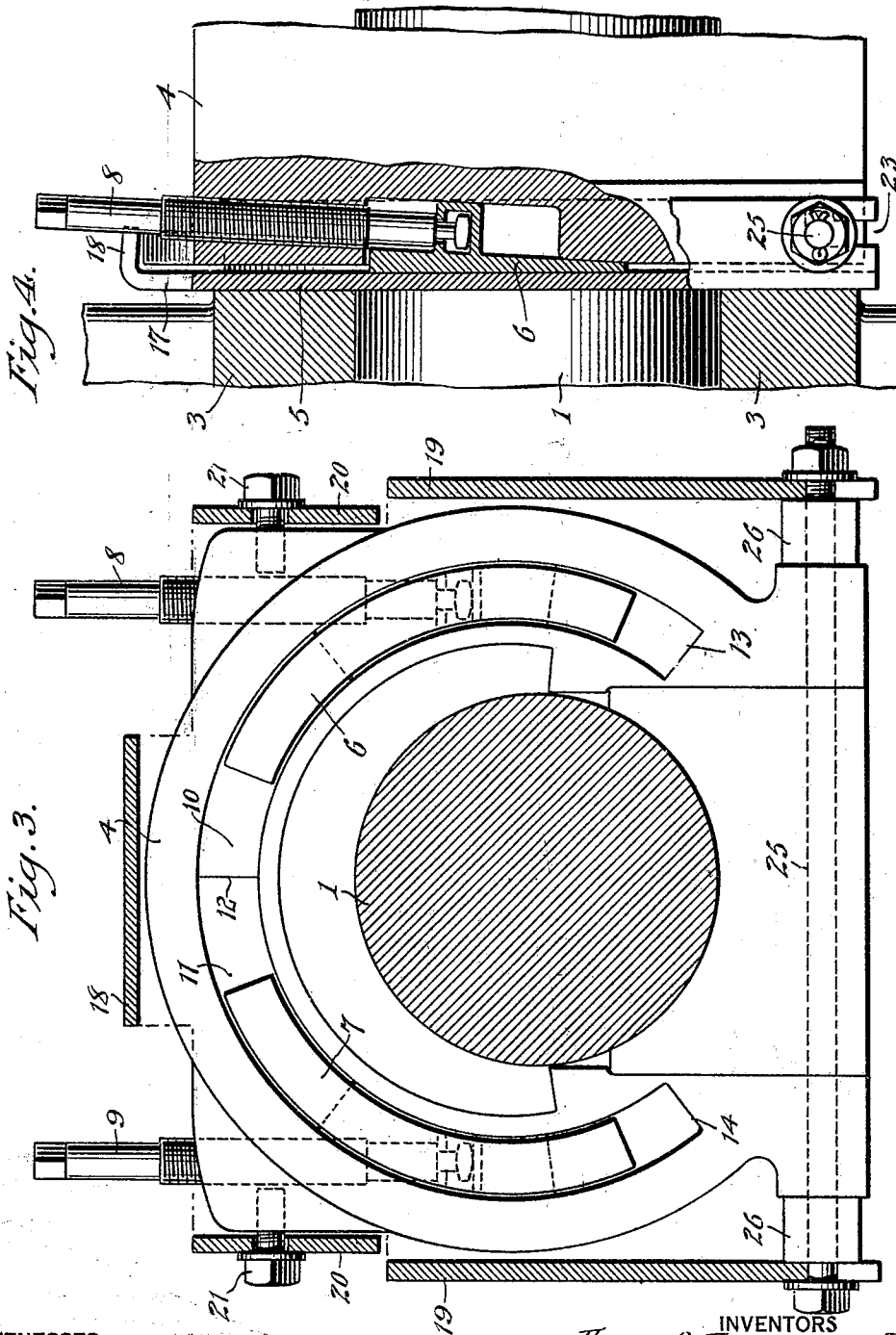
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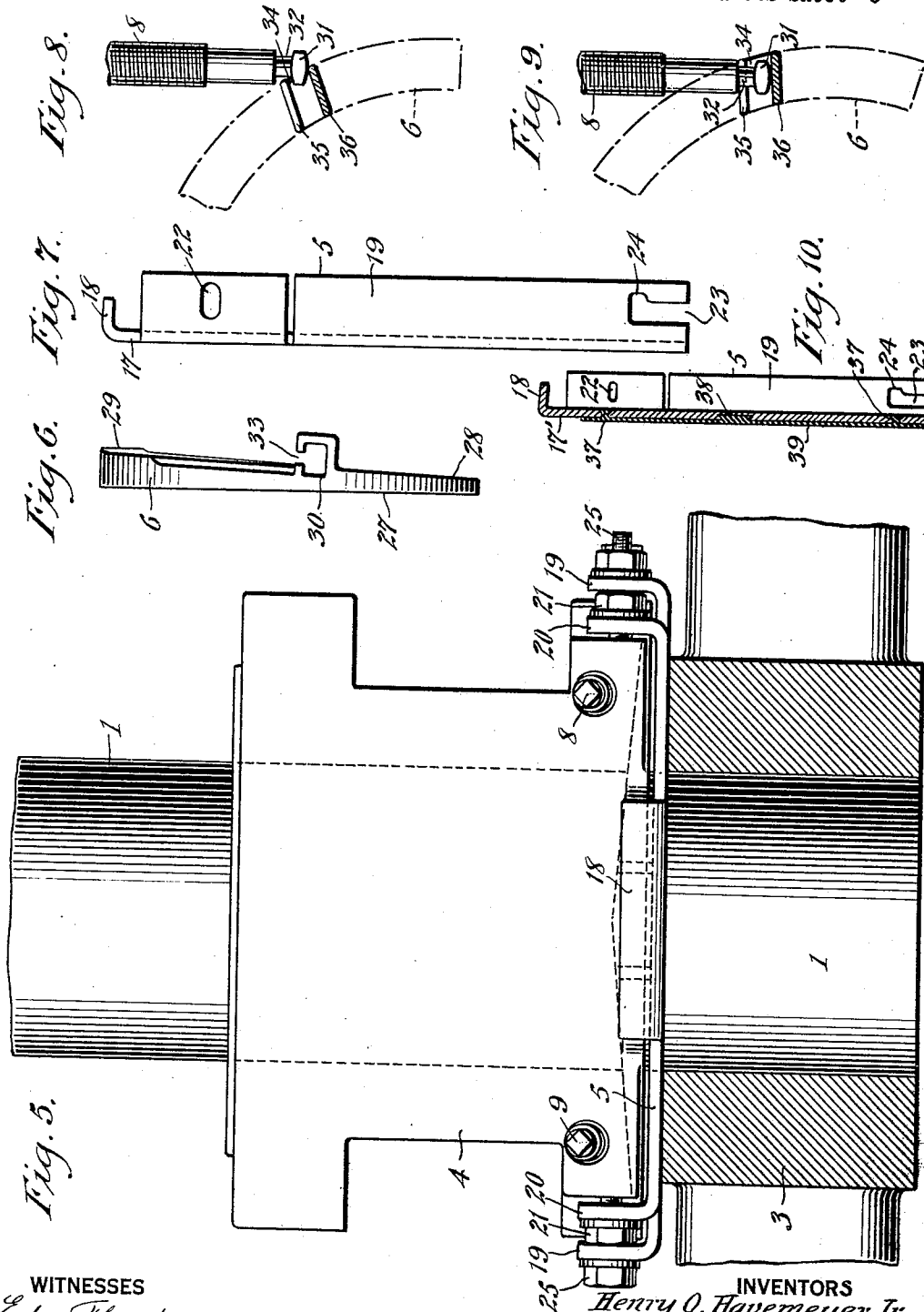
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END PLAY LINER FOR LOCOMOTIVE DRIVING BOXES

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This invention relates to liners and means for adjusting the same, and particularly to an improved end play liner for locomotive driving boxes, the object being to provide an improved construction wherein the liner may be adjusted and changed from time to time without dropping the wheels.

Another object of the invention is to provide an end play liner wherein the liner plate may be readily mounted and then adjusted from time to time to take up the wear, the adjustment being accomplished without putting the locomotive into the shop.

A further object, more specifically, is to provide a liner plate and a series of adjustable wedge members or liner wedges arranged to be shifted from time to time to move the liner outwardly and thereby take up the wear on the liner.

In the accompanying drawings,—

Figure 1 is a side elevation of an end play liner constructed according to the present invention, the axle of a locomotive being shown in connection therewith, the view being taken on the line 1—1 of Fig. 2;

Figure 2 is a side view of the structure shown in Fig. 1, part of one of the driving wheels of the locomotive being shown in connection therewith;

Figure 3 is a sectional view through Figure 2 on the line 3—3;

Figure 4 is a side view of the structure shown in Fig. 1 with certain parts broken away for better illustrating the arrangement of the liner wedge and adjusting screw;

Figure 5 is a plan view of the structure shown in Fig. 2;

Figure 6 is an edge view of one of the liner wedges shown in Fig. 3;

Figure 7 is an edge view of the liner shown in Fig. 1;

Figure 8 is a diagram showing how the screw enters the socket in the wedge;

Figure 9 is a diagram similar to Figure 8 showing a further movement of the wedge and adjusting screw;

Figure 10 is a vertical sectional view through a slightly modified liner to that shown in Fig. 7, the same illustrating a liner with a brass face cast in position;

Referring to the accompanying drawings by numerals, 1 indicates the shaft of one of the driving wheels of an engine, and 2 a driving wheel connected with the shaft 1. The driving wheel 2 is provided with a hub 3 which would bear against the driving box 4 except for the liner 5. The liner 5 is provided in order to take up the wear instead of the box 4. Heretofore liners have been provided between the bearing boxes and the hubs of the driving shaft, whereby the liners will take up the wear, rather than the bearing boxes. From time to time new liners must be provided. In order to do this, the locomotive must be taken to the roundhouse or other suitable place and the wheels dropped, as it is termed in railroad parlance. The dropping of the wheels consists in moving the wheels and axles downwardly out of the way so that the workman may have access to the driving box and may remove the old liner and place a new one in position. After this has been done the wheels and axles are again lifted to their correct position and the parts secured together in the usual manner. The locomotive is then in condition for further use. In the present instance means have been provided whereby the liners may be adjusted from time to time without dropping the wheels. In order to accomplish this result, a special liner 5 has been provided, and coacting with this liner are liner wedges 6 and 7 operated by suitable adjusting screws 8 and 9. As these screws and wedges are identical, the description of one will apply to both. As shown in Fig. 3, the wedges 6 and 7 are fitted into oppositely inclined grooves 10 and 11 formed in the driving box 4. The grooves 10 and 11 taper from a central line 12 to the respective points 13 and 14, and at points 13 and 14 are shallowest. The liner 5 is formed to fit normally flatwise against the end of the bearing box 4, as shown in Figs. 1 and 4. As shown particularly in Fig. 1, the liner is substantially U-shaped and the respective legs 15 and 16 merge at the center of the top and also merge into an extension 17 which is turned over for forming the stop or hook 18 designed to engage the upper part of the rounded portion 4' of bearing box 4, so that the liner

will not drop too far down when being installed. Each edge of the liner 5 is formed with a comparatively long flange 19 and a short flange 20, flange 20 being offset inwardly to conform to the shape of the driving box 4, and so that it may be clamped in place by the respective screw bolts 21 extending through the respective slots 22. The lower end of each of the flanges 19 is formed with a vertical slot 23 merging into a laterally extending notch 24. A bolt 25 extends through the bearing box 4, through suitable spools or washers 26 and through the slot 23 at the upper end. The notch 24 merges into slot 23 and forms in effect a lateral slot coacting with slot 22, whereby the liner 5 may be moved back and forth longitudinally of the axle 1. When the liner is first placed in position it is placed in contact with the face of the box 4, and as the hub 3 wears the same, liner wedges 6 and 7 are adjusted so as to force the liner away from box 4 more and more according to the amount of wear, and as indicated in Fig. 4. The liners 6 and 7 are identical in construction, except that one is the reverse of the other. Liner 6, as shown in Fig. 6 and in diagram in Figs. 8 and 9 is an arc-shaped wedge having a flat surface 27 designed to bear against the inner surface of the liner 5 and a pair of contact surfaces 28 and 29 adapted to bear against the face of the driving box 4. The wedge 6 is also provided with a socket 30 adapted to receive the enlargement or head 31 carried by the screw 8. A neck 32 connects the head 31 to the body of the screw so that the head may readily enter the socket 30. It will be noted that the socket 30 is provided with an opening 33 and is open at point 34, whereby the head 31 may readily enter and engage the upper wall 35 of the socket, as well as the lower wall 36. The opening 33 accommodates the neck 32 as the wedge is moved around in the arc of a circle during the adjustment of the various parts. It will be noted from Figs. 3 and 4 that the screws 8 and 9 are squared on the upper edge so that a suitable wrench may be fitted thereon, and these screws may be adjusted from time to time without removing the wheels and axles of the engine and even without running the engine into the roundhouse. In the course of time the liner becomes worn, but the parts are so arranged that the liner can be adjusted to take up the slack as it occurs, and when necessary the liner may be removed and a new one inserted without dropping the wheels and with a minimum effort. This may be done by removing the screws 21 and loosening the screw 25. When these members have been removed and loosened the plate 17 may be readily raised and a new one substituted and these members tightened and replaced. The screws 8 and 9 are screwed in a reverse direction back to their starting point when a new liner is

placed in position, so that the action may be repeated on the new liner from time to time, as desired. During the use of the locomotive the wearing action on the liner 5 is the same as usual, but when this has become worn to a certain extent a workman merely operates the screws 8 and 9 until the lost motion has been eliminated. This prevents the locomotive from being laid aside for several days for repairs, and consequently, permits of greater efficiency in the use of the locomotive. It also eliminates an appreciable amount of cost in the upkeep and proper adjustment of the locomotive.

In Fig. 10 will be seen a modified form of liner in which the liner body 17' is substantially the same as liner 17, except that it is provided with suitable holes 37 or suitable undercut grooves 38, whereby a casting of brass 39 may be cast directly to body 17' and thereby present a wearing surface. It will be understood that this form of liner, the form shown in Fig. 4, or other specific form of liner may be used without departing from the spirit of the invention, provided the same is mounted as set forth and used alone or operated in connection with the wedges heretofore described. As indicated in Figs. 3 and 4, the liner 17 may be removed without dropping the wheels by merely loosening bolt 25, removing bolts 21 and then pulling upwardly on the liner. A new liner may be supplied by reverse operation.

What we claim is:—

1. An end play liner for locomotive driving boxes, comprising a liner plate, means for holding the plate in position, a pair of wedges coacting with the plate for shifting the same in a direction substantially longitudinally of the locomotive axle to take up unnecessary play, means for guiding said wedges in arc shaped paths and screw means acting at a tangent to said guiding means for forcing said wedges along said paths.

2. An end play liner for locomotive driving boxes, comprising a liner plate mounted on the driving box, said mounting permitting the liner to move longitudinally of the axle extending through the box, a pair of wedges carried by the box back of the liner, and a plurality of means acting on said wedges for moving the wedges substantially in an arc, said wedges acting on said box and on said liner for shifting the liner in a direction longitudinally of the axle extending through the box, said means acting on said wedges including a screw for each wedge acting at a tangent to the wedge.

3. In a device of the character described, a bearing plate, a wedge coacting therewith, an arc-shaped guide for said wedge, and a screw for shifting the wedge along said guide to move the bearing plate in one direction.

4. In a device of the character described, a liner formed with turned-over edges, each

edge having a slot, screw members extending through said slots for holding the liner in place while allowing a back and forth movement thereof, a pair of wedges coacting with said liner for shifting the liner and means for moving each of said wedges in an arc.

5 5. In a device of the character described, a liner plate for driving boxes of locomotives, a pair of wedges positioned to engage the rear face of said liner plate, and longitudinally movable screws acting independently on said wedges for moving each of the wedges independently in a direction to cause the wedges to move said liner plate in a direction longitudinally of the axis of the plate, each of said screws moving at a tangent to the movement of the wedges.

15 6. In a device of the character described, a liner, a wedge arranged adjacent each edge, each of said wedges having an inclined bearing surface, and a screw coacting with each wedge for moving the wedges substantially in an arc, each of said screws having a head, an end and a restricted neck adjacent the head, each of said wedges having an apertured projection on its rear face for receiving said necks for connecting the screws with the wedges, so that the rotation of the screws will not interfere with the movement of the wedges.

25 7. In a device of the character described, a liner, a wedge for shifting said liner, said wedge having a flat surface engaging with the liner, and an inclined surface on the opposite side, said opposite side being also formed with a socket having an opening at the top and one side, and a screw for actuating said wedge, said screw having a neck at one end merging into an enlarged head, said head being adapted to fit into said socket, while the neck extends through one of said openings.

40 8. In a device of the character described, the combination with a locomotive driving box having an inclined groove merging into a depression of a liner for said box, a wedge fitting into said groove, said wedge being formed with a socket member extending into said depression, and a screw carried by said box formed with a head loosely fitting into said socket, whereby as said screw is operated said wedge will be moved for shifting said liner longitudinally of the bore of said box.

55 9. In an end play liner for locomotive driving boxes, the combination with a driving box provided with a pair of inclined grooves, each groove having a depression substantially centrally thereof, of a liner plate fitted against the end of the box, a liner wedge arranged in each of said grooves, each of said wedges having an extending portion forming a socket, said extending portion fitting into said depressions and a screw for each wedge, each of said screws being fitted into a threaded

bore in said driving box, each screw having a head loosely fitting into said socket, whereby as said screws are rotated said wedges are shifted for shifting the liner longitudinally of the bore of the box.

10. The combination with the driving box of a locomotive, of a liner loosely mounted on said box, said liner having a pair of slots at the bottom extending substantially vertically, and a pair of apertures near the top extending substantially horizontally, a bolt extending through the first-mentioned slot to clamp the lower part of the liner in place, and a clamping member extending through each of said apertures for clamping the upper part of the liner in position, said slots, apertures and bolts being so positioned that when removed the liner may be removed.

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