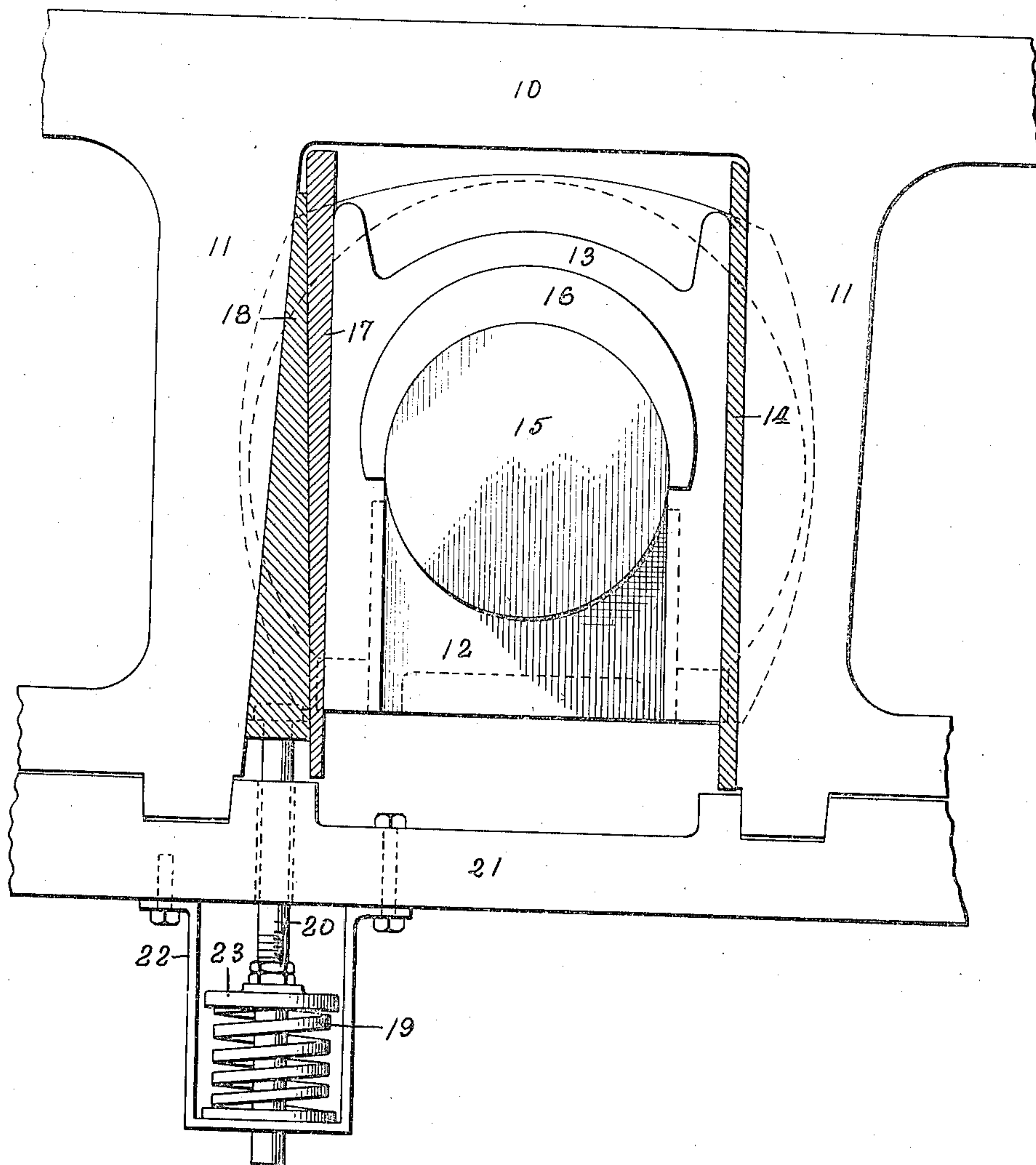


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AXLE BOX FOR VEHICLES.  
APPLICATION FILED SEPT. 10, 1909.

958,270.

Patented May 17, 1910.



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# UNITED STATES PATENT OFFICE.

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## AXLE-BOX FOR VEHICLES.

958,270.

Specification of Letters Patent.

Patented May 17, 1910.

Application filed September 10, 1909. Serial No. 517,168.

*To all whom it may concern:*

Be it known that I, JAMES E. McDANIEL, a citizen of the United States, residing at Columbia, in the county of Richland and State of South Carolina, have invented new and useful Improvements in Axle-Boxes for Vehicles, of which the following is a specification.

My invention relates generally to the journal boxes of vehicles, such journal boxes being sometimes so mounted as to permit quite a little vertical play of the box and shaft with respect to the frame in which the box is mounted.

My invention relates particularly to journal boxes for power vehicles, the embodiment which I have described herein having been designed especially for use as a driving box for a locomotive.

In locomotive construction it is the common practice to mount the driving boxes between a pair of parallel jaws forming a part of the locomotive frame. As thus mounted, the boxes are called pedestal bearings. Between each side of the box, which is usually made in two halves, and the adjacent jaw or side of the frame is placed a wearing plate for taking up the wear which would otherwise take place between the sides of the box and the jaws. By this provision wear on the box proper during the play of the box between the jaws is prevented, thus avoiding the expense of renewing the boxes when their sides become worn, the side wearing plates being renewed instead. Another advantage of the use of the side plates rests in the fact that they may be made of anti-friction metal, thus securing a free and easy play of the box. In the use of these wearing plates, however, it has been found that unless inspectors keep close watch upon the boxes and renew the wearing plates as soon as excessive lost motion exists, the box oscillates from side to side of the jaws in its vertical movement and in the forward and reverse movements of the locomotive, thus causing a very rapid wear of the plates, which soon results in such a pounding of the box within the frame that the parts of the box are disarranged with respect to each other and to the shaft. What most frequently happens is that the crown plate between the shaft and the upper half of the box on which the weight of the locomotive rests, is jarred from its place and drops out,

thus letting the weight down on the upper half of the box or else throwing all the weight on the balance of the driving boxes which, owing to this extra weight and the pounding caused by the defective journal box, are themselves liable to be injured. More than one accident has been caused by just such a defective driving box as above described, as the pounding may break some part of the engine in case the locomotive is not stopped at once. Various arrangements of the journal box and combinations of the journal box with the wearing plates and jaws have been devised to obviate this trouble. Certain automatic devices have also been used in connection with the box to effect an automatic taking up of the wear of the plates, but so far as I am aware none of these have been satisfactory, and only a few have been effectual in any degree.

In one form of automatic device with which I am acquainted use is made of a wearing plate on one side of the box in the form of a wedge, which is spring pressed to its seat between the side of the box and face of the jaw. As the box moves up and down due to the passage of the engine over rough sections of track, the wearing plate follows it being pressed closely to its seat and all wear being automatically taken up by the spring behind it. Such a device is quite effectual in automatically taking up the wear and preventing lateral play between the sides of the box and the jaws. But it has been found in practice that this wedge shaped plate owing to imperfect lubrication between the side of the box and the plate will sometimes jam hard and fast between the side of the box and the adjacent face of the jaw. The result is either that the wedge is moved solely by its engagement with the side of the box, then acting as a simple wearing plate, or else that the wedge is so jammed between the side of the box and the face of the jaw that the box is fixed rigidly in position and cannot move. Both of these conditions are highly objectionable, and the box is as bad or worse than if the wedge shaped plate had not been used. When the wedge jams firmly between the side of the box and the face of the jaw, the condition is that of a box fixed in place, no vertical travel of the box between the pedestals and jaws being possible. That this is very damaging to the engine is evident, the parts of



the engine connected to the shaft being rapidly thrown out of alinement, and the effect of the equalizers destroyed.

The object of my invention is to overcome this difficulty with a box provided with the automatic wedge adjustment. I have invented a very simple means for use in connection with the spring pressed wedge, which overcomes the difficulty entirely. If instead of forming one of the wearing plates as a wedge, and using this plate alone, this plate is formed as a wedge and in addition, a wedge is used between this plate and the face of the jaw, spring pressure being applied to this latter wedge, I have found that entirely satisfactory results may be obtained. The reason for this is that the jamming and sticking together of the parts is avoided. To this end the wedge shaped wearing plate is preferably, though not necessarily, given a special form.

My invention will be readily understood by the following description, taken in connection with the accompanying sheet of drawings, which illustrates my invention as applied to a locomotive driving box, the view shown being a transverse section, showing all the parts in their relative positions.

Referring to the drawings 10 is the pedestal, depending from which are jaws 11. The driving box made up of a lower half 12 and the upper half 13 is located between the jaws 11 and surrounds the driving shaft 15.

16 is the usual crown plate, which takes up the wear caused by the weight of the locomotive through the equalizers on the upper half of the box.

14 is a wearing plate provided between one side of the driving box and the adjacent jaw 11. In boxes as usually constructed there are two of these wearing plates, one on each side. On the opposite side of my driving box, however, are the two wedge shaped members 17 and 18, which are reversely tapered with respect to each other. The member 17 is the wearing plate corresponding to the plate 16 on the opposite side of the box, but the member 18 is spring pressed to its seat between the plate 17 and the face of the jaw 11, the face of the jaw being tapered as shown in order to secure a more efficient wedging action, there being less danger of a sticking of the wedge when this face is tapered.

19 is a spring acting on the member 18 through the intermediary of a rod 20, which passes through the yoke 21 connecting the jaws 11 together and is swiveled to the bottom of the member 18. The spring is confined between the yoke 21 and an adjustable abutment 23 on the rod 20. As thus described, except for the gravity wedge or plate 17 the arrangement is that previously described in pointing out the defects of the

arrangement. With the elements as I have described them, the gravity wedge 17 acting in connection with the spring pressed wedge 18 there is an improvement in the operation, the parts being less likely to stick together as the box moves up and down between the jaws, because there are two lubricated surfaces instead of one, as heretofore, one of these surfaces being between the member 17 and the side of the box, and the other being between the member 17 and the member 18. If the side of the box stuck to the member 17 the wedge 18 would still be free to perform its function, and if the member 17 stuck to the wedge 18 they would act in conjunction as a wedge between the side of the box and the tapered face of the adjacent jaw 11. There is thus secured a much increased reliability. But by the simple expedient of making the wedge shaped plate member 18 of a length less than the distance between the top and bottom of the jaws, I have found that most reliable automatic adjustment can be had. It will be noted that the wedge-shaped gravity plate 17 terminates short of the yoke 21, and also short of the pedestal 10, above the driving box, thus when the driving box is carried upward as the driving wheel passes over a high place in the track the plate 17 is carried with it for a short distance until its upper end comes into contact with the pedestal 10. It is thus in effect drawn away from the wedge member 18, which, while it follows closely with its surfaces in contact, is prevented from making as firm a contact as might otherwise be the case. When the boxes are moved down again by the shaft, the lower end of the gravity wedge 17 strikes the yoke 21 and the member 17 is held stationary while the box moves downward. There is thus little tendency to jam the parts, and even should there be a slight jamming or sticking of the parts together the downward movement of the box on the one hand and the pedestal and wedge 18 on the other, causes an impingement of the lower end of the wedge plate 17 on the yoke 21 resulting in a loosening of the parts due to the fact that the gravity wedge 17 has been in effect knocked loose. In actual use this takes place continually when the engine passes over rough places, and the parts are thus kept in relative motion and work freely upon each other. The greatest liability to stick exists between the gravity wedge 17 and the side of the box, there being greater relative movement between these surfaces than between the wedge 18 and the gravity wedge. The fact that this sticking is prevented by the striking of the gravity wedge 17 against the top and bottom of the jaws greatly increases the efficiency of my arrangement. It is thus apparent that I have overcome the difficulties above enumerated.



ated, and produced an automatic adjustment for a driving box, which is free from the trouble heretofore experienced, and operates in a most satisfactory manner.

5 While I have described the best form of my invention now known to me, it is obvious that it may be given other forms without departing from its generic spirit, for instance, by a suitable modification my invention can be applied to a sliding journal box for use with machines of many types and power vehicles of all descriptions. Also it is evident that I may provide a different arrangement of springs, that I may use 10 means for yieldingly pressing the wedge into its socket other than a spring, and that I may provide abutments for engaging the gravity wedge which are different from the pedestal 10 and the yoke 21. All of such 20 modifications which do not depart from the generic spirit of my invention, I desire to cover by the annexed claims.

What I claim and desire to secure by Letters Patent is:

25 1. In combination with an axle box and a frame in which said box is slidably mounted, two wedges acting upon one another located between one side of said box and the adjacent frame, one of said wedges being 30 yieldingly pressed into engagement with the other.

2. In combination with an axle box for power vehicles, and a frame in which said box is slidably mounted, two wedges tapering in opposite directions and engaging one another, located between one side of said box and said frame, one of said wedges being yieldingly pressed into engagement with the other.

40 3. In combination with an axle box for power vehicles and a frame in which said box is slidably mounted, a wedge shaped plate between one side of said box and the adjacent face of said frame, and a yielding 45 wedge located between the said plate and said frame.

4. In combination with an axle box for power vehicles and a frame in which said box is slidably mounted, a wedge shaped 50 plate between one side of said box and the adjacent face of said frame, and a spring pressed wedge located between the said plate and said frame.

5. In combination with an axle box for power vehicles and a pair of jaws between 55 which said box is slidably mounted, a wedge shaped plate between one side of said box and the adjacent face of one of said jaws, and a wedge located between said plate and said frame, said wedge being yieldingly 60 pressed into position at all times.

6. In combination with a bearing box and a frame in which said box is slidably mounted, abutments above and below said box on said frame, a wedge shaped plate on one side 65 of said box between said box and said frame, said plate being of a length less than the distance between said abutments, and a yieldingly pressed wedge engaging said plate. 70

7. In combination with an axle box for power vehicles and a pair of jaws between which said box is slidably mounted, a wedge shaped wearing plate on one side of said box, said wearing plate being of a length 75 less than the depth of said jaws, and a yieldingly pressed wedge engaging said plate.

8. In combination with an axle box for locomotives and the pedestal jaws between which said box is slidably mounted, a wear- 80 ing plate on one side of said box between said box and one of said jaws, a wedge shaped wearing plate on the other side of said box, a spring pressed wedge engaging said plate, a yoke closing the mouth of said 85 jaws, a rod for actuating said wedge passing through said yoke, and a spring confined between an abutment on said rod and an abutment on said yoke.

9. In combination with a bearing box, 90 and a frame in which said box is slidably mounted, a wearing plate which has a limited vertical play on one side of said box, abutments on the frame which limit the vertical play of the said plate, and a take-up 95 member cooperating with said plate to prevent lateral lost motion between the box and the sides of the frame.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses. 100

JAMES E. McDANIEL.

Witnesses:

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ARTHUR W. HAMBY.