No. 872,014. PATENTED NOV. 26, 1907.

W. G. PRICE.

BOLSTER SWING DAMPER.

APPLICATION FILED AUG. 18, 1906.

FIG. 1

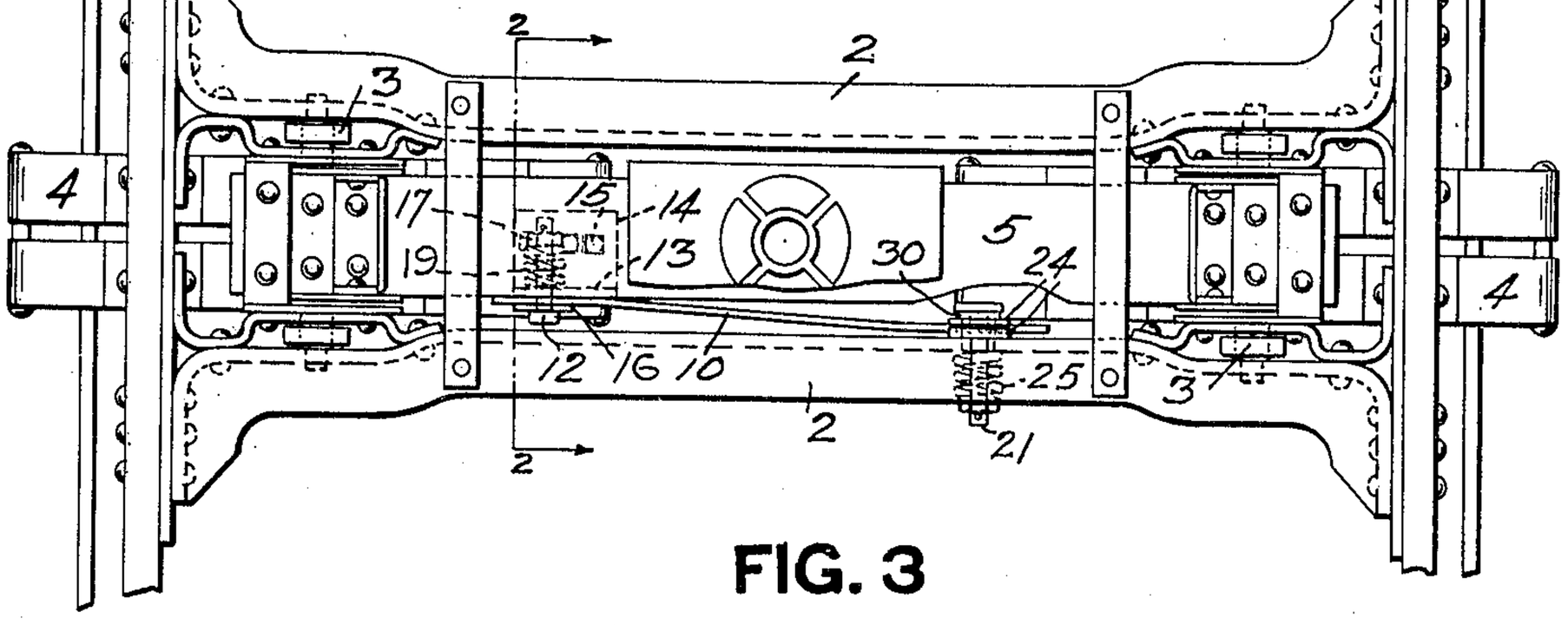

FIG. 3

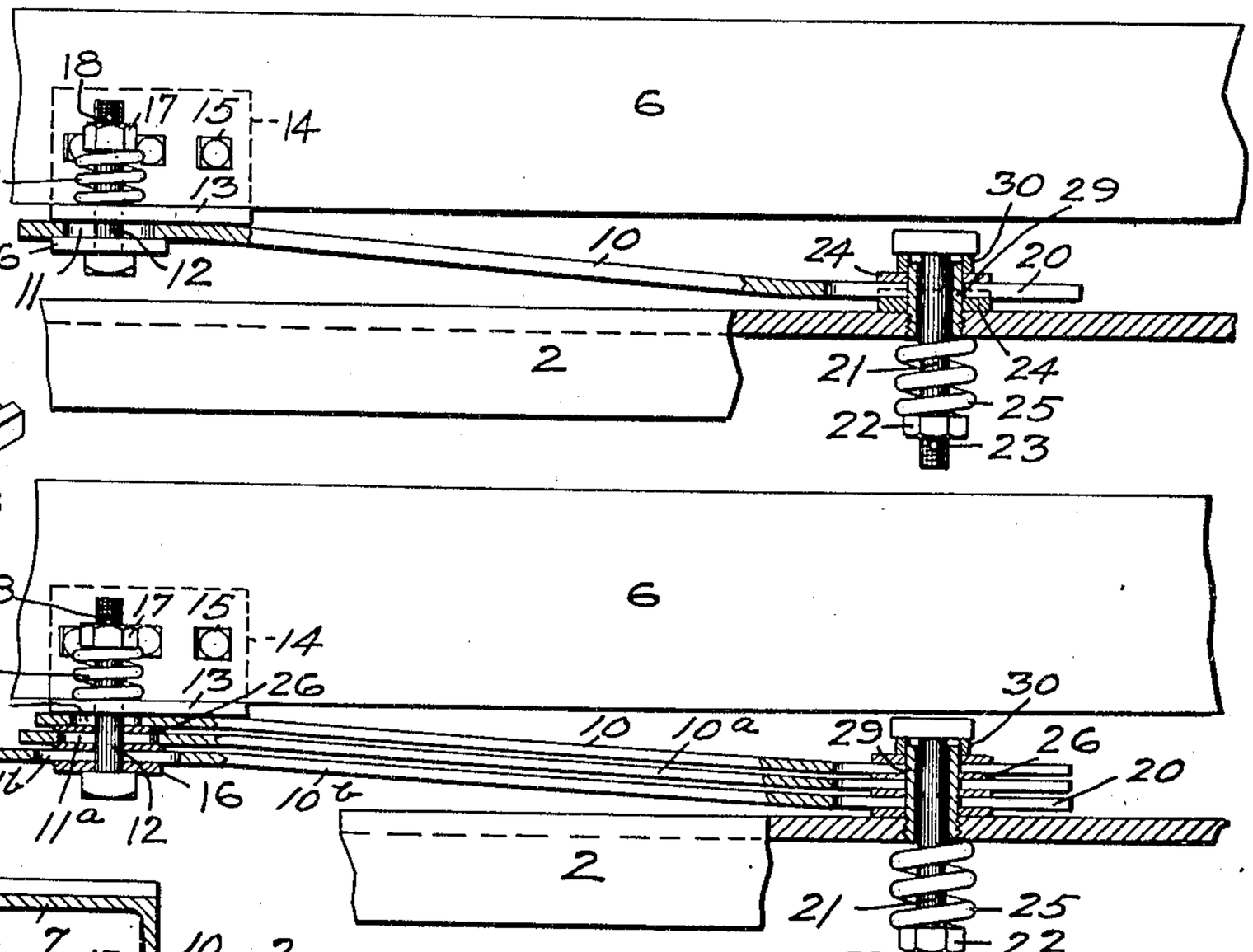

FIG. 6

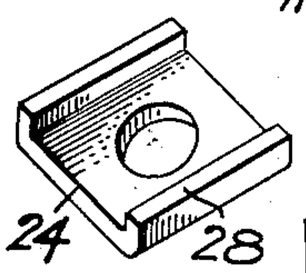

FIG. 2

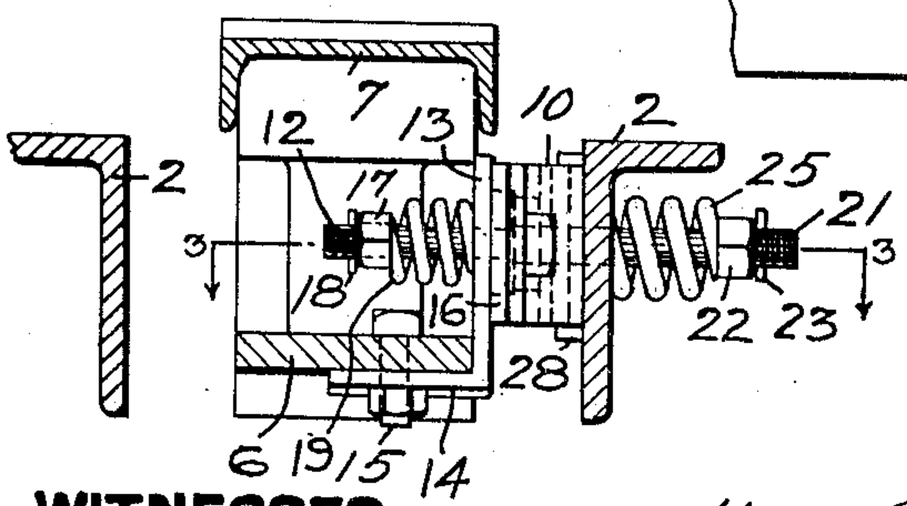

FIG. 4

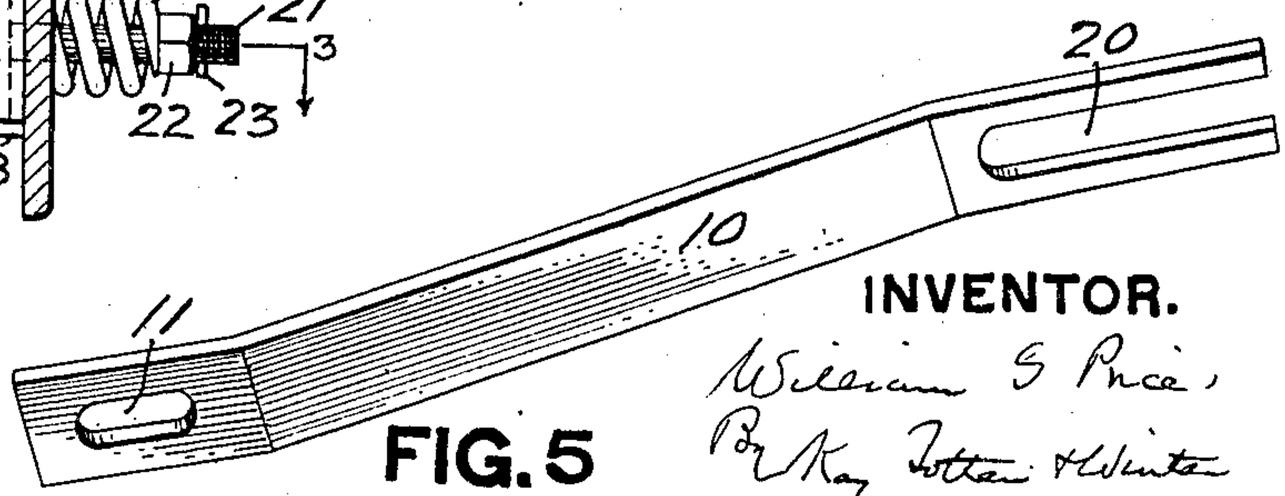

FIG. 5

WITNESSES.

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WILLIAM G. PRICE, OF NEW CASTLE, PENNSYLVANIA.

BOLSTER SWING-DAMPER.

No. 872,014. Specification of Letters Patent. Patented Nov. 26, 1907.

Application filed August 18, 1906. Serial No. 331,137.

To all whom it may concern:

Be it known that I, WILLIAM G. PRICE, a resident of New Castle, in the county of Lawrence and State of Pennsylvania, have invented a new and useful Improvement in Bolster Swing-Dampers, (Case 1;) and I do hereby declare the following to be a full, clear, and exact description thereof.

This invention relates to railway trucks, and more especially to electric motor trucks for street railway and similar service.

The object of the invention is to provide means for damping or checking the endwise movement of swinging bolsters such as are ordinarily used in trucks of this type, in order to provide an easy riding truck.

On most motor trucks the bolsters supporting the car body are mounted to have both a vertical and end-wise movement in the truck frame, this being accomplished in various ways, principally by supporting the bolster upon elliptic springs held by so-called bolster hangers, which swing to permit endwise movement of the bolsters, so as not to give too sudden movements to the car body when rounding curves, on rough track, and the like. If the bolster has too much endwise swing it will strike against the side frames, thus causing a blow which is disagreeable to the passengers. Consequently, it has heretofore been the practice to provide means which checks the swinging movement of the bolster before it strikes the side frames, such checking means being generally referred to as "damping" means.

It is highly desirable that only slight impulses on the part of the bolster to move endwise should not be restricted, or at least only restricted to a very slight extent so as to give an easy riding truck, but that tendencies of the bolster to swing to a greater extent should be restricted, and the resistance should keep on increasing as the bolster continues to swing outwardly.

The special object of this invention is to provide bolster swing damping means which attains the object just stated, namely, to give a free or only slightly impeded swinging movement to the bolster through small amplitudes, but to give an automatically increasing resistance as the bolster continues to swing outwardly. This object is accomplished by the arrangement of friction mechanism hereinafter described and claimed.

In the accompanying drawings Figure 1 is a plan view of a portion of a truck frame and bolster provided with my invention; Fig. 2 is a transverse section on the line 2—2 Fig. 1; Fig. 3 is a horizontal section on the line 3—3 Fig. 2; Fig. 4 is a similar view showing a modification; Fig. 5 is a perspective view of the friction plate; and Fig. 6 is a perspective view of one of the washers.

The truck frame may be of any suitable type, that shown having side frames connected by transoms 2 which are shown as sections of angle bar. The frame is provided with bolster hangers 3 carrying elliptic springs 4 upon which the bolster 5 rests. It is obvious that this manner of mounting the bolster permits the same to move both vertically by compression of the springs, and end-wise by the swinging of the hangers. This type of bolster is known in the trade as a swing bolster. The bolster may be of any desired type, that shown being a truss having a bottom chord 6 and top chord 7.

My improved friction mechanism includes a plate or plates having one end in frictional engagement with the bolster and its opposite end in frictional engagement with the frame, preferably the transom, said frictional engagement being automatically adjustable. In Figs. 1 to 6 this friction mechanism is shown as a single plate 10 arranged in the space between the bolster and the transom and extending longitudinally of the bolster. At one end the plate is provided with a short slot 11 through which passes a bolt 12, which extends through the vertical up-turned portion 13 of a plate 14 secured to the bottom member 6 of the bolster by means of bolts 15. Interposed between the plate 10 and head of the bolt 12 is a washer 16. The inner end of the bolt is provided with a nut 17 and cotter pin 18, and between the nut and the upturned portion 13 of the plate is a spiral spring 19 which is normally under compression and acts to yieldingly draw the bolt inwardly so that the plate 10 is frictionally held between the upturned plate 13 and washer 16. The opposite end of the plate is provided with a long slot 20, preferably opening on the end of the plate so as to facilitate removal and replacement, through which slot passes a bolt 21 which also extends through an opening in the transom 2 and having on its inner end a nut 22 and cotter pin 23. Washers 24 are placed on the bolt 21 on both sides of the plate 10. Sur-

rounding the bolt between its nut 22 and the transom 2 is the spiral spring 25 which is normally under compression and which serves to frictionally clamp the plate 10 between the washers 24. Preferably the spring 25 will be stronger than the spring 19 so that a greater friction is exerted on the outer than on the inner end of the plate 10.

When the bolster begins to move end-wise the plate 13, bolt 12 and washer 16 are necessarily carried with it. Consequently this end-wise movement of the bolster is resisted by the friction between the plate 10 and the washer 16 on one side and plate 13 on the other. The amount of this friction can be adjusted by adjusting the nut 17 on the bolt 12, and can be made as light as desirable so as to give only a slight damping effect on the initial swinging movements of the bolster. As soon, however, as the swinging movement of the bolster has reached such an amplitude that the bolt 12 reaches the end of the slot 11, the plate 10 is carried with the bolster, thus utilizing the friction at the outer end of said plate, between it and the washers 24, for checking or damping this endwise movement, and as the friction here is much greater than at the inner end of the plate, due to the greater strength of the spring 25, there is a proportionately greater resistance to the end-wise movement of the bolster as it swings outwardly, thus checking said outward movement before the bolster strikes the side frame. The friction device therefore gives the desirable result of a very light resistance to only slight endwise movements of the bolster, with increasing resistance to greater end-wise movements of the bolster.

By using a number of plates side by side as shown at 10, 10^a and 10^b, Fig. 4, with washers 26 interposed between the plates, said plates being secured by means of the same bolts as above described, but having slots 11 of different lengths as indicated at 11, 11^a and 11^b, it is obvious that a number of increases of friction may be obtained for a very long swing of the bolster. The beginning of the swing is resisted merely by the friction at the inner ends of the plates, but as the swing continues to go outwardly the plate 10 having the slot 11 is first caused to move, and if the swing still continues the plates 10^a and 10^b are successively brought into motion, thus getting successively increasing friction at the outer ends of the plates as will be obvious.

By means of the friction mechanism described I obtain a variable resistance to the movement of the bolster endwise, but comparatively small resistance to the movement of the bolster vertically. The plate 10 is so long that the bolster has a long leverage, which readily overcomes the rotary friction at the bolts 12 and 21, which arises when the bolster movements are vertical. Should the bolster from any cause be given a rotary movement on its longitudinal axis, the springs 19 and 25 yield sufficiently to permit the plate 10 to separate the washers and thus prevent said plate from becoming twisted.

To prevent wear on the bolt 21 I prefer to turn the upper and lower edges of one of the washers 24 inwardly as shown at 28. The plate 10 rides on one of these flanges and hence does not rub against the bolt. As a further precaution the bolt may be surrounded by a sleeve 29, shown as a short pipe section screwed into the transom. A collar 30 surrounds the outer end of this sleeve and transmits the pressure of the bolt head to the washer 24.

What I claim is:

1. In a car truck, the combination of the truck frame, a bolster mounted therein for both vertical and endwise movement, and friction mechanism between the bolster and truck frame and arranged to resist endwise movement of the bolster with increasing force as the bolster moves outwardly.

2. In a car truck, the combination of the truck frame, a bolster mounted therein for both vertical and endwise movement, and friction mechanism between the bolster and truck frame and arranged to automatically provide increasing friction as the bolster moves outwardly.

3. In a car truck, the combination of a truck frame including transoms, a bolster mounted between the transoms for both vertical and endwise movement, and friction mechanism between the transom and bolster and arranged to give automatically increasing friction as the bolster moves outwardly.

4. In a car truck, the combination of the transoms, a bolster mounted between the transoms for both vertical and endwise movement, and a friction plate having at one end frictional connection to the bolster and at its opposite end frictional connection to the transom.

5. In a car truck, the combination of a truck frame, a bolster mounted therein for both vertical and endwise movement, a friction plate having an adjustable frictional connection at one end of the bolster and an adjustable frictional connection at its opposite end to the frame.

6. In a car truck, the combination of a truck frame, a bolster mounted therein for endwise movement, a plate having a limited frictional sliding connection with the bolster and having its opposite end in frictional engagement with the frame.

7. In a car truck, the combination of a frame, a bolster mounted therein for endwise movement, a friction plate connected to the bolster by a slot and pin, and having a frictional sliding engagement at its opposite end with the frame.

8. In a car truck, the combination of a

frame, a bolster mounted therein for endwise movement, a plate having a slot and bolt connection with the bolster, a washer on the bolt bearing against the plate, a spring on the bolt for pressing the washer and plate together, and the opposite end of said plate having a frictional sliding connection with the frame.

9. In a car truck, the combination of a frame, a bolster mounted therein for endwise movement, a friction plate having a limited sliding frictional engagement with the bolster, the opposite end of the plate having a slot and bolt connection with the frame, and a spring surrounding the bolt for pressing the plate against the frame.

10. In a car truck, the combination of a frame, a bolster mounted therein for endwise movement, a friction plate having a slot and bolt connection with the bolster at one end, a spring surrounding the bolt for frictionally pressing the plate against the bolster, said plate at its opposite end having a slot and bolt connection with the frame, and a spring surrounding the bolt for frictionally pressing the plate against the frame.

11. In a car truck, the combination of a frame, a bolster mounted therein for endwise movement, a friction plate engaging the bolster, the opposite end of the plate having a slot and bolt connection with the frame, a sleeve surrounding the bolt, and a spring arranged to press the plate against the frame.

12. In a car truck, the combinatino of a frame, a bolster mounted therein for endwise movement, a friction plate engaging the bolster and having a slot and bolt connection with the frame, a washer on the bolt having flanges on its edges to support and guide the plate, and a spring arranged to press the plate against the frame.

In testimony whereof, I, the said WILLIAM G. PRICE, have hereunto set my hand.

WILLIAM G. PRICE.

Witnesses:
M. D. VOGEL,
F. W. WINTER.