H. M. PFLAGER.

FRICTION DRAFT GEAR FOR RAILROAD CARS.

APPLICATION FILED AUG. 27, 1906.

999,252.

Patented Aug. 1, 1911.

2 SHEETS—SHEET 1.

Fig. 1.

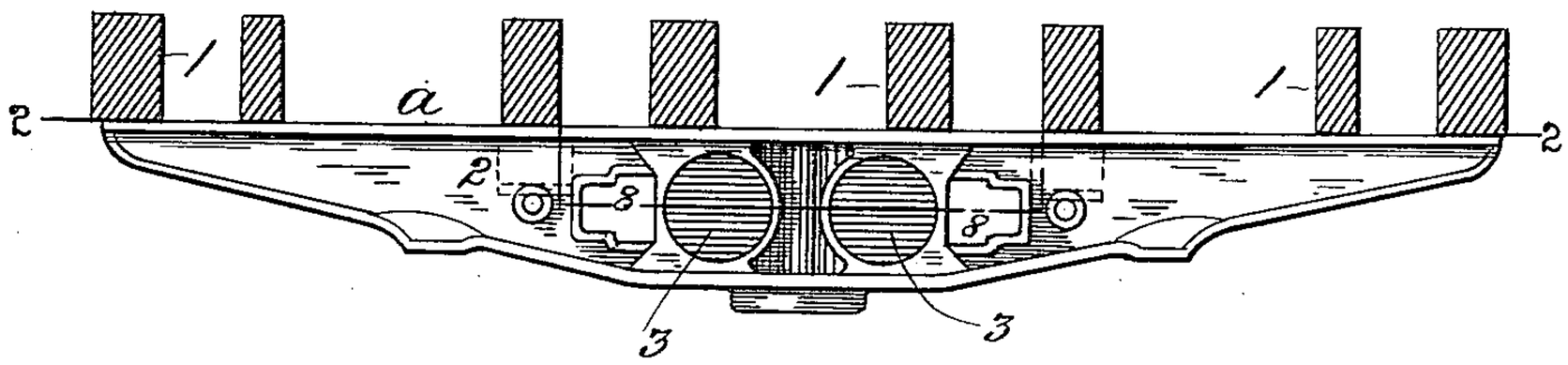


Fig. 2.

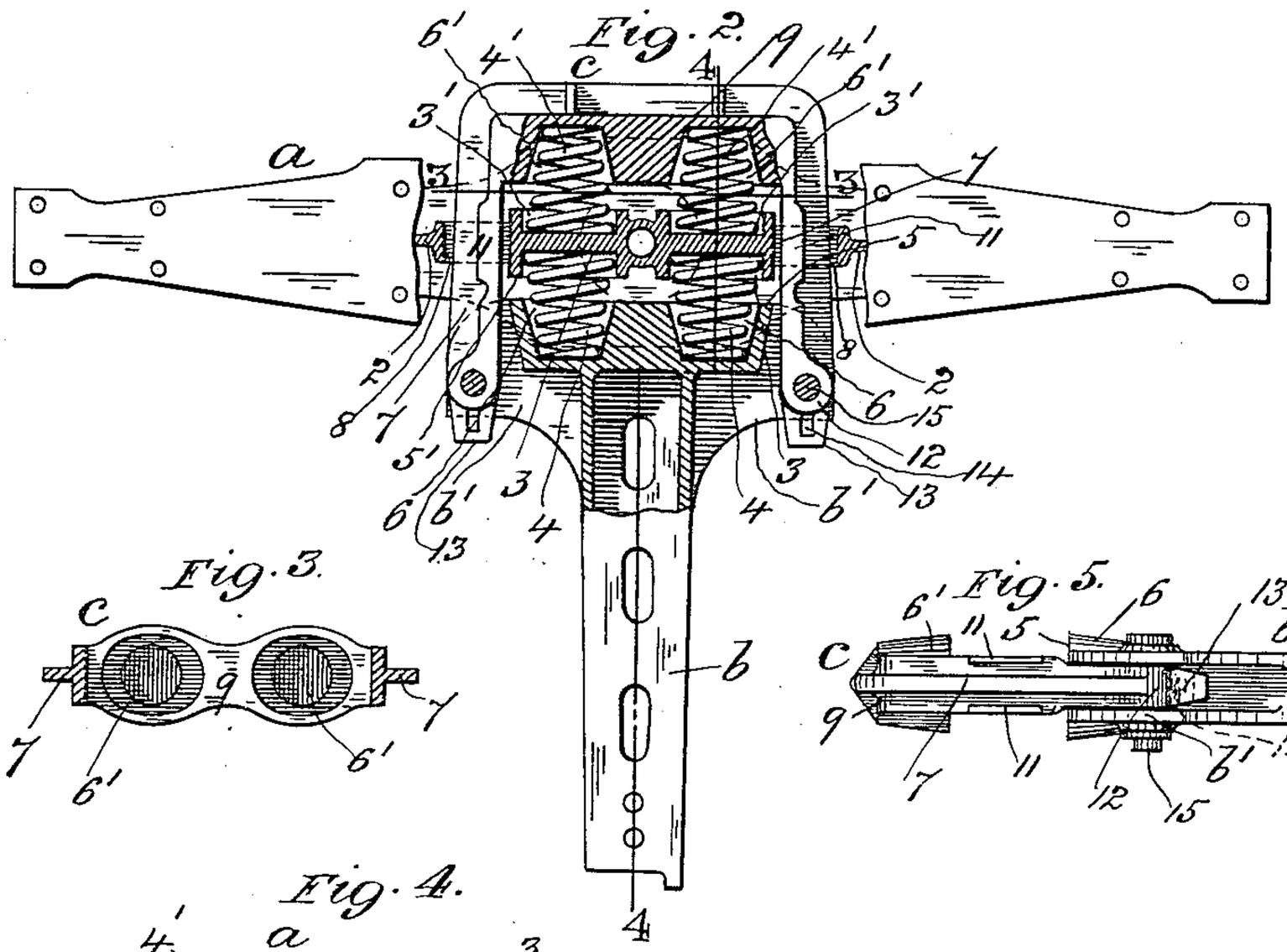


Fig. 3.

Fig. 5.

Fig. 4.

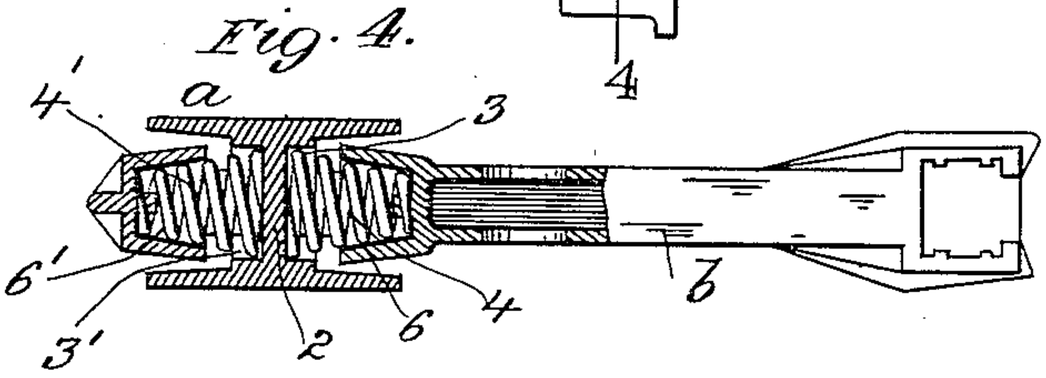
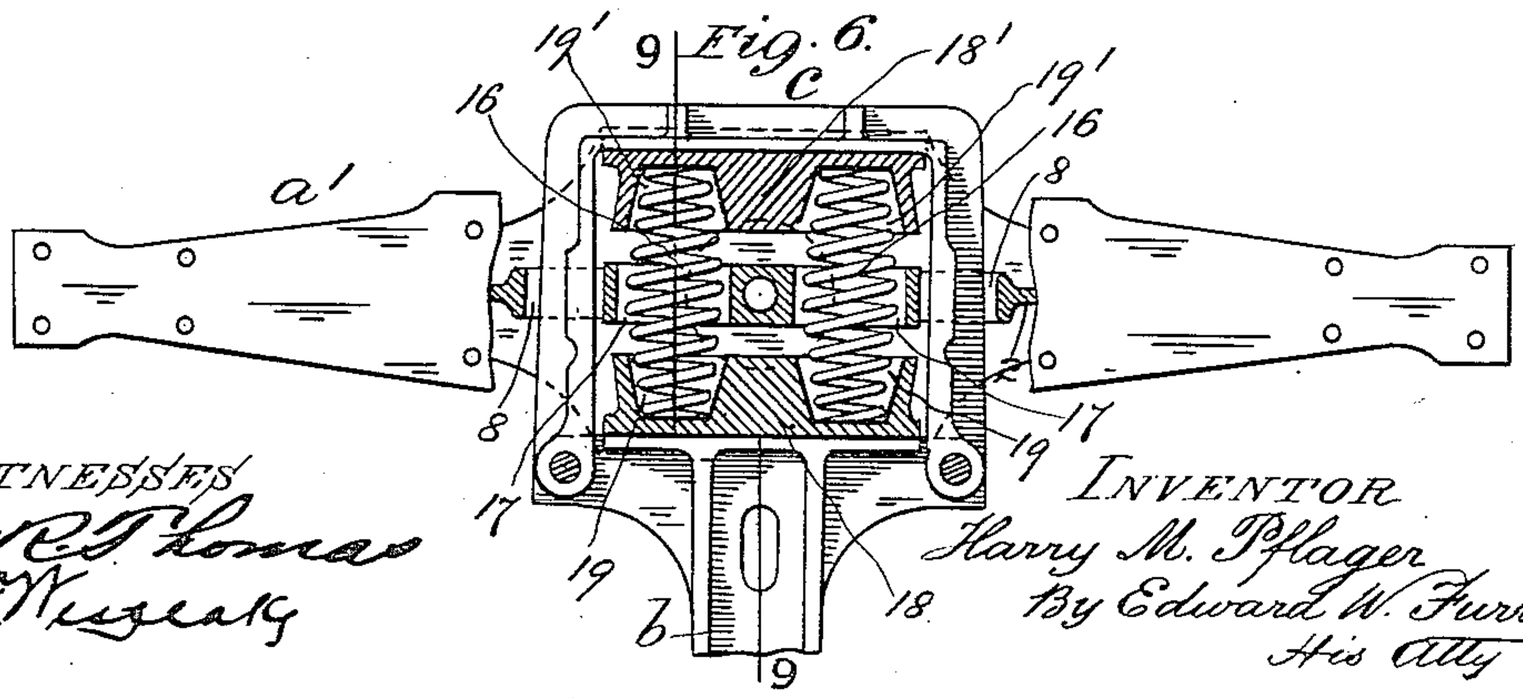


Fig. 6.



WITNESSES

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2 SHEETS—SHEET 2.

Fig. 7.

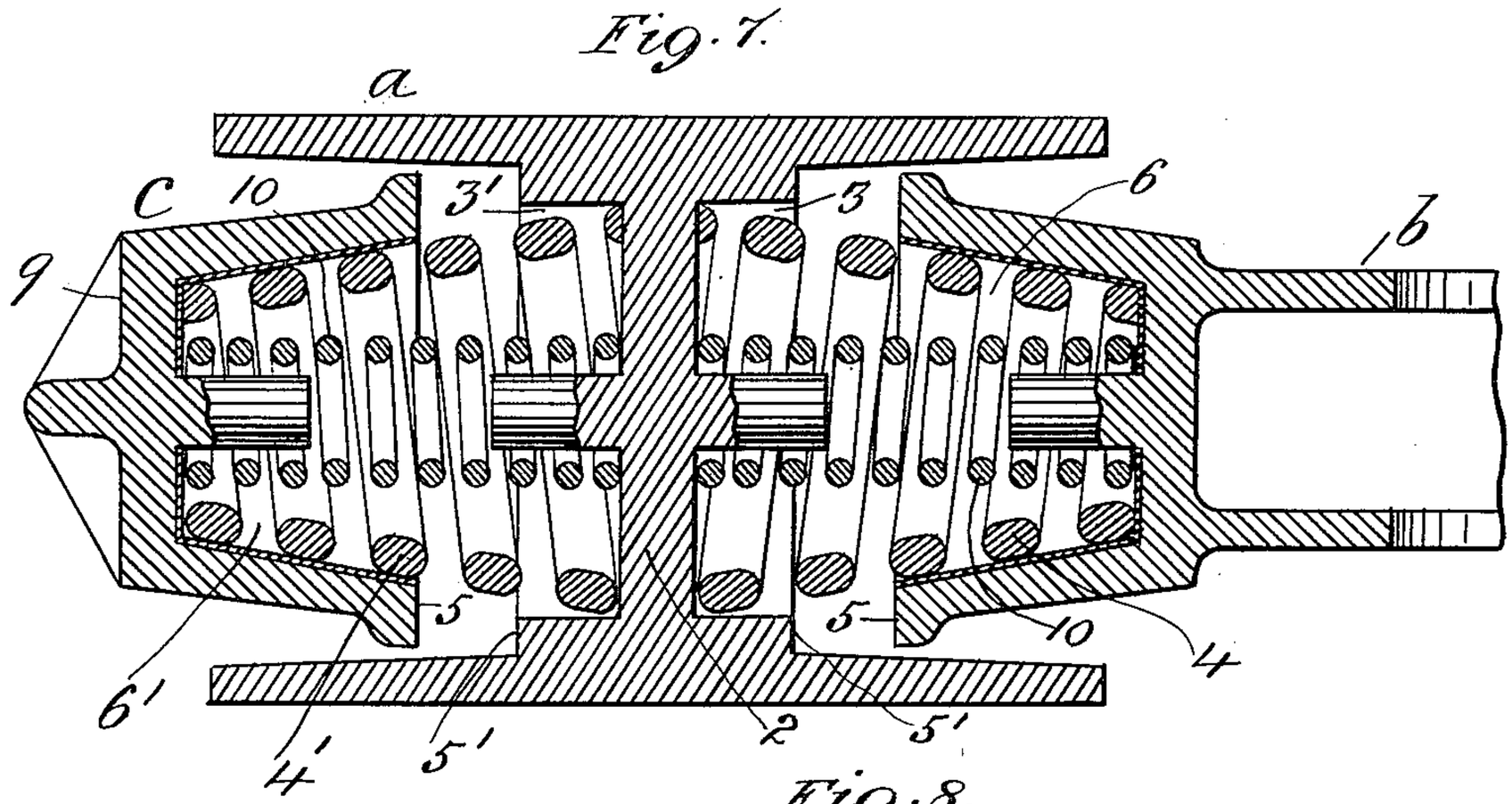


Fig. 8.

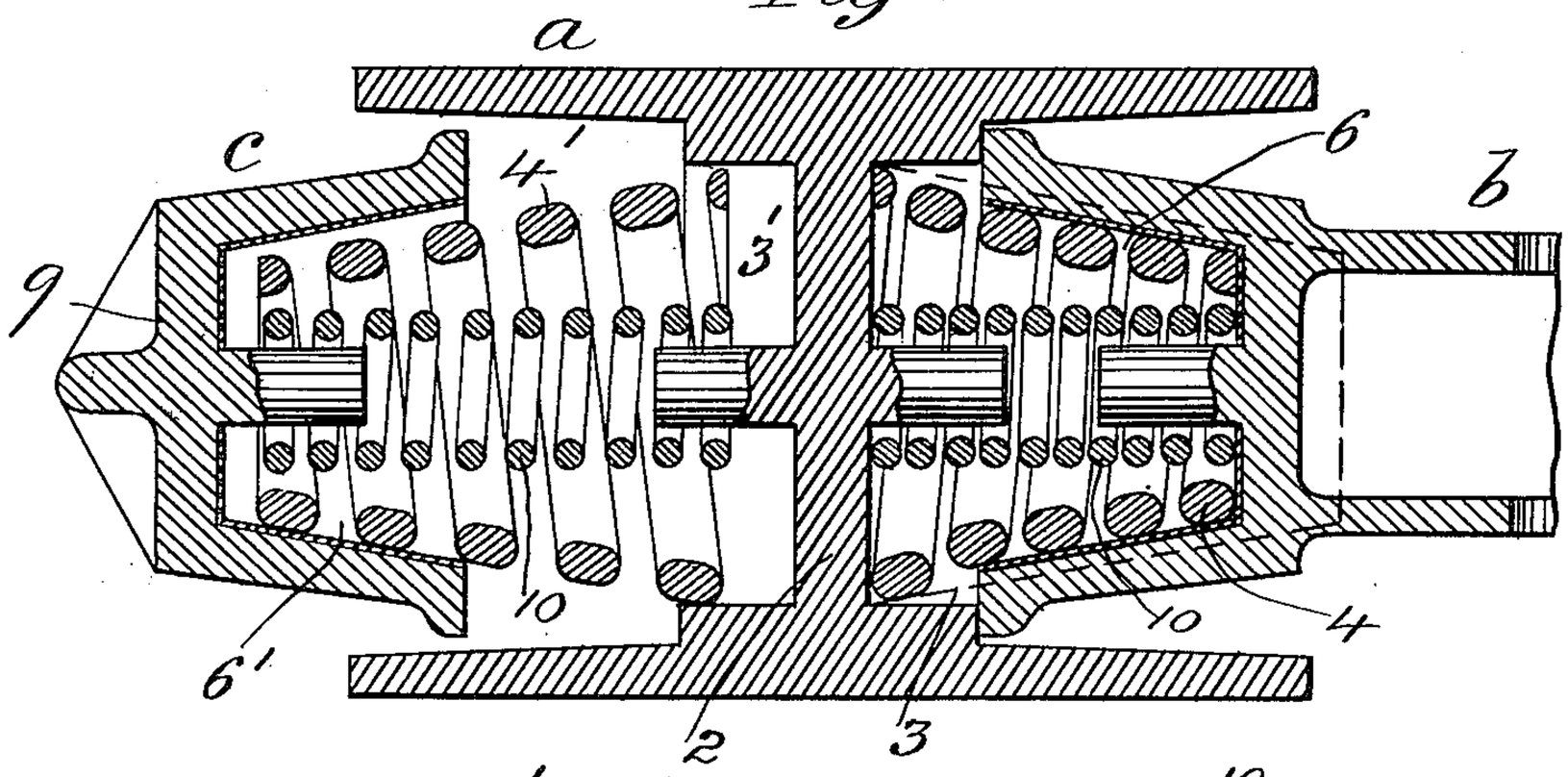
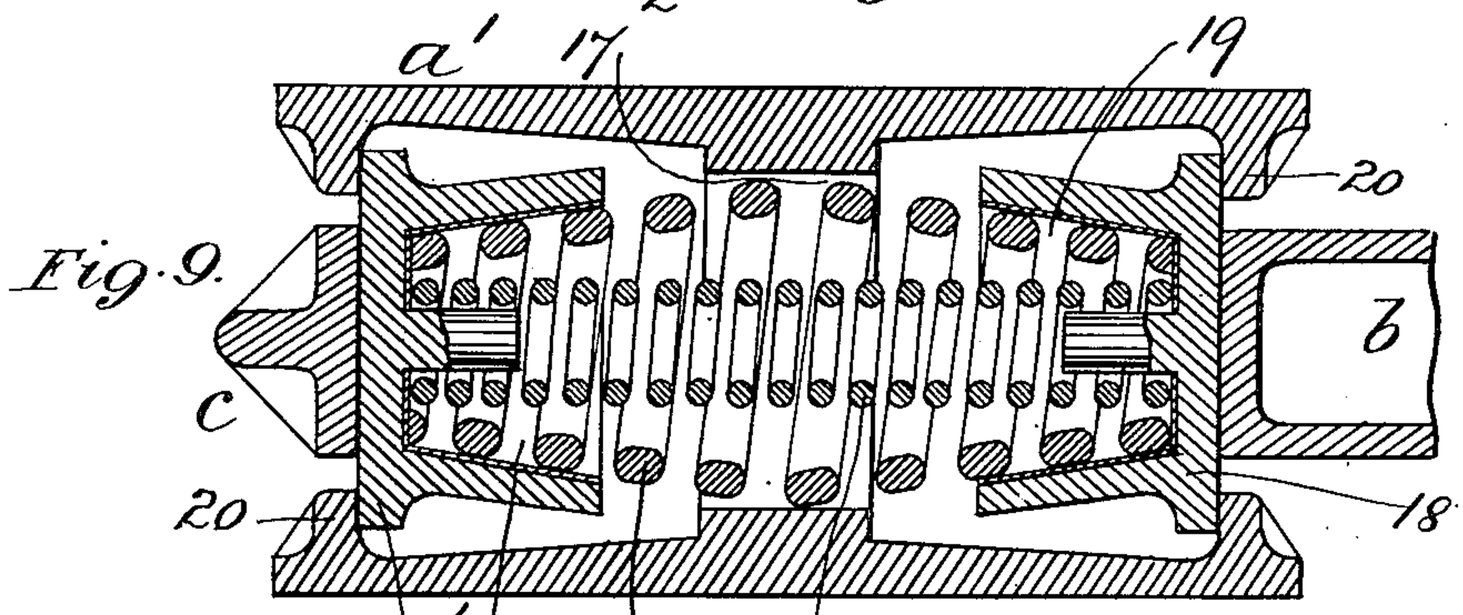


Fig. 9.



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FRICTION DRAFT-GEAR FOR RAILROAD-CARS.

999,252. Specification of Letters Patent. Patented Aug. 1, 1911.

Application filed August 27, 1906. Serial No. 332,215.

To all whom it may concern:

Be it known that I, HARRY M. PFLAGER, a citizen of the United States, residing at St. Louis, in the State of Missouri, have invented a new and useful Improvement in Friction Draft-Gear for Railroad-Cars, of which the following is a specification.

My invention relates to that class of draft-gear commonly known as "friction draft-gear" in which the compressive resistance of springs is supplemented by frictional resistance, and is particularly applicable to the draft-gear of a railroad car having springs and follower-plates operated by a draw-bar and yoke, and arranged within a housing therefor fixed between the ordinary draft-timbers, or directly to the longitudinal sills of the car, my invention in the present case being specially adapted to the self centering draft-gear described in the Letters Patent of the United States granted to me October 18, 1904, No. 772,370, and January 23, 1906, No. 810,805, for an improvement in draft-gear for railroad cars, in which the springs are arranged in the same horizontal plane at each side of the longitudinal center-line of the car, and have their housings in openings formed transversely through the body-bolster, combined with follower-plates and operated by the draw-bar extension and yoke, or with the housings for the springs formed in each side of the body-bolster, and in the draw-bar and yoke respectively without follower-plates as the case may be.

My invention has for its object to produce a simple, strong, compact, and effective combined spring and friction draft-gear by which resistance to the "buffing" and "pulling" strains respectively is gradually increased, the longitudinal play of the draw-bar reduced, and the recoil of the springs retarded.

It consists in features of novelty as hereinafter described and claimed, reference being had to the accompanying drawing forming part of this specification, whereon,

Figure 1, is a side elevation of a car body-bolster analogous to that described in my said Letters Patent, and specially adapted to my improved combined spring and friction draft-gear; Fig. 2, a horizontal section thereof on line 2—2 in Fig. 1, showing the improved draft-gear in its normal position applied thereto; Fig. 3, a vertical transverse section through the yoke forming part of my improved draft-gear, on line 3—3 in Fig. 2; Fig. 4, a vertical longitudinal section through the bolster and draft-gear on line 4—4 in Fig. 2; Fig. 5, a side elevation of the yoke seen in Figs. 2, 3, and 4, detached; Fig. 6, a horizontal section corresponding to Fig. 2, showing an alternative arrangement of the draft-gear; Fig. 7, a vertical longitudinal section to enlarged scale through the draft-gear corresponding to Fig. 4, showing the springs in their free or normal position; Fig. 8, a similar view to Fig. 7, showing the springs compressed on one side and free on the other side of the bolster in the "buffing" position of the draft-gear, and Fig. 9, a vertical longitudinal section to enlarged scale through the bolster and draft-gear on line 9—9 in Fig. 6.

Like letters and numerals of reference denote like parts in all the figures.

In my improved friction draft-gear, which is hereinafter described as preferably applied to the self-centering draft-gear for a railroad car described in my said Letters Patent of January 23, 1906, No. 810,805, *a* represents the car body-bolster, which in the present case is preferably made I-shaped in cross section of cast steel integral throughout, and secured to the car-sills 1, by bolts (not shown) in the usual well-known manner. In, or projecting from the front and rear sides respectively, of the upright web (or other analogous member) 2 of the bolster *a* at each side of the longitudinal center line of the car and in the same horizontal plane with each other, is formed a cylindrical pocket 3 3′ adapted to receive and form the bearing seat for preferably the diametrically large end of a conical spiral spring 4 4′, the springs 4 on the front side of the bolster *a* being arranged for "buffing" and the springs 4′ on the rear side of the bolster *a* for "pulling."

b is the draw-bar extension which is formed or provided at its inner end with a head *b*′ arranged horizontally across or T-wise thereto, with its outer face 5 opposite to the front side of the bolster *a*, the space or clearance between the face 5, and the face 5′ of the pockets 3 in the front side of the bolster *a* when the parts are assembled in the normal or free position of the draft-gear, being equal to the "buffing" play of the draw-bar extension *b*, the outer end of the latter having the usual head and coupler (not shown).

In the face 5 are formed two diametrically elliptical and longitudinally conical shaped pockets (similar to that seen in Fig. 3) or housings 6, which are arranged in the same horizontal plane, one on each side of the longitudinal center-line of the car, opposite to the pockets 3 in the front side of the bolster *a*, the small ends and adjacent longitudinal portions of the conical "buffing" springs 4 in the said position of the parts bearing respectively at opposite sides circumferentially against the corresponding diametrically small portions of the walls of the pockets 6 as seen in Fig. 4, and clear of the diametrically large portions of the pockets 6 as seen in Fig. 2. If desired the walls of the pockets 6 in lieu of being circumferentially continuous may be segmental.

To the ends of the head *b'* of the draw-bar extension *b* are pivoted the arms 7 of a yoke *c*, which is arranged in the same plane with the draw-bar extension *b*, the arms 7 being adapted to slide through openings 8 formed therefor transversely through the web 2 (or analogous member) of the bolster *a*.

On the inside of the bar 9 which connects the arms 7 of the yoke *c* together at the rear side of the bolster *a*, are formed or fixed two pockets or housings 6', which are arranged opposite to the pockets 3' in the rear side of the bolster *a*, and otherwise constructed and configured in the same manner as the pockets 6 before described, the pockets 6' in like manner receiving and forming the bottom bearing seats for the smaller ends and adjacent longitudinal portions of the conical draft-springs 4'.

In the operation of "buffing" the draw-bar extension *b* is pushed rearward and compresses the "buffing" springs 4 against the front side of the bolster *a* (or bottoms of the pockets 3) as seen in Fig. 8, and in so doing, owing to their close circumferential fit or bearing against the opposite diametrically small portions of the wall of the elliptical pockets 6, the normal angle of their taper relatively to the bearing seats of their large ends within the pockets 3, is reduced as indicated by the dotted lines in Fig. 8 which consequently causes the coils of the springs 4 within the pockets 6 to be frictionally forced by a gradually increasing pressure from their original diametrically circular form into that of an ellipse having its larger diameter, at the respective positions of the engaged coils, corresponding, or thereabout, to the large diameter of the pocket 6, whereby the resistance to the "buffing" strain is increased by an accumulative friction resistance which on the release of the "buffing" strain correspondingly resists the too sudden recoil of the springs 4. In the meantime the yoke *c* with its pockets or housings 6' recede from the draft-springs 4' which lie free within their housings 3' and 6'. When "pulling" on the draw-bar extension *b*, the operation described for the "buffing" springs 4 is repeated by the draft-springs 4' and the "buffing" springs 4 released from their "buffing" position by their recoil combined with that of the usual inner auxiliary springs 10.

It is here noted that if desired the relative positions of the cylindrical pockets 3 (3') and housings 6 (6') may obviously be reversed without departure from the principle of my invention, that is to say, the pockets 3 in lieu of being formed in the bolster *a*, as described may be formed on the inner end of the draw-bar extension *b*, *b'*, and the housings 6 on the bolster *a*, the springs 4 being reversed accordingly.

For maintaining the horizontal position of the draw-bar extension *b*, with its head *b'* and yoke *c* during their forward and rearward movements I preferably form each arm 7 of the yoke *c* with horizontal flanges 11 which bear against and ride between the corresponding sides of the openings 8 through the bolster *a* at all times. Furthermore, each arm 7 is preferably formed in front of its pivotal hub or connection 12 to the head *b'* of the draw-bar extension *b*, with a lug 13 having an upright keyway 14 therethrough immediately over and extending beyond the front edge of the head *b'* thereat, whereby on inserting a suitable tool through the keyways 14 against the said edge as a fulcrum, the hubs 12 are pried into, and held at the proper position for enabling the yoke *c* to be coupled to the head *b'* by the pins 15 (or analogous fastenings) against the tension of the springs 4 and 4'.

Figs. 6 and 9, show the application of my invention to a draft-gear (substantially such as that described in my said Letters Patent of Oct. 18, 1904, No. 772,370,) in which the springs 16 (preferably of a double cone shape as shown) pass through circular openings or housings 17 formed therefor transversely through the body-bolster *a'*, and are combined with front and rear follower-plates 18, 18', having on (or in) their inner faces conical, elliptical pockets or housings 19, 19' for receiving and engaging the small end portions of the springs 16, and corresponding in every particular to the pockets 6 and 6' before described, the forward and rearward movements of the follower-plates 18, 18' being limited by stops 20 which project from the bolster *a'*.

It will be noted that the springs 16 are shown integral throughout respectively, but if desired they may be otherwise made, such as in two parts with an intervening plate or otherwise as found most suitable.

I do not limit myself to the particular arrangement and application of my improved

friction draft and "buffing" gear as above described to the body-bolster of a railroad car, as it is obvious that by modifying the details of construction, the same principle may be used in other arrangements of draft-gear for railroad cars or other vehicles having draft-springs, and follower-plates or their equivalents, combined with suitable housings or casings fixed to the framework of the car, or for other purposes where the gradual elimination of inertia or resistance to the momentum of moving objects is required.

What I claim as my invention and desire to secure by Letters Patent, is:

1. In a friction device, a tapered coil spring in combination with a support therefor, and a friction element fixed to said support and coöperating with said spring at different points around certain of its convolutions whereby, when the spring is compressed, the frictional engagement of said convolutions with said friction element distorts the convolutions, increasing the resistance of the spring.

2. In a friction device, a tapered coil spring and a friction element arranged outside of said spring for coöperating with certain of the convolutions thereof, at different points, whereby when the spring is compressed the engagement of said friction element with said convolution causes them to be distorted, whereby the resistance of the spring is increased.

3. In a friction "buffing" device, the combination of a conical spiral spring, a fixed seat for one end of the spring, a movable seat for the other end of the spring, and a housing for the spring projecting from one of the said seats, the said housing having its internal circumferential surface diametrically elliptical and adapted to bear longitudinally at its small diameter against the opposite circumferential parts of the spring adjacent to its said seat within the said housing, substantially as described.

4. In a friction "draft" and "buffing" gear for a railroad car, the combination with the car body-bolster of a conical spiral spring adapted to bear at one end against the front side of the bolster, a similar spring adapted to bear against the rear side of the bolster, a draw-bar having a suitable coupler and adapted to bear at its inner end against the other end of the spring on the front side of the bolster, a yoke jointed at its ends to the draw-bar and slidable through the bolster transversely thereto, the said yoke being adapted to bear against the other end of the spring on the rear side of the bolster, and a housing for each spring projecting from one of the said end bearing surfaces thereof, the said housings having their internal circumferential surface diametrically elliptical and adapted to bear longitudinally at their small diameters against the opposite circumferential parts of the springs adjacent to their said bearing surfaces within the said housings, substantially as described.

5. In a friction "draft" and "buffing" gear for a railroad car, the combination with the body-bolster, of a conical spiral spring tapering from its maximum diameter in the middle to each end and movable through the bolster transversely thereto, a draw-bar having a suitable coupling, a yoke jointed at its ends to the draw-bar, a front and rear follower-plate bearing respectively against the inner end of the draw-bar and the said yoke and against the corresponding small ends of the spring, a housing for the springs projecting from each of the said plates, the said housings having their internal circumferential surface diametrically elliptical and adapted to bear longitudinally at their small diameters against the opposite circumferential parts of the spring adjacent to its ends, and limiting stops for the said plates, substantially as described.

6. In a draft-gear for a railroad car, the combination with the draw-bar and the springs, of a yoke jointed at the ends to the said bar, and a lug projecting from each of the said ends and having a keyway therethrough, immediately over and in front of a projecting edge of the said bar, substantially as described and for the purpose set forth.

7. In a friction device, an endwise compressible frictional member comprising a succession of continuous coils or loops of varying external diameters, and an externally arranged drum, the drum and member coöperating frictionally.

8. In a friction device, an endwise compressible frictional member comprising a succession of connected coils or loops of varying external diameter, and an externally arranged drum member brought into frictional contact with said coil member after a partial compression of said coiled member.

In testimony whereof, I have signed my name to this specification in the presence of two subscribing witnesses.

HARRY M. PFLAGER.

Witnesses:
CHARLES W. BLOCK,
EDWARD W. FURRELL.