No. 825,349. PATENTED JULY 10, 1906.

I. A. RANDEL.

DRAFT RIGGING FOR CARS.

APPLICATION FILED JAN. 12, 1906.

2 SHEETS—SHEET 1.

Fig. 2.

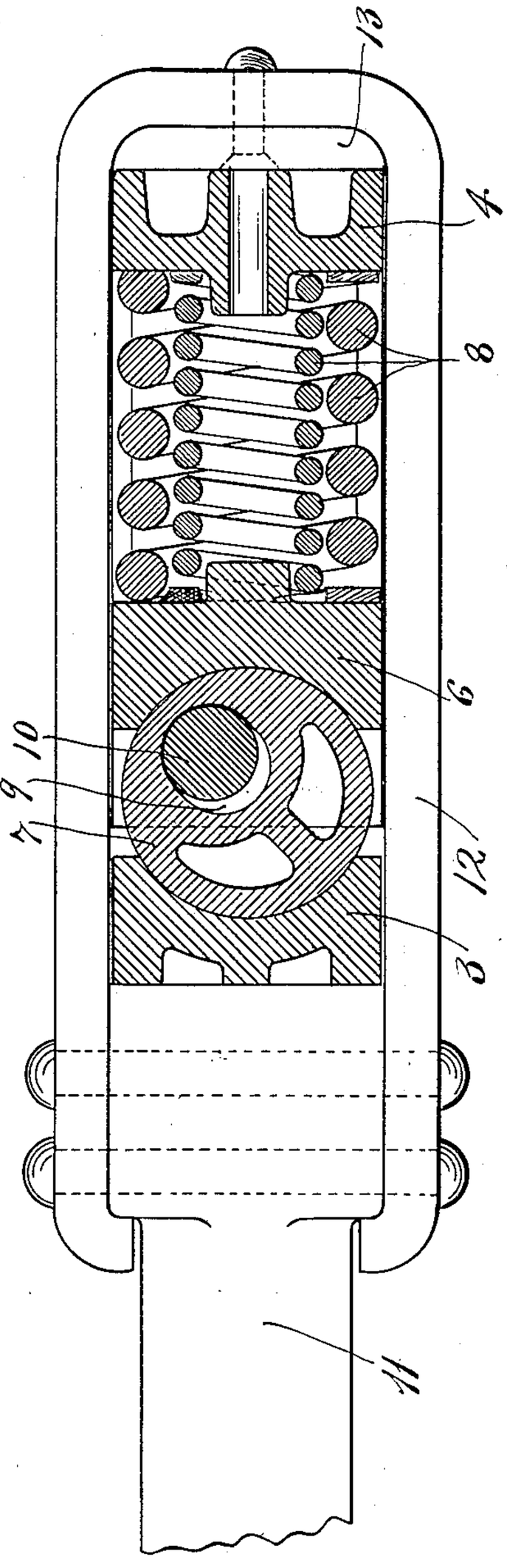
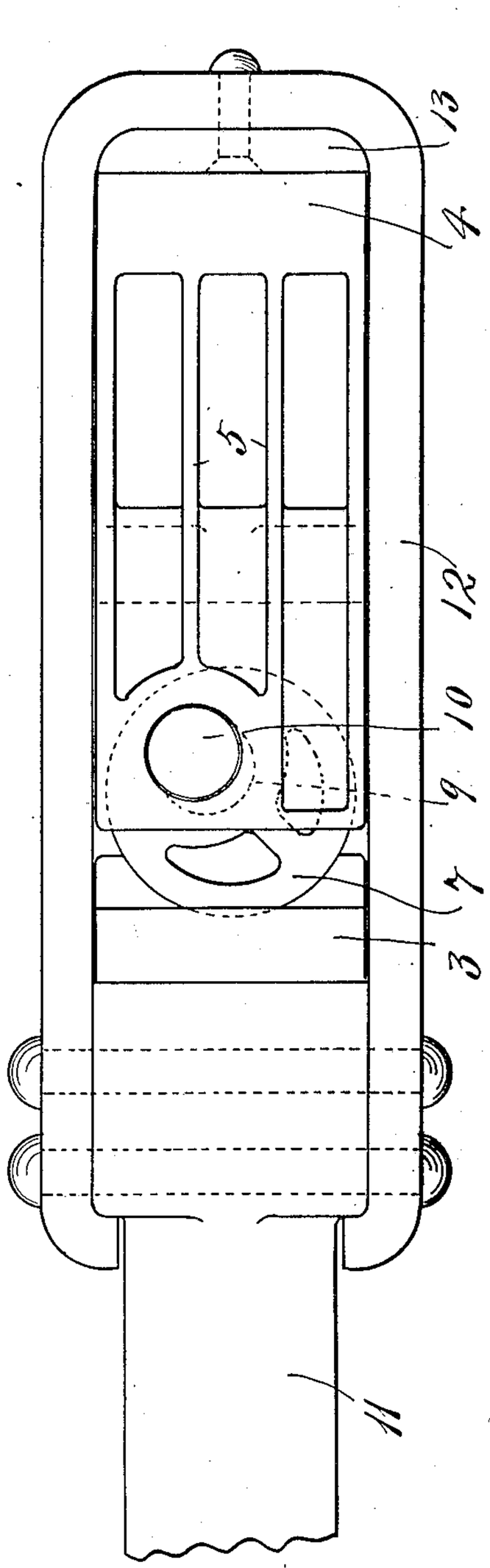


Fig. 1.



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2 SHEETS—SHEET 2.

Fig. 3.

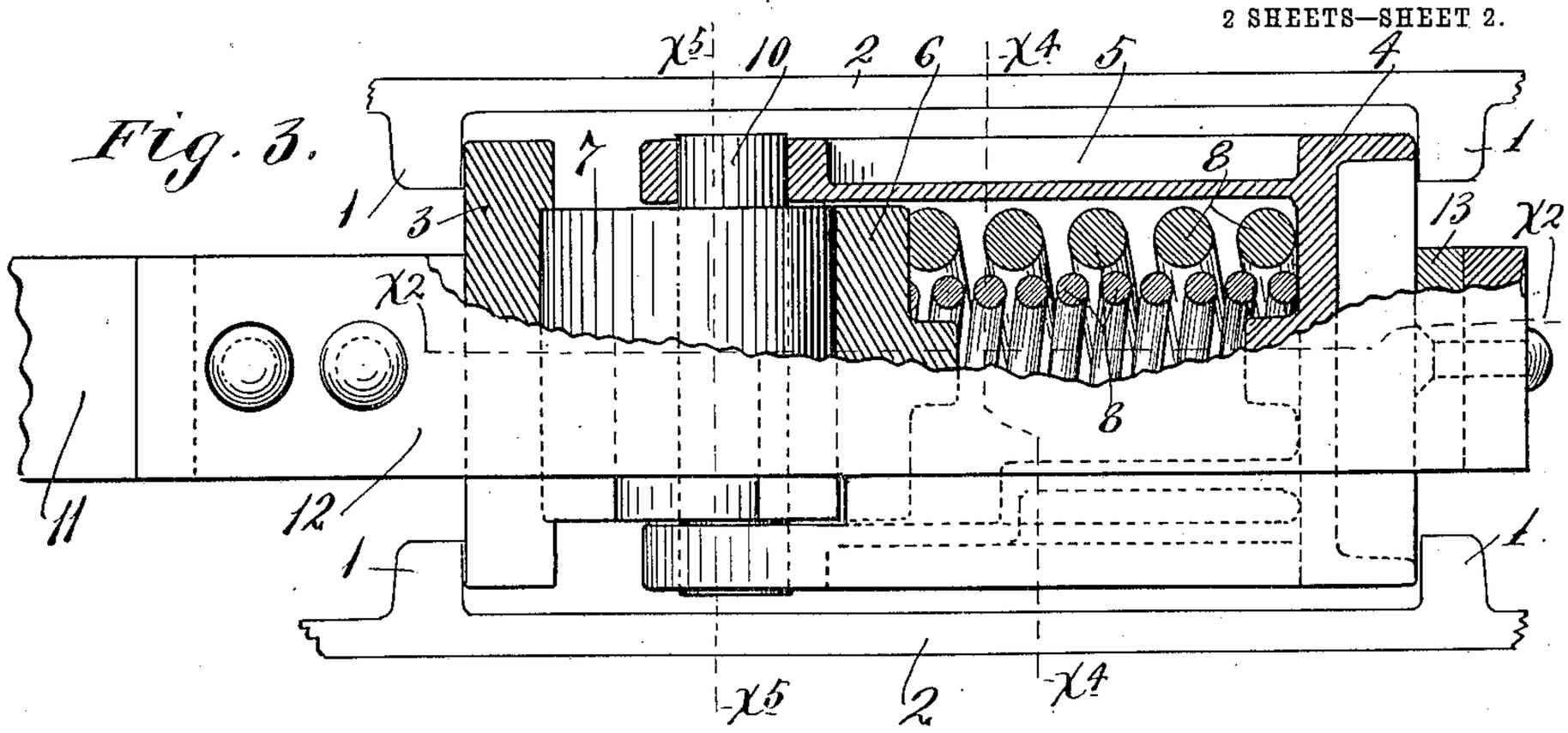


Fig. 4

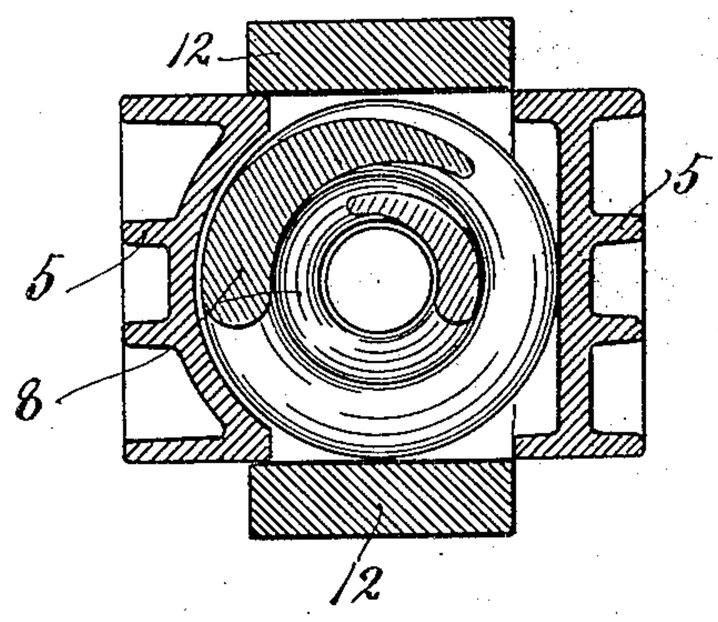


Fig. 5.

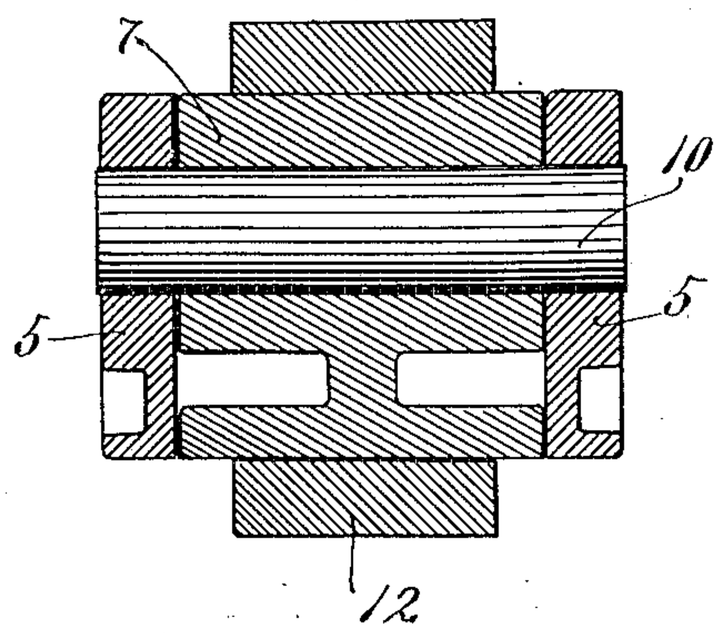
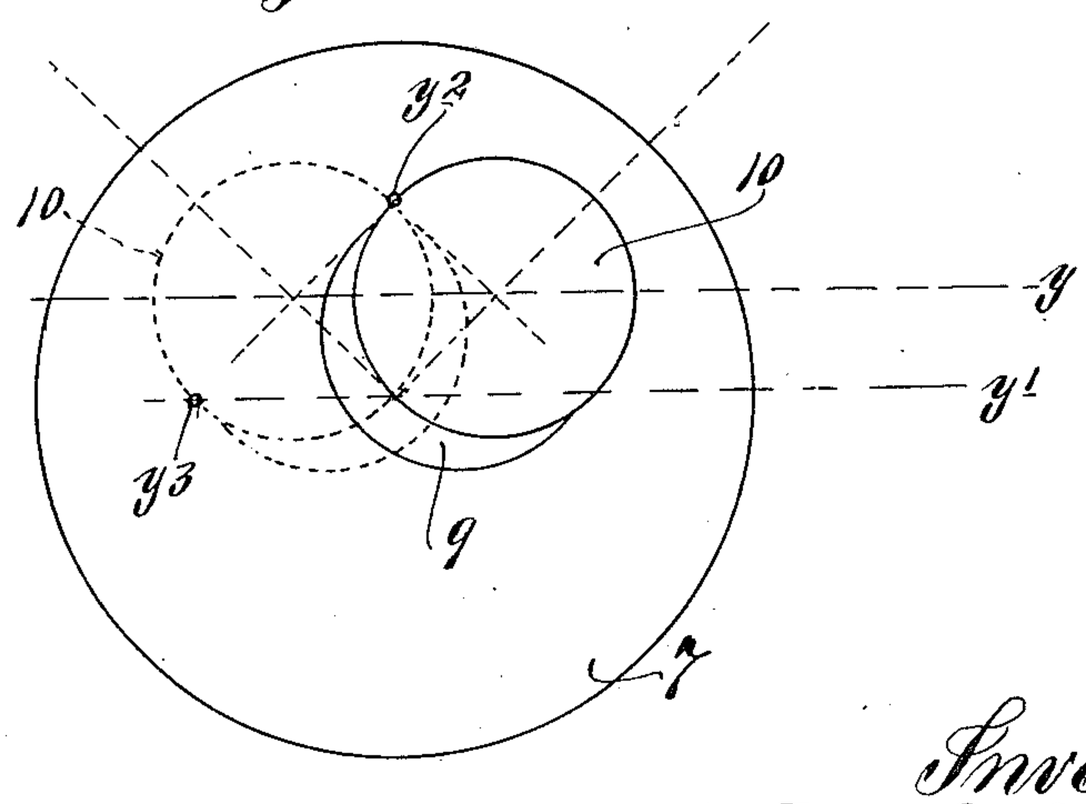


Fig. 6.



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UNITED STATES PATENT OFFICE.

IVAR A. RANDEL, OF CHICAGO, ILLINOIS, ASSIGNOR TO ALVIN C. McCORD, OF CHICAGO, ILLINOIS.

DRAFT-RIGGING FOR CARS.

No. 825,349. Specification of Letters Patent. Patented July 10, 1906.

Application filed January 12, 1906. Serial No. 295,701.

To all whom it may concern:

Be it known that I, IVAR A. RANDEL, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Draft-Rigging for Cars; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My present invention has for its especial object to provide an improved draft-rigging for cars, but relates, broadly, to improved means for cushioning the movements of relatively movable bodies.

The invention incorporated in the draft-rigging suitable for railway-cars is illustrated in the accompanying drawings, wherein like characters indicate like parts throughout the several views.

Figure 1 is a view in side elevation, showing the improved draft-rigging, some parts being broken away. Fig. 2 is a view, partly in side elevation and partly in vertical section, on the line x^2 x^2 of Fig. 3. Fig. 3 is a plan view of the draft-rigging with some parts broken away and some parts sectioned. Fig. 4 is a transverse vertical section taken on the line x^4 x^4 of Fig. 3. Fig. 5 is a transverse vertical section taken on the line x^5 x^5 of Fig. 3; and Fig. 6 is a diagrammatic view, in side elevation, illustrating the action of a so-called "differential" friction-wheel.

In Fig. 3 the numeral 1 indicates draft lugs or abutments, shown as formed integral with draft-plates 2, which in practice are rigidly secured to the draft-timbers of the car, but which, however, may take various forms, so far as my invention is concerned.

The numerals 3 and 4 indicate the primary followers which coöperate with the front and rear pairs of abutments 1, respectively. The rear follower 4 is formed with long laterally-spaced and forwardly-projecting arms 5, that terminate a considerable distance rearward of the forward follower 3.

The numeral 6 indicates a supplemental follower which is loosely seated between the arms 5 of the follower 4. This supplemental follower 6 and the coöperating primary follower 3 are formed with seats that closely fit the cylindrical surface of an interposed friction-wheel 7. A cushioning-spring 8, involving one or more coils, is compressed between the supplemental follower 6 and the primary follower 4 and exerts a strain which causes said supplemental follower 6 and the primary follower 3 to tightly press against the said friction-wheel 7. The friction-wheel 7 is formed with an eccentric slot 9, that is elongated slightly in a radial direction. A heavy push-pin or stub-shaft 10 extends transversely through the slot 9 of said friction-wheel and at its ends is seated in the forward ends of the arms 5 of the rear follower 4.

An ordinary draft-bar 11 normally bears at its rear end against the front follower 3 and is provided with a yoke 12, that embraces the followers 3, 4, and 6 in a vertical plane and is, as shown, provided at its rear extremity with a rigidly-secured block 13, that normally bears directly against the rear follower 4.

The normal positions of the parts of the draft-rigging are illustrated in the drawings, Figs. 1, 2, and 3. It is evident that when the draft-bar 11 and its yoke 12 are moved forward as underdraft strains the rear follower 4 will be moved forward, while the front follower 3, and hence the supplemental follower 6, will remain stationary and the cushioning-spring 8 will be compressed. When the rear follower 4 moves forward, the push-pin 10 is also moved forward, thereby causing the friction-wheel 7 to rotate in frictional contact with the follower 3 and supplemental follower 6. The said friction-wheel therefore operates as a frictional retarding device or spring-dampener, and it is evident the greater the force tending to compress the spring the greater will be the frictional engagement between the said friction-wheel and the said followers 3 and 6.

In the preferred arrangement of this improved cushioning device provision is made for differentially decreasing the leverage with which the spring-compressing force acts to rotate the frictional wheel or member, so that the cushioning power of the spring and of the friction device are differentially increased. Means for differentially increasing the cushioning power of the spring is, however, broadly claimed in the prior patent, No. 763,998, issued to Alvin C. McCord, of date July 5, 1904, entitled "Draft-rigging for cars."

The diagram view Fig. 6 illustrates the differential leverage action of the push-pin 10. In the said view the line marked y indicates

the line of travel of the axis of the push-pin 10 when the rear follower 4 is moved forward. The line marked y' is a line drawn parallel to the line y, intersecting the axis of the friction-wheel 7. The point marked y^2 indicates the point of contact between the push-pin 10 and the upper wall of the slot 9 of the friction-wheel when the said friction-wheel is in normal position. (Indicated in Figs. 1, 2, and 3 and by full lines in said Fig. 6.) The point marked y^3 indicates the point of contact between the said push-pin 10 and the wall of said slot 9 when the cushioning-spring is given its extreme compression and the said friction-wheel is given its extreme rotation. It will thus be seen that normally the point of contact between the push-pin 10 and the slot of the friction-wheel is far above or away from the axis of rotation of the said friction-wheel 7 and that under rotation of said friction-wheel this point of contact gradually approaches the line y', which is drawn through the axis of said friction-wheel, thereby gradually decreasing the leverage which the force transmitted through the follower 4 and push-pin 10 has to rotate the said friction-wheel. Of course this decreasing leverage or decreasing ability to rotate the friction-wheel has the effect of increasing the cushioning power of the spring or the ability of the spring to stand draft or bumping strains. As is obvious, shocks to the draft-rigging are greatly reduced by this differentially-increased frictional action, and, furthermore, the amount of movement which must necessarily be given to the draft-bar is thereby reduced to a minimum. The said frictional device also prevents a sudden recoil of the cushioning-spring when the compressing power is suddenly removed.

Under bumping strains the rear follower 4 will of course remain stationary, while the forward primary follower 3 and the supplemental follower 6 and friction-wheel 7 will be moved bodily rearward, and the said friction-wheel will be rotated by the push-pin 10, which latter is then held stationary. The action of the said friction-wheel is, however, the same both underdraft and bumping strains.

The device described, even with the spring and supplemental follower removed, would operate to some extent as a cushion having a varying frictional resistance. The rotary frictional member or wheel 7 I consider a broadly new feature in a cushioning device whether or not it be arranged for differential leverage action, and hence it will of course be understood that the device described is capable of many modifications within the scope of my invention as herein set forth and claimed. As one modification the rotary friction wheel or member might have pinions on its sides and the relatively movable follower might have racks meshing therewith. As already indicated, this cushioning device is capable of use generally for cushioning the movements of movable bodies respecting each other. It might, for instance, be used in connection with car-springs.

What I claim, and desire to secure by Letters Patent of the United States, is as follows:

1. A cushioning device comprising a pair of primary followers, the one thereof having a pair of projecting arms, a transverse push-pin mounted in the ends of said arms, a supplemental follower working between the follower-arms, a spring compressed between said supplemental follower and the said armed follower, and a frictional wheel pressed between said supplemental follower and the other primary follower, and having an eccentric slot in which said push-pin works, substantially as described.

2. A cushioning device comprising a pair of members movable the one with respect to the other, a rotary frictional member, and a variable leverage connection whereby a movement of one of said members with respect to the other will rotate said frictional member with a changing leverage, substantially as described.

3. A cushioning device comprising a pair of primary members, a supplemental member, a spring compressed between said supplemental member and one of said primary members, a rotary frictional member pressed between said supplemental member and the other primary member, and a variable leverage connection whereby a movement of one of said primary members with respect to the other will compress said spring and rotate said frictional member with a changing leverage, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

IVAR A. RANDEL.

Witnesses:
EDWARD B. FLEISCH,
ARTHUR B. WALKER.