J. J. TATUM.

FRICTION DRAFT GEAR.

APPLICATION FILED SEPT. 17, 1908.

1,146,772.

Patented July 13, 1915.

3 SHEETS—SHEET 1.

Fig. 1.

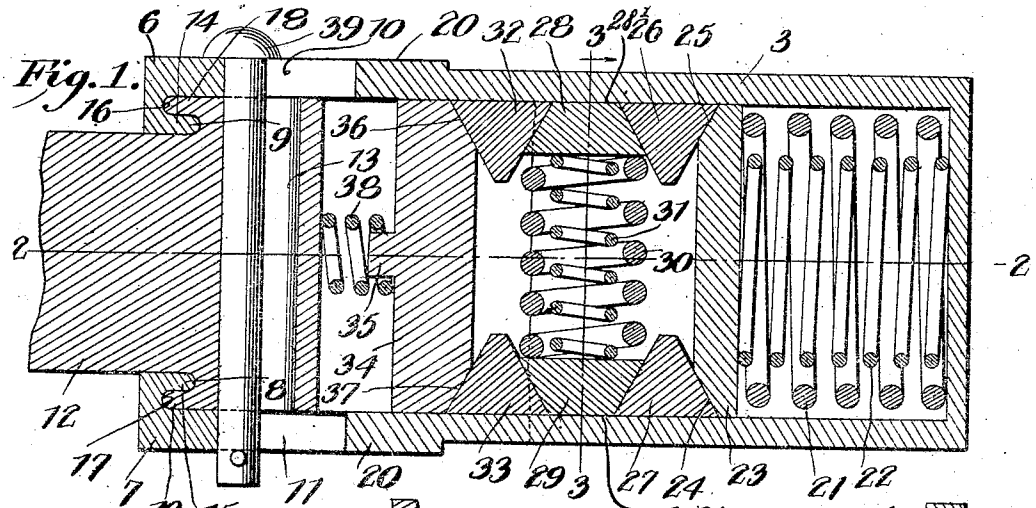


Fig. 2.

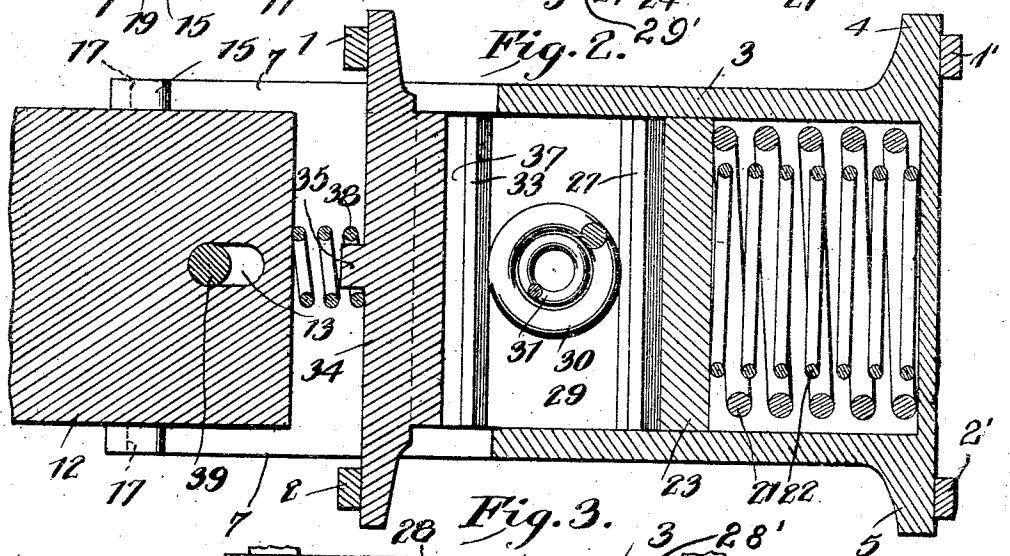


Fig. 3.

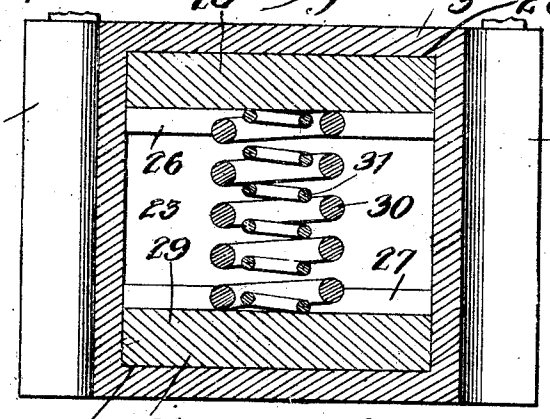


Fig. 8.

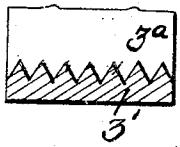
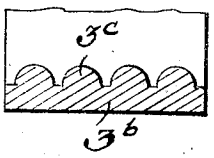


Fig. 9.



Witnesses

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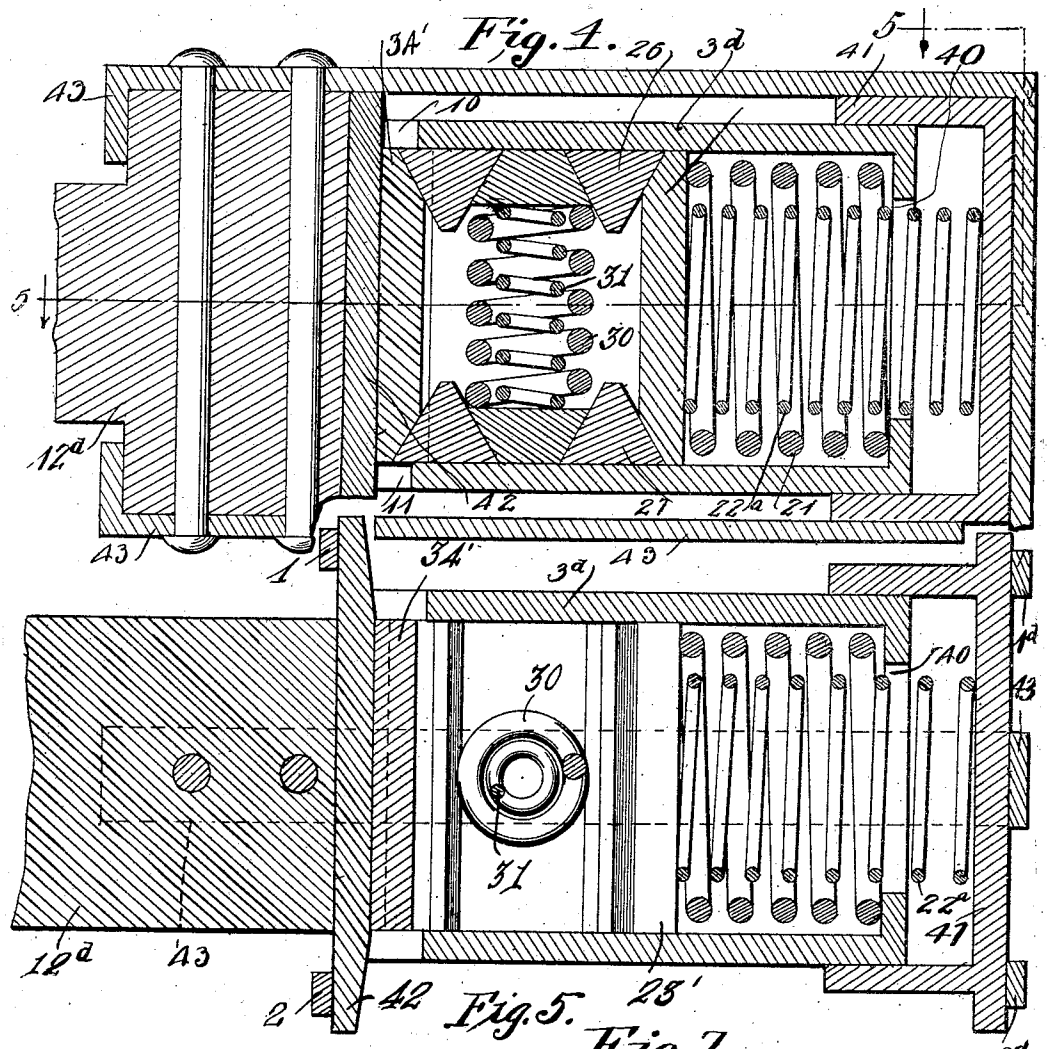
FRICTION DRAFT GEAR.

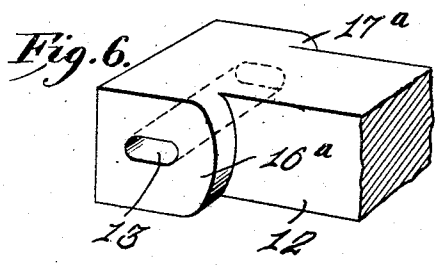
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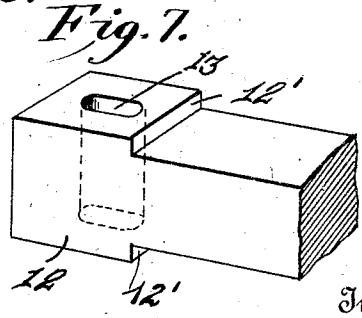
1,146,772.

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3 SHEETS—SHEET 2.







Witnesses

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FRICTION DRAFT GEAR.

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3 SHEETS—SHEET 3.

Fig. 10.

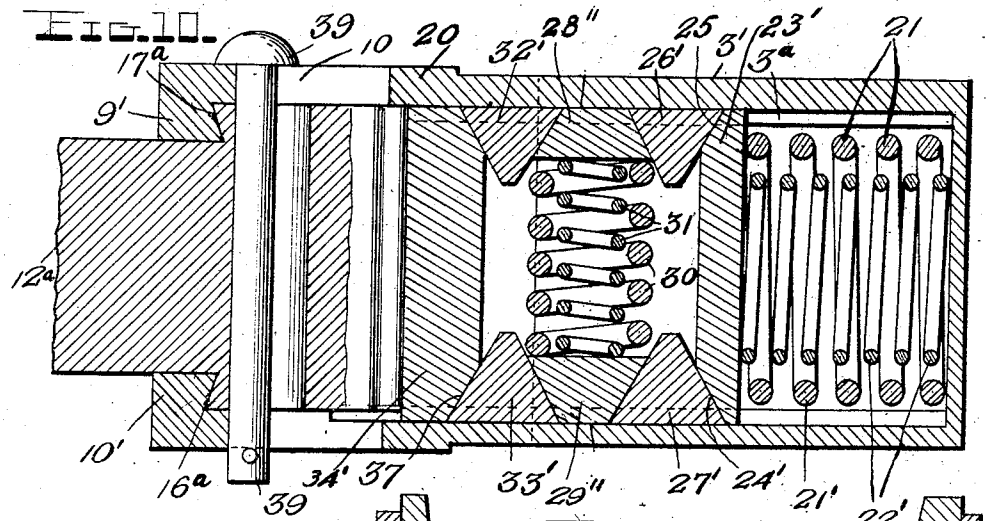


Fig. 11.

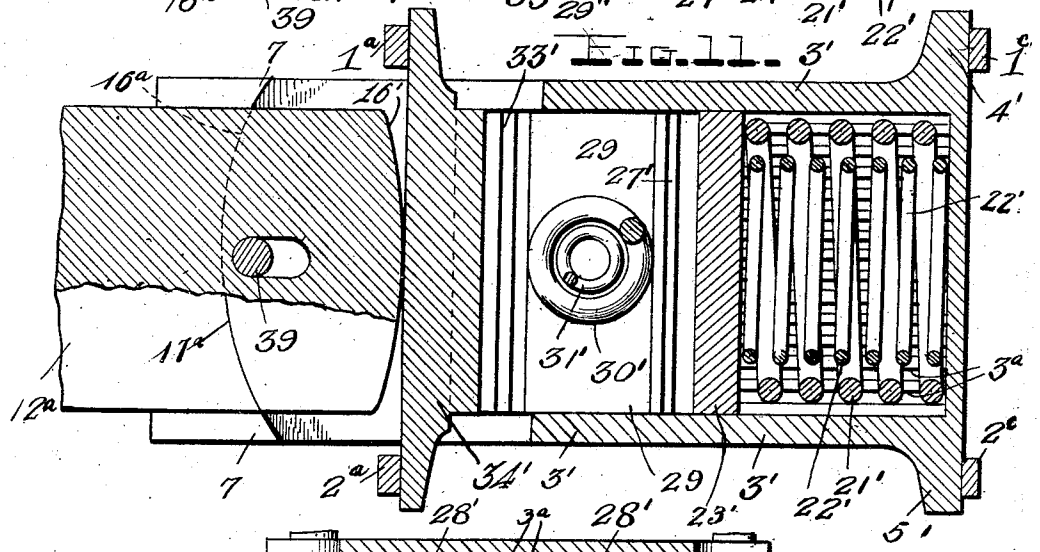
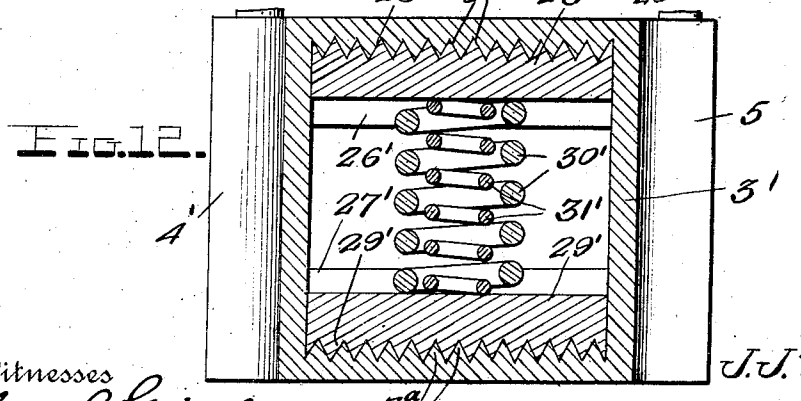


Fig. 12.



Witnesses
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UNITED STATES PATENT OFFICE.

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FRICTION DRAFT-GEAR.

1,146,772. Specification of Letters Patent. Patented July 13, 1915.

Application filed September 17, 1908. Serial No. 453,496.

To all whom it may concern:

Be it known that I, JOHN J. TATUM, a citizen of the United States, residing at Baltimore, State of Maryland, have invented certain new and useful Improvements in Friction Draft-Gear; and I do 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.

This invention relates to improvements in draft gears or riggings, and more particularly those designed for use on railway cars.

In draft gears for railway cars it has been common to provide a buffing or cushioning means within a casing and to surround these parts with a yoke or frame that is rigidly connected at its front end to the coupler or draw bar, the rear end of the yoke projecting beyond the rear or inner end of the casing and having the same amount of movement as the coupler. This construction requires considerable space and consists of an unnecessary number of parts.

It is the principal object of my invention to overcome these objections by providing a draft gear consisting of few parts compactly arranged so as to reduce the required space on the car for the application of the draft gear. This object is accomplished by dispensing with the usual shifting yoke or frame and mounting the casing for sliding movement and loosely connecting its front end with the coupler or draw bar, as will be hereinafter fully described.

Another object of my invention is to provide an improved buffing or cushioning means consisting of friction surfaces, blocks and springs arranged to reduce wear and maintain the highest possible friction capacity in a given space.

With these and other objects in view, the invention consists of certain novel features of construction, and the combination and arrangement of parts as will be more fully described and claimed.

In the accompanying drawings: Figure 1 is a vertical longitudinal sectional view through a draft gear constructed in accordance with my invention; Fig. 2 is a horizontal section taken on the line 2—2 of Fig. 1; Fig. 3 is a transverse section taken on the line 3—3 of Fig. 1; Fig. 4 is a vertical longitudinal sectional view of a modification; Fig. 5 is a horizontal section taken on the line 5—5 of Fig. 4; Fig. 6 is a detail perspective view of a modified draw-bar head; Fig. 7 is a similar view of another modified draw-bar head; Figs. 8 and 9 are sectional views through portions of modified forms of casings; Fig. 10 is a vertical longitudinal section of another modified form of draft gear; Fig. 11 is a horizontal sectional view thereof, and Fig. 12 is a vertical transverse section through the form shown in Figs. 10 and 11.

In the embodiment of my invention illustrated in Figs. 1, 2 and 3 of the drawings, I employ a casing 3, which may be of any desired cross-sectional shape, and in which may be mounted a suitable cushioning or buffing means, the one illustrated being preferably employed and hereinafter described. This casing 3 may be mounted in any suitable manner for longitudinal sliding movement, and at its rear is provided with lateral extensions or projections 4, 5, which coact with rear stop lugs 1′, 2′ of the under-frame of the railway car. By having the rear end of the shiftable casing 3 coact with the rear stops in this manner it will be seen that such end forms, in effect, a back follower member or plate.

34 denotes a front follower member or pressure block extending through suitable openings in the casing 3 and having its projecting ends coacting with the front stop lugs 1, 2, of the under-frame of the car (see Fig. 2). As stated above, the buffing or cushioning means is arranged within the casing between its closed rear end and the front follower member or pressure block 34. It will be understood that the front and rear stops 1, 2, and 1′, 2′, may be of any form and construction.

A coupler or drawhead 12 arranged at the open front end of the casing 3 and between arms or extensions 6, 7, carried by the casing 3 and movable therewith. The arms or members 6, 7, project forwardly from opposite sides or walls of the casing and, preferably, but not necessarily, are formed integral with the top and bottom thereof, such arms being preferably thickened, as shown at 20, to reinforce and strengthen them. The coupler or draw-bar 12 has loose connection with the casing 3 or its forwardly or longitudinally projecting arms 6, 7, such connection being preferably a slot

and pin connection. One method of making this loose slot and pin connection is illustrated in Figs. 1 and 2 and comprises a pin, key or bar 39 passed through openings or slots 13, 10, 11, formed, respectively, in the draw-bar 12 and arms 6, 7. The opening 13 in the draw-bar is in the form of a slot and is formed in the enlarged or thickened rear end of the same. This enlarged rear end of the draw-bar 12 is formed with hook-like lugs or shoulders 18, 19, which are adapted to engage similar hook-like lugs or shoulders 14, 15, formed on the outer ends of the arms 6, 7. By forming the engaging lugs or shoulders on the coupler or draw-bar and the arms of the casing, the strain will be taken off of the pin or key 39, as will be readily understood on reference to Fig. 1. The draw-bar 12 is forced outwardly or forwardly to maintain the said shoulders or lugs in engagement by means of a suitable spring, such as a coil spring 38, interposed between the rear end of the draw-bar and the front face of the follower member or pressure block 34, said spring being retained in position by a lug or pin 35 carried by the front follower member or pressure block.

My improved buffing or cushioning means, which is preferably employed within the casing 3, comprises a main compression spring 21, which may be assisted by a second spring 22, the latter being arranged within the former and both arranged longitudinally in the rear of the casing 3 between its closed rear end and the friction block 23. This block 23 is formed with diagonal faces or inclines 24, 25, and is mounted to slide longitudinally in the casing. A plurality of friction blocks 26 and 27, which are substantially pyramidal or triangular in cross-section, are arranged in the casing with one of their inclined faces in engagement with the diagonal faces or inclines 24 and 25 of the friction block 23. The flat base of the triangular block 26 is adapted to move on the inner face of one wall of the casing 3 with its narrow side or apex facing inwardly and the base of the block 27 is adapted to move on the inner surface of the opposite wall of the casing with its narrow side or apex facing inwardly. Compression friction blocks 28, 29, formed substantially pyramidal in cross-section, but preferably formed slightly wider than the blocks 26, 27, are arranged with one of their inclined faces in position to engage said blocks 26, 27, and with their wide faces positioned to engage with concentrically arranged compression springs 30 and 31 disposed between them. These compression springs 30 and 31 are adapted to be compressed by the movements of the blocks 28, 29, toward each other. The block 28 is mounted in the casing so that its long narrow side or end 28′ will contact with the inner face of one wall of the casing and the block 29 is arranged within the casing with its long narrow side 29′ in contact with the inner face of the opposite wall of the casing. Friction blocks 32 and 33, similar to the blocks 26, 27, are arranged with one inclined side in position to engage the sides of blocks 28, 29, opposite blocks 26, 27. The opposite inclines of the blocks 32, 33 are engaged with inclines 36, 37, formed on the front follower member or pressure block 34 (see Fig. 1).

Draft strains transmitted through the draw-bar 12 will shift or slide the casing 3 forwardly on the under-frame of the car, which movement will be resisted by the front follower member or pressure block 34 and by compression springs 21 and 22 and 30 and 31, the springs 21 and 22 being compressed longitudinally while the springs 30 and 31 are compressed transversely of the casing.

In the buffer action, the buffer strains are transmitted from the draw-bar 12 to the spring 38, which, when fully compressed, will allow the buffer strain to be transmitted by the front follower plate or pressure block 34 to the cushioning or buffing devices within the casing 3. In this connection, it will be noted that owing to the engagement of the extensions 4, 5, on the rear end of the casing 3, with the rear stop lugs 1′, 2′, the casing occupies a stationary position and the rearward movement of the front follower member or block 34 will cause the springs 21, 22 and 30, 31 to be compressed, as above explained. In this connection, it will be noted that the slots in which the pin 39 works must be of sufficient length to allow the solid compression of spring 38 and springs 30, 31 and 21, 22, and, consequently, when the springs have been fully compressed the cushioning effect will be exhausted and the pin 39 will be at the end of the slots.

The construction above described and shown in Figs. 1 and 2, comprises an arrangement of friction blocks and compression springs, whereby the maximum amount of frictional and resilient resistance is secured in a limited space, and in such manner that the constant wear of the friction blocks, due to frictional engagement with each other, will not seriously disable said blocks or decrease their efficiency. The amount of frictional resistance secured by the peculiar construction and arrangement of the various friction and friction compression blocks is such that the gear will withstand the hard usage to which friction gears of this character are subjected. It will be noted that both draft and buffer strains will be positively resisted by the friction blocks, the inclined faces of which are adapted to bear with great resistance against each other

and that the moment the draft or buffer strains are removed, the springs will force the various parts to their normal positions.

In Fig. 7 the draw bar is shown with flat shoulders 12′ instead of hook-shaped shoulders or lugs, as in Fig. 1.

In Fig. 6 the draw bar is shown with rounded or curved shoulders 16′, 17′, so that the coupler or draw bar will be permitted to have a limited radial movement. Similar curved shoulders 16^a, 17^a, are shown on the draw bar 12^a in the modified form of the invention illustrated in Figs. 10, 11 and 12 of the drawings. The last-mentioned embodiment of my invention is quite similar to the one shown in Fig. 1, the only differences being in respect to the shape of the shoulders 16^a, 17^a, the omission of the spring 38, and the provision of ribs or corrugations within the casing to increase the amount of friction surface. In Figs. 10, 11 and 12 of the drawing the casing 3′ has formed on the inner faces of its top and bottom longitudinal ribs or corrugations 3^a, and similar ribs or corrugations are formed on the opposing surfaces of the friction blocks or members 23′, 26′, 27′, 28″, 29″, 32′, 33′. By providing these longitudinal ribs on the coacting or engaged parts, the amount of friction surface will be materially increased. The ribs or corrugations may be V-shaped in cross-section, as shown in Fig. 12, and also in Fig. 8, or said corrugations may be of semi-cylindrical shape, as shown at 3^c of the casing 3^b in Fig. 9 of the drawing. The springs 21′, 22′ and 30′, 31′, are employed in Figs. 10, 11 and 12, the same as in Fig. 1, and the front follower member or pressure block 34′ is similar and coacts with the front stops 1^a, 2^a, the lugs 4′, 5′, on the rear of the casing 3′ coacting with the rear stops 1^c, 2^c. In this form of the invention, which omits the spring 38, the rear face of the coupler or draw-bar head 12^a is curved or rounded and bears against the front follower member or pressure block 34′. In other respects the construction and operation of this form of the invention are the same as the form shown in Fig. 1.

My improved spring buffing or cushioning means described above in connection with my improved yokeless draft-gear may be used in connection with a draft gear having a yoke, and in Figs. 4 and 5 of the drawings I have illustrated the same. The casing 3^d in this modification is formed with a rear opening, through which the inner coil spring 22^a is adapted to project against a back follower plate 41. This plate 41 engages the rear stops 1^d, 2^d, and is arranged in the rear portion of a U-shaped frame or yoke 43. This yoke extends around the casing 3^d and has its forwardly projecting ends rigidly secured to the coupler or draw-bar 12^d, as shown in Fig. 4. In operation, the draft strains will be imparted to the cushioning springs and pressure blocks through the yoke 43 and the rear follower plate or member 41.

It will be noted that in the preferred embodiment of my invention, illustrated in Figs. 1 and 10 of the drawings, the necessity of a yoke or U-shaped strap is obviated and the number of parts necessary to produce an effective draft gear is, therefore, reduced. This feature is of great economic importance to railroad construction, since it enables the production, operation and replacement of various parts of the gear at a lower cost than has been heretofore practical.

It will be noted that the necessity for the surrounding yoke has been overcome by mounting the casing for sliding or shifting movement and having its rear end serve as the back follower plate while its front end loosely receives the coupler or draw bar, the latter coacting with the buffing or cushioning means within the casing.

From the foregoing description, taken in connection with the accompanying drawings, the construction and operation of the invention will be readily understood without requiring a more extended explanation.

Various changes in the form, proportion and the minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of the invention claimed.

I claim as my invention:

1. A friction draft gear comprising a casing, a horizontally compressible spring arranged therein, a vertically compressible spring also arranged therein, inwardly moving friction compression blocks arranged to bear against said vertically compressible spring and friction blocks arranged to engage said compression blocks and moved by said horizontally compressible spring, said blocks being shaped to increase the resisting efficiency of the gear on the crowding of the blocks on each other.

2. A friction gear comprising a casing formed with laterally projecting arms, front and rear follower stops, said casing engaging said rear follower stops, a longitudinally compressible spring mounted in the casing and adapted to bear against the inner end thereof, a pressure block arranged to bear against the other end of said compression spring, a plurality of pyramidally-shaped friction blocks arranged to bear against the pressure block, a plurality of compression blocks arranged to engage the pyramidally-shaped blocks, a spring compressible transversely of the casing and positioned between the compression blocks, a second pressure block formed with laterally extending arms arranged to bear against the front follower stops, and a plurality of pyramidally-shaped blocks positioned between the last

mentioned pressure plate and the compression blocks.

3. A friction gear comprising a casing formed with lateral projections, compression means arranged to bear against the inner end of the casing and be compressed by a longitudinal movement thereof, a longitudinally movable pressure block arranged to bear against the compression means, said block being formed with diagonal faces, a plurality of pyramidally-shaped independent friction blocks arranged to bear against the diagonal faces of the pressure blocks, a plurality of diagonally faced independently movable compression blocks arranged to bear against the pyramidally-shaped blocks, means arranged between the compression blocks and adapted to be compressed in a direction transversely of the casing, pyramidally-shaped blocks arranged to bear against a part of the faces of the compression blocks, a diagonally faced pressure plate formed with laterally projecting follower arms arranged to extend through the casing and engage lugs formed on the under-framing of a car and adapted to move against the last-mentioned pyramidal blocks, and means for connecting the casing to a coupler head.

4. A friction gear comprising a slidable casing, a longitudinally compressible spring mounted in the casing and adapted to bear against the inner end thereof, a pressure block arranged to bear against the other end of said compression spring, a plurality of pyramidally shaped friction blocks arranged to bear against the pressure block, a plurality of compression blocks arranged to engage the pyramidally shaped blocks, a spring compressible transversely of the casing and positioned between the compression blocks, a second pressure plate and a plurality of pyramidally-shaped blocks positioned between the last mentioned pressure plate and the compression block.

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

JOHN J. TATUM.

Witnesses:
E. B. MILLER,
R. HUNEWELL.