J. F. COURSON.

DRAFT GEAR.

APPLICATION FILED JULY 8, 1916.

1,237,755.

Patented Aug. 21, 1917.

3 SHEETS—SHEET 1.

Fig. 1.

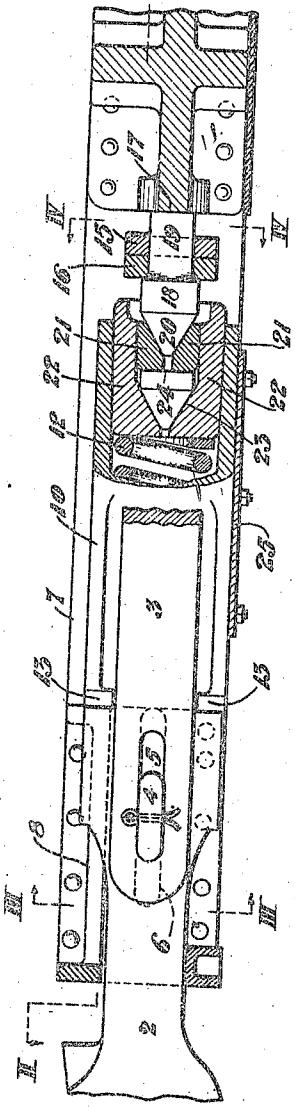


Fig. 2.

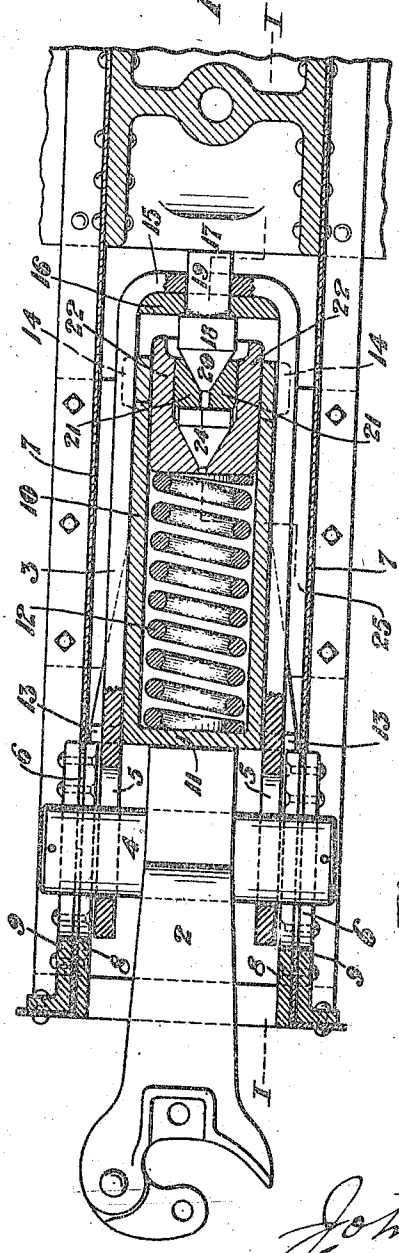


Fig. 4.

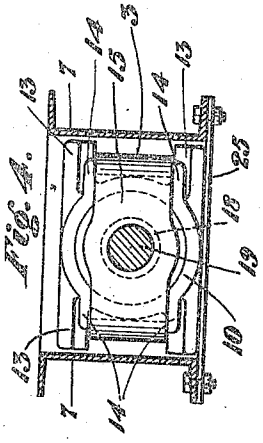
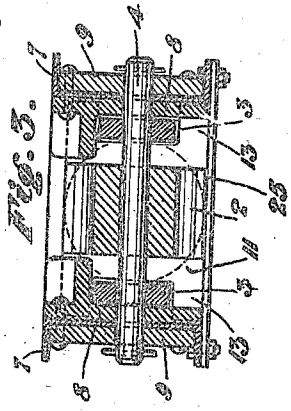


Fig. 5.



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3 SHEETS—SHEET 2.

Fig. 5.

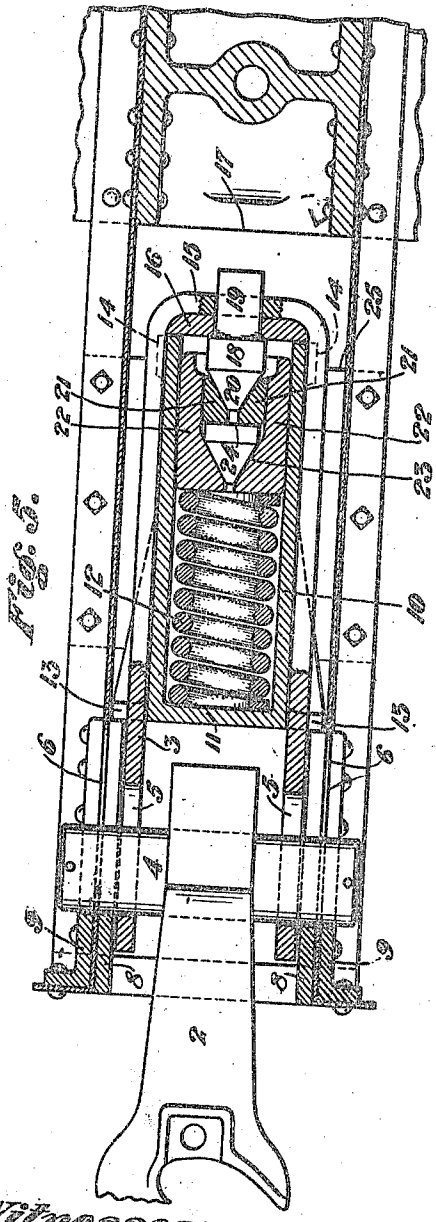
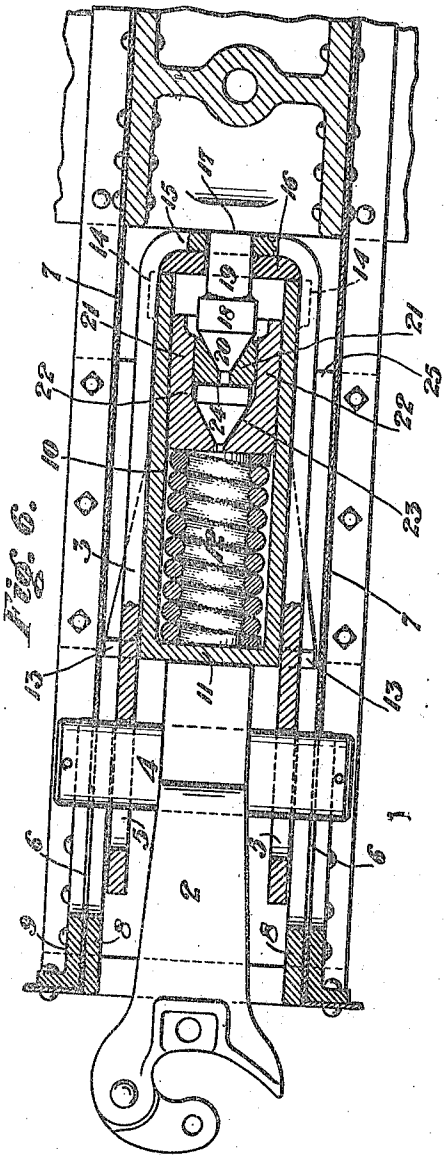


Fig. 6.



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3 SHEETS—SHEET 3.

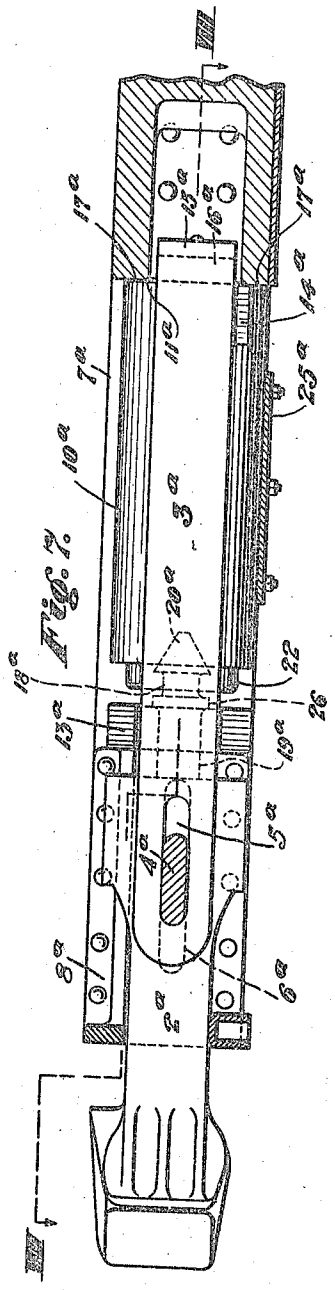

Fig. 7.

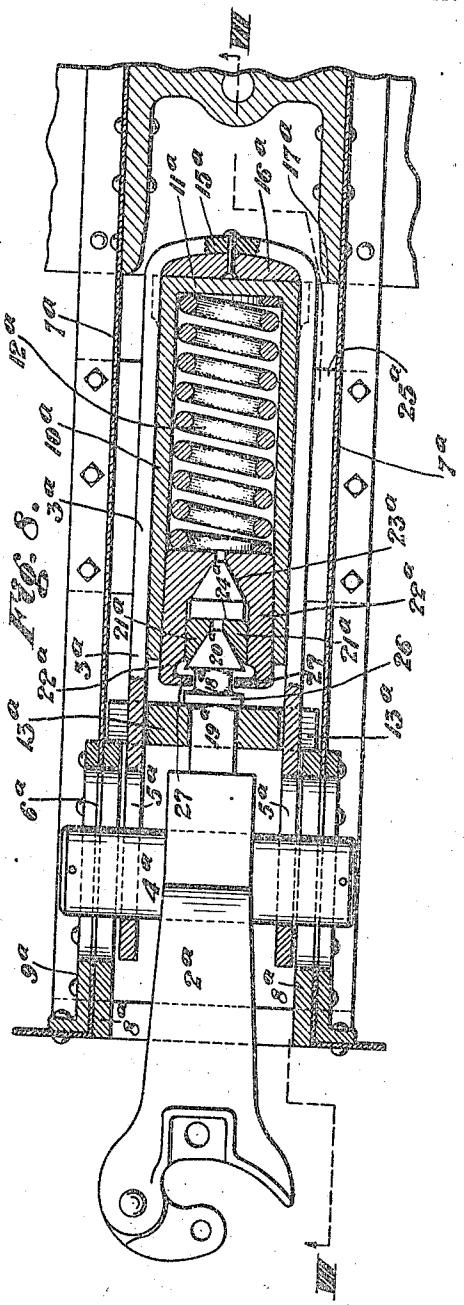

Fig. 8.

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UNITED STATES PATENT OFFICE.

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DRAFT-GEAR.

1,237,755. Specification of Letters Patent. Patented Aug. 21, 1917.

Application filed July 8, 1916. Serial No. 108,166.

To all whom it may concern:

Be it known that I, JOHN F. COURSON, a citizen of the United States, residing at Pitcairn, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Draft-Gears, of which the following is a specification.

My invention consists of an improvement in draft gears of the general class utilizing springs and friction shoes in connection with centrally arranged expanding wedge mechanism, operable upon buffing or pulling, to effect resistance to such strains through the mechanism inclosed within an embracing cylinder or casing.

The particular objects in view are to provide, in a gear of this type, means whereby the gear may be mounted within the usual or any standard car framing and be capable of operation in either buffing or pulling, without exceeding the normal maximum extent of movement of the drawbar in pulling, while permitting of a considerable additional movement in buffing.

Ordinarily, in gears of this type, movement in pulling is to the same extent as in buffing, and subject to ordinary restrictions, such pulling and buffing movement being limited to any desired maximum. By my improvement it is designed to provide a gear which is capable of absorbing the usual normal or expected pulling strains within such limit of range of movement of the drawbar, which ordinarily do not utilize but a portion of the entire capacity of the gear, and to provide for a considerable longer movement of the drawbar in buffing, with a proportionately increased desirable resistance.

These objects are secured by so mounting the resistance member of the gear within the car framing, and so connecting it with the drawbar by means adapted to utilize the resisting action in pulling to the desired degree, and the resistance in buffing to a considerably greater degree in connection with corresponding additional movement.

The several objects in view are accomplished, in certain preferred forms of the apparatus, as more fully hereinafter described and illustrated in the accompanying drawings, in which—

Figure 1 is a longitudinal vertical sectional view through the complete gear as assembled, the parts being shown in normal extended position, as indicated by the section line I. I. of Fig. 2.

Fig. 2 is a corresponding horizontal sectional view, indicated by the line II. II. of Fig. 1.

Figs. 3 and 4 are cross sectional views, indicated by the lines III. III. and IV. IV. respectively of Fig. 1.

Fig. 5 is a view corresponding to Fig. 2, but showing the gear extended to its limit of movement in pulling.

Fig. 6 is a similar view, showing the gear compressed, as in buffing.

Fig. 7 is a view similar to Fig. 1, showing a modified construction and arrangement of the friction gear mechanism and casing, indicated by the line VII. VII. of Fig. 8.

Fig. 8 is a view similar to Fig. 2, showing the construction illustrated in Fig. 7 in horizontal section, indicated by the line VIII. VIII. of Fig. 7.

In the drawings, referring to Sheets 1 and 2, 2 represents the drawbar of the coupler connected with the front end portions of a U-shaped yoke 3 by a transverse bolt or key 4, which extends through slots 5 in the front portions thereof, and through slots 6 in the center sills 7 of the car framing at each side.

Slots 5 are of sufficient length to permit of backward independent movement of the bolt 4 in buffing, and slots 6, extending backwardly and forwardly of the bolt 4 in normal position, provide for the desired range of movement in either direction.

The center sills 7 are reinforced, preferably co-extensive with the length of slots 6, with inner and outer reinforcing members 8, 9, respectively, riveted to the center sills, as shown, members 8 also providing bearing abutments for the front portion of the friction member.

Said member comprises a cylindrical casing or shell 10, which in the construction shown on Sheets 1 and 2, is closed at its for-

ward end by a cross bearing wall 11, against the outer face of which the end of the draw-bar bears, and providing an inner bearing for the spring 12. Said spring has a capacity of say 18,000 pounds and in the normal position of the gear is under sufficient tension to maintain the parts of the gear in close fitting engagement.

Casing 10 is provided with laterally extending lugs 13, which engage against the rear end portions of reinforcing members 8 in pulling, and is also provided with laterally extending supporting and guiding lugs 14 for the yoke member 3. Said member extends around across and beyond the inner end of the casing by means of a connecting member 15, and is preferably provided with a reinforcing filler plate 16 secured to it in any suitable manner.

Backwardly beyond the rear portion of the friction member is a transverse center block abutment 17 fixedly mounted between the center sills 7, 7, by rivets or otherwise. A central wedge block or buffer pressure bar 18 bears backwardly by its stem extension 19 against the front face of said abutment, and is provided with a wedge terminal 20 of pyramidal or coniform shape or other suitable construction, the face of which corresponds in degree of slope to the inner face of expanding wedges 21.

Said faces, *i. e.*, of terminal 20, and the inner contacting faces of wedges 21, taper inwardly toward the longitudinal center of the gear at such an angle as to produce a maximum expansion, with resulting free release. Wedges or wedge blocks 21 bear outwardly against the inner faces of a plurality of friction shoes 22 arranged in an annular series within the casing 10, and are adapted to frictionally engage the inner surface thereof.

Shoes 22 are provided at their other ends with inwardly disposed wedge faces 23, against which bear the faces of a pressure transmitting wedge 24 in abutting engagement with the ends of wedge blocks 21, whereby to expand the friction shoes 22 equally throughout their length.

It will be understood, however, that any suitable wedge mechanism may be utilized which is adapted to expand or distend the friction shoes within the casing and against the inner sides thereof, and to, at the same time, compress the spring 12, upon forward movement being imparted to the central wedge by the yoke 3 in pulling, or rearward movement being imparted to the casing by the coupler drawbar, in buffing.

Central wedge 18 provides by its enlarged middle portion a bearing shoulder, against which the filler plate 16 engages, in pulling, due to the reduced cross section of the extended stem 19. The gear may be supported in any suitable manner, as by a plate 25.

The construction and operation of the device will be readily understood from the foregoing description.

In pulling, the coupler 2 and bar 4 will draw the central wedge forwardly against the resistance of the friction mechanism within the fixedly held casing 10 until the strain is absorbed, which ordinarily is within the maximum limit above referred to, and not exceeding the length of the slots 6 forwardly of the cross bar.

In buffing, the spring 12 will be first partially compressed, bolt 4 passing freely back through slots 5, 5, and 6, 6, and simultaneously effecting an expansion of the wedge mechanism and resulting friction, central wedge 18 being in abutting engagement against abutment 17. Backward movement of the casing away from the abutting engagement with the inner ends of members 8 is to substantially the same degree of movement until the inner open end of the casing makes abutting engagement against the face of filler plate 16.

Thereupon, continued further movement will thrust the plate and yoke members 3 backwardly with the casing until the rear cross member 15 comes close to or into engagement with the face of abutment 17, during which time the resistance of the friction mechanism and the compression spring 12 is steadily increasing, as indicated in Fig. 6. By this means a very considerably longer longitudinal movement may be imparted to the gear in buffing than in pulling, which movement may be varied as desired, depending on the length and extent of projection of the stem 19 inwardly beyond cross member 15 before it engages abutment 17.

Such movement or travel may be variable, depending upon the strains to be absorbed in buffing, and should be sufficient to effect absorption of the maximum strains.

In the arrangement shown in Figs. 7 and 8, substantially the same construction and operation is shown and provided for, except that the casing 10^a of the strain-absorbing member is reversed in position, its closed end being embraced by the rear end 15^a of the yoke 3^a and the friction-creating mechanism being acted upon directly by the draw bar. In such case a separate abutment cross piece 13^a is provided, bearing forwardly against the rear ends of reinforcing members 8^a, and providing a positive engagement for the collar 26 of the central wedge 18^a, the stem 19^a of which extends forwardly through a suitable opening in said cross piece 13^a.

The friction shoes 22^a are also provided at their end portions with inwardly extending lips 27 operable to retain the central wedge

member against removal or undue movement, by engaging the front portion of the wedge terminal 20^a, at the same time providing for ample movement in operation.

The rear end portion of the casing 10^a abuts directly against the rear abutment 17^a which is provided at its middle portion with clearance for the rear portion 15^a of the yoke and its filler block 16^a, which may thus pass backwardly independently of the casing in buffing.

The other parts of the construction are substantially the same as already described, and indicated by the same numerals having the exponent "a."

In either buffing or pulling, the operation already described is substantially the same, providing for absorption of the pulling shocks within a predetermined limit of movement, and absorption of the buffing shocks without such limitation.

The advantages of the invention will be readily understood and appreciated by all those familiar with this class of mechanism. It provides a construction which is simple and compact, economical to manufacture, and capable of performing its functions within prescribed limitations as to pulling, while permitting the much greater shocks of buffing to be absorbed without such limitation of travel.

The invention may be utilized without necessarily restricting it to the exact strain-absorbing member illustrated or to other details, and may be varied in such features by the skilled mechanic within the scope of the appended claims.

What I claim is:

1. A draft gear of the class described having a rearwardly movable casing, a drawbar in abutting engagement with the casing and movable away therefrom, means opposing forward movement of the casing, movable resistance mechanism within the casing, and means connecting the drawbar with the casing adapted to provide for a limited extent of movement of said resistance mechanism within the casing in pulling and a relatively increased movement of the casing in relation to the resistance mechanism in buffing.

2. A draft gear of the class described having a rearwardly movable casing held against forward movement, a drawbar movable rearwardly with the casing and forwardly independent thereof, forwardly movable resistance mechanism within the casing embodying a distending element held against rearward movement, and means positively engaging said distending element connecting the casing and resistance mechanism with the drawbar with clearance providing for rearward movement of the drawbar and casing independent of said means.

3. A draft gear of the class described having a rearwardly movable casing held against forward movement, a drawbar movable rearwardly with the casing and forwardly independent thereof, forwardly movable resistance mechanism within the casing held against rearward movement, and an element connecting the casing and resistance mechanism with the drawbar with clearance providing for a limited extent of movement of the drawbar and said element and the resistance mechanism in pulling and an increased movement of the drawbar and casing with relation to the resistance mechanism in buffing.

4. In combination with car framing, a casing provided with shock absorbing mechanism in abutting engagement with the car framing and movable away from such engagement, a longitudinally movable drawbar having a transverse bolt slidably mounted in the car framing and having a predetermined limit of movement in pulling and capable of exceeding such movement in buffing, and a yoke embracing the casing and in slotted engagement with said bolt.

5. In combination with car framing, a casing provided with shock absorbing mechanism in abutting engagement with the car framing and movable away from such engagement, a longitudinally movable drawbar having a transverse bolt slidably mounted in the car framing and having a predetermined limit of movement in pulling and capable of exceeding such movement in buffing and a yoke embracing the casing and in slotted engagement with said bolt, the drawbar and yoke being adapted to effect compression of the shock absorbing mechanism in one direction of movement or the other.

6. In combination with car framing, a casing provided with shock absorbing mechanism in abutting engagement with the car framing and movable away from such engagement, a longitudinally movable drawbar having a transverse bolt slidably mounted in the car framing, and having a predetermined limit of movement in pulling and capable of exceeding such movement in buffing and a yoke embracing the casing and in slotted engagement with said bolt, the drawbar and yoke being adapted to effect compression of the shock absorbing mechanism in one direction of movement or the other and in variable degrees.

7. In combination with car framing, a casing in abutting engagement with the car framing and movable away from such engagement, shock absorbing mechanism within the casing, a longitudinally movable drawbar having a transverse bolt slidably mounted in the car framing and having a

greater movement in buffing than in pulling, a yoke embracing the casing and in slotted engagement with said bolt, friction creating mechanism within the casing, a central wedge operable to effect expansion of the friction creating mechanism, and an opposing abutment therefor.

8. In combination with car framing having forward stop abutments, a cylindrical casing engaging said abutments, a rear abutment, a drawbar having a transverse bolt in slotted engagement with the framing and having a greater movement in buffing than in pulling, a yoke embracing the casing and in slotted engagement with the transverse drawbar bolt, a spring and friction creating mechanism within the casing and, a central wedge engaging said rear abutment and friction creating mechanism respectively.

In testimony whereof I hereunto affix my signature in the presence of a witness.

JOHN F. COURSON.

Witness:
C. M. CLARKE.