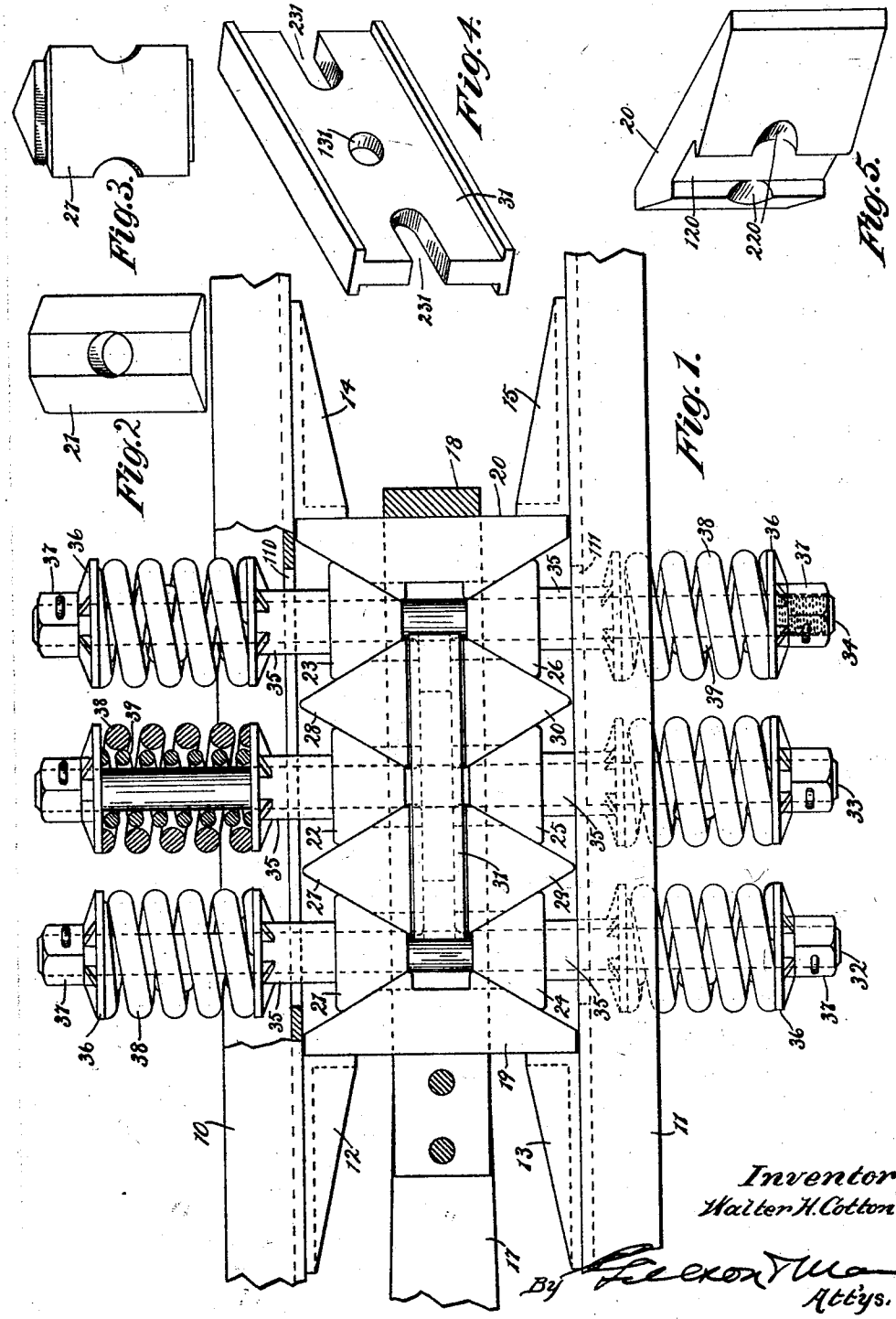
March 16, 1926. 1,576,722

W H. COTTON

DRAFT GEAR

Filed March 23, 1923 2 Sheets-Sheet 1



March 16, 1926. 1,576,722

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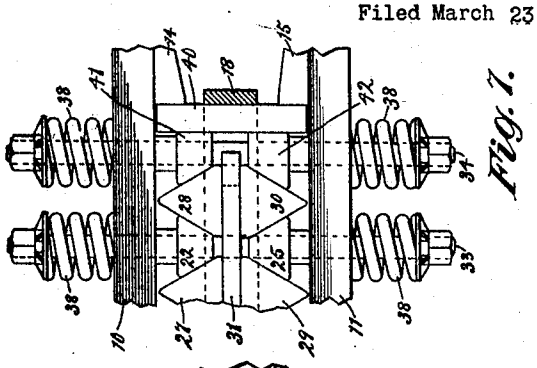


Fig. 7.

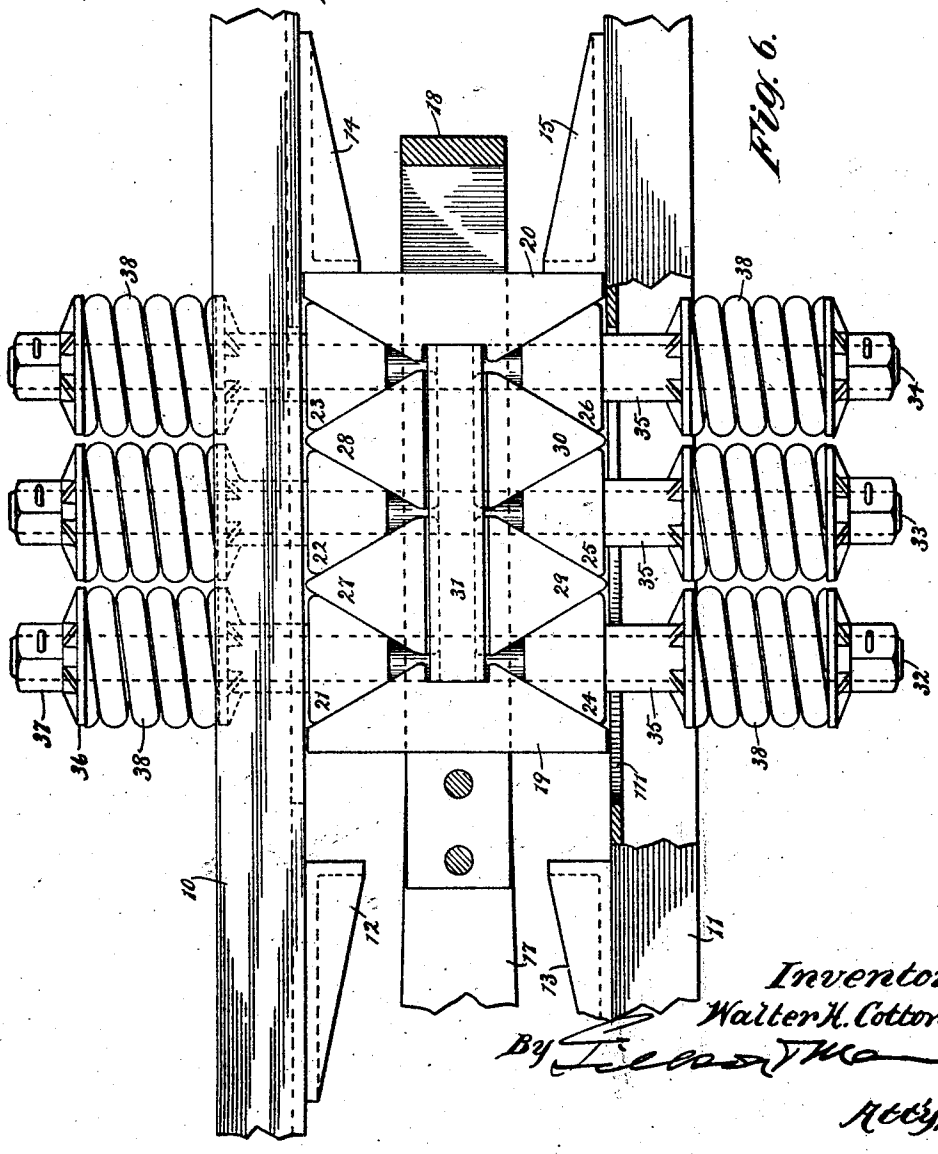


Fig. 6.

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UNITED STATES PATENT OFFICE.

WALTER H. COTTON, OF CHICAGO, ILLINOIS, ASSIGNOR TO UNION DRAFT GEAR CO., A CORPORATION OF ILLINOIS.

DRAFT GEAR.

Application filed March 23, 1923. Serial No. 627,073.

To all whom it may concern:

Be it known that I, WALTER H. COTTON, a citizen of the United States, and resident of Chicago, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Draft Gears, of which the following is a specification, and which are illustrated in the accompanying drawings, forming a part thereof.

The invention relates to draft gears or shock-absorbing devices for use in connection with railway cars; and has for its objects to secure simplicity of construction and application, together with high efficiency and long range of compressive movement.

The invention consists in a device as hereinafter described, and as illustrated in the accompanying drawings, in which

Fig. 1 is a detail plan view, partly in section, of the underframing of a car and of the improved gear;

Figs. 2 and 3 are details of wedging elements forming parts of the gear;

Fig. 4 is a view in perspective of a friction plate forming a part of the gear;

Fig. 5 is a view in perspective of one of the followers forming a part of the gear;

Fig. 6 is a view similar to Fig. 1, showing the gear under compression; and

Fig. 7 is a view similar to Fig. 1, showing a modified form of construction.

The usual center sills of a car, which may be of any desired form of construction, are shown at 10, 11; a pair of draft lugs applied, respectively, to the two sills, at 12, 13, and a pair of buffing lugs similarly applied, at 14, 15. The butt of a coupler is shown at 17, and the coupler extension or yoke at 18, this element taking the form of a loop for inclosing the gear.

The draft gear comprises front and rear followers 19, 20, which engage, respectively, the draft and buffing lugs, the end of the coupler butt and the rear end of the yoke. The inner faces of the followers are beveled inwardly from their side margins toward the center of the gear, to form wedging faces as shown.

A pair of triangular wedge-blocks 21, 24, are seated against the inclined faces of the follower 19, and a similar pair of blocks 23, 26, are seated against the inclined faces of the follower 20. A pair of triangular friction-blocks 27, 29, are seated against and cooperate with the opposite wedging faces of the blocks 21, 24, and a similar pair of friction-blocks 28, 39, cooperate in like manner with the blocks 23, 26. A pair of wedge-blocks 22, 25, are interposed between and cooperate, respectively, with the blocks 27, 28, and with the blocks 29, 30.

The several wedge-blocks 21 to 26 are similar in form, one of them being shown in Fig. 2. The several blocks 27 to 30 are similar in form, one of them being represented in Fig. 3. The follower 19 is similar in form to the follower 20, which is shown in Fig. 5.

A friction plate 31 is located on the axis of the gear and in engagement with the faces of the blocks 27, 28, 29 and 30, which are parallel thereto. The length of the plate 31 is less than the distance between the inner faces of the followers 19, 20, when the gear is expanded, and this plate determines the limit of compressive movement. The range of this movement may be extended, without shortening the plate 31, by providing the followers with vertical recesses, as shown at 120, within which the ends of the plate may enter.

Each of the wedge-blocks 21 to 26 is perforated on its median line which is transverse to the axis of the gear, and a tension rod, as 32, 33 and 34, extends through the apertures of each pair of these blocks. The plate 31 is slotted inwardly from its ends, as shown at 231, 231, to accommodate the rods 32 and 34 and permit its free movement with reference thereto. It is also centrally apertured, as shown at 131, to receive the rod 33. This perforation may be of approximately the diameter of the rod, as the two elements have no relative movement.

The several rods 32, 33 and 34 are shown as of equal length, and as extending through openings 110, 111, in the sills 10 and 11. Upon each of these rods is sleeved a pair of spring seats 35, located outside of the sills but having inwardly projecting stems which seat against the outer faces of the wedge-blocks through which the rod passes. Upon the outer ends of each of the rods is mounted a pair of spring seats 36, which bear outwardly against retaining nuts 37, screwed upon the ends of the rod.

Helical springs 38 are mounted upon the end portions of each of the tension rods,

reacting between the inner and outer seats 35, 36. In order to secure ample spring resistance without employing an excessively heavy spring, an inner helical spring, as 39, may be inclosed within each of the springs 38.

When the followers 19, 20, are provided with the recesses 120, their wedge faces may be transversely grooved, as shown at 220, to provide clearance for the adjacent tension rods when the gear is compressed. The blocks 27 to 30 are similarly recessed as shown.

When the gear is installed the several springs are placed under sufficient tension to hold all of the cooperating faces of the various frictional elements of the gear in contact. The length of the wedge-blocks 21 to 26, transverse to the axis of the gear, is such as to permit sufficient outward movement of these blocks, due to the complete compression of the gear, without interference with the sills 10, 11. The length of the blocks 27 to 30, transverse to the axis of the gear, may be such that their outer ends are approximately in contact with the inner faces of the sills when the gear is expanded.

When the gear is compressed, as by a buffing action, the follower 20 remains at rest against the buffing lugs, the follower 19 is pushed backwardly, forcing outwardly, by a wedging action, the blocks 21, 24, against the resistance of the springs 38. These blocks, while sliding upon the blocks 27, 29, are also moved backwardly, pushing back the blocks 27, 29, which force outwardly and backwardly the blocks 22, 25. The latter blocks similarly act upon the blocks 28, 30, forcing outwardly the blocks 23, 26.

In addition to the backward movement of the blocks 27 to 30, they have an inward movement due to the wedging action, which brings them into frictional engagement with the plate 31. The several tension rods move laterally with the wedge-blocks through which they pass as the latter are carried backwardly, and the friction plate 31 travels with the central rod.

When the gear is relieved from the buffing force, it is restored to the normal position of Fig. 1 by the expansion of the several springs and the consequent inward movement of the blocks 21 to 26. In draft the action of the gear is the same as in buff, except that the follower 19 remains at rest and the remaining parts are moved forwardly.

In the modification of Fig. 7, the followers, as 40, are provided with flat inner faces, and the pair of cooperating wedge blocks, as 41, 42, are provided with faces complementary thereto. In other respects the gear may be the same as already described, differing in action only in that the frictional engagement of the blocks 41, 42, with the follower is increased. While the range of movement is decreased the capacity may be the same. In the construction of Fig. 1 it is entirely feasible to provide for a compressive movement of four and one-half inches, without lengthening the gear beyond usual practice, the range of movement depending upon the pitch of the wedging faces.

As the gear is compressed friction is developed between all of the contacting faces of the various elements, and the area of these faces is sufficient to provide for the absorption of a very large percentage of the force applied, but with comparatively little wear of the parts.

The gear may be made at comparatively low cost, as the cheaper grades of metal may be employed and practically no machining is required. It is of such simple form that it may be easily assembled without the employment of skilled labor. For the same reason repairs and replacements may be easily effected, and usually without requiring the removal of the entire gear from the car.

While preferred forms of construction are shown, various changes of detail may be made without departing from the scope of the invention. The number of tension rods and of cooperating parts may be varied.

I claim as my invention:

1. In a draft gear, in combination, a follower the inner face of which is wedge-shaped, a friction plate on the longitudinal median line of the gear and normally out of engagement with the follower, a friction block bearing against each face of the plate and having a face receding from the adjacent wedge face of the follower, a wedge block interposed between the named face of the block and such adjacent face of the follower, spring means for advancing the wedge block, and means for resisting lateral movement of the friction block away from the wedge block.

2. In a draft gear, in combination, a follower the inner face of which is wedge-shaped, a friction plate on the longitudinal median line of the gear, a friction block bearing against each face of the plate and having a face receding from the adjacent wedge face of the follower, a wedge block interposed between the named face of the block and such adjacent face of the follower, spring means for advancing the wedge block, and means for yieldingly resisting lateral movement of the friction block away from the wedge block.

3. In a draft gear, in combination, a follower the inner face of which is wedge-shaped, a friction plate on the longitudinal

median line of the gear and normally out of engagement with the follower, a friction block bearing against each face of the plate and having a face receding from the adjacent wedge face of the follower, a wedge block interposed between the named face of the block and such adjacent face of the follower, a rod projecting through the two wedge blocks transverse to the axis of the gear, a spring on each end portion of the rod and reacting between the adjacent wedge block and a head on the rod, and means for resisting lateral movement of the friction block away from the wedge block.

4. In a draft gear, in combination, a follower the inner face of which is wedge-shaped, a friction plate on the longitudinal median line of the gear and normally out of engagement with the follower, a friction block bearing against each face of the plate and having a face receding from the adjacent wedge face of the follower, a wedge block interposed between the named face of the block and such adjacent face of the follower, spring means for advancing the wedge block, and wedge means for resisting lateral movement of the friction block away from the wedge block.

5. In a draft gear, in combination, a follower the inner face of which is wedge-shaped, a friction plate on the longitudinal median line of the gear, a friction block bearing against each face of the plate and having a face receding from the adjacent wedge face of the follower, a wedge-block interposed between the named face of the block and such adjacent face of the follower, spring means for advancing the wedge-block, wedge means for resisting lateral movement of the friction block away from the wedge-block, and resilient means for resisting movement of such wedge means.

6. In a draft gear, in combination, a follower the inner face of which is wedge-shaped, a friction plate on the longitudinal median line of the gear, a triangular friction block bearing against each face of the plate and having a face receding from the adjacent wedge face of the follower, a wedge block interposed between the named face of the block and such adjacent face of the follower, spring means for advancing the wedge block, a wedge block engaging the third face of each friction block, spring means for advancing the last-named wedge block, and means for resisting lateral movement of such block away from the friction block.

7. In a draft gear in combination, a pair of followers, the inner face of each being wedge-shaped, a friction plate located on the longitudinal median line of the gear and of less length than the normal distance between the followers, a series of triangular friction blocks engaging each face of the plate, such blocks with the inclined faces of the followers forming a succession of surfaces outwardly inclined from the median line of the gear, adjacent surfaces being oppositely inclined, a series of wedge blocks interposed between adjacent inclined surfaces, rods projecting through oppositely disposed wedge blocks, and springs mounted on each end portion of each rod for resisting outward movement of the wedge blocks associated therewith.

8. In a draft gear, in combination, a follower the inner face of which is wedge-shaped, a friction plate on the longitudinal median line of the gear, a friction block bearing against each face of the plate and having a face receding from the adjacent wedge face of the follower, a wedge block interposed between the named face of the block and such adjacent face of the follower, spring means for advancing the wedge block, means for yieldingly resisting lateral movement of the friction block away from the wedge block, and means for maintaining the friction plate in constant relative relation to the two followers.

9. A pair of opposed followers, a floating friction plate on the longitudinal median line of the gear, the length of the plate being less than the normal distance between the followers, two sets of friction and wedging elements, one at each end portion of the gear, for cooperating with the followers and plate, a pair of wedges interposed between the two sets, a rod extending through the wedges and through a close-fitting apperture in the friction plate, and springs on the rod urging the wedges inwardly.

10. A draft gear comprising in combination a pair of lug engaging followers, a pair of opposed wedge blocks slidingly engaging the inner face of each follower, the inner face of each block being inclined away from the center line of the gear and from the adjacent follower, friction blocks slidably engaging such inclined faces and complementary thereto, and a friction plate on the longitudinal center line of the gear and slidably engaging the friction blocks.

11. A draft gear comprising in combination a pair of lug engaging followers the inner face of each being wedge shaped, a floating friction plate on the center line of the gear and of less length than the normal distance between the followers, triangular friction blocks slidably engaging the side faces of the plate, and a wedge block interposed between each inclined face of the followers and the adjacent face of a friction block.

12. A draft gear comprising in combination a pair of lug engaging followers the inner face of each being wedge shaped, a floating friction plate on the center line of the gear and of less length than the normal

distance between the followers, two pairs of triangular friction blocks engaging opposite sides of the plate, and wedge blocks interposed between contiguous faces of the followers and friction blocks and of the friction blocks of each pair.

13. A draft gear comprising in combination a pair of lug engaging followers, a pair of opposed wedge blocks slidingly engaging the inner face of each follower, a tension rod extending through the members of each pair of wedge blocks transverse to the axis of the gear, springs mounted on each rod and urging the blocks toward each other, a friction plate located on the axis of the gear and friction blocks engageable with each side of the gear and with the wedge blocks, the engaging faces of the wedge and friction blocks being oblique to the axis of the gear.

14. A draft gear comprising in combination a pair of wedge shaped followers, a floating friction plate located on the axis of the gear between the followers and normally out of contact with each, a pair of triangular friction blocks slidably engaging each side of the plate, three pairs of triangular wedge blocks, one pair thereof being interposed between each of the followers and the adjacent friction blocks and the third pair being interposed between the members of each pair of friction blocks, a tension rod passing through the members of each pair of wedge blocks transverse to the axis of the gear and springs mounted on the end portions of each rod and bearing inwardly on the wedge blocks associated therewith.

15. A draft gear comprising, in combination, a pair of lug engaging followers, a pair of opposed wedge blocks slidingly engaging the inner face of each follower, the inner face of each block being inclined away from the center line of the gear and from the adjacent follower, friction blocks slidably engaging such inclined faces and complementary thereto, a friction element on the longitudinal center line of the gear and slidably engaging the friction blocks and means for resiliently holding the elements in frictional engagement.

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