J. P. COURSON.

DRAFT GEAR.

APPLICATION FILED JAN. 9, 1912.

1,031,424.

Patented July 2, 1912.

2 SHEETS—SHEET 1.

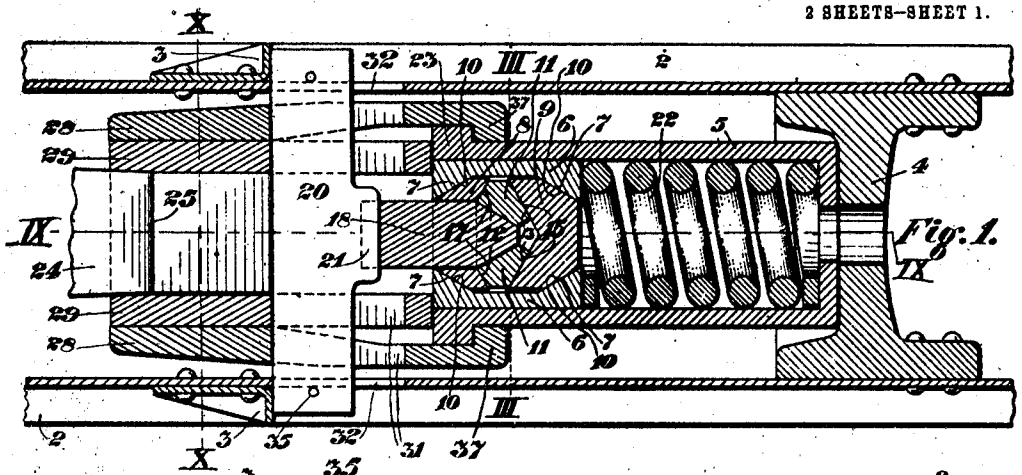

Fig. 1.

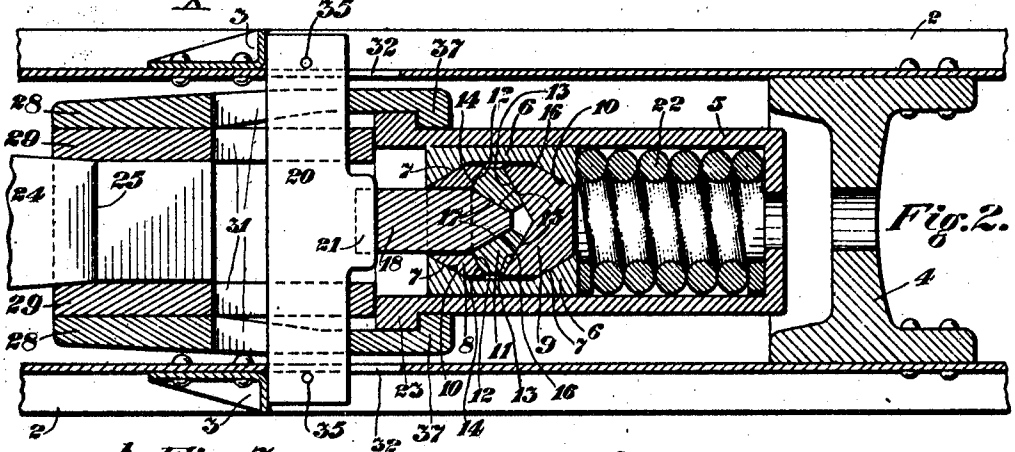

Fig. 2.

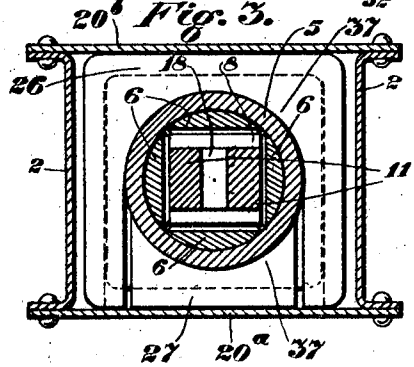

Fig. 3.

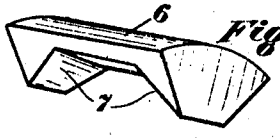

Fig. 4.

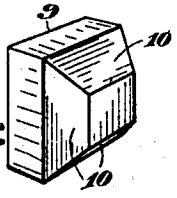

Fig. 6.

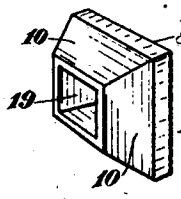

Fig. 5.

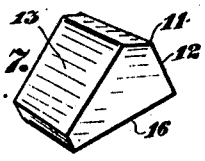

Fig. 7.

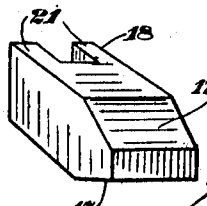

Fig. 8.

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2 SHEETS—SHEET 2.

Fig. 9.

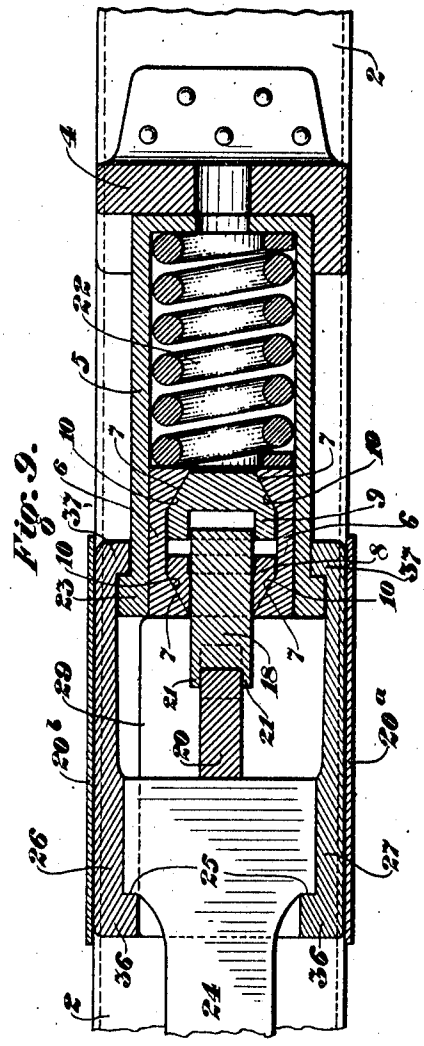
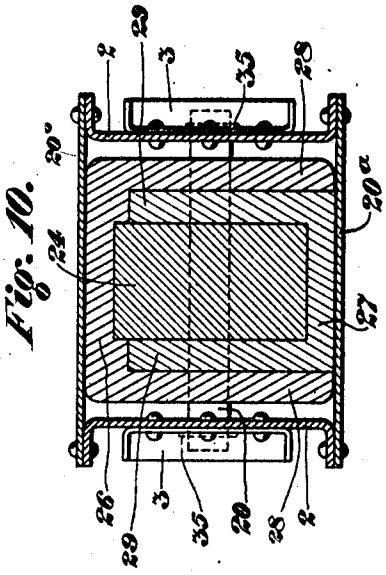


Fig. 10.



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UNITED STATES PATENT OFFICE.

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DRAFT-GEAR.

1,031,424. Specification of Letters Patent. Patented July 2, 1912.

Application filed January 9, 1912. Serial No. 670,284.

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 relates to the class of draft gearing for railway cars and it has for its object to provide a draft gear of simple construction and high efficiency as to resistance to the shocks of buffing and pulling.

The particular object in view is to provide a construction in which assembled friction shoes and wedging means are so arranged within an inclosing casing, with a spring, as to develop a high frictional resistance while providing for a prompt, certain and free release action, with other features of advantage, as shall be more fully hereinafter described.

Preferred arrangements of the invention are shown in the accompanying drawings, in which:

Figure 1 is a longitudinal horizontal sectional view through a draft gear made according to my invention, in normal position. Fig. 2 is a similar view showing the gear in the position assumed under pulling strains. Fig. 3 is a vertical cross section on the line III. III. of Fig. 1. Fig. 4 is a perspective detail view of one of the friction shoes. Fig. 5 is a similar view of one of the endmost wedges. Fig. 6 is a similar view of the other endmost wedge. Fig. 7 is a similar view of one of the intervening expanding wedges, and Fig. 8 is a similar view of the central wedge block. Fig. 9 is a longitudinal vertical section on the line IX. IX. of Fig. 1. Fig. 10 is a cross section on the line X. X. of Fig. 1.

Referring to the drawings, these show an arrangement of the invention in which a single gear is applied to the framing of a steel car having the usual center sills 2, 2, a pair of laterally arranged brackets 3, 3, secured to the sills 2 by rivets or otherwise, and a rear abutment 4 for the gear case similarly secured. The gear case 5, which may be of any suitable or preferred construction, is generally cylindrical in form, adapted to contain my improved friction-creating mechanism, and normally abuts by its rear end against the abutment 4, as in Fig. 1.

In the particular friction mechanism illustrated, I have shown a plurality, preferably four, of segmental friction shoes 6 having outer faces conforming to the curvature of the inner surface of the cylinder 5, which may be of uniform diameter or tapered as preferred, and inner inclined wedging faces 7, 7, at each end, oppositely disposed, with an intervening clearance space. The inclination of faces 7 to the longitudinal axis of the gear is of a sufficiently acute angle to insure a high degree of wedging expansion of shoes 6. Within said friction shoes and in operative position with relation to the faces 7, are the single expanding wedges 8 and 9 respectively at front and rear, each of which wedges is provided with series of outer wedge faces 10 conforming to the angle of and adapted to operatively engage the endmost series of faces 7, 7, of shoes 6 to press them outwardly into binding frictional engagement with the cylinder, when the wedges 8 and 9 are separated longitudinally. This latter effect is secured by means of a plurality, preferably two, of intervening expanding wedges 11, of usual wedge shape, (see Fig. 7) having oppositely disposed outer wedge faces 12 and 13 respectively adapted to engage corresponding inner wedge faces 14 and 15 respectively of the endmost friction wedges 8 and 9. Each expanding wedge 11 is also provided on its inner side with a wedge face 16 adapted to co-act with one of the wedge faces 17 of a central wedge block 18.

The angles of the wedge faces 7, 10, 16 and 17 are acute, for expanding efficiency and may be approximately at 30° to the horizontal axis of the gear. The angles of wedge faces 12, 13, 14 and 15 are relatively blunt for releasing efficiency, and may be approximately at 60° to the same horizontal axis, or at 30° to planes rectangular thereto. The object of said arrangement is that uniformity of wedge action is secured with full efficiency as to expanding and free release. I do not, however, desire to be limited to any particular degree of inclination of the wedge faces, as they may be made of any desired or preferred slope.

The central wedge 18 extends through a central clearance opening 19 in wedge block 8 and forwardly beyond the group of assembled wedges, and bears by its front end against the rear of a transverse follower 20,

preferably having a lipped engagement therewith, as indicated at 21. A spring 22 mounted within the casing 5, bearing by its rear end against the inner end of the casing and at front against the inner ends of friction shoes 6. A plurality of springs may be employed if desired.

The casing 5 in the construction shown, is annularly flanged at its front end as indicated at 23 for the purpose of providing for connection with the draw bar 24. Said drawbar, which may be of any desired construction as to its coupler head, is enlarged at the rear end providing substantial shoulders or abutments 25 at top and bottom, as clearly shown in Fig. 9. For the purpose of connecting the drawbar with the casing, I use a two-part coupling box consisting of interfitting top and bottom box members. Each of said members is rectangular in form, having longitudinal sides 28 and 29 respectively, interfitting with each other and overlapping at each side of a middle clearance space, through which extends the shank of the drawbar 24. The rear end of each is rounded in semi-circular formation, for engagement with the annular shoulder 23 of the casing. Each side wall 28 and 29 of each of said members 26 and 27 is longitudinally slotted, as indicated at 31. When said members are assembled in engagement with the inner head of the drawbar, said slots are in registering position, and provide transverse clearance for the follower 20, which extends outwardly at each side through similar slots 32 in the webs of the center sills 2. The outer box member embraces the upper semi-cylindrical portion of the casing 6 and annularly recessed inner end portions of each of said box members embrace the upper and lower cylindrical flange abutment 23, and engage and completely surround it. The rear portions of the box members extend inwardly behind the annular shoulder 23 so that when the box members are assembled, they will be held in embracing position by the transverse follower 20. Said follower is provided with retaining keys or pins 35 at each end, preventing longitudinal movement or displacement. At the front ends the box members are provided with inwardly extending lips or flanges, adapted when assembled, to engage the shoulders 25 of the drawbar, and at the rear ends with inwardly turned lips 37 which surround and embrace the annular shoulder 23 of casing 5.

In addition to the holding action of the follower 20, I also provide a bottom plate 20^a and a top plate 20^b, extending across and connected to the center sill members 2, and embracing the box members at top and bottom. By this means the supporting of the box housing is insured in addition to the action of the follower (see Fig. 3).

By this construction and arrangement the casing and drawbar are connected but are capable of relative longitudinal movement toward each other, due to the slots 31 being considerably longer than the width of the follower 20, and the follower also has the same degree of movement through said slots and slots 32, in the operation of buffing. On the other hand the assembled coupling boxes 26 and 27, with the casing 5, have the same extent of forward movement with relation to the relatively stationary follower 20 in the operation of pulling.

The operation is as follows: In pulling the casing 5 is drawn forward against the central wedge 18 and follower 20 bearing against the brackets 3 of the center sills 2, as in Fig. 2. In buffing, casing 5 bears backwardly against abutment 4 of the center sills and drawbar 24 exerts backward pressure through follower 20 against central wedge 18, thrusting it inwardly of the relatively stationary casing 5. With either movement the central wedge block 18 and casing 5 are brought together. Due to resistance of spring 22 especially when compressed, and friction shoes 6, the action of acute wedge faces 17 on acute wedge faces 16 of expanding wedges 11 separates these wedges laterally in opposite directions, their relatively blunt faces 12 and 13 then acting as acute wedges, in lateral movement, against the contacting faces 14 and 15 of endmost wedges 8 and 9. This results in longitudinal movement in opposite directions, forwardly and backwardly, of the single endmost wedges 8 and 9. Thereupon, acute angle faces 10 of the endmost wedges, acting on similar faces 7 of the shoes 6, thrust them outwardly with great binding or frictional force, against the inner faces of the casing 5, the degree of frictional resistance being in proportion to the shock. Upon release of pressure wedge block 18 will recede, due to the resisting pressure of faces 16 on faces 17, expanding wedge blocks 11 will collapse, and endmost wedge blocks 8 and 9 will recede toward each other releasing their hold on friction shoes 7 and effecting loosening of the friction shoes from the casing.

It will be understood that the degree of taper, in operative directions, of the several co-acting wedge faces, while sufficiently acute to effect a high degree of expanding action of the wedges and resulting frictional contact of the shoes with the casing, is not so acute as to prevent separation of the several parts upon relaxation of the pressure. The ultimate frictional resistance is due to the combined effect of the co-acting sets of faces, to wit, faces 17—16, 12—14, 13—15, and 10—7, all preferably of substantially the same degree of working taper with relation to their direction of movement. I do

not, therefore, depend on the wedging action of a single pair or set of very acute wedge faces or the releasing effect of unduly blunt wedge faces which if necessarily present for release, have no especial efficiency in wedge action. On the contrary all of the several wedge faces co-act cumulatively to produce the combined separating result, effecting together a total frictional resistance between the shoes and casing to a very high degree.

It will be understood that the gear may be changed or modified by the skilled mechanic in various features or details, but all such are to be considered as within the scope of the following claims.

What I claim is:

1. In a friction draft gear, the combination with the casing and a relatively movable drawbar, of friction shoes engaging the casing, a buffing block adapted to transmit drawbar strains, longitudinally separated wedge blocks engaging the friction shoes, and wedge blocks interposed between said wedge blocks and the buffing block, substantially as set forth.

2. In a friction draft gear, the combination with the casing and a relatively movable drawbar, of friction shoes engaging the casing having inner inclined faces, longitudinally separated wedge blocks engaging the friction shoes having outer and inner inclined faces, a buffing block adapted to transmit drawbar strains having outer inclined faces of different angle from the inner inclined faces of said wedge blocks, and wedge blocks interposed between said longitudinally separated wedge blocks and the buffing block, substantially as set forth.

3. In a friction draft gear, the combination with the casing, of friction shoes, a buffing block, longitudinally separated wedge blocks engaging the friction shoes having inner inclined faces, and wedge blocks interposed between said wedge blocks and the buffing block having inner faces engaging the faces of the buffing block and outer faces of steeper inclination engaging the inner faces of the longitudinally separated friction-block-engaging wedge blocks, substantially as set forth.

4. In a friction draft gear, the combination with the casing, of friction shoes, a buffing block, longitudinally separated wedge blocks having outer faces engaging the faces of the friction shoes and inner faces of steeper inclination, and wedge blocks having inner faces engaging the faces of the buffing block and outer faces disposed at a more obtuse angle to the longitudinal center of the buffing block and engaging the inner faces of the longitudinally separated friction-block-engaging wedge blocks, substantially as set forth.

5. In a friction draft gear, the combination with the drawbar, casing, spring, and friction members, of a compound wedge comprising a central wedge member, endmost wedge members engaging the friction members, and collapsible wedge members engaging the central wedge member and said end-most wedge members.

6. In a friction draft gear, the combination with the drawbar, casing, spring and friction members having inner inclined wedge faces at each end, of a central wedge, oppositely acting wedges engaging said inclined faces of the friction members, and a plurality of collapsible wedges engaging said wedges and the central wedge.

7. In a friction draft gear, the combination with a casing, spring, and friction shoes having inner endmost opposing inclined faces, of endmost expanding wedges engaging said faces, intervening separating wedges, and a central wedge engaging the separating wedges and operable to press them apart laterally and effect longitudinal separation of the endmost wedges, substantially as set forth.

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

JOHN F. COURSON.

Witnesses:
C. M. CLARKE,
EDWIN TRUEB.