J. F. COURSON.

FRICTION DRAFT GEAR.

APPLICATION FILED MAY 3, 1911.

1,067,587. Patented July 15, 1913.

2 SHEETS—SHEET 1.

Fig. 1.

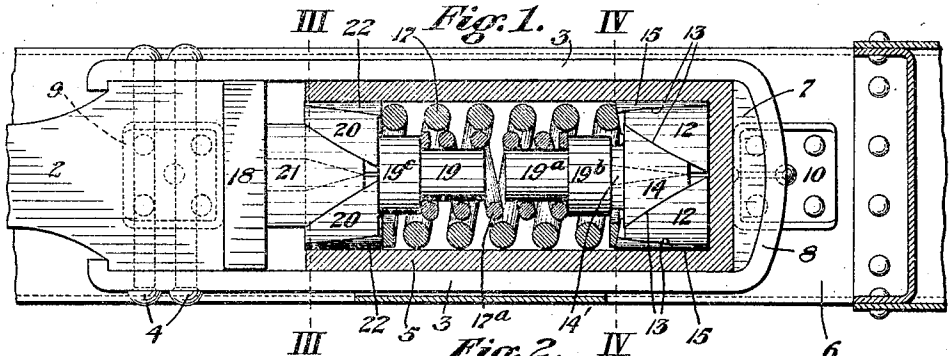



Fig. 2.

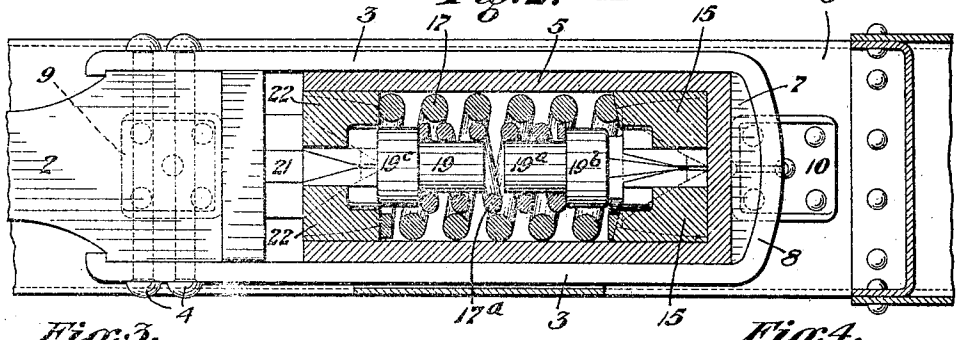



Fig. 3.

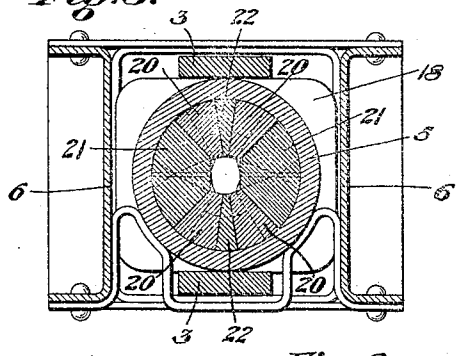



Fig. 4.

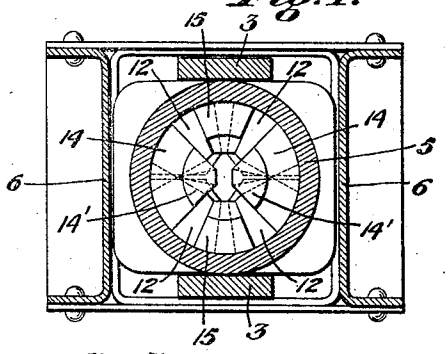



Fig. 5.

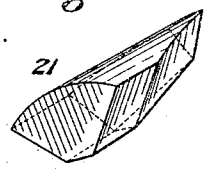



Fig. 6.

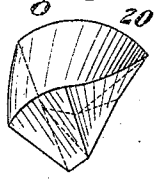



Fig. 7.

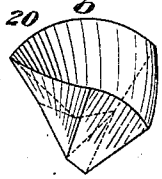
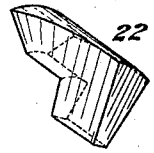



Fig. 8.




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2 SHEETS—SHEET 2.

Fig. 9.

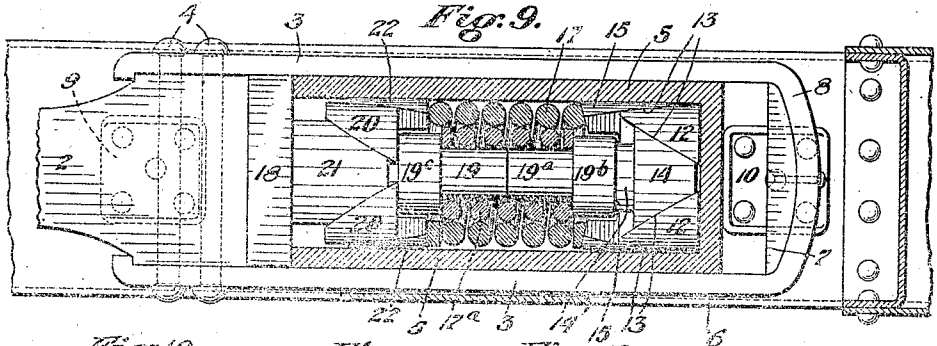



Fig. 10.

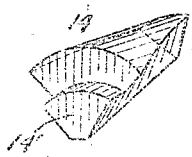



Fig. 11.

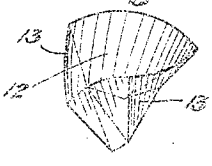



Fig. 12.

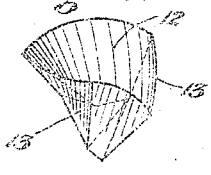



Fig. 13.

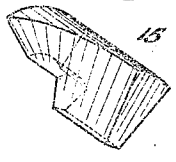



Fig. 15.

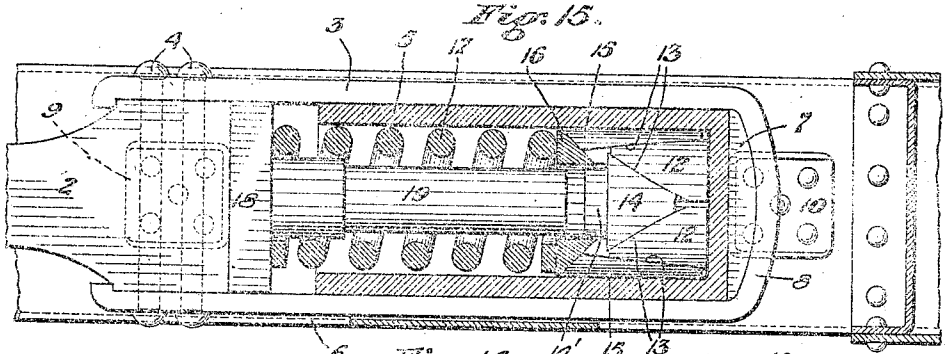



Fig. 14.

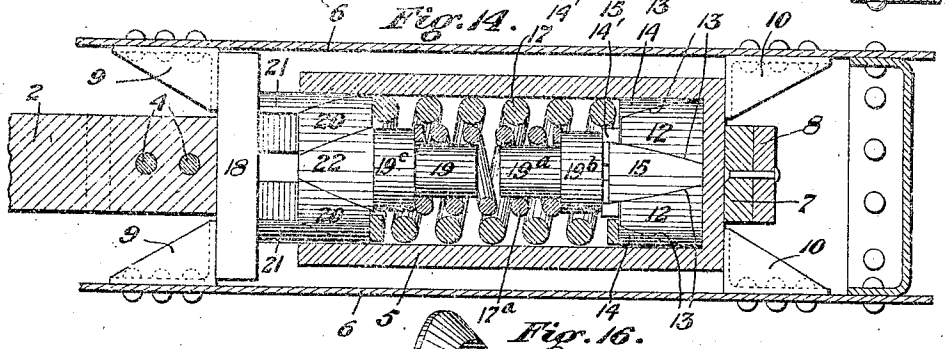
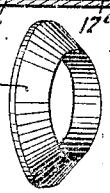



Fig. 16.




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# UNITED STATES PATENT OFFICE.

JOHN F. COURSON, OF PITCAIRN, PENNSYLVANIA.

## FRICTION DRAFT-GEAR.

1,067,587. Specification of Letters Patent. Patented July 15, 1913.

Application filed May 3, 1911. Serial No. 624,803.

*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 Friction Draft-Gears, of which the following is a specification.

My invention consists of an improvement in friction draft gears for railway cars, etc.; and it has for its object to provide frictional resistance between themselves and against the interior of the casing by means of a group or groups of segmental wedge blocks and means assembled therewith for transmitting to the several parts the pulling and buffing strains.

The construction has in view the creation of high resistance with a minimum of longitudinal movement and free release.

These objects are obtained by designing and assembling the wedging and friction elements in the manner hereinafter more fully described.

In the drawings: Figure 1 is a central vertical sectional view, partly in elevation, of one construction of the draft gear assembled, the parts being shown in extended position. Fig. 2 is a similar view, the central wedging members being shown in section. Fig. 3 is a cross section on the line III, III of Fig. 1. Fig. 4 is a similar section on the line IV, IV of Fig. 1. Figs. 5, 6, 7 and 8 are detail views of the several friction wedge blocks used at the front end of the gear. Fig. 9 is a view similar to Fig. 1, the parts being shown in position under compression. Figs. 10, 11, 12 and 13 are views similar to Figs. 5 to 8 inclusive of the several friction wedge blocks used at the rear end of the gear. Fig. 14 is a sectional plan view showing the construction and position of the parts shown in Fig. 1. Fig. 15 is a view similar to Fig. 1 but showing the use of friction wedge blocks at the rear or inner end of the gear only. Fig. 16 is a detail view of the spring-bearing wedge ring shown in Fig. 15.

In the drawings, 2 represents the draw bar of a coupler fixedly connected with a yoke 3 by transverse rivets 4, in the manner customary in this art, said yoke embracing the casing or cylinder 5 at top and bottom as shown, the yoke and casing being located between the center sills 6, 6. A bearing block or piece 7 is set against the rear end of casing 5 against the outer end of which block bears the rounded end 8 of yoke 3, preferably secured to the end of the yoke. The front stops 9 are shown in dotted lines in Fig. 1 extending inwardly at each side from the center sills 6, which sustain the pulling effect of the draft gear and impart it to said sills, while similar rear stops 10 act to receive and impart buffing strains in the same manner.

The simplest embodiment of the invention is shown in Fig. 15, employing an assembled group of friction wedge blocks at the inner end only of the casing. These blocks are so shaped and arranged that when grouped together within the cylinder they comprise a cylindrical sectional unit. Each block forms by its exterior face a cylindrical frictional bearing surface for the inner face of the cylinder and each is provided with tapering wedge faces, and each is segmental shape in cross section for compact assemblage and internal friction. As shown in Fig. 15 the group consists of four longitudinally stationary blocks 12, the rear ends of which abut against the inner end of cylinder 5. The front portions of said blocks 12 taper at each side as at 13 providing wedge faces for lateral separation thereof by the other adjacent actuating blocks to wit, by the alternately disposed front wedge blocks 14 or 15. There are two of each of said blocks 14 and 15, in pairs, oppositely located, *i. e.* blocks 14 are opposite each other between blocks 12, while blocks 15 are likewise opposite each other, alternately between blocks 14, and between the other or opposite faces of blocks 12.

The inner portions of blocks 14 and 15 taper at angles corresponding to faces 13 of blocks 12 so that when inward pressure is exerted against either blocks 14 or 15 the effect will be to separate adjacent blocks 12 (as by blocks 14) and to force the other blocks 15 forwardly in the cylinder. On the other hand, if pressure is first exerted inwardly against blocks 15, then blocks 14 will be wedged forwardly.

In the construction shown I employ a tapered bearing ring 16, the inner tapered face of which bears against the outer inwardly tapered ends of blocks 15 which are purposely made longer than blocks 14, and are thus normally held against the cylinder. The other side of ring 16 is flat, providing a bearing for pressure spring 17 which bears

by its other end against the usual follower 18 seated against the rear end of the draw bar 2 between the arms of yoke 3.

The central stem 19 extends inwardly from follower 18 and in the normally open position of the gear as shown terminates within a short distance of the end of bearing extensions 14′ of blocks 14, at each side of the center. Said extensions 14′ constitute bearing terminals for the end of the stem to transmit the force of the impact in buffing and pulling.

The operation of the construction as thus assembled is as follows: Spring 17, having a limited capacity to the extent of its energy, normally bears against the follower plate 18 and ring 16, tending to thrust blocks 15 inwardly to the extent of their travel and tightly against the adjacent faces of blocks 12. The inward thrust of blocks 15 tends to separate blocks 12 at each side of each block 15 and to thrust the adjacent blocks 12, 12 (one at each side of block 14) toward and closely adjacent to each other. The blocks 14, located equidistantly between blocks 15 and opposite each other, are likewise by such action normally thrust forwardly to the position shown for engagement by end of stem 19 and at a location slightly beyond the inner end of bar 19 as in Fig. 15. Upon pulling strain being imparted to cylinder 5 through draw bar 2 and yoke 3 against stops 9, or buffing strain being imparted backwardly through draw bar 2, follower 18, spring 17 and stem 19 against the cylinder 5 and stops 10, the primary effect is, when the end of stem 19 abuts against the extension 14′ of wedge blocks 14, to separate the blocks 12, 12, at each side of wedge block 14, whereupon the blocks 12 acting against blocks 15, thrust them forwardly toward the draw bar, carrying ring 16 forwardly against the compressing spring 17. The accumulated effect of inward travel of wedge blocks 14 under impact of the resistance of stem 19, either in pulling or buffing, and of the limited resisting pressure of spring 17, is to effect lateral spreading of wedge blocks 12, the pairs of said blocks acting upon each converging side of blocks 15, thereby forcing said blocks forwardly within the casing in a direction opposite to the longitudinal travel of blocks 14. Due to the interengagement of the several segmental wedge block sections their radially contacting faces are in tight binding engagement with each other, as are also their several partly cylindrical faces with the interior surface of cylinder 5. The great strains and pressures developed by the interengaging wedges forcing the frictional faces of blocks 15 into tight binding engagement with the interior of cylinder 5 and against the accumulating pressure of spring 17, result in a high degree of frictional resistance between the several parts, both as to their external cylindrical faces, and their several radially disposed interengaging segmental faces.

It will be observed that, by the construction as thus constituted, the frictional travel of the wedge blocks 14 and 15 is in opposite directions and against the inner surface while the annular frictional travel of the blocks 12 is also in opposite directions as to each pair of blocks engaged by block 14, in directions annularly of the interior. Also that the angles of the several wedge faces is such as to provide for free and ample release of the parts without sticking, upon release of either pulling or buffing pressure.

What has just been said as to the construction, arrangement and operation of the parts equally describes the arrangement of the assembled wedge blocks at the inner end of the cylinder in the principal figures of the drawings. These parts, being substantially the same with the exception of the interposed ring 16, are identified by similar numerals and include, as an alternative construction, a relatively short stem $19^a$ having an inner terminal head $19^b$ adapted to normally abut against the extensions 14′ of wedge blocks 14. Said blocks together with the oppositely tapered blocks 12, 12, and the spring-bearing friction blocks 15, 15 are retained in their normal position as shown in Fig. 1 by the usual spring 17, and a supplemental spring $17^a$. Said spring $17^a$ embraces stem $19^a$ and also stem 19 which bears by its outer head $19^c$ against the inner ends of frictional blocks 20, 20. Said blocks 20, like blocks 12, are in pairs, one block of each pair being located at each side of the main central wedge block 21, which in turn bear by their forward ends against the follower 18. Between the blocks 20 of said pair of blocks and the corresponding block 20 of the companion pair on the other side of the gear, are interposed the friction wedge blocks 22, 22, corresponding in position to blocks 15, as do blocks 21 correspond to blocks 14. The wedge faces of blocks 21, which produce the initial movement in the front set of wedge blocks, act against the adjacent contacting faces of blocks 20, 20, to expand them laterally within the casing 5, apart from each other, while the opposite tapered wedge faces of said blocks 20, instead of being inclined in the opposite direction (as are the corresponding faces of blocks 12) are inclined in the same general direction as are the faces of blocks 20 which contact with faces of blocks 21. Likewise, the faces of the intermediate wedge blocks 22 are similarly disposed, making contact with the adjacent tapered faces of blocks 20. The effect of this construction is that as blocks 20 are separated by blocks 21 and act upon blocks 22, said blocks are thrust inwardly of the casing 5,

compressing spring 17. The general inward movement of the entire assembled series of wedge blocks at the front of the casing also acts to thrust stem 19 inwardly until it makes contact with stem 19ª, blocks 22 in the meantime having been carried inwardly at a greater speed of travel than blocks 20, as in Fig. 9. Thereupon, stems 19 and 19ª, forming a rigid resisting abutment, further movement of either the draw bar in buffing or of the casing 5 in pulling, operates to exert further expansion in each set of assembled blocks at front and back, producing proportionately increased expansion of the several blocks and frictional engagement by their cylindrical surfaces against the interior of the cylinder.

The operation of the apparatus will be readily understood from the foregoing description. The advantages result primarily in great frictional contact pressure between the friction blocks and casing within a comparatively short range of longitudinal movement of the blocks and immediate and complete separation of the binding parts upon release of buffing or pulling pressure. The parts are easily assembled and maintained in assembled relation by reason of the interfitting engagement of the several segmental shaped wedge blocks, while the practically continuous cylindrical surfaces thereof insure a symmetrical disposition of the wearing strains with equal wear throughout.

Having described my invention what I claim is:

1. The combination with a casing and a relatively movable drawbar; of a unitary series of annularly assembled wedge blocks within the casing having contacting angle faces of varying inclination, and means adapted to impart longitudinal movement to some of said blocks.

2. The combination with a casing and a relatively movable drawbar; of a unitary series of annularly assembled wedge blocks within the casing having outer cylindrical faces engaging the casing and interengaging radially disposed angle wedge faces of varying inclination with relation to the longitudinal center of the casing, said blocks engaging each other by their contacting wedge faces transversely of the series, and means adapted to impart longitudinal movement to some of said blocks.

3. In combination, a casing, a drawbar in operative relation thereto, a follower, stop abutments, a plurality of cylindrical unitary groups of wedge blocks within the casing each group comprising alternately arranged longitudinally and laterally movable friction members each having a tapered formation providing opposite wedge faces, a spring interposed between said groups of blocks, and a stem adapted to transmit pressure from certain of the blocks of one group to certain of the blocks of the other group.

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

JOHN F. COURSON.

Witnesses:

C. M. CLARKE,

CHAS. S. LEPLEY.