

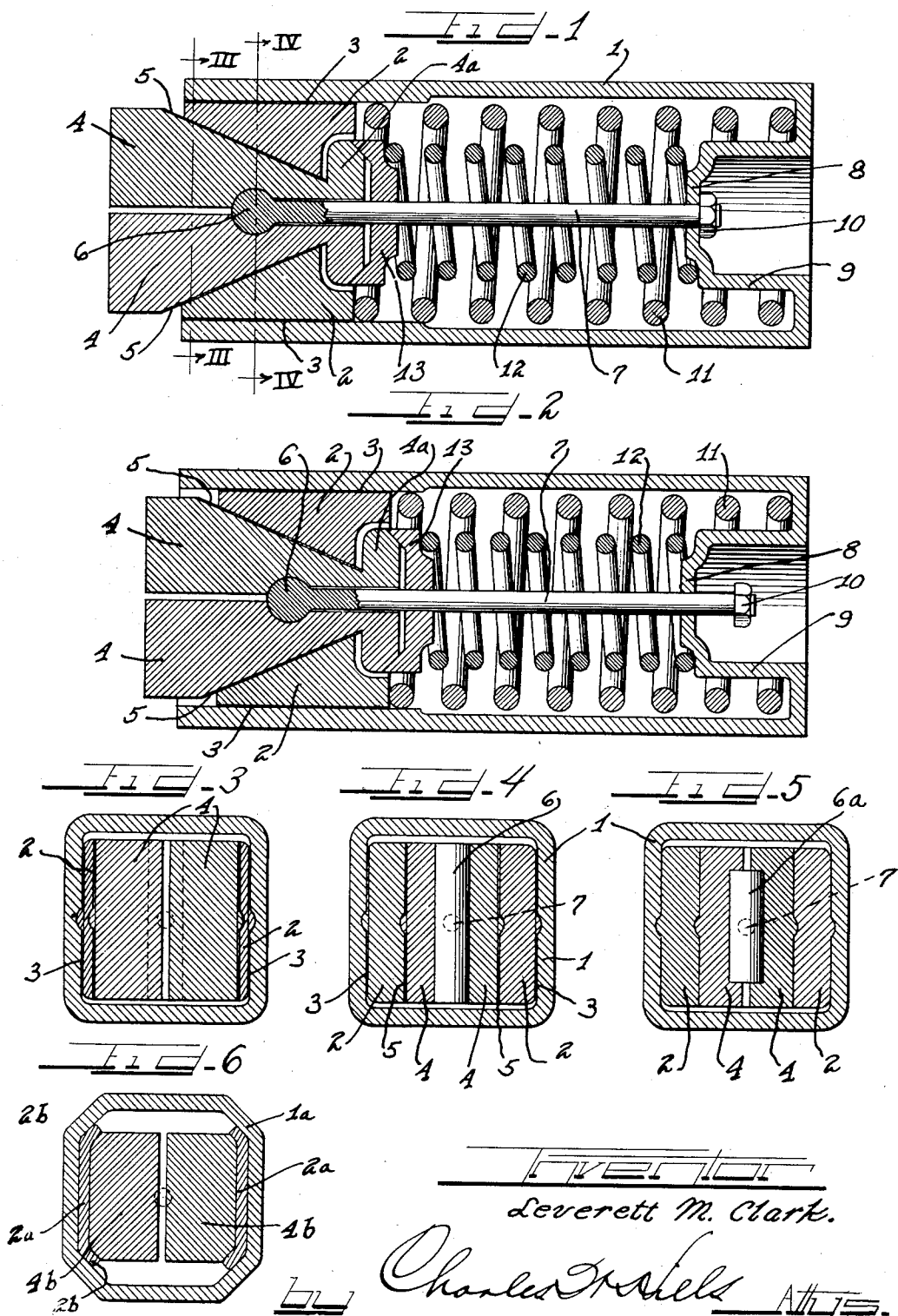
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DRAFT GEAR

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DRAFT GEAR

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This invention relates to a draft gear.

Heretofore draft gears or friction mechanism have not been provided with any definite means for equalizing the actuating pressures over the entire contacting surfaces of the friction generating members. The equalization of such actuating pressures is exceedingly important for the reason that the same minimizes any undue abrasion and the resultant wear of the surfaces and in promoting uniform and smooth action of the energy-translating operation as well as in furthering and insuring a positive release or return of the operating parts after applied pressures have been removed.

In addition to the means for equalizing the actuating pressures as above referred to, it is also important that the most uniform action be obtained between the actuating and friction generating members in order to make it possible to employ any ordinary combination of contacting members. One way of obtaining this result involves the coating of one or both of the actuating pressure surfaces with lead or lead alloy to permanently reduce and stabilize the coefficient of friction of these surfaces, eliminating all undue abrasion and wear so as to more uniformly control the applied pressures against the friction-generating surfaces. In view of the fact that the differentiated movements between the actuating and friction-generating members are very small, lead or lead alloy inserts in one or both of the surfaces would not properly function to produce the result occurring by the use of a lead or lead alloy coating.

Another feature of this invention resides in a structure wherein the tie-bolt is combined with the equalizing member that makes the assembly self-contained and for holding it to a definite length.

The invention comprises the novel structures and combination of parts hereinafter described and more particularly pointed out and defined in the appended claims.

In the accompanying drawing which illustrates certain preferred forms of this invention and in which similar reference numerals refer to similar features in the different views:

Figure 1 is a longitudinal sectional view through a draft gear involving this invention.

Figure 2 is a view similar to Figure 1 showing the parts in a different position.

Figure 3 is a reduced sectional view taken upon the line III—III of Figure 1 looking in the direction of the arrows.

Figure 4 is a slightly reduced sectional view

taken upon the line IV—IV of Figure 1 looking in the direction of the arrows.

Figure 5 is a view similar to Figure 4 illustrating a slight modification of the invention.

Figure 6 is a sectional view taken substantially in the same plane as Figure 3 but illustrating a slight modification of certain parts of this invention.

As illustrative of this invention, there is shown in the drawing especially in Figures 1 to 4, a rectangular casing 1, a pair of side wedges 2 which coact with the surfaces of the casing to form the friction-generating member. These side wedges are preferably provided with a coating of lead or lead alloy 3 upon their outer surfaces. Between the side wedges 2 there are a pair of center wedges 4 which coact with the inclined surfaces of the side wedges 2. The inclined surfaces of the central wedges 4 are coated with lead or lead alloy 5 or the like. Whenever an external force or pressure is applied to the outer extended end of the center wedges 4, the side wedges 2 are forced inwardly and against the side walls of the casing 1 through the bridging resistance of the equalizing pin or member 6, which is positioned between the center wedges. It will be noted that the equalizing pin 6 is of substantially cylindrical form and occupies a concave recess in each central wedge 4 and equalizes the actuating pressures over the entire contacting surfaces of the friction generating members. A tie-bolt 7 integral with the equalizing pin or head 6 extends longitudinally through the casing 1 and is slidably mounted in the inner wall 8 of an inwardly extending hollow boss 9 integral with the casing and extending inwardly from the inner end thereof. The nut 10 upon the inner end of the tie-bolt 7 is adapted for engaging the wall 8 for limiting the outward movement of the wedge elements 2 and 4.

A relatively stout coil spring 11 in the casing bears against the inner edges of the side wedges 2 and a lighter coil spring 12 is in the large coil spring 11 and positioned upon the boss 9 and bears against a follower 13, which in turn bears against laterally offset heads 4a on the central wedges 4 and which laterally offset heads 4a are located in suitable recesses in the inner ends of the side wedges 2. It will be noted that the engaging surfaces of the heads 4a and the follower 13 are suitably beveled or inclined in order that, whenever externally-applied pressures have been removed from the outwardly-projecting ends of center wedges 4, the pressure of helical spring 12 can unbalance the center wedge pressure

against the adjacent side wedges sufficiently to cause the combined pressures of springs 11 and 12 to return the wedges to normal position.

It will be appreciated that by the employment of the hollow boss 9 at the end of the casing, the rod 7 is supported at a point within the casing and need not be extended beyond the casing.

In Figure 5, there is shown a slight modification which differs from the foregoing structure in that the equalizing pin 6a does not extend entirely across the casing as shown in Figure 4. In this modified form of structure, the equalizing pin 6a is shorter than the width of the central wedges 4, the opposed faces of which are provided with arcuate recesses for receiving the said equalizing pin.

In Figure 6, there is shown a slightly modified form of structure in which the casing 1a is of octagonal form. It will be noted that in this form of the invention, the side wedges 2a are provided with inclined lateral lips 2b that engage beveled corners on the central wedges 4b. It will be obvious that in this modified form of construction, there can be no lateral play between the side wedges 2a and the central wedges 4b.

Whenever an external force or pressure is applied to the outer extended ends of the center wedges 4, the side wedges 2 are forced against the casing through the bridging resistance of the equalizing pin or member 6. As soon as the static resistance of the side wedges 2 has been overcome, the center and side wedges are moved into the casing 1 against the resistance of the pre-compressed helical springs 11 and 12 until the combined frictional and spring resistance equals the externally applied pressure. It is to be noted that helical spring 12 resists the inward movement of the center wedges 4 through the follower 4a. Due to the beveled coating parts of the center wedges 4 and the follower 4a, the tendency is to draw the inner ends of the center wedges away from the side wedges 2 with the equalizing pin 6 acting as a fulcrum, but the greater pressure which is externally applied to the center wedges 4 counteracts this tendency during the inward movement of the wedge groups. The lead coating between the central wedges and the side wedges will tend to reduce the coefficient of friction while the lead coating between the side wedges and the housing will tend to stabilize the coefficient of friction.

It will be considered that various forces or pressures of various magnitudes will be applied externally to the outwardly projecting ends of the center wedges 4 according to the operation of railway vehicles, colliding speed, rates of speed changes between adjacent vehicles, pulling forces of locomotives, etc., and that the corresponding movements of the wedge groups and the amount of kinetic energy-translation will be governed thereby up to the limit of wedge group travel or the cushioning capacity of the friction mechanism. When previously applied forces or pressures are removed from the outwardly projecting ends of center wedges 4, the pressure of helical spring 12 acting through follower 4a against angular surfaces of center wedges 4 unbalances the center wedge pressure against adjacent side wedges sufficiently to cause the combined pressures of springs 11 and 12 to return the wedges to normal position. It is to be noted that the partially compressed spring 11 when the mechanism is released as described, forces the side wedges 2 against the center

wedges 4 and in this manner compensates for any wear of any and all contacting surfaces. This action is entirely automatic and serves to maintain the capacity of the mechanism against whatever normal wear may occur.

Reverting again to the equalizing function of the pin 6, it is desired to point out that this pin not only acts to equalize the pressures of the central wedges under normal conditions when the forces acting on the center wedges are normal thereto but also when such forces or pressures are applied at an angle to the center wedges as occurs when railway vehicles are operating on curved tracks. It will therefore be apparent, that the capacity and operating characteristics of the friction mechanism will not be materially affected when external forces or pressures are applied at an angle to the center wedges.

I am aware that many changes may be made and numerous details of construction may be varied through a wide range without departing from the principles of this invention, and I therefore do not purpose limiting the patent granted hereon otherwise than necessitated by the prior art.

I claim as my invention:

1. In a friction mechanism of the class described, a housing, a pair of side wedges slidably mounted in said housing, a pair of center wedges between said side wedges, an equalizing member between said center wedges, a rod integral with said equalizing member, means for supporting said rod within said housing, said equalizing member tending to spread said center wedges against said side wedges, said center wedges having inner beveled ends, a follower co-operating with said beveled ends, and yielding means pressing against said follower tending to withdraw said center wedges from contacting relation with said side wedges.

2. In a friction mechanism of the class described, a housing having an inwardly directed hollow boss at one end, a pair of side friction wedges within the other end of said housing, a pair of center wedges between said side wedges, an equalizing member between said center wedges, said equalizing member having a rod slidably mounted in said boss, said side wedges having a recess and said center wedges having laterally extending heads positioned in said recess, a follower engaging said heads, said heads and follower having coating inclined surfaces tending to draw the center wedges together, a spring within said housing bearing upon said side wedges, and a second spring within said housing bearing on said follower for the purpose set forth.

3. In a draft gear, a housing, side wedges mounted in said housing, said side wedges having complementary recesses, center wedges between said side wedges and having heads located in said recesses, said heads being beveled upon their outer edges, a follower having beveled portions engaging the beveled portions of said heads, a spring in said housing acting upon said follower and a second spring in said housing acting upon said wedges.

4. In a draft gear, a housing having a bearing wall at one end, a pair of side wedges extending into the other end of said housing, a pair of center wedges between said side wedges, a cylindrical member mounted between said center wedges, said cylindrical member having a rod extending through said bearing wall and yielding

means in said housing acting upon said center wedges and said side wedges.

5 5. In a draft gear, a housing, side wedges extending into one end of said housing, center wedges between said side wedges, said center wedges having their inner ends beveled upon the outer edges thereof, a follower having beveled portions engaging the bevels on said ends, a
10 and yielding means acting upon the inner ends of said side wedges.

15 6. In a draft gear, a housing, side wedges in said housing, center wedges between said side wedges, an equalizing member between said center wedges, said member having a rod extending longitudinally of said housing, means for slidably anchoring said rod for limiting the outward movement of said center wedges and yielding means in said housing in opposed relation to said
20 side wedges and center wedges.

7. In a draft gear, a housing having an inwardly directed boss at one end, a pair of side fric-

tion wedges within the other end of said housing, said wedges having a coating of lead adjacent said housing, center wedges between said side wedges, an equalizing member between said center wedges having a rod slidably mounted in said boss, said center wedges having a coating of lead contacting said side wedges and yielding means acting on said wedges. 80

8. In a draft gear, a housing, side wedges extending into one end of said housing and having a coating of lead adjacent said housing, center wedges between said side wedges and having a coating of lead adjacent said side wedges, the inner ends of said center wedges having their outer corners beveled, a follower having beveled portions coacting with said beveled corners for drawing said center wedges together, yielding means acting upon said follower and yielding means acting upon the inner ends of said side wedges. 85 90 95

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