Nov. 10, 1931. H. E. TUCKER 1,831,084

DRAFT GEAR

Original Filed July 9, 1927

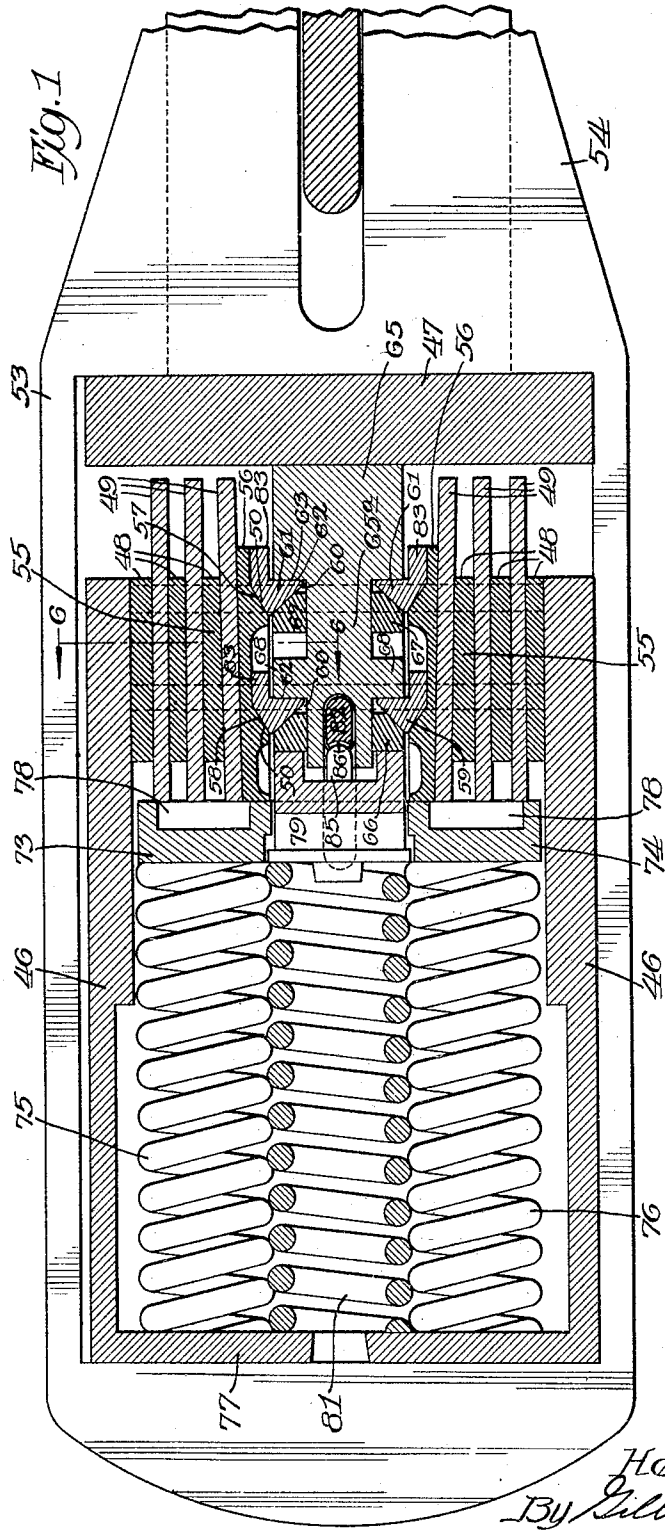


Fig. 1

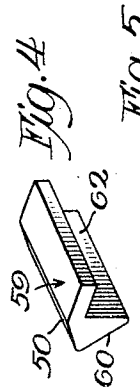


Fig. 4

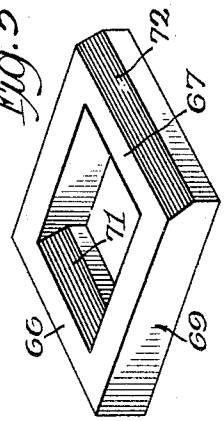


Fig. 5

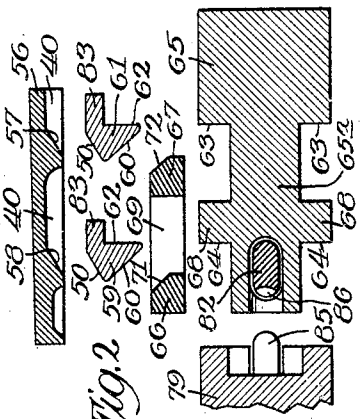


Fig. 2

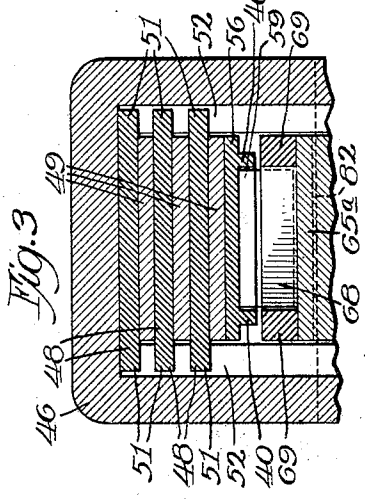


Fig. 3

Inventor:
Herbert E. Tucker
By Gillen, Evans & Cox Attys.

Patented Nov. 10, 1931 1,831,084

UNITED STATES PATENT OFFICE

HERBERT E. TUCKER, OF SOUTH BEND, INDIANA, ASSIGNOR TO UNIVERSAL DRAFT GEAR ATTACHMENT CO., A CORPORATION OF ILLINOIS

DRAFT GEAR

Original application filed July 9, 1927, Serial No. 204,618. Divided and this application filed July 9, 1928. Serial No. 291,241.

This application is a division of my application for patent on improvements in draft gear filed July 9, 1927, Serial No. 204,618.

The invention relates to that type of draft gear in which a system of wedging and friction elements are enclosed within a chambered follower or casing, which also house springs cooperating with such elements, a plate follower constituting the opposite end of the gear and the whole being enclosed within a yoke or equivalent device.

The object of the invention is to provide an improved system of wedging and friction elements in gears of this type by means of which the capacity of the gears is increased, certainty and smoothness of action is obtained on release, and in which provision is made for taking up the slack incident to wear and maintaining the efficiency of the gear.

In the accompanying drawings showing a preferred embodiment of the invention

Fig. 1 is a longitudinal, central, vertical section of the gear enclosed within a yoke shown in elevation;

Fig. 2 is a detail sectional view of various of the elements of the gear;

Fig. 3 is a detail section on the line 6—6 of Fig. 1; and

Figs. 4 and 5 are views in perspective of certain of the wedging elements.

The enclosing yoke, which may of course be of any desired form, is shown at 53. The chambered follower or casing 46 is seated against the inner end of the yoke, the forward end of the casing being open, and a cooperating plate follower 47 within its forward end.

Two groups of intercalated friction plates are housed within the forward end of the casing. The plates 48 forming one set of each group are anchored to the casing by means of laterally extending lugs 51 which slidingly fit within channels formed across the faces of the top and bottom walls of the casing, whereby while having no longitudinal movement with reference to the casing, they are capable of transverse movement.

The plates 49 of the other set of each group are longer than the plates 48, normally projecting beyond each end thereof, and are free to move both laterally and longitudinally except as restrained by friction. At least one of the plates of each group, as the plate 55 is tapered toward its outer end, constituting a wedge for cooperating with the other elements in increasing the friction between the parts and also contributing to the certainty and smoothness of action on release.

Frictionally engaging the inner plate of each group is a wedging shoe 56 having upon its inner side a pair of forwardly and inwardly inclined wedging surfaces 57, 58, one adjacent each end of the shoe.

A centrally disposed thrust element 65 is seated against the plate follower 47 and has a stem 65*a* projecting into the casing 46, its lateral faces being flat and parallel, and having a pair of laterally projecting lugs 68, 68, the inner faces of which take the form of flat shoulders 62. The inner face of the base portion of the element 65 is also provided with a similar pair of shoulders 63. Wedge blocks 61, 59, substantially triangular in form, are seated respectively on each of the shoulders 63 and the forwardly facing shoulders 62 of the lugs 68 and fit loosely between longitudinal flanges 40 projecting from the inner faces of the shoes 56, one of their faces as 50 conforming to the inclination of and engaging one of the wedging faces 57, 58 of a friction shoe 56.

Each of the blocks 59, 61 is preferably provided with a backwardly extending stem as 83 which normally seats against a flat surface of the friction shoe. The third face 60 of each of the triangular blocks is inclined at a somewhat more obtuse angle than the face 50 and cooperates with a corresponding face as 71, 72 formed on blocks 66, 67 which, but for the inclined face named, may as shown be approximately square in cross section and which are seated against the side faces of the stem 65*a*. The elements 66, 67 at each side of the gear are preferably united at their ends by integral webs 69, thus forming a rectangular structure.

A centrally disposed helical spring 81 reacts between the inner end 77 of the casing 46

and a spring seat 79 which bears upon the elements 66 and is chambered to receive the stem 65*a* of the thrust element, the chamber being of sufficient depth to avoid contact therewith. Spring seats 73, 74 engage the inner ends of the friction plates 49 of each group and the friction shoe 56 associated therewith, these seats being integrally united at their ends to form a unitary structure. Helical springs 75, 76, which are preferably four in number, react between the seats 73, 74 and the inner end of the casing 46.

With view to lightness, the plate engaging faces of the seats 73, 74 may be ribbed as shown at 78.

The parts named as being enclosed within the casing having been assembled, a retaining key 82 is inserted through suitably elongated openings in the side walls of the casing, passing through the stem 65*a*. Midway of the ends of the key a recess 86 is formed for the reception of a lug 85 projecting forwardly and centrally from the bottom of the recess in the spring seat 79, the end of the stem 65*a* being apertured for its accommodation, thereby preventing the withdrawal of the key and securing the parts in assembled relation before the installation of the gear.

In the released position of the gear, the spring seats 73, 74 are in contact with the inner ends of the plates 49 and of the friction shoes 56, and the outer ends of the plates 49 are out of contact with the plate follower 47.

Upon the compression of the gear, as in buff, the plate 47 moves backwardly carrying with it the thrust element 65 thereby advancing the wedge elements 59, 61 and exerting a compressive action on the friction plates, which is augmented by the wedging action of the tapering plates 55 as the friction shoes are carried forwardly against the resistance of the springs 75, 76. There is a movement of the wedge elements 59, 61 toward the axis of the gear and because of the comparatively acute angle of their faces 71 to this axis, the elements, 66, 67 are advanced against the resistance of the spring 81. At the commencement of the compression of the gear, the spring seats 73, 74 are moved away from the friction plates 49. When the follower 47 comes into contact with the plates 49, the latter are carried forwardly against the resistance of the friction developed between their surfaces and the surfaces of the plates 48 which latter of course remain stationary.

The frictional resistance builds up as the compression of the gear progresses because of the tapering form of the plates 55. The limit of compression is reached when the follower 47 comes into engagement with the end of the casing 46.

Upon release, the central elements of the gear including the friction shoes are moved backwardly substantially as a unit by the action of the springs, the tapering form of the plates 55 facilitating this action, carrying with them the follower 47. The plates 49 remain at rest until the spring seats 73, 74 make contact with their inner ends, whereupon they are also moved backwardly.

The action of the gear in draft is substantially the same as in buff, but in the reverse direction.

The elements 66 and 67 compensate for any wear of the parts by being advanced along the parallel faces of the stem 65*a* by the pressure of the spring 81 thereby forcing the elements 59, 61 laterally outward and thus taking up all of the slack. This action, while slightly decreasing the strength of the spring 81, although to a negligible extent, has no weakening effect on the springs 75, 76.

The gear may be changed in various of its details without departing from the scope of the invention.

I claim as my invention:

1. In a draft gear in combination, a chambered follower, a plate follower, two groups of intercalated friction plates within the casing, one set of plates of each group being anchored to the casing against longitudinal movement, the other set being floating and normally projecting beyond the casing, a pusher element seated against the plate follower and projecting into the casing between the groups of plates and having a plurality of forwardly facing shoulders on each side, a friction shoe engaging the inner plate of each group and having a plurality of inwardly and forwardly inclined wedging faces on its inner side, wedges seated on the pusher shoulders and cooperating with the wedge faces of the shoes, the inner faces of such wedges being backwardly inclined, a spring reaction between the closed end of the chambered follower and a central spring seat, spring seats bearing on the inner ends of the shoes and engageable with the floating plates, springs reacting between the last named seats and the closed end of the chambered follower, and wear compensating elements interposed between the first named spring seat and the wedges and having sliding engagement with the lateral walls of the pusher element.

2. In a draft gear in combination, a chambered follower, a plate follower, two groups of intercalated friction plates within the casing, one plate of each group being tapered toward its outer end, one set of plates of each group being anchored to the casing against longitudinal movement, the other set being floating and normally projecting beyond the casing, a pusher element seated against the plate follower and projecting into the casing between the groups of plates and having a plurality of forwardly facing shoulders on each side, a friction shoe engaging the inner plate of each group and having a plurality

of inwardly and forwardly inclined wedging faces on its inner side, wedges slidably seated on the pusher shoulders and cooperating with the wedge faces of the shoes, means tending to urge such wedges laterally outward, a spring reacting between the closed end of the chambered follower and the wedges, integrally united spring seats bearing on the inner ends of the shoes and engageable with the floating plates, and springs reacting between the last named seats and the closed end of the chambered follower.

In testimony whereof I affix my signature.

HERBERT E. TUCKER.