

Nov. 19, 1940.

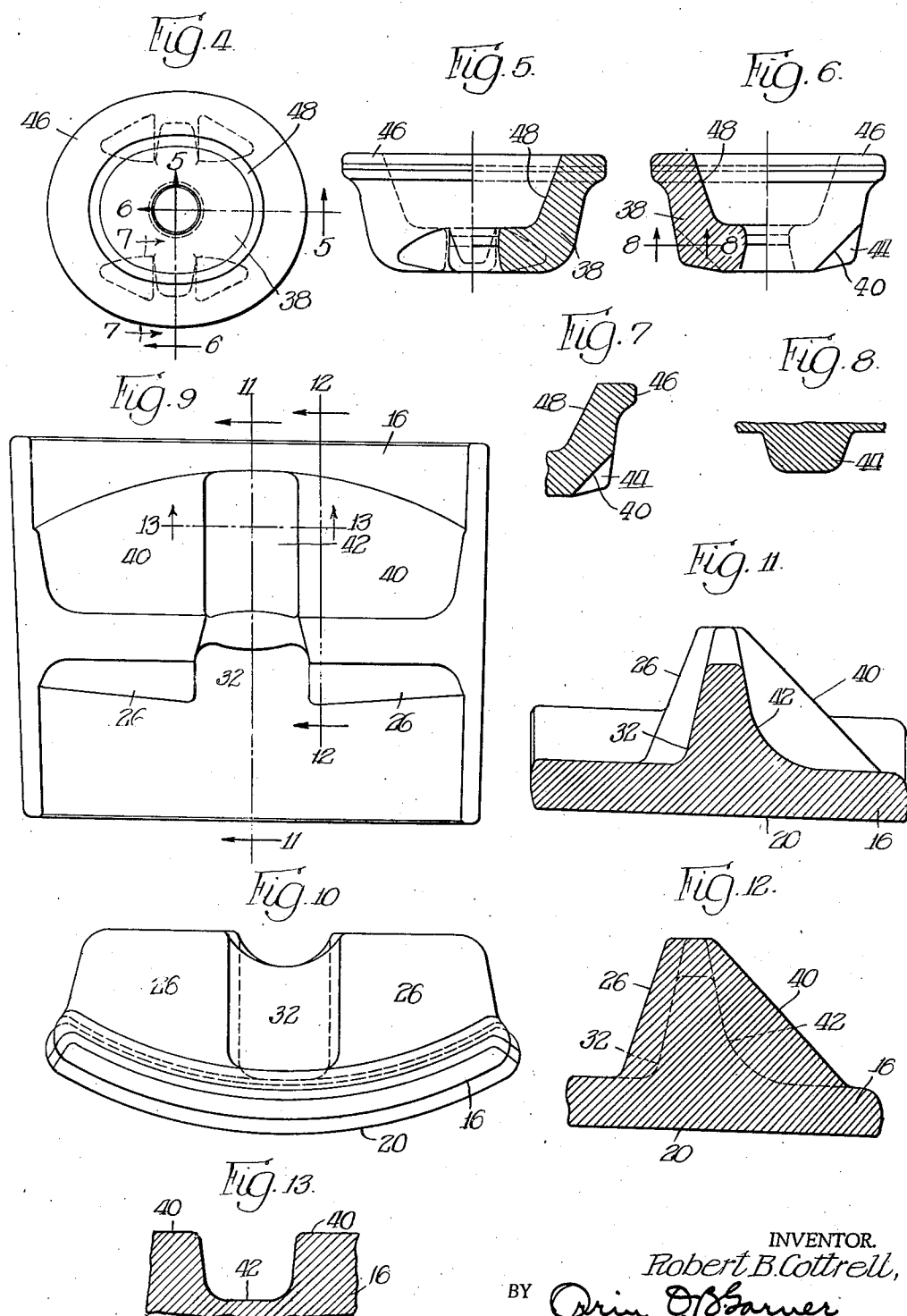
R. B. COTTRELL

2,222,479

DRAFT GEAR

Filed March 27, 1939

3 Sheets-Sheet 2



INVENTOR.
Robert B. Cottrell,
BY *Orin O. Barber*
ATTORNEY.

Nov. 19, 1940.

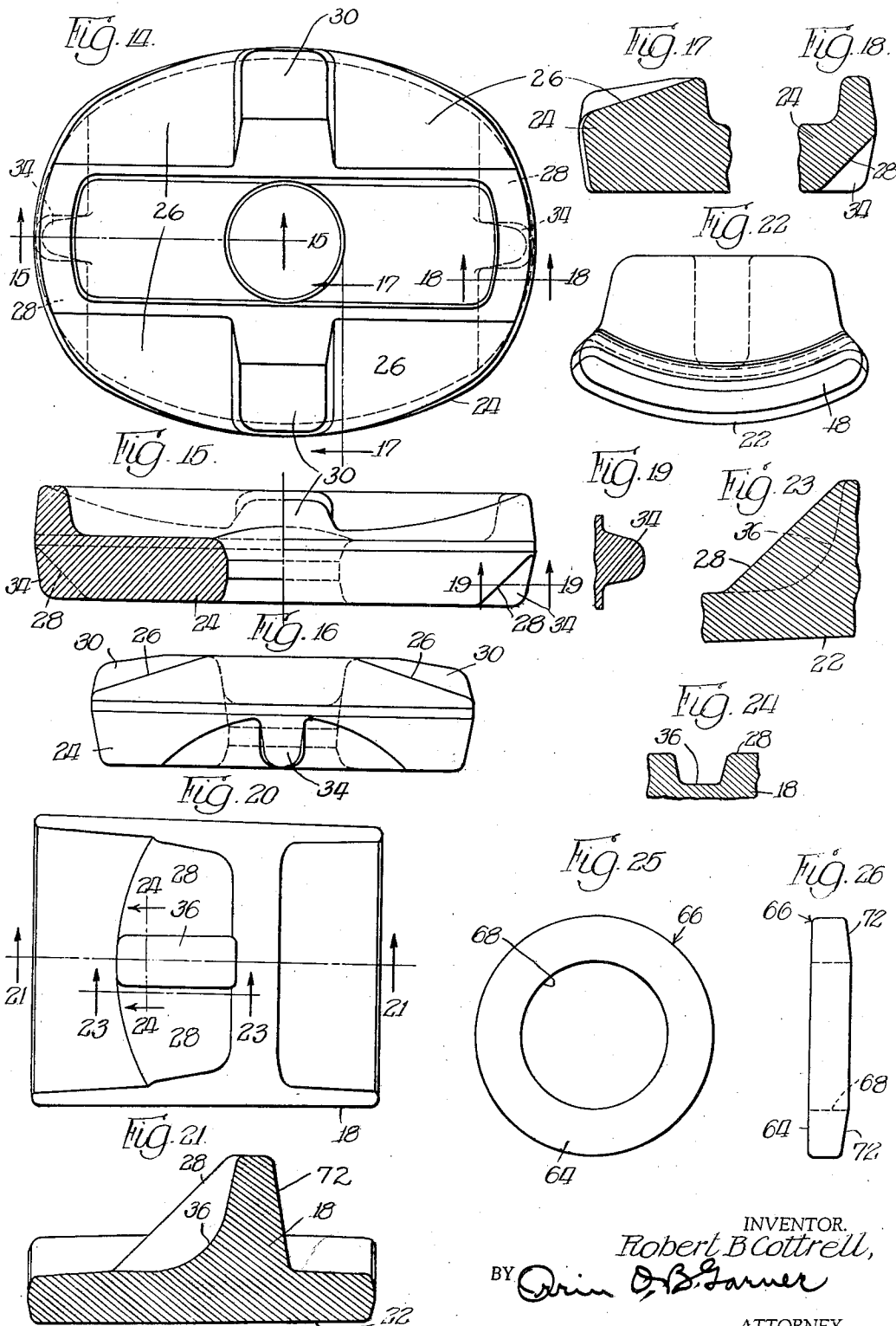
R. B. COTTRELL

2,222,479

DRAFT GEAR

Filed March 27, 1939

3 Sheets-Sheet 3



INVENTOR.
Robert B. Cottrell,
BY *Orin D. Garner*
ATTORNEY.

UNITED STATES PATENT OFFICE

2,222,479

DRAFT GEAR

Robert B. Cottrell, Chicago, Ill., assignor to American Steel Foundries, Chicago, Ill., a corporation of New Jersey

Application March 27, 1939, Serial No. 264,383

27 Claims. (Cl. 213—32)

My invention relates to a draft gear for a railway car and more particularly to a form generally designated "barrel type" comprising a housing, a compression spring, and a clutch mechanism assembled in the open end of said housing. My invention is an improvement upon what I have designated a "series type" gear as disclosed in my co-pending applications Serial Nos. 172,925 and 182,559.

An object of my invention is a gear of such type wherein means is provided between the parts to control the relative rotation thereof within the barrel. A more definite object of my invention is a draft gear of the clutch type comprising a plurality of sets of diametrically opposed shoes seated alternately against the open end of the housing wherein a wedge block is positioned between the respective sets of shoes and provided with means engaging both sets of shoes, whereby said shoes are restricted from rotative movement with respect to said wedge and vice versa.

My invention contemplates a form of such a type of gear wherein both sets of shoes are seated against oval friction surfaces of the housing and wherein a definite ratio or relationship is established between the length of radii of said oval surfaces for a purpose to be hereafter more fully explained.

A definite object of my invention is a novel gear of such type wherein one set of shoes has an arcuate bearing against an associated friction surface of the housing, said friction surface being defined with the radius less than half the inner diameter of said housing along the axis at opposite ends of which said shoes are seated.

A further definite object of my invention is a draft gear mechanism of the above type wherein tongue and groove engagement is afforded between adjacent parts including one set of shoes, the intervening wedge block, and an adjacent set of shoes and said wedge block as well as between one set of said shoes and a follower wedge associated with said mechanism.

The novel features of my invention are set forth in the accompanying specification and associated drawings as well as the claims which follow.

Figure 1 is a top plan view of a draft gear incorporating my invention, one-half of the view being in section, the section being taken substantially in the horizontal plane bisecting the device and as indicated by the line 1—1 of Figure 3.

Figure 2 is a side elevation of the gear shown in Figure 1, partly in section, the section being taken substantially in the vertical plane bisecting

the device as indicated by the line 2—2 of Figure 3.

Figure 3 is a transverse section through the clutch mechanism adjacent the open end of the housing substantially as indicated by the line 3—3 of Figure 2.

Figure 4 is a top plan view of the follower wedge associated with my invention.

Figure 5 is a side elevation thereof, half in section, the section being taken in the longitudinal plane bisecting the device substantially as indicated by the line 5—5 of Figure 4.

Figure 6 is an end view of the follower wedge, half in section, the section being taken in the plane bisecting the device transversely and substantially as indicated by the line 6—6 of Figure 4.

Figure 7 is a fragmentary sectional view taken in a transverse plane substantially as indicated by the line 7—7 of Figure 4.

Figure 8 is a fragmentary sectional view through one side of the follower wedge, the section being taken substantially in the plane as indicated by the line 8—8 of Figure 6.

Figure 9 is a plan view of my novel form of outer friction shoe, Figure 10 is an end view thereof, and Figure 11 is a sectional view taken in the plane bisecting the device as indicated by the line 11—11 of Figure 9.

Figure 12 is a fragmentary sectional view in a plane parallel to the view shown in Figure 11 but spaced therefrom as indicated by the line 12—12 of Figure 9.

Figure 13 is another fragmentary sectional view taken transversely of the shoe and substantially in the plane indicated by the line 13—13 of Figure 9.

Figure 14 is a plan view of my novel form of wedge block, Figure 15 being a side elevation thereof, half in section, the section being taken substantially in the plane indicated by the line 15—15 of Figure 14.

Figure 16 is an end view of the wedge block.

Figures 17 and 18 are fragmentary sectional views through portions of the wedge block, the sections being taken substantially in planes as indicated by the lines 17—17 and 18—18 of Figure 14, and Figure 19 is a further fragmentary sectional view taken substantially in the plane indicated by the line 19—19 of Figure 15.

Figure 20 is a plan view of the inner friction shoe.

Figure 21 is a sectional view in a plane bisecting the shoe substantially as indicated by the line 21—21 of Figure 20.

Figure 22 is an end view of the inner shoe.

Figure 23 is a fragmentary sectional view through the shoe taken substantially in the plane indicated by the line 23—23 of Figure 20.

Figure 24 is a further fragmentary sectional view taken substantially in the plane indicated by the line 24—24 of Figure 20.

Figure 25 is a plan view of the spring cap associated with my novel gear, and Figure 26 is a side view thereof.

Describing in detail my novel draft gear and referring particularly to Figures 1 to 3, the housing 2 of novel form is of barrel type with the base 4 formed with the lateral flanges 6, 6 at opposite sides thereof, said flanges being reinforced by the ribs, 8, 8, said ribs being formed at opposite edges of the openings 10, 10 in opposite walls of the housing adjacent the base thereof, said openings facilitating drainage when said draft gears may be positioned upright. Adjacent the open end of the housing and for approximately one-third the length thereof are formed the outwardly flaring friction faces designated 12, 12 on the long axis thereof and 14, 14 on the short axis of said housing.

Within said flaring open end is seated the clutch mechanism comprising the diametrically opposed outer friction shoes 16, 16 and the diametrically opposed alternately arranged inner friction shoes 18, 18, said outer friction shoes having friction surfaces 20, 20 at the rear thereof seated against the beforementioned friction surfaces 14, 14 of the housing and the inner friction shoes 18, 18 having friction surfaces 22, 22 (Figure 21) similarly seated against the friction surfaces 12, 12 on the long diameter of the housing. Between the respective sets of friction shoes is seated the wedge block 24 of the form shown in detail in Figures 14 to 19 inclusive, said wedge block having engagement with said outer friction shoes 16, 16 along spaced diagonally arranged faces 26, 26 and having engagement with said inner friction shoes at spaced diagonally arranged surfaces indicated at 28, 28, said diagonally arranged faces 26 being located at the sides of said wedge block and said surfaces 28 at the ends thereof as hereafter more particularly described. The wedge block 24 also has a tongue and groove engagement with each outer shoe and each inner shoe, the tongues 30, 30 centrally formed on the top of said wedge block at opposite sides thereof being received in the corresponding slots 32, 32 centrally formed in the top face of each outer friction shoe. Likewise on the bottom face of the wedge block and at opposite ends thereof are the centrally formed relatively narrow tongues 34, 34 received in the slots 36, 36 centrally formed on each of the inner friction shoes 18, 18. The outer friction shoes 16, 16 have a similar type of engagement with the follower wedge 38, said follower wedge having engagement with each of said shoes on spaced diagonally arranged surfaces indicated at 40, 40 between which is formed the tongue 44 accommodated in the groove or slot 42 formed on the side of the follower wedge 38. The said follower wedge 38 is of generally cup-like form having the flat outer annular surface indicated at 46 for abutment with the usual follower block, said follower wedge having the central cup-like cavity 48 accommodating the end of the retaining bolt 50 and the nut 52 threaded thereon. The opposite end of the retaining bolt is received in the cavity 54 centrally formed in the bottom wall 4 of the housing, the lateral walls of said cavity indicated at

56 forming positioning means for the large compression spring 58 and the end wall 60 thereof forming a seat for the small compression spring 62. The outer end of the large compression spring 58 is seated as at 64 against the spring cap 66 which is shown in detail in Figures 25 and 26, said spring cap having a ring-like form with a flat inner face affording the before-mentioned seat at 64 and having the relatively large central opening 68 accommodating the small compression spring 62 which extends therethrough and is seated as at 70 against the inner surface of the wedge block 24. The spring cap 66 has engagement with the inner friction shoes along the diagonally arranged faces 72, 72, the entire top surface of the spring cap having a chamfered form to accommodate said seating.

The inner friction shoes 18, 18 are seated against the friction faces of the housing on the long diameter thereof and the engaging surfaces therebetween are formed on a radius less than half the length of the inner diameter of said housing along said axis as indicated at 25 (Figure 3). This arrangement is for a definite purpose, said purpose being to prevent the rotation of said shoes within said housing. The outer friction shoes 16, 16 may be formed with a radius longer than one-half the diameter on the short axis of the housing, the relative length of said radii being best seen in the modification herein described from a consideration of Figure 3. The outer shoes formed with said relatively large radius will be afforded some freedom of movement against the friction surfaces of the housing whereon they are seated as compared with the very restricted movement of the inner friction shoes with respect to said housing because of said before-mentioned relatively short radius with which the friction surfaces of said inner shoes are defined.

At the same time relative rotational movement within the housing of the outer shoes with respect to the inner shoes is limited by the tongue and groove engagement which is provided between the inner friction shoes and the wedge block and again between the outer friction shoes and said wedge block. Likewise, relative rotational movement between the outer friction shoes 16, 16 and the follower wedge 38 is restricted or substantially prevented by the tongue and groove engagement therebetween. It will thus be seen that rotational movement of the various parts of the clutch mechanism within the friction end of the housing is substantially prevented by providing engagement means between all of the parts and by controlling the radius of the friction surfaces on the backs of the inner friction shoes and their complementary engaging friction surfaces on the housing.

In my novel arrangement as above described it will further be noted that each outer friction shoe 16 is seated against the outer follower wedge at spaced diagonally arranged engaging surfaces 40, 40, said surfaces being positioned on opposite sides of the groove which affords engagement with the associated tongue 44 on the follower wedge. Likewise each of said outer friction shoes 16 has engagement with the wedge block along spaced diagonally arranged friction surfaces 26, 26 between which is formed the groove 32 accommodating the tongue 30 on the wedge. Again, each of the inner friction shoes 18 has engagement with the bottom face of the wedge 24 along two spaced diagonally arranged surfaces 28; 28 between which surfaces is formed

the groove 36 accommodating the tongue 34 on the wedge. This novel arrangement is accompanied by the development of a relatively high capacity as compared with the requirements set forth in the standards provided by the Association of Americal Railroads. At the same time this relatively high capacity is accompanied with compression springs of relatively light capacity in comparison with other clutch type gears.

This relatively high capacity is made possible by the compact series arrangement referred to in my above-mentioned co-pending applications and is particularly discussed in said application Serial No. 172,925.

It is to be understood that I do not wish to be limited by the exact embodiment of the device shown which is merely by way of illustration and not limitation as various and other forms of the device will, of course, be apparent to those skilled in the art without departing from the spirit of the invention or the scope of the claims.

I claim:

1. In a draft gear, a housing having an oval friction end with inner friction surfaces, resilient means, a spring cap, and clutch means seated in said friction end and comprising a wedge follower, an outer set of friction shoes seated against said housing on the short axis of said friction end, a wedge block, an inner set of friction shoes seated against said housing on the long axis of said friction end, the shoes of respective sets overlapping longitudinally of said gear, said inner set of shoes abutting said spring cap, said outer set of shoes abutting said wedge follower, and both sets of said shoes having engagement with said wedge block, the seating surfaces of one set of said shoes against said housing being formed on a radius less than half the long diameter of said oval end to prevent relative rotation of said last-mentioned shoes with respect to said housing, and interlocking means between said follower wedge and one set of said shoes and between said wedge block and both sets of said shoes to prevent relative rotation of said parts.

2. In a draft gear, a housing having an oval friction end with inner friction surfaces, resilient means, a spring cap, and clutch means seated in said friction end and comprising a wedge follower, an outer set of friction shoes seated against said housing on the short axis of said friction end, a wedge block, an inner set of friction shoes seated against said housing on the long axis of said friction end, the shoes of respective sets overlapping longitudinally of said gear, said inner set of shoes abutting said spring cap, said outer set of shoes abutting said wedge follower, and both sets of said shoes having engagement with said wedge block, the seating surfaces of one set of said shoes against said housing being formed on a radius less than half the long diameter of said oval end to prevent relative rotation of said last mentioned shoes with respect to said housing, and interlocking means between said wedge block and said last mentioned shoes to prevent relative rotation of said wedge block and said outer shoes with respect to said housing.

3. In a draft gear, a housing having an oval friction end with inner friction surfaces, resilient means, a spring cap, and clutch means seated in said friction end and comprising a wedge follower, an outer set of friction shoes seated against said housing on the short axis of said friction end, a wedge block, an inner set

of friction shoes seated against said housing on the long axis of said friction end, the shoes of respective sets being alternately arranged and overlapping longitudinally of said gear, said inner set of shoes abutting said spring cap, said outer set of shoes abutting said wedge follower, and both sets of said shoes having engagement with said wedge block, the seating surfaces of one set of said shoes against said housing being formed on a radius less than half the long diameter of said oval end to prevent relative rotation of said last mentioned shoes with respect to said housing, and interlocking means between said wedge block and both sets of shoes to prevent relative rotation of said wedge block and said shoes with respect to said housing.

4. In a draft gear, a housing having an oval friction end with inner friction surfaces, resilient means, a spring cap, and clutch means seated in said friction end and comprising a wedge follower, an outer set of friction shoes seated against said housing on the short axis of said friction end, a wedge block, an inner set of friction shoes seated against said housing on the long axis of said friction end, the shoes of respective sets being alternately arranged and overlapping longitudinally of said gear, said inner set of shoes abutting said spring cap, said outer set of shoes abutting said wedge follower, and both sets of said shoes having engagement with said wedge block, the seating surfaces of one set of said shoes against said housing being formed on a radius less than half the long diameter of said oval end to prevent relative rotation of said last-mentioned shoes with respect to said housing, and interlocking means between said follower wedge and said outer shoes and between said wedge block and both sets of said shoes to prevent relative rotation of said wedge block, said shoes and said follower wedge with respect to said housing.

5. In a draft gear, a housing having an oval friction end with inner friction surfaces, resilient means, a spring cap, and clutch means seated in said friction end and comprising a wedge follower, an outer set of friction shoes seated against said housing on the short axis of said friction end, a wedge block, an inner set of friction shoes seated against said housing on the long axis of said friction end, the shoes of respective sets being alternately arranged and overlapping longitudinally of said gear, said inner set of shoes abutting said spring cap, said outer set of shoes abutting said wedge follower, and both sets of said shoes having interlocking engagement with said wedge block, the seating surfaces of one set of said shoes against said housing being formed on a radius less than half the long diameter of said oval end to prevent relative rotation of said last mentioned shoes with respect to said housing, and interlocking means between said wedge block and both sets of said shoes to prevent relative rotation of said wedge block and both sets of said shoes with respect to said housing.

6. In a draft gear, a housing having an oval friction end with inner friction surfaces, resilient means, a spring cap, and clutch means seated in said friction end and comprising a wedge follower, an outer set of friction shoes seated against said housing on the short axis of said friction end, a wedge block, an inner set of friction shoes seated against said housing on the long axis of said friction end, the shoes of respective sets being alternately arranged

and overlapping longitudinally of said gear, said inner set of shoes abutting said spring cap, said outer set of shoes abutting said wedge follower, and both sets of said shoes having interlocking engagement with said wedge block, the seating surfaces of one set of said shoes against said housing being formed on a radius less than half the long diameter of said oval end to prevent relative rotation of said last-mentioned shoes with respect to said housing, and interlocking means between said wedge block, said follower wedge, and both sets of said shoes to prevent relative rotation of said clutch means with respect to said housing.

7. In a draft gear, a housing having an oval friction end with internal friction surfaces, resilient means, a spring cap, and clutch means seated in said friction end and comprising a wedge follower, an outer set of friction shoes seated against said housing on the short axis of said friction end, a wedge block, an inner set of friction shoes seated against said housing on the long axis of said friction end, the shoes of respective sets being alternately arranged and overlapping longitudinally of said gear, said inner set of shoes abutting said spring cap, said outer set of shoes abutting said wedge follower, and both sets of said shoes having interlocking engagement with said wedge block, the seating surfaces of one set of said shoes against said housing being formed on a radius less than half the long diameter of said oval end to prevent relative rotation of said last-mentioned shoes with respect to said housing.

8. In a draft gear, a housing having an oval friction end with sets of internal friction surfaces arranged on the long and short diameters respectively, resilient means, wedging means comprising a block and a follower and inner and outer pairs of diametrically opposed friction shoes having arcuate seats against said sets of surfaces respectively, the shoes of respective sets being alternately arranged and overlapping longitudinally of said gear, one set of said shoes having the arcuate surfaces of said seats formed on a radius less than half the length of said long diameter to prevent rotation of said last-mentioned shoes within said housing.

9. In a draft gear, a housing of oval shape having a friction end with pairs of inner friction faces arranged respectively on the long and short axes of said friction end, a spring, wedging means comprising a wedge follower and a wedge block and inner and outer sets of diametrically opposed friction shoes in engagement with said housing along said pairs of friction faces respectively, said sets being arranged in series between said spring and said wedge follower, said wedge block being interposed between said sets in interlocking relationship with both shoes of each set, and interlocking means between said outer shoes and said wedge follower whereby relative rotation of all parts of said wedging means is prevented.

10. In a draft gear, a housing having an oval friction end with pairs of opposed internal friction faces arranged respectively on the long and short axes thereof, a spring, wedging means comprising a wedge follower and a wedge block and inner and outer sets of diametrically opposed friction shoes in engagement with said housing, said sets being arranged in series between said spring and said wedge follower, said wedge block being interposed between said sets, and interlocking means between said wedge block

and both sets of said shoes and between said follower and one set of said shoes to prevent relative rotation of the parts of said wedging means with respect to each other within said housing.

11. In a draft gear, a housing having an oval friction end with pairs of opposed internal friction faces, a spring, wedging means comprising a wedge follower and a wedge block, and inner and outer sets of diametrically opposed friction shoes in engagement with said housing along said pairs of faces respectively, said sets being arranged in series between said spring and said wedge follower with said wedge block interposed between said sets and interlocking means between said wedge block and both sets of shoes, and between said wedge follower and one set of shoes, the other set of said shoes having friction surfaces formed on a radius less than half the long diameter of said housing along which said last-mentioned shoes are seated to prevent relative rotation of said last mentioned shoes with respect to said housing.

12. In a draft gear, a housing having an oval friction end with sets of opposed internal friction faces, diametrically opposed pairs of friction shoes having arcuate seats against said sets of faces respectively, the shoes of respective sets overlapping longitudinally of said gear, a wedge block interposed between the sets of shoes, one set of said shoes having seating surfaces against said housing formed on a radius less than half the long diameter of said housing along which said last-mentioned shoes are seated to prevent relative rotation of said last-mentioned shoes with respect to said housing, both sets of said shoes having interlocking relationship with said wedge block whereby said wedge block and all of said shoes are restrained against rotation within said housing.

13. In a draft gear, a housing having an oval friction end with internal friction surfaces aligned with the long and short axes thereof respectively, a spring, wedging means comprising a wedge follower and a wedge block and inner and outer sets of diametrically opposed friction shoes in engagement with said housing along said friction surfaces, said sets being arranged in series between said spring and said wedge follower with the shoes of respective sets in overlapping relationship for a major portion of their length longitudinally of said housing, said wedge block being interposed between said sets, and interlocking means between said follower and each of said outer shoes to prevent relative rotation of said follower and outer shoes, said interlocking means comprising flanges on said outer shoes projecting into channels formed on opposite sides of said follower.

14. In a draft gear, a housing having an oval friction end with internal friction faces arranged in pairs along the long and short axes thereof respectively, a spring, wedging means comprising a wedge follower and a wedge block and inner and outer sets of diametrically opposed friction shoes in engagement with said housing along said pairs of friction faces respectively, said sets being arranged in series between said spring and said wedge follower, said wedge block being interposed between said sets, and interlocking means between said wedge block and each of said shoes to prevent relative rotation of said wedge block with respect to said shoes, and means on the shoes of one set engaging said housing to prevent relative rotation of the shoes of said last-mentioned set

within said housing whereby said wedge block and all of said shoes are retained against rotation with respect to each other and with respect to said housing.

5 15. In a draft gear, a housing having an oval friction end with two pairs of diametrically opposed friction faces arranged along the long and short diameters thereof, a spring, wedging means comprising a wedge follower and a wedge
10 block and inner and outer sets of diametrically opposed friction shoes in engagement with said housing along said pairs of faces respectively, said sets being arranged in series between said
15 spring and said wedge follower with the shoes of respective sets overlapping for a substantial portion of their length longitudinally of said housing, said wedge block being interposed between said sets, and interlocking means between
20 said wedge block and all of said shoes to prevent relative rotation of said wedge block and said shoes with respect to each other.

16. In a draft gear, a housing having an oval friction end with internal arcuate friction faces arranged respectively along the long and short
25 diameters thereof, a spring, wedging means comprising a wedge follower and a wedge block and inner and outer sets of diametrically opposed friction shoes in engagement with said housing with the shoes of respective sets ar-
30 ranged along respective diameters, said sets being arranged in series between said spring and said wedge follower, said wedge block being interposed between said sets, and interlocking means between said wedge block and the inner
35 set of said shoes, said last-mentioned shoes having friction surfaces seated against certain of said friction faces, said surfaces being formed on a radius less than half the length of the diameter of said housing along which said last-
40 mentioned shoes are seated to prevent relative rotation of said last-mentioned shoes with respect to said housing whereby said last-mentioned shoes, said wedge block, and said housing are restrained against relative rotation with
45 respect to each other.

17. In a draft gear, a housing having an oval friction end with arcuate friction surfaces arranged in diametrically opposed pairs along the long and short diameters of said oval end, a
50 spring, wedging means comprising a wedge follower and a wedge block and inner and outer sets of diametrically opposed friction shoes in engagement with said housing along said pairs of friction surfaces respectively, said sets being
55 arranged in series between said spring and said wedge follower, said wedge block being interposed between said sets, and interlocking means between said wedge block and both sets of said shoes, one set of said shoes having friction sur-
60 faces formed on a radius less than half the length of the diameter along which said last-mentioned shoes are seated whereby said last-mentioned shoes are restrained against rotation within said housing and all of said shoes and
65 said wedge block are restrained against relative rotation with respect to each other.

18. In a draft gear, an oval housing having a friction end with pairs of opposed internal friction faces arranged respectively on the long
70 and short axes thereof, a compression spring, and clutch means comprising a wedge follower, a wedge block, and inner and outer sets of diametrically opposed friction shoes seated against said pairs of friction faces respectively, said sets
75 of shoes being arranged in series between said

spring and said wedge follower, said wedge block being interposed between said sets, and interlocking means between said outer set of shoes and said wedge follower and between said
5 wedge block and both sets of said shoes whereby all parts of said clutch means are restrained against relative rotation with respect to each other.

19. In a draft gear, a housing having an oval friction end with pairs of diametrically opposed
10 internal friction faces arranged respectively along the long and short diameter thereof, a compression spring, and clutch means comprising a wedge follower, a wedge block, inner and outer sets of diametrically opposed friction
15 shoes seated respectively against said pairs of friction faces, said wedge block being interposed between said sets of shoes in interlocking relationship with each shoe of each set, said wedge follower having interlocking relationship
20 with the shoes of said outer set and one set of said shoes having means engaging means on said housing to prevent relative rotation thereof, whereby said clutch means is restrained against relative rotation with respect to said
25 housing.

20. In a draft gear, a housing having an oval friction end with internal friction surfaces arranged in pairs along the long and short diam-
30 eters of said oval end, and clutch means comprising an outer follower, an outer pair of friction shoes seated along said short diameter, an inner pair of friction shoes seated along said long diameter, a wedge block interposed between
35 said sets of friction shoes and interlocked with each shoe of each set, said outer set of shoes having tongue and groove engagement with said wedge follower and one set of said shoes having seating surfaces against said housing formed
40 on a radius less than half the diameter along the axis on which said last mentioned shoes are seated to prevent relative rotation of said last-mentioned shoes with respect to said housing, whereby all of said clutch means is restrained against rotation within said housing.

21. In a draft gear, a housing of barrel type having an oval friction end with internal friction surfaces and clutch means comprising a
45 wedge follower, an outer set of friction shoes interlocked with said wedge follower against rotation with respect to said follower and seated against certain of said surfaces along the short diameter of said oval end, an inner pair of friction shoes seated against said friction surfaces
50 along the long diameter of said oval end, and a wedge block interposed between said sets of shoes and having interlocking engagement with each shoe, whereby said shoes, said follower, and said wedge block, comprising the parts of
55 said clutch means, are restrained against relative rotational movement with respect to each other.

22. In a draft gear, a housing comprising an oval friction end with friction surfaces arranged in diametrical opposition to each other along the
65 long and short axes of said oval end, a wedge follower, an outer pair of friction shoes seated against said friction surfaces on the short axis of said oval end and having tongue and groove engagement with said follower, an inner pair of
70 friction shoes seated against said friction surfaces on the long axis of said oval end, a wedge block interposed between said sets of friction shoes and having tongue and groove interlocking engagement with each shoe, one set of said shoes
75

having seating faces against said friction surfaces formed on a radius less than half the diameter of the axis along which said last-mentioned shoes are seated to prevent relative rotation of said last-mentioned shoes with respect to said housing, whereby all of said shoes, said wedge block, and said follower are restrained against relative rotation with respect to each other and with respect to said housing.

23. In a draft gear, a barrel housing having an oval end with internal friction faces arranged respectively along the long and short axes of said oval end, a wedge follower, and pairs of diametrically opposed friction shoes arranged respectively against opposite friction faces, the outer set of said shoes having tongue and groove engagement with said wedge follower, and a wedge block interposed between said sets of shoes and having tongue and groove engagement with each shoe, whereby said wedge follower, said shoes and said wedge block are restrained against relative rotation with respect to each other.

24. In a draft gear, a barrel housing having an oval end with internal friction faces arranged respectively along the long and short axes of said oval end, a wedge follower, and pairs of diametrically opposed friction shoes, arranged respectively against opposite friction faces, the outer set of said shoes having tongue and groove engagement with said wedge follower, and a wedge block interposed between said sets of shoes and having tongue and groove engagement with each shoe, one set of said shoes having its seating surfaces against said housing formed on a radius less than half the diameter of the axis along which said last-mentioned shoes are seated to restrain said shoes against rotation within said housing, whereby said shoes, said wedge block and said wedge follower are restrained against relative rotation with respect to each other and with respect to said housing.

25. In a draft gear, a housing having an oval friction end with pairs of opposed internal friction surfaces aligned on the long and short axes thereof respectively, a spring cap, wedging means comprising a wedge follower, a wedge block and inner and outer sets of diametrically opposed friction shoes in engagement with said housing, said sets being arranged in series be-

tween said spring cap and said wedge follower, said wedge block being interposed between said sets, and interlocking means between said wedge block and both sets of said shoes and between said follower and one set of said shoes to prevent relative rotation of the parts of said wedging means with respect to each other within said housing.

26. In a draft gear, a housing having an oval friction end with internal friction surfaces aligned with the long and short axes thereof respectively, a spring cap, wedging means comprising a wedge follower and a wedge block and inner and outer sets of diametrically opposed friction shoes in engagement with said housing along said friction surfaces, said sets being arranged in series between said spring cap and said wedge follower with the shoes of respective sets in overlapping relationship for a major portion of their length longitudinally of said housing, said wedge block being interposed between said sets, and interlocking means between said follower and each of said outer shoes to prevent relative rotation of said follower and said outer shoes, said interlocking means comprising flanges on said outer shoes projecting into channels formed on opposite sides of said follower, said wedge cap having diagonal face engagement with the shoes of one set.

27. In a draft gear, a housing having an oval friction end with two pairs of diametrically opposed friction faces arranged along the long and short diameters thereof, a spring cap, wedging means comprising a wedge follower and a wedge block and inner and outer sets of diametrically opposed friction shoes in engagement with said housing along said pairs of faces respectively, said sets being arranged in series between said spring and said follower with the shoes of respective sets overlapping for a substantial portion of their length longitudinally of said housing, said wedge block being interposed between said sets, interlocking means between said wedge block and all of said shoes to prevent relative rotation of said wedge block and said shoes with respect to each other, and said spring cap having diagonal face engagement with the shoes of one set.

ROBERT B. COTTRELL.