May 30, 1939. W. C. HEDGCOCK 2,160,417

DRAFT-GEAR HOUSING

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Fig. 1.

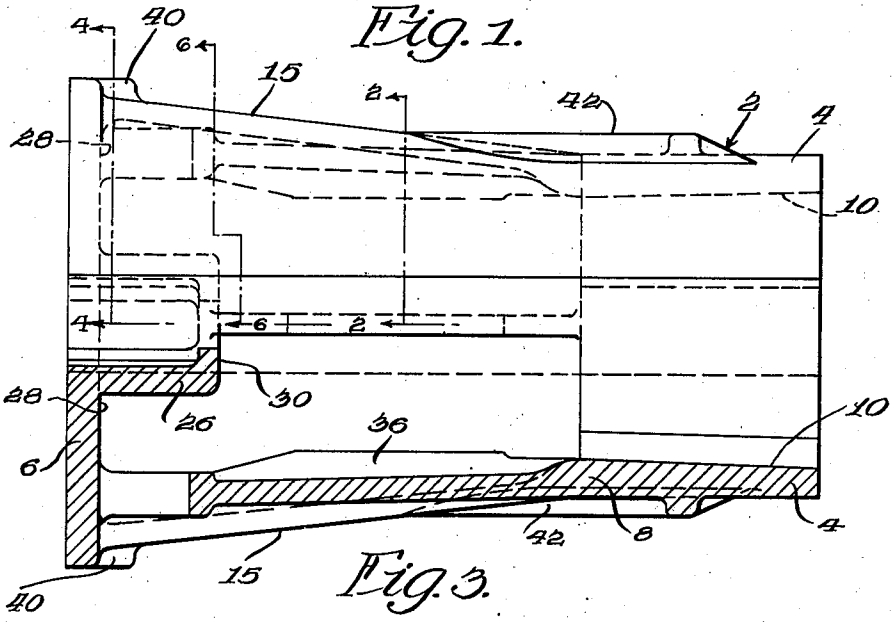


Fig. 3.

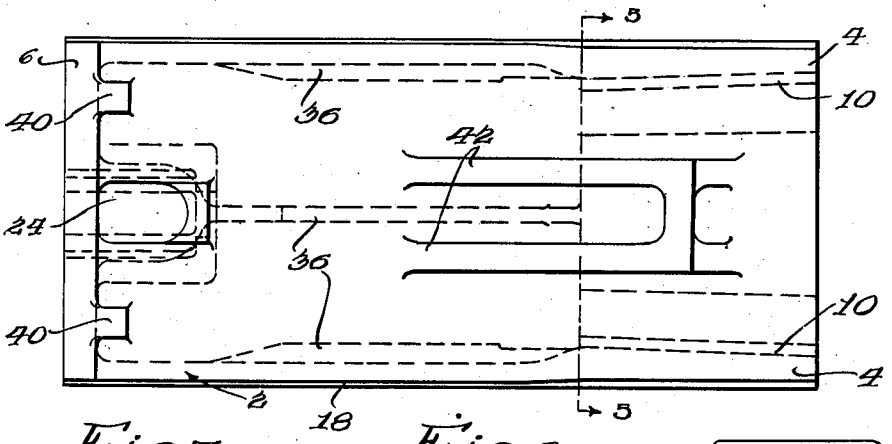
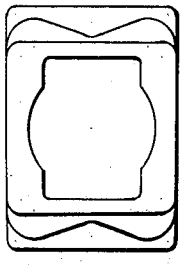


Fig. 7.

Fig. 8.



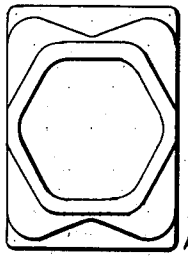
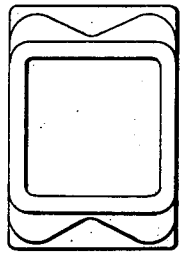


Fig. 9.



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Fig. 2.

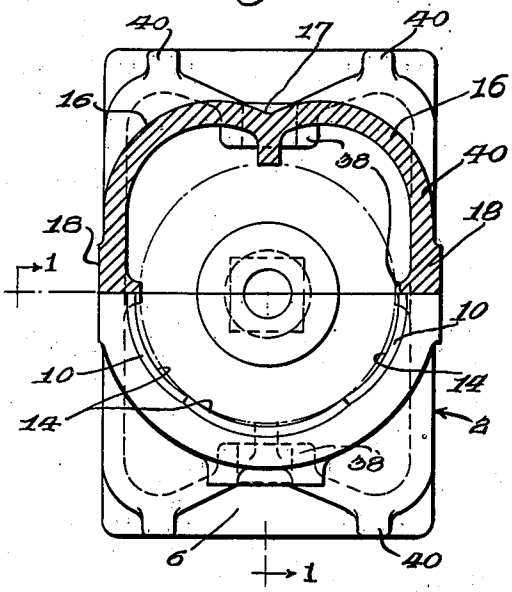


Fig. 3.

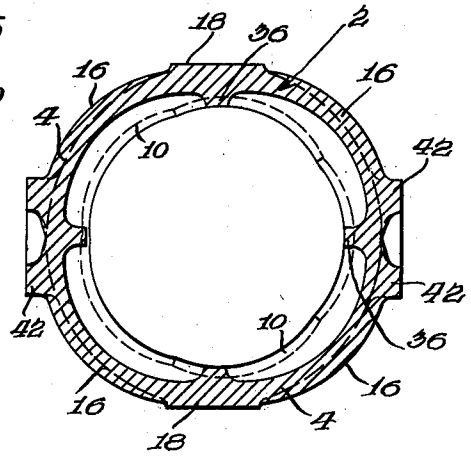


Fig. 6.

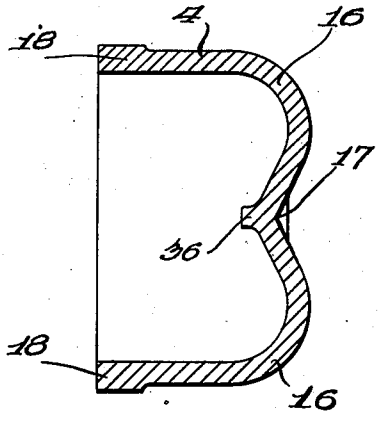
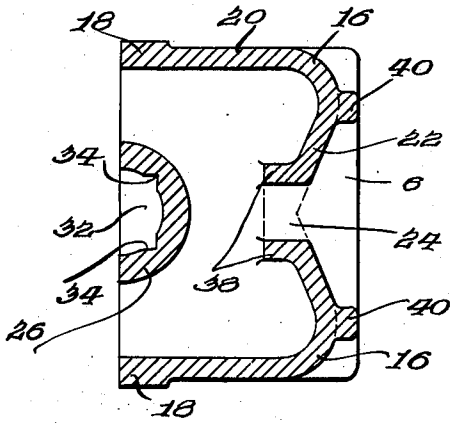


Fig. 4.



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UNITED STATES PATENT OFFICE

2,160,417

DRAFT-GEAR HOUSING

William C. Hedgcock, Chicago, Ill., assignor to American Steel Foundries, Chicago, Ill., a corporation of New Jersey

Application June 24, 1936, Serial No. 86,901

10 Claims. (Cl. 213—32)

My invention pertains to draft gears and more particularly to a form of housing for draft gears of the so-called barrel type designed for use within the standard gear pocket.

The great majority of draft gears used on American railways today are of the barrel type, that is to say, the gear consists of a housing of generally cylindrical form within which may be provided any one of a large number of friction mechanisms. The pocket provided for the cushioning mechanism on cars of standard design has standard dimensions with a length of 24⅝ inches and a width between the sills of 12¾ inches. All such barrel type gears are designed to seat within that space and usually within a somewhat shorter space in order to leave room at the front end of the gear for the so-called front follower block. The above mentioned standard space is usually defined by lugs secured on the sill, front and rear, and generally designated front draft lugs and rear draft lugs. These barrel type gears are subjected to great loads in the direction of their length inasmuch as they furnish the cushioning mechanism when cars are brought together for coupling purposes and, likewise, when in a train as a result of starting and stopping operations.

In the common type of housing for such draft gears, the barrel proper is substantially a cylinder from end to end with one end open and a broad rectangular base to have bearing against the draft lugs. Commonly, the base is reinforced and buttressed by heavy diagonal ribs cast integral with the base and the housing. In combining the cylindrical barrel and the rectangular base with the heavy flared ribs joining the two and generally reinforcing the structure, a great deal more metal is used than is required in a structure of equivalent strength made according to my invention.

An object of my invention is to provide a form of housing for draft gears of the barrel type which will meet all the requirements of operation and, at the same time, will permit unusual facility of manufacture.

A further object of my invention is to provide a form of housing for draft gears of the barrel type wherein the maximum efficiency will be secured in the disposition of the metal used, both from the standpoint of manufacture and from that of use.

A still further object of my invention is to provide such a draft gear housing which will eliminate such unfavorable features as sudden changes in section, re-entrant angles and sharp corners, such features greatly increasing manufacturing difficulties and increasing the liability of failure in service.

A yet further object of my invention is to provide a draft gear housing of a design which will reduce the difficulties inherent in casting such an object by so designing the structure as to diminish greatly the difficulties due to shrinkage and particularly the resultant cracks and other defects common in difficult castings.

Yet another object of my invention is to provide such a housing which will have a gradual change from a substantially circular or polygonal section required at the mouth or open end to a section of generally convoluted form flaring outwardly to the base or opposite end. My structure thus provides reinforcement of the base and stiffening of the walls while, at the same time, eliminating undesirable features otherwise present in such a casting.

Still another object of my invention is to provide such a draft gear housing wherein uneven metal sections as well as re-entrant angles and sharp ribs will be eliminated.

With these and various other objects in view, the invention may consist of certain novel features of construction and operation as will be more fully described and particularly pointed out in the specification, drawings and claims appended hereto.

In the drawings, which illustrate embodiments of the device and wherein like reference characters are used to designate like parts—

Figure 1 is a top plan view partly in section of one embodiment of my improved design of housing, the section being taken substantially in the plane indicated by the line 1—1 of Figure 2;

Figure 2 is an end elevation of the structure shown in Figure 1, the view being taken partly in section and at the open end, the section being substantially in the plane indicated by the line 2—2 of Figure 1;

Figure 3 is a side elevation of the housing shown in Figures 1 and 2;

Figure 4 is a section through the structure of Figure 1, the section being taken near the base and substantially in the plane indicated by the line 4—4 of Figure 1;

Figure 5 is a vertical section through the structures shown in Figures 1 to 4, the section being taken near the middle, but closer to the open end and substantially in the plane indicated by the line 5—5 of Figure 3; superposed on this section in a dotted outline is shown the form of the mouth opening of this modification;

Figure 6 is a section through the structure

shown in Figure 1, the section being taken between those shown in Figures 2 and 4 and substantially in the plane indicated by the line 6—6 of Figure 1; and

Figures 7, 8 and 9 are views at the open or mouth end of modified forms of my novel housing, the modifications consisting only of providing different openings for combination with various designs of friction mechanism.

Referring more particularly to the modification of my invention illustrated in Figures 1 to 6 inclusive, the housing 2 is of generally cylindrical form having the walls 4 integrally formed with the rectangularly shaped base 6. From a vertical plane nearer the open or mouth end as indicated at 8 the walls taper to the open end as at 10, 10 in order to accommodate friction shoes designed to have sliding engagement therewith. Although this particular modification shows a mouth of fluted form as at 14, 14 to receive a plurality of friction shoes having their outer surfaces of a form complementary to the said fluted portion, nevertheless, it will be understood that the shape of the open end or mouth of my novel housing may be varied to suit the form of friction mechanism designed to be inserted therein. Other forms of openings are hereafter more particularly pointed out.

From the point 8, previously mentioned, my novel housing is flared gradually toward the base as at 15, 15 and of convoluted form, said convolutions assuming a more pronounced form as the base 6 is approached. The form of these convolutions and the gradual change in the shape of the barrel becomes more clearly apparent by an examination of the sectional views as follows: Figure 5 shows a section taken a short distance inwardly of the vertical plane indicated by the point 8 (Figure 1). Here the convoluted form, which becomes more pronounced as the base is approached, is just beginning to take shape as indicated by the flutes 15, 16. From this view it is apparent how gradual is the change in this modification from the open end of the housing to the point where the section of Figure 5 is taken. In the other modifications shown, the gradation of section form from the open end to approximately the point where this section is taken would vary somewhat depending upon the shape of the opening itself, but in every case the change in the shape of the section is a gradual one comparable to that shown in this modification.

In the section next shown (Figure 2), at the mid-point of the housing the flutes 16, 16 have assumed a slightly more pronounced form and the channels 17 where the flutes merge are apparent. Proceeding toward the base, the next section is shown in Figure 6 approximately midway between that shown in Figure 2 and the base. Here the flutes 16, 16 have assumed a still more pronounced form and the channels 17 between the flutes are more pronounced. Such channels are not formed along the surfaces 18, 18 inasmuch as it is necessary to provide flat surfaces at those areas against which the yoke which surrounds the draft gear may be guided. The final section through the housing is taken adjacent the base and is shown in Figure 4. Here the flutes 16 have assumed their most pronounced form. Yet, at the same time, it will be apparent that the turn from the top wall 20 through the flute 16 to the side wall 22 is a very gradual one and no sharp angles are involved. This section is taken through the opening 24 formed near the base in each side wall of the housing and designed to facilitate cleaning of the casting and also for drainage. Such drainage is desirable because gears are often "worked in" while submerged, or partly submerged in water and also because they are often permitted to stand upright when unprotected from the weather. This view also shows the central spring positioning means 26 around which will be placed the main spring (not shown) of the gear. The base of the housing provides a spring seat 28 for the said main spring and the flat top portion of the positioning means 26 serves as a spring seat 30 upon which may be positioned one or more auxiliary springs (not shown). Within the innermost spring may be received the retainer bolt (not shown) which is commonly used as securing means to retain the friction mechanism within the housing. The square head of the retainer bolt may be received within the pocket 32 provided within the spring positioning means 26 and may be positioned therein against turning by engagement of its square head in the corners 34, 34 provided within the pocket 32.

Within the larger end of the housing are provided the flanges 36 which serve as additional positioning means or guides for the outer or main spring, already referred to. The edges of the openings 24 form reinforcing flanges 38 also serving as positioning means for the main spring. Adjoining the base of the casting are integrally formed the abutments 40, 40 which serve to increase the bearing against the sills which would otherwise be limited to the edge of the base 6. Guide flanges 42 provide abutment means which may serve to position the front end of the gear if desired. Such guiding is commonly unnecessary, but is sometimes found desirable and, in such cases, means may be riveted or otherwise secured to the inner faces of the center sills against which the flanges 42 may abut and, in certain cases, have sliding engagement.

Figures 7, 8 and 9 are plan views of the open ends of modified forms of my improved housing. Although the shape of mouth opening may vary, there is a gradual tapering from the shape at the mouth opening to a form at the base which is substantially the same as that of the modification shown and described in detail in Figures 1 to 6, inclusive. Likewise, in each case, the walls will be substantially of the same thickness throughout and will flare gradually toward the base from the inner extremity of the mouth portion which provides frictional surfaces for shoes commonly associated therewith. In all of these modifications the base is integrally formed with the walls without the lateral flanges commonly used, and the wall contours are substantially the same as that of the modification shown in Figures 1 to 6, thus avoiding all sharp angles and sudden changes in section.

It is to be understood that I do not wish to be limited by the exact embodiments of the device shown, which are 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 housing, the combination of a base and an integrally formed top and bottom and lateral wall structure, said housing having a friction portion adjacent the open end with tapering internal friction faces formed around substantially the entire inner area of the

open end of said housing, said lateral walls having convoluted portions tapering gradually from adjacent said base to said friction portion in buttress-like formations merging into said friction portion to provide maximum compressive strength in said structure, said entire wall structure being free of sharp changes in section throughout the length thereof.

2. In a draft gear housing, the combination of base, integrally formed top and bottom walls, said housing having adjacent the open end a friction portion of tapering internal faces, said lateral walls having convoluted portions tapering from adjacent said base to said friction portion in buttress-like formation to provide maximum compressive strength therein, and longitudinal flanges along said walls reinforcing the junctures of said convoluted portions, all of said walls having substantially straight-line formation along every longitudinal plane bisecting said housing.

3. In a draft gear housing, the combination of a base, top, bottom and lateral walls integrally formed therewith, said housing having a friction portion adjacent the open end with tapering internal faces, said lateral walls having convolutions tapering from adjacent said base to said friction portion in buttress-like formation to provide maximum compressive strength therein, and internal longitudinal flanges along said lateral walls reinforcing the junctures of said convolutions, said flanges presenting parallel inner edges forming spring positioning means, all of said walls having substantially straight-line formation from end to end along any longitudinal plane bisecting said housing.

4. In a draft gear housing the combination of a base, top and bottom and lateral walls integrally formed therewith, said walls having portions adjacent the open end of said housing with friction faces flaring from their inner ends to the open end of said housing, said walls having substantially cylindrical form adjacent the inner ends of said faces and said lateral walls flaring therefrom toward said base in convolutions forming buttress-like structures of maximum compressive strength, and outer longitudinal flanges along said lateral walls and overlying the junctures of said portions with the remainder of said walls.

5. In a draft gear housing the combination of a base, top and bottom and lateral walls integrally formed therewith, said walls having portions adjacent the open end of said housing with friction faces flaring from their inner ends to the open end of said housing, said walls having substantially cylindrical form adjacent the inner ends of said faces and said lateral walls flaring therefrom toward said base in convolutions forming buttress-like structures of maximum compressive strength, and longitudinal flanges reinforcing said lateral walls at the junctures of said convolutions.

6. In a draft gear housing the combination of a base, top and bottom and lateral walls integrally formed therewith, said walls having portions adjacent the open end of said housing with friction faces flaring from their inner ends to the open end of said housing, said walls having substantially cylindrical form adjacent the inner ends of said faces and said lateral walls flaring therefrom toward said base in convolutions forming buttress-like structures of maximum compressive strength, and longitudinal flanges reinforcing said lateral walls at the junctures of said convolutions, said flanges having parallel inner edges forming spring positioning means.

7. In a cast steel draft gear housing the combination of a base and integral top and bottom and lateral walls, tapering friction faces on said walls adjacent the open end of said housing, said walls having a substantially circular section at the inner ends of said faces and convolutions of buttress-like form flaring therefrom along said lateral walls to said base to provide maximum stiffness and compressive strength in said lateral walls, and longitudinal flanges overlying said lateral walls at the junctures of said circular portion with said convoluted portion.

8. In a cast steel draft gear housing the combination of a base and integral top and bottom and lateral walls, tapering friction faces on said walls adjacent the open end of said housing, said walls having a substantially circular section at the inner ends of said faces and convolutions of buttress-like form flaring therefrom along said lateral walls to said base to provide maximum stiffness and compressive strength in said lateral walls, certain of said walls having outer longitudinal flanges extending from central areas thereof toward said open end and inner longitudinal flanges extending from said areas toward said base.

9. In a cast steel draft gear housing the combination of a base and integral top and bottom and lateral walls, tapering friction faces on said walls adjacent the open end of said housing, said walls having a substantially circular section at the inner ends of said faces and convolutions of buttress-like form flaring therefrom along said lateral walls to said base to provide maximum stiffness and compressive strength in said lateral walls, certain of said walls having outer longitudinal flanges extending from central areas thereof toward said open end and overlying the junctures of said circular portion with said convoluted portions and inner longitudinal flanges extending from said areas toward said base, said inner flanges having parallel inner edges forming spring positioning means.

10. In a cast steel draft gear housing the combination of a base and integral top and bottom and lateral walls, tapering friction faces on said walls adjacent the open end of said housing, said walls having a substantially circular section at the inner ends of said faces and convolutions of buttress-like form flaring therefrom along said lateral walls to said base to provide maximum stiffness and compressive strength in said lateral walls, certain of said walls having outer longitudinal flanges extending from central areas thereof toward said open end and overlying the juncture of said buttress-like portion with said circular portion and inner longitudinal flanges extending from said areas toward said base, said inner and outer flanges overlapping for a substantial portion of their length.

WILLIAM C. HEDGCOCK.