Jan. 23, 1940. N. E. GEE 2,188,042

RESILIENT DRIVE UNIT FOR LOCOMOTIVES

Filed April 7, 1938

Fig. 1.

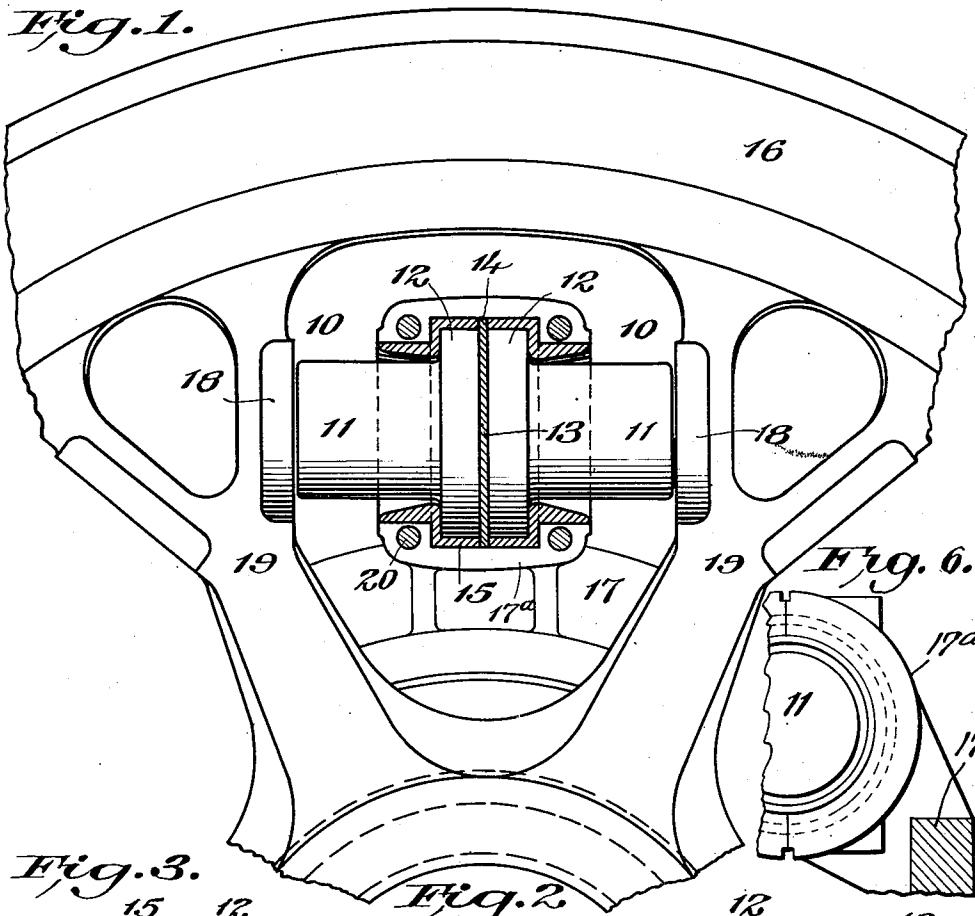


Fig. 6.

Fig. 3.

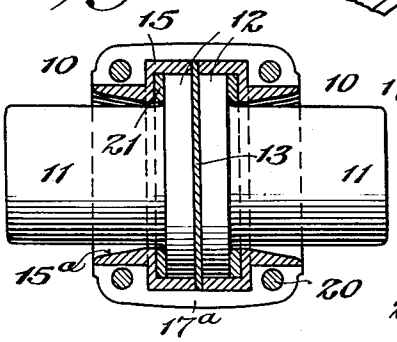
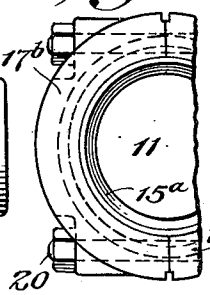


Fig. 2.



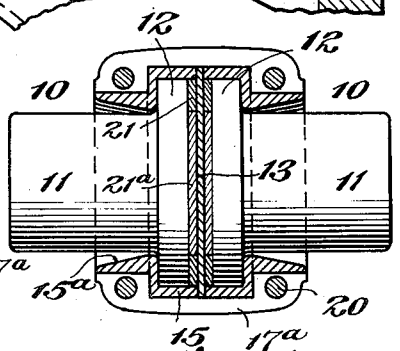


Fig. 4.

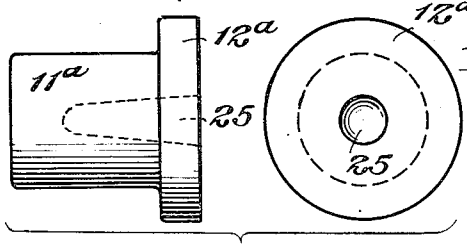


Fig. 5.

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RESILIENT DRIVE UNIT FOR LOCOMOTIVES

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6 Claims. (Cl. 105—131)

This invention relates to an improved drive connection for electric locomotives or the like, and has for its primary object the provision of a yielding or resilient unit arranged between the driving motor and the driven wheel of the locomotive.

Another object of the invention is to provide a simple and practical one-piece drive unit made of resilient material, and of such form as to be readily interlocked with and carried by the driving mechanism associated with the driving motor.

A further object is to provide a drive unit in its simplest adaptable form for electric locomotives which can be manufactured at a minimum cost; is easily applied, and which gives maximum service with minimum maintenance costs.

A still further object is to provide a drive unit which will not produce undue wear on the surface of the driven part against which it impinges.

With these and other objects in view, which will become more readily apparent as the nature and scope of the invention is better understood, the same is shown in a practical form in the accompanying drawing, in which:

Figure 1 is a fragmentary view showing a portion of a driving wheel of an electric locomotive, between two adjacent spokes of which the present invention is shown in operative position.

Figure 2 is an end elevation of the parts shown in Figure 1 of the drawing and illustrates the cap intended to hold the driving unit housings in position on the spider.

Figure 3 is a vertical sectional view, partly in elevation showing a modified form of construction wherein the base of the drive units are thinner than shown in Fig. 1, and metal ring shims in reserve position.

Figure 4 is a detail view similar to Figure 2 showing the position of the driving units after the ring shims have been shifted to compensate for wear, and a shim plate is also used to back up the body of the unit.

Figure 5 shows side and bottom end views of a modified form of body for the resilient driving units.

Figure 6 is a separate detail end elevation partly in section of the portion of the casting or cradle on the spider.

Similar numerals refer to similar parts throughout the several figures of the drawing.

In carrying the invention into effect, no change is contemplated in the motor, spider casting or the method of carrying the motor on the vehicle frame. Thus, the invention is readily adaptable to all types of quill drive locomotives.

Many forms of drive mechanisms have been heretofore proposed or used with varying degrees of success, but, in the meantime, electric locomotive designs have sought for a more dependable and economical drive, particularly one that is easily manufactured, readily applied and which requires minimum attention. To this end, the present invention has in view the use of a plurality of opposed drive units, each designated in its entirety by the numeral 10.

Each unit 10 is preferably made as one integral piece of rubber, or some synthetic form of the same, or a rubber composition, and requires no reinforcement in the form of holding or driving plates. The use of such metal plates or other forms of reinforcement restricts deflection or deformation and adds to the first cost, and, at the same time, introduces the possibility of failures through the rubber breaking away from the metal when in service. In shape, the drive unit consists of a cylindrical body or column portion 11 and an annular flange-like base portion 12. When installed for service, the base portion 12 rests against a single driving plate 13 whose peripheral edge 14 is clamped between the housing units 15, which are integral annular members that completely surround the base 12 and also partly enclose the cylindrical body 10. Each integral one-piece housing 15 has an outwardly flared wall 15a where it surrounds the body 11, and the plate 13 and housing adequately provide for the required deflection of the units 10 when heavy motor torque is being transmitted therethrough from the spider 17 to the pads 18 on the driving wheel spokes 19.

In Figures 2 and 6 the portion of the casting or cradle on the spider which supports the driving units is designated as 17a while the cap section which cooperates therewith is designated as 17b. The cap section 17b is held to the spider by the bolts 20. Thus, it will be seen that the annular holders 15 for the units 10, and the torque plate 13 are all removably clamped in operative relation to the spider casting 17 by the sections 17a and 17b and are thus held in alignment with the spokes 19 of the driving wheel 16.

Figure 1 shows the base 12 of each elastic unit 10 deep enough to originally fill the space between the torque plate 13 and the inner shoulder of the annular housing 15. When the unit becomes compressed by continued use, and the base 12 becomes thinner, or of less than its original depth, suitable shims may be used between the bottom of the elastic unit and the torque plate 13.

Figure 3, for example, illustrates one way of using shims or spacing rings 21. These rings are

shown in their initial or reserve position, that is, between the outer face of the flange 12 of the resilient unit and the annular inner shoulder of the housing sections. When the elastic unit becomes compressed or somewhat compacted due to continuous use, the longitudinal length or depth of the body or barrel portion 11 becomes shorter. When this occurs, the cap section 17a is removed and the housing sections 15 may be separated and the rings 21 removed from the position shown in Figure 3 and placed against the back of the base 12, that is, between the base and the driving plate 13 as shown in Fig. 4. At the same time the shim disc 21a is placed within the ring 21 so as to adequately back up the unit against the plate 13. Thus, the barrel or body 11 of the elastic unit is caused to be projected forwardly the distance of the shims to compensate for wear. In the initial assembly of the device, however, the rings or shims may be placed as indicated in Figure 3 so as to make up the proper thickness of the base and also so that they will be available when adjustments are necessary.

Figure 5 of the drawing illustrates a modified form of resilient drive unit wherein the barrel portion 11a is provided with an interior hollow core 25 which produces an interior space which will permit the elastic body or barrel 11a to exert some of its expansion toward the axis of the unit instead of expanding it entirely in an outward direction. In other words, by providing the hollow cavity or core 25, the outside diameter of the body or barrel 11a does not become expanded or distorted outwardly to as great extent under load as the solid body shown in Figures 1 to 4, inclusive. This feature has the advantage of permitting a reduction in the size of the housing and consequently using less metal therein which adds to the lightness of the mounting. It should be further noted that in addition to the function of the core or cavity 25 of the rubber drive unit to accommodate the inward flow or movement of rubber when the unit is under compression, such core or cavity also has the added advantage of facilitating the uniform and homogeneous curing of the rubber unit during the process of its manufacture.

From the foregoing it will be apparent that the present invention has primarily in view the provision of a resilient member including a body or barrel and a base in the form of a flange, the body or barrel and the flange being adapted to be positioned in the circular housings, which are adapted to be clamped between the semicircular sections 17a and 17b of the spider 17 and securely held in place by a plurality of bolts 20 which hold the assembly to the spider casting.

When it becomes necessary to effect a renewal or an adjustment, the bolts 20 holding the cap section 17b in position are removed, thus releasing the cap section after which the housings enclosing the resilient units can be removed for replacement or adjustment.

It may be also pointed out that the flaring walls 15a of the housing permit of the compression of the body or barrel 11 without cutting the same as might be the case if the tapered or flared clearance were not provided. Also the flaring walls 15a of the housing permit the outer end of the barrel 11, which engages the wheel pad 18, to follow the wheel over uneven track, while the frame of the locomotive on which the motor is carried moves in a horizontal plane. Therefore, it will be observed that the flaring walls of the housing members provide an outwardly flaring mouth portion which provides an easement clearance to accommodate outward deflection or flow of the rubber body when under compression, thereby combining with the hollow core or recess to adequately take care of the inward and outward deflection or flow of the rubber under heavy loads.

I claim:

1. A resilient drive for locomotive wheels, comprising, a molded resilient body including a substantially cylindrical column and a flanged circular base of greater diameter than the column, a housing carried by a motor driven part and having a portion for snugly receiving said flanged base and also having an outwardly flaring mouth portion surrounding the column to support the same under varying degrees of expansion, and a drive plate fitted in the housing at the bottom of said base.

2. A resilient drive for locomotive wheels, comprising, a circular longitudinally divided housing carried by a motor driven part and having a base plate therein arranged transversely to the longitudinal axis of the housing, said housing also having a pair of annular cavities adjacent the plate and outwardly directed flaring mouth portions communicating with said cavities, and a pair of molded resilient torque transmitting elements mounted in said housing, said elements each comprising a flanged circular base portion fitting in said cavities and abutting against opposite sides of said plate and column portions projecting outwardly through said flaring mouth portions of the housing to engage a wheel part.

3. A resilient drive for locomotive wheels, comprising, a housing carried by a motor driven part and including an annular cavity having one side closed by a drive plate and its other side bounded by a shoulder leading to an outwardly flaring wall portion, a molded elastic unit including a column and a flanged base, said base fitting in the cavity and said column extending through the flared wall of the housing to engage a wheel part, and means insertible in the cavity for shortening the distance between said shoulder and the plate and engaging a portion of the base thereby to compensate for reduced thickness of the base due to wear.

4. A resilient drive for locomotive wheels, including, in combination, a locomotive wheel having a driving pad thereon integral with a spoke of the wheel, a motor driven member, a housing supported on said last named member, said housing including an outwardly flaring casing portion, a rubber drive unit including a normal cylindrical body portion having a base held within the housing while its end opposite the base is adapted to contact with said pad on the wheel spoke, the said cylindrical body portion of the rubber body being adapted to expand radially to progressively engage the flaring mouth portion of the housing as the load between the motor driven member and the wheel increases.

5. A resilient drive for locomotive wheels, including, in combination, a locomotive wheel having driving pads on its spokes, a motor-driven member, a pair of duplicate housing members supported on the motor-driven member, a drive plate held between the housing members, a rubber drive unit carried by each of the housing members and comprising a cylindrical body portion and a base flange portion integral therewith, said body portion being adapted to engage a driving pad on the wheel and the base flange portion

being arranged within a housing member against the drive plate.

6. A resilient drive for locomotive wheels including in combination, a locomotive wheel having a driving surface, a motor-driven member, a housing member supported on the motor-driven member and provided with an opening formed with an easement clearance thereabout, and a rubber drive unit held within the housing and adapted to engage said driving surface of the wheel, the said rubber drive unit extending through said opening with the easement clearance thereabout and provided with an interior, central, longitudinally disposed cavity.

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