K. F. ELERS.

DRIVING MECHANISM.

APPLICATION FILED MAR. 30, 1914.

1,258,631.

Patented Mar. 5, 1918.

2 SHEETS—SHEET 1.

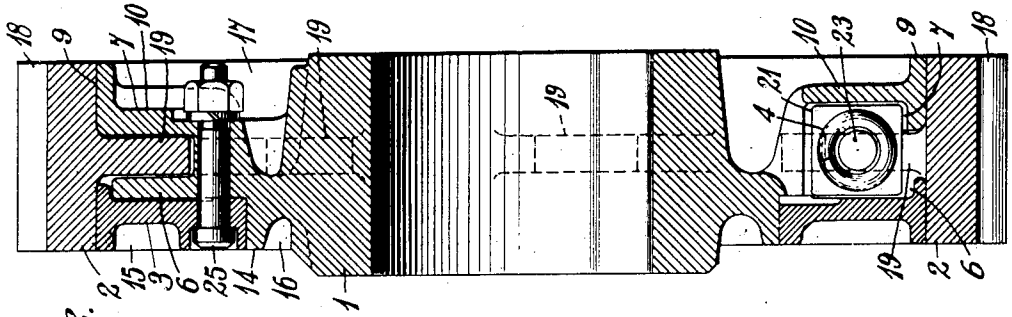


Fig. 2.

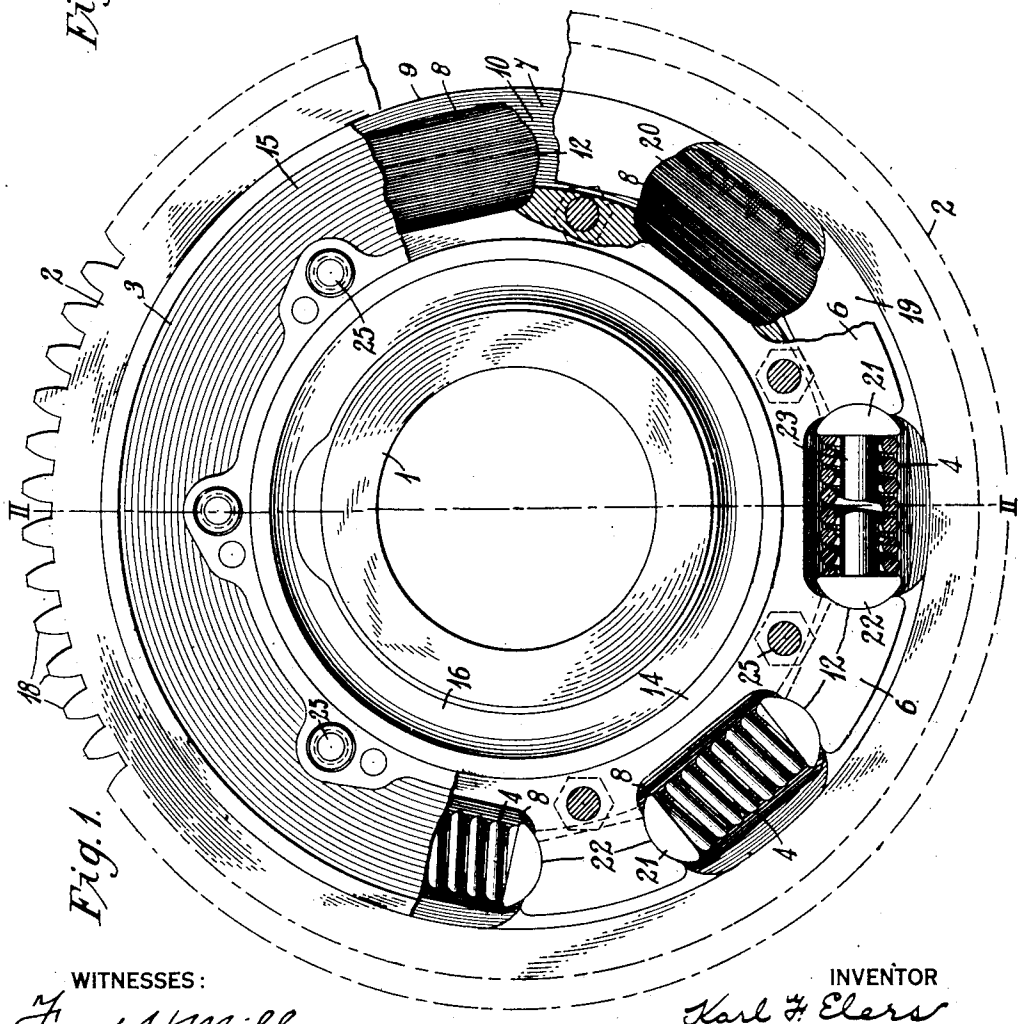


Fig. 1.

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2 SHEETS—SHEET 2.

Fig. 3.

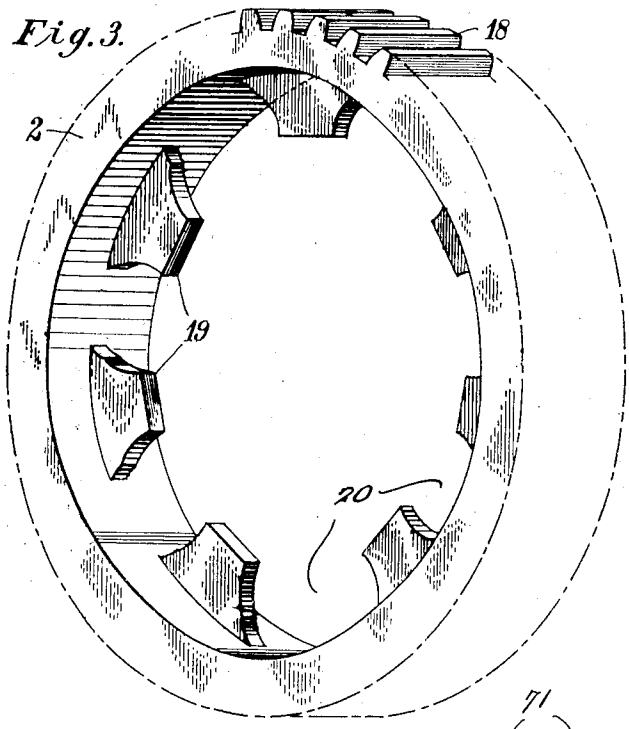


Fig. 5.

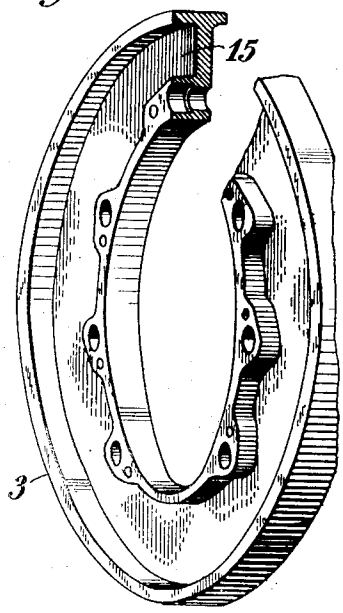
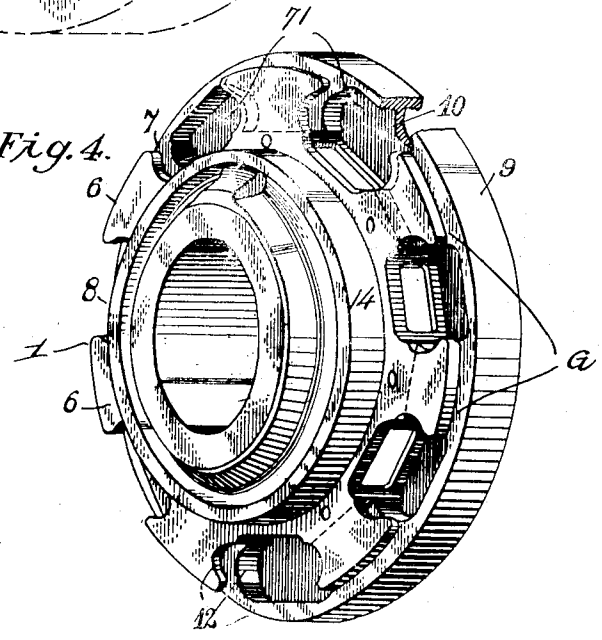


Fig. 4.



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KARL F. ELERS, OF PITTSBURGH, PENNSYLVANIA, ASSIGNOR TO WESTINGHOUSE ELECTRIC AND MANUFACTURING COMPANY, A CORPORATION OF PENNSYLVANIA.

DRIVING MECHANISM.

1,258,631. Specification of Letters Patent. Patented Mar. 5, 1918.

Application filed March 30, 1914. Serial No. 828,228.

To all whom it may concern:

Be it known that I, KARL F. ELERS, a citizen of the United States, and a resident of Pittsburgh, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Driving Mechanisms, of which the following is a specification.

My invention relates to driving mechanisms, and it has special reference to such resilient gears as are employed between the driving motors and driving wheels of electric railway vehicles.

The object of my invention is to provide a device of the above-indicated character which shall be simple, compact and durable in construction, and shall embody relatively few parts which may be assembled or dismantled with facility.

Another object of my invention is to provide a device of this general class which, by reason of its peculiar arrangement of parts, may be cheaply manufactured, and shall embody a plurality of coil springs all of which are placed under compression for driving purposes, irrespective of the direction of operation.

More specifically, the object of my invention is to simplify and improve the construction and operation of the apparatus set forth in Patent 985,518, granted to the Westinghouse Electric & Manufacturing Company February 28th, 1911, upon an application filed by me.

In the accompanying drawing, Figure 1 is a view, partially in section and partially in side elevation, of a device constructed in accordance with my invention, a portion of the apparatus being broken away at different places in order to clearly show the construction. Fig. 2 is a sectional side view of the device taken on the line II—II of Fig. 1, Fig. 3, Fig. 4 and Fig. 5 are, respectively, perspective views of the rim, hub and side plate of the device herein described.

Referring to the drawing, the apparatus comprises a body member or hub 1, a relatively movable gear member or rim 2, a detachable cover plate and bearing member 3 and a plurality of coil springs 4.

The hub 1 is provided with a plurality of integral, laterally-spaced radial projections, arms or lugs 6 and 7, the projections, arms or lugs 6 being angularly separated by peripheral recesses 8, while the projections 7 are integral with a circumferential flange or bearing member 9 and are joined together by webs 10 for the purpose of providing a closed side for retaining the parts in position. The spaces, recesses or interior depressions 71 between the projections 7 correspond to the recesses 8 between the projections 6. The projecting members 6 and 7 are of like configuration and are provided with curved end surfaces 12 which constitute seats for the springs 4, as hereinafter set forth. The radial projections 6 are of less length than the projecting members 7 and the free outer ends thereof do not engage the gear rim 2. The hub 1, furthermore, is provided with a laterally-extending circular flange 14 which supports the removable bearing member 3, in a manner to be described. Side recesses 15, 16 and 17 are provided for the sake of economizing weight and material.

The rim 2 is annular in form and is provided with a plurality of gear teeth 18 and with centrally-disposed, inwardly-projecting integral radial members, arms or lugs 19 which are disposed in the grooves G formed between the radial projections 6 and 7 of the hub 1 and are correspondingly shaped, being separated by peripheral recesses 20 similar to the recesses 8 of the hub member 1.

Inasmuch as the radial members 6 and 7 of the hub 1 and the radial members 19 of the rim 2 are correspondingly located in side-by-side relation, the recesses 8 and 20 register, the one with the other, to form pockets in which the springs 4 are placed.

Each of the springs 4 is provided with spring seats 21 which severally comprise a body or curved bearing portion 22 which cooperates with the curved seats 12 of the hub and rim projections 6, 7 and 19, and an integral shank member 23 which projects within the spring. The length of the shanks 23 are such that a limited amount of relative movement between the hub 1 and rim 2 is permitted, after which, engagement of the shank portions 23 is effected and the driving

effort transmitted directly and positively through them.

The cover plate and bearing member 3 is annular in form and its inner surface fits tightly over the flange 14 of the hub 1, while its outer periphery constitutes a bearing for the gear rim 2. The member 3 is secured rigidly in place by means of a plurality of bolts 25, in a well-known manner.

The peripheral spaces between the lugs on the hub and rim members permit of placing the lugs or projections on one member between those on the other for assembling and disassembling the mechanism. The integral web portions 10 on the hub restrain the lateral displacement of the springs.

When the structure is assembled, as shown in the drawing, the springs 4 may be entirely inclosed and are so disposed and retained that it is impossible for them to become damaged or moved out of position. Moreover, the springs normally are free from strain and are of maximum length. All of the springs are placed in compression when power is transmitted in either direction of operation.

It is evident that modifications in the specific structural details may be effected without departing from the spirit and scope of my invention, and I desire that only such limitations shall be imposed as are indicated in the appended claims.

I claim as my invention:

1. In a driving mechanism, the combination with a hub having circumferential sets of laterally spaced outwardly disposed radial projections, and a relatively movable rim surrounding said hub and having integral circumferential inwardly disposed radial projections having free ends severally disposed intermediate said laterally spaced projections, of coil springs interposed between adjacent groups of projections, and retaining members coöperating with the respective ends of said springs and having projecting portions adapted for coöperative engagement to limit the relative movement of said hub and said rim.

2. In a driving mechanism, the combination with a hub having radial projections and a relatively movable rim coöperating therewith and having correspondingly located radial projections, of coil springs having their respective ends coöperating with the adjacent hub and rim projections, and members associated with the ends of said springs for retaining said springs in position and limiting the relative movements of said hub and rim.

3. In a driving mechanism, the combination with a hub member having a plurality of pairs of outwardly projecting radial members, and a rim member movably mounted on said hub member and having integral inwardly projecting radial members severally disposed between each pair of outwardly projecting radial members, of a plurality of coil springs interposed between the peripherally adjacent radial members, and a detachable side member secured to said hub member and constituting a bearing for said rim member.

4. In a driving mechanism, the combination with a hub having a laterally projecting circular flange and a plurality of spaced circumferential flanges, said circumferential flanges being provided with correspondingly located recesses, and a relatively movable rim having an inwardly projecting flange disposed intermediate said spaced hub flanges and provided with correspondingly located recesses, of coil springs disposed in the registering recesses of said hub and rim flanges, and a side member coöperating with the laterally projecting circular flange and constituting a bearing for said rim.

5. In a driving mechanism, the combination with a hub having laterally spaced circumferential flanges and a relatively movable rim having an inwardly projecting flange disposed between the hub flanges, said hub flanges and rim flanges having correspondingly located registering peripheral recesses forming pockets, of coil springs disposed within said pockets.

6. In a driving mechanism, the combination with a hub having a plurality of laterally spaced peripheral projecting members severally provided with correspondingly located recesses, one of said peripheral members constituting a bearing, and a relatively movable rim surrounding said bearing member and having an inner flange member interposed between the laterally spaced peripheral projecting hub members and having correspondingly located recesses registering with the hub recesses, of springs disposed in said registering recesses and cooperating with said hub and said rim, and a bearing member for said rim secured to said hub.

7. A driving mechanism comprising a hub provided with a pair of laterally spaced peripheral flanges, one of said flanges having equally spaced interior depressions therein and the other flange having openings therethrough corresponding in position to said depressions, a rim provided with similarly spaced centrally disposed inward projections having free ends, the spaces intermediate said rim projections being adapted to register with the depressions and openings of said hub to provide pockets, and a plurality of coil springs disposed in said pockets and having their opposite ends respectively bearing against both the rim and the hub.

8. A driving mechanism comprising a hub having a peripheral flange and a laterally spaced set of peripheral outwardly projecting radial arms having free ends, a rim having a plurality of similarly spaced inwardly projecting free-ended arms adapted to register with the respective arms of said hub, a plurality of coil springs interposed in the spaces between the registering arms, and a removable cover plate disposed adjacent to said hub arms and secured rigidly to said hub, the rim having bearings upon said hub flange and said cover plate.

9. A driving connection comprising a hub having sets of laterally-spaced radial projections and openings between adjacent projections, a rim having similarly positioned radial projections adapted to be received between said hub projections and to be admitted through said openings, and resilient connecting means positioned in said openings between adjacent sets of said projections.

10. A resilient wheel comprising a member having laterally-spaced radial projections, a member having radial projections disposed between said first-named projections and arranged in sets with pockets therebetween, of connecting means inserted in said pockets for resiliently joining said members, and means for preventing lateral displacement of said connecting means.

11. A resilient wheel comprising two parts having coöperating flanges, the flanges on one part being provided with grooves, the flanges on the other part being of such width that they will enter between the first-mentioned flanges, said parts being relatively rotatable so that said last-mentioned flanges enter the grooves in said first-mentioned flanges and register therewith, a plurality of tangentially-disposed helical springs and spring seats for said springs, said springs and seats being interposed between said flanges for opposing relative motion between said parts, said flanges on one of said parts being provided with means engaging said spring seats for holding said springs against lateral displacement.

12. A resilient wheel comprising two parts having coöperating flanges, the flanges on one part being provided with grooves, the flanges on the other part fitting into said grooves, a plurality of tangentially disposed helical springs, and spring seats for said springs, said springs and seats being interposed between said flanges for opposing relative motion between said parts, said flanges on one of said parts being provided with means for holding said springs against lateral displacement.

13. In a driving mechanism, the combination with a hub having two spaced sets of integral radial lugs and a flange joining the lugs of one set, and a relatively movable rim surrounding said hub and having a bearing upon said flange and provided with radial members disposed between, and corresponding to, the spaced lugs on the hub, of springs interposed between adjacent groups of said lugs and radial members, and a detachable cover member secured to said hub and constituting a bearing for said movable rim.

14. In a driving mechanism, the combination with a hub member and a rim member that are relatively movable, one of said members being provided with two spaced sets of oppositely-disposed radial lugs, and the other member being provided with a single set of radial lugs that are integral therewith and that correspond to, and are located between, the lugs on the other member, the peripheral spaces between the said lugs permitting of placing the lugs on one member between those on the other for assembling and disassembling the mechanism, and resilient means interposed between adjacent groups of said lugs and opposing relative movements between the said members.

15. In a driving mechanism, the combination with a hub member and a rim member that are relatively movable, one of said members being provided with two spaced sets of oppositely-disposed radial lugs, and the other member being provided with a single set of radial lugs that are integral therewith and that correspond to, and are located between, the lugs on the other member, the peripheral spaces between the said lugs permitting of placing the lugs on one member between those on the other for assembling and disassembling the mechanism, and resilient means interposed between adjacent groups of said lugs and opposing relative movement between the hub and the rim, said means being restrained from displacement by one of said members.

16. A driving mechanism comprising a hub having two spaced sets of oppositely disposed radial lugs, a rim having a set of integral projecting radial members corresponding to the said lugs and located between the two sets thereof, the peripheral spaces between the said lugs and said members permitting of placing the members between the lugs for assembling and disassembling, and resilient means interposed between adjacent groups of said lugs and said members and opposing relative movements between the hub and the rim.

17. A driving mechanism comprising a hub having two spaced sets of oppositely disposed radial lugs, the hub and both sets of lugs being integral, a rim having a set of integral inwardly projecting radial members corresponding to the said lugs and located between the two sets thereof, the peripheral spaces between the said lugs and

said members permitting of placing the members between the lugs for assembling and disassembling, and resilient means interposed between adjacent groups of said lugs and said members and opposing relative movements between the hub and the rim.

In testimony whereof, I have hereunto subscribed my name this 23 day of Mar. 1914.

KARL F. ELERS.

Witnesses:
JAMES F. CURTIS,
B. B. HINES.