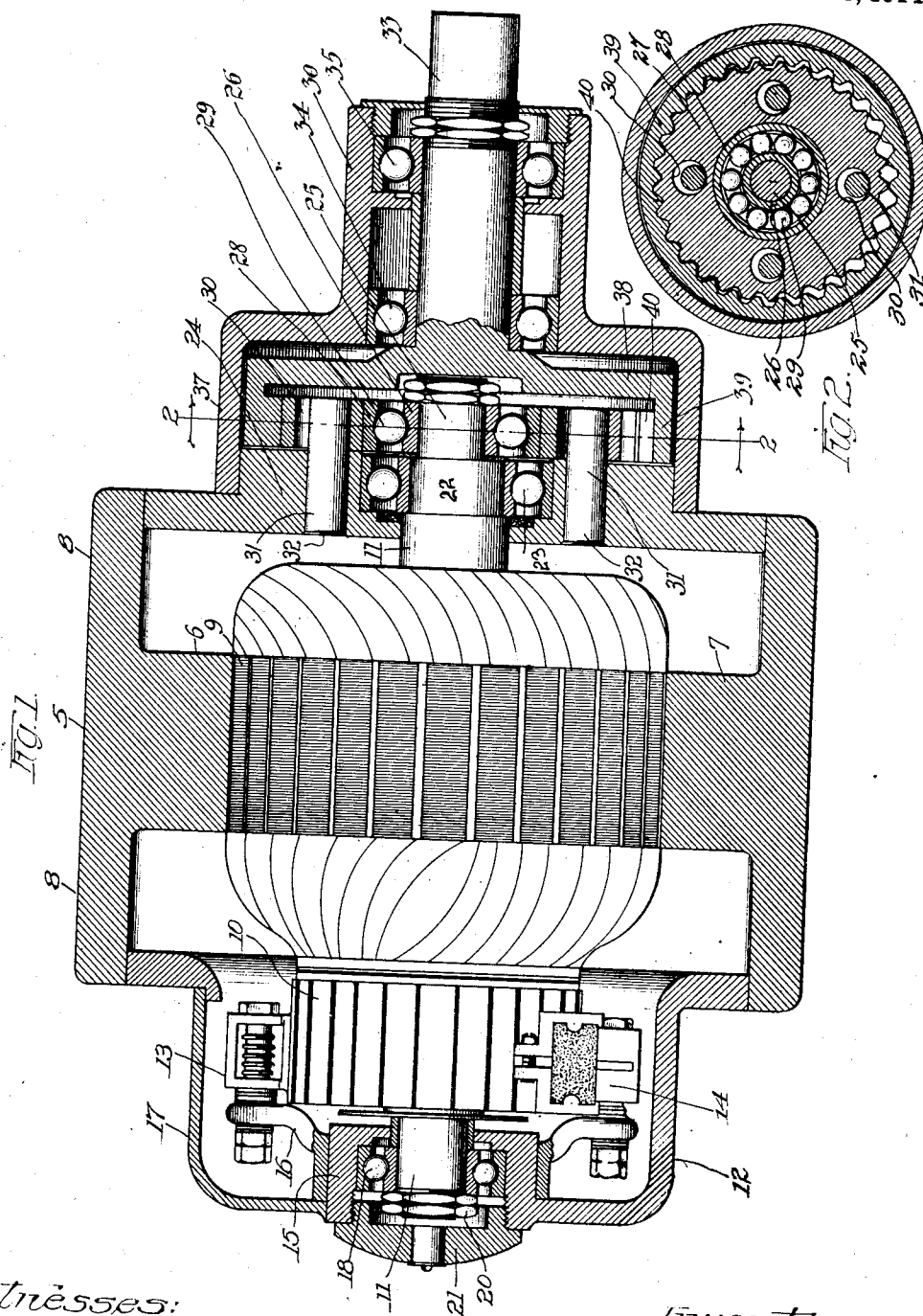


V. G. APPLE.
SPEED REDUCTION GEARING.
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1,089,181.

Patented Mar. 3, 1914.



Witnesses:
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UNITED STATES PATENT OFFICE.

VINCENT G. APPLE, OF DAYTON, OHIO, ASSIGNOR TO THE APPLE ELECTRIC COMPANY,
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SPEED-REDUCTION GEARING.

1,089,181.

Specification of Letters Patent.

Patented Mar. 3, 1914.

Application filed March 24, 1913. Serial No. 756,349.

To all whom it may concern:

Be it known that I, VINCENT G. APPLE, a citizen of the United States, residing at Dayton, in the county of Montgomery and State of Ohio, have invented certain new and useful Improvements in Speed-Reduction Gearing, of which the following is a specification.

My invention relates to improvements in power transmitting speed reduction gearing.

One of the objects of my invention is to provide a speed-reduction gearing which is well adapted for association with an electric motor and which, as shown, is reduced to the ultimate in simplicity, in fewness of parts, and in the linear contraction of the space required to contain said parts. In my copending application entitled Power transmitting mechanism, Serial No. 730,378, filed November 9, 1912, I have shown a similar speed reduction gear, somewhat different in specific construction. In this application I will point out the features of novelty of my present invention.

Other and further objects of my invention will become readily apparent to persons skilled in the art from a consideration of the following description when taken in conjunction with the drawing, wherein—

Figure 1 is a longitudinal central section of an electric motor showing my speed-reduction gearing in a casing comprising an integral part of the casing of said motor; and Fig. 2 is a transverse sectional view, on line 2—2 of Fig. 1, looking in the direction of the arrows.

In both views the same reference characters are employed to indicate similar parts.

5 is a magnetic frame forming part of the casing, having magnetic field poles 6 and 7 and forming part of the casing with part 8 thereof extended laterally from the magnetic frame. An armature 9 is rotatable in the casing, is provided with the commutator 10, and is mounted on the shaft 11. A casing 12 surrounds the commutator and contains the commutator brush-holders 13 and 14 that are mounted upon a hub 15 and secured in a quadrant 16. A removable panel 17 may form a part of the casing 12 and affords a means for access to the commutator and brushes. The hub 15 contains a ball bearing 18 for the commutator end of the shaft 11. Check nuts 20 are employed

as means for holding the ball bearing members of the bearing 18 upon the shaft 11. A cap 21 may have screw threaded engagement with the hub 15 for closing the opening in the casing 12.

The power end of the shaft 11 is reduced, as at 22, for association with the ball bearing 23 that is mounted in the support or plate 24 forming part of the casing 8. The shaft is further reduced, as at 25. This part of the shaft is eccentric to the main portion thereof and carries a ball bearing member 26. The spur-gear 27 carries a corresponding ball bearing member 28 for association with the balls 29. The spur gear 27 is provided with a plurality of perforations 30 that are larger than the corresponding projecting studs 31. The studs 31, of which there are four shown in the drawing, are secured in the bearing plate 24 of the casing 8 as by riveting, indicated at 22. By this means the spur-gear 27 is free to be moved in its own diametric plane by means of the eccentric 25 but it is prevented from rotation.

As so far described the parts and their association are similar to those disclosed in my copending application to which reference heretofore has been made. The distinguishing features of my present invention lie in the arrangement and association of the driven shaft 33. This shaft is provided with bearings 34 and 35 in the hub 36, which hub forms a part of the casing 37 that overlies the speed-reducing mechanism. The inner end of the shaft 33 is expanded into a disk 38, which has a flange 39 laterally and inwardly extended from the peripheral edge thereof. This flange is provided with internal gear teeth 40 that intermesh with similar teeth provided on the outside periphery of the spur-gear 27. The spur-gear 27 is provided with twenty-nine teeth while the internally-gear member 38 is provided with thirty teeth; therefore the driving shaft 11, by the operation of its eccentric 25, will effect the speed-reducing mechanism to the extent that said driving shaft must be rotated thirty revolutions in order to effect one revolution of the driven shaft 33.

It will be obvious that the driving shaft 11 and the driven shaft 33 are in the same axial alignment and therefore the distribution of weight and metal around the axis is uniform. When the motor is to be used for rotating a

drill or for rotating other like slowly moving devices it will be found that this arrangement is very convenient and advantageous.

5 The method of supporting the internally geared member on the same bearing that affords support for the driven shaft is an arrangement that adds to the efficiency of the device and greatly reduces the cost of its
10 construction.

While my invention is especially adapted for use in connection with electric motors, it may also be used in association with motors of other types, such as gas engines, air engines, and other such motors, and it may also
15 be employed in lines of shafting where a section of a shaft is rotated at a given speed, and it is desired to rotate the adjoining sections at a reduced speed. The alinement of
20 the shaft may be maintained and remain undisturbed by the introduction of my speed reducing mechanism therein.

While I have herein described a single embodiment of my invention for the purpose
25 of clear disclosure, it is evident that many changes, such as suggested, may be made without departing from the spirit and scope thereof, and within the contemplation of the appended claims.

What I claim is:

1. In a device of the character described, 30
a driving shaft; an eccentric rotatable thereby; a spur-gear radially movable by said eccentric; a driven shaft; an internal-gear member overlying said spur-gear, in mesh 35
therewith, having a different number of teeth therefrom and directly carried by said driven shaft; a casing wall adjacent one face of the spur gear, and a stud secured in said wall and projecting into an opening in said 40
spur gear.

2. In a device of the character described, a driving shaft; an eccentric rotatable thereby; a spur-gear, radially movable by said eccentric; a driven shaft having its inner end 45
expanded into a disk with an overhanging internal gear member provided with a different number of teeth from and in mesh with said spur-gear, a casing wall adjacent one face of the spur gear, and studs secured 50
in said wall and projecting into openings in said spur gear.

In testimony whereof I hereunto set my hand in the presence of two witnesses.

VINCENT G. APPLE.

In the presence of—

E. V. MARTIN,
FOWLER S. SMITH.