No. 616,396. Patented Dec. 20, 1898.

C. O. C. BILLBERG & P. A. N. WINAND.

COMBINED BEARING AND POWER TRANSMITTING DEVICE.

(Application filed Nov. 23, 1897.)

(No Model.)

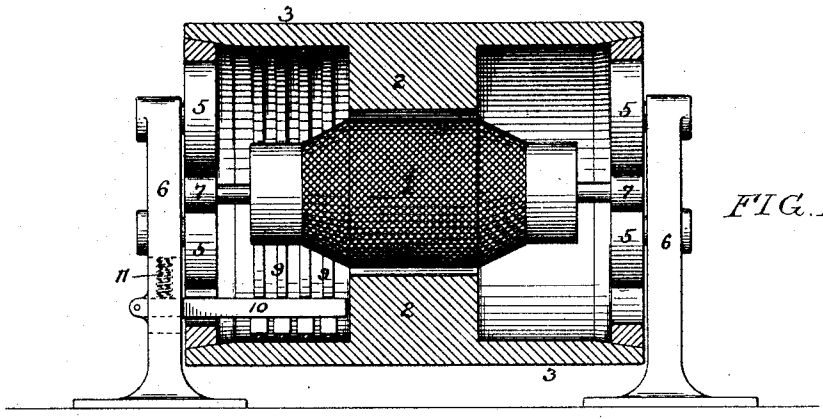


FIG. 1.

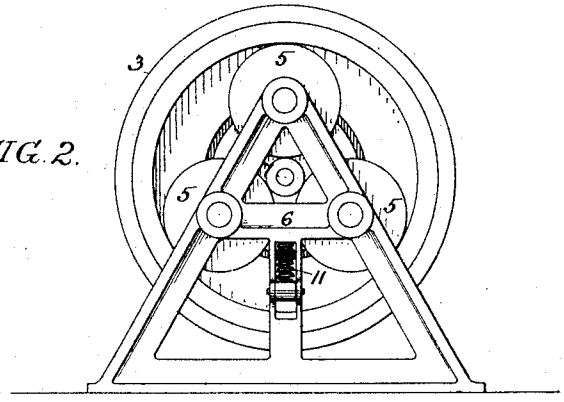


FIG. 2.

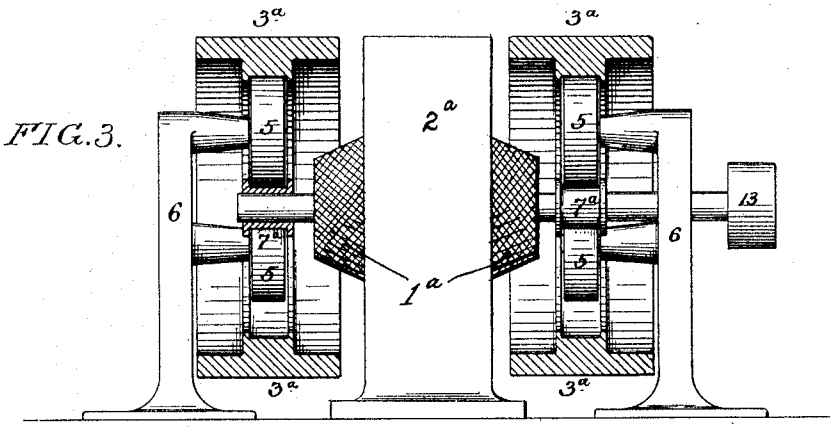


FIG. 3.

Witnesses:
Charles De Cour
F. E. Beckhold

Inventors
Carl O. C. Billberg and Paul A. N. Winand
by their Attorneys
Howson & Howson

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

CARL O. C. BILLBERG, OF LEWISBURG, AND PAUL A. N. WINAND, OF PHILADELPHIA, PENNSYLVANIA.

COMBINED BEARING AND POWER-TRANSMITTING DEVICE.

SPECIFICATION forming part of Letters Patent No. 616,396, dated December 20, 1898.

Application filed November 23, 1897. Serial No. 659,593. (No model.)

To all whom it may concern:

Be it known that we, CARL O. C. BILLBERG, a subject of the King of Sweden and Norway, and a resident of Lewisburg, and PAUL A. N. WINAND, a subject of the King of Belgium, and a resident of Philadelphia, Pennsylvania, have invented a Combined Bearing and Power-Transmitting Device, of which the following is a specification.

Our invention consists of a special form of power-transmitting device which constitutes not only a means of increasing or decreasing the speed of the driven part in respect to the driving part, or vice versa, but also a roller-bearing for said parts.

In the accompanying drawings, Figure 1 is a longitudinal section illustrating our invention as applied to an electric motor. Fig. 2 is an end view of the same; and Fig. 3 is a view similar to Fig. 1, but illustrating another application of our invention.

In Figs. 1 and 2 we have illustrated our invention as applied to an electric motor in which the field-magnets are connected to pulleys which are geared to the armature-shaft, so as to be caused to rotate at a slower speed than the armature and in the opposite direction, the field-magnets and their pulleys thus constituting the drum of a hoisting apparatus, a drum for receiving a driving-belt or some other element of mechanism to be driven by the motor, or the machine may be a dynamo in which the drum is the driving element and the armature the driven element, the power-transmitting devices being the same in either case. Supposing, however, that the device is a motor of the class described, 1 will represent the armature of the motor, and 2 the field-magnets, which have at each end a pulley 3, forming part thereof, each of said pulleys being mounted upon a series of wheels 5, which have shafts or spindles turning in bearings in an end frame 6, or which turn upon suitable studs projecting from said end frame, these wheels 5 being either friction-wheels, as shown in the drawings, or spur-wheels meshing with teeth formed upon the inner face of the pulley 3, all of the wheels 5 of the series engaging with a pinion 7, secured to and rotating with the armature-shaft, the pinion being of the same character as the wheels 5 and being supported wholly thereby, so that the wheels 5 rotate at precisely the same surface speed as said pinion and constitute roller-bearings therefor, and also serve as roller-bearings for the pulley 3, whereby a frictionless support and bearing for both the armature-shaft and pulley are provided and the operation of the machine is correspondingly facilitated.

Upon a bed of insulating material in the interior of one of the pulleys 3 are mounted a series of rings 9, of copper or other conducting metal, with which engage contact shoes or brushes carried by an arm 10, mounted in guides in one of the end frames 6 and acted upon by a spring 11, so that said contact shoes or brushes are caused to bear yieldingly against the rings 9 and convey current to and from the same. If the field-magnet does not rotate, these rings 9 will not be necessary nor will they be required in the case of multiphase alternating-current motors in which the part corresponding to the drum 3 does not rotate, and when it is desired to convey current to the rotating part 1 the rings may be carried by the latter instead of by the part 3.

When a non-rotating field-magnet is used, there may be independent pulleys at the ends of the same, and in case of a dynamo the power may be applied to these pulleys or to one of them in order to rotate the armature-shaft.

In Fig. 3 we have shown a construction in which power-transmitting devices are thus employed to transmit power between a pair of independent pulleys 3^a and a pair of pinions 7^a on a central shaft 12, which may have a pulley 13 for receiving or transmitting power, accordingly as said shaft is the driving or driven device, the fixed field-magnet being in this case shown at 2^a and the ends of the armature at 1^a.

In some multiphase alternating-current motors or dynamos and also in some classes of continuous-current machines the central rotating element, which we have heretofore designated the "armature," is sometimes called the "field," and the outer or surrounding element, whether fixed or rotating, is called the "armature." Hence in the claims we have

used in place of the terms "armature" and "field" the terms "central rotating element" and "surrounding element," respectively.

Having thus described our invention, we claim and desire to secure by Letters Patent—

1. Power-transmitting mechanism in which are combined a shaft with two or more pinions thereon, a pulley concentric with and surrounding said pinions, and intermediate wheels constituting the only bearings for both the pulleys and the pinions and also as a means of transmitting power from one to the other.

2. The combination in an electric motor or dynamo, of a central rotating element, a surrounding element, a shaft for said central rotating element having a pinion at each end, pulleys at the ends of the surrounding element, each pulley being concentric with and surrounding one of the pinions of the shaft, and wheels intermediate of each pulley and its pinion, said wheels constituting the only bearings for both pulley and pinion and serving to transmit power from one to the other.

3. The combination in an electric motor or dynamo, of a central rotating element, a surrounding element, a shaft for said central rotating element having pinions at each end, pulleys each concentric with and surrounding one of said pinions, and each forming part of the surrounding element, and a series of wheels intermediate of each pulley and its pinion and constituting the only bearings for the same and as a means of transmitting power from one to the other.

4. The combination in an electric motor, of an armature and its shaft, a rotating drum-like field-magnet geared to said shaft, current-collector rings mounted on the interior of said drum, and contact shoes or brushes bearing upon said rings.

In testimony whereof we have signed our names to this specification in the presence of the subscribing witnesses.

C. O. C. BILLBERG.
PAUL A. N. WINAND.

Witnesses to signature of C. O. C. Billberg:
W. N. BAKER,
C. D. COX.

Witnesses to signature of P. A. N. Winand:
WILL. A. BARR,
JOS. H. KLEIN.