F. W. REEVES.

SYNCHRONIZING ACCELERATOR FOR MOTORS.

APPLICATION FILED DEC. 12, 1914.

1,203,267. Patented Oct. 31, 1916.

FIG. 1

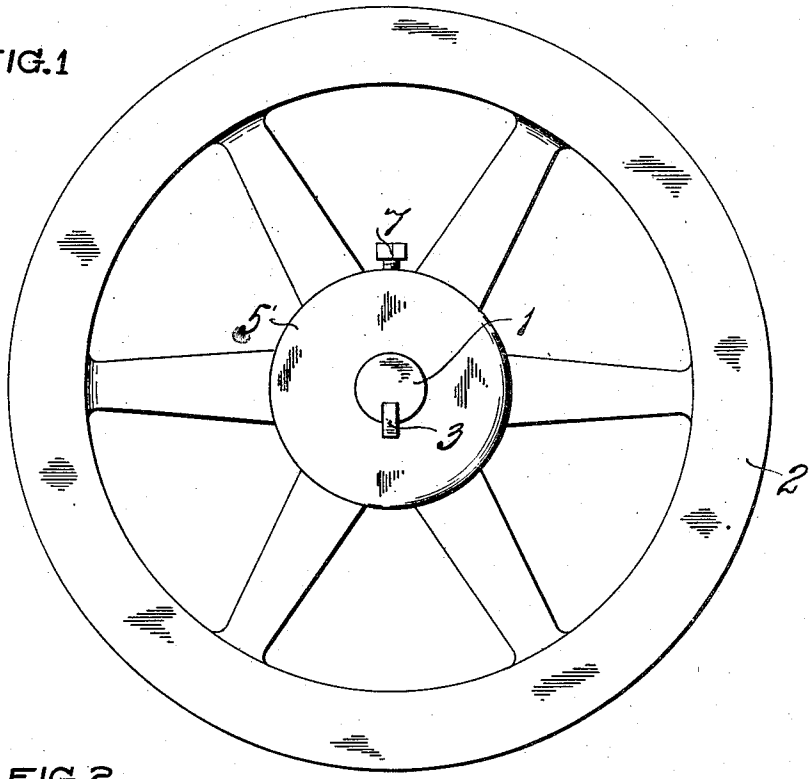


FIG. 2

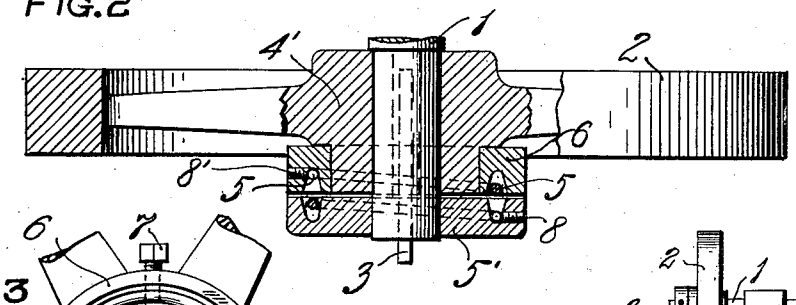


FIG. 3

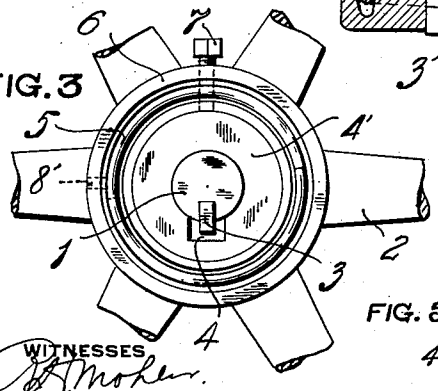


FIG. 4

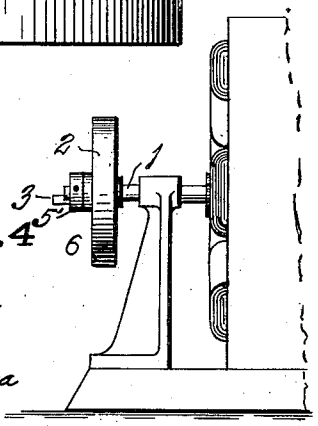
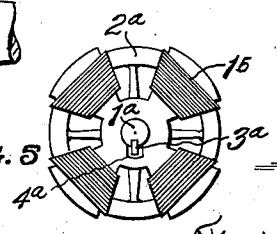


FIG. 5



WITNESSES

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SYNCHRONIZING ACCELERATOR FOR MOTORS.

1,203,267. Specification of Letters Patent. Patented Oct. 31, 1916.

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To all whom it may concern:

Be it known that I, FREDERICK W. REEVES, a citizen of the United States, residing at Pittsburgh, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Synchronizing Accelerators for Motors, of which improvement the following is a specification.

My invention has for its object, to provide means for effecting more perfect synchronism of the rotor of synchronous motors.

In all synchronous motors, as far as I am aware, the rotor has an occasional "see-saw-ing" action, that is, the rotor instead of running without variation in time, relative to the poles of the stator, surges back and forth, due to the rise and fall of the voltage supply or sudden change in speed of the alternator at the source of supply, and the object of my invention is to provide means to quickly restore synchronism.

I accomplish my object by the application of an additional rotative member to the rotor, both mounted on the same shaft, there being also certain features in the mounting and action of one with respect to the other, as will be hereinafter more specifically described in this specification and particularly pointed out in the appended claims, reference being had to the accompanying drawings forming a part hereof, said drawings representing the following views:

Figure 1 is a side elevation of one form of the additional or auxiliary member. Fig. 2 is a plan thereof, partly in section. Fig. 3 is a side elevation of a portion of said member. Fig. 4 is a side elevation of a motor showing the application of my improvement thereto, and Fig. 5 is an end elevation of a rotor showing a modification of the improvement applied thereto.

In carrying out my invention I have shown a simple and practical form thereof in Figs. 1 to 4, inclusive, wherein I provide the shaft 1 of the rotor with a revoluble member of sufficient weight and dimensions for the purpose intended, which in this instance is in the form of a fly wheel 2. In applying the member or wheel to the rotor shaft to accomplish the desired results, it must be loosely applied and so arranged that free movement or play thereof will be permitted on the shaft in a rotative direction for a given or predetermined distance. This limitation of movement or play, is preferably carried out by providing a suitable projecting stop and spaced abutments to coöperate therewith and disposed between the wheel and shaft, which in this instance comprises a key 3 fixedly fitted in a key-way in the shaft and a key-way 4 in the hub portion 4′ of the wheel. This key-way 4′ is of greater dimensions than the cross-section of the projecting portion of the key, so that its opposite side walls will serve as the spaced abutments to be engaged by the key at the proper time.

Yieldable means is preferably employed in connection with the stop and abutments, the means employed in this instance comprising a coil spring 5, disposed between the outer collar or member 5′ which is part of the shaft, being fixed to the motor shaft by the key 3, and the inner collar 6, the latter collar being secured upon the wheel hub by a set-screw 7, said collar 6 forming practically a part of the wheel hub. The spring is arranged within grooves formed within the adjacent faces of the two collars and are of such dimensions as to permit free action of the spring therein, said spring being secured at one end to the collar 5′ by a set-screw 8 and at its opposite end to the collar 6 by a set-screw 8′.

In practice, assuming the motor to be in operation, then in the event that the rotor be caused to surge forward the key 3 will strike against one of the walls of the key-way 4 in the wheel hub, causing said fly wheel to be slightly accelerated, with the result that the rotor will be retarded toward the opposite direction with equal force, causing the key to then strike against the opposite wall of the key way, so that a few of such impacts quickly restores the rotor to synchronism. These few impacts follow one another with such rapidity as to not cause any perceptible variation in speed. It will also be apparent that in starting the motor a few impacts, as above described, will quickly bring about perfect step of the rotor and thus reduce the tendency to "see-saw" or "hunt."

By means of the spring 5 synchronism is more quickly established, as for instance, if the collar 6 on the wheel hub be adjusted so as to reduce the space between the key 3 and forward wall of the key-way 4, a greater tension of the spring will then be placed at the opposite side of the key to be overcome when said key tends to strike against the said opposite wall of the key-way than at the forward side thereof, it being apparent

that as synchronism is being established the tendency of the key to strike the rear wall of the key-way is then lessened.

In Fig. 5, I have shown a modification, being a transposition of parts and operative conditions from that previously described, wherein the rotor 1^b is loosely mounted on its shaft 1^a, and the wheel 2^a fixed on said shaft, there being a key 3^a fixed to the shaft and a key-way 4^a formed in the rotor in which the shaft key plays. In this construction the operation will be readily understood from the explanation previously given.

Having shown and described an embodiment of my invention, what I claim is:

1. In a synchronous motor, the combination with the shaft thereof, of an abutment fixed thereto, a fly wheel loosely mounted on said shaft, said wheel being provided with a pair of spaced abutments between which the shaft abutment extends and said shaft abutment being adapted to come into direct contact therewith, an adjustable member carried by said wheel, and a spring connecting said shaft with said member.

2. The combination with the shaft of a rotor, of a rotative member mounted thereon with limited play in a rotative direction, an adjustable collar carried by said member, a member fixed to the shaft, and a spiral spring interposed between and connecting said collar and fixed member with one another.

In testimony whereof, I have hereunto signed my name in the presence of two subscribing witnesses.

FREDERICK W. REEVES.

In the presence of—
R. S. HARRISON,
BESSIE L. MCGRATTY.