Aug. 5, 1924.

1,503,818

H. W. CRANE

ELECTRIC MOTOR GOVERNOR

Filed April 14, 1922

Fig. 2

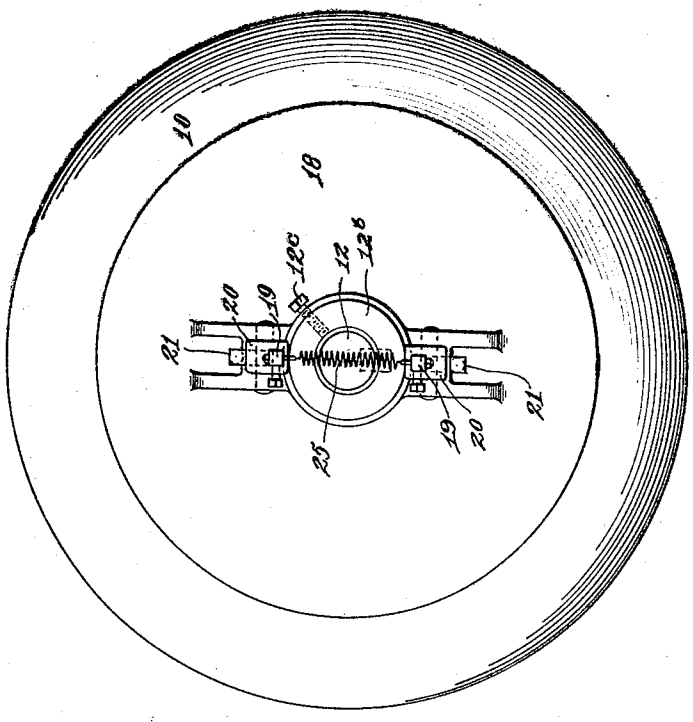
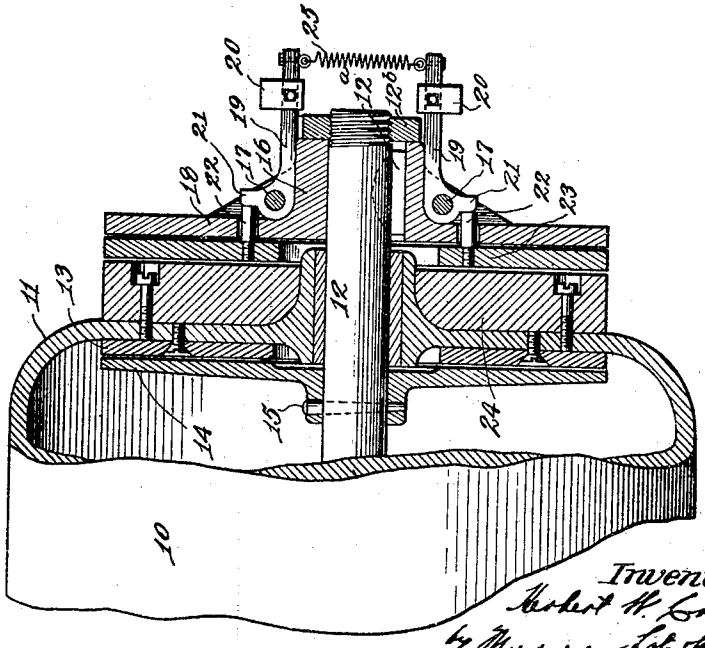


Fig. 1



Inventor.
Robert W. Crane
by Munson Colt & Nelson
Attys

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UNITED STATES PATENT OFFICE.

HERBERT W. CRANE, OF CHICAGO, ILLINOIS.

ELECTRIC-MOTOR GOVERNOR.

Application filed April 14, 1922. Serial No. 552,722.

To all whom it may concern:

Be it known that I, HERBERT W. CRANE, a citizen of the United States, and resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in an Electric-Motor Governor, of which the following is a specification.

My invention relates to governors and particularly to a specific application of a well known governing principle to an electric motor.

One of the particular objects of my invention is to provide a simple device which may be applied to and operate efficiently in connection with a variable speed electric motor with the object of maintaining a constant speed thereof under different working conditions. The device utilizes the common tendency of the motor armature to reciprocate longitudinally to a very limited extent, this reciprocation being sufficient to move cooperating disks into and out of frictional engagement. The required movement is secured by mounting two or more governing arms on the shaft exteriorly of the motor, the arms acting through thrust pins carried by a friction disk to bring pairs of friction surfaces successively into contact.

The invention will be more readily understood by reference to the accompanying drawings, wherein,

Fig. 1 is a longitudinal sectional view showing a governor of my invention applied to a motor casing, and

Fig. 2 is an end view thereof.

In the drawings it will be seen that the governing device is intended to be associated with a motor having a casing 10, provided with an end wall 11, and with an armature shaft 12. The governing action is secured in part by the cooperation of two friction disks 13, 14, the former rigidly fixed to the end wall 11, of the casing and the latter secured to the shaft 12 by means of a pin 15. On the overhung end of the shaft 12 is secured a sleeve 16, by means of a key 12^a, and a threaded adjusting nut 12^b, held in adjusted position by a set screw or bolt 12^c. Bell cranks which act as governor arms are pivoted to the sleeve by means of shafts 17 mounted in apertured ears 18. One arm 19 of the bell crank carries an adjustable weight 20, and the other arm 21 engages a thrust pin 22, which projects through the flange of the sleeve and is fixed in a metallic disk 23. The disk is in close proximity to a fibre block 24, secured to the end wall 11 of the motor. A tension spring 25 connects the arms 19 to the bell cranks and tends to neutralize the centrifugal force, tending to separate the governor weights 20. The action is as follows:

When the parts are installed the armature shaft is permitted to have such slight freedom of longitudinal movement as will permit the friction disks 13, 14, 23, 24, to separate. The separation need be very slight; of course, any separation even though it be only 1/100th of an inch is sufficient. When the armature starts its rotation the governor weights are urged outwardly by the centrifugal force and the disk 23 is caused to contact the block 24. The exertion of additional force by the governor will cause the armature shaft to move to the right as viewed in Fig. 1, this movement being sufficient to cause the friction disks 13, 14, to contact. Thus the speed of the motor may be controlled within narrow limits, all without change in the design of the motor and without the utilization of expensive or complicated parts. The device is particularly applicable for use on motors intended for intermittent operation. The provision of the two opposed friction-producing areas enables accurate control of speed without thrust on any motor bearings.

Obviously the construction is capable of some modification and I do not wish to be limited except as indicated in the appended claims.

I claim:

1. In a governing device for electric motors, the combination of an armature shaft mounted for limited longitudinal reciprocation, a casing, a friction disk rigid with said shaft and adapted to cooperate with a wall of said casing, and governor weights attached to and operated by said shaft whereby to effect such movement of the shaft as will cause the friction disk to move into contact with the casing.

2. In a governing device for electric motors, the combination of a housing having an end wall, an armature shaft mounted in said housing, a friction disk secured to the shaft and in close proximity to the end wall of the housing, governor arms and weights attached to and operated by the rotation of the shaft, and means operable by the governor arms for effecting longitudinal movement of the shaft whereby to

bring said friction disk into contact with an adjacent wall surface.

3. In a governor for electric motors, the combination of a housing having an end wall, an armature shaft mounted in the housing, a disk rigidly secured to the shaft at a point interiorly of the housing and in proximity to said end wall, governor arms secured to the shaft and adapted to be moved by centrifugal force, and means providing a fixed thrust surface against which the expansive force of said arms may be exerted, whereby to effect longitudinal movement of the shaft and to bring said disk into contact with the end wall of the housing.

4. In a governor for electric motors, the combination of a housing, an armature shaft mounted therein, a friction disk secured to the shaft and located interiorly of the housing in close proximity to the end wall thereof, governor arms secured to an overhung end of said shaft, means provided by said casing serving as an abutment against which the centrifugal force of the arms may be exerted, whereby the centrifugal force tends to effect bodily longitudinal movement of the shaft and governor arms to the extent of moving the friction disk into contact with the housing wall.

5. In a governor for electric motors, the combination of a fixed wall, an armature shaft, a friction disk rigid with the shaft, governor arms mounted on the shaft, and a fixed surface against which the centrifugal force of the governor may be exerted whereby to effect bodily longitudinal movement of the armature shaft, the governing device and the friction disk into contact with said wall.

6. In a governor for electric motors, the combination of an armature shaft, a casing, means providing pairs of friction surfaces on the interior and exterior respectively of an end wall of the casing, friction disks rotatable with said shaft, one of the disks being movable longitudinally of the shaft, and the other fixed relative thereto, and a governor acting to move said longitudinally movable disk into contact with a friction surface and then to move said shaft to bring said fixed disk into contact.

Signed at Chicago, Illinois, this 8th day of April, 1922.

HERBERT W. CRANE.