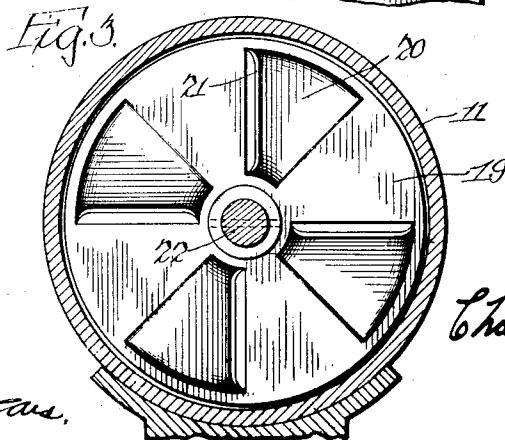
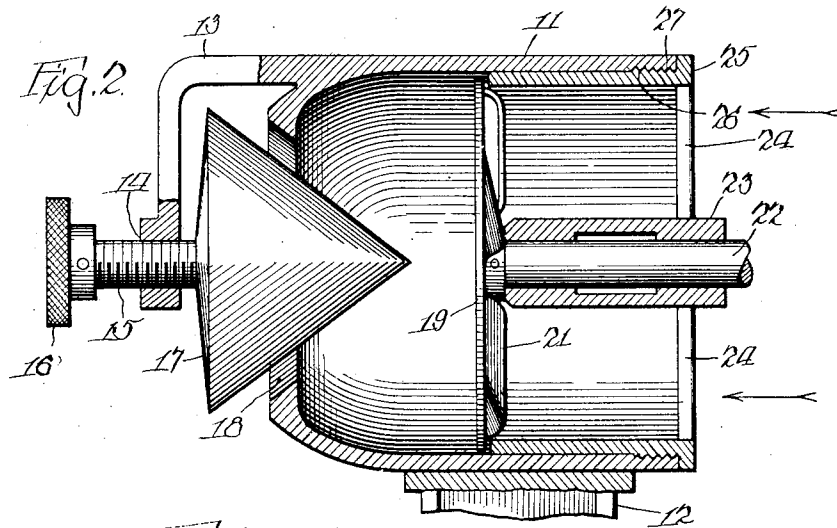
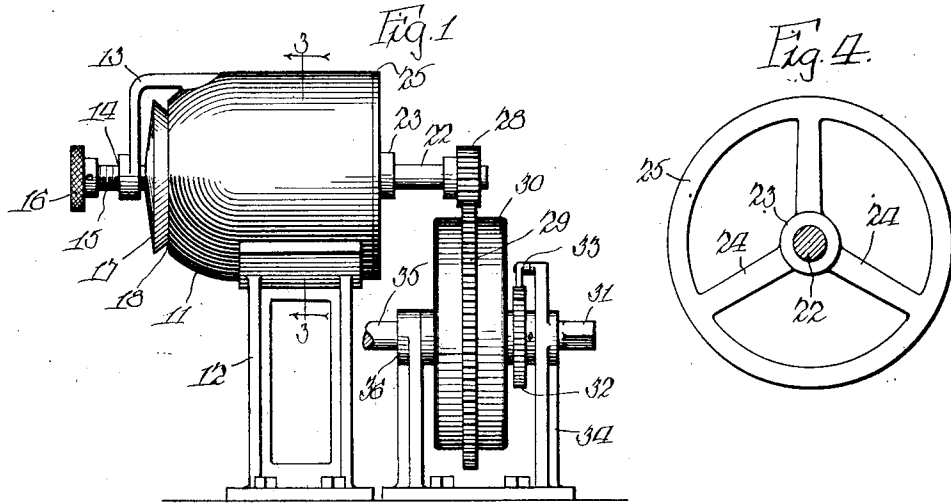


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GOVERNOR FOR MOTORS.
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GOVERNOR FOR MOTORS.

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To all whom it may concern:

Be it known that I, CHARLES H. GILL, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Governor for Motors, of which the following is a specification.

My invention relates to that class of motor governors wherein the speed of the motor is regulated to uniformity by mechanism adapted to offer resistance to the running of said motor, such resistance increasing in proportion as the motor's speed is increased and decreasing in proportion as the motor's speed is decreased. All present governors of this type, within my knowledge, employ some manner of friction brake in direct contact with a moving element to furnish the resistance required for governing the speed of the motor.

The objects of my invention are, first, to provide a governor wherein the regulating resistance is obtained through the pressure of air against a movable member; second, to obviate the defects incident to the wear of friction surfaces against each other; third, to provide means whereby the governor may be operatively connected to a motor; and, fourth, to provide means whereby the governor may be adjusted so as to permit of regulating the motor to run at any desired degree of speed within a wide range. I attain these objects by the mechanism illustrated in the accompanying drawing, in which—

Figure 1 is a side elevation showing my governor geared to a motor spring; Fig. 2 is a longitudinal cross section of my governor only; Fig. 3 is a cross section on the line 3—3 of Fig. 1; and Fig. 4 is a detail elevation of one end of the casing of my governor.

Referring to the drawing, a casing 11, of cylindrical form, is supported by a stand 12. An arm 13 forms a part of the casing 11 and has an internally threaded opening 14 through its lower end. A screw 15, having a milled head 16, coöperates with the internal threads in the opening 14 and is adapted to be screwed in or out through that opening. The end of the screw 15 opposite from the milled head 16 carries a conical stopper or gate member 17 capable of closing the beveled circular opening or air passage 18 in one end of the cylindrical casing 11 or of leaving it opened to varying degrees according to the distance the screw

15 is screwed inward or outward in respect to the opening 18.

In the preferred construction shown, a rotor 19, having a multiplicity of air openings 20 and an equal number of inclined blades 21, is adapted to be rotated with the shaft 22 to which it is fixed. The shaft 22 is journaled in a bearing 23 which is supported by the three spider arms 24 as shown in Fig. 4. The spider arms 24 form a part of an inner sleeve 25 which is provided with screw threads 26 adapted to co-operate with the internal threads 27 in the inner wall of the casing 11 and to be screwed into the end of the casing 11. The thickness of the walls of the sleeve 25 and the position of the fully open end of that sleeve are such that this thickness acts as a partial seal against the tendency of air to escape too freely between the rim of the rotor 19 and the inside of the casing 11. While one particular form of rotor or air compressor is here illustrated numerous other forms of fan or propeller could be used in its stead.

The foregoing fully describes my invention, but for the sake of making clear the application of the governor to a motor I have illustrated it as applied to a spring motor in Fig. 1 of the drawing. 28 designates a pinion fixed to the shaft 22 of the governor. This pinion meshes with the spur teeth 29 on the periphery of a motor spring casing 30 driven by a motor spring (not shown). This motor spring is adapted to be wound by a key or crank adapted to be fitted onto the squared end of the motor spring carrying shaft 31 provided with the usual retaining pawl 33 and ratchet wheel 32 to prevent rotation of the shaft 31 in a direction opposite to the winding direction. The motor spring and its associated winding mechanism is shown as supported by a suitable stand 34. A shaft 35 is journaled in a bearing 36 formed in the support or stand 34 and is fixed to the motor spring casing 30 to rotate with said casing. The opposite end of the shaft 35, illustrated as broken away, may be connected with whatever mechanism the spring motor is to actuate.

In operation, the speed of rotation of the spring casing 30, under the uncoiling impulse of the motor spring, is resisted by my governor through the operative connection provided by the spur gear teeth 29 and the pinion 28. The rotation of the pinion 28 causes the shaft 22 to which it is fixed to rotate, carrying with it in rotation the

rotor 19. This rotor 19 draws air into the cylindrical chamber formed by the casing 11 as indicated by the arrows in Fig. 2 of the drawing, and forces this intaken air into the space between the rotor 19 and the end of the casing 11 provided with the opening 18. The amount of air capable of escaping through the opening 18 will depend upon the position of the conical stopper or gate member 17 with respect to the opening 18. Whenever the rotor 19 is rotated at such speed that the amount of air drawn into the casing 11 is greater than the amount that can escape through the opening 18, as at that time adjusted, there will be a piling up or compression of the air in the outlet end of the cylinder and consequent resistance to the rotation of the rotor 19. This resistance will increase in proportion as the speed of the rotor is increased until a point is reached where the power of the motor is insufficient to overcome any more resistance and still maintain its attained speed. At that point the speed will remain constant because any increase in speed will produce corresponding increase in resistance and any decrease in speed will so decrease the resistance as to permit increase of speed without increase of power.

Now, if greater speed is desired than the constant speed attained, the milled head 16 of the screw 15 is turned so as to bring the conical stopper or gate member 17 farther out of the opening 18, thus increasing the size of the air outlet. More air can now escape in a given time and, consequently, the rotor 19 can attain greater rotary speed before the compression of air causes sufficient resistance to stop its further speed increase. It is obvious that further closing of the opening 18 will have the opposite effect—of reducing the speed of the rotor 18 and the motor driving said rotor.

While I have described a specific construction and embodiment of my invention, I do not wish to be limited to such construction since it is evident that very numerous and obvious changes might be made in construction without departing from the spirit of my invention.

Having described my invention, I claim:

1. In a governor for motors, the combination of a cylindrical air chamber, a rotatable shaft, a fan member carried by said shaft within said air chamber, an air compression space, air inlet openings, an air outlet gate of beveled circular form, a conical stopper member for said outlet gate, a threaded shaft carrying said stopper member, an internally threaded bearing for said threaded shaft, means for manually turning said threaded shaft and means for operatively connecting said governor to the motor it is to govern.

2. In a governor for motors, the combina-

tion of an air chamber, a rotor adapted to compress air in said chamber, means for operatively connecting said rotor with the motor to be governed, a circular outlet gate for air in said chamber, a stopper member for said outlet gate, a threaded shaft carrying said stopper member, an internally threaded bearing for said threaded shaft and means for manually turning said threaded shaft.

3. In a governor for motors, the combination of an air chamber, an end-thrust or propeller-type rotary fan member adapted to compress air in said chamber, means for operatively connecting said fan member with the motor to be governed, a circular outlet gate in said chamber, a stopper member for said outlet gate and means for manually controlling the extent of opening of said outlet gate.

4. In a governor for motors, the combination of an air chamber, an end-thrust or propeller-type rotary fan member adapted to compress air in said chamber, means for operatively connecting said fan member with the motor to be governed and manually operated means for regulating the escape of compressed air from said chamber.

5. In a governor for motors, the combination of an air chamber, a shaft geared to the motor to be governed and positively driven by said motor, an end-thrust or propeller-type fan member carried by said shaft and adapted to compress air in said chamber, the said fan member having its speed of rotation checked in proportion to the degree of compression of the air in said chamber through the braking effect of the air pressure upon the said fan member.

6. In a governor for motors, the combination of an air chamber, shaft rotatable in said chamber through gearing to the motor to be governed, a plurality of fan blades fixed upon said shaft at angles to their plane of rotation with said shaft and adapted to compress air in said chamber and to have their rotation with said shaft resisted by the air so compressed in proportion to the degree of such compression and manually operated means for regulating the escape of air from said chamber to control the degree of compression therein.

7. In a governor for motors, the combination of a cylindrical air chamber, air inlet openings in one end of said chamber, an air escape opening in the opposite end of said chamber, manually operated means for controlling the extent of the said air escape opening, a rotatable shaft partly within said chamber, gearing connecting said shaft with the motor to be governed and an end-thrust or propeller-type fan member carried by said shaft and rotatable therewith.

CHARLES H. GILL.