

M. L. SEVERY & G. B. SINCLAIR.
CENTRIFUGAL SWITCH.
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1,163,040.

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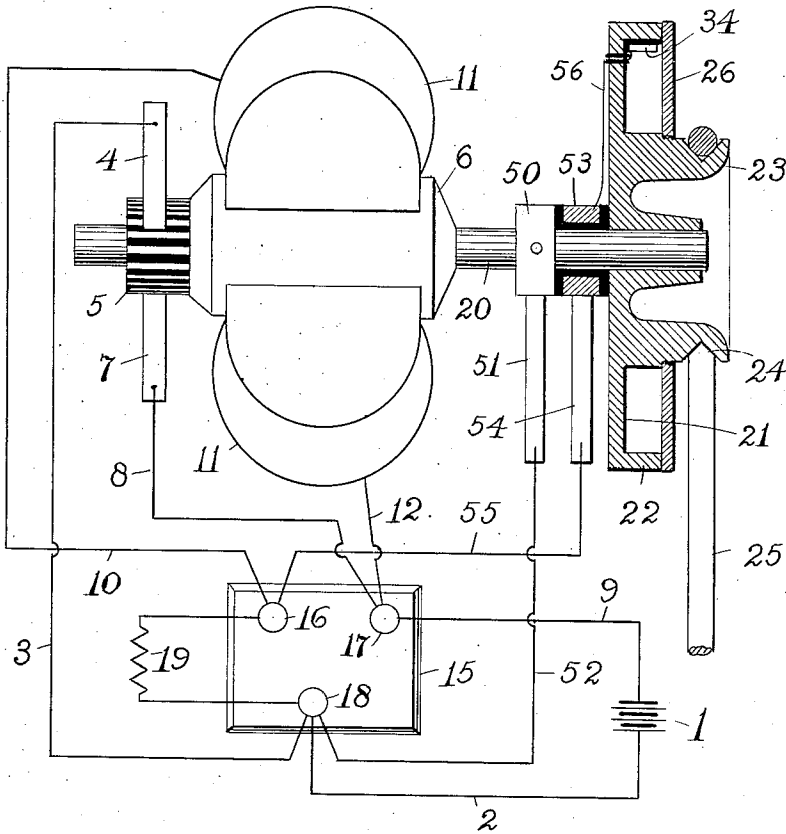


Fig. 1

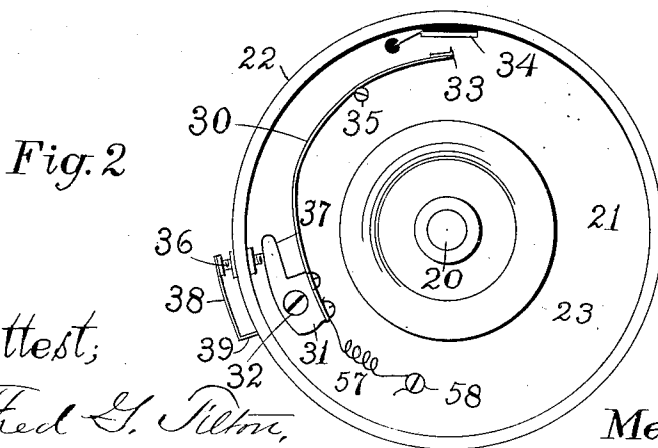


Fig. 2

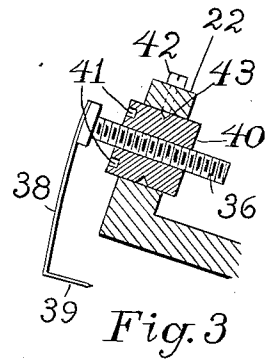


Fig. 3

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UNITED STATES PATENT OFFICE.

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CENTRIFUGAL SWITCH.

1,163,040.

Specification of Letters Patent.

Patented Dec. 7, 1915.

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To all whom it may concern:

Be it known that we, MELVIN L. SEVERY and GEORGE B. SINCLAIR, both citizens of the United States, and residing at Arlington Heights, in the county of Middlesex, and Winthrop, in the county of Suffolk, respectively, in the Commonwealth of Massachusetts, have invented certain new and useful Improvements in Centrifugal Switches, of which the following is a full, clear, and exact description.

The object of our invention is the construction of a simple, economical and efficient centrifugal switch adapted for use as a governor for controlling the speed of electric motors and the like; and our invention consists in the effecting of the improvements in details of construction hereinafter set forth.

Referring to the drawings forming part of this specification, Figure 1 is a plan view of an electric motor and governor embodying our improvements, a part thereof being in section. Fig. 2 is an elevation of the governor disk showing the centrifugal make-and-break mechanism. Fig. 3 is a detail sectional view on a larger scale of the tension-adjusting device for said mechanism.

The motor to which our governor is applied is preferably shunt-wound; the current being conducted thereto from a suitable source 1 by means of lead wires 2, 3 to the commutator brush 4; thence through the commutator 5 and armature-windings 6 to the brush 7; and thence through the wires 8, 9 back to said source.

For the field of the motor, the course of the current is through the wire 2, resistance 19, wire 10 to the field-windings 11; and thence through the wires 12 and 9 back to the source.

For convenience in illustration, the block 15 carrying the binding posts 16, 17 and 18 is shown at one side of the motor, instead of secured upon the same as is ordinarily done. The resistance 19 is introduced between the binding posts 16 and 18 and indicated by zig-zag lines in the conventional manner, although we prefer to employ a pencil of compressed graphite for the purpose.

Upon the shaft 20 of the motor is fixed a

fly-wheel or disk 21 having a flange 22; while its extended hub 23 is formed with a groove 24 for the reception of the round belt 25 by means of which the power produced by the motor is transmitted to any desired mechanism. The space between said flange, disk and hub is preferably inclosed by means of a removable annular cover 26, held in place either by friction or suitable screw threads as indicated. Within said space is located the governing device consisting of a leaf spring 30 held at one end by the disk and adapted to have its free end brought by centrifugal force into touch with a contact-plate 34 normally insulated therefrom. The means for securing said spring to the disk comprises the block 31 somewhat tightly pivoted to the disk 21 by a suitable pin or screw 32; while the free end thereof is provided with a contact point 33 preferably formed of silver. Said contact plate 34 is rigidly secured to the flange 22 but insulated therefrom. A screw or pin 35 supports the spring 30 when little or no centrifugal force is being exerted. An adjusting screw 36 abutting against the extension 37 of said block 31 enables said block to be turned sufficiently to vary the contripetal energy of the spring 30, and thereby adjust the governor for different speeds. A spring arm 38 having an inturned point 39 pressing against the surface of the flange 22, permits of the more accurate adjustment of said screw, and also its positive retention at the points to which it may be brought.

To enable the spring arm 38 to be of substantial length without reaching beyond the edges of the flange 22 at certain points of adjustment, the screw 36 fits in a thimble 40 located in said flange; said thimble being formed with holes 41 or other means for its turning, and a set screw 42 entering a groove 43 to fix it at any point to which it may be turned. Hence, when the screw 36 is being adjusted, its spring arm 38 overhangs the edge of the flange 22, then the thimble is turned enough to permit the said arm to remain in contact with the flange, the set screw 42 set up, and the final exact adjustment of the said arm continued.

Secured upon the shaft 20 is a ring 50 having a suitably supported brush 51 contacting therewith, from which brush a lead-

wire 52 runs to the binding post 18. Between this ring 50 and the disk 21 is fixed a second ring 53 insulated from all other parts; a brush 54 being provided for engagement with this ring, and joined by the wire 55 to the binding post 16. This ring 53 is connected by an insulated wire 56 to the plate 34 above described.

The ring 50 being fixed directly to the shaft 20, is in circuit with the disk 21 and hence with the spring arm 30; although to render the circuit more sure, a wire 57 is made to join said spring arm to a screw 58 set into the disk.

The operation of this governor is as follows: When the current is switched on, its full strength goes to the armature, but only a considerably weakened current passes to the field owing to the resistance 19 above described. Consequently the motor immediately attempts to attain a high speed, and soon brings the contact 33 into touch with the plate 34. This closes the circuit and shunts out the resistance 19; inasmuch as the current can now pass from the binding post 18 to the binding post 16 through the wire 52, brush 51, ring 50, shaft 20, disk 21, screw 58, wire 57, spring arm 30, plate 34, wire 56, ring 53, brush 54 and wire 55; instead of having to force its way through said resistance. Equal current being thus delivered to both armature and field, the motor slows down until the spring arm 30 moves out of contact with the plate 34, when the motor speeds up slightly and the circuit again closes, and so on; the resultant speed obtained from the motor being practically constant. In actual trial, the variations are incapable of detection.

What we claim as our invention and for which we desire Letters Patent is as follows, to wit:—

1. The combination of a member designed to be rotated at a predetermined speed, a contact carried by said member, a leaf spring rigidly held at one end by said member and adapted to be moved by centrifugal energy relative to said contact, and means inclosing said spring against atmospheric

interference tending to distort said spring's desired flexure.

2. The combination of a member designed to be rotated at a predetermined speed, a contact carried by said member, a leaf spring rigidly held at one end by said member and adapted to be moved by centrifugal energy relative to said contact, and means for surrounding said spring with an inclosed body of gas rotating therewith.

3. The combination of a rotating member, an insulated contact carried by said member, a block pivotally carried by said member, a screw for angularly adjusting said block, and a leaf spring rigidly held at one end by said block and adapted to be brought into touch with said contact when said member rotates with a predetermined speed.

4. The combination of a rotary disk having a peripheral flange, a leaf spring carried by said disk, an electric circuit, means whereby a predetermined speed of said disk causes said leaf spring to close said circuit, and an adjusting device projecting through said flange and externally operative for varying the tension on said leaf spring.

5. The combination of a rotary disk having a peripheral flange, a leaf spring, a block pivoted to said disk and supporting said spring, an extension from said block, a set screw engaging said extension, a thimble rotatively adjustable in said flange and threaded to receive said set screw, a spring arm rigid with said screw and having an inturned point engaging the surface of said flange, said flange being too narrow to retain its engagement with said point at all angles of said arm's adjustment, and means whereby a predetermined speed of said disk causes said leaf spring to close the circuit to said motor.

In testimony that we claim the foregoing invention, we have hereunto set our hands this 15th day of December, 1905.

MELVIN L. SEVERY.
GEORGE B. SINCLAIR.

Witnesses:

HELENA E. FLAGG,
FREDERIC W. PARKE.