

R. S. HARDIN AND E. W. WIEHLE.
CENTRIFUGAL SWITCH.
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1,419,626.

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Fig. 1.

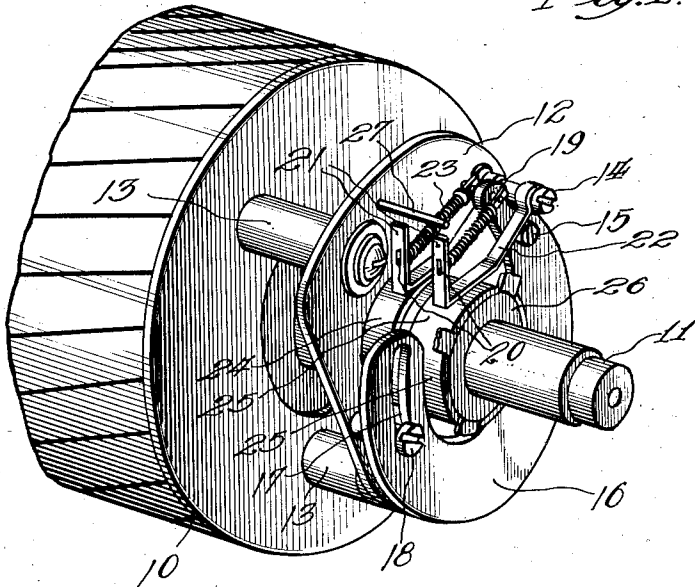
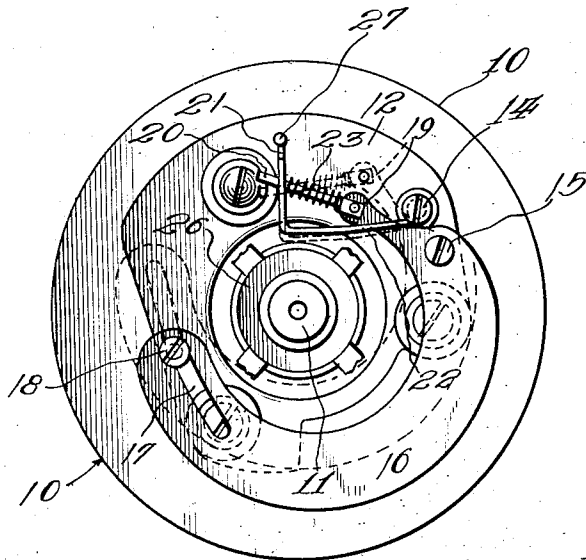


Fig. 2.



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UNITED STATES PATENT OFFICE.

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NOIS.

CENTRIFUGAL SWITCH.

1,419,626.

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To all whom it may concern:

Be it known that we, RAY S. HARDIN and EDWARD W. WIEHLE, citizens of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Centrifugal Switches, of which the following is a specification.

This invention relates to centrifugal switches and is particularly adapted to be used on the rotors of alternating current motors.

The primary object of this invention is to provide a switch which will open with a snap, thereby providing a quick break of electric current through the winding when a predetermined speed is reached.

Another object is to provide a switch having this quick break wherein the brushes have a rotary movement relative to the contact members.

These and other objects are accomplished by our invention, which is fully described in the following specification and shown in the accompanying drawings, in which Fig. 1 is a perspective view of the end of the rotor equipped with our centrifugal switch, and showing the same in closed position, and Fig. 2 is an end elevation of the same, showing the switch in open position.

The rotor 10 is mounted upon a shaft 11, which may be journaled in the motor frame, (not shown) in any well known manner. A support 12 is carried by the rotor and is secured to the rotor by means of posts 13, and has pivot pins 14 and 15 secured thereto. A centrifugal member 16 is pivotally mounted upon the pin 15, and has at its outer end a slotted opening 17 which is concentric with the pin 15 and through which a screw 18 is loosely inserted so as to limit the inward and outward throw of the centrifugal member 16.

The inner end of the centrifugal member is extended beyond the pivot pin 15 and carries a pin 19 on which is pivotally mounted one end of a guide rod 20. The opposite end of this guide rod is preferably flattened and passes through a slot in the bent up outer end 21 of the brush 22, which is pivotally mounted upon the pin 14. A spring 23 is placed under compression between the end 21 and the enlarged end of the rod 20.

A similar brush is similarly mounted upon the opposite side of the centrifugal member 16 and connected in like manner to the pin 19. These brushes bear upon contact members 24 and 25, which are insulated from each other and carried upon the insulating block 26, which is preferably carried by the motor frame (not shown) and journaled upon the shaft 11.

With the armature at rest, the parts will assume the position shown in Fig. 1 and in the dotted lines as shown in Fig. 2, with the brushes 22 held in engagement with the contact members 24 and 25. In this position it will be observed that the direction of the application of the springs 23 is such as to tend to hold the centrifugal member 16 retracted, as shown in the dotted lines in Fig. 2, and at the same time to hold the brushes 22 in engagement with the contact members.

As the motor is started and gains in speed, the centrifugal member 16 will be forced outwardly by centrifugal force until the line of application of the spring 23 will pass through the pivot pin 14 of the brush 22. As the member 16 continues to move outwardly, the pin 19 will move inwardly until a point is reached where the upward pressure upon the brushes 22 is sufficient to overcome the friction of these parts, and the brushes will move upward with a snap until they are stopped by the pin 27, as shown in full lines in Fig. 2.

It will be observed that in this position the line of action of the spring 23 is never permitted to pass through the pivot 15, so that the spring 23 always tends to force the centrifugal member 16 to the retracted position shown in the dotted lines in Fig. 2.

At the instant of starting, the brushes are in engagement with the contact members 24 and 25, and the current flows there-through to the starting windings (not shown), in a well known manner. As soon as a predetermined speed is reached, the brushes 22 are snapped out of engagement, as previously described, breaking the current which is flowing through the starting windings, and doing it so quickly that no arc of any consequence is able to follow these brushes.

The essence of this invention is the toggle joint which gives a quick break, thereby preventing arcing, and while the device is

shown in connection with a rotor of a motor it will be understood that it is not limited to this specific application, but that it may be used in other relations requiring a centrifugal switch.

While we have shown and described but a single embodiment of our invention, it is to be understood that it is capable of many modifications. Changes, therefore, in the construction and arrangement may be made without departing from the spirit and scope of the invention, as disclosed in the appended claims, in which it is our intention to claim all novelty inherent in our invention as broadly as possible in view of the prior art.

What we claim as new and desire to secure by Letters Patent is:

1. In a centrifugal switch for electric motors, a contact member, a support carried by the rotor, a centrifugal member movably carried by said support and movable outwardly by centrifugal force, a brush movably carried by said support, and a spring operably connecting said centrifugal member and brush and tending to force said centrifugal member inwardly under all conditions and operating to hold said brush in contact with said stationary member until a predetermined speed is reached and to force said brush out of contact with said stationary member at speeds greater than said predetermined speed.

2. In a centrifugal switch for electric motors, a contact member, a support carried by the rotor, a centrifugal member pivotally mounted on said support and movable outwardly by centrifugal force, a brush movably carried by said support, and a spring operably connecting said centrifugal member and brush and tending to force said centrifugal member inwardly under all conditions and operating to hold said brush in contact with said stationary member until a predetermined speed is reached, and to force said brush out of contact with said stationary member at speeds greater than said predetermined speed.

3. In a centrifugal switch for electric motors, a contact member, a support carried by the rotor, a centrifugal member pivotally mounted on said support and movable outwardly by centrifugal force, a brush pivotally mounted on said support, and a compression spring mounted between the brush

and inner end of the centrifugal member, so that as said inner end moves inwardly and the outer end moves outwardly under the action of centrifugal force, the line of action of said spring passes through the axis of the pivot point of said brush at a predetermined speed and the brush is snapped out of contact with said stationary member.

4. In a centrifugal switch for electric motors, a contact member, a support carried by the rotor, a centrifugal member pivotally mounted on said support and movable outwardly by centrifugal force, a brush pivotally mounted on said support, a compression spring mounted between the brush and inner end of the centrifugal member, so that as said inner end moves inwardly and the outer end moves outwardly under the action of centrifugal force, the line of action of said spring passes through the pivot point of said brush at a predetermined speed and the brush is quickly moved out of contact with said stationary member, and a stop preventing outward movement of the brush from bringing the line of application of said spring through the axis of the pivot point of said centrifugal member.

5. In a centrifugal switch for electric motors, a contact member, a support carried by the rotor, a centrifugal member pivotally mounted on said support and movable outwardly by centrifugal force, a brush carried by said support, and a toggle joint having a spring operable by said centrifugal member to move said brush out of contact with the contact member as the centrifugal member moves outwardly and to cause the brush to engage the contact member as the centrifugal member moves inwardly.

6. In a centrifugal switch, a contact member, a support carried by the rotor, a centrifugal member pivotally mounted on said support, a brush, and a spring mounted between the brush and the centrifugal member so that as the centrifugal member moves outwardly under centrifugal force, the line of action of said spring passes through the axis of the pivot point of said brush at a predetermined speed and the brush is snapped out of contact with said stationary member.

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