April 15, 1941. H. L. COLLINS 2,238,383

MOTOR SPEED ADJUSTING DEVICE

Filed Oct. 17, 1938

Fig. 1

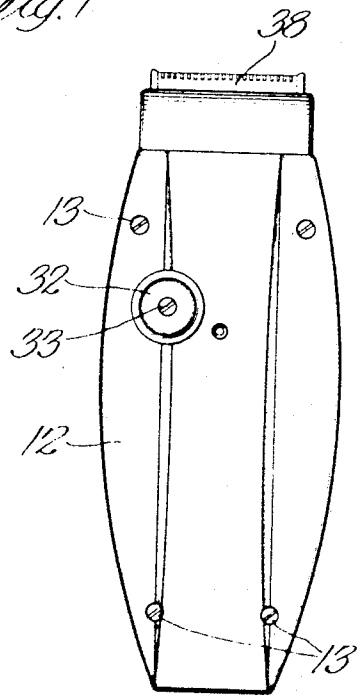


Fig. 2

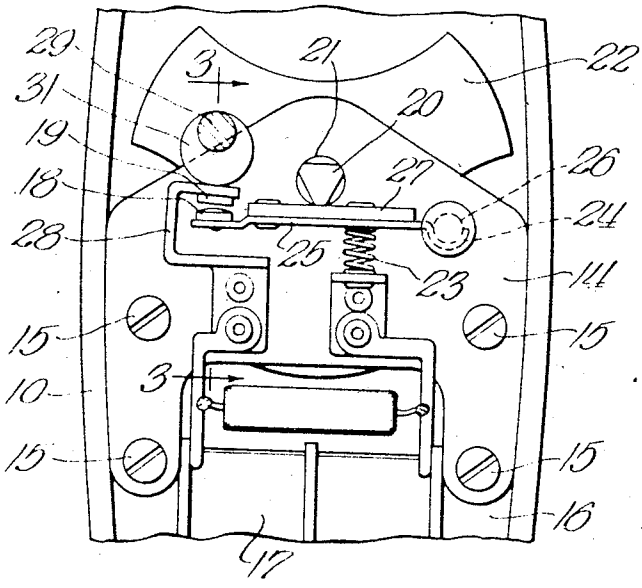


Fig. 3

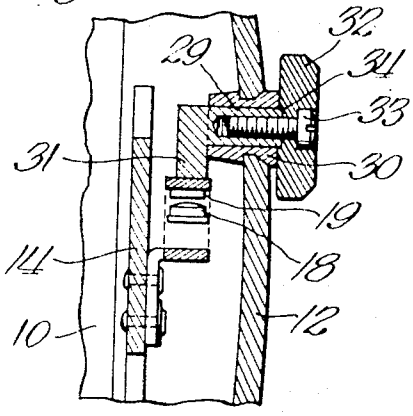


Fig. 11

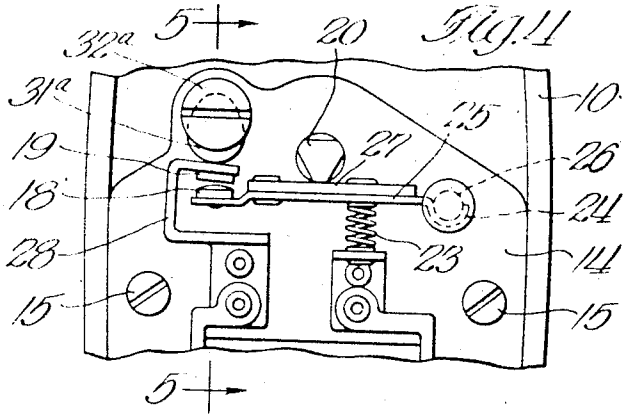


Fig. 5

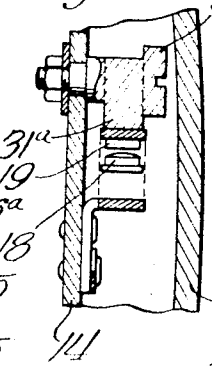


Fig. 7

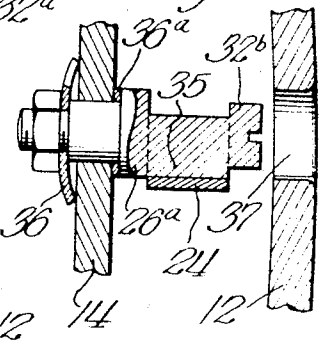
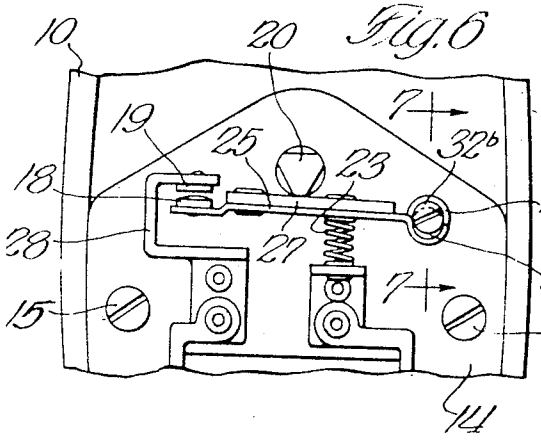


Fig. 6



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MOTOR SPEED ADJUSTING DEVICE

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Application October 17, 1938, Serial No. 235,469

3 Claims. (Cl. 200—30)

An object of my invention is to provide an adjusting device for changing the speed of a motor particularly of the contact breaker type commonly used for dry shavers and the like.

Another object is to provide means to change the speed of the motor which consists of mechanism to vary the position of one contact relative to the other so that the contacts are engaged a variable portion of the rotation of the motor shaft.

More particularly it is my object to provide in connection with a motor having a cam for moving one contact relative to another one and thereby intermittently breaking the circuit, a means to adjust the relative positions of the contacts so that they remain in circuit closing position during variable portions of the rotation of the cam.

Another object is to provide in connection with a motor having a stationary contact bracket and a movable contact, means to vary the position of the contact carried by the stationary bracket consisting of an eccentric or the like rotatable to different positions for bending the stationary contact bracket closer to or farther from the movable contact.

With these and other objects in view my invention with respect to its salient features which I believe to be novel and patentable will be pointed out in the appended claims. For a detailed understanding of the invention reference is made to the following description and to the accompanying drawing in which:

Figure 1 is a front elevation of a dry shaver with my contact adjusting mechanism applied thereto.

Figure 2 is an enlarged front elevation showing the cover plate of the dry shaver removed and an adjusting shaft of the adjusting mechanism shown in section.

Figure 3 is a sectional view on the line 3—3 of Figure 2 showing the adjusting mechanism supported by the shaver motor casing and coacting with the contacts of the motor.

Figure 4 is a view similar to Figure 2 showing a modified construction.

Figure 5 is a sectional view on the line 5—5 of Figure 4.

Figure 6 is a view similar to Figure 2 showing another modified construction; and

Figure 7 is an enlarged sectional view on the line 7—7 of Figure 6.

On the accompanying drawing I have used the reference numeral 10 to indicate generally a dry shaver motor housing and 12 a cover therefor. The cover 12 may be secured in position as by screws 13.

In the casing 12, a motor is provided including an end plate 14 secured by screws 15 to a field core 16 on which are mounted windings 17. The windings 17 are adapted to be energized by electric current controlled by contacts 18 and 19. The contacts in turn are controlled as to separation and engagement by a cam 20 on the shaft 21 of the motor. The armature of the motor is indicated at 22.

The contact 18 is biased to engage the contact 19 by a spring 23. The spring also serves to retain a hooked end 24 of a bar 25 against a headed pivot pin 26. A strip of insulation 27 is mounted on the bar 25 for engaging the cam 20.

The contact 18 is the movable contact while the contact 19 is a stationary contact carried by a bracket 28. The bracket 28 may be made of brass or the like whereby it has inherent resiliency tending to separate the contact 19 from the contact 18.

My adjusting mechanism consists of a stub shaft 29 journaled in a bearing sleeve 30. A cam 31 is mounted on or formed integral with the shaft 29 and engages the bracket 28. The bearing sleeve 30 is carried by the cover 12 and on the outer end of the shaft 28 a knob 32 is mounted. The knob 32 may be attached to the shaft 29 by a screw 33 and the outer end of the shaft may be angular to fit a similar shaped angular socket 34 in the knob 32 so that rotation of the knob will effect rotation of the shaft 29 and thereby the cam 31.

With the structure illustrated in Figures 1, 2 and 3 it is possible to vary the speed of the motor merely by rotating the cam 31 in one direction or the other. By rotating it so that the cam 31 bends the bracket 28 toward the contact 18, the contacts 18 and 19 are engaged for a greater portion of the rotation of the shaft 21 than when the bracket 28 is permitted to bend away from the contact 18. Thus in the first instance the motor is speeded up while in the latter instance it is slowed down and the speed of the motor is thereby adjustable within a wide range of limits.

In Figures 4 and 5 I show a modification in which a cam 31*a* has a slotted head 32*a* instead of a knob for rotating it. In this instance the cover plate 12 must be removed in order to adjust the cam. After the adjustment is once made, the friction of the bracket 28 against the cam retains the adjustment.

In Figures 6 and 7 I show another modifica-

tion in which the pivot pin for the contact bar 25 is adjusted instead of the stationary contact being adjusted. This is accomplished by providing a pivot pin 26a of modified construction when compared with the one shown in Figure 2. The modification consists of an eccentric portion 35 of the pin 26a being provided for the hook end 24 of the bar 25. A head 32b is provided for the pin 26a and the pin can be rotated relative to the bearing plate 14 of the dry shaver motor. To retain its adjustment, a spring washer 36 may be provided on the pin 26a. The cover 12 may be provided with an opening 37 through which a screw driver or the like can be thrust for coaction with the pivot pin head 32b.

By way of general illustration, a shaver head 38 is shown on the upper end of the casing in Figure 1. The various modifications in my invention are each movable to effect a change in the relative positions of the contacts so that their engagement in proportion to the rotation of the motor shaft are changed to greater or less degrees depending on whether more or less speed is desired from the motor. I have found that such an adjustment of speed is particularly desirable when using a shaver head on different beards or on different parts of the same beard. Some beards or parts thereof are cut better with high speed of the motor while others are cut better with lower speed of the motor.

In the operation of the device shown in Figure 6 it is obvious that any adjustment of the right hand or hook end 24 of the bar 25 downwardly will move the contact 18 closer to the contact 19. Thus in a somewhat reverse manner the relative positions of the contacts 18 and 19 are changed to secure the same results as with the structures shown in Figures 2 and 4.

In accordance with the provisions of the patent statutes I have described the principle of operation of my invention together with illustrations thereof which I consider to represent the best embodiments thereof. I desire that it be understood however, that the structure disclosed is only illustrative and that the invention may be carried out by other means and by the use of mechanical equivalents such as come within the scope of the appended claims.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. An adjustable contact structure for a contact breaker type of motor comprising a contact carrying arm, a hook-shaped portion at one end of said arm, a contact mounted on the other end thereof, a strip of insulation mounted on said arm intermediate said ends for engaging a motor cam, a rotatable mounting pivot, an eccentric portion on said pivot, said hook-shaped portion of said arm engaging said eccentric portion, a head on said pivot for retaining said hook-shaped portion in position longitudinally of said pivot, and a spring engaging said arm adjacent said pivot for retaining said hook-shaped portion of said arm in engagement with said eccentric portion of said pivot.

2. An adjustable contact structure for a contact breaker type of motor comprising a contact carrying arm, a hook-shaped portion at one end of said arm, a rotatable mounting pivot, an eccentric portion on said pivot, said hook-shaped portion of said arm engaging said eccentric portion, a head on said pivot for retaining said hook-shaped portion in position longitudinally of said pivot, and a spring engaging said arm adjacent said pivot for retaining said hook-shaped portion of said arm in engagement with said eccentric portion of said pivot.

3. Means for mounting the moving contact of a contact breaker type of motor comprising a contact carrying arm, a notched portion at one end of said arm, a rotatable mounting pivot, and an eccentric portion on said pivot pin, said notched portion on said arm engaging said eccentric portion.

HARRY L. COLLINS.