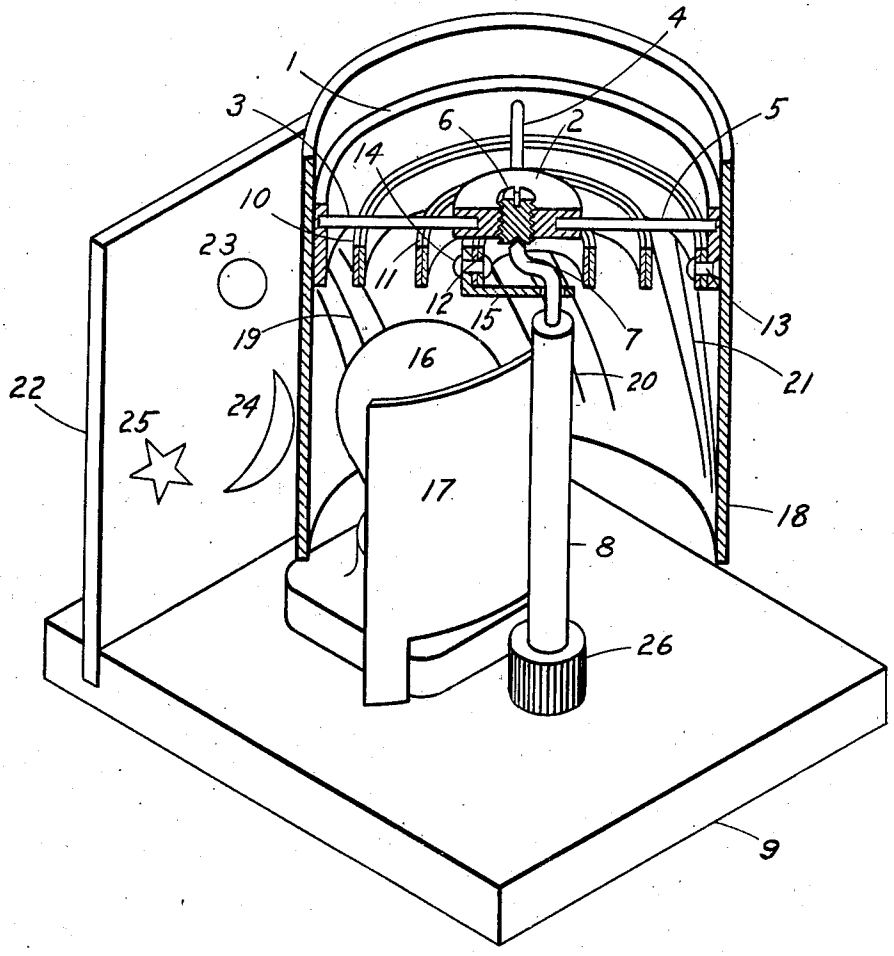
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ROTARY HEAT MOTOR

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INVENTOR

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ROTARY HEAT MOTOR

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1 Claim. (Cl. 60—23)

The principal object of my invention is to provide a simple and inexpensive slow speed motor for the operation of animated signs directly from the heat of the lamp used in lighting the sign.

Additional and important applications being the operation of displays, timers, switches, toys, water circulators and all other small power applications where it is desired to obtain slow speed motion from a heat source.

Another object of my invention is to provide a dependable power source by eliminating such trouble producing parts as windings, high speed bearings and gears, and at the same time produce a silent motor whose torque increases as the motor is slowed down by any form of overload.

A further object of my invention is to produce a heat motor whose commutation, or timing, is accomplished by carrying the propelling element through the heating zone by mounting it on a single rotating member which revolves through two different temperature zones.

A simple embodiment of my invention uses a strip of thermostatic bimetal spirally coiled within a pivoted ring, the outer end of the bimetal being attached to the ring and the inner end by a bearing to the offset throw of a crank shaft, on the central end of which shaft the ring rotates. A light bulb supplies heat to one side of the bimetal coil causing it to distort throwing tension on the crank at right angles to the heat source, resulting in rotation of the ring and bimetal spiral which carries other sections of the bimetal into the heated zone with recurring action and consequent continuous rotation.

The operation of my motor will be more clearly understood by referring to the accompanying drawing, in which 1 is a pivoted frame ring in section, 2 a pivot hub member, shown in section, joined by the spokes 3, 4, and 5 to ring 1, and carrying hardened cup point set screw 6 to act as a pivot bearing.

7 is a crank shaft whose central throw is pointed to carry bearing 6, and is supported by post 8 which in turn is manually rotatable in base 9. 10, 11, and 12 are consecutive coils of a thin bimetal spiral, shown in section, which is fastened to frame ring 1 by rivet 13, and by rivet 14 to a crank bearing 15. 16 is a source of heat and light, 17 is a combination reflector and heat baffle.

18 is a transparent cylinder, shown in section, on which 19, 20, and 21 are irregular light varying and intercepting streaks.

22 is a screen on which are translucent designs 23, 24, and 25 so placed as to be in the path of light passing through cylinder 18. 26 is a knurled sleeve for rotating the crank 7 and post 8 in base 9 to control the motor speed and direction.

From the foregoing it will be observed that the reflector baffle 17 divides the space within the cylinder 18 into two zones, one of which is occupied by the lamp 16, which when lighted causes a draft of hot air to rise through the section of bimetal spiral 10, 11, and 12 directly over it.

It will also be obvious that this rising hot air will induce a draft of cool air through the opposite side of the same bimetal spiral 10, 11, and 12, by the well-known suction action of warm air currents in chimneys.

Now it is well known in the art that if a bimetal spiral be uniformly heated or cooled, it will tend to wind or unwind concentrically because of the uniform bending action of all the bimetal, but if one side of the spiral be heated more than the other, the bending tendency will be greatest in the section of greatest temperature change, which will result in the spiral becoming eccentric.

Since the bimetal spiral 10, 11, and 12 is secured to ring 1 by rivet 13, the only way it can become eccentric is by moving the central turn of bimetal at 12, and since 12 is attached to crank 7 by crank bearing 15 it will be obvious that pressure will be exerted on crank 7 at approximate right angles to the heated section of bimetal 10, 11, and 12, which is above lamp 16.

Since this pressure is out of line with the axis of rotation of ring 1, which is free to rotate on the central point of crank shaft 7 at cup bearing 6, the entire motor and cylinder assembly will revolve, carrying the already heated bimetal section away from lamp 16 and into the cool draft rising on the opposite side of heat baffle 17.

In this way a continually recurring distortion of the bimetal at right angles to the heating zone will hold pressure on crank 7 producing continuous rotation of the motor.

It will also be observed that by rotating post 8 by knurled sleeve 26, the position of motor bearing 6 with respect to crank 7 and heat source 16 can be adjusted to any relation, thereby causing the bimetal distortion which is always at approximate right angles to the heating zone, to produce rotation in either direction, or by adjusting it to a neutral position, motor may be stopped. By adjusting the crank to various angles between the neutral and maximum torque

positions, various speeds may be secured in either direction.

Because the light from source 16 which falls on the decorations 23, 24 and 25 is intercepted and varied by the revolving streaks 19, 20, and 21, as they rotate with cylinder 18 at speeds and direction selectable by turning sleeve 26, a variety of animated effects are available on screen 22.

Having described a simple form of my invention, it will be apparent that the rotary principle of self-commutation may be applied with any form of heat responsive distorting member by revolving it through zones of different temperature.

What I claim is:

In combination a source of heat and a bimetal spiral rotatably mounted adjacent to said heat source, a stationary crank associated with said bimetal whereby its bending action will be transferred into torque when different sections of said bimetal are carried to and from said heat source.

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