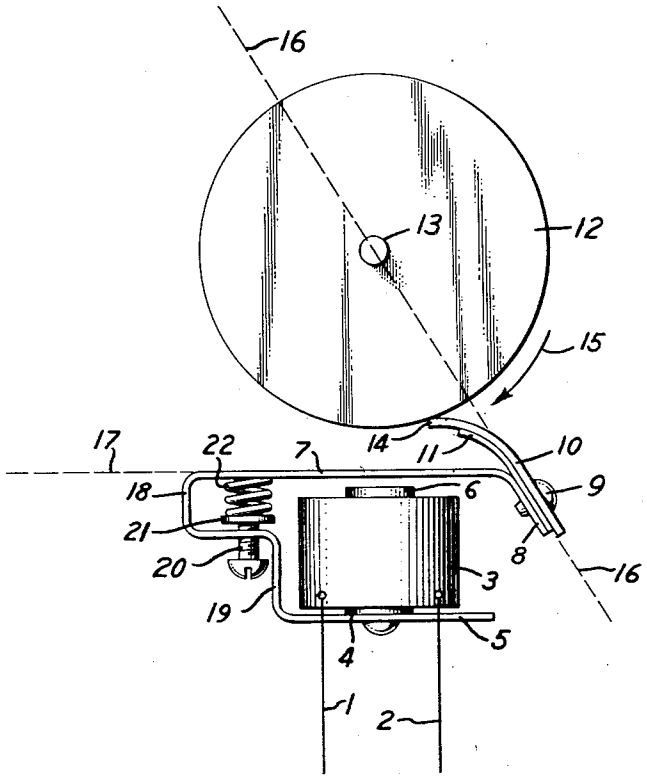
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IMPULSE MOTOR

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INVENTOR

Harry Fuchs

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IMPULSE MOTOR

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3 Claims. (Cl. 310—21)

My invention relates to a new and improved impulse motor, operable by pulses of electric current, and adapted to provide rotary motion.

One object of my invention is to provide a new and improved impulse motor in which the actuating armature is tensioned away from the electroresponsive power unit by a resilient element and tensioned toward the said electroresponsive power unit by a substantially continuously arched actuating element adapted to cause rotation of a rotatable element.

Other objects of my invention will be set forth within the scope of the following description and drawing which illustrate one embodiment of my invention as an example, it being understood that many other embodiments are included in my invention as fall within the scope of the appended claims and within the doctrine of equivalents.

In the drawing, which is schematic for purpose of clearness 1 and 2 indicate lines from a source of electric current such as pulsating direct current or alternating current. The electroresponsive device as for example the electromagnetic coil 3, is connected to lines 1 and 2, and has a core one end of which is indicated by 4 secured to the bracket 5 and the other end thereof indicated by 6 being adapted to actuate and reciprocate the vibratable element or armature 7.

The vibratable element 7 has an offset 8 to which is secured, by means of the screw or rivet 9, an actuating element 10 which may be of leather, rubber or other suitable material which is deformable out of plane into an arch, or other type of bend.

A leaf spring 11, the use of which is optional, tensions the actuating element 10 against the surface or periphery of the rotatable element 12 secured to the shaft 13, and it will be observed that when electromagnet 3 reciprocates the vibratable element 7 in an up and down direction, the end 14 of the substantially continuously arched or bent actuating element 10 will push the periphery of the rotatable element 12 in a leftward direction, the said endwise pushing action of the end 14 being transverse to the direction of movement of the vibratable element 7, and the rotatable element will thus be actuated to rotate in a rightward direction as indicated by the arrow 15. It will be noted that the actuating element 10 is continuously substantially arched or bent and under tension while arched or bent, and that the arch or bend does not straighten out during the actuation of the vibratable element or armature 7. The leaf spring 11 may be omitted when the actuating element 10 is of laterally resilient material which does not become fatigued during continued use, one example of such material being rubber.

The offset 8 is positioned at an angle substantially in line with the axis 13 of the rotatable element 12, said line being indicated by the dotted line 16; and this dotted line 16 forms an acute angle with the dotted line 17 extending from the vibratable element 7, the end 14 extending from the apex of the said acute angle and being positioned within the said acute angle.

The bracket 5, upon which the electromagnet 3 is mounted, is one leg of the U-shaped bracket structure 18, the other leg being the vibratable armature 7. To shorten the magnetic circuit of the electromagnet 3, and also to provide compactness, the bracket structure 5 has an angular bend as indicated by 19.

The adjustable screw 20 passes through a threaded portion in one leg of the U-shaped structure 18, and has affixed at its end a washer 21 adapted to support one end of the resilient element such for instance as the spring 22, and the other end of spring 22 being adapted to exert pressure or tension against the vibratable armature 7. Spring 22 cushions the impact of armature 7.

It will be noted that the actuating element 10 is arched or bent toward the armature 7 with the end 14 exerting pressure against the rotatable element 12; and that while spring 22 exerts pressure on the armature 7 in a direction away from the electromagnet 3, the pressure of actuating element 10 against rotatable element 12 exerts pressure on the armature 7 in a direction toward the electromagnet 3. This novel construction and interrelation of parts produces the new and useful and very desirable result of smooth operation with a minimum of noise upon the reciprocation of armature 7 by the electromagnet 3.

It will be further noted that when electromagnet 3 attracts armature 7 the spring 22 cushions the impact of the armature 7, and when electromagnet 3 releases armature 7 the end 14 pushes the rotatable element 12 leftwardly a small distance; hence the cushioning and pulsing actions operate successively with respect to one another.

The screw 20 is turned and adjusted until resilient element 22 exerts the correct amount of pressure against armature 7 so that armature 7 will not hit the core end 6 when the electromagnet 3 vibrates the armature 7.

It will be understood that various modifications may be made in the construction and arrangement of parts without departing from the spirit of the invention as claimed and within the doctrine of equivalents.

I claim:

1. In an electro-mechanical device, a bracket structure having two legs and a section joining the two legs, an electroresponsive device secured to one leg adapted to vibrate the other leg, a resilient element positioned at the section joining the two legs and adapted to cushion the impact of said other leg upon its vibration by the electroresponsive device, and adjustable means associated with the resilient element adapted to vary the tension thereof.

2. An electro-mechanical device comprising a rotatable element, a U-shaped bracket structure having two legs and a section joining the two legs, an electroresponsive device secured to one leg adapted to vibrate the other leg, an actuating element secured to said other leg adapted to intermittently engage the rotatable element in response to the actuation of said other leg by the electroresponsive device, and a resilient element positioned at the section joining the two legs adapted to cushion the impact of the said other leg.

3. An electro-mechanical device comprising a rotatable element, a U-shaped bracket structure having two legs and a section joining the two legs, an electroresponsive device secured to one leg adapted to actuate the other leg, an actuating element secured to said other leg adapted to intermittently engage the rotatable element in response to the actuation of said other leg by the electroresponsive device, a resilient element positioned at the section joining the two legs adapted to cushion the impact of the said other leg, and means for varying the tension of the resilient element.

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