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B. B. GRACE

2,543,014

ELECTRIC CONTACT-CONTROLLING DEVICE

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Fig. 1.

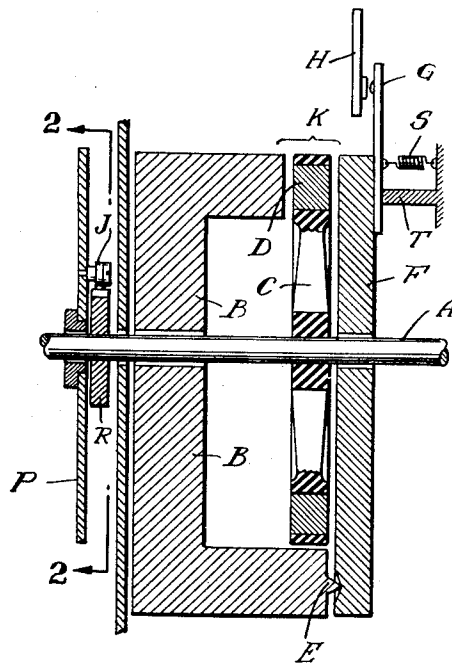


Fig. 2.

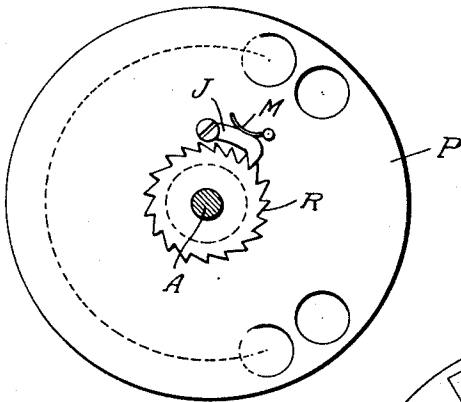
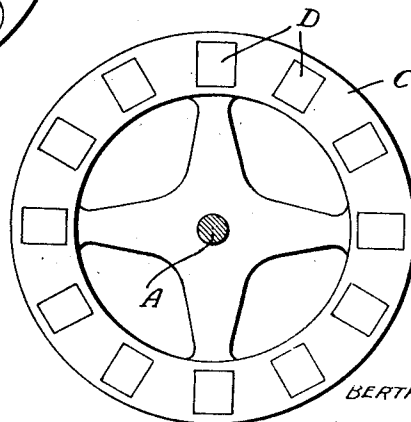


Fig. 3.



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ELECTRIC CONTACT-CONTROLLING DEVICE

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1 Claim. (Cl. 200—87)

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This invention relates to electrical contact-operating devices and more particularly though not exclusively to devices for the operation of the impulsing contacts of dial mechanisms such as are used at subscriber's stations in automatic telephone systems.

In accordance with this invention the contacts are operated by the variation of the magnetic linkage between a magnet of constant strength, and an armature operatively connected with a moving contact of a set.

In accordance with a further feature of the invention the linkage is varied by the movement of a piece of magnetic material in relation to an air gap between the magnet and armature.

In order that the invention may be clearly understood, a description will be given of one of its embodiments, reference being made for this purpose to the accompanying drawing in which:

Fig. 1 is a sectional elevational view of a magnetic contact-operating device for use in a telephone subscriber's dial mechanism;

Fig. 2 is a rear view of the dial and ratchet mechanism taken on the line 2—2 of Fig. 1 and

Fig. 3 is a front view of the spider shown in Fig. 1.

In the device shown in the drawing a permanent magnet B, or a combination of a permanent magnet and soft-iron pole pieces, is of U-shape with one leg rather longer than the other; on the longer leg is formed a knife-edge pivot E upon which the armature F is pivoted with its free extremity overlying the pole-face of the shorter leg. Passing through the base or cross-piece of the magnet B, in a position nearer the shorter leg than the longer, is a spindle A which is rotatable upon operation by the subscriber, as by his manipulating the usual dial. Fixed on the spindle A is a spider C which is of non-magnetic material but which carries one or more pole-pieces D on its rim. These pole-pieces, as the spindle is rotated, pass through the air gap K between the magnet B and armature F, the armature F being normally urged away from the magnet as by means of a spring. As these pole-pieces D pass into and out of the air gap, they cause variations in the magnetic linkage between the magnet and armature, causing the armature F to be attracted as a pole-piece enters the air gap and released as it passes out.

The armature F carries at its free extremity an arm upon which is mounted a contact G co-operating with the contact H; when the armature is attracted these contacts G and H make, and when the armature is released they break.

As applied to a dial mechanism, the spindle A may have a one-way connection with the dial finger-plate.

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The frequency and duration of the contacting is determined by the number and angular size of the pole-pieces D, and by the speed of rotation of the wheel C.

It will be understood that the invention may take other forms; for example, the pole-pieces D may be arranged so that they short-circuit the magnetic flux through the armature. Again the armature may be arranged to be repelled by the magnet rather than attracted, and an electromagnet may be used instead of a permanent magnet. The invention may be applied to other electrical contact operating devices than dialling mechanism.

What is claimed is:

An electric contact operating device comprising a magnet of substantially U-shape having one leg of said U-shape longer than the other, said longer leg being formed with a knife-edge pivot thereon, an armature operatively positioned for cooperation with said magnet having one extremity pivotally mounted on said pivot edge, the other extremity of said armature being in overlying relation to the shorter leg of said magnet and defining an air-gap between said armature and magnet, switch means actuated by said armature, means to normally bias said armature away from said magnet, and a piece of magnetic material mounted for movement into and out of the air-gap between said magnet and said armature, said material being operative to cause variations in the magnetic linkage between said magnet and said armature thereby overcoming the bias on said armature and causing actuation of said switch means.

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