J. A. WOTTON.

CONTACT DEVICE.

APPLICATION FILED DEC. 16, 1920.

1,400,126. Patented Dec. 13, 1921.

Fig. 1

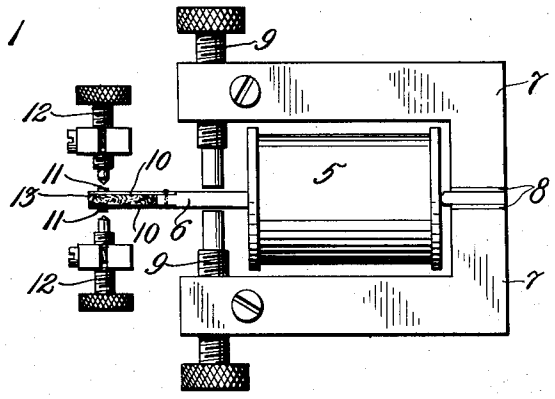


Fig. 2

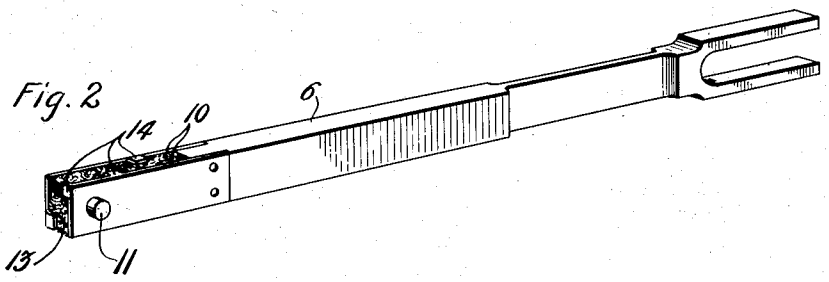


Fig. 3

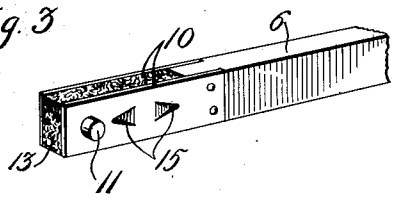
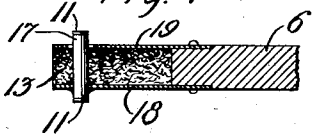


Fig. 4



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UNITED STATES PATENT OFFICE.

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CONTACT DEVICE.

1,400,126. Specification of Letters Patent. Patented Dec. 13, 1921.

Application filed December 16, 1920. Serial No. 431,179.

To all whom it may concern:

Be it known that I, JAMES A. WOTTON, a citizen of the United States, residing at Montclair, in the county of Essex, State of New Jersey, have invented certain new and useful Improvements in Contact Devices, of which the following is a full, clear, concise, and exact description.

This invention relates in general to contact devices and more particularly to such a device adapted for use in high speed relays in which the spacing between contacts is very small.

In high speed relays, such for example as those used in telegraph circuits, the spacing between the contacts is necessarily very small and trouble results therefrom due to the appreciable change in the spacing as a result of the pitting of the contacts. This pitting of the contacts is very much aggravated by mechanical rebounding or chattering, which results in arcing at the contacts. Not only does this chattering decrease the life of the contacts themselves, but results in poor operation of the apparatus and serves as a limit to the speed and sensitivity at which the apparatus may work.

It is an object of the present invention to provide a contact device in which chattering and the consequent arcing is practically eliminated and in which these advantages are obtained without causing any sacrifice in the sensitivity of the apparatus.

It is a further object of the invention to provide such a device which will be compact, cheap to manufacture, and require low maintenance when in service.

To accomplish these objects and in accordance with a feature of the invention, there is provided a contact device in which the contact button is so mounted that there is practically no tendency for mechanical rebound. In accordance with another feature of the invention the arrangement of the device is such that its mechanical dimensions are not altered materially by changes due to excessive humidity.

These and other features of the invention will be more clearly understood by reference to the accompanying drawing in which Figure 1 is a plan view of a relay employing a contact device embodying the features of this invention; Fig. 2 is an enlarged view in perspective of the contact device disclosed in Fig. 1; Fig. 3 is a view showing a slightly modified structure of the form shown in Fig. 2; and Fig. 4 is a modified structure in which both contact buttons are rigidly connected together.

Referring now to the drawing, there are shown in Fig. 1 certain essential parts of a polarized relay of the type disclosed in a pending application to William O. Beck, Serial No. 233,931, filed May 11, 1918. This relay includes an operating coil 5, through which extends an armature 6, clamped at one end between the magnetic members 7, 7, but separated therefrom by means of non-magnetic shims 8, 8. Adjustable pole pieces 9, 9 are provided, as shown, to complete the magnetic circuit. The armature 6 is provided at its free end with flexible spring members 10, 10, which are held in place securely by riveting or similar means. Contact buttons 11, 11 are provided on the spring members so arranged as to be in alinement with the adjustable contact screws 12, 12. A cushion 13 is held in place between the flexible springs 10, 10 and in intimate contact therewith. This cushion is made of a material having a modulus of elasticity differing widely from that of the flexible spring members, and must be practically non-hydroscopic. Rabbit's fur felt has been found to be very satisfactory for this use since such material does not absorb moisture as does a textile felt and its elastic properties are especially suitable for the use at hand.

In the structure shown in Fig. 2, which is the preferred type, the spring members 10, 10 are provided with tabs or right-angled extensions 14, 14, which serve to hold the felt 13 in place. The springs 10 are slightly tensioned against the surface of the felt so as to be in intimate contact therewith.

In the structure shown in Fig. 3, tongue members 15, 15 are forced into the felt 13 to serve in holding the felt in place.

Since in high speed telegraph relays the air gap between the contacts is very small, being of the order of 3/1000 of an inch, it is essential that the contact buttons 11, 11 remain a constant distance apart. This may be accomplished by employing material which is practically non-hydroscopic, such as rubber or fur felt but rubber, is unsatisfactory since its modulus of elasticity changes with age. In the structure shown

in Fig. 4 the contact buttons 11, 11 are secured to a stem 17, which in turn is secured to a spring member 18. The spring member 19 is provided with a perforation through which the stem member 17 extends. With this structure any change in dimensions of the material 13 due to the absorption of moisture would not affect the spacing of the air gaps.

The contact device of the type disclosed, has been found to afford decided advantages over the type of contact devices formerly employed. Its use has increased the life of the contacts more than six fold, thus making a very considerable saving in the maintenance cost of the apparatus in which it is employed. Furthermore, by reducing the pitting of the contacts, it allows the apparatus to function more satisfactorily with decreased air gaps, thus resulting in higher sensitivity and greater speed of operation.

What is claimed is:

1. A contact device comprising a vibrating member, a plurality of resilient members secured to the free end thereof, a contact button rigidly secured to one of the resilient members, and a body of elastic material secured between and in intimate contact with said resilient members.

2. A contact device comprising a comparatively stiff vibrating member, a plurality of resilient members secured to the free end thereof, a contact button rigidly secured to each of the resilient members, and a body of non-hydroscopic elastic material secured between and in intimate contact with said resilient members.

3. A contact device comprising a comparatively stiff vibrating member, a plurality of resilient members secured to the free end thereof, a contact button rigidly secured to each of the resilient members, and a body of fur felt secured between and in contact with said resilient members.

4. A contact device comprising a comparatively stiff vibrating member, a plurality of resilient spring members secured to the free end thereof, contact members secured to the spring members, and a body of felt located between the spring members and held in place by right-angled projections on the spring members.

5. A contact device comprising a comparatively stiff vibrating member, a plurality of resilient spring members secured to the free end thereof, contact members secured to the spring members, and a body of elastic non-hydroscopic material against which said spring members are tensioned.

6. A contact device comprising a vibrating member, a plurality of resilient members secured to the free end thereof, a contact button rigidly secured to one of the resilient members, and damping means secured between and frictionally engaging said resilient members.

In witness whereof, I hereunto subscribe my name this 15th day of December, A. D., 1920.

JAMES A. WOTTON.