S. F. BRIGGS.

VIBRATOR CONTACT.

APPLICATION FILED OCT. 12, 1914.

1,223,143.

Patented Apr. 17, 1917.

FIG. 1.

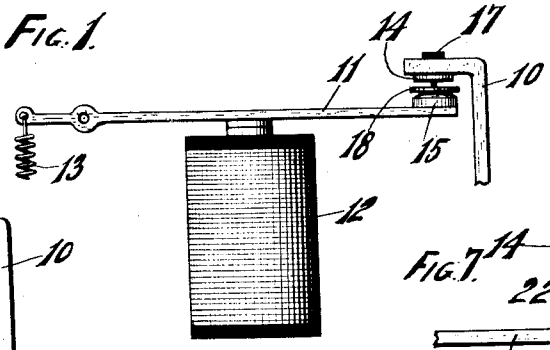


FIG. 6.

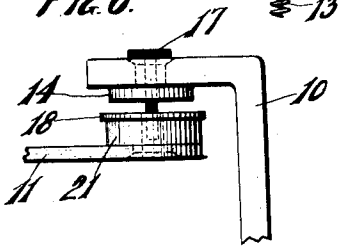


FIG. 7.

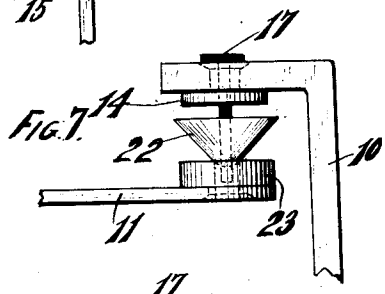


FIG. 2.

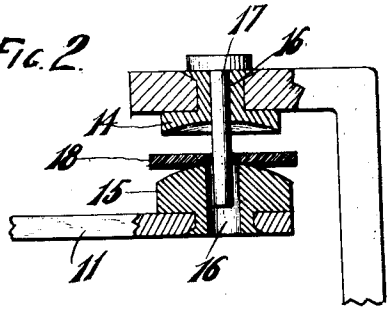


FIG. 3.

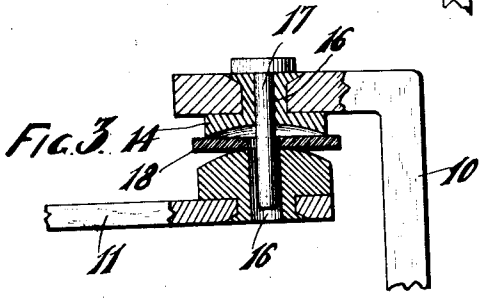


FIG. 4.

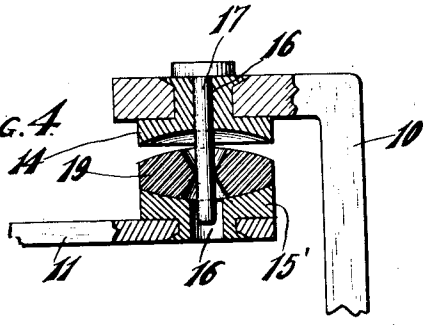
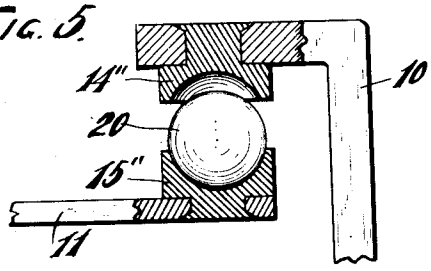


FIG. 5.



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VIBRATOR-CONTACT.

1,223,143. Specification of Letters Patent. **Patented Apr. 17, 1917.**

Application filed October 12, 1914. Serial No. 866,232.

To all whom it may concern:

Be it known that I, STEPHEN F. BRIGGS, a citizen of the United States, and resident of Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented new and useful Improvements in Vibrator-Contacts, of which the following is a description, reference being had to the accompanying drawings, which are a part of this specification.

This invention has for its object to provide contact points for makes and breaks of electrical instruments such as Terrel regulators, master vibrators, magneto contacts, vibrating rectifiers, relays and the like, which will be free from the usual pitting that necessitates frequent attention in order to keep the instrument in an operative condition. Contact points as usually constructed are known to pit and stick by reason of the arcing that takes place on the break of the circuit and thus render the instrument inoperative. The effect of the arcing is to cause metal from one contact point to become deposited on the other contact point and to build up thereon in the form of a cone until the air gap between the contact points is bridged and the make and break thus rendered ineffective.

It has been customary to make the contact points of platinum which is less liable to pitting than other metals, but the cost of platinum is so great as to materially increase the cost of manufacture of the instrument and in many cases its use is prohibited by its cost. Even with the use of platinum contact points there is a certain amount of pitting which necessitates a certain amount of care, requiring the contact points to be rubbed down to a smooth surface, in some instances as frequently as once a day.

It is the object of this invention to avoid the pitting of contact points by avoiding constant repetition of arcing at the same point through the provision of a loose contact member between the contact points proper, free to turn by the action of the contact points thereon to change the point of arcing and distribute it over a broad surface during a succession of operations, thus preventing the detrimental effects of the arcing becoming localized.

With the above and other objects in view the invention consists in the vibrator contacts as herein claimed and all equivalents.

Referring to the accompanying drawings in which like characters of reference indicate the same parts in the different views:

Figure 1 is a side view of an instrument provided with contact points constructed in accordance with this invention, a magnet and retracting spring being shown associated therewith;

Fig. 2 is an enlarged detail sectional view of the preferred form of contact points in their open position;

Fig. 3 is a similar view thereof in their closed position;

Fig. 4 is a similar view of a modified form of the invention; and,

Fig. 5 is a similar view of a further modification.

Figs. 6 and 7 are views of other modifications.

In these drawings 10 indicates a stationary contact support and 11 is a movably mounted contact support preferably constituting the armature of a magnet 12 and being retracted from the magnet by a spring 13 when the magnet is deënergized. Contact points 14 and 15 are secured to the stationary contact support 10 and the movable contact support 11 in any approved manner, as by having shanks pass through openings in the contact supports and upset or riveted thereto. These contact points may be of silver or tungsten, or carbon or graphite, or other of the lesser expensive metals suitable for the purpose, and are preferably provided with central openings 16 therethrough with a headed pin 17 of fiber or other insulating material tightly fitting within the opening of the upper contact and freely fitting within the opening of the lower contact. The lower contact which in this instance is the movable contact, though it may be the stationary contact, preferably has a rounded or convexed upper surface on which rests a loose intermediate contact member 18 having a central opening through which the insulating pin 17 passes, and such opening being sufficiently larger than the insulating pin to permit the intermediate contact member to rock on the convex surface of the

lower contact and to freely turn thereon. This intermediate contact member may be a flat disk of platinum or other suitable metal, though it is preferably of a different metal from the contact points 14 and 15 as being less liable to pitting. It is also preferable to have the bottom surface of the upper contact point concave to assure its contact with the intermediate contact member taking place at the outer edge thereof.

In operation the vibrations of the movable contact support 11 cause the contact points to alternately close and open the circuit controlled by them by moving the intermediate contact member into engagement with the upper contact point and then away therefrom, and the freedom of the intermediate contact member both as to tilting movements on the lower contact point and as to rotary movements around the insulating pin enables it to adapt itself to the surface of the contact points at each contact and to turn under the influence of the vibrations so as to change its contacting surface and avoid repetition of contact at localized spots. The intermediate contact member by its rocking motions and its rotary travel serves to keep itself free from pitting and to minimize the pitting action of the contact points, and should irregularities occur in the contacting surfaces the efficiency of the contact will not be impaired thereby, as the intermediate contact member by tilting will contact with various points and not be confined in its contact to the high points of such irregularity.

The form of the invention shown in Fig. 4 differs from that described in that the lower contact point has its upper surface concave instead of convex, and the intermediate contact member 19 has a convex upper and lower surface, and the opening therethrough is of an hour glass shape to permit a slight rocking of the intermediate contact member in its concave seat and also to permit it to turn as in the other construction.

A further modification is shown in Fig. 5 wherein the intermediate contact member 20 is in the form of a ball or sphere confined between the spherically convex surface of the contact points 14″ and 15″. With this construction there is no necessity for the use of an insulating pin as the space between the contact points is insufficient to permit the spherical contact member to pass therethrough.

The details of construction may be otherwise modified without departing from the invention, such as by employing contact points with flat contact surfaces and a flat intermediate contact member therebetween, as shown in Fig. 6, or by the use of a conical intermediate contact member as shown in Fig. 7. Other modifications may suggest themselves to those skilled in the art whereby a contact member free to change its position of contact is interposed between two contact points or constitutes one of a pair of contact points.

What I claim as new and desire to secure by Letters Patent is:

1. An electrical vibrating contact means, comprising a pair of contact members one of which is movable with relation to the other, and a loose third contact member therebetween capable of unrestrained turning movement to change the position of its contacting surface incident to the movements of the movable contact member.

2. An electrical vibrating contact device, comprising a pair of coöperating contact members one of which is movable with relation to the other and one of which is positioned above the other, and a third contact member loosely mounted on the lower contact member and capable of freely turning thereon and adapted to contact with the upper contact member.

3. An electrical vibrating contact device comprising a pair of coöperating contact members one positioned above the other and one movable with relation to the other, and an intermediate contact member loosely seated on the lower contact member to turn and rock thereon for changing the position of its contact surface incident to the movements of the movable contact member.

4. An electrical contact device, comprising a pair of contact members, one of which is movable with relation to the other, an insulating pin on one contact member and a third contact member positioned between the pair of contact members and loosely mounted on the insulating pin.

5. An electrical contact device, comprising a pair of contact members one of which is movable with relation to the other, an insulating pin on one contact member, a third contact member positioned between the said contact members and loosely mounted on the insulating pin, one of the first mentioned contact members having a convex contact surface.

6. An electrical contact means, comprising a pair of contact members, one positioned above the other and one movable with relation to the other, and the lower contact member having a convex upper surface, an insulating pin on one contact member projecting into an opening in the other contact member, a third contact member loosely mounted on the insulating pin and seated on the convex surface of the lower contact member.

7. An electrical contact means, comprising a pair of contact members comprising a stationary contact member and a movable contact member therebeneath, both being provided with openings therethrough, an in-

sulating pin tightly fitting within the opening of the upper contact member and freely entering the opening of the lower contact member, the lower contact member having a convex upper surface and the upper contact member having a concave lower surface, and a third contact member comprising a metal disk positioned between the pair of contact members and having a central opening through which the insulating pin freely passes.

8. An electrical contact device, comprising a pair of contact members, one of which is movable with relation to the other, an insulating support, and a third contact member positioned between the pair of contact members and loosely mounted on the insulating support.

9. An electrical contact means, comprising a pair of contact members one of which is movable toward the other for contact abutment, and a loose, freely movable third contact member interposed between the pair of contact members to take the abutting engagement of both of them.

10. An electrical contact means, comprising a pair of contact members one of which is movable with a vibratory movement with relation to the other, and an independent freely movable third contact member positioned between the pair of contact members and capable of unrestrained turning movement to change its contact surface incident to the vibratory movements of the movable contact member.

11. An electrical contact device, comprising a pair of electrically connected terminal contact members one of which is movable with respect to the other, and an independent, loose, non-connected current contacting member interposed between the contact members and capable of freely changing its position when the contact members separate.

In testimony whereof, I affix my signature, in presence of two witnesses.

STEPHEN F. BRIGGS.

Witnesses:
KATHERINE HOLT,
MARGARET FORRESTAL.