

E. GARRETSON.
ELECTRIC CONTACT MAKING DEVICE.
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1,198,340.

Patented Sept. 12, 1916.

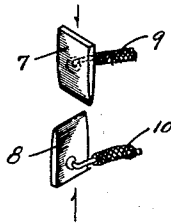


Fig. 1.

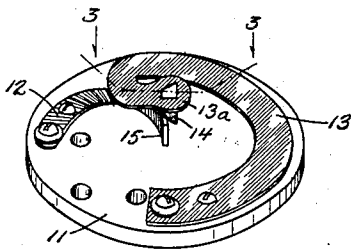


Fig. 2.

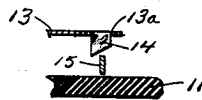


Fig. 3.

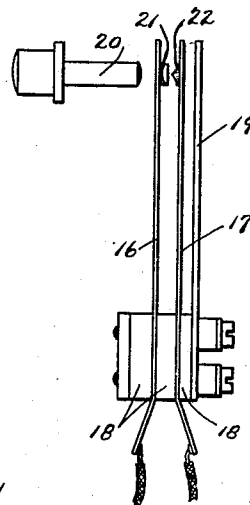


Fig. 4.

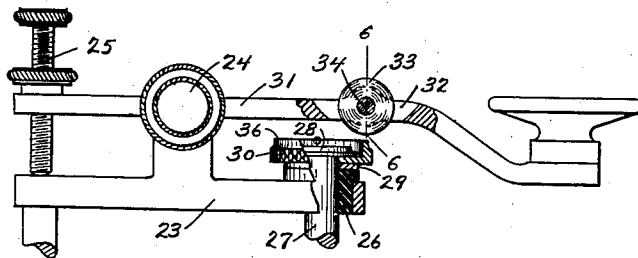


Fig. 5.

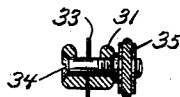


Fig. 6.

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ELECTRIC CONTACT-MAKING DEVICE.

1,198,340.

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To all whom it may concern:

Be it known that I, EUGENE GARRETSON, a citizen of the United States of America, residing at Buffalo, in the county of Erie and State of New York, have invented certain new and useful Improvements in Electric Contact-Making Devices, of which the following is a full, clear, and exact description.

As is well known to those skilled in the art, the present construction of electric contact making devices permits the accumulation of foreign matter, such as dust, grease and the products of chemical and electrochemical action between the contacting surfaces. The manufacture of these devices has also been expensive for the reason that rare metals have been employed as contacts, which, while practically free from chemical action, have not materially avoided the disadvantages caused by foreign matter. These disadvantages have been very apparent, especially in push buttons which are located out of doors where they are exposed to dampness and dust laden air and which are accessible to insects; also in keys where the continued sparking of higher potential currents causes oxidation of the surfaces. Attempts have been made to overcome these disadvantages by providing contact making devices having rubbing or self-cleaning contacts. These devices, however, require considerable motion and energy for their operation. In some of these devices the contact areas have been unnecessarily large, others have been defective because of the use of wire-like contacts. The former construction facilitates the accumulation of foreign matter and when the device is operated there is a tendency to embed such foreign matter into the surfaces instead of expelling the same therefrom. These large surface contacts at the same time reduce the pressure per unit of area to a small amount, thus making a poor contact. Where the contact is limited to a mere point, difficulty has been experienced in getting mechanical alinement of the parts. These points also afford but little facility for radiation or distribution of heat by conduction and no possibility of a lateral cleaning motion.

The general object of my invention has been to provide a device which would combine the advantages and eliminate the dis-

advantages of both the surface and point contact by providing a contact which is effected by the abutment of two knife edges.

As will be seen, the area of contact is virtually a point and the applied pressure produces a high pressure per unit of area of contacting surface. Moreover a slight lateral motion under this high pressure given to the contacting parts effectually cleans the contacts at each operation, thus expelling foreign matter, as well as providing a separate area for contact and for the final break or spark when the circuit is opened. Furthermore, no accurate mechanical alinement of the contact parts of my device is necessary and the point of contact is strong and durable, as it is reinforced lineally in both directions by the remaining parts of the knife edges. This construction also accelerates the radiation and dissipation of any heat produced at the contacts.

The spark formed by the contacts in my device is confined to and concentrated within a small area and is thus intensified so that there is a tendency to vaporize any residuum of spark-formed oxides. The edges of the knives also tend to cut through foreign matter, such as films of dust, corrosion or the webs or cocoons of insects, thus making a very effectual contact with but little motion or applied pressure. Furthermore, my device eliminates the use of expensive contact metals and in the case of push buttons the contact knife edges may be formed integral with the springs thereof. I have also sought to provide contact means which may be used, for example, in connection with a telegraph key so that by simple and slight movement of one or both of a pair of edged contact disks, a fresh contact may be obtained. In this form the contacts are so designed that they may be machined so as to present a continuity of alined contact areas. This obviates the necessity of the usual scraping or sand papering of the contacts, which destroys the alinement of the contacting surfaces.

In producing my device, I have sought to provide an improved contact means which may be used in any of the many types of contact making devices, and the drawings, I have shown some of the many applications of my device.

In the drawings, forming part of this specification, like characters of reference in-

dicating like parts throughout the several views, of which:

Figure 1 is a perspective view of the elementary principle and application of my invention. Fig. 2 is a perspective view of the base of a push button circuit closer, and shows my invention applied thereto. Fig. 3 is a vertical sectional view of the contact shown in Fig. 2 and is taken on line 3—3 thereof. Fig. 4 is a side elevation of a telephone key showing my invention applied thereto. Fig. 5 is a side elevation of a telegraph key provided with my invention. Fig. 6 is a sectional view of the upper or disk contact of the telegraph key and is taken on line 6—6 of Fig. 5.

In Fig. 1 of the drawings, 7 represents the upper contact knife and 8 the lower contact knife. These knives are provided along their adjacent and co-acting surfaces with substantially sharp edges. When these two knives are moved toward each other in the direction indicated by the arrows, a comparatively small but very good contact will result. 9 and 10 are the electrical terminals for knives 7 and 8, respectively.

In Fig. 2, where I show my device applied to a push button, 11 is the insulated base, 12 the lower contact spring and 13 the upper contact spring thereof. The lower contact spring is screwed to the base at its outer end in the usual manner and is curved inwardly toward the center and twisted so as to have its inner end 15 disposed vertically or at right angles to the outer end of the spring. The upper contact spring 13 is formed in the usual spiral shape, so as to give it elasticity and from the outer circular end 13^a thereof is preferably punched, a downwardly extending knife-like contact tab 14. This tab is located so as to lie directly above the inner end 15 of the contact spring 12 and has its lower edge cut off at an angle so that when it is depressed and contacts with the end 15 of the spring 12, it will cause a slight lateral motion of the end 13^a, or the end 15, or both. This lateral motion causes the points of first engagement (which are also the points of break) on both lineal contact edges to move away from the center line of operation immediately after first contact is made, and causes other portions of such lineal edges to engage when contact is fully established, so that each contact edge has an arc receiving portion and a clean contacting portion. These portions are separate and distinct so that all deterioration of the contact edges is confined to one portion of each of such edges and the remaining portions are not subjected to arcing.

In Fig. 4 is shown my invention adapted to a telephone key. In this figure 16 and 17 represent the contact springs, which are suitably held in the insulating blocks 18 by

the usual means. 19 is the anvil or stop for the contact springs and 20 is the plunger of the key. The spring 16 is provided with a contact point 21 and the spring 17 with a contact point 22. These contact points are preferably circular in their greatest cross-section, each having its face cut away at each side of the center, thus forming a chisel shaped knife-edge. The contact points are assembled so that their edges lie at right angles to each other, thus providing a small, substantially sharp contact point. When the contact springs are brought together there will be a relative sliding motion between the contacting parts.

In Figs. 5 and 6, where I have shown my invention applied to a telegraph key, 23 is the base of the key carrying the usual pivot screws 24 and adjusting screws 25. At the contact end of the base 23 is provided a bushing 26 of insulating material. A bolt 27 having a head 28 passes through this bushing and disposed between the head 28 and the top of the bushing is a metallic washer 29 and the cup-shaped contact disk 30. This disk is provided with a narrow, upper, flat, annular, surface 36 and is knurled on its outer surface so that it may be easily rotated. 31 is the lever of the key which is provided, immediately above the contact disk 30, with a slot 32. A contact disk 33 is disposed in the slot 32 and arranged immediately above the outer portion of the rim of the contact disk 30. A bolt 34 having a knurled clamping nut 35 is passed through the lever 31 and disk 33 whereby the disk 33 may be securely clamped within the slot 32. When the contacting parts of the disks 30 and 33 become worn or oxidized, or if, for other reasons, the contact is not good, the disk 30 may be rotated slightly so as to bring a new contact surface beneath the disk 33. A new surface upon the periphery of the disk 33 may be brought into operative position by simply loosening the bolt 34 and slightly rotating the disk 33. Thus, it will be seen that manifold new contact surfaces may be provided without delay, inconvenience or necessity of renewal, or refinishing of parts.

In the drawing, I have shown but a few of the applications of my invention, but it is obvious that the same may be applied to any contact making device without departing from the spirit of my invention or the scope of the appended claims.

Having thus described my invention, what I claim is:

1. A contact making device comprising two, edged, contact members, each movable from the center line of operation and each edge having an arcing portion and contacting portion.

2. A contact making device comprising two, edged, contact members, said members

having arcing portions coincident, only, upon first make of contact and upon break of contact, and contacting portions coincident on the final make of contact.

5 3. A contact making device comprising a plurality of movable, contact members, said members having contacting edges, all of which are movable with respect to each other and the stationary parts of the device.

10 4. A contact making device comprising a plurality of laterally moving contacts, each having a motion, the components of such motion being parallel and perpendicular to the direction of the operating force.

15 5. A contact making device comprising, two, movable, edged, contact members, so formed that when they are moved against each other they will have a correlative, lateral movement and will make a rubbing contact.

20 6. A contact making device comprising two, edged, contact members, so formed that when they are moved against each other they will make a rubbing contact and each being movable in a plane substantially perpendicular to the plane in which the other moves.

25 7. A contact making device comprising two, edged, contact members, each having its larger surface perpendicular to the larger

surface of the other, said members being so 30 formed that when they are moved against each other they will make a rubbing contact, and each being movable in a plane substantially perpendicular to the plane in which the other moves.

35 8. A contact making device comprising a plurality of edged, contact members, so formed that when they are moved against each other they will make a rubbing contact, and each being movable in a plane substantially perpendicular to the plane in which the other moves.

40 9. A push button comprising a lower contact member carried by a spring arm and arranged to have a lateral motion, and an upper contact member carried by a spring arm arranged to have vertical and lateral motions, said upper member having an angularly disposed lower edge engageable with said lower contact member.

50 In testimony whereof, I have hereunto signed my name in the presence of two subscribing witnesses.

EUGENE GARRETSON.

Witnesses:

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WALTER H. KELLEY.