(Model.)

G. CUMMING & C. M. BRINKERHOFF.

TELEGRAPHIC ELECTRODE.

No. 256,646. Patented Apr. 18, 1882.

Fig. 1

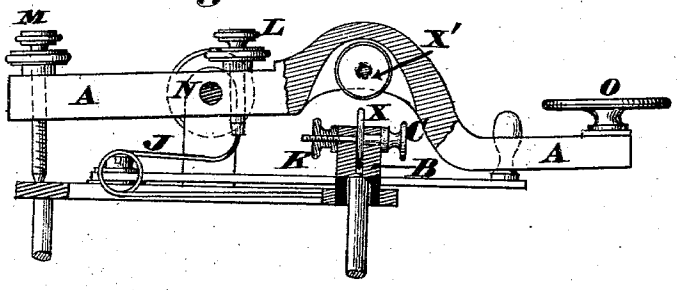


Fig. 2

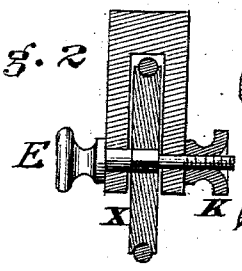


Fig. 3

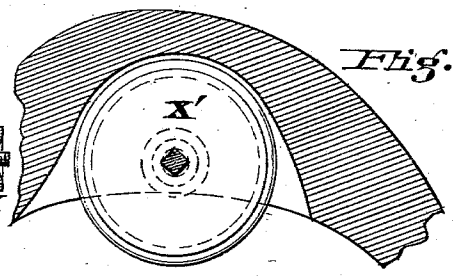


Fig. 4

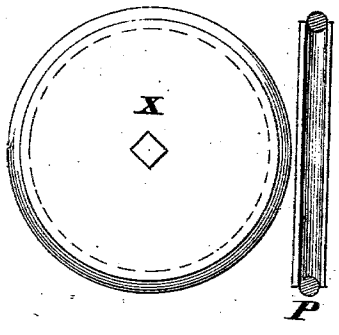


Fig. 5

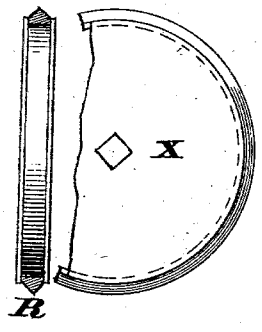
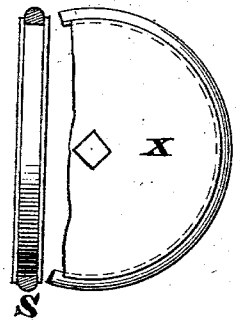


Fig. 6



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UNITED STATES PATENT OFFICE.

GEORGE CUMMING AND CLARA M. BRINKERHOFF, OF NEW YORK, N. Y.

TELEGRAPHIC ELECTRODE.

SPECIFICATION forming part of Letters Patent No. 256,646, dated April 18, 1882.

Application filed August 12, 1881. (Model.)

To all whom it may concern:

Be it known that we, GEORGE CUMMING and CLARA M. BRINKERHOFF, of the city, county, and State of New York, have jointly invented certain new and useful Improvements in Telegraphic Electrodes, or the contact-points of telegraph-instruments, capable of being applied to all telegraphic machinery, whether keys, relays, sounders, repeaters, transmitters, or pole-changers for single lines, duplexes, quadruplexes, sextuplexes, or other multiple power of the same; and we do hereby declare the following to be a full, clear, and exact description of the said invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a view in side elevation of a telegraph-key containing our improvements. Figs. 2 and 3 are enlarged sections of the upper disks shown in Fig. 1. Figs. 4, 5, and 6 show different forms of constructing the disks and their tires and rims or peripheries.

Our invention relates to an improvement in telegraph-instruments, and is especially applicable to keys having the contact-points on the peripheries of disks, such as described in the application of George Cumming (one of these applicants) filed May 10, 1881, serial number 32,939. In the said application referred to the peripheries of the disks constituting the electrodes of the instrument are made flat, and the result is that when the two disks meet there is a contact extending entirely across the width of the disks.

Now, the object of our present invention is to reduce the area of contact to the merest point; and to this end it consists of co-operating peripheral contact-electrodes arranged in planes at approximately right angles to each other and having their contact-surfaces brought to a mere line or edge.

Telegraph keys or relays are usually constructed with an armature or lever swung on trunnions, or otherwise held in place, forming a hammer which impinges on a stationary anvil, thus making and breaking the electrical connection. Heretofore the contact between the two electrical poles of telegraph-instruments have been made either by metal points or the ends of wires cut square, or by a point coming in contact with the side face or margin of a disk. The first method is objectionable because, by reason of oxidation or fusion, or by dust collecting between the electrodes, imperfect electrical connection is made, or else a freezing or adherence of the points is caused thereby, technically known as "sticking." The second method is also objectionable, because it only partially remedies the same difficulty—viz., sticking—by allowing only one of the contact-points to be adjustable, and the point of contact being still on a flat surface, as in the first method, which gives a large surface for the possibility of adherence. The difficulty of sticking is remedied by providing for the adjustability of both electrodes or contact-points, whereby perfect electrical connection is insured, and at the same time the smallest possible surface of actual contact—a mere geometrical point or dot—is attained, together with the largest possible surface held in reserve to be used at a moment's notice when necessary or required.

In our new key two metal wheels or disks are used as the two electrodes or contact-points. The peripheries of the said disks are best placed at right angles to each other (or they may be in the same plane) and impinging upon each other at every motion or vibration of the key or armature-lever, thus acting as the contact-surfaces of the telegraph-instrument which contains them. In the form of key we have adopted as the best the two disks are sunk respectively in the arch of the lever or hammer, and in the insulated standard or anvil which runs through the base directly underneath, the said disks being held in place by axles permanently affixed through the center of each disk and set screws or nuts working on the same, the two disks moving freely, when required to be loosened from their beds, in slots, grooves, or holes provided for this purpose. In the relay or other instrument working with a battery, in connection with the key, the action and arrangement of the electrodes are much the same as in the key, with only such alterations as the form of the machine makes necessary. The action of the device in the key is as follows: By a pressure at the button O connection is made between the two electrical poles

of the key by the two disks X and X′ touching one another on their peripheries on a line vertical to the axis of each disk.

In the relay or other instrument working with a battery, in connection with a circuit-breaking key, the same action is effected by means of coils or helices being charged with electricity by the closing of the key, in which state the strength of the battery flowing through them forms a temporary magnet, which causes the armature to fly toward the helices by the power of magnetic attraction. When the key is open, the circuit being broken and the helices no longer magnetic, the armature is pulled back by a spring, so that this successive opening and closing of circuit causes a vibration of the armature-lever, making and breaking connection on the peripheries of the wheels or disks.

In Fig. 1 of the drawings, X and X′ are the disks, arranged at right angles to each other. They may be, of course, in the same plane; but a mechanical circle is not a geometrical circle, and a smaller contact-surface is secured by placing them at right angles. The disk X is made adjustable in the standard B by the set-screw C. The upper disk, X′, is pivoted in the lever A, and is adjusted by the set-screw E. These may be made in the usual form, or they may extend through the standard or lever, as shown in Figs. 1 and 2, and be fastened by the nuts K K.

L is a set-screw for adjusting the spring J, and M is the set-screw for regulating the play of the armature or lever A, which is hung on trunnion N.

The contact-points of an electric key should be composed of a non-corrosive metal which will resist a high temperature, and platina or platinum is ordinarily used for that purpose. In order, therefore, to avoid the expense of making the entire disks of so expensive a metal, we make them of brass or other cheap conductor, and in their peripheries form grooves, in which we press, solder, or otherwise secure a thin strip or wire of platinum, the walls of the grooves serving to keep said strips or wires from any lateral displacement. In Fig. 4 a round wire, P, is shown let into a groove in the periphery of disk X, while in Fig. 5 a triangular wire, R, and in Fig. 6 a half-round wire, S, is shown so let into said disk.

By bringing each of the electrodes to a fine edge in cross-section it will be seen that the smallest possible contact-surfaces are brought together when the peripheries of the disks are made to touch, thus effectually preventing sticking.

The platinum wire by the process of drawing it is condensed and forms a better and more durable contact-surface than platinum otherwise formed.

Having described our invention, what we claim is—

In electrical instruments, co-operating peripheral contact-electrodes arranged in planes at approximately right angles to each other and having their contact-surfaces brought to a mere line or edge, substantially as described.

GEORGE CUMMING.
CLARA M. BRINKERHOFF.

Witnesses:
HERMANN PETERSEN,
WILLIAM DIECKS.