

Dec. 11, 1923.

1,477,527

B. RAETTIG
CONTACT SPRING

Filed April 20, 1923

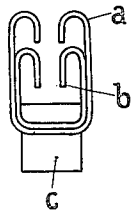


Fig. 1.

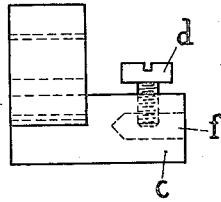


Fig. 1a.

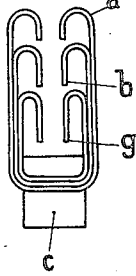


Fig. 2.

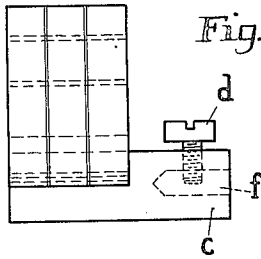


Fig. 2a.

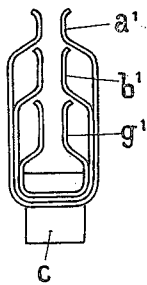


Fig. 3.

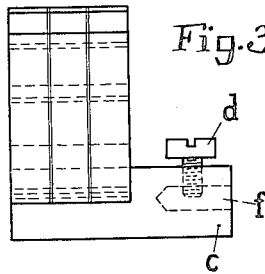


Fig. 3a.

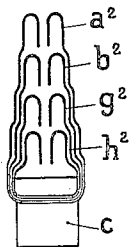


Fig. 4.

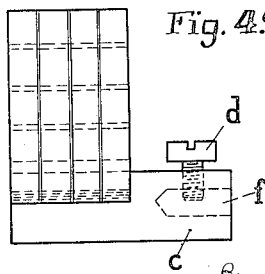


Fig. 4a.

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By: *Knight* *attip.*

UNITED STATES PATENT OFFICE.

BRUNO RAETTIG, OF HOFFNUNGSTHAL, GERMANY.

CONTACT SPRING.

Application filed April 20, 1923. Serial No. 633,513.

To all whom it may concern:

Be it known that I, BRUNO RAETTIG, a citizen of the German Reich, residing at Hoffnungsthal, Germany, have invented certain new and useful Improvements in Contact Springs (for which an application for patent has been filed in Germany on the March 9th, 1922), of which the following is a specification.

This invention relates to a contact spring of the type used for electric apparatus, specially for electric switch apparatus.;

The contact springs commonly used, especially for higher intensities of current, present the inconvenience that the contact faces of the contact spring are in contact only with a small part of their total surface with the counter-contact faces, for instance the contact faces of the switch-knives, whereby detrimental heating frequently results. This poor contact is further increased by the spark produced at the interruption, said spark producing burnt spots on the contact surfaces. Under certain conditions, the molten drops produced at the burnt points push the contact springs away from one another and prevent a perfect contact with the counter-contact faces.

To avoid these inconveniences it has been proposed to use spark drawing devices in connection with contact springs which however complicates the construction of the contact springs, said spark-drawing devices moreover not being adapted to assist in the transmission of current.

According to this invention the inconveniences mentioned are avoided by the arrangement that the contact springs are made of several springs which with regard to the counter-contact part are situated the one behind the other. It has already become known to subdivide contact springs so that, at higher intensities of current, the springs are subdivided by milled slits into several parts situated the one at the side of the other, each part being independently resilient. According to this invention the subdivision of the springs in transverse direction may be utilized also.

The springs of the several layers are preferably of different lengths so that the contact faces of the individual springs are superposed.

The subdivision according to the invention presents the advantage that even at high intensities of current comparatively

thin blades of sheet metal may be used, the accurate working and fashioning of thin sheet metal being much easier than that of thick sheet metal. Another advantage is that each of the successive springs possesses individual elasticity and comes in contact with the counter contact. By this arrangement a much better contact is ensured, since, if one pair of contact faces should fail, only a very small part of the total contact surface is inoperative whilst with contact springs made in one piece the entire contact surface becomes inactive if the contact is poor. The outer contact spring serves in this arrangement as a spark-drawing device.

Four embodiments of the invention are shown by way of example on the accompanying drawing, the contact springs shown being of the preferred shape produced by the bending of two arms in different shapes.

Each of the Figures 1 to 4 shows in front elevation one embodiment of the invention. Figs. 1^a to 4^a are respective side elevations of these embodiments.

According to Fig. 1 the contact spring consists of two contact springs *a*, *b* of which the outer one, *a*, has short inwardly bent arms, the inner one, *b*, having longer inwardly bent arms. These bent arms serve as contact surfaces. The contact springs *a* and *b* are fixed by soldering or by means of screws in the well known manner in a slitted connecting piece *c*. The line wires are clamped in a bore *f* of the connecting piece *c* by means of a wire terminal screw *d*. The connection may however be effected in any other convenient manner.

In the form of construction shown in Fig. 2 three single springs *a*, *b*, *h* are arranged the one behind the other. Each contact spring is further subdivided in transverse direction by means of slits or in such a manner that in the slit of a connecting piece *c* several contact springs are fixed the one at the side of the other in transverse direction.

Fig. 3 shows an arrangement of three contact springs *a*₁, *b*₁, *g*₁ the one behind the other which differ from the contact springs shown in Figs. 1 and 2 only as regards the shape of the contact faces.

Fig. 4 shows an arrangement of several contact springs *a*₂, *b*₂, *g*₂, *h*₂ similar to Figs. 1 to 3. The individual contact springs are however made from comparatively thin sheet metal and joggled at several points in

longitudinal direction. This arrangement ensures an especially soft but good elasticity and contact giving. The shape of each individual spring may be altered otherwise in
5 any convenient manner.

I claim:—

In a switch of the kind as described, a spring contact comprising nested U-shaped members, the arms of said members being
10 turned inwardly to form opposite series of

aligned spaced contact faces, the arms supporting said faces being independently resilient.

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

BRUNO RAETTIG.

Witnesses:

HENRY W. HAAS,
G. ROERSCHER.