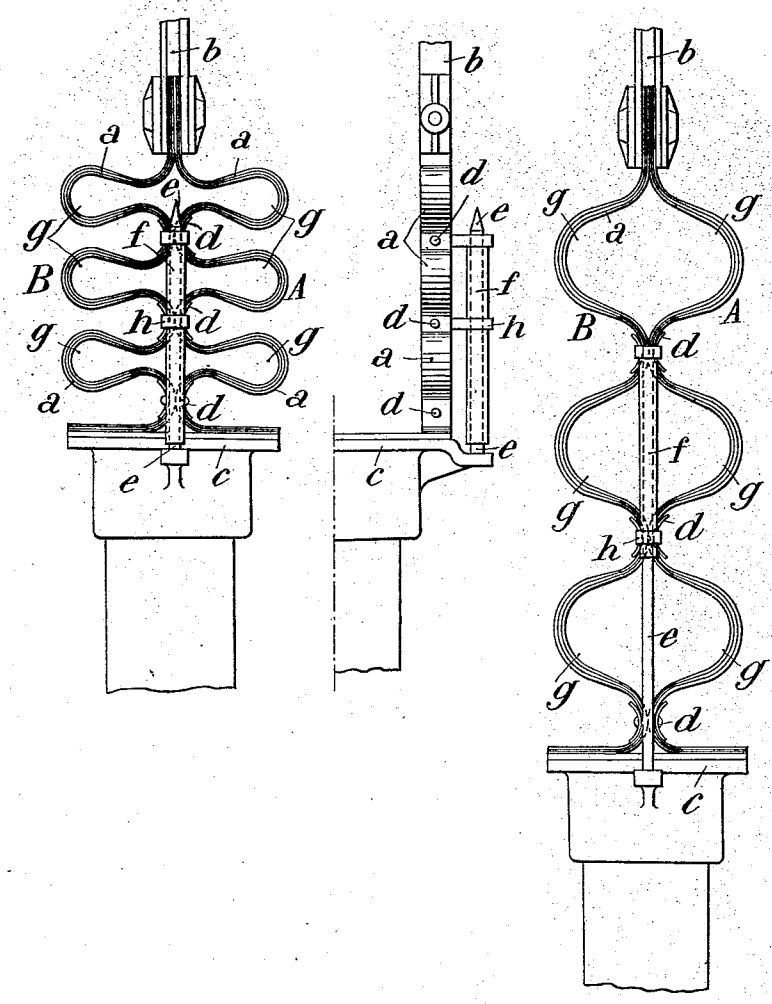
No. 891,343. PATENTED JUNE 23, 1908.

C. A. KELLER.

FLEXIBLE ELECTRICAL CONNECTION DEVICE AND THE LIKE.

APPLICATION FILED DEC. 7, 1907.

Fig. 1. *Fig. 2.* *Fig. 3.*



Witnesses
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CHARLES ALBERT KELLER, OF PARIS, FRANCE.

FLEXIBLE ELECTRICAL CONNECTION DEVICE AND THE LIKE.

No. 891,343. Specification of Letters Patent. Patented June 23, 1908.

Application filed December 7, 1907. Serial No. 405,603.

To all whom it may concern:

Be it known that I, CHARLES ALBERT KELLER, citizen of the Republic of France, residing at Paris, France, have invented new and useful Improvements in or Relating to Flexible Electrical Connection Devices and the Like, of which the following is a specification.

This invention relates to flexible electrical connection devices more particularly those to which an up and down movement must be given as in those used in connection with the electrode or electrodes of electric furnaces. Such electrodes are usually arranged vertically necessitating the use of supple or flexible connections capable of following their up and down movements caused by electric regulation. As a rule, large flexible copper cables are used for the purpose. This arrangement requires a comparatively large space and is very awkward in furnaces having several vertical electrodes, more particularly when such electrodes are used for the discharge and return of the current. In the latter case, in fact, a short circuit between the two poles is liable to occur.

According to this invention an arrangement is provided by means of which it is possible to obtain a flexible connection requiring very small horizontal space, practically scarcely exceeding that of the electrode itself.

In the accompanying drawing which shows one form of flexible connection by way of example, Figure 1 is a front elevation of a flexible connection shown in the raised position of the electrode. Fig. 2 is a side elevation thereof, and Fig. 3 is a front elevation of the same connection shown unfolded and in the low position of the electrode.

The device according to this invention comprises very flexible and thin bars *a* for instance half a millimeter thick, connected on the one hand to the fixed upper conductor *b* supplying the current and on the other hand to the support or holder *c* of the electrode. These flexible bars are divided into two groups A and B connected at several points of their length by suitable binding devices *d*. A guide rod *e* arranged at each side of the holder *c* and engaging with a lateral tube *f* secured to the upper binding device *d* forces the bars to rise or to descend vertically when the electrode receives a vertical movement. The points of connection *d* bring about the formation of separate loops *g* which contract or expand according to the position to be given to the electrode. In this way a very practical flexible connection is obtained between the conductors or bars supplying the current and the electrode, without the connections being brought into contact with the flames of the furnace. The guiding is easily effected by means of one or two symmetrical rods *e* engaging with the tubes *f* which are supported at one or more points in their length by brackets *h* secured to the binding devices *d* as shown in Fig. 2.

To obtain satisfactory results, it is necessary to connect the bars or blades *a* of a flexible group in such a manner that their curves are not absolutely the same. This result is easily obtained by slightly varying the length of all these blades.

It will be understood that the details of construction may be varied without departing from this invention.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. A flexible electrical connection comprising a pair of groups of electrical conductors, each group comprising a plurality of strips of electrically conducting flexible material arranged in superposed relation, separable parts electrically secured to said conductors and movable apart from each other a distance less than the length of said strips whereby the same are maintained slack, a rod secured to one of said parts, a tube telescoping said rod, and means looping the slack in said strips and connecting the loops to said tube.

2. A flexible electrical connection comprising a pair of groups of electrical conductors, each group comprising a plurality of strips of electrically conducting flexible material arranged in superposed relation and in contact throughout their length, the strips of each group having different lengths, separable parts electrically secured to said conductors and movable apart from each other, a distance less than the length of said strips whereby the same are maintained slack, a rod secured to one of said parts, and means looping the slack in said strips and slidably connected with said rod.

3. A flexible electrical connection comprising a pair of groups of electrical conductors, each group comprising a plurality of strips of electrically conducting flexible ma-

terial, separable parts electrically secured to said conductors and movable apart from each other a distance less than the length of said strips whereby the same are maintained slack, and means looping the slack in said strips, said means being slidably connected with one of said parts.

4. A flexible electrical connection comprising a pair of groups of electrical conductors, each group comprising a plurality of strips of electrically conducting flexible material, separable parts electrically secured to said conductors and movable apart from each other a distance less than the length of said strips whereby the same are maintained slack, and means looping the slack in said strips.

5. A flexible electrical connection comprising an electrical conductor composed of a plurality of strips of electrically conducting flexible material, separable parts electrically secured to said conductor and movable apart from each other a distance less than the length of said strips whereby the same are maintained slack, and means for looping the slack in said strips.

In testimony whereof I have affixed my signature, in presence of two subscribing witnesses.

CHARLES ALBERT KELLER.

Witnesses:
DEAN B. MASON,
JULIEN CAVERIN.