J. ORR.

ELECTRODE HOLDER.

APPLICATION FILED APR. 19, 1911.

1,076,054.

Patented Oct. 21, 1913.

2 SHEETS—SHEET 1.

Fig. 2.

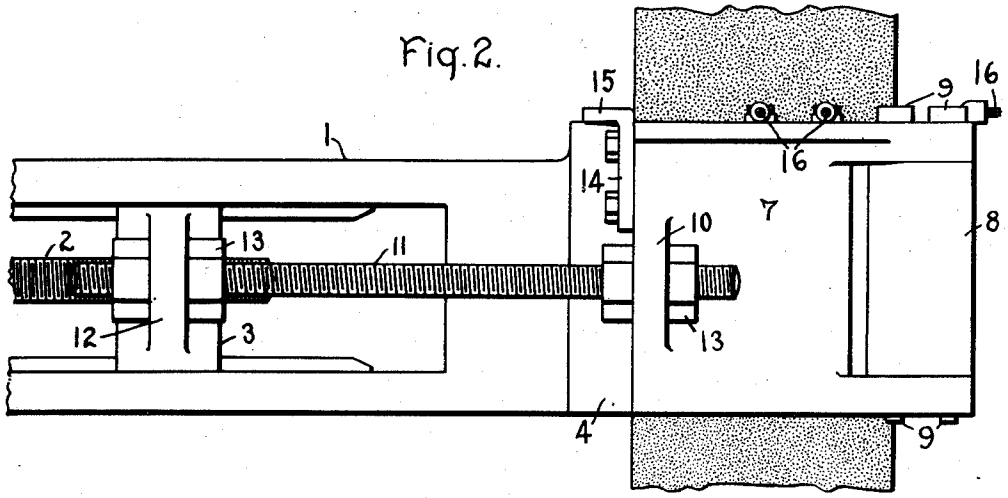
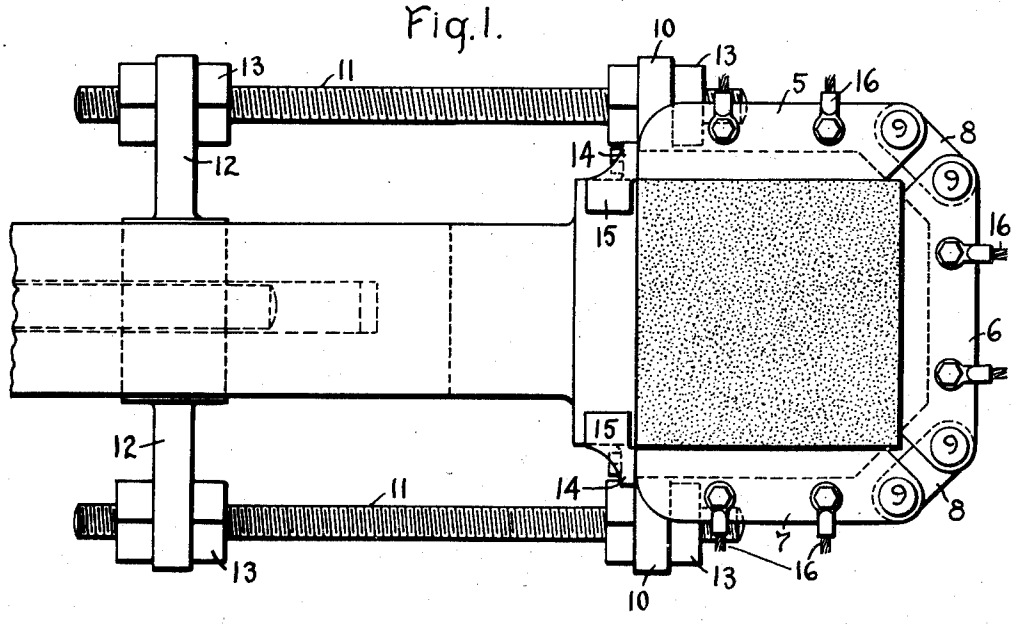


Fig. 1.



Witnesses:

Irving E. Stevens.

J. Ellis Glen

Inventor

John Orr,

by Albert G. Davis

His Attorney.

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2 SHEETS—SHEET 2.

Fig. 3.

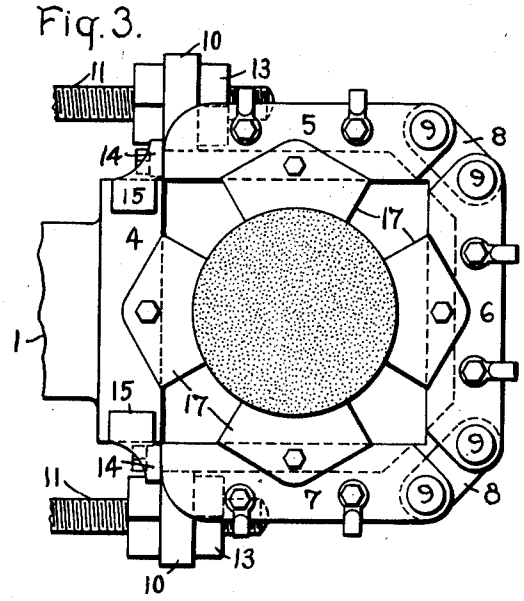


Fig. 4.

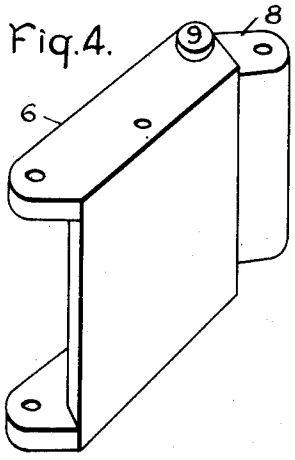
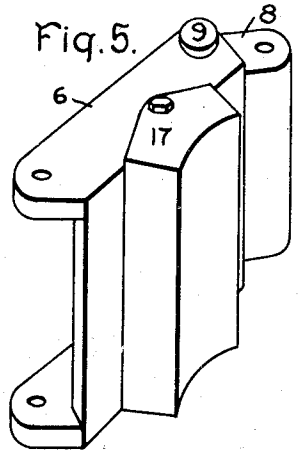


Fig. 5.



Witnesses:
Irving E. Stevens.
J. Ellis Glen.

Inventor:
John Orr,
by Albert G. Davis
His Attorney.

UNITED STATES PATENT OFFICE.

JOHN ORR, OF SCHENECTADY, NEW YORK, ASSIGNOR TO GENERAL ELECTRIC COMPANY, A CORPORATION OF NEW YORK.

ELECTRODE-HOLDER.

1,076,054. Specification of Letters Patent. Patented Oct. 21, 1913.

Application filed April 19, 1911. Serial No. 622,120.

To all whom it may concern:

Be it known that I, JOHN ORR, a citizen of the United States, residing at Schenectady, county of Schenectady, State of New York, have invented certain new and useful Improvements in Electrode-Holders, of which the following is a specification.

My invention relates to structural features of industrial electric furnaces and comprises particularly a novel means for supporting and conducting current to an electrode.

In electric furnaces consuming large amounts of energy, particularly in furnaces of the arc type, difficulties have been experienced heretofore, in providing an electrode support which will be not only easily adjustable but will make a good electrical contact with the electrode so as to avoid hot spots and a destruction of the support.

The support or holder constructed in accordance with my invention comprises an adjustable collar consisting of a number of contact plates joined together by links at their adjoining ends and adapted to make a good contact with the electrode surface when drawn together.

The novel features of my invention will be pointed out with greater particularity in the claims appended to and forming part of this specification.

In the accompanying drawings, Figure 1 is a top view of one type of electrode holder adapted to be used with a rectangular electrode; Fig. 2 is a side view of the same; Fig. 3 is a somewhat modified form of holder adapted to be used with a cylindrical electrode; and Figs. 4 and 5 are detailed views of contact plates.

Referring to Fig. 1, the bracket or arm 1 forms a support for the electrode and is suitably attached to the framework of the furnace. It is longitudinally adjustable by means of a screw 2 passing through a block 3 moving in a suitable guide as best shown in Fig. 2. The arm 1 carries at its end a contact plate 4 which forms one part of the electrode holder. The contact plates 5, 6 and 7 are adjustable with respect to the fixed contact plate 4 and preferably consists of some good conductor such as copper. As shown in Figs. 1 and 4, the adjacent ends of these adjustable contact plates are connected to each other by links 8 movably attached to the plates by means of pins 9. In order to make a good electrical contact, the contact plates are given the same configuration as the surface of the electrode; in other words, with a flat sided electrode the contact plates are made flat and with a round electrode they are given a curved surface having the same radius as the curved surface of the electrode. Contact plates 5 and 7, which join the fixed plate 4, are provided with lugs 10 through which loosely pass screw threaded rods 11. The other end of the rods 11 passes through holes in the projecting lugs 12 attached to the guide 3. The links 8 are wide enough to maintain the adjacent ends of the adjustable plates 5, 6 and 7 out of contact with each other so that when the plates 5 and 7 are drawn toward the fixed plate 4 by tightening the screws 11, they will approach each other, thereby contracting the space inclosed by them and exerting pressure upon an electrode of proper size inserted in the holder. In the specific arrangement shown, plates 6 and 4 and plates 5 and 7 will approach each other respectively, thereby making both a firm mechanical and a good electrical contact with the body of the electrode. Suitable nuts 13 maintain the plates in position when properly adjusted. Brackets 14 are attached to the side of the contact plates by means of suitable nuts as best shown in Fig. 2 and have laterally projecting lugs 15 resting upon the fixed support and in this manner assist in supporting the weight of the electrode. Current conductors 16 are attached to each of the contact plates by means of suitable bolts and nuts.

The construction shown in Figs. 3 and 5 is very similar to that shown by Figs. 1, 2 and 4 except that additional contact shoes 17 having a curved surface on either inner side are attached to the main adjustable contact plates 5, 6 and 7, and adapt this structure for holding and conducting current to a cylindrical electrode. The contacting surface may be varied by increasing the curved contacting surface. It would, of course, be possible to make the surface of the main holder plates themselves curved but the use of separate contact shoes which are replaceable enables the holder to be adapted for holding various sizes of cylindrical electrodes, it being merely necessary

to substitute the contact shoe having a surface of appropriate radius of curvature for holding various sizes of electrodes.

What I claim as new and desire to secure by Letters Patent of the United States, is,—

1. An electric furnace electrode holder comprising the combination of a fixed support, adjustable supporting plates of considerable contact area coöperating therewith and movable links connecting adjoining ends of said contact plates and maintaining the same spaced apart, and means for drawing said adjustable plates toward the fixed support whereby the inclosed space is contracted.

2. An electrode holder for electric furnaces comprising contact plates spaced apart from one another, links pivotally attached connecting adjacent ends of said plates and means for drawing said plates toward each other to contract the space inclosed thereby.

3. An electrode holder comprising the combination of a fixed support, movably supporting plates adjustable with respect to said fixed support and having a surface configuration similar to that of the electrode to be supported, connecting links movably connecting said plates but spacing the same out of contact with one another, and means for drawing said movable plates toward the fixed support, thereby contracting the space inclosed by them and exerting pressure upon the electrode.

4. An electrode holder comprising the combination of a fixed support, adjustable contact plates having a considerable surface area contacting with the electrode, links movably connecting said plates but maintaining the connected ends out of contact with each other, and means for drawing said linked plates toward said fixed support, thereby exerting pressure upon the electrode surface and electrical connections for said contact plates.

5. In an electric furnace, the combination of a fixed contact plate, movable contact plates, two of which are placed on an angle to said fixed plate, links adjustably connecting the adjacent ends of said adjustable plates, said links being of sufficient width to maintain ends out of contact with each other, lugs projecting from the adjustable plates extending at an angle to the fixed plate, and a threaded rod loosely passing through said lugs for drawing the adjustable plates toward the fixed plate, thereby contracting the space inclosed by the plates.

6. An electrode holder comprising a plurality of plates, links pivotally attached to adjacent ends of said plates and spacing said plates apart, a bracket coacting with said linked plates, adjustable means for urging said linked plates toward said bracket, contact shoes attached to the inner surface of said plates and means for making electrical connection to said plates.

7. An electrode holder comprising the combination of a plurality of holder plates, links movably connecting said plates and spacing the same out of contact with each other, and means for urging said plates toward each other to contract the space inclosed thereby.

8. An electric furnace electrode holder comprising the combination of a plurality of holder plates, links movably connecting and spacing apart said holder plates, contact shoes having a surface configuration adapted to the electrode to be supported mounted on said holders, and means for urging said holders toward each other to contract the space inclosed thereby.

In witness whereof, I have hereunto set my hand this 18th day of April, 1911.

JOHN ORR.

Witnesses:
BENJAMIN B. HULL,
HELEN ORFORD.