

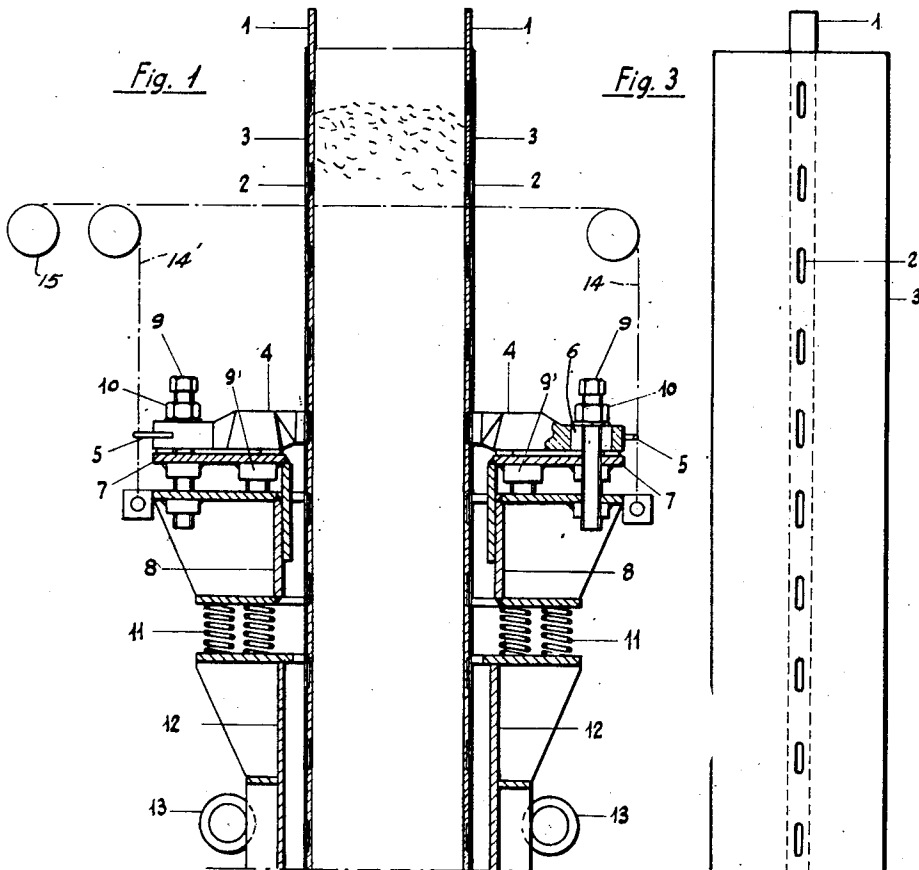
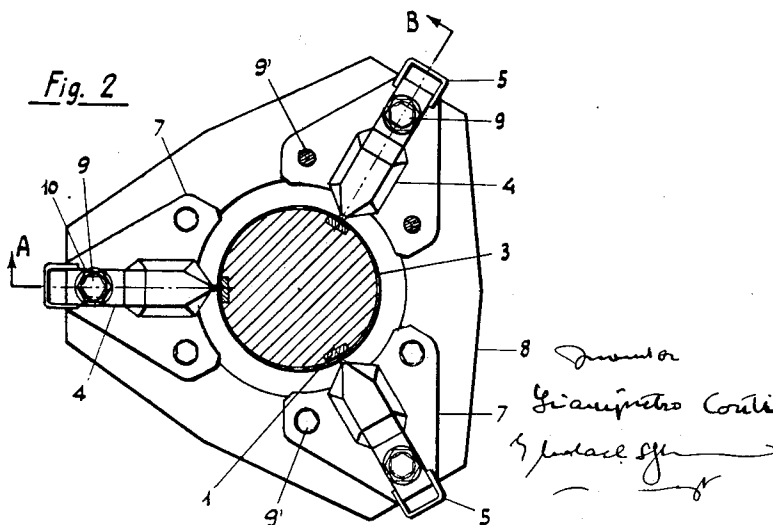
Jan. 1, 1952

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2,580,518

SÖDERBERG ELECTRODE SUSPENSION

Filed May 28, 1949



UNITED STATES PATENT OFFICE

2,580,518

SÖDERBERG ELECTRODE SUSPENSION

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Application May 28, 1949, Serial No. 95,996
In Italy June 1, 1948

4 Claims. (Cl. 13—14)

1

The present invention relates to a suspension for electrodes of the Söderberg type as employed in electric arc-resistance furnaces.

Various systems have been experimented for the suspension of these electrodes, whose constitution, as known, is such as to allow for getting hold only on a metal-sheet of thickness not over 2 mm.

The first suspensions utilized for the clamping of the electrodes the same members that feed the electric current. These suspensions, based on the use of clamps constituted by movable members, offer the inconvenience of compressing the electrode to such an extent as to cause inadmissible deformations.

The suspension by means of straps is good from many points of view but does not permit to load the straps alone with the whole weight of the electrode and, therefore, requires supplementary suspensions. Moreover, it easily happens that one of the straps slides before the others owing to differences in friction factors as determined by different conditions of the contract surfaces.

With the exception of the systems providing a big crane over the bay of the furnace, none of the conventional systems of suspension allows for easy taking-on of the electrode.

It is an object of the present invention to eliminate the above-mentioned inconveniences by providing a suspension for electrodes of the Söderberg type, which is essentially characterized in that the electrode is supported by members penetrating into the electrode through the sheet-metal cylinder containing the electrode mixture.

It is also an object of the invention to provide a set of recesses in the electrode along one or two of its generating lines, into which recesses the pointed ends of supporting members are made to penetrate, the said supporting members being provided above the conventional holding suspension cylinder hanging from the electrode-regulation winch.

It is another object of the invention to provide electrode-supporting members resting on the holding suspension cylinder with the interposition of sturdy springs designed to compensate possible unbalanced loads on the said supporting members.

It is another object of the invention to provide electrode-supporting members supported in such a manner as to allow for their being displaced and orientated with respect to the recesses into which they are to be fitted.

2

A further object of the invention is to provide an electrode reinforced by flat steel bars of convenient thickness in register with the generating lines along which there are provided the recesses designed to receive the supporting members, the said recesses being provided in these flat steel bars.

Further features of the suspension proposed by the present invention will appear from the following description of one practical form of embodiment, selected merely by way of example, and diagrammatically illustrated in the accompanying drawing.

The drawing shows in Fig. 1 a suspension according to the invention, in vertical section along the line A—B of Fig. 2; in Fig. 2, the same suspension in plan, and, in Fig. 3, a detail of the electrode.

With reference to these three figures, 1 designates flat steel bars incorporated with the electrode 3 below the sheet-metal cylinder and welded to the latter; each of these bars carries a set of equally spaced recesses 2 being in alignment with openings in the metal sheet cylinder; 4 are members radially arranged in a plane normal to the axis of the electrode 1 and provided with handles 5 at their ends opposed to their pointed ends and designed to engage with the recesses 2; 6 are grooves in the members 4, of such dimensions as to allow for displacement and orientation of each of said members 4, in its own plane with respect to a bolt 9 that ties it to the bearing plate 7; 9' are two further bolts passing through the plates 7 and supporting the said plates together with the bolt 9, on a suspension ring 8; 12 is the conventional holding suspension cylinder guided by rolls 13 and bearing the above defined structure with the interposition of sturdy helical springs 11.

In the form of embodiment here considered by way of example, each electrode 3 is supported at three equally spaced points by means of an equal number of supporting members 4, which with their pointed ends engage in the recesses 2 of the flat steel bars 1. Through these supporting members 4, the weight of the electrode is transmitted to the bearing plates 7, to the bolts 9, 9', to the suspension ring 8, to the springs 11, to the holding suspension cylinder 12, which in a manner known in itself is supported by suspension members 14, 14' controlled by the electrode-regulating winch 15.

This suspension allows for controlled extension and taking-on of the electrode. To carry out these operations, the electrode is sustained with an auxiliary suspension (which may be con-

stituted also by a suspension quite analogous to the type hereinbefore described, but arranged in another position along the electrode), the nuts 10 are unscrewed from the bolts 9, the handles 5 are gripped and the supporting members 4 are extracted from the respective recesses 2 of the electrode 3. This displacement of the supporting members 4 is made possible by the grooves 5. By acting upon the regulating winch, it is thus possible to raise or to lower the assembly of members mounted on the holding suspension cylinder 12, making possible the controlled extension of the electrode in the former case and the taking-on of the electrode in the latter case. To take up again operation with the main suspension, the holding cylinder 12 is stopped in the desired position and the operations are carried out in the reverse order by introducing the supporting members 4 into the recesses 2 of the flat steel bars 1. Precision adjustment of the position of the supporting members 4 in height is effected by acting upon the screws 9 and 9'. If the auxiliary suspension is loosened, the main suspension takes the load and the springs 11 compensate for any possible unbalanced loads on the supporting members 4.

The suspension hereinbefore described merely by way of example may be varied in many ways as to the number and arrangement and shape of the composing members, without departing from the scope of the present invention.

I claim:

1. In an electric arc-resistance furnace, an electrode of the Söderberg type, comprising a metal sheet cylinder containing an electrode mixture; a plurality of flat bars arranged in the electrode for reinforcing the same along at least two of its generating lines; a plurality of recesses in each of said bars; a suspension for the electrode including a plurality of supporting members engaging said recesses, respectively; a holding suspension cylinder arranged below said supporting members and hanging from an electrode controlling winch; and resilient means arranged between said supporting members and said suspension cylinder to compensate for any unbalanced loads on said supporting members.

2. Holding device for a cylindrical Söderberg electrode, comprising in combination, a flat bar arranged in the cylindrical electrode for reinforcing the same along a generating line thereof; a plurality of recesses arranged along said bar; a supporting member displaceably arranged in a plane substantially at right angles to the longitudinal axis of the electrode and having a pointed end engaging one of said recesses; a bearing plate for said supporting member; a suspension ring arranged below said bearing plate; a suspension cylinder arranged below said suspension ring; and resilient means carrying said

suspension ring and carried by said suspension cylinder.

3. Holding device for a cylindrical Söderberg electrode, comprising in combination, a flat bar arranged in the cylindrical electrode for reinforcing the same along a generating line thereof; a plurality of recesses arranged along said bar; a supporting member displaceably arranged in a plane substantially at right angles to the longitudinal axis of the electrode and having a pointed end engaging one of said recesses; a bearing plate for said supporting member; a hole arranged in said supporting member; a screw bolt tying said supporting member to said bearing plate, said screw bolt penetrating loosely through said hole in said supporting member; means connected to said supporting member for withdrawing it from the recess engaging position when said screw bolt is loosened; a suspension ring arranged below said bearing plate; and resilient means arranged between said bearing plate and said suspension ring.

4. In an electric arc-resistance furnace, an electrode of the Söderberg type comprising a metal sheet cylinder having openings and containing an electrode mixture, said openings being arranged along at least two of the generating lines of said metal sheet cylinder; reinforcing means for said electrode arranged adjacent to said metal sheet cylinder inwardly thereof and having recesses aligned, respectively, with said openings in said metal sheet cylinder; a suspension for said electrode separate from a current carrying means and including a plurality of supporting members engaging said aligned recesses and openings; a holding suspension cylinder arranged below said supporting members and hanging from an electrode controlling winch, and resilient means carried by said suspension cylinder and carrying said supporting members to compensate for any unbalanced load on said supporting members.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,442,033	Sem et al. _____	Jan. 9, 1923
1,774,674	Sem _____	Sept. 2, 1930
1,928,854	Grolee _____	Oct. 3, 1933
2,073,356	Torchet _____	Mar. 9, 1937
2,169,563	Legeron _____	Aug. 15, 1939
2,297,484	Lehrer et al. _____	Sept. 29, 1942

FOREIGN PATENTS

Number	Country	Date
63,096	Norway _____	Jan. 6, 1941
454,584	Great Britain _____	Oct. 5, 1936