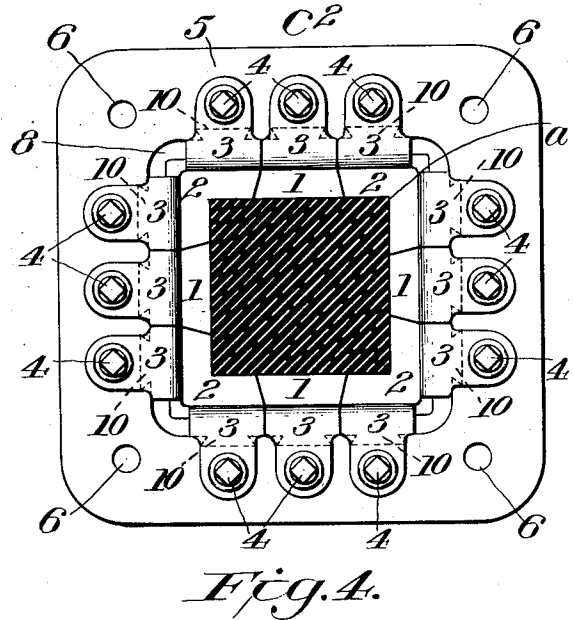
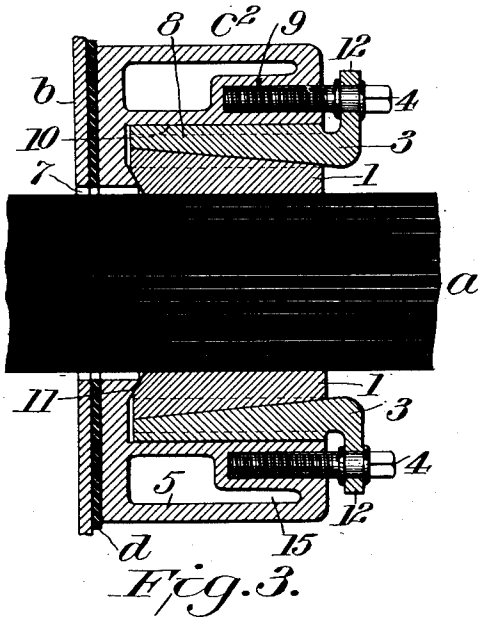
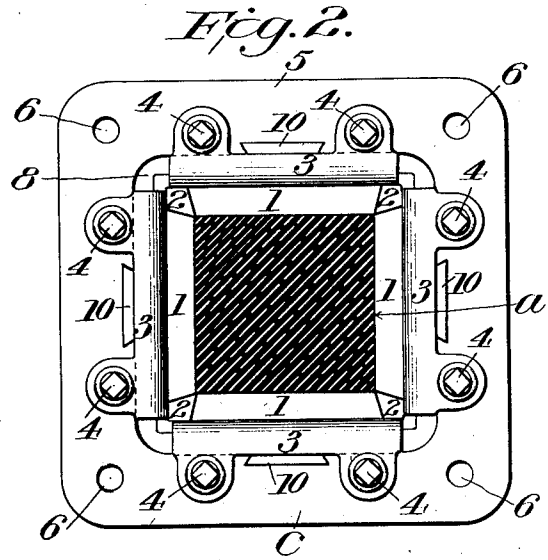
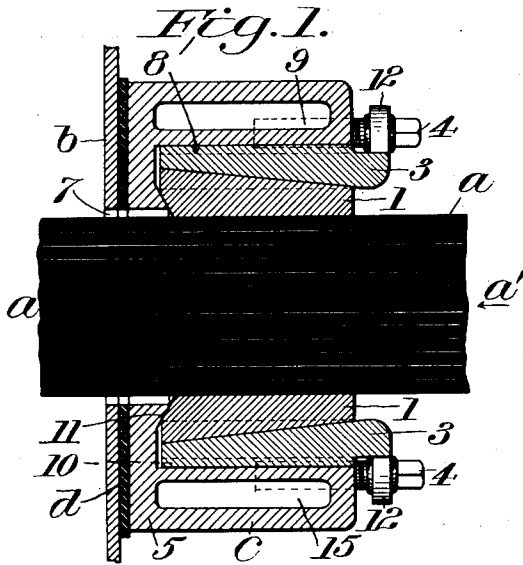


E. R. TAYLOR.
ELECTRODE COLLAR FOR ELECTRIC FURNACES.
APPLICATION FILED JAN. 17, 1911.

1,028,150.

Patented June 4, 1912.

2 SHEETS—SHEET 1.



Inventor

Edward R. Taylor

By

J. T. Walker,

Attorney.

Witnesses

W. H. Evans.

J. T. Walker.

E. R. TAYLOR.
ELECTRODE COLLAR FOR ELECTRIC FURNACES.
APPLICATION FILED JAN. 17, 1911.

1,028,150.

Patented June 4, 1912.

2 SHEETS—SHEET 2.

Fig. 5.

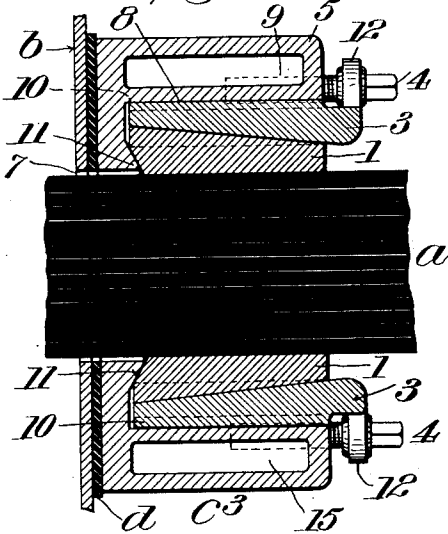


Fig. 6.

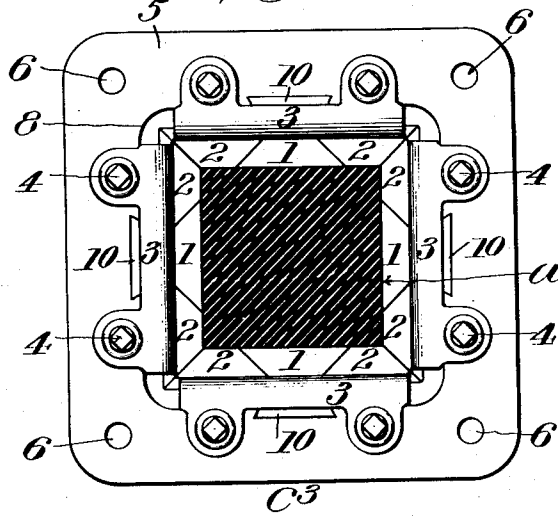


Fig. 7.

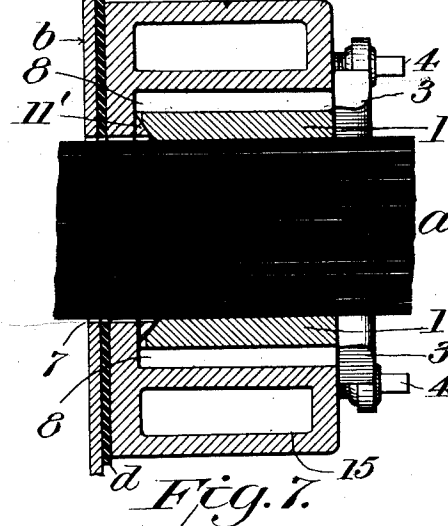


Fig. 8.

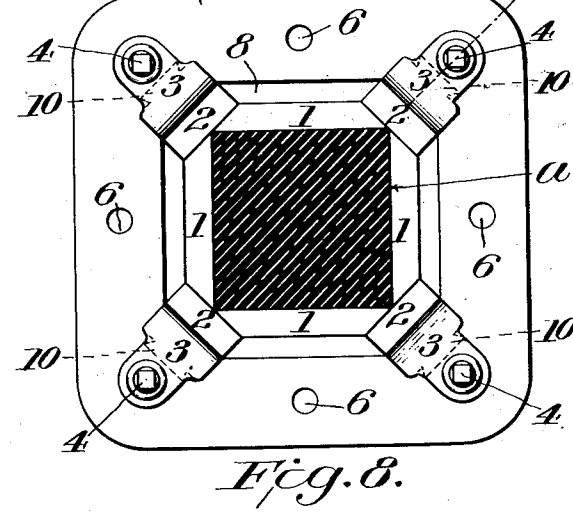
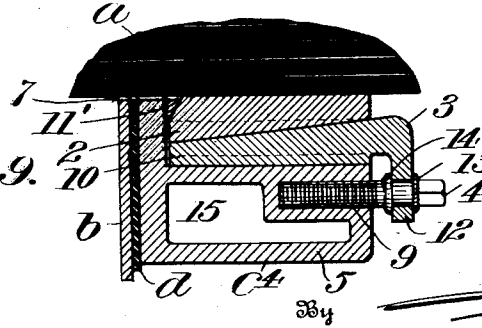


Fig. 9.



Inventor

Edward R. Taylor

Attorney.

Witnesses
W. H. Evans

J. T. Walker.

UNITED STATES PATENT OFFICE.

EDWARD R. TAYLOR, OF PENN YAN, NEW YORK.

ELECTRODE-COLLAR FOR ELECTRIC FURNACES.

1,028,150.

Specification of Letters Patent.

Patented June 4, 1912.

Application filed January 17, 1911. Serial No. 603,059.

To all whom it may concern:

Be it known that I, EDWARD R. TAYLOR, a citizen of the United States of America, and a resident of Penn Yan, in the State of New York, have invented a new and useful Improvement in Electrode-Collars for Electric Furnaces, of which the following is a specification.

This invention relates to those electric furnaces in which endwise movable "stemless" electrodes, square in cross section, are employed; especially horizontal or inclined electrodes, hereinafter referred to in common as "horizontal" electrodes.

Primarily this invention is additional to an improvement in electric smelting furnaces set forth in my previous specification forming part of an application for United States Letters Patent filed July 7, 1910, and allowed July 27, 1910, Serial No. 570,836; (Patent No. 985,226, dated February 28, 1911) hereinafter referred to as my companion specification.

The leading objects of the present invention are to provide for closing the electrode-admitting opening in the furnace shell around each electrode against the entrance of air and the escape of gas; and to provide, if desired, for the transmission of the electric current by the same means.

Other objects will be set forth in the general description which follows:

Two sheets of drawings accompany this specification, as part thereof.

Figures 1 and 2 are respectively a central longitudinal section and a face view of an electrode collar constructed in accordance with the present invention; Figs. 3 and 4 are like views illustrating a second species of the same invention; Figs. 5 and 6 are like views illustrating a third species; Figs. 7 and 8 are like views illustrating a fourth species; and Fig. 9 is a fragmentary section in a diagonal plane on the line z , Fig. 8.

Like reference characters refer to like parts in all the figures.

A stemless electrode of carbon, square in cross section, and periodically movable endwise by suitable means, to take up wear, is represented at a ; the iron shell of an electric furnace at b ; metallic electrode collars at c , c^2 , c^3 and c^4 , respectively; and an interposed layer of suitable insulation at d . Each of said electrode collars includes a

sufficient number of movable sections of different patterns or proportions, represented respectively at 1, 2 and 3; means for tightening such sections and for retracting the same to free the electrode, in the form of screws, 4, parallel with the electrode; and a rectangular frame, 5, which may be an iron casting, constructed to interact with said sections, and to be fixedly attached to the furnace shell by insulated bolts, represented by bolt holes, 6, in the face views, and further insulated from the shell by said insulation d . The movable sections 1, 2 and 3, jointly, in each species, are adapted to maintain the required contacts with the several sides and angles of the electrode a , with the frame 5 and with each other, under different adjustments.

In each species a rectangular electrode admitting opening, 7, is common to the furnace shell b , the collar frame 5 and the interposed insulation d ; the frame 5 is further constructed with a deep face recess, 8, having four sides parallel with those of said opening, 7, and with the sides of the electrode a ; screw sockets, 9, are provided to interact with the several screws 4; the several movable sections 3 which contact with said screws are held to said recess sides or to corresponding walls of the face recess by dovetailed guides, 10, so as to move parallel with the electrode; said movable sections 3, hereinafter referred to as the outer sections, and the inner movable sections 1, and 2, respectively, are constructed with wedging inclines which constitute their adjoining longitudinal surfaces; the other longitudinal surfaces of said inner sections 1 and 2 are straight; the inner ends of the several inner sections are beveled to interact with a beveled collar, 11 or 11', within said face recess, to make an air and gas-tight closure around the electrode admitting opening 7, the bevels being so formed as to loosen said sections should they be carried with the electrode in the feeding operation represented by the arrow a' , Fig. 1; the outer sections 3 are provided on the back of each at its outer end with a rigid lug 12 or a pair of such lugs; each of the screws 4 is constructed with a squared outer end, and with parallel collars 13 and 14, Fig. 9, adjacent thereto to interact with said lugs 12; and a cooling chamber, 15, is conveniently formed in the frame 5 around said face recess 8 to provide

for cooling the movable sections 1, 2 and 3, and the screws 4.

In the species represented by Figs. 1 and 2 there are four of each of said movable sections; the inner sections 1 and 2 are respectively side pieces, 1, and corner pieces, 2, fitted to each other and to an electrode of specific dimensions in cross section; the outer sections 3 each interact with a pair of the screws 4; and the beveled collar 11 within the face recess 8 is integral with the back of the frame 5.

In the species represented by Figs. 3 and 4, the electrode collar, c^2 , includes eight of the inner sections 1 and 2; four of the same being side pieces 1, and four corner-embracing pieces 2; there are twelve outer sections 3, three at each side of the face recess 8, with a screw 4 to each outer section; and two outer sections interact with each corner-embracing piece 2 of the inner sections so as to provide a better contact with the electrode corners or angles. Otherwise the construction may be the same as already described.

In the species represented by Figs. 5 and 6, the electrode collar, c^3 , includes twelve of the inner sections 1 and 2, having adjoining bevels, the planes of which are diagonal to the electrode at its several angles, and elsewhere at right angles and parallel to such diagonal bevels, as shown in Fig. 6. Otherwise the construction may be identical with that of the first species, Figs. 1 and 2; including four outer sections 3, and eight of the screws 4.

In the electrode collar c^4 , represented by Figs. 7, 8 and 9, there are four of each of the movable sections 1, 2 and 3, and the inner sections consist of side pieces 1 and corner pieces 2, as in the first species, Figs. 1 and 2; but the faces of the corner pieces 2 are at right angles to the diagonals of the electrode, and contact with matching bevels on the side pieces; the outer sections 3 are arranged behind the several corner pieces 2 as above described, and within corner extensions of the face recess 8; the screws 4 are reduced to four in number; the dovetailed guides 10 are located within such corner extensions, as shown in dotted lines in Figs. 8 and 9, and the beveled collar, 11', is a separate part to facilitate giving it any required bevel at the inner end of each of the movable sections or such as require this provision.

The electrode collar, in any of its forms may, if desired, be adapted for the connection of the current conductors in the manner set forth in said companion specification forming part of said patent application Serial No. 570836, (Patent No. 985,226) or in any known or improved way; each of the movable parts may have more or less movement as required, and other like modi-

fications will suggest themselves to those skilled in the art.

The interior of the collar at and in the vicinity of the beveled collar 11 or 11' may be coated with a suitable clay wash immediately before tightening the movable sections to insure air-tight and gas-tight joints; and if the collar is to be used for the transmission of the current to the electrode, the sides of that portion of the electrode which is to be embraced by the collar may be coated with carbon cement to insure the required perfect contact at all points.

Having thus described said improvement, I claim as my invention and desire to patent under this specification:

1. The combination with a stemless furnace electrode rectangular in cross section, especially a square horizontal electrode, of an air-tight and gas-tight electrode collar adapted to be fixedly attached to the furnace and composed of a frame constructed with an electrode-admitting opening, and a face recess surrounding said opening, movable sections arranged within said recess and longitudinally with reference to the electrode and constructed to contact with the several sides and angles of the electrode, with the frame and with each other, and means including rotatable longitudinal screws for tightening the movable sections and retracting them to free the electrode.

2. An electrode collar adapted to be attached to and insulated from the shell of an electric furnace and to interact with an electrode square in cross section; said collar having, in combination, a metallic frame constructed with an electrode admitting opening and a face recess surrounding said opening, inner movable sections within said recess constructed and arranged to contact with the electrode and with each other and having longitudinal wedging inclines on their backs, endwise movable outer sections having wedging inclines in contact with those of said inner sections, and means for moving said outer sections endwise to tighten or loosen said inner sections around the electrode.

3. An electrode collar adapted to be attached to and insulated from the shell of an electric furnace, and to interact with an electrode square in cross section; said collar having, in combination, a metallic frame constructed with an electrode admitting opening and a face recess surrounding said opening, movable sections within said recess constructed and arranged to contact with the electrode and with each other to prevent the entrance of air and the escape of gases through said opening, said sections including endwise movable wedging sections, and said frame and wedging sections being constructed with the respective members of a dovetailed guide for each of these

sections, and means for moving these sections endwise to tighten or loosen the movable sections of the collar as required.

4. An electrode collar adapted to be
5 attached to and insulated from the shell of
an electric furnace, and to interact with an
electrode square in cross section; said collar
having, in combination, a metallic frame
constructed with an electrode admitting
10 opening and a face recess surrounding said
opening, inner movable sections within said
recess constructed and arranged to contact
with the electrode and with each other and
having longitudinal wedging inclines on
15 their backs, endwise movable outer sections
having wedging inclines in contact with
those of said inner sections, said frame and
outer sections being constructed with the re-
spective members of a dove-tailed guide for
20 each of the outer sections, and means for
moving these outer sections endwise to
tighten or loosen said inner sections around
the electrode.

5. An electrode collar adapted to be
25 attached to and insulated from the shell of
an electric furnace, and to interact with an
electrode square in cross section; said collar
having, in combination, a metallic frame
constructed with an electrode admitting
30 opening and a face recess surrounding said
opening, and provided within said recess
and around said opening with a beveled
collar, inner movable sections within said
recess constructed and arranged to contact
35 with the electrode and with each other and
having longitudinal inclines on their backs
and bevels at their inner ends, endwise mov-
able outer sections having longitudinal in-
clines in contact with those of said inner
40 sections, and means for moving these outer
sections endwise to tighten or loosen said
inner sections around the electrode; said
bevels of the inner sections being constructed
and arranged to contact with said beveled
45 collar around the electrode admitting open-
ing.

6. An electrode collar adapted to be
attached to and insulated from the shell of
an electric furnace, and to interact with an
50 electrode square in cross section; said collar
having, in combination, a metallic frame
constructed with an electrode admitting
opening, a face recess surrounding said
opening and screw sockets in the face of the
55 frame around said recess, movable sections
within said recess constructed and arranged
to contact with the electrode and with each
other and including endwise movable wedg-
ing sections, said frame and said wedging
60 sections being constructed with the respec-
tive members of a dovetailed guide for each
of these sections parallel to the respective
screw sockets, and screws fitted to said
sockets and constructed and arranged to
65 operate said wedging sections as required.

7. An electrode collar adapted to be
attached to and insulated from the shell of
an electric furnace, and to interact with an
electrode square in cross section; said col-
lar having, in combination, a metallic frame
70 constructed with an electrode admitting
opening, a face recess surrounding said
opening and screw sockets in the face of
the frame parallel to the electrode, inner
movable sections within said recess con-
75 structed and arranged to contact with the
electrode and with each other and having
longitudinal wedging inclines on their
backs, endwise movable outer sections hav-
ing wedging inclines in contact with those
80 of said inner sections, said frame and outer
sections being constructed with the respec-
tive members of a dovetailed guide for each
of these outer sections, and screws fitted to
said sockets; said outer sections and screws
85 being constructed and arranged to coop-
erate in tightening or loosening said inner
sections around the electrode.

8. An electrode collar adapted to be at-
tached to and insulated from the shell of
90 an electric furnace, and to interact with an
electrode square in cross-section; said collar
having, in combination, a metallic frame
constructed with an electrode admitting
opening and a face recess surrounding said
95 opening, and provided within said recess
and around said opening with a beveled col-
lar, operating screws fitted to said sockets,
inner movable sections within said recess
constructed and arranged to contact with
100 the electrode and with each other and hav-
ing longitudinal wedging inclines on their
backs and bevels at their inner ends, the lat-
ter constructed and arranged to contact with
said beveled collar, and endwise movable
105 outer sections having longitudinal wedging
inclines in contact with those of said inner
sections and constructed and arranged to co-
operate with said screws in tightening or
loosening said inner sections around the
110 electrode.

9. An electrode collar adapted to be at-
tached to and insulated from the shell of
an electric furnace, and to interact with an
115 electrode square in cross section; said col-
lar having, in combination, a metallic frame
constructed with an electrode-admitting
opening and a face recess surrounding said
opening, movable sections within said re-
cess constructed and arranged to contact
120 with the electrode and with each other and
including side pieces and corner pieces con-
structed and arranged respectively to con-
tact with the several sides of the electrode
and with its angles, and means for operat-
125 ing said sections to tighten or loosen the
same around the electrode as required.

10. An electrode collar adapted to be at-
tached to and insulated from the shell of an
electric furnace, and to interact with an elec- 130

trode square in cross section; said collar having, in combination, a metallic frame constructed with an electrode admitting opening and a face recess surrounding said opening, inner movable sections within said recess constructed and arranged to contact with the electrode and with each other and including side pieces and corner pieces constructed and arranged respectively to contact with the several sides of the electrode and with its angles and having longitudinal wedging inclines on their backs, endwise movable outer sections having wedging inclines in contact with those of said inner sections, said frame and outer sections being constructed with the respective members of a dovetailed guide for each of these outer sections, and means for moving these outer sections endwise to tighten or loosen said side pieces and corner pieces around the electrode.

11. An electrode collar adapted to be attached to and insulated from the shell of an electric furnace, and to interact with an electrode square in cross section; said collar having, in combination, a metallic frame constructed with an electrode-admitting opening, a face recess surrounding said opening and screw sockets in the face of the frame parallel to the electrode, operating screws fitted to said sockets, inner movable sections within said recess constructed and arranged to contact with each other and including side pieces and corner pieces constructed and arranged respectively to contact with the several sides of the electrode and with its angles and having longitudinal wedging inclines on their backs, and

endwise movable outer sections having longitudinal wedging inclines in contact with those of said side pieces and corner pieces and constructed and arranged to cooperate with said screws in tightening or loosening the inner sections around the electrode.

12. An electrode collar adapted to be attached to and insulated from the shell of an electric furnace, and to interact with an electrode square in cross section; said collar having, in combination, a metallic frame constructed with an electrode-admitting opening, a face recess surrounding said opening and screw sockets in the face of the frame parallel to the electrode, operating screws fitted to said sockets, inner movable sections within said recess constructed and arranged to contact with each other and including side pieces and corner pieces constructed and arranged respectively to contact with the several sides of the electrode and with its angles and having longitudinal wedging inclines on their backs, and endwise movable outer sections having longitudinal wedging inclines in contact with those of said side pieces and corner pieces and constructed and arranged to cooperate with said screws in tightening or loosening the inner sections around the electrode; said frame and outer sections being further constructed with the respective members of a dovetailed guide for each of the outer sections parallel to the respective screws; substantially as hereinbefore specified.

EDWARD R. TAYLOR.

Witnesses:

H. J. MACNAUGHTON,
H. P. MORGAN.