No. 897,203. PATENTED AUG. 25, 1908.

J. HÄRDÉN.

ELECTRIC FURNACE.

APPLICATION FILED MAY 8, 1908.

2 SHEETS—SHEET 1.

Fig. 1.

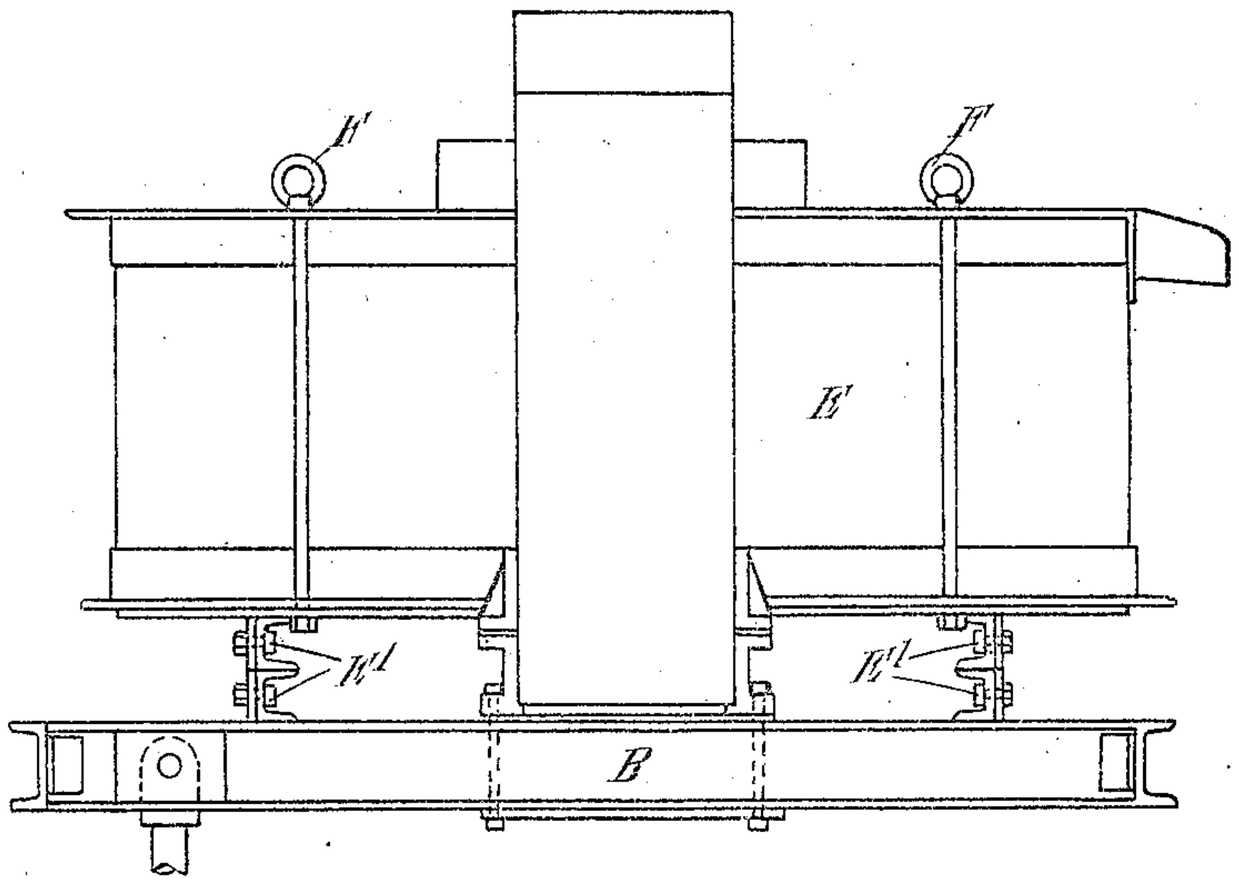
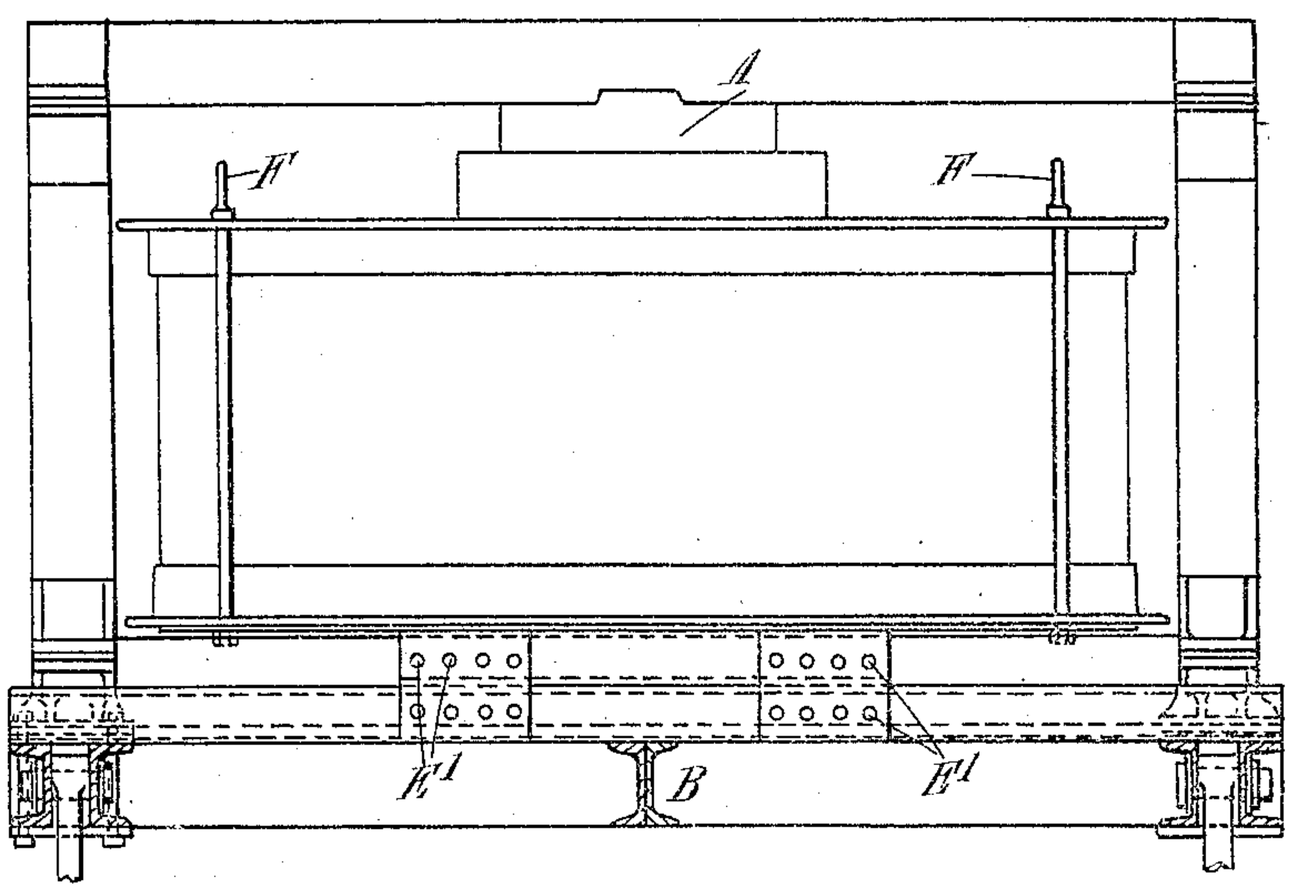


Fig. 2.



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2 SHEETS—SHEET 2.

Fig. 3.

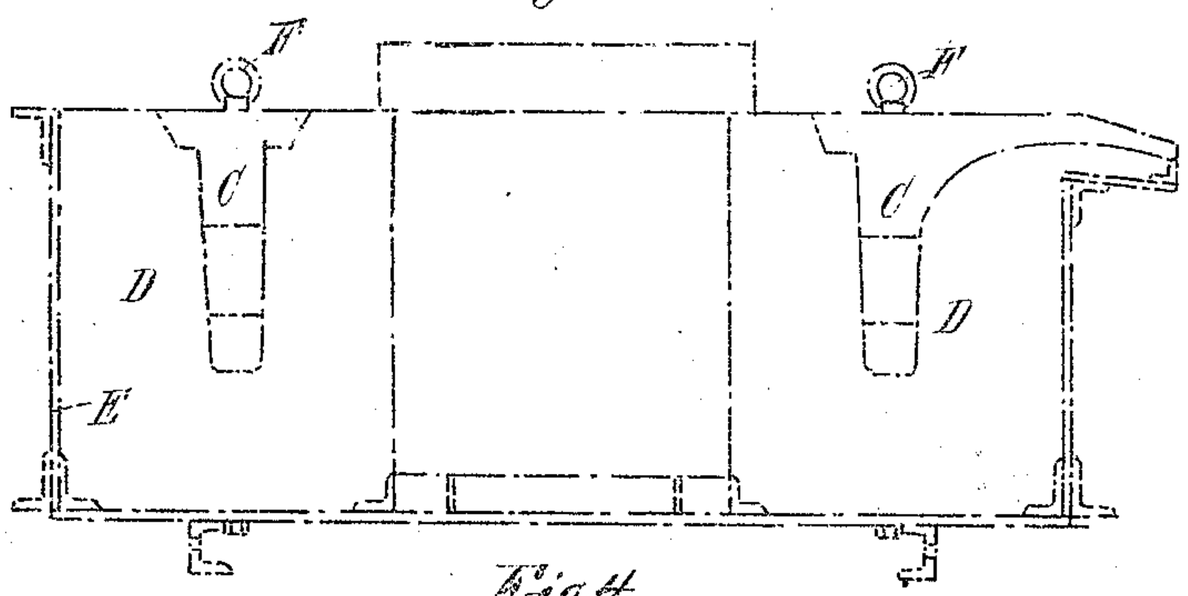
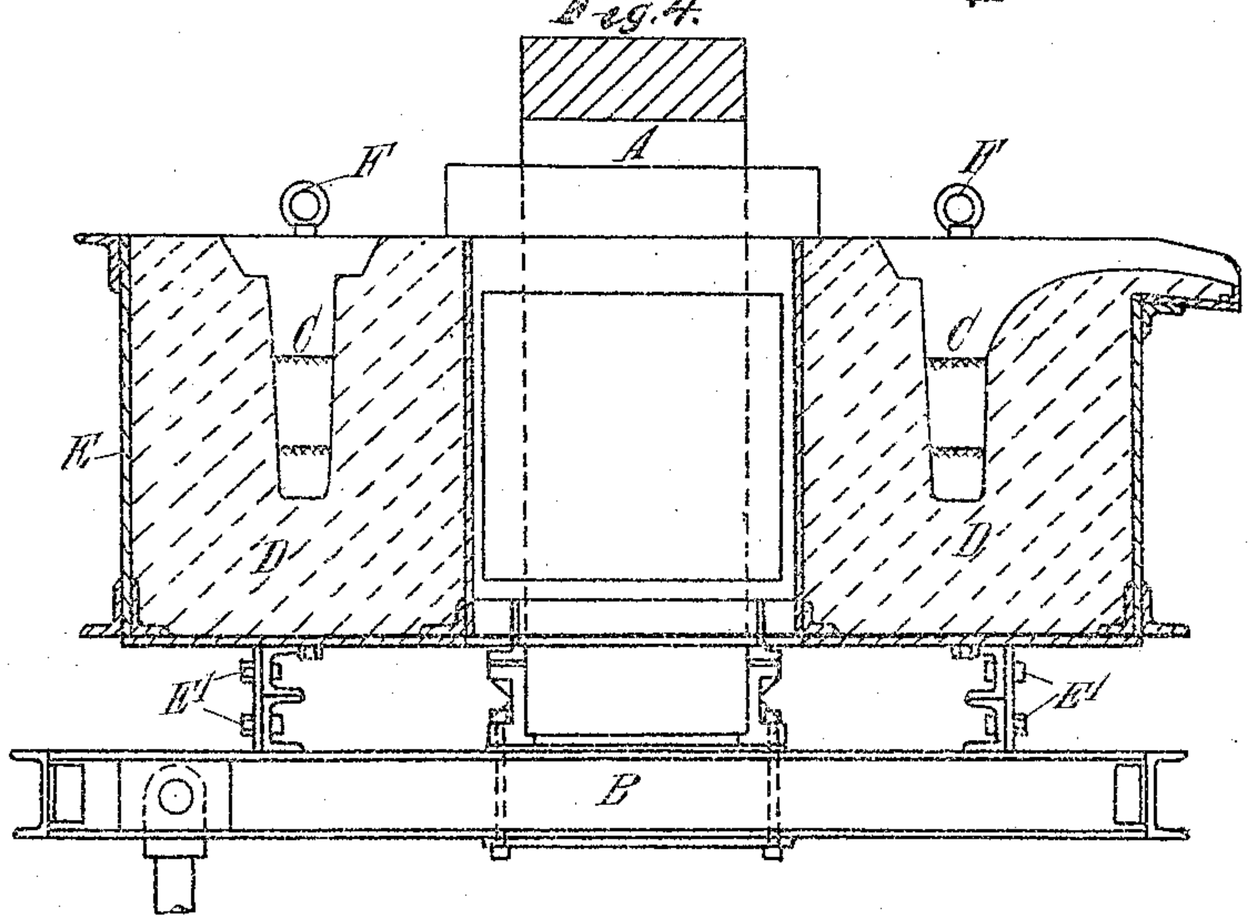


Fig. 4.



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UNITED STATES PATENT OFFICE.

JOHANNES HÄRDÉN, OF LONDON, ENGLAND, ASSIGNOR TO THE GRÖNDAL KJELLIN COMPANY LIMITED, OF LONDON, ENGLAND.

ELECTRIC FURNACE.

No. 897,203. Specification of Letters Patent. Patented Aug. 25, 1908.

Application filed May 8, 1908. Serial No. 431,707.

To all whom it may concern:

Be it known that I, JOHANNES HÄRDÉN, a subject of the King of Sweden, residing at 20 Abchurch Lane, in the city of London, England, have invented certain new and useful Improvements Relating to Electric Furnaces, of which the following is a specification.

This invention relates to electric furnaces of the induction type comprising an annular fusion chamber surrounding one limb or member, termed the core, of an iron frame, the primary winding being wound thereon, and the material in said fusion chamber serving as the secondary winding. The lining of these fusion chambers needs to be frequently repaired, and for this purpose it has been usual to suspend operations for several days to allow the relining material to mature, harden, and dry slowly; otherwise the walls crack and are soon destroyed. Thus the whole furnace and auxiliary plant is rendered idle until the new lining is ready for use, and consequently the economy of the furnace is considerably impaired. To overcome this defect it has been proposed to use a primary winding common to two or more fusion chambers, so that said winding serves as the primary for any one of the chambers while one or more of the remainder are being repaired. Such an arrangement, however, necessitates the two or more fusion chambers being made definite parts of the furnace. The chief object of the present invention is to obviate the disadvantages above stated.

According to this invention the furnace is provided with a removable hearth or lining, so that when repairs become necessary the furnace charge may be run off into a ladle or other contrivance and contained therein while a fresh hearth or lining is being substituted for the defective one. The latter may then be repaired at leisure.

In order that the said invention may be clearly understood and readily carried into effect, I will describe the same more fully with reference to the accompanying drawings, in which:—

Figures 1 and 2 are elevations taken at right angles to each other, and Fig. 3 is a vertical section in dotted lines of one form of furnace constructed according to this invention. Fig. 4 is a vertical longitudinal section through a furnace constructed according to the present invention, a tilting support being shown in connection therewith.

A is the central limb or core of an iron frame closed upon itself, the said core having the primary coil of the furnace wound thereon, and B is the bed or framework on which the furnace stands.

C is the annular fusion chamber in which the charges are placed.

The hearth or lining D is built or stamped in a metallic or other suitable casing E, which is independent of the other parts of the furnace and attached to the main body or framework thereof in any appropriate manner, as for example by bolts E′.

The casing E may be provided with lifting hooks F or other appropriate means so that it, together with the hearth or lining D, can be lifted from the body of the furnace (as shown in dotted lines in Fig. 3) by means of a crane or otherwise, and a spare one put in its place without any appreciable delay, thus greatly increasing the working efficiency of the furnace and its auxiliary plant.

When a damaged hearth or lining is about to be removed, the molten material in it may be transferred to a ladle, gas heated furnace, or other contrivance for keeping the material hot, and contained therein during the act of substituting a spare casing and lining; the said molten material may then be run into the spare lining and thus obviate the necessity of restarting the furnace by means of iron rings as is now usual, but is objectionable owing to the tendency of the said rings to break. The spare casing with its lining may be heated, previous to the transference of the molten material from the gas-heated furnace or other contrivance, by means of coke, gas-jets, or charcoal, and thus prevent the temperature of the lining from becoming changed too suddenly. By the use of removable hearths or linings as hereinbefore described, great economy in working is obtained as regards time, labor and material, and the output of the plant is materially increased.

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

1. In an electric induction furnace, an iron frame, a primary coil positioned thereon, an annular fusion chamber surrounding one limb of said frame, a housing for said fusion cham-

ber, a movable support for supporting said housing, means for securing said housing to said support, and means for removing said housing and fusion chamber off said support and from said frame.

2. In an electrical induction furnace, an iron frame, a primary coil mounted thereon, an annular fusion chamber surrounding one limb of said frame, a housing for said fusion chamber, an angle iron surrounding the upper edge of said housing for bracing the same, angle irons surrounding said housing on the lower edge thereof upon the exterior and interior periphery thereof, a pair of braces secured to said housing and acting as supports therefor, a tilting support, means for securing said first mentioned supports rigidly to said tilting support, and means for removing said housing and said fusion chamber when said securing means have been removed.

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

JOHANNES HÄRDÉN.

Witnesses:

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ERNEST H. ROBERTS.