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E. SCHIEGRIES ET AL.
FITTINGS FOR METALLURGICAL FURNACES.
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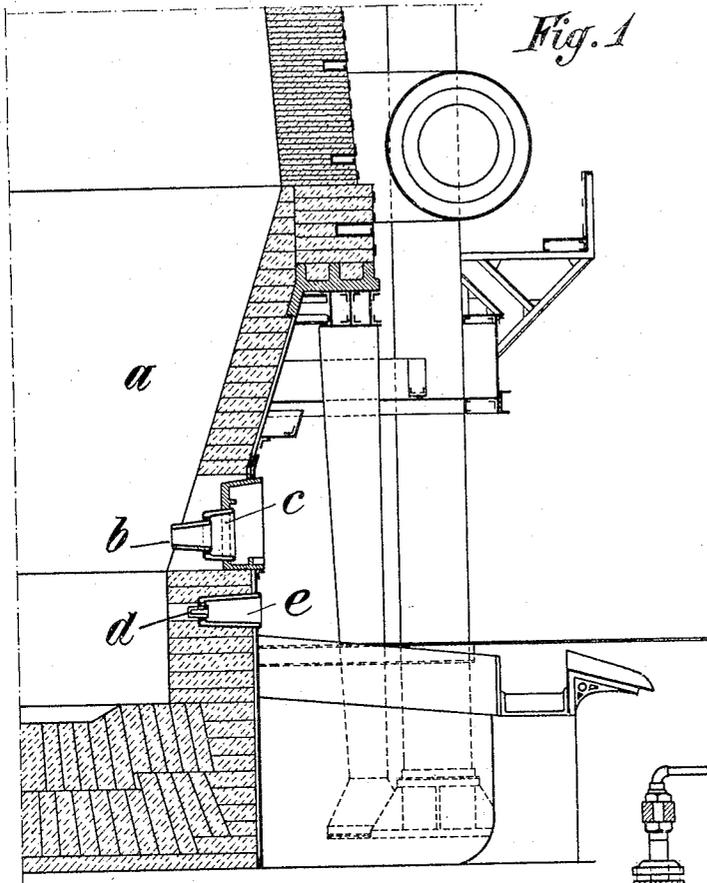


Fig. 1

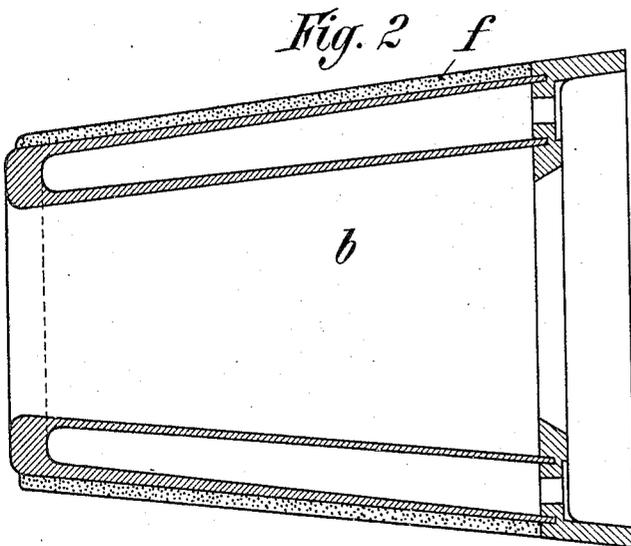


Fig. 2

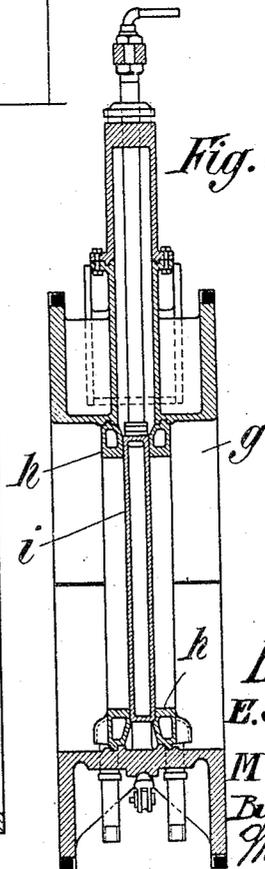


Fig. 3

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UNITED STATES PATENT OFFICE.

EDUARD SCHIEGRIES AND MAX PASCHKE, OF DUISBURG-MEIDERICH, GERMANY.

FITTINGS FOR METALLURGICAL FURNACES.

Application filed May 12, 1922. Serial No. 560,387.

To all whom it may concern:

Be it known that we, EDUARD SCHIEGRIES and MAX PASCHKE, both subjects of Germany, and residing at Duisburg-Meiderich, have invented certain new and useful Improvements in or Relating to Fittings for Metallurgical Furnaces, of which the following is a specification.

Our invention relates to improvements in fittings for metallurgical furnaces, and the object of the improvements is to provide fittings which greatly resist the action of heat and chemicals, which can be manufactured at comparatively low cost, and which can easily be handled. With this object in view our invention consists in making the fittings of metallurgical furnaces and their auxiliary apparatus and devices, which hitherto have been made of copper or bronze, of aluminium or its alloys. Aluminium or its alloys have the following advantages, over copper or bronze.

The outer surfaces of the aluminium or of its alloys are oxidized. Fittings subjected to oxidizing influences when in use on blast furnaces for instance, become of course self-oxidized, but otherwise oxidation must be artificially obtained, for instance by treating the fittings with dilute nitric acid or by directing upon them a blast of highly heated air. The layer of oxide greatly resists the action of heat and of chemicals.

The low specific gravity of aluminium as compared with that of copper or bronze lowers the cost of the fittings by about two-thirds.

The handling of the fittings is rendered extremely easy.

With reference to the advantage set forth above, the invention can be used in metallurgy whenever the fittings are under high temperatures, more particularly in blast furnaces and their auxiliary parts, such as blast tuyers and their protective casing, slag tuyers and casing, cooling plates and cooling beams, cooling boxes, hot blast valves and the like.

The resistance to heat is increased by covering those parts of the fittings facing the fire with a plastic material the chief component of which is clay, before they are set in position. Experiments have shown that when in service the surfaces of aluminium and clay in contact become so intimately cemented to each other that a de-

struction of the aluminium by mechanical or chemical action or by the heat appears to be almost precluded.

Experiments have furthermore shown that the resistance of the fittings to the actions just mentioned (and more particularly chemical action) increases with the density of the materials used in the manufacture of the said fittings. An alloy of about 8% copper and 92% aluminium has proved particularly suitable as regards density and cost. Density may of course be increased by means of other alloys, the cost of which is however higher than the above.

In order that our invention be more clearly understood several examples embodying the same have been shown in the accompanying drawing, in which the same letters of reference have been used in all the views to indicate corresponding parts. In said drawing,

Fig. 1, is a vertical cross-section showing one side of the lower part of a blast furnace,

Fig. 2, is a longitudinal section of a blast tuyer, and

Fig. 3, is a sectional view showing a hot blast valve.

As shown in Fig. 1, the blast furnace *a* is provided with blast tuyers *b* and casings *c* therefor, and a slag tuyer *d* and its casing *e*, which parts are made from aluminium or suitable alloys thereof, a preferred alloy being the one containing about 8 per cent of copper and 92 per cent of aluminium. Preferably the said parts are coated with clay which when heated is intimately cemented to the fitting and provides a bar against the injurious influence of heat and chemicals. Fig. 2 shows the blast tuyer *b* having a coating of clay *f*.

In Fig. 3 we have shown a hot blast valve comprising a tubular casing *g*, valve seats *h* in the form of rings fitted within the casing *g*, and the valve body *i*. The rings *h* and the valve body *i* are made from aluminium or a suitable alloy thereof.

We claim:

1. Integral water cooling fittings for metallurgical furnaces made from a material containing metallic aluminium.
2. Integral water cooling fittings for metallurgical furnaces made from an aluminium alloy.
3. Integral water cooling fittings for metallurgical furnaces made from a material

containing metallic aluminium and having an oxidized surface.

4. Integral water cooling fittings for metallurgical furnaces made from a material containing metallic aluminium and having a coating of clay.

5. Twyers for metallurgical furnaces made from a material containing metallic aluminium.

10 6. Twyers for metallurgical furnaces made from an aluminium alloy.

7. Twyers for metallurgical furnaces made from a material containing metallic aluminium and having an oxidized surface.

8. Twyers for metallurgical furnaces made from a material containing metallic aluminium and having a coating of clay.

In testimony whereof we hereunto affix our signatures.

EDUARD SCHIEGRIES.
MAX PASCHKE.