Jan. 24, 1933. E. F. BEGTRUP 1,895,219

MEANS FOR DRYING MOLD COPES

Filed April 9, 1932 2 Sheets-Sheet 1

Fig. 1

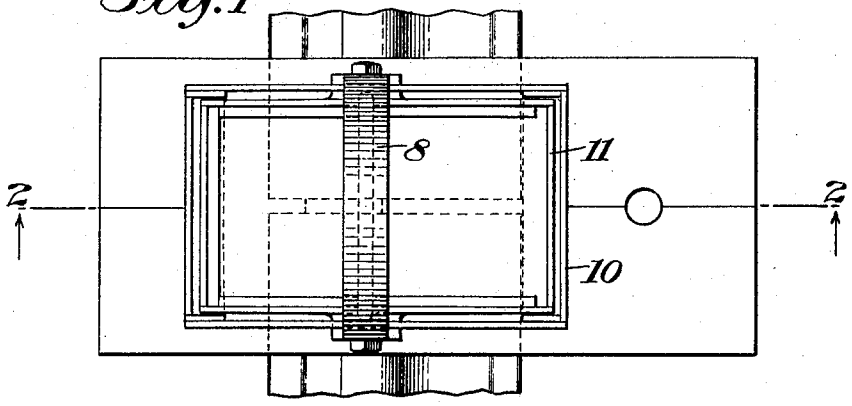
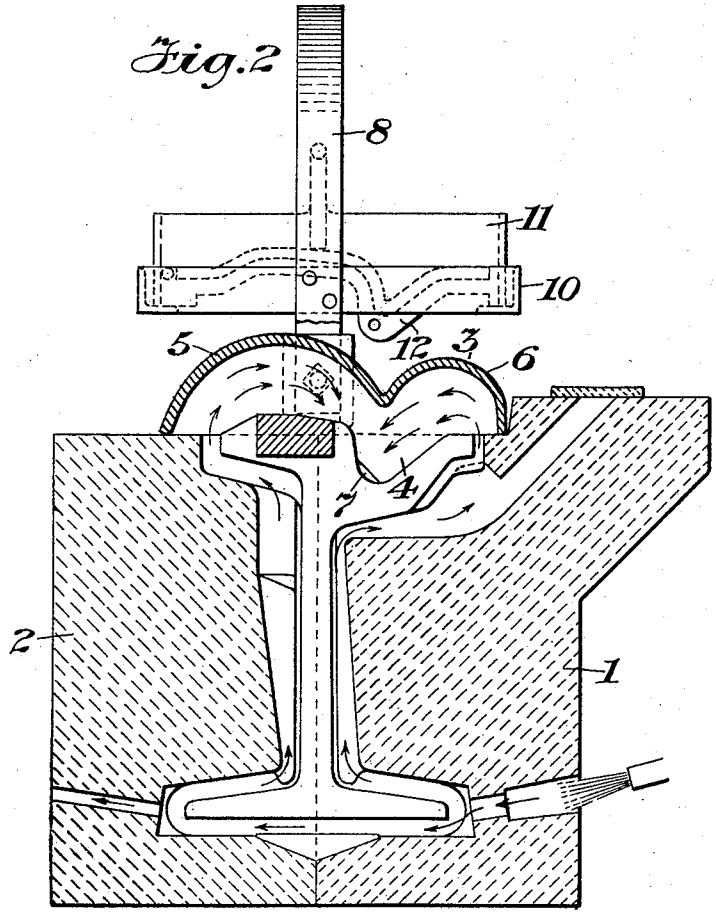


Fig. 2



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Filed April 9, 1932 2 Sheets-Sheet 2

Fig. 3

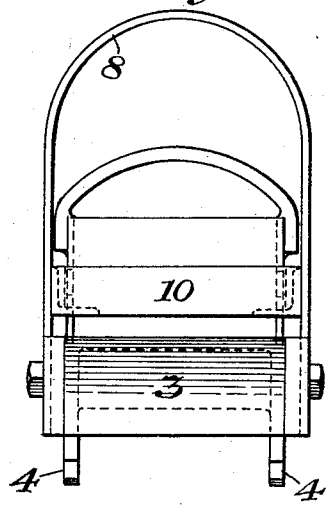


Fig. 4

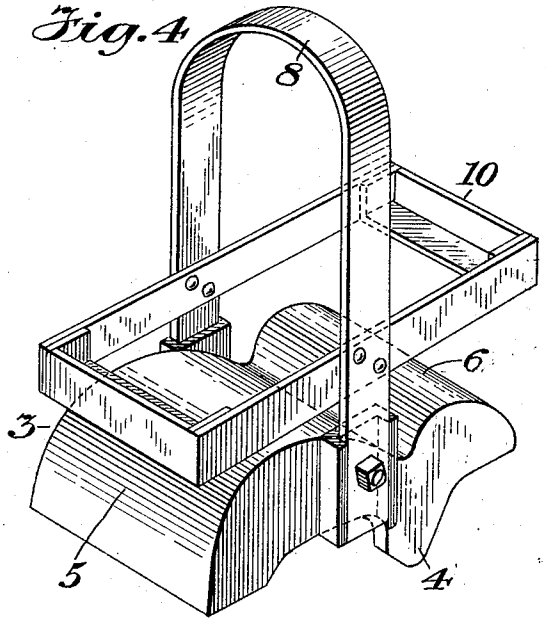
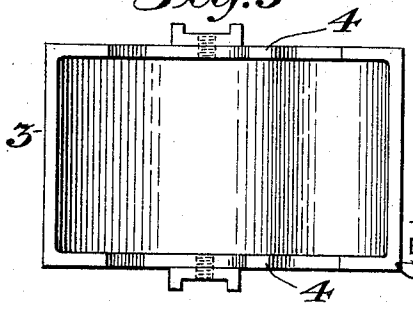


Fig. 5



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UNITED STATES PATENT OFFICE

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MEANS FOR DRYING MOLD COPES

Application filed April 9, 1932. Serial No. 604,206.

The invention relates to certain improvements in the welding of railway rails and the like by the aluminothermic or analogous process, which includes the enclosing of the rail ends in a mold of refractory material to receive the superheated molten metal which effects the weld, the mold, when employed in the application of the method without interrupting traffic, usually comprising a longitudinally divided lower mold section and a cope section adapted to be applied to the lower section; the instant invention having for its object an improved means for effecting the drying and curing of the cope section by the otherwise waste heat during the usual preheating of the mold and enclosed rail ends.

In a companion application, there is described a novel form of hood designed to accelerate the preheating of the rail heads and to effect a material economy in time and fuel, and the present invention contemplates the association with a hood, preferably of the type referred to, of means for supporting the refractory cope member of the mold immediately above the hood and close enough to be within the zone of radiated heat from the heated hood, so that the refractory material of the cope will be effectively dried and preheated ready for application to the body of the mold immediately prior to the pouring or teeming of the superheated molten metal into the mold to effect a weld.

The invention is illustrated in the accompanying drawings, in which:—

Fig. 1 is a plan view of a typical mold applied to the welding of girder or trilby rails having the hood and the cope support applied thereto.

Fig. 2 is a sectional elevation on line 2—2 of Fig. 1, the cope support and bail being shown in full elevation.

Fig. 3 is a side elevation of the hood and cope support.

Fig. 4 is a perspective view thereof.

Fig. 5 is a bottom plan view of the hood.

In alumino-thermic rail welding without interruption to traffic, it has been customary to use a three part mold, the lower portion of which comprises two halves designed to enclose the rail ends to substantially the level of the tread surfaces of the rails, so as to leave the tread and the gauge faces or the flanges of the rails free, whereby the wheels of traffic may pass over the applied mold without contacting the latter. The lower mold sections are provided with the usual cavities to receive the molten metal which effects the welding together of the rail ends. The refractory cope or complementary mold section is formed to fit the contour of the tops of the rail ends and to engage the upper faces of the lower mold sections to complete the enclosing of the rail ends.

During the preheating of the rail ends by means of hot gases introduced into the mold, by means of a blow torch or similar apparatus, the lower mold sections become thoroughly baked and dried, but the upper or cope section cannot be effectively dried or baked during the preheating of the rail ends, because of the necessity of frequently removing the cope section to permit passage of traffic. Furthermore, the preheating of the rail ends may be greatly facilitated and expedited by the substitution of a reflecting hood for the refractory cope, which will have the effect of directing the products of combustion downward against the rail heads before said products are vented, preferably, along the faces of the rail heads. It is, therefore, regarded as uneconomical and impracticable to effect the preheating of the mold with the cope in position. The welder is, therefore, confronted with the problem of separately drying the refractory cope, because, for best results in rail welding operations, it should be completely dry when it is finally applied to the lower mold sections and the superheated molten metal is poured to effect the weld. It has, therefore, been customary either to bake the refractory copes in suitable ovens or furnaces removed from the rail welding operations and apparatus, or to be satisfied with mediocre and some times unsatisfactory results by placing the cope in position upon the mold for short periods during the preheating operations in an attempt to effect at least a surface drying of the refractory material of the mold.

The present invention contemplates the

provision of means for effectively preheating the rail ends and the lower sections of the mold with a minimum expenditure of time and preheating fuel and simultaneously to effect the drying and preheating of the cope sections, thereby eliminating the use of separate ovens and furnaces heretofore employed for the latter operations, when the best results were sought, and these means are exemplified in the accompanying drawings as applied to a mold for effecting the alumino-thermic welding of girder or trilby rails.

In Fig. 2 of the drawings, 1 and 2 indicate the lower mold sections, which contain the usual joint defining cavities about the base, web and under faces of the rail heads, the mold sections extending to substantially the level of the tread and flange surfaces of the heads and the mold cavity opening through the top of the mold sections adjacent the rail heads. Spanning the opening in the top of the body of the mold is a hood 3, comprising perpendicular side walls 4, the lower edges of which conform to the top of the mold and to the upper faces of the rail heads, except for cut away portions adjacent the heavier portions of the rail heads to form vents 7. The top and side walls of the hood are formed by double arches 5 and 6, the lower edges of which contact the top of the mold, the two arches meeting above and in substantial alignment with the rail heads. Secured to the side walls 4 of the hood is a bail 8, which serves as a convenient means for applying and removing the hood, and fastened to the vertical legs of this bail is a rectangular rack 10 overlying the hood and which may be conveniently formed of angle irons adapted to receive and support the upper flask section 11 containing the refractory cope 12.

From the foregoing description, it will be apparent that, when the hood 3, with the refractory cope mounted above the same, is applied to position with the hood spanning the openings in the upper faces of the mold sections 1 and 2, the hot gases from the blow torch employed to preheat the rail ends and the mold will traverse the mold cavities and be deflected by the double arches in the top of the hood against the head sections of the rail ends and will be vented ultimately at the openings 7 along the faces of the rail heads. The hot gases will heat the metal of the hood to a relatively high degree and the heat radiated therefrom will impinge the bottom of the refractory cope and thereby dry the latter to a sufficient extent to enable it to be applied to the lower mold sections without further drying or curing preparatory to teeming the superheated molten metal into the mold; that is to say, the refractory material of the cope will be effectively dried by the waste heat from the preheating operation and may be removed from its supporting rack above the hood, and, when the latter has served its purpose and been removed, the cope may be applied immediately to its proper position on the top of the lower mold sections.

A further advantage of this arrangement is, that the drying of the cope by the radiated heat from the hood continues at all time during the preheating of the rail ends, because when the hood is removed to allow the passage of car wheels, the relative position of the hood and cope is still maintained and consequently the drying continues.

What I claim is:

1. A removable hood adapted to span the open top of a rail welding mold during preheating of the latter, and means carried by and overlying the hood for supporting a mold cope section immediately above the hood whereby the mold cope section may be dried and cured by heat from the hood.

2. A hood for welding molds, comprising a body portion adapted to span the open top of the mold during preheating of the latter, and a mold cope supporting rack attached to and overlying said body portion whereby the mold cope section may be dried and cured by heat from the hood.

3. A hood for welding molds, comprising a body portion adapted to span the open top of the mold during preheating of the latter, a handle connected to the body portion, and a mold cope supporting rack secured to the handle and overlying the body portion.

4. A hood for welding molds, comprising a body portion adapted to span the open top of the mold during preheating of the latter, a bail connected to the body portion and spanning the top thereof, and a mold cope supporting rack secured between the side members of the bail.

5. A hood for welding molds, comprising a body portion adapted to span the open top of the mold and having perpendicular side walls and a double arched top, a bail fixed to the side walls and spanning the top, and a mold cope supporting rack secured between the side members of the bail.

In testimony whereof I affix my signature.

EDWARD F. BEGTRUP.