July 11, 1933. E. F. BEGTRUP 1,917,868

HOOD FOR WELDING MOLDS

Filed April 9, 1932

Fig. 1

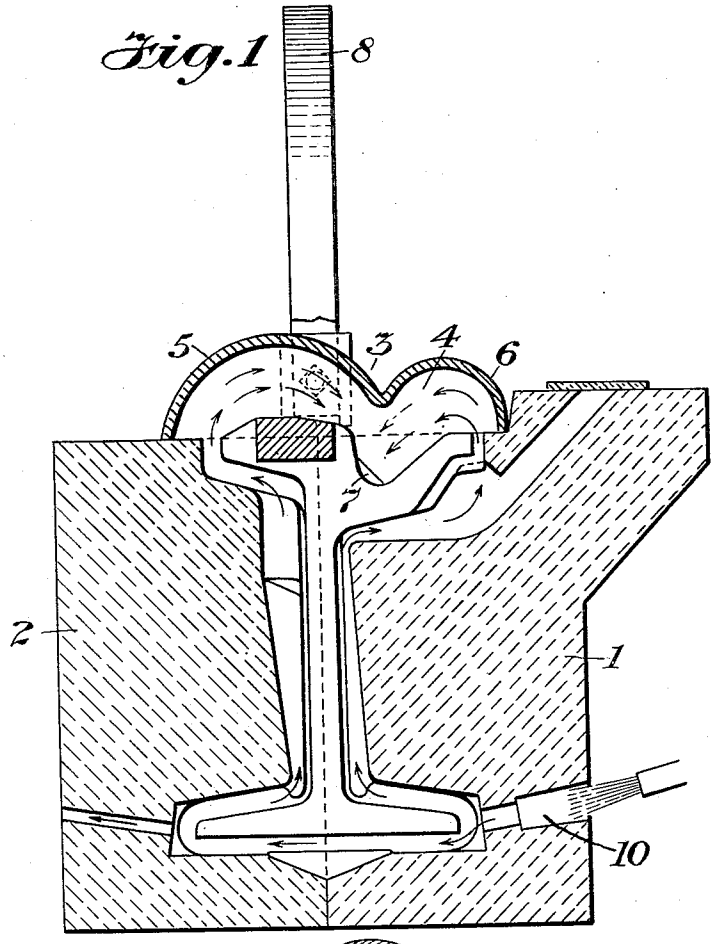
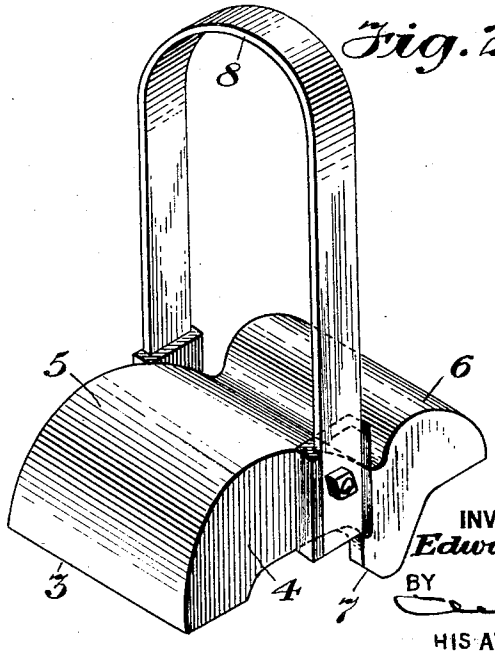


Fig. 2



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Patented July 11, 1933 1,917,868

UNITED STATES PATENT OFFICE

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HOOD FOR WELDING MOLDS

Application filed April 9, 1932. Serial No. 604,207.

This invention relates to certain improvements in the welding of rails by superheated molten metal, such as alumino-thermic steel, and has for its object to provide a novel and highly efficient means to be associated with the mold to expedite the preheating of the mold and the rail ends enclosed therein, said means comprising a hood adapted to overlie the top of the mold and being provided with an imperforate double arched top, which will cause the rising combustion products to be deflected downward against the rail heads and to be vented along the surfaces of the rail heads, thereby causing the combustion products to give up a much larger proportion of their heat units to the rail heads than was possible of realization with the former types of hoods.

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

Fig. 1 is a sectional elevation of a typical rail welding mold adapted for use without interrupting traffic, the new hood of my invention being applied thereto.

Fig. 2 is a perspective view of the hood.

In the alumino-thermic welding of rails, without interruption to traffic, it is common to employ a three part refractory mold to enclose the rail ends, including a two part base section and a removable cope section, the mold being fashioned to enclose the rail ends which are separated from the interior mold walls by surrounding spaces into which the superheated thermit steel is poured so as to surround the rail ends and fuse therewith to form a substantially uniform weld. The two lower mold sections enclose the rail ends to substantially the level of the treads or running surfaces thereof and the upper or cope section is fitted to and constitutes the completing supplement to the lower sections and is separately removable to permit passage of traffic during the preliminary operations of placing the mold and preheating the interior of the mold and rail ends prior to the actual pouring of the thermit steel. The refractory cope or upper section is usually pierced by one or more openings leading into the mold cavity, such, for example, as the pouring gate and the riser or vent, which are usually disposed on opposite sides of the mold, with reference to the rail heads. In order to avoid the necessity of removing and replacing the refractory cope to accommodate passing traffic during the preliminary operations, as aforesaid, it has been customary to apply to the top of the lower mold sections a generally dome-like hood which spans the openings in the main body of the mold and is intended to retain the products of combustion from the blow torch or similar preheating device in contact with the heads of the rails enclosed within the mold, the hood being provided with a vent opening in its top to permit the escape of the combustion products. This particular type of hood has been reasonably effective in preheating the rail ends, but, owing to its general form and the location of the vent in the highest point thereof, a very considerable portion of the hot gases escape through the vent without coming into physical contact with the rail ends, so that much of the heating effect of these gases is lost. The preheating of the rail ends in a mold of this character and employing a hood of the form described usually requires about thirty minutes, during which time, if the traffic is frequent, numerous car wheels will have passed over the site of the joint and it is quite evident that the jarring and hammering of the wheels at the joint have a tendency to injure and disintegrate the mold, especially as the latter becomes more frangible as it reaches the higher temperatures desired in the preheating. For these reasons, as well as that of economy of labor, it is highly desirable that the necessary degree of preheat of the rail ends and the interior of the mold, prior to the actual pouring of the molten metal, be accomplished in the shortest possible time and the instant invention is designed especially to meet these conditions.

Referring to the drawing, 1 and 2 indicate the lower sections of the refractory mold adapted to enclose the ends of the rails to be welded to substantially the level of the tread surface of the rails, the mold sections being provided with the usual cavities defining the space into which the superheated molten

metal is poured to effect the weld, as will be understood by those skilled in the art. These cavities extend to the top of the mold sections and define the collar or protuberance, which characterize welds of this type.

As stated, it is customary and, in fact, necessary to preheat the mold and the ends of the rails enclosed therein preparatory to teeming superheated molten metal into the mold to effect the weld. This preheating is effected by means of a blow torch or the like, the flame of which is directed through a preheating gate formed in the lower part of one of the mold sections, such as indicated at 10, and the products of combustion flowing through the mold cavity and about the rail ends would quickly escape from the mold, if the latter were not provided with a cope or a hood to confine the combustion products as much as possible. It is inexpedient to use the regular cope during the preheating operation, because of the labor involved in the frequent removal and replacement thereof to accommodate traffic and also because of the likelihood of damaging the cope or the mold by such removals and replacements. The ordinary dome-shaped hood with a top vent will obviate the difficulties and objections incident to the use of the refractory cope, but, as stated, it is more or less wasteful of the combustion products and, therefore, inefficient as a means for preheating the mold and the rail ends, both in the expenditure of time and preheating fuel. The new type of hood embodying my invention, however, avoids all of the noted objections and provides a means for effecting the necessary preheating of the rail ends and the interior of the mold in the shortest possible time.

As shown in the drawing, the hood comprises a hollow metal casting 3 having perpendicular end walls 4, the lower edges of which are fashioned to conform to the upper surfaces of the mold sections 1 and 2 and the upper surfaces of the rails, except at points adjacent the heavier portions of the rail heads where the lower edges are cut away to provide vents 7 immediately adjacent the rail heads. The top and sides of the hood are formed as double arches 5 and 6, which are joined in a line substantially above and in general alignment with the heavier portions of the rail heads, the lower edges of the sides closely engaging the top surface of the mold sections. For purposes of convenience in handling, the hood is provided with a bail 8 or other suitable handle by means of which the hood may be readily applied to and removed from position.

As indicated by the arrows in the drawing, the products of combustion of the preheating medium traverse the mold cavity and contact the base, the web and the under faces of the head sections of each rail end and then pass out of the openings in the top of the mold into the hood, where they are deflected downward by the double arch, forming the top and sides of the hood, to contact with the heavier portions of the rail heads and can escape only by way of the vents 7, so that the said products are kept in contact with the rail heads as long as possible, with the result that they give up a large amount of their heat units to the rail heads, which heat units would have been wasted in the older type of hood.

While the mold and the hood have been illustrated as of the type employed for welding girder or trilby rails, it will be understood that the invention is not limited to this particular type, but is equally applicable to the welding of ordinary T-rails and rails of any other standard pattern, the mold sections and the hood being appropriately fashioned to cause the products of combustion to be deflected downward against the rail heads, to circulate thereabout and to be discharged or vented ultimately along the surfaces adjacent the heavier portions of the heads.

What I claim is:

1. A hood for welding molds, comprising end walls having lower marginal edges substantially conforming to the top of the mold and the top surfaces of the rail heads and having limited sections adjacent the latter cut-away to provide vents, and a double arched wall forming the sides and top.

2. A hood for welding molds, comprising end walls having lower marginal edges substantially conforming to the top of the mold and the top surfaces of the rail heads, and a double arched wall forming the sides and top.

In testimony whereof I affix my signature.

EDWARD F. BEGTRUP.