Aug. 23, 1932. F. A. FAHRENWALD 1,872,712

LEAD PAN

Filed April 25, 1931

Fig 1

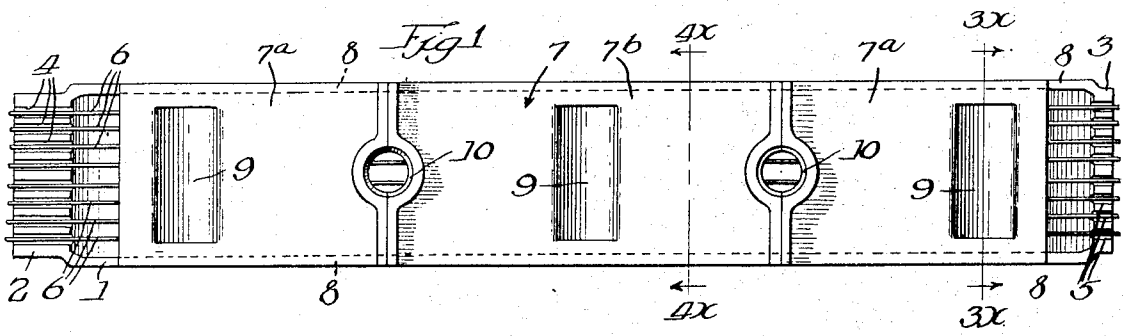


Fig 2

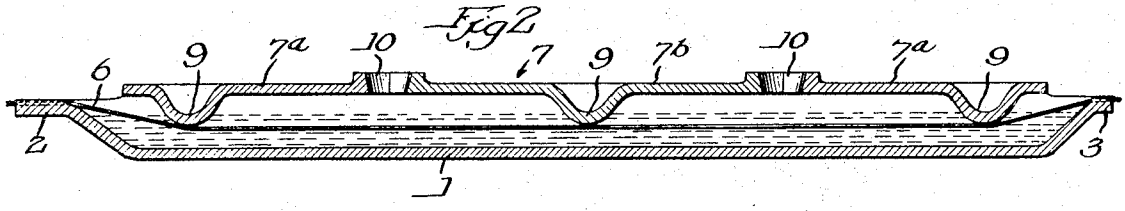


Fig 3

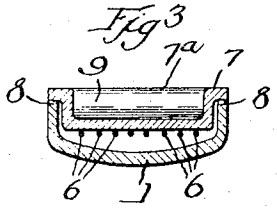


Fig 4

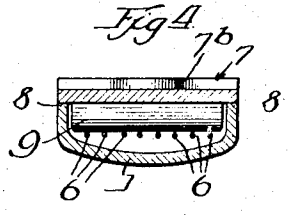


Fig 5

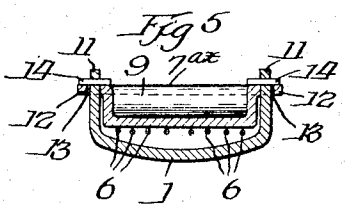


Fig 6

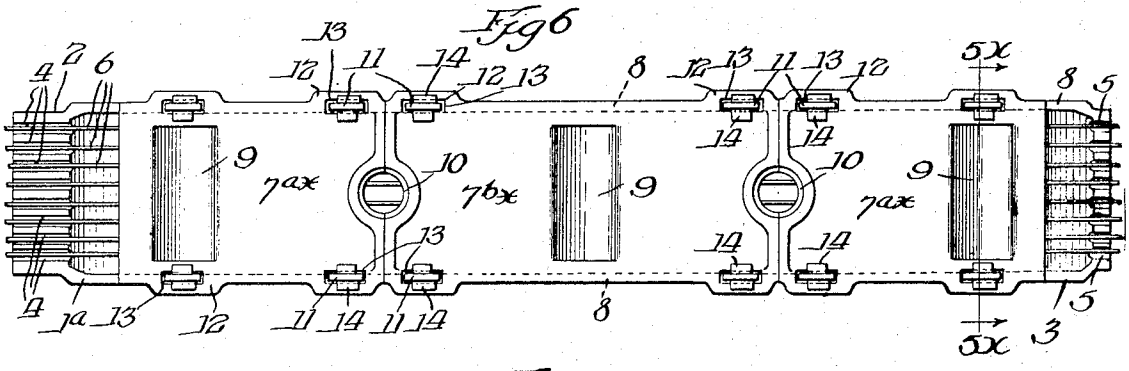
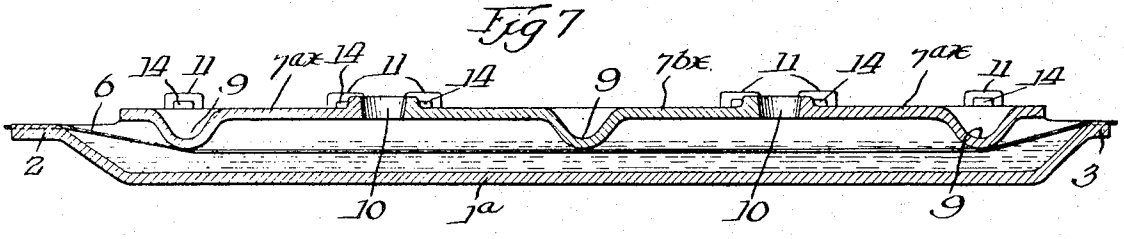


Fig 7



Witness

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Patented Aug. 23, 1932 1,872,712

UNITED STATES PATENT OFFICE

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LEAD PAN

Application filed April 25, 1931. Serial No. 532,824.

This invention relates to pans for containing molten lead, constructed of alloy capable of resisting heat appropriate to the purposes of normalizing metal goods such as wire, flat strips, and the like, and which pans, in order to facilitate effective submergence of the continuously moving goods for the necessary duration of time, are designed in the form of a long shallow trough, closed at top to reduce atmospheric oxidation of the molten lead, and provided with so-called sinkers to hold the heat treated goods beneath the surface of the bath through which they travel.

The present invention provides a design of lead pan which, while serving the purposes of the pans heretofore made, is more easily constructed; is more substantial and resistant under stresses encountered in use; is more convenient to use, with respect to the introduction of the goods into the bath; will avoid the use of separately formed sinkers; and will afford greater protection of the lead bath from ingress of atmospheric oxygen. Accordingly, the invention proceeds upon the principle of forming the pan proper or container portion of the utensil as a separate piece from the top closure or cover thereof, so that the latter can be laid on after the wires or strips are laid in through the open top of the trough; the cover being fitted under conditions which cause it soon to become sealed as a result of the use of the utensil; the sinkers being integral with the cover so that slots or other openings to admit the sinkers are avoided; and the inconvenience of separately handling and securing and releasing the sinkers is not involved. And the cover may be subdivided into a plurality of panel-like sections which prevents the development of stresses resulting in warping of the cover, which would render it unfit for use. Pyrometer openings are preferably made in the cover, for instance, at the meeting edges of the two cover sections, but these openings may be tamped to check the circulation of atmosphere over the bath. Also, the cover sections and walls of the trough may be designed with cooperating hold-down means, such, for instance, as perforated lugs on the walls passing through perforated ears on the cover sections and receiving hold-down keys; but even special hold-down means may be dispensed with since the nature of the cover adapts it to be made with sufficient mass to resist lifting force of the traversing wires or strips, by the mere weight of the cover.

In the accompanying drawing—

Figures 1 to 4 show one construction of the new lead pan, Figure 1 being a plan view; Figure 2 being a vertical longitudinal section; and Figures 3 and 4 being two transverse sections taken, respectively, on lines $3x$—$3x$ and $4x$—$4x$ of Figure 1.

Figures 5 to 7 show another construction of the new lead pan; Figure 6 being a top plan view; Figure 7 a vertical longitudinal section; and Figure 5 a transverse section on the line $5x$—$5x$ of Figure 6.

The two constructions selected for purposes of illustration differ mainly in the omission of special cover holding means, in Figures 1 to 4, and the use of a hold-down means for the cover, in Figures 5 to 7.

Referring to Figures 1 to 4, 1 represents the receptacle in the form of an elongated shallow trough having at its respective ends, lips 2, 3, constructed with channels 4, 5, adapting them to support and guide goods, such as wires 6, drawn continuously through the bath of the pan as an incident to the heat treatment of such goods. Trough 1 is closed at top by a cover indicated generally by the reference character 7, but preferably composed of a plurality of panel-like sections, for instance, end sections $7a$ and one or more intermediate sections $7b$, suitably fitted to sealing faces such as 8 on the side walls of the trough in a manner to cause the pan, over the greater portion of its superficial area, to be closed against free ingress or egress of atmosphere, so that the greater portion of the molten lead, which constitutes the bath through which the goods are being drawn, will be protected from free oxidation.

As a further barrier against free circulation of atmosphere over the main body of the bath, the cover 7 has sinkers 9 formed integral therewith and designed in the form of baffles

which dip into the surface of the bath. These sinkers 9 serve the further purpose of resisting lateral displacement of the cover upon the trough, for which reason each cover section 7*a* or 7*b* is preferably constructed with its own sinker. Such clearance as may be manifest between the ends of a sinker and the opposing side walls of the trough will, after the utensil is put into use, become obstructed by lead oxide so that only the extreme end portions of the bath are exposed to free atmosphere. This sealing by accumulation of lead oxide will also take place to a materially helpful degree at the points 8 between the cover and the walls. 10 represents pyrometer vents with which the cover 7 is preferably provided. These vents, with or without the inserted pyrometers, may be tamped while the utensil is in use in order to check convection of atmosphere through the space above the bath.

In Figures 1 to 4 the cover sections will rely on their own mass for holding them down against lifting force resulting from the tendency of the goods to straighten out under the tension at which they are drawn through the bath, and this construction will be found satisfactory even with a relatively light cover in the case of small wire or thin strips. In cases where heavier stock is to be heat treated, it may be found desirable to provide a special means for holding down the cover sections; and to this end, as shown in Figures 5 to 7, trough 1*a* is constructed with lugs 11 on its side walls and ears 12 having perforations 13 on its cover sections 7*ax*, 7*bx*, so that after the cover sections, otherwise designed as described in connection with Figures 1 to 4, are placed in position upon the trough, wedging or other forms of keys 14 may be inserted to hold the cover in place. Structural features disclosed in Figures 5 to 7 and not specifically enumerated, are indexed by the same reference characters and covered by the same description as corresponding parts in Figures 1 to 4.

The service of old types of lead pan is usually terminated during a first run or heat by some localized failure in either its top closure or pan portion, and such failure generally necessitated scrapping the entire casting. In utensils having the new construction herein disclosed, both the pan member and the cover member may be used a number of times; and if one of these members fails, it alone need be replaced instead of the entire utensil. Moreover, with the cover member formed in sections, waste resulting from discard in the event of failure is still further reduced, inasmuch as but a single section of the cover will have to be replaced.

I claim:

1. A lead pan for heat treatment purposes, constructed with a trough for containing molten metal to be traversed by goods subjected to heat treatment, and a cover for said trough formed of a plurality of sections adapted to meet and provide a top closure for the trough; said cover sections being individually provided with means for positioning them upon the trough, and also with means for holding submerged in the bath of the trough, goods traversing said bath.

2. A lead pan for the purposes described, comprising a trough, a cover composed of a plurality of separately removable cover sections, and sinkers for submerging the goods beneath the surface of the bath; said sinkers being formed integrally upon and removable with the respective cover sections and entering between the walls of the trough and resisting lateral displacement of the cover sections thereon; and the cover sections, when positioned by their sinkers, being constructed to abut at their ends and thereby complete the closure of the trough.

3. A lead pan for heat treatment purposes, comprising separately formed trough and cover members constructed with intersecting key-receiving lugs and ears for holding the cover member down upon the trough member; said cover member carrying means for holding submerged in the bath of the trough member, goods traversing said bath.

4. A lead pan as described in claim 2, in which the trough and cover sections are likewise provided with releasable interengaging means resisting relative movement between the cover sections and the trough vertically.

Signed at Chicago Heights, Illinois, this 20th day of April, 1931.

FRANK A. FAHRENWALD.