Oct. 26, 1943. A. A. WASHTON 2,332,956

APPARATUS FOR CASTING LEAD BALLAST

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Fig. 1.

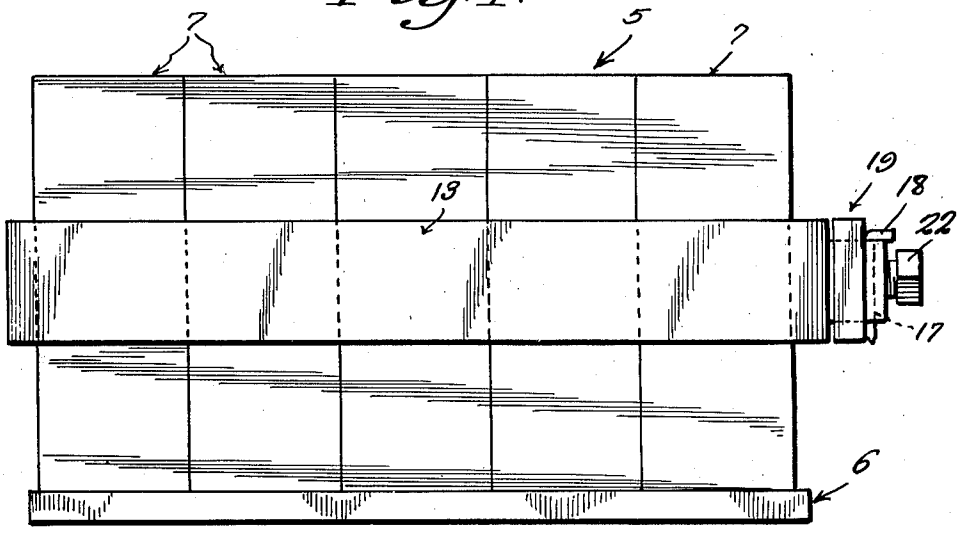


Fig. 2.

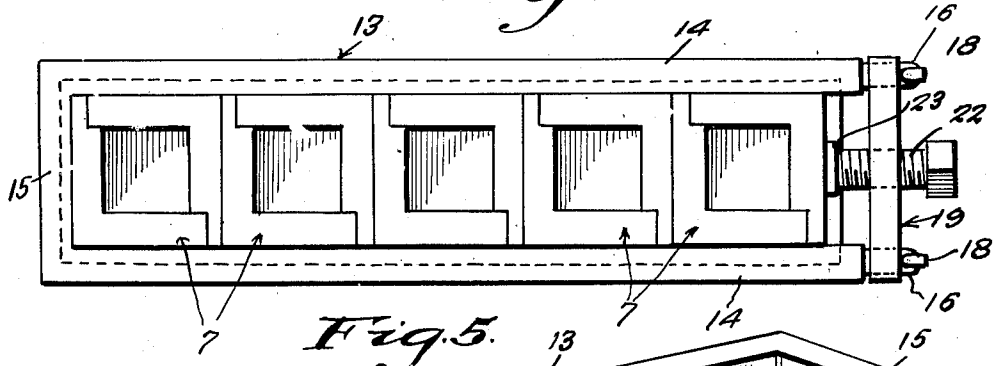
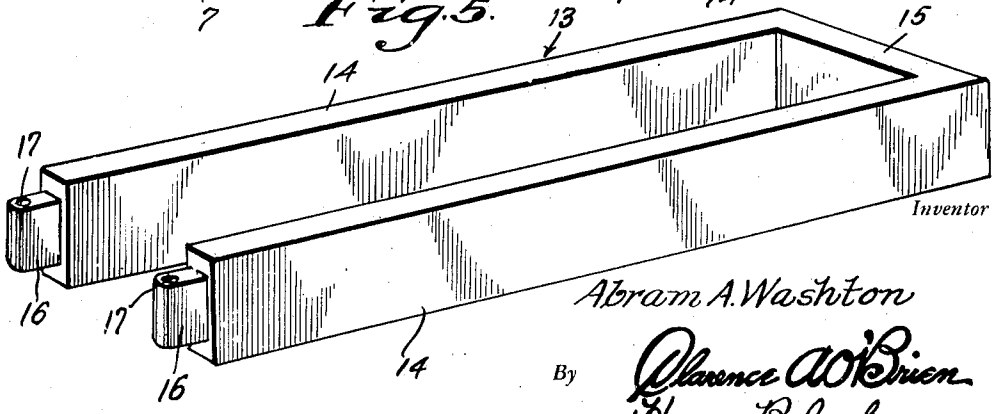


Fig. 5.



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Fig. 3.

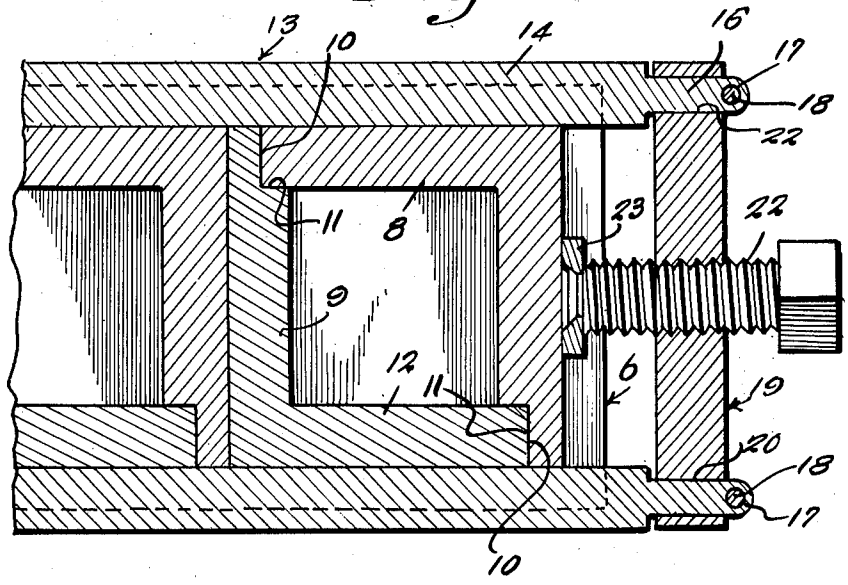


Fig. 4

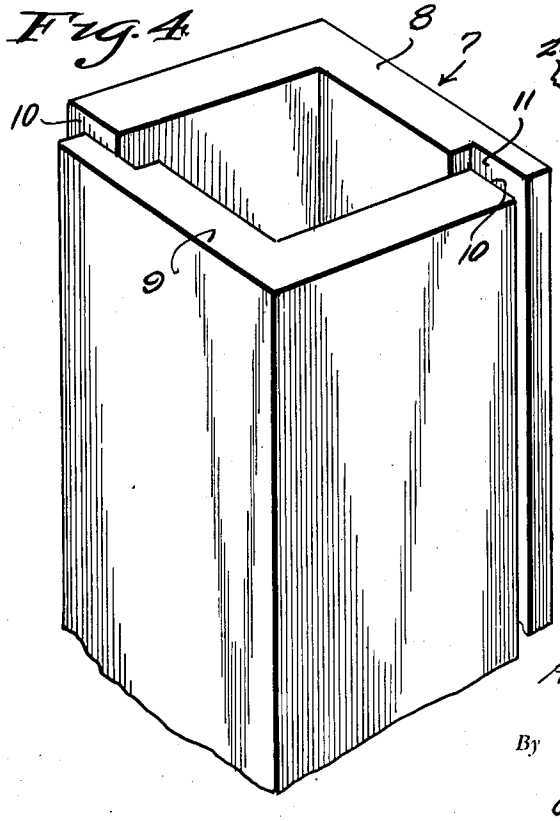
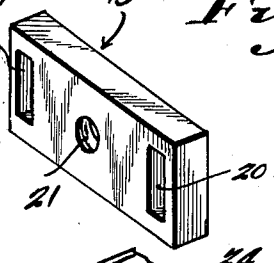


Fig. 6.



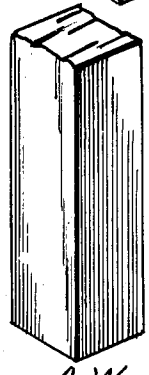


Fig. 7.

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APPARATUS FOR CASTING LEAD BALLAST

Abram A. Washton, New London, Conn.

Application June 25, 1942, Serial No. 448,461

1 Claim. (Cl. 22—146)

The invention relates to improved apparatus for pouring both virgin and secondary lead for the production of what are known as "A" pigs as used for ballast in submarines, the primary object of the invention being to provide apparatus for this purpose which eliminates the surface irregularities, and hence deviations in form and weight of the pigs, which results from presently used apparatus, and thereby eliminate the finishing operations now required to make the pigs uniform in shape and cross section and in weight.

Other important objects and advantages of the invention will be apparent from a reading of the following description taken in connection with the appended drawings, wherein for purposes of illustration a preferred embodiment of the mold of the present invention is shown.

The "A" pig which is used for ballast in submarines measures 3⅛" x 3⅛" x 14" and its weight is approximately 55½ pounds. As now practiced the pouring of these pigs is done in a mold having a 14" long surface and a side wall height of 3⅛", with the result that when the pig is poured and has cooled off, there is a pronounced depression in the middle of the top 14" surface, the only cure for which is to pour additional lead into the depression and fill it and finish off the resulting surface to trueness. In practice it is rare that a perfectly smooth surface results on the repaired side of the pig, although considerable time and expense are expended in that aim.

In accordance with the method of the present invention instead of the pouring being done in a horizontally elongated mold of usual construction, the pouring is done in a vertically elongated mold of a certain character described herein, with the result that all four sides of the resultant pigs and the tops and bottoms thereof are absolutely smooth and true, with the exception of a slight depression, about the size of a ten-cent piece, on the upper end of the pig, which can be disregarded or can be relatively easily and inexpensively trued up. The importance of the regular smooth and geometrically perfect sides of the pig will be apparent when it is considered that it is important to eliminate air spaces between the pigs as they are laid longitudinally upon each other in the submarines for ballast purposes, such air spaces occurring when the sides of the pigs are irregular as now produced, the result of such air spaces being uneven and insecure packing of the ballast pigs. As the result of the present method and apparatus, the contact between the pigs when packed for ballast purposes is substantially geometrically perfect, so that air spaces are eliminated, and better and tighter packing are allowed, thereby saving space and eliminating to a substantial extent the danger of shifting of the ballast.

To suitably and sufficiently carry out the process of the present invention it is necessary to have a sectional mold, the sections of which are of substantially equal heat absorbing characteristic and uniform trueness, and so arranged that the point of separation of the sections will be at the corners of the pigs; otherwise pigs of non-uniform density and non-uniform contour will result. The mold disclosed herein admirably lends itself to the conduct of the present method with the highest type of result.

Referring in detail to the drawings, wherein a preferred type of mold in accordance with the present invention is shown:

Figure 1 is a general side elevational view.

Figure 2 is a top plan view of Figure 1.

Figure 3 is a fragmentary enlarged horizontal sectional view.

Figure 4 is an isometric view showing the two sections of a mold unit in partly separated relation.

Figure 5 is a perspective view of the clamp.

Figure 6 is a perspective view of the clamp yoke.

Figure 7 is a perspective view of one of the "A" pigs.

Referring in detail to the drawings, the numeral **5** generally designates the plural mold in accordance with the present invention, the same comprising a flat horizontal base **6** of suitable metal or other suitable material, upon which rest in perpendicular or other substantially vertical position a plurality of mold units **7**, each consisting of a pair of similar mold sections **8** and **9** having the lower ends straight cut and squared to rest flush on the top of the base **6**.

Each of the sections **8** and **9** of the mold units are exactly similar in cross section and rise to the same level above the base **6**, each said section consisting of an L-shaped cross section body, one arm of the L-shape being squared and unmutilated as indicated by the numeral **10** and the other arm having its terminal portion cut away at its inner side as indicated by the numeral **11** to define a rectangular notch running the full height of the section. As indicated in the drawings the sections are assembled upon the base **6** with the unmutilated squared ends **10** seated in the grooves **11**, the grooves **11** being of

a depth and width to assemble the sections to define a perfectly square interior chamber 12 as indicated in Figures 2 and 3 of the drawings.

To hold the mold units in properly assembled relation with respect to each other and with respect to the base 6 a clamp structure is provided which is composed of an elongated U-shaped clamp frame 13 which has parallel legs which are spaced apart substantially exactly the width of the mold units, the legs 14 being slightly longer than the assembled plurality of mold units when they are in the abutting relation indicated in Figure 2 of the drawings, with the extreme left hand mold unit engaging the bight portion 15 of the clamp frame. The free ends of the legs 14 have reduced extensions 16 formed thereon which have openings 17 accommodating removable stop pins 18. The clamping yoke 19 consists of an adequately rigid metal bar 19 which has vertical slots opening through the opposite end portions thereof and of substantially the same shape as the extensions 16 on the free ends of the clamp frame legs, with a threaded hole 21 in the middle of the yoke to threadably receive the pressure screw 22 which has a rotatably connected pressure head 23 on its inner end to engage the end section of the extreme right hand mold unit as indicated in Figures 2 and 3 of the drawings. It will be obvious that with the mold units in place on the base and the clamp frame 13 in place, with the yoke 19 on the extension 16 and with the pins 13 in place, operation of the screw 22 by any suitable means in a longitudinally inward direction will compress the mold sections toward the bight portion 15 of the clamp frame, thereby securely and exactly assembling the mold units for the pouring operation. The molten lead is poured into the upper ends of the mold units and when cool the screw 22 is relaxed, the clamping frame 13 is taken off, and the sections of the mold units are separated from the pigs.

Having described the invention, what is claimed as new is:

Apparatus for casting square lead pigs comprising a horizontal base, a plurality of vertical mold units resting on said base and embodying vertical chambers closed at their lower ends by said base and open at their upper ends to receive molten lead, said chambers being uniformly square in cross section from end to end, each mold unit comprising a pair of similar removable sections L-shaped in horizontal cross section and characterized by similar mass and heat absorbency, the inner side of one wing of each section being notched to conformably receive an unmutilated portion of a wing of another section, whereby the sections, when assembled, provide a substantially square cross section hollow block with the lines of separation between the sections being precisely located at diagonally opposite corners of said chambers, and a removable clamp frame enclosing and engaging the mold units and assembling the same in side-by-side relation on the base, said frame consisting of a U-shape with the legs engaging opposite sides of the mold units and with the bight engaging the end of one extreme mold unit, a yoke removably mounted on the free ends of said legs, anchoring means for the yoke, and a pressure screw on said yoke engaging the end of the the opposite extreme mold unit.

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