July 6, 1948. E. MARBURG 2,444,838

SECTIONAL HOT TOP

Filed April 3, 1947

FIG. 1.

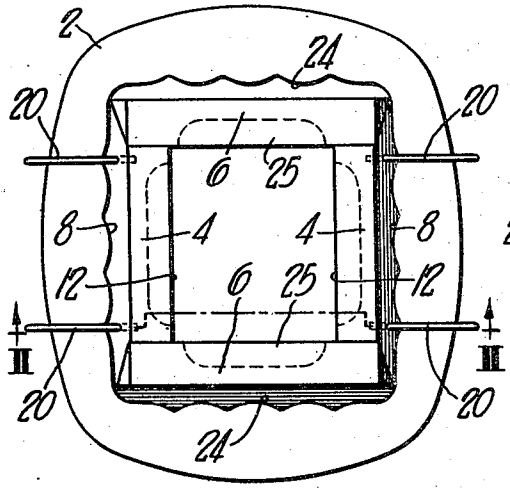


FIG. 3.

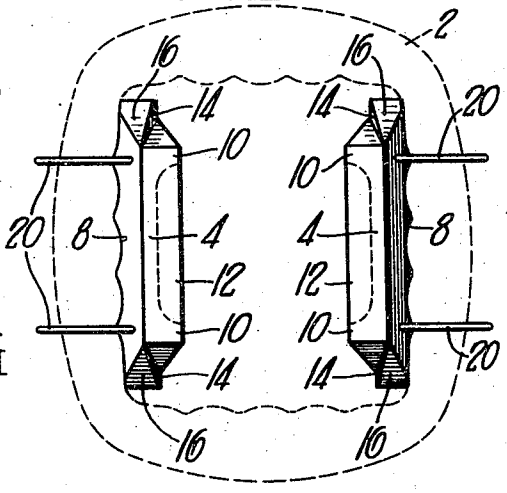


FIG. 2.

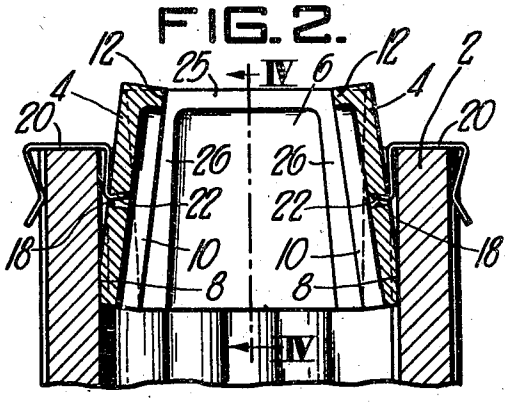


FIG. 4.

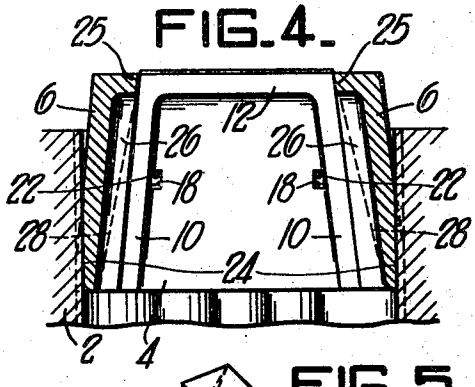


FIG. 5.

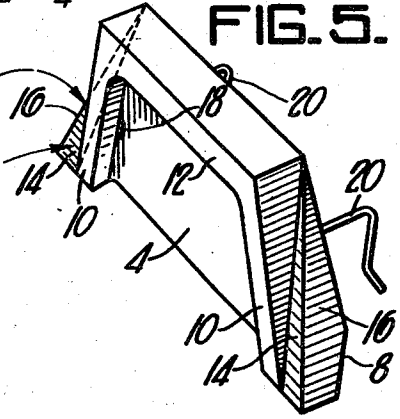
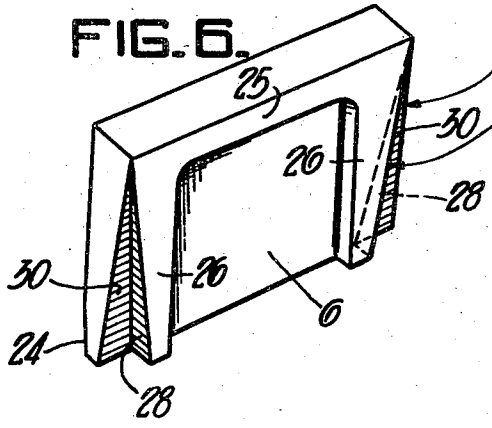


FIG. 6.



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Patented July 6, 1948 2,444,838

UNITED STATES PATENT OFFICE

2,444,838

SECTIONAL HOT TOP

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Application April 3, 1947, Serial No. 739,141

5 Claims. (Cl. 22—147)

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This invention is a continuation-in-part of my copending application, Serial No. 602,913, filed July 2, 1945, now Patent No. 2,433,775, issued December 30, 1947, and relates to a sectional hot top for ingot molds and the like and more particularly to such hot tops for small ingot molds. The walls of hot tops in present use are relatively thick (1¾ to 2½ in.) which causes the steel to freeze at too slow a rate near the hot top junction and also causes segregation in the ingot. The hot tops now in use have the sides and corners of approximately the same thickness so that the metal in the corner freezes first and continues to freeze faster than the metal at the sides until the interior shape of the frozen metal approximates a circle or ellipse. Thus, the metal in the corners is useless to perform its function. In sectional hot tops the sections in some instances do not closely fit the mold walls and the hot metal rises between the hot top and the mold wall causing fins which are objectionable in the rolling of the ingot.

It is an object of my invention to provide a hot top which displaces useless metal from the corners of the hot top, thus increasing its efficiency.

Another object is to provide a hot top having thin walls.

Still another object is to provide a sectional hot top having means for self-wedging all the sections of the hot top against the mold walls.

These and other objects will be more apparent after referring to the following specification and attached drawings, in which:

Figure 1 is a top plan view of the hot top in place on a mold;

Figure 2 is a sectional view taken on the line II—II of Figure 1;

Figure 3 is a top plan view of the side slabs in place on a mold shown in broken lines:

Figure 4 is a sectional view taken on the line IV—IV of Figure 2;

Figure 5 is a perspective view of a side slab; and

Figure 6 is a perspective view of an end slab.

Referring more particularly to the drawings, the reference numeral 2 indicates the top of a mold on which a hot top is mounted. The hot top consists of two side slabs 4 and two end slabs 6. The side slabs have their lower edges bevelled at 8, the outside surface of the bevelled portion having the same contour as the inner surface of the mold, the remaining portion of the outer surface of the slab being flat. The bottom of the side slabs are substantially wider than the top in order to form a wedge surface on each

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end of the slab. The central portion of the slab 4 is thin, it being about one inch thick as compared to the ordinary thickness of two or more inches. At each end of the slab 4 is a flange 10 tapering inwardly toward the top, extending outwardly from the mold wall and forming a reinforcement for the slab. A flange 12 is also provided at the top portion of the slab to add transverse strength and prevent longitudinal breakage. A shoulder 14 is provided on each flange 10 and tapers from the top downwardly and inwardly toward the opposite side slab. A second shoulder 16 extending downwardly and outwardly toward the adjacent end wall of the mold is also provided on the flange 10. Slots 18 are provided in the side slabs 4. A support hook 20 having a hook portion 22 is supported on top of the mold as shown in Figure 2 above each of the slots 18 with the hook portion inserted into the slot 18.

The end slabs 6 have their lower edges bevelled at 24, the outside faces of the bevelled portion having the same contour as the inner surface of the mold. The central portion of this slab is reduced in the same manner as the side slab and a flange 25 is provided at the top portion of the slab to add transverse strength and prevent longitudinal breakage. Flanges 26 are provided on each end of the slab 6 and extend toward the opposite end slab. A wedge surface 28 is provided on each flange 26 and faces the shoulders 14 of the side slabs 4 as shown by the arrows in Figures 5 and 6. A second wedge surface 30 is provided adjacent each surface 28 and faces the shoulders 16 of the slabs 4 as shown by the arrows in Figures 5 and 6. It will be understood that the surfaces 28 and shoulders 14 have complementary wedge surfaces. This is also true of the surfaces 30 and shoulders 16.

In assembling a hot top on the mold, a pair of hooks 20 are placed in the openings 18 of each side slab 4 and the slabs are placed in position and supported from the top of the mold with their lower beveled portion in contact with the mold as best shown in Figures 2 and 3. The end slabs 6 are then wedged in place in the mold with their surfaces 28 contacting the shoulders 14 of side slabs 4 so that the base of the latter is pushed outwardly to contact the mold wall and the surfaces 30 contacting the shoulders 16 of the side slabs 4 so that the end slab is wedged into tight contact with the mold wall. It will be noted that this construction blocks off the corners of the hot top to form an irregular elliptical outline of the interior as best shown in Figure 1. Because of

the arrangement of shoulders 14 and 16 and wedging surfaces 28 and 30, the bottom of all of these slabs are in contact with the mold, thus preventing flow of the hot metal upwardly between the hot top and the mold wall.

While one embodiment of my invention has been shown and described, it will be apparent that other adaptations and modifications may be made without departing from the scope of the following claims.

I claim:

1. A sectional hot top for a mold comprising two side and two end slabs of refractory material, means for supporting the side slabs on opposite sides of the mold, each of said side slabs having a pair of shoulders on each end, one of said shoulders tapering downwardly and inwardly toward the opposite side slab, the second of said shoulders extending downwardly and outwardly toward the adjacent end wall of the mold, the end slabs being located on opposite ends of the mold, each of said end slabs having a pair of wedge surfaces on each end, one of said wedge surfaces being complementary to and in contact with the first of said shoulders of the side slabs, and the second of said wedge surfaces being complementary to and in contact with the second of said shoulders whereby the bottoms of all the slabs are forced into contact with the mold wall.

2. A hot top for a mold according to claim 1 in which the slabs have bevelled lower portions to contact the mold.

3. A sectional hot top for a mold comprising two side and two end slabs of refractory material, means for supporting the side slabs on opposite sides of the mold, each of said side slabs having a pair of shoulders on each end, one of said shoulders tapering downwardly and inwardly toward the opposite side slab, the second of said shoulders extending downwardly and outwardly toward the adjacent end wall of the mold, the end slabs being located on opposite ends of the mold, each of said end slabs having a pair of wedge surfaces on each end, one of said wedge surfaces being complementary to and in contact with the first of said shoulders of the side slabs, the second of said wedge surfaces being complementary to and in contact with the second of said shoulders whereby the bottoms of all the slabs are forced into contact with the mold wall, each of said slabs having thin center portions and thickened end portions.

4. A sectional hot top for a mold comprising two side and two end slabs of refractory material, means for supporting the side slabs on opposite sides of the mold, each of said slabs having thin center portions and outwardly extending vertical flanges on each end thereof, each of the flanges on the side slabs having a pair of shoulders thereon, one of said shoulders tapering downwardly and inwardly toward the opposite side slab, the second of said shoulders extending downwardly and outwardly toward the adjacent end wall of the mold, the end slabs being located on opposite ends of the mold, each of the flanges on the end slabs having a pair of wedge surfaces thereon, one of said wedge surfaces being complementary to and in contact with the first of said shoulders of the side slabs, and the second of said wedge surfaces being complementary to and in contact with the second of said shoulders whereby the bottoms of all the slabs are forced into contact with the mold wall.

5. A hot top for a mold according to claim 4 in which the slabs have bevelled lower portions to contact the mold.

EDGAR MARBURG.

REFERENCES CITED

The following references are of record in the file of this patent:

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