Oct. 27, 1964 M. K. MORRIS 3,154,391

INGOT

Filed Sept. 27, 1962 3 Sheets-Sheet 1

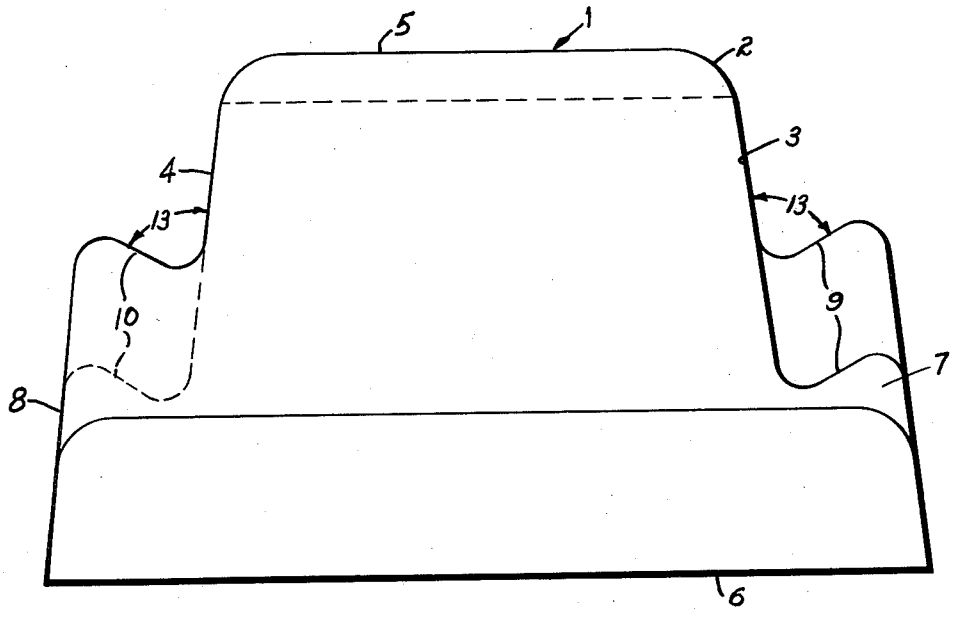


FIG-4

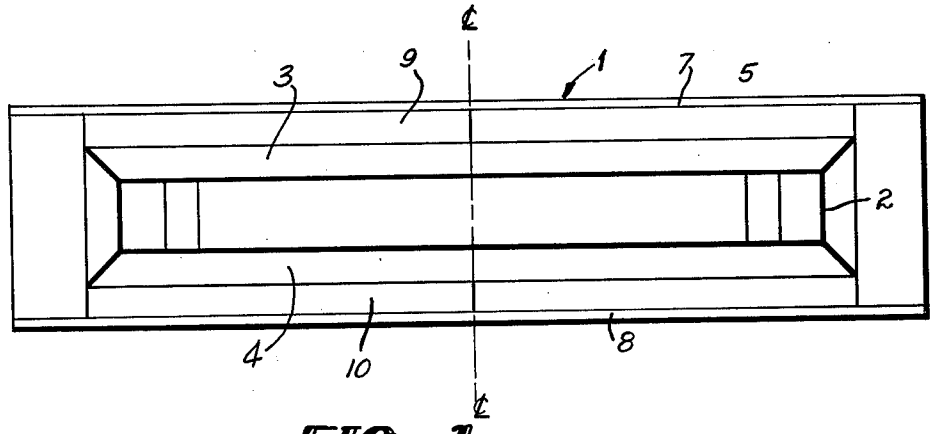


FIG-1

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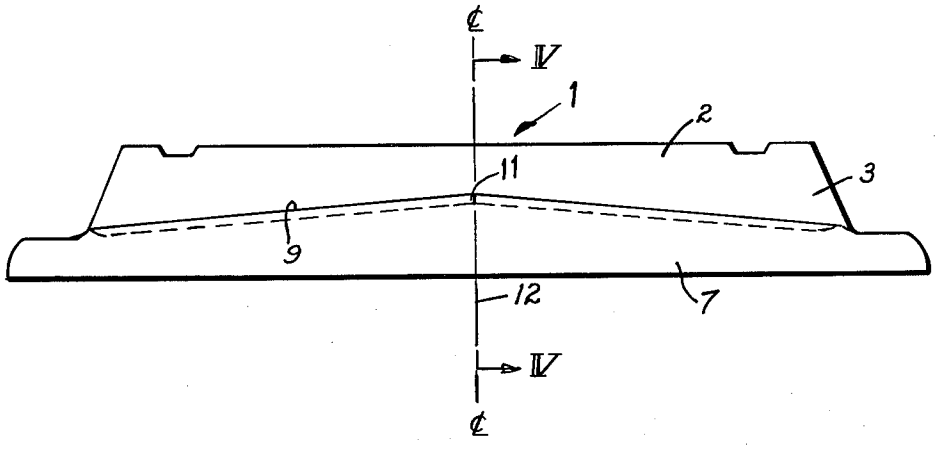


FIG - 2

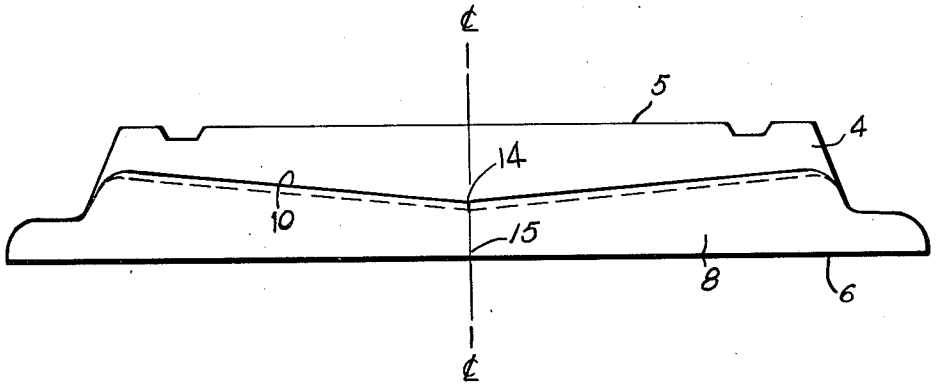


FIG - 3

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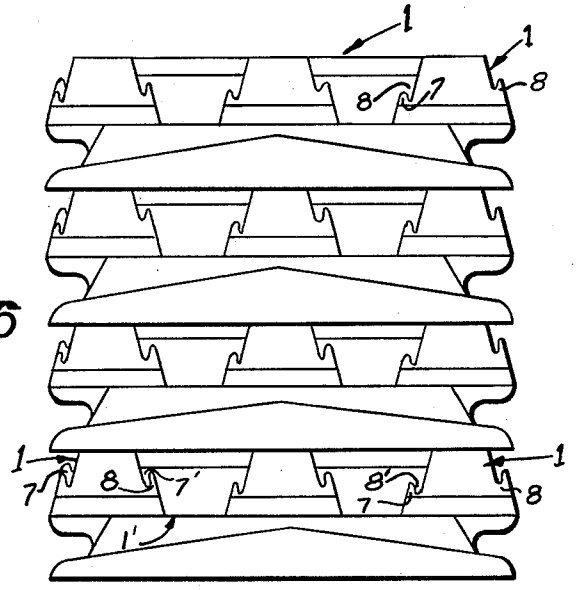


FIG-6

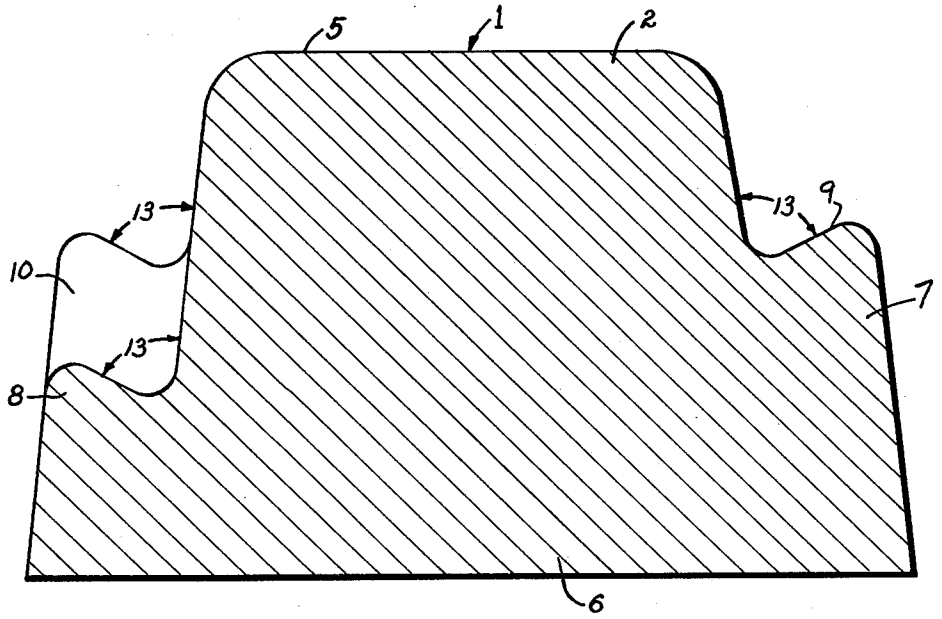


FIG-5

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3,154,391

INGOT

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4 Claims. (Cl. 29—184)

This invention relates to ingots and more particularly to cast ingots provided with interlocking means for engagement with similar ingots adapting them for assembly in a stable stack.

Accordingly, it is an object of this invention to provide ingots of novel construction adapting them for assembly into a stable stack or bundle.

It is another object of this invention to provide an ingot with novel interlocking means for interlocking engagement with like means provided on similar and adjacent ingots.

A further object of this invention is to provide interlocking similar ingots which upon assembly provide a rigid layer resistant against longitudinal and lateral movements.

A still further object of this invention is to provide ingots adapted to be secured together in interlocked engagement to provide a stable layer of ingots as a platform for succeeding ingot layers.

Other objects and advantages of this invention will become more apparent from the following description and drawings in which:

FIGURE 1 is a plane view illustrating an ingot in accordance with this invention;

FIGURE 2 is an elevational view of one side of the ingot illustrated in FIGURE 1;

FIGURE 3 is an elevational view illustrating the opposite side of the ingot of FIGURE 1;

FIGURE 4 is an elevational end view of the ingot shown in FIGURE 1;

FIGURE 5 is a cross-sectional view taken along lines V—V of FIGURE 2; and

FIGURE 6 is an end elevational view of an assembled stack comprised of the ingot shown in the preceding figures.

The ingot 1 illustrated in the drawings is characterized as a cast bar or pig 2 of metal, such as aluminum and the like, generally of quadrilateral cross-section and having slanted or oblique side walls 3 and 4 intermediate the upper surface 5 and lower surface 6. Each of side walls 3 and 4 has laterally projecting therefrom, adjacent the lower surface 6, a pair of flanges or berms 7 and 8, respectively, one having a configuration complementary of the other. Each of the berms will have their surfaces complementary to the other and may be generally described as bowed relative to the upper and lower bar surfaces, with the upper berm surfaces 9 and 10 further characterized by being angled, generally acute, relative to the bar side walls to thus define compound angle therewith.

In the embodiment illustrated, the upper berm surface 9, of berm 7, is substantially planar and symmetrically slanted downwardly toward the lower bar surface 6 from a high point 11 relative to the upper bar surface 5 at the mid-point or center 12 of berm 7. In addition, the berm surface 9 is slanted downwardly from its lateral edge toward the bar side wall 3. Although the upper surface 9 of berm 7 has been illustrated as of angled configuration, it is to be understood that other configurations may also be employed as for example an arched configuration provided that a complementary configuration is defined by the upper surface 10 of berm 8.

With regard to the particular embodiment illustrated, the upper surface 10 of berm 8 is provided with a configuration complementary to the upper surface 9 of berm 7. As shown in the drawings, the upper surface 10 of berm 8 is substantially planar and symmetrically slanted upwardly toward the upper bar surface 5 from a low point 14 at the mid-point 15 of berm 8, with the upper berm surface 10 further defining an angle with the bar side wall 4 identical to the above angle 13. Accordingly, the upper surface 10 of berm 8 also defines a compound angle wtih the bar side wall 4. As indicated above the upper surface 10 of berm 8 may take other configurations than the specific angle embodiment illustrated in FIGURE 3, as for example an arched configuration provided that it is complementary to the configuration defined by upper surface 9 of berm 7.

This construction in a plurality of ingots adapts each of the ingots for interlocking engagement with similar ingots disposed in side-by-side relationship in the same layer of a stack with, as illustrated in FIGURE 6, the berm 8 of an ingot 1 meshing with a complementary berm 7′ of a configuration corresponding to berm 7 provided on an adjacent ingot 1′ whereby the complementary configurations of adjacent ingots enables their assembly together in a nesting relationship. The bowed configuration of the upper berm surfaces when meshed with complementary surfaces of adjacent ingots results in an arrangement which is resistant to longitudinal displacement of the ingots while, in conjunction, the compound angles defined by the upper berm surfaces and the side walls of the adjacent ingots provides an arrangement resistant against lateral displacement of the ingots. As a result, a layer of ingots when disposed in interlocked engagement with one another provides a very stable and firm platform for supporting succeeding layers of ingots disposed thereon. As illustrated in FIGURE 6, each succeeding layer of ingots is generally disposed at right angles to the preceding layer. When sufficient layers of the bars have been assembled to the desired stack height, the assembly may then be secured together by appropriate and conventional banding for handling and transport.

Although the invention has been described with reference to specific embodiments, materials and details, various modifications and changes, within the scope of this invention, will be apparent to one skilled in the art, and are contemplated to be embraced within the invention.

What is claimed is:

1. An ingot adapted to form part of a stack comprising an elongated cast bar of quadrilateral cross-section with a pair of opposed substantially flat parallel upper and lower surfaces, a lateral berm projecting from each of the side walls of said bar and coextending with each other longitudinally along a pair of adjacent lateral edges of said bar, one of said berms having an upper berm surface symmetrically bowed upwardly toward said upper bar surface to a high point relative to said upper bar surface at the mid-point of said berm with said upper berm surface further defining an acute angle with its adjacent corresponding side wall of said bar whereby said upper berm surface forms a compound angle with said side wall, and the other of said berms having an upper berm surface symmetrically bowed downwardly toward said lower bar surface to a low point relative to said upper bar surface at the mid-point of said other berm with the last said upper berm surface defining said acute angle with its adjacent corresponding side wall of said bar with the last said berm being adapted for interlocking engagement with a berm corresponding to the first said berm of an adjacent inverted similar bar disposed in side-by-side relationship therewith in the same layer of said stack.

2. A stack of ingots comprised of layers of ingots with each of said layers having a plurality of alternately inverted similar ingots disposed in side-by-side relationship with adjacent ingots in interlocked engagement with one another, each of said ingots comprising an elongated cast bar of quadrilateral cross-section having a pair of substantially flat parallel upper and lower surfaces, a lateral berm projecting from each of the side walls of said bar and coextending with each other longitudinally along a pair of adjacent lateral edges of said bar defining the lower surface thereof, one of said berms having an upper surface symmetrically bowed upwardly toward said upper bar surface to a high point relative to said upper bar surface at the mid-point of said berm with said upper berm surface further defining an acute angle with its adjacent corresponding side wall of said bar whereby said upper berm surface forms a compound angle with said side wall, and the other of said berms having an upper berm surface symmetrically bowed downwardly toward said lower bar surface to a low point relative to said upper bar surface at the mid-point of said other berm with the last said upper berm surface defining said acute angle with its adjacent corresponding side wall of said bar with the last said berm being disposed in interlocked relationship with a berm corresponding to the first said berm on an adjacent inverted similar bar disposed in side-by-side relationship in said layer of said stack.

3. An ingot adapted to form part of a stack comprising an elongated cast bar of quadrilateral cross-section with a pair of substantially flat parallel upper and lower surfaces, a lateral berm projecting from each of a pair of side walls of said bar and coextending with each other along a pair of adjacent lateral edges of said bar, one of said berms having an upper substantially planar berm surface symmetrically slanted downwardly toward said lower bar surface from a high point relative to said upper bar surface at a mid-point of said berm with said upper berm surface defining an acute angle with its adjacent corresponding side wall of said bar whereby said one berm forms a compound angle with said side wall, and the other of said berms having an upper substantially planar berm surface symmetrically slanted upwardly toward said upper bar surface from a low point relative to said upper bar surface at the mid-point of said other berm with the last said upper berm surface defining said acute angle with its adjacent corresponding side wall of said bar with the last said berm being adapted for interlocking engagement with a berm corresponding to the first said berm on an adjacent inverted similar bar disposed in side-by-side relationship in the same layer of said stack.

4. A stack of billets comprised of layers of ingots with each of said layers having a plurality of alternately inverted similar ingots disposed in side-by-side relationship with adjacent ingots in interlocked engagement with one another, each of said ingots comprising an elongated cast bar of quadrilateral cross-section having a pair of substantially flat parallel upper and lower surfaces, a lateral berm projecting from each of a pair of side walls of said bar and coextending with each other longitudinally along a pair of adjacent lateral edges of said bar, one of said berms having an upper substantially planar berm surface symmetrically slanted downwardly toward said lower bar surface from a high point relative to said upper bar surface at the mid-point of said berm with said upper berm surface defining an acute angle with its adjacent corresponding side wall of said bar whereby said one berm forms a compound angle with said side wall, and the other of said berms having an upper substantially planar berm surface symmetrically slanted upwardly toward said upper bar surface from a low point relative to said upper bar surface at the mid-point of said other berm with the last said upper berm surface defining said acute angle with its adjacent corresponding side wall of said bar with the last said berm being nested in interlocked engagement with a berm corresponding to the first said berm on an adjacent inverted similar bar disposed in side-by-side relationship in the same layer of said stack.

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