July 14, 1964 R. N. SCHNACKE 3,140,926

INGOT

Filed Nov. 9, 1962 2 Sheets-Sheet 1

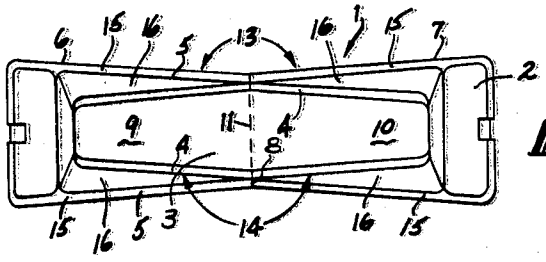

FIG - 1

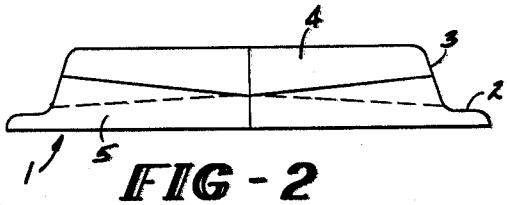

FIG - 2

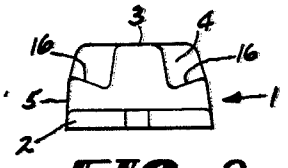

FIG - 3

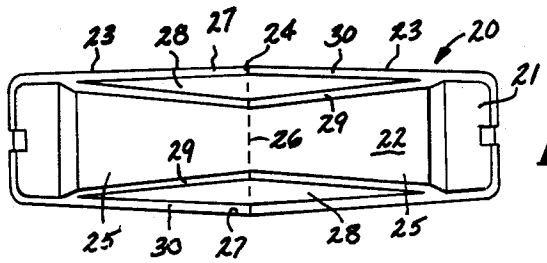

FIG - 5

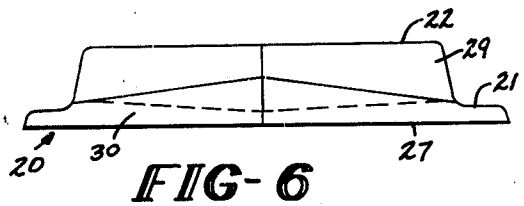

FIG - 6

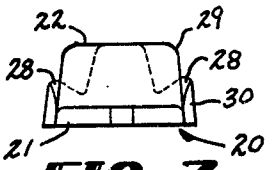

FIG - 7

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INGOT

Filed Nov. 9, 1962 2 Sheets-Sheet 2

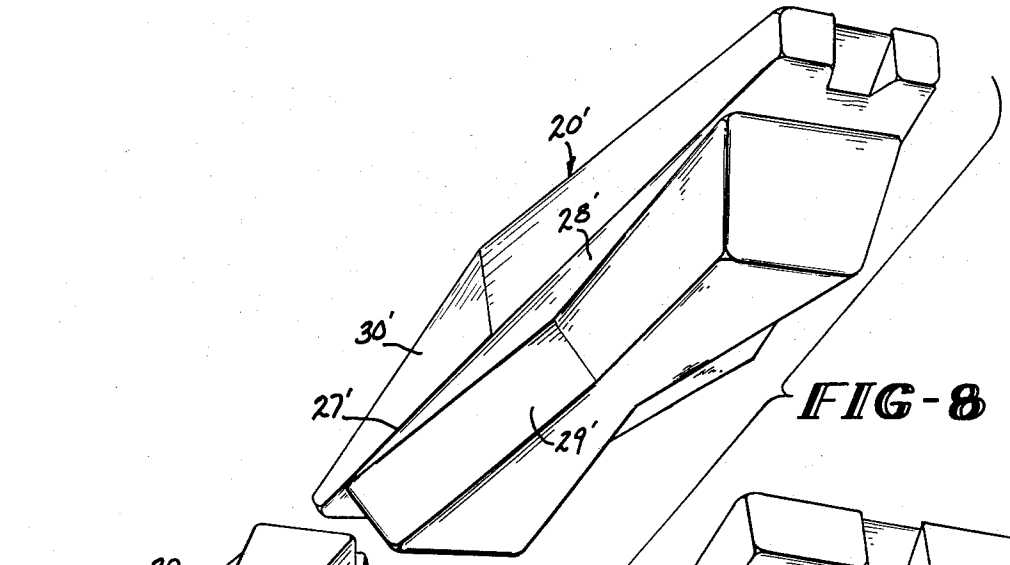


FIG-8

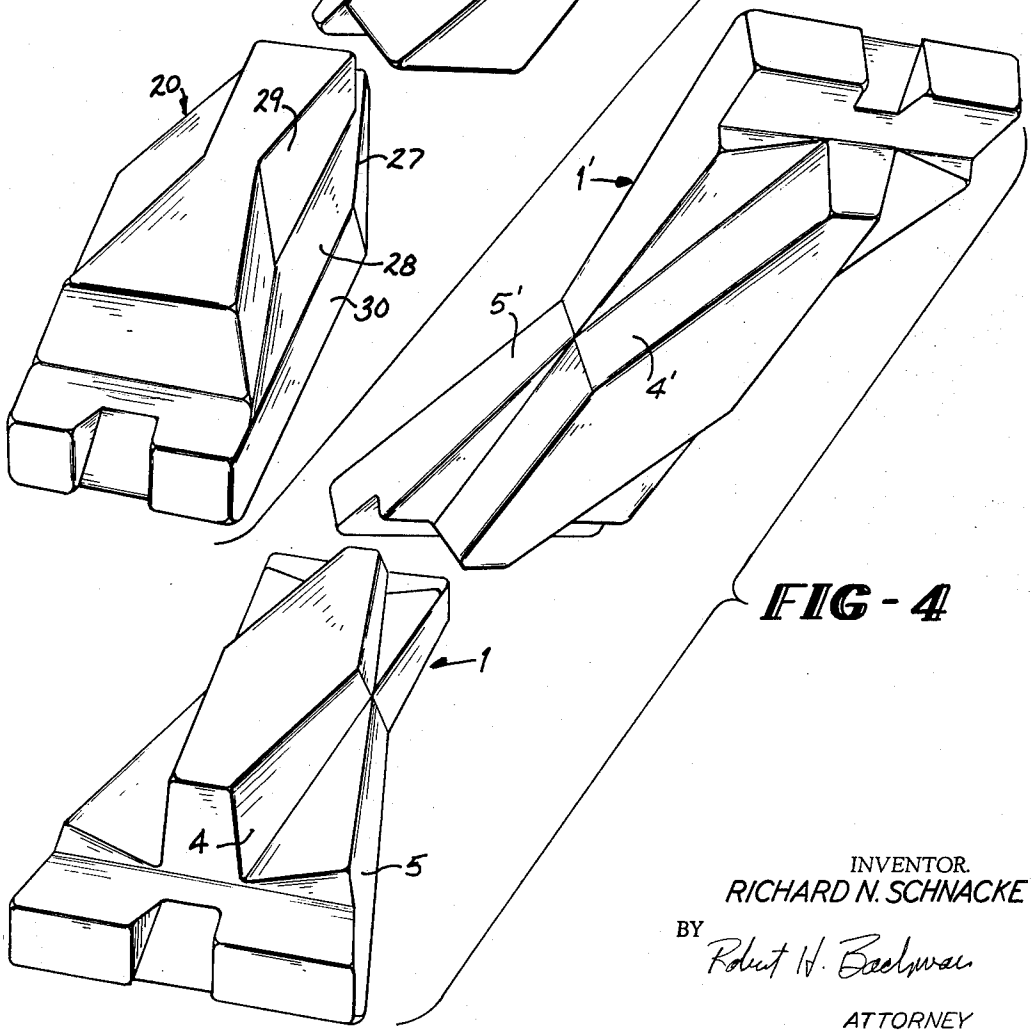


FIG-4

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United States Patent Office 3,140,926 Patented July 14, 1964



# 3,140,926 INGOT

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Filed Nov. 9, 1962, Ser. No. 236,600
10 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 interlocked engagement with like means provided on similar and adjacent ingots.

It is a further object of this invention to provide interlocking ingots 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 of an ingot constructed in accordance with this invention;

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

FIGURE 3 is an elevational end view of the ingot shown in FIGURE 1;

FIGURE 4 is an exploded perspective view depicting two of the ingots shown in FIGURE 1 for purposes of illustrating the manner in which they are to be interlocked;

FIGURE 5 is a plane view of an ingot constructed in accordance with another embodiment of this invention;

FIGURE 6 is an elevational side view of the ingot shown in FIGURE 5;

FIGURE 7 is an elevational end view of the ingot shown in FIGURE 5; and

FIGURE 8 is an exploded like view in perspective depicting two of the ingots shown in FIGURE 5 for the purpose of illustrating the manner for interlocking them with each other.

Referring to the drawings, the ingot **1** is a cast bar or pig of metal, such as aluminum and the like, generally characterized with a quadrilateral cross-section and, as illustrated, may be described as comprised of a base portion **2** and a body portion **3** each generally having side walls of oblique or slanted configuration converging toward the top surface of the body portion **3**. In accordance with this invention the adjacent side walls **4** and **5** of the body portion and base portion respectively are bowed in opposite directions from a common point with the side walls **4** of the body portion having a bow complementary to that of the base portion side wall **5**. More specifically, the base portion **2** defines two truncated triangles **6** and **7** in end-to-end relationship and having a common apex **8**. In addition, the body portion **3** defines two truncated triangles **9** and **10** in end-to-end relationship extending parallel to corresponding triangles **6** and **7**, with the truncated triangles **9** and **10** having a common base **11** coextending with the common apex **8** of triangles **6** and **7**. As can be seen in the drawings the angle **13** defined by the base side walls **5** are complementary to the angle **14** defined by the body portion side walls **4**. This relationship of the body portion to the base portion defines laterally projecting flanges **15** at the apexes of the body portion **3**. Each of the upper faces of flanges **15** is



characterized by a substantially planar upper face **16** disposed at an angle, generally acute, to their corresponding adjacent body portion side walls **4**.

This construction of the ingots permits them to be placed in interlocked engagement with each other by the meshing of the flanges of one ingot with the flanges of an inverted similar ingot disposed in side-by-side relationship in the same layer of a stack. Further, the configuration of the side walls of the body and base portion enables the body portion of one ingot to be meshed or nested in the base portion side wall **5** of the adjacent ingot **1'**, and concurrently, the body portion side wall **4'** of the adjacent ingot **1'** is adapted to mesh in the base portions side wall **5** of the first ingot **1**. This interlocked relationship of the ingots permits their assembly into a very stable and firm arrangement enabling their formation into layers which serve as a very secure platform for receiving succeeding layers of the ingots. The resulting stack or bundle is nearly perfect fitting and advantageously attains high poundage per cubic foot with a resultant saving of space.

An additional advantage of the present invention is attained by sloping the locking surfaces obliquely in three planes at once. This enables the resisting of shifting movements with a single set of locking surfaces.

FIGURES 5 to 8 illustrate another embodiment **20** of this invention likewise comprised of a base portion **21** and a body portion **22** projecting upwardly from the base portion. However, in this embodiment the base portion **21** is comprised of two truncated triangles **23** disposed in end-to-end relationship about a common base **24**. In addition, the upwardly projecting body portion **22** is comprised of two truncated triangles **25** disposed in end-to-end relationship about and having a common apex **26** coextending with the common base **24** of the base portion **21**. This conjoint construction of the body portion defines from the base portion **21** laterally projecting flanges **27** whose upper faces **28** are disposed at an angle to the side walls **29** of the body portion **22**. In contrast to the preceding embodiment, in the instant embodiment, the side walls **30** of the base portion **21** will mesh or nest in the angled seat defined by the body side walls **29'** of a similarly inverted ingot **20'** disposed in side-by-side relationship with ingot **20** whereas the base side wall **30'** of the adjacent ingot **20'** will mesh or nest in the angle defined by the body side walls **29** of ingot **20**. As will be appreciated, the conjoint nesting of the side walls of one ingot with the side walls of the adjacent inverted ingot prevents longitudinal displacement by a resistance to longitudinal shifting because of the relationship of the nested side walls. Further, the inter-engagement or meshing of the flanges **27** and **27'** with one another by means of the compound angles formed by their upper faces **28** and **28'**, respectively, offers resistance against lateral shifting of the ingots.

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 elongated ingot adapted to form part of a stack comprising a base portion and an upwardly projecting integral body portion narrower than said base portion and extending longitudinally on said base portion with said base portion defining two lateral projections on each side of said body portion with the upper surface of each pair of flanges defining an acute angle with its adjacent corresponding side wall of said body portion whereby said flanges are adapted for interlocking engagement with the flanges of an adjacent inverted similar ingot disposed in side-by-side relationship in the same layer of said stack with the body portion side wall of the first said ingot adapted to nest in the base portion side wall of the second

said ingot and with the body portion side wall of the second said ingot adapted to nest in the base portion side wall of the first said ingot.

2. An ingot according to claim 1 wherein said interlocking surfaces are obliquely sloped.

3. An elongated ingot adapted to form part of a stack comprising a base portion and an upwardly projecting integral body portion narrower than said base portion and extending longitudinally on said base portion with said base portion defining two lateral projections on each side of said body portion with the side wall of each pair of flanges and body portions being similarly bowed in opposed relationship with one another about a common point with each of said bowed side walls being complementary to each other, and with the upper surface of each of said flanges defining an acute angle with its adjacent corresponding side wall of said body portion whereby said flanges are adapted for interlocking engagement with the flanges of an adjacent inverted similar ingot disposed in side-by-side relationship in the same layer of said stack with the body portion side wall of the first said ingot adapted to nest in the base portion side wall of the second said ingot and with the body portion side wall of the second said ingot adapted to nest in the base portion side wall of the first said ingot.

4. An ingot according to claim 3 wherein said interlocking surfaces are obliquely sloped.

5. An elongated ingot adapted to form part of a stack comprising a base portion and an upwardly projecting integral body portion extending longitudinally on said base portion, said base portion having its side walls bowed toward each other and said body portion having its side defined by an adjacent pair of side walls of said body portion and said base portion having their apexes coextending through a common line with the bowed configuration of the base side wall adjacent one of said body side walls being complementary to the bowed configuration of the opposite side wall of said body portion.

6. An elongated ingot adapted to form part of a stack comprising a base portion and an upwardly projecting integral body portion extending longitudinally on said base portion, said base portion defining two truncated first triangles in end-to-end relationship and having a common apex, and said body portion defining two truncated second triangles in end-to-end relationship extending parallel to said first triangles and having a common base portion coextending with said common apex with the side walls of said body portion defining an angle complementary to the angle defined by the side walls of said base portion whereby portions of said base portions form lateral projections at each of the side walls of said body portion adjacent the apexes thereof, each of said flanges having substantially planar upper surfaces defining an acute angle with its adjacent corresponding side wall of said body portion whereby said flanges are adapted for interlocking engagement with the flanges of an adjacent inverted similar ingot disposed in side-by-side relationship in the same layer of said stack with the body portion side wall of the first said ingot adapted to nest in the base portion side wall of the second said ingot and with the body portion side wall of the second said ingot adapted to nest in the base portion side wall of the first said ingot.

7. A stack of ingots comprised of layers of said ingots with each of said layers having a plurality of alternatively inverted similar ingots disposed in side-by-side relationship with adjacent ingots in interlocked engagement with one another, each of said ingots comprising a base portion and an upwardly projecting integral body portion extending longitudinally on said base portion, said base portion defining two truncated first triangles in end-to-end relationship and having a common apex, said body portion defining two truncated second triangles in end-to-end relationship extending parallel to said first triangles and having a common base coextending with said common apex with the side walls of said body portion defining an angle complementary to the angle defined by the side walls of said base portion whereby portions of said base portion form laterally projecting flanges at each of the side walls of said base portion adjacent the apexes thereof, each of said flanges having a substantially planar upper face defining an acute angle with its adjacent corresponding side wall of said body portion disposing said flanges in interlocked engagement with the flanges of an adjacent inverted similar ingot disposed in side-by-side relationship in said layer of said stack with the body portion side wall of the first said ingot nested in the base portion side wall of the second said ingot and with the body portion side wall of the second said ingot nested in the base portion side wall of the first said ingot.

8. An elongated ingot adapted to form part of a stack comprising a base portion and an upwardly projecting integral body portion extending longitudinally on said base portion with said base portion having each of its opposite side walls bowed outwardly away from each other and with said body portion having each of its corresponding opposite side walls similarly bowed inwardly toward each other, each of the bows defined by each adjacent pair of side walls of said body portion and said base portion having their base segments coextending with each other on a common plane and with the side walls of said body portion defining a bow complementary to the bow defined by the side walls of said base portion whereby portions of said base portion define laterally projecting flanges at each of the side walls of said body portion, each of said flanges having substantially planar upper faces defining an acute angle with its adjacent corresponding side wall of said body portion whereby said flanges are adapted for interlocking engagement with the flanges of an adjacent inverted similar ingot disposed in side-by-side relationship in the same layer of said stack with the body portion side wall of the first said ingot adapted to nest in the base portion side wall of the second said ingot and with the body portion side wall of the second said ingot adapted to nest in the base portion side wall of the first said ingot.

9. An elongated ingot adapted to form part of a stack comprising a base portion and an upwardly projecting integral body portion extending longitudinally on said base portion, said base portion defining two truncated first triangles in end-to-end relationship and having a common base and said body portion defining two truncated second triangles in end-to-end relationship extending parallel to said first triangles and having a common apex coextending with said common base with the side walls of said body portion defining an angle complementary to the angle defined by the side walls of said base portion whereby portions of said base portion form laterally projecting flanges at each of the side walls of said body portion adjacent the common apex thereof, each of said flanges having substantially planar upper faces defining an acute angle with its adjacent corresponding side wall of said body portion whereby said flanges are adapted for interlocking engagement with the flanges of an adjacent inverted similar ingot disposed in side-by-side relationship in the same layer of said stack with the body portions side wall of the first said ingot adapted to nest in the base portion side wall of the second said ingot and with the body portion side wall of the second said ingot adapted to nest in the base portion of the side wall of the first said ingot.

10. 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 a base portion and an upwardly projecting integral body portion extending longitudinally on said base portion, said base portion defining two truncated first triangles in end-to-end

relationship and having a common base and said body portion defining two truncated second triangles in end-to-end relationship extending parallel to said first triangles and having a common apex coextending with said common base with the side walls of said body portion defining an angle complementary to the angle defined by the side walls of said base portion whereby portions of said base portion form laterally projecting flanges at each of the side walls of said body portions at the common apex thereof, each of said flanges having substantially planar upper faces defining an acute angle with its adjacent corresponding side wall of said body portion with said flanges disposed in interlocked engagement with the



flanges of an adjacent inverted similar ingot disposed in side-by-side relationship in same layer of said stack with the body portion side wall of the first said ingot nested in the base portion side wall of the second said ingot and with the body portion side wall of the second said ingot nested in the base portion side wall of the first said ingot.

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# UNITED STATES PATENT OFFICE

# CERTIFICATE OF CORRECTION

Patent No. 3,140,926 July 14, 1964

Richard N. Schnacke

It is hereby certified that error appears in the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 3, line 32, after "side" insert -- walls bowed away from each other with each of the bows --; line 64, for "alternatively" read -- alternately --.

Signed and sealed this 22nd day of December 1964.

EAL)
ttest:

RNEST W. SWIDER
testing Officer

EDWARD J. BRENNER
Commissioner of Patents