Oct. 18, 1955 S. E. McFALL 2,720,968

INTERLOCKING INGOTS

Filed Dec. 31, 1952

2 Sheets-Sheet 1

Fig. 1

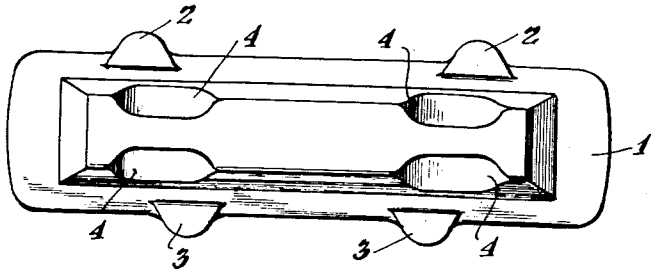


Fig. 2

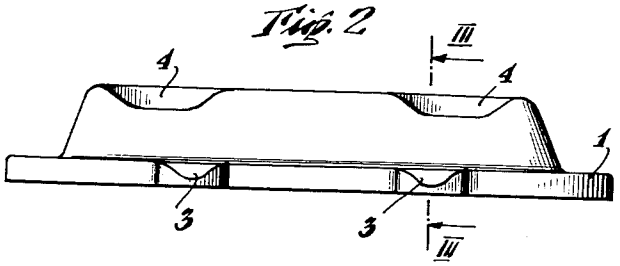


Fig. 3

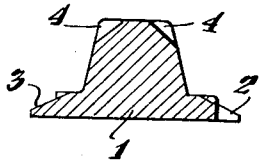
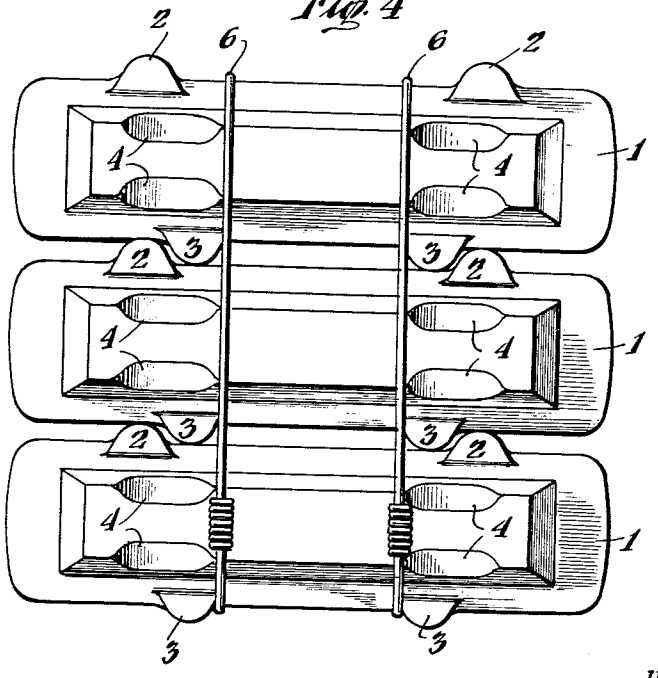


Fig. 4



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Fig. 5

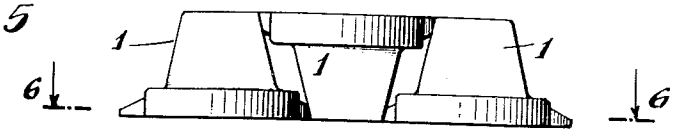


Fig. 6

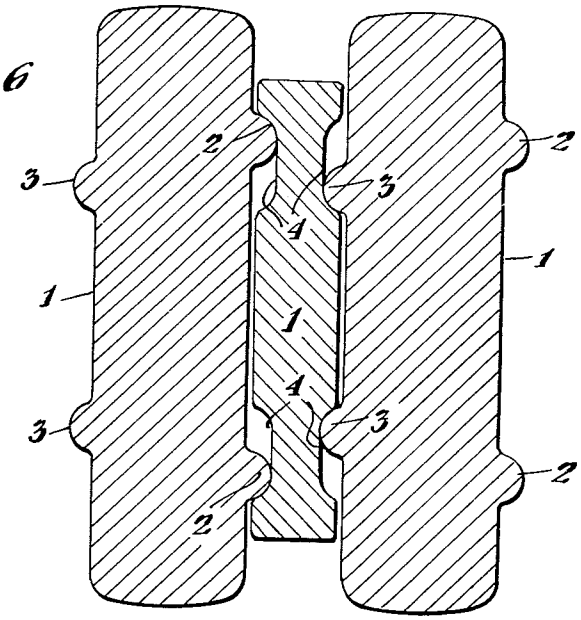
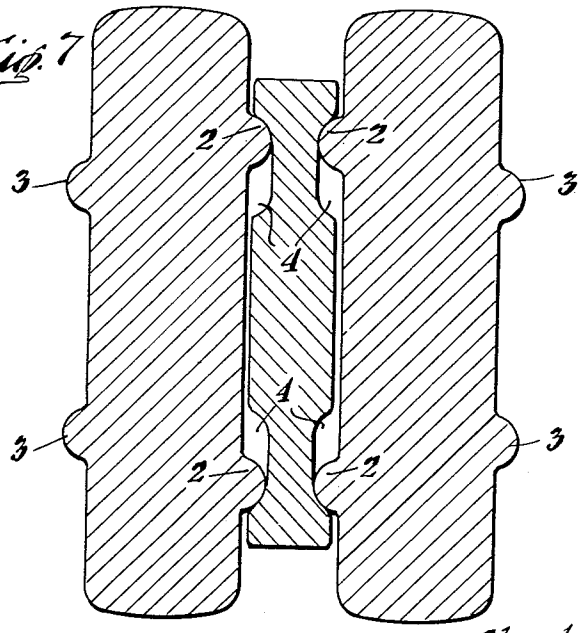


Fig. 7



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INTERLOCKING INGOTS

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Application December 31, 1952, Serial No. 328,901

3 Claims. (Cl. 206—65)

The present invention relates to articles adapted to be stacked in tiers or layers, and to shipping bundles containing a plurality of such layers.

The invention as described herein is applied to metal ingots, particularly aluminum ingots and to shipping bundles of such ingots. While the invention is of especial utility in connection with such ingots, it is of more general utility in connection with other articles, and I therefore do not intend to limit my invention in its broadest aspects to any specific article.

In the copending application of William G. M. Wilson, Serial No. 328,838, filed December 31, 1952, there is shown and described an aluminum ingot which is adapted to be assembled in tiers with other similar ingots. The ingots described by Wilson may be assembled either in tiers wherein all ingots are upright or in tiers wherein the alternate ingots are inverted. When so assembled, lugs and notches provided on the ingots interlock to prevent endwise sliding of the ingots relative to one another. Such endwise sliding is undesirable for many reasons. Specifically, it sometimes causes adjacent bundles in freight cars to interlock so that the bundles have to be cut apart and each ingot unloaded by hand.

When ingots are constructed as shown and described in the Wilson application mentioned above, each ingot is provided with a pair of widely spaced lugs on one side and a pair of narrowly spaced lugs on the opposite side. All the lugs are located at the bottom of the ingot. At the top of the ingot there are provided corresponding widely and narrowly spaced notches. When such ingots are being assembled in tiers, it is necessary that all the ingots be kept oriented in the same sense. If one ingot is turned end for end, its widely spaced lugs will be found facing the narrowly spaced notches on the adjacent ingots and vice versa. Since ingots occasionally become turned end for end in handling prior to their assembly into bundles, considerable time and effort is spent in turning these ingots back so that their orientation will be the same as the other ingots in the bundle.

It is therefore an object of the present invention to construct an ingot adapted for assembly either in tiers wherein all the ingots are upright or in tiers wherein each alternate ingot is inverted, and which is adaptable to assembly in tiers of the alternate inverted type regardless of its orientation. A further object of the invention is to provide a bundle of such ingots.

The foregoing and other objects of the invention are attained by constructing ingots similar to those described in the Wilson application mentioned above, but modified to the extent of widening all the notches, so that they are substantially twice the width of the lugs. Consequently, any pair of notches on a first ingot will receive either a narrowly spaced or a widely spaced pair of lugs on an adjacent inverted ingot, whether the orientation of that adjacent ingot is the same or the reverse of the orientation of the first ingot.

In the drawings:

Fig. 1 is a plan view of an ingot constructed in accordance with the invention;

Fig. 2 is an elevational view of the ingot of Fig. 1;

Fig. 3 is a sectional view taken on the line III—III of Figs. 1 and 2, looking in the direction of the arrows;

Fig. 4 is a plan view showing the top tier of a bundle of ingots when assembled with all the ingots upright;

Fig. 5 is an elevational view of a tier of three ingots assembled with the middle ingot of the tier inverted;

Fig. 6 is a sectional view taken on the line VI—VI of Fig. 5, showing the interlocking of the lugs and notches when the orientation of the two end ingots is the same;

Fig. 7 is a view similar to Fig. 6 showing the interlocking of the lugs and notches when the orientation of one of the two end ingots is reversed.

Referring to the drawings, there is shown in Figs. 1 to 3 an ingot **1** having on one side adjacent its bottom a pair of widely spaced projecting lugs **2** and on its opposite side near the bottom a pair of more narrowly spaced projecting lugs **3**. The top of the ingot **1** is formed with four notches **4**, all of which have a width which is twice that of lugs **2** and **3**. The inner ends of the notches **4** are aligned with the lugs **3** while the outer ends of the notches **4** are aligned with the lugs **2**.

The distance between the inwardly facing surface of the lugs **2** is just slightly larger than the distance between the outwardly facing surfaces of the lugs **3**, so that the lugs **3** on an adjacent similar article may slide freely between the lugs **2**.

The distance between each lug **3** and the end of the ingot is made substantially equal to the distance between the corresponding lug **2** and the end of the ingot plus the width of the lug **2**. By so dimensioning the lugs and their spacing from the ingot ends, they may be made to hold the ends of the ingots in substantial alignment, so that the completed bundle has on its ends no projections nor recesses which would be likely to cause interlocking of adjacent bundles.

Fig. 4 shows a bundle having a top layer consisting of three of the ingots **1** held together by a pair of bands **6**. The ingots **1** are all upright. It may be seen that the ingots **1** are held against longitudinal movement by the interlocking of the narrowly spaced lugs **3** on each ingot with the widely spaced lugs **2** on the adjacent ingots.

Figs. 5 to 7 illustrate a tier of three ingots **1** assembled with the center ingot inverted. When the two end ingots have the same orientation, as illustrated in Fig. 6, the notches **4** on the center ingot receive the wide lugs **2** on the left hand ingot and the narrow lugs **3** on the right hand ingot. The lugs and notches are effective to lock the adjacent ingots against any substantial relative endwise movement.

The situation which exists when the two end ingots have opposite orientation is illustrated in Fig. 7. There the notches **4** on the inverted ingot receive the widely spaced lugs **2** of both the end ingots. Again each pair of adjacent ingots is locked against endwise movement.

The tier of ingots illustrated in Figs. 5 to 7 may be extended to contain any convenient number of ingots and may be assembled with other such tiers to form a bundle.

The lugs have been disclosed as located at the bottom of the ingot and the notches at the top. This is the most convenient arrangement for casting purposes. However, the interlocking would be just as effective with the lugs at the top and the notches at the bottom. Therefore, in this specification and the appended claims, it is to be considered that the terms bottom and top are relative, referring to opposite horizontal faces of the ingot, without limitation as to the particular face which is up.

Modifications of my invention other than that described herein will readily appear to those skilled in the art and I therefore intend my invention to be limited only by the appended claims.

I claim:

1. An elongated article adapted to form with other similar articles a tier of articles interlocked against relative longitudinal movement comprising an elongated body with a first pair of lugs projecting laterally from one side of said body and having their facing surfaces longitudinally spaced by a predetermined distance, and a second pair of lugs projecting laterally from the opposite side of said body, the surfaces of said second pair of lugs nearest the end of said body being spaced longitudinally by a distance slightly smaller than said predetermined distance so that two such articles may be placed side by side with the second pair of lugs on one article fitting between the first pair of lugs on the other article and cooperating therewith to prevent relative longitudinal shifting of the articles, both said pairs of lugs being adjacent the bottom of said body, said body also having two pairs of longitudinally spaced notches formed in the opposite sides of said body and adjacent the top thereof, each said notch having a width equal to the sum of the widths of one of said first lugs and of one of said second lugs, so that when said article is placed with other similar articles in a tier which consists of alternate upright and inverted articles, the lugs and notches on adjacent articles cooperate to prevent relative longitudinal shifting of the articles, even though some of the articles may be turned end for end.

2. An article as defined in claim 1, consisting of an ingot.

3. A bundle consisting of at least one tier of elongated articles interlocked against relative longitudinal movement, each said article comprising an elongated body with a first pair of longitudinally spaced lugs projecting laterally from one side of said body, and a second pair of longitudinally spaced lugs projecting laterally from the opposite side thereof, both said pairs of lugs being at the same level adjacent the bottom of said body, each lug of said second pair having its surface nearest the end of the body spaced from said end by a distance slightly greater than the sum of the distance of the corresponding surface of the corresponding lug of the first pair from said end of the body plus the width of said corresponding lug, all said lugs being of substantially equal width, said body also having two pairs of longitudinally spaced notches formed in the opposite sides of said body and adjacent the top thereof, each said notch having a width substantially equal to twice the width of one of said lugs, with its end nearest the end of said body aligned with the corresponding end of one of said first pairs of lugs, and its end nearest the center of said body aligned with the corresponding end of one of said second pair of lugs, the articles in said tier being alternately upright and inverted, with the lugs and notches on adjacent articles cooperating to prevent relative longitudinal shifting of the articles, regardless of the relative endwise orientation of adjacent articles, and at least one band extending transversely around said bundle and holding said articles against lateral shifting movement, said band being effective to hold said lugs and notches in interlocking engagement.

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