Jan. 16, 1962 E. BERTRAM ETAL 3,017,042

BILLET

Filed May 9, 1957

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Fig. 1

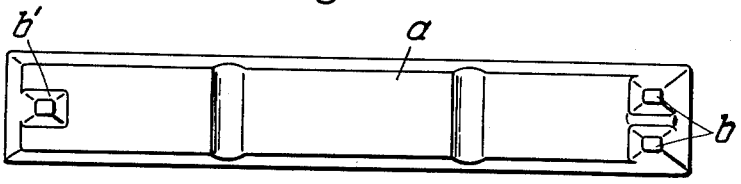

Fig. 2

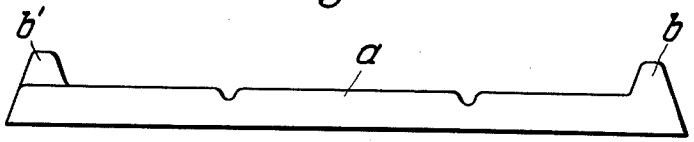

Fig. 3

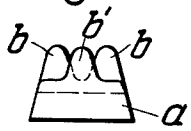

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Fig. 4

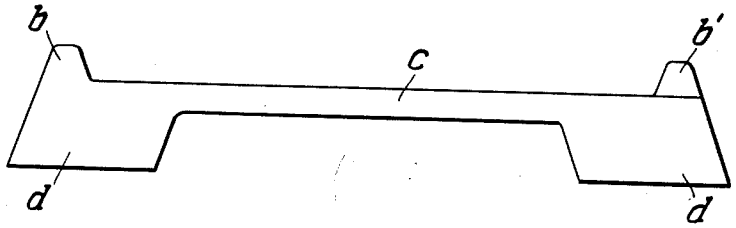

Fig. 5

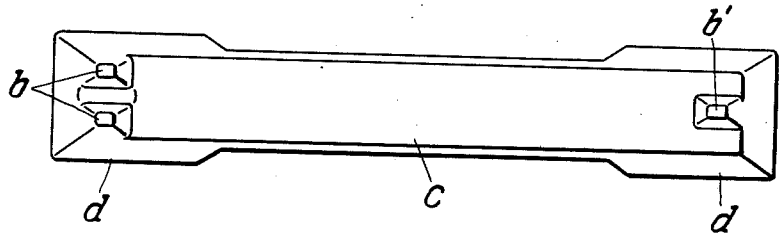

Fig. 6

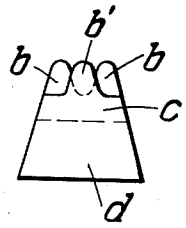

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Fig. 7

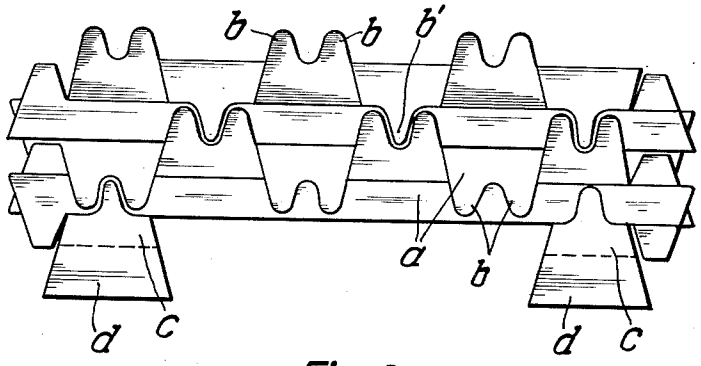
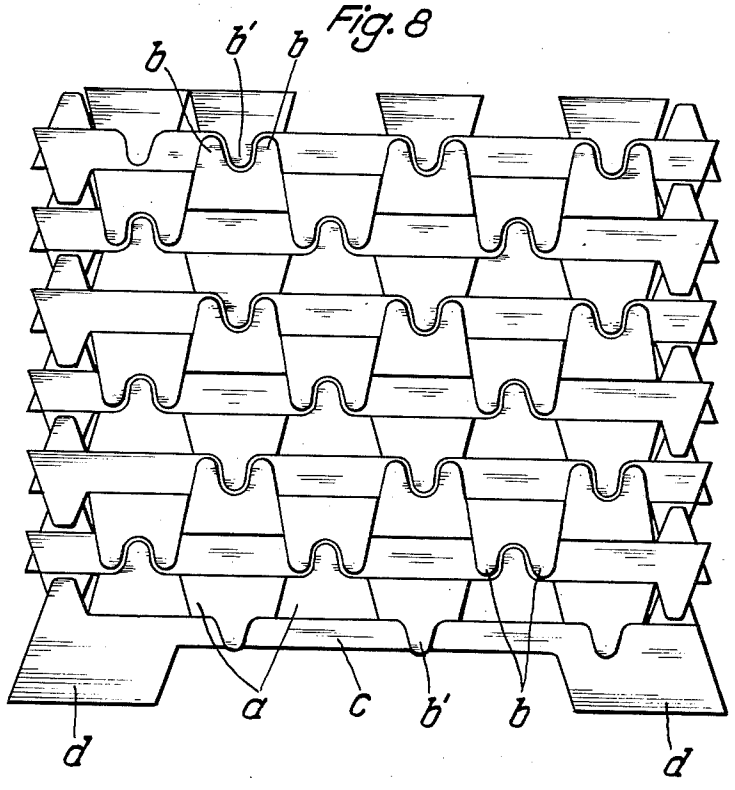


Fig. 8



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3,017,042
BILLET

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4 Claims. (Cl. 214—10.5)

This invention relates to billets, bars, or similarly cast shaped articles adapted to be stacked and conveyed by means of lifting and handling equipment, such as fork-lift trucks. The invention is especially directed to billets which can be stacked without requiring special supports or bands in order to prevent the stack from collapsing while being moved.

In order to prevent billets from shifting relative to each other and being displaced after they have been stacked together, it is known to give the billets such shape that the stacked billets mutually engage each other. In one form, the elongated side edges of the billets are provided with projections which engage cooperating recesses in adjacent billets.

It has also been known to provide grooves in the body of the billet with cooperating elevations or projections which are preferably located on their undersurfaces, whereas the grooves are on the top surface, so that the grooves and projections will engage as the billets are stacked.

Also, it is known to provide elongated billets having projections on the shortened edges, which edges have oblique surfaces by reason of techniques required in the casting of the billets. It has been found that such billets with the oblique or beveled surfaces required for extracting the billets from the molds still have a certain amount of relative play between each other when arranged in the stack so that the individual billets within the stack can shift and make an unwieldy stack, even though there is little danger of the stack collapsing.

The object of the instant invention is to produce a billet having a form such that the billets can be stacked with substantially no lateral play between the individual billets.

In general, the object is obtained by forming an elongated billet with discrete pyramidal elevations in the form of pointed teeth adjacent the narrow ends of the billet. An even number of teeth is formed adjacent one narrow end, whereas an odd number of teeth is formed adjacent the opposite end during the casting of the billet. It is generally sufficient to have one tooth at one end and two teeth at the other. In stacking the billets, they are placed one upon another in such a way that the odd number of teeth engage the even number of teeth of an adjacent billet, with the billets in each course being alternately arranged with their teeth pointing upwards and downwards.

The bottom billet for the stack has the teeth as described above and, in addition, has feet formed at the ends thereof in order to provide clearance above the floor, as required for the insertion of the fork of a lift truck.

The means by which the object of the invention is obtained are described more fully with reference to the accompanying drawings, in which:

FIGURE 1 is a plan view of a billet according to the invention;

FIGURE 2 is a side elevational view of FIGURE 1;

FIGURE 3 is an end elevational view of FIGURES 1 and 2;

FIGURE 4 is a side elevational view of a bottom billet;

FIGURE 5 is a plan view of FIGURE 4;

FIGURE 6 is an end elevational view of FIGURE 4;

FIGURE 7 is an end elevational view of a plurality of stacked billets; and

FIGURE 8 is a side elevational view of FIGURE 7.

Each individual billet is composed of an elongated bar *a* having oblique or beveled side edges. On the face of the billet toward which the sides converge are cast discrete pyramidal elevations in the form of pointed teeth. Adjacent one narrow end of the billet are an even number of teeth *b*, as, for example, two teeth. On the opposite end of the billet are an odd number of teeth, as, for example, the single tooth *b'*. The slope of the beveled end of the bar is continued at the same angle on the outer end portions of the billets *b* and *b'*, and all the sides of the teeth have similar angles of slope.

The bottom billet or bar *c*, as shown in FIGURES 4 to 6, is of similar construction with the addition that it is provided at its ends with the feet *d*.

The billets are stacked as shown in FIGURES 7 and 8. Two bottom billets *c* are placed on the floor parallel to each other. The first course of bars *a* is then laid on billets *c*. Starting from the left-hand side of FIGURE 7, it is shown that the lowest course of bars *a* is formed by first placing a bar *a* with its teeth pointing upwardly on the base bar *c*. Then a second bar *a* is placed along side of the first bar with its teeth projecting downwardly. The oblique side edges of the bars are thus in flush contact with each other and the downwardly projecting teeth *b* and *b'* are flush with the beveled edges of the sides of the bottom billet *c*. Successive bars *a* are thus alternately arranged across the bottom bar, it being noted that the extreme right bar can be dropped into place and can be restrained by the end tooth on bottom bar *c*.

The next course is then laid at right angles to the first course, and with the end teeth of the left-hand bar, note FIGURE 7, downwardly projecting and engaging the upwardly projecting tooth of bottom bar *c*.

The third course is then laid in the same direction of the first course, and the alternate bars *a* have their downwardly projecting teeth engaging the upwardly projecting teeth of the bars of the first course. The bars so arranged are prevented from shifting in one direction by means of the teeth engaging the beveled side edges of the bars in adjacent courses, and from shifting in another direction by the inter-engagement of teeth with those of the third or superimposed bars. In this manner, substantially all of the lateral play between the individual bars is prevented, and a stable stack is obtained.

The bars can be stacked in courses until a desired height is reached. As indicated in the upper left-hand corner of FIGURE 8, the top-most course can contain one additional bar which can be easily dropped into place. In practice, it has been found preferable to place an even number of bars *a* across the bottom billets *c*, and then to form additional courses by means of crosswise laid courses of an even number of bars *a* until the stack is complete.

Having now described the means by which the object of the invention is obtained, we claim:

1. A solid stack of billets, each billet being composed of an elongated bar having opposite flat substantially rectangular surfaces extending longitudinally of said bar, a single tooth mounted perpendicular to one rectangular surface adjacent one end of said bar, a pair of teeth mounted perpendicular to said one surface adjacent the other end of said bar with the space between the pair of teeth having a shape complementary to said single tooth, and each billet having a longitudinal length between each tooth and the pair of teeth equal to a whole multiple of the width of the billet; a lowest row of billets laid in side by side contact parallel to each other with the teeth of alternate billets projecting up and down, respectively, a

second similar row of billets laid upon said lowest row at right angles thereto, a third similar row of billets laid upon said second row and parallel to and in vertical alignment with the billets of said lowest row, and with the downwardly turned teeth of the third row interengaging with the upwardly projecting teeth of said lowest row.

2. A stack of billets as in claim 1, each billet and teeth having sides beveled at the same angle.

3. A cast billet adapted to be stacked in courses of crossed rows with similar shaped billets comprising an elongated bar, an even number of pyramidal pointed toothlike projections extending transversely of said bar adjacent one end thereof, at least one of an odd number of projections adjacent the other end and on the same side of said bar and aligned intermediately of said even number projections, each projection having a height substantially equal to but not greater than the thickness of the billet, and said odd number projections each having a shape complementary to the space between adjacent even numbered projections so as to fit into such space in a superimposed billet.

4. A billet as in claim 3, said even number projections being two in number.

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