

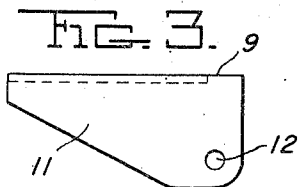
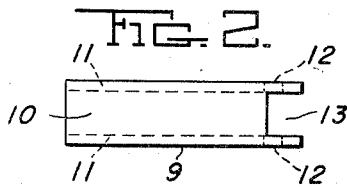
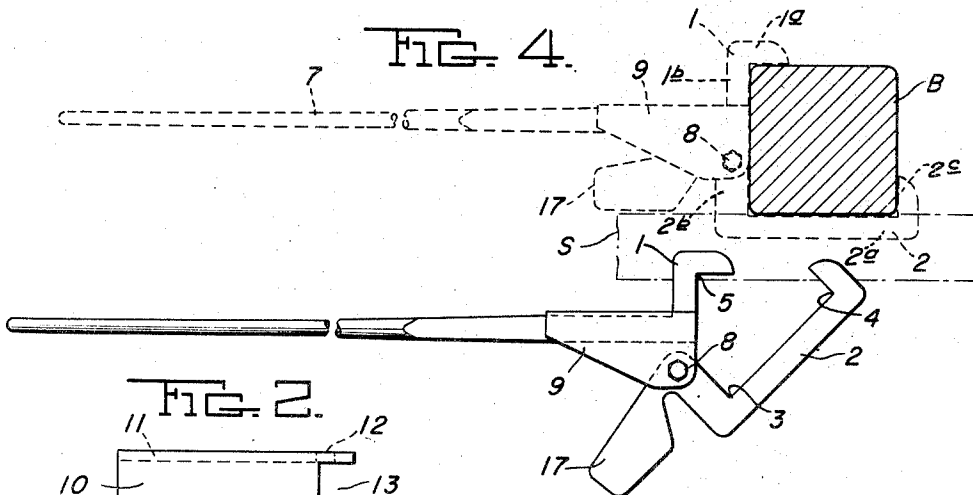
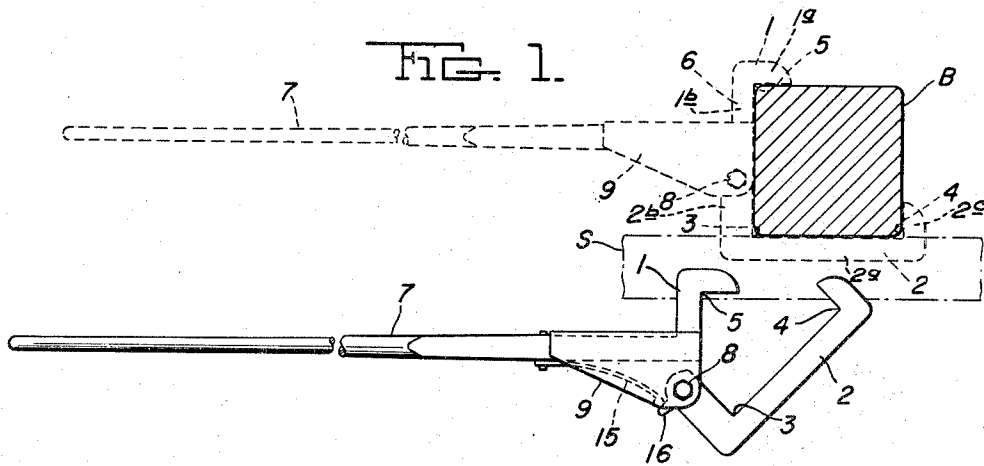
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BLOOM-TUMBLING TOOL

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BLOOM-TUMBLING TOOL

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1 Claim. (Cl. 294—17)

This invention relates to a tool in the nature of a cant-hook for tumbling or rotating heavy steel billets and blooms.

Billets or blooms rolled from steel ingots into substantially square or rectangular sections generally have surface defects that must be removed by chipping or grinding before further rolling. In the removal of such surface defects, the blooms are commonly supported on skids while their surfaces are finished by a workman. After one surface has been finished, the bloom is rotated through an angle of 90° to present a new surface for finishing operation.

Cant-hooks are commonly employed to turn or tumble blooms on their supporting skids. One form of tool which has been in use for many years for this purpose is shown in Patent No. 2,132,553. As shown in the patent, the tool was intended to be applied to a bloom with its operating lever in a horizontal position so that the bloom would be rolled away from the workman applying a lifting force to the lever. However, this tool is capable of being applied with its operating lever in a vertical position so that a bloom could be rotated by an operator pulling on the lever. Upon slippage of the tool from engagement with the bloom when operated in this manner, the operator would in some cases fall backwardly and at times pull the bloom on himself with serious injury. The nature of the forces involved and resulting in such injuries will be better appreciated when consideration is given to the manual effort required to rotate a bloom having a weight of from 1000 to 3000 pounds.

One of the principal objects of this invention is to provide a bloom-tumbling tool having improved provisions for preventing slippage when in operating engagement with a bloom to be turned.

A further object of the invention is to provide a bloom-tumbling tool with clamping jaws in the nature of corner hooks which are engaged with diametrically opposite corners of the bloom and in which the tumbling force applied to the bloom increases the clamping engagement of the jaws with the corners of the bloom.

A still further object of the invention is to provide a bloom-tumbling tool with bloom clamping jaws which must be sprung apart in order to be moved into clamping engagement with a bloom and which are so arranged relative to each other that application of the tool with its tumbling lever in a vertical position is discouraged.

Other objects and advantages of the invention will be apparent from the following description.

In the drawings, there is shown a preferred embodiment and a modified form of the invention. In this showing:

Figure 1 is a side elevational view of the preferred embodiment of the tool of this invention illustrating in dotted lines the manner in which it is applied to a bloom;

Figure 2 is a plan view of a bracket used in the tool of Figure 1 and Figure 3 is a side elevation thereof; and

Figure 4 is a view similar to Figure 1 of a modified form of the invention.

As shown in the drawings, the tumbling tool is formed

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of a pair of clamping jaws or bloom gripping corner hooks 1 and 2. The jaw 2 has a U-shape having L-shaped corners 3 and 4 for gripping engagement with the two corners of a billet B along the bottom side thereof supported on skids S as viewed in Figures 1 and 4. The jaw 1 has the shape of an angle providing an L-shaped corner 5 for engagement with the corner of the billet at one end of a side thereof the opposite end of which is gripped by the corner 3. The leg 6 of the jaw 1 is integral with and extends in a direction normal to the axis of the operating lever 7.

The jaw 2 is mounted for pivotal movement with respect to the jaw 1 by a pivot 8 extending between the side flanges of a bracket 9 secured to the lever 7. As best shown in Figures 2 and 3, the bracket 9 has a U-shape and is comprised of a web and spaced parallel side flanges 11. The flanges 11 have openings 12 in which the pivot pin 8 is supported. The web is cut away at 13 to provide a space through which the leg 6 of the bracket 1 extends. The bracket 9 is rigidly secured to the lever 7 in the position shown in Figures 1 and 4 as by welding.

In the preferred embodiment of the invention shown in Figure 1, a leaf spring 15 has one end secured to the lever 7 and its other end engaged with a lug 16 extending outwardly from the jaw 2 for biasing the jaw 2 to the pivotal position shown in solid lines. In the modified form shown in Figure 4, the jaw 2 has a gravitational bias to a similar position which is provided by a counterweight 17 connected with the U-shaped jaw 2 and extending outwardly from the pivot 8. The tools of both modifications are applied to a billet B by forcing the tool upwardly and outwardly with respect to the billet to spread the jaws 1 and 2 apart for engagement of the jaw 1 and its corner 5 over one top corner of the billet and engagement of the jaw 2 with the bottom corners as shown in dotted lines. When the tool is moved to its engaged position as shown in dotted lines, the bias of the counterweight 17 or spring 15 is effective to maintain the jaws in gripping engagement with the corners of the billet and particularly the diametrically opposite corners thereof engaged by the angle 4 on the jaw 2 and the angle 5 on the jaw 1. After engagement with the billet in this manner, the application of an upward force to the lever 7 will be effective to rotate the billet in a clockwise direction as viewed in Figures 1 and 4. Such turning force will tend to move the jaws 1 and 2 about the pivot 8 in a direction toward each other and thus increase the clamping engagement of their corners 4 and 5 with the billet. The tool of this invention thus reduces the possibility of slippage while being used to cant a bloom and thus eliminates a source of injury to the workman.

The tools shown in Figures 1 and 4 are most effectively applied to the bloom from the bottom thereof as shown in the drawings. When applied in this manner, the operating lever projects outwardly from the front face of the bloom so that it may be turned only by lifting upwardly on the bloom to rotate it away from the workman. This feature discourages the application of the tool in other positions such that its operation to turn a bloom will result in movement of the bloom toward the workman. It will thus be apparent that the tool of this invention in this respect eliminates another source of injury to the operator.

In an operative tumbling position on a bloom B, as shown in dotted lines in Figures 1 and 4, the L-shaped jaw or turning member 1 is comprised of a horizontal arm 1a which extends inwardly over and engages a portion of the top face of the bloom and a vertical arm 1b which engages and extends downwardly over the front face of the bloom to a point substantially centrally thereof. The turning lever 7 is integrally connected with the bottom of the vertical arm 1b and, as described above, extends outwardly therefrom in a direction normal to the bloom front face.

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The U-shaped turning member 2 is comprised of a horizontal arm 2a and a pair of integral vertical arms 2b and 2c. The vertical arm 2b extends downwardly over and engages a portion of the front face of the bloom and has its upper end terminating at a point below the longitudinal axis of the turning lever 7. The pivot 8 and bracket 9 connect the upper end of the leg 2b to the lever 7 for pivotal movement relative thereto. This arrangement of course locates the pivot 8 and the axis of pivotal movement of the U-shaped turning member 2 at a point below the center of the bloom as shown in the drawings. The horizontal arm 2a of the U-shaped member 2 is integrally connected with the lower end of the vertical arm 2b and extends inwardly over and engages the lower face of the bloom. At the outer end of the horizontal arm 2a, the leg 2c extends vertically upwardly over and engages a portion of the back face of the bloom. In this operative turning position of the lever 1, these parts of the turning members 1 and 2 thus embrace all four faces of the bloom B for a turning movement thereof upon application of an upward force to the lever 7 as described above.

While several embodiments of my invention have 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:

A tool for tumbling square steel blooms which in operative tumbling position on a bloom comprises a first turning member of L-shape including a horizontal arm extending inwardly over and engaging a portion of the top face of said bloom and a vertical arm extending downwardly over the front face of said bloom to a point substantially centrally thereof, said vertical arm engaging

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a portion of said front face, a manually operable turning lever connected with the bottom of said vertical arm and extending horizontally outwardly therefrom in a direction normal to said bloom front face, a second turning member of U-shape including a vertical arm extending downwardly over and engaging a portion of the front face of said bloom with its upper end terminating at a point below the longitudinal axis of said lever, means including a pivot connecting said upper end to said lever for pivotal movement relative thereto, said U-shaped member further including a horizontal arm integrally connected with the lower end of said last-named vertical arm and extending inwardly over and engaging a portion of the lower face of said bloom, and a vertical arm connected with the outer end of said last-named horizontal arm and extending upwardly over and engaging a portion of the back face of said bloom, and means biasing the pivotal movement of said U-shaped turning member about said pivot to an operative turning position.

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