

(No Model.)

A. H. MOORE.
BOX PILE.

No. 520,487.

Patented May 29, 1894.

Fig. 1.

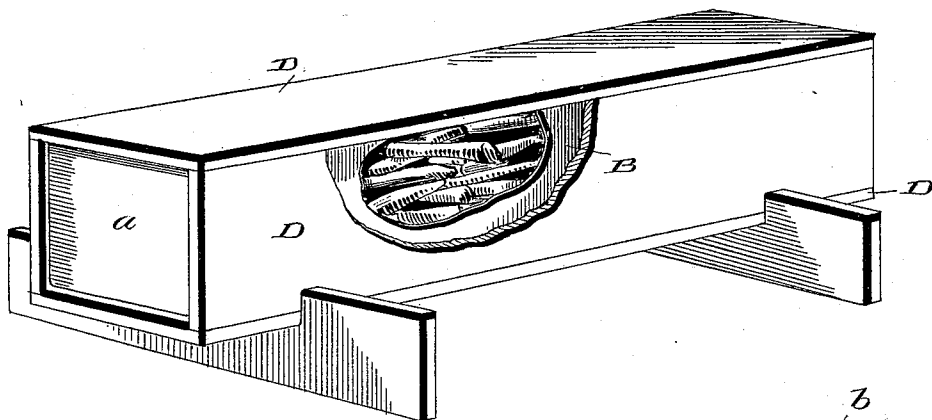


Fig. 2.

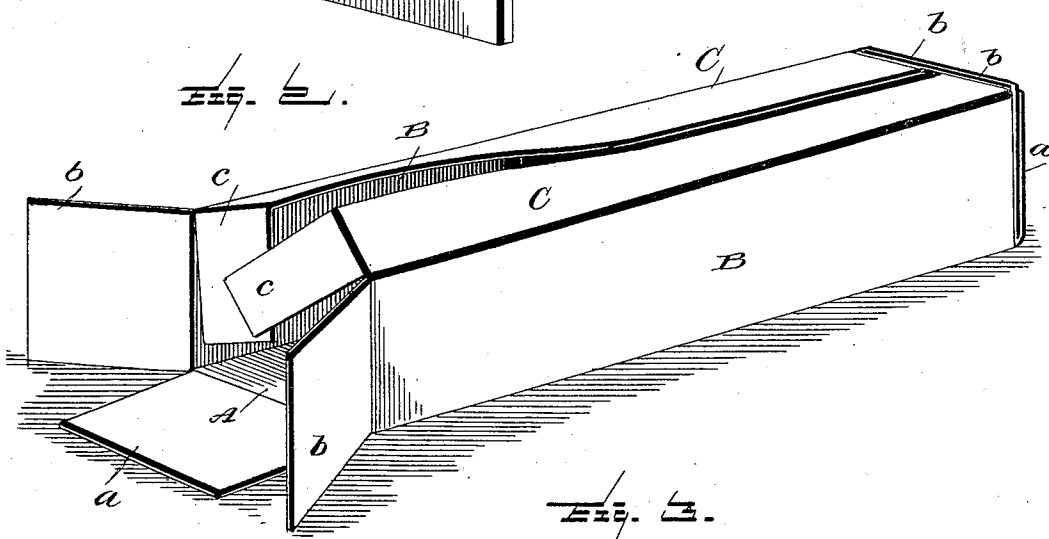
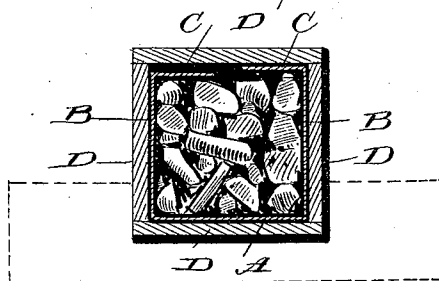


Fig. 3.



Witnesses:

L. C. Mills.
A. L. Hough.

Inventor:

Alfred H. Moore
by Franklin H. Hough
Attorney.

UNITED STATES PATENT OFFICE.

ALFRED H. MOORE, OF BROOKLYN, NEW YORK, ASSIGNOR OF ONE-HALF TO
GEORGE WHITLOCK, OF SAME PLACE.

BOX-PILE.

SPECIFICATION forming part of Letters Patent No. 520,487, dated May 29, 1894.

Application filed September 16, 1893. Serial No. 485,658. (No model.)

To all whom it may concern:

Be it known that I, ALFRED H. MOORE, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Box-Piles; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to compound ingots.

The object of the invention is the production of a billet or bar of steel incased by iron, which will possess great tensile strength and a corresponding increase in elastic limit.

In carrying out the invention I provide the instrumentalities shown in the accompanying drawings, in which—

Figure 1, is a perspective view of the box-pile just prior to rolling; parts being broken away. Fig. 2, is a detail view of the sheet-metal case for receiving the steel. Fig. 3, is a cross-section of the box-pile.

The preferred form of sheet-metal case is constructed from a single piece of sheet-metal so shaped as to provide four thicknesses at each end to retain the steel in place, each side having a flap at its ends to fold over and form a closure, thereby providing the required thickness of metal to protect the steel. The sheet-metal case is composed of a bottom A having end flaps *a*, sides B having flaps *b*, and a top which is formed of two parts C which nearly meet in the center, leaving a small space between the edges through which the steel is passed into the case. The parts C have end flaps *c*. These end flaps *c* are first folded, then the side flaps and lastly the bottom flaps *a*, the whole being riveted together. After the case is filled with steel it is surrounded on its four sides by bars of iron D, the top bar closing the space between the parts C of the case and forming a tight box-pile.

This box-pile is heated and rolled in the usual well known ways. When in heating

for the rolling process the iron cover or casing of the box-pile becomes hot enough to roll, the steel within the case will have reached a half molten state and will be in a semi-fluid condition. In this form it throws off carbon which destroys or consumes all of the sulphur and phosphorus contained in the iron and cures it of "cold-short" and "red-short," making the billet equal and superior to the best charcoal iron and with a gain of from forty to sixty per-cent. in tensile strength and elastic limit than can be attained in either iron or steel by itself or in any combination obtainable by other processes.

The iron box or closure makes about one half the weight of the box-pile, and it takes up just enough carbon to make it "best" iron, and not enough to make it steel.

The steel being subjected to pressure in rolling while in a semi-fluid or molten condition, is cured of porosity and has its tensile strength increased, which adds to the safety of the bar or other article formed from the compound metal.

Importance is attached to the sheet metal case B, as by its use I practically exclude the air, and the steel with which the box pile is filled is heated to a semi-fluid condition, as in a closed crucible, and while in this condition, is passed between the rolls, the pressure curing the steel of all porosity and increasing the tensile strength more than forty per cent. As soon as the sheet iron casing becomes heated to a white, it closes up and clings about the steel and makes the case or box pile inside the muck bar casing absolutely air tight preventing loss of carbon through the otherwise open ends of the box pile. The carbon thrown off by the half molten steel consumes or drives off all sulphur and phosphorus from the iron casing of muck bar and sheet iron, thus desulphurizing, dephosphorizing and carbonizing the iron just enough to make it what is known in the market as "best iron."

Having thus described my invention, what I claim to be new, and desire to secure by Letters Patent, is—

1. The herein described box-pile consisting of a sheet metal case, scrap steel inclosed

within said case, and an outer case of metal bars, substantially as shown and described.

2. The herein described box-pile consisting of a sheet metal case composed of bottom
5 with end flaps sides with flaps, and a top of two parts with end flaps, scrap steel inclosed in said case and an outer case of metal bars.

In testimony whereof I affix my signature in presence of two witnesses.

ALFRED H. MOORE.

Witnesses:

L. H. BELLAMY,

E. C. MOORE.