(No Model.)

E. S. BRAINARD.

COMPOSITE METAL BAR.

No. 324,527. Patented Aug. 18, 1885.

Fig. 1

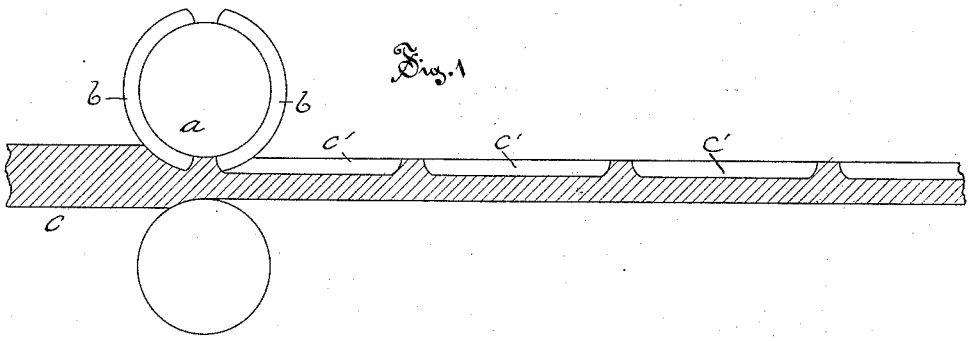


Fig. 2

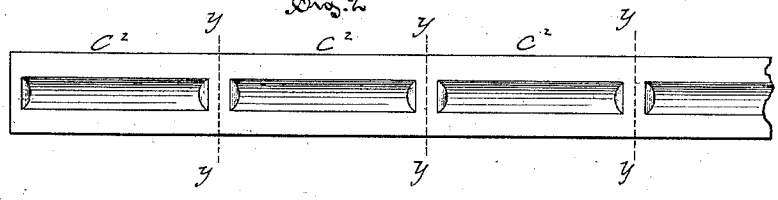


Fig. 3

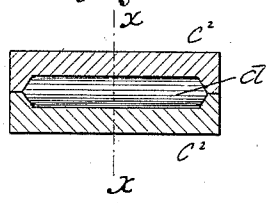


Fig. 4

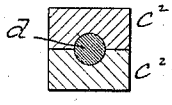


Fig. 5

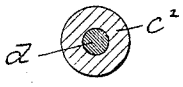


Fig. 6

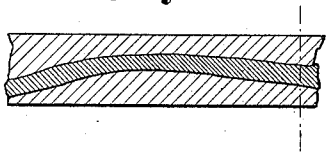


Fig. 7



Witnesses:

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UNITED STATES PATENT OFFICE.

EDWIN S. BRAINARD, OF MANCHESTER, CONNECTICUT.

COMPOSITE METAL BAR.

SPECIFICATION forming part of Letters Patent No. 324,527, dated August 18, 1885.

Application filed January 12, 1885. (No model.)

To all whom it may concern:

Be it known that I, EDWIN S. BRAINARD, of Manchester, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Composite Metal Bars, of which the following is a description, reference being had to the accompanying drawings, where—

Figure 1 is a diagram view illustrating the method of forming a series of covering-sections. Fig. 2 is a top view of such a series. Fig. 3 is a view in central longitudinal section through a box formed by placing two of the blanks face to face and inclosing a bar of harder material. Fig. 4 is a detail view in cross-section of such a bar on plane denoted by line *x x* of Fig. 3. Fig. 5 is a detail view in cross-section of a finished bar composed of two different metals, the central one completely inclosed in the outer. Fig. 6 is a view in longitudinal section of a bar made by the old method and illustrating several of the defects of the old method. Fig. 7 is an end view of the same bar.

My invention relates, particularly, to bars of metal which are made up of a central core and a wrapping layer or layers, the process of making which is to form a pile of several different kinds of metal in bars, then heating this pile, then rolling it to the desired form, and this process is particularly adapted to the making of a bar of iron with a steel central portion within the bar.

My invention consists in the improved pile formed by inclosing the central core with wrapping-pieces having sockets, the wrapping-pieces completely inclosing the core on the ends as well as sides, as more particularly hereinafter described.

My invention is herein described and illustrated with reference to its application to the making of steel-centered bars with softer metal as a covering, which bars are intended to be used in making a peculiar steel-centered calk for horseshoes, which calk, owing to its peculiar construction, sharpens by wear.

In order to produce a horseshoe-calk of this kind that shall be best fitted for such a use, it is necessary that the inclosed bar of the harder metal shall be exactly central longitudinally of the bar, and shall be of substantially uniform cross-section throughout its length, and such a result it is impossible to produce by any of the prior methods of forming a pile for rolling into a bar.

One method of making my improved pile is herein described, and by the use of such pile a bar is produced with the inner portion in exactly the predetermined position, with the core continuous and the whole of a uniform cross-section.

In the accompanying drawings, the letter *a* denotes a pair of rolls appurtenant to the common form of iron-rolling mill, one roller, however, bearing one or more projecting dies, *b*. By means of these rollers and dies a bar of metal, *c*, may be indented along one side with a series of sockets, *c'*, that for the special purpose in hand are preferably semi-cylindrical in cross-section, so that when such a series of blanks is divided, as at lines *y y* of Fig. 2, by putting any two of the sections c^2 face to face a box is formed that will closely inclose a cylindrical core, *d*, of harder metal than the outside covering. The pile thus formed is preferably made up with a hard-steel core, and the outer portion of the pile must cover the core on the ends as well as on the sides, for when the ends are exposed the carbon of the steel for a considerable distance from each end of the pile is consumed, and just so much is wasted for the purpose in hand. After being made up into lengths of about two feet and the parts bound together in the usual manner the pile is heated, and then rolled and reduced to the desired size of bar at a single heat, the different component parts being welded together in the operation.

The shape of the core as to cross-section need not be cylindrical, as a core of any other shape may be used equally well, with the certainty that the shape will be substantially preserved in the finished bar.

In Figs. 6 and 7 the faults in shape and location of a bar rolled from a pile made up in the old way are illustrated, the non-central position of the core and its flattened form of cross-section causing great waste when the bar is cut into the length of about one inch to form blanks for making into calks. These calks are

bluntly pointed in a lathe, and the other end is threaded to form a stem for screwing into the threaded socket in a horseshoe. If the cutting of the thread on the stem exposes the steel center, as is likely to be the case when the faulty bars are used, the calk breaks very easily in the shoe, and when the cutter encounters the steel center in turning the conical point of the calk it strips the thread and spoils the calk.

Blanks cut from a bar made from my improved pile are free from all such loss and objections.

I claim as my invention—

A pile or fagot formed of two or more wrapping-pieces of metal that have socketed faces, and that completely inclose on the ends, as well as sides, a core of harder metal, as steel, all substantially as described.

EDWIN S. BRAINARD.

Witnesses:
CHAS. L. BURDETT,
H. R. WILLIAMS.