(No Model.)

# B. H. WARREN.

## HORSESHOE CALK.

No. 335,259. Patented Feb. 2, 1886.

Fig. 1

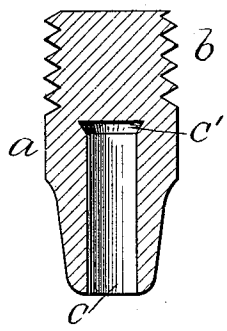



Fig. 2

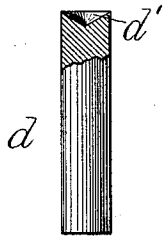



Fig. 3

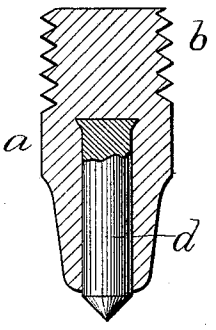



Fig. 7

Fig. 4

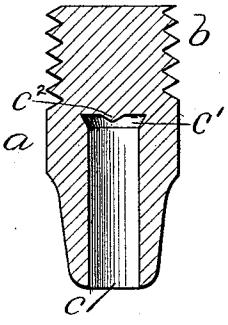
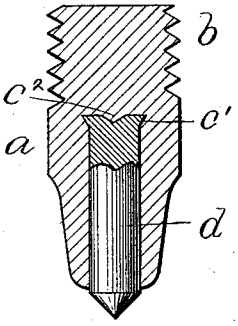



Fig. 5.

Fig. 6

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# UNITED STATES PATENT OFFICE.

B. HOWARD WARREN, OF QUINCY, ASSIGNOR TO THE NEVERSLIP HORSESHOE COMPANY, OF BOSTON, MASSACHUSETTS.

## HORSESHOE-CALK.

SPECIFICATION forming part of Letters Patent No. 335,259, dated February 2, 1886.

Application filed May 11, 1885. Serial No. 165,008. (No model.)

*To all whom it may concern:*

Be it known that I, B. HOWARD WARREN, of Quincy, in the county of Norfolk and Commonwealth of Massachusetts, have invented certain new and useful Improvements in Horseshoe-Calks, of which the following is a description, reference being had to the accompanying drawings, where—

Figure 1 is a view in central vertical section of a horseshoe-calk with a socket formed in accordance with my improvement. Fig. 2 is a side view of the center or core with part broken away to show the recessed end. Fig. 3 is a view in central longitudinal section of a horseshoe-calk, showing the center secured in place by my improved method. Fig. 4 is a view in central vertical section of the body of a horseshoe-calk embodying an alternate form of my invention. Fig. 5 is a view of the center or core used with this last form of body. Fig. 6 is a view in central longitudinal section of a calk with the center secured in place by the alternate device. Fig. 7 is a detail view of an alternate device for securing the center in the enlargement in the socket in the calk.

My invention relates to the class of horseshoe-calks such as are shown and described in the patent to Samuel Stone, of November 2, 1875, No. 169,495, and is an improvement on the invention of said Stone, which forms the subject-matter of his pending application of Serial No. 157,190, filed February 27, 1885; and my improvement consists in the peculiar means for holding the core in the body of the calk.

In the accompanying drawings, the letter *a* denotes the body of a horseshoe-calk, which in this form is provided with a threaded shank, *b*, and has a socket, *c*, opening toward the point of the calk, and preferably formed by drilling. This socket has an enlargement, *c'*, at the bottom, formed in any convenient manner.

The letter *d* denotes a center or core, which is made of harder metal than the body *a* of the calk, and is cylindrical in form and of a diameter to closely fit in the socket *c*. This core has in one end a cavity, *d'*, deeper at the center than toward the edges, so that when the core is forcibly driven into the socket this end, striking the end wall of the cavity, is upset and pressed outward, so as to more or less completely fill the enlargement *c'* at the bottom of the socket. This core is preferably made of steel, tempered throughout its length, and the temper withdrawn from the end bearing the cavity, so as to enable that end to be expanded in the socket, in the manner already described. This core may be left blunt, as illustrated in Fig. 2, or may be sharpened, as shown in Fig. 3, and this sharpening may be done either before the core is fixed in place in the body of the calk or after such operation. In the former case a set-punch having a conically-recessed end may be used in driving the core into its socket.

An alternate and equivalent means of holding the core in place in the body of the calk is illustrated in Figs. 4 and 6, in which a central projection, $c^2$, is formed on the end wall of the socket in such position that when a blunt-ended core—such as is shown in Fig. 5—is driven into place in the calk its inner end will be expanded and pressed into the enlargement in practically the same manner as before described.

Another means of expanding the inner end of the central core is by cutting a central slot of a limited depth in the end of the core, fixing in such slot the narrow edge of a short wedge, and then driving the core into the socket.

The particular advantage of my improvement is due to the fact that this core is not loosened, but is more firmly held in place, by wear of the calk.

I claim as my improvement—

As a new article of manufacture, a removable horseshoe-calk having a socket opening toward the point of the calk, with a lateral enlargement at the bottom of the socket, and a core with its inner end expanded into such enlargement, all substantially as described.

Witness my hand, at Boston, this 27th day of April, 1885.

B. HOWARD WARREN.

Witnesses:

ELMER P. HOWE,

CHANNING RUST.