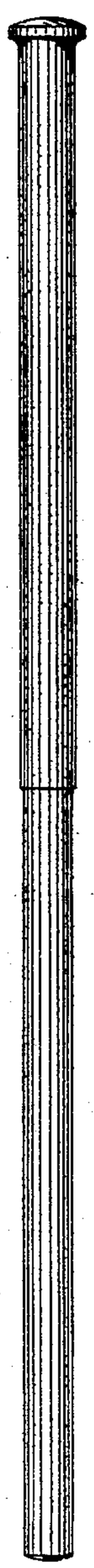
F. B. TORREY.

Manufacture of Butt and Bilge Bolts.

No. 152,194. Patented June 16, 1874.



Witnesses.

Ewell A. Dick.

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UNITED STATES PATENT OFFICE.

FRANCIS B. TORREY, OF BATH, MAINE.

IMPROVEMENT IN THE MANUFACTURE OF BUTT AND BILGE BOLTS.

Specification forming part of Letters Patent No. **152,194**, dated June 16, 1874; application filed May 23, 1874.

To all whom it may concern:

Be it known that I, FRANCIS B. TORREY, of Bath, Maine, have invented certain new and useful Improvement in the Manufacture of Butt and Bilge Bolts for ship-building purposes, of which the following is a specification:

Bolts for the above purpose have been usually made of wrought metal; but many are now using a cast bolt, because of its comparative cheapness, and for other reasons not necessary to enumerate. Much difficulty, however, is experienced in using the latter bolt, for, if made of a composition or mixture hard enough to admit of the bolt being readily driven without bending, it is apt to be too brittle and poorly adapted for clinching or upsetting. If, on the other hand, it is made of a soft mixture or composition, it will not drive well, but is very liable to bend and break down.

In order to obviate all these objections, and to produce a composition bolt that will drive well without liability of breaking during that operation, and that will at the same readily clinch after being thus driven, I make the bolt of a comparatively soft mixture or composition, and then impart to this bolt the requisite stiffness to make it drive well without impairing its clinching properties, by cold-hammering or compressing the same, so as to give it a surface hardness. I thus produce a cold-hammered or compressed composition bolt, which is admirably adapted for the use for which it is designed, combining in itself all the good qualities of both the soft and the hard composition bolts, without any of the defects of either, and fully equal in quality to a wrought bolt, while costing much less than the latter.

I make my improved bolt mostly of a composition of copper and zinc, say, in the proportion of two of the former metal to one of the latter, and I sometimes add a little tin and lead to the mixture. From this composition the bolts are made by casting in the usual way.

I would remark here, however, that while I specify the composition I prefer to use, I do not limit myself to that special composition, since any ordinary or suitable compound metal or alloy adapted to ship-building purposes, and having the requisite softness or malleable properties, may be employed.

The bolt made as above described is too soft and yielding to be practically available for use, and in order to complete it I condense it, and give it a surface hardening, by compressing, swaging, or cold-hammering it — processes well known in the art, and readily understood without further explanation. After this process the bolt is completed, and is ready for use.

I have devised the bolt with special reference to the requirements of ship-building, but it can, of course, be used for other purposes.

The drawing hereto annexed represents one style of finished bolt made in accordance with my invention.

Having now described my invention, and the manner in which the same is or may be carried into effect, what I claim, and desire to secure by Letters Patent, is—

The mode described of manufacturing bolts for ship-building and other purposes by casting the same from a suitable soft metallic compound or alloy, and then condensing and surface-hardening it by the compressing or cold-hammering operation.

In testimony whereof I have hereunto signed my name.

FRANCIS B. TORREY.

Witnesses:
W. D. MUSSENDEN,
GEO. SNELL.