T. B. MILLS & B. M. SMITH.

Improvement in Girders and Chords for Iron Bridges.

No. 132,975. Patented Nov. 12, 1872.

FIG. 1.

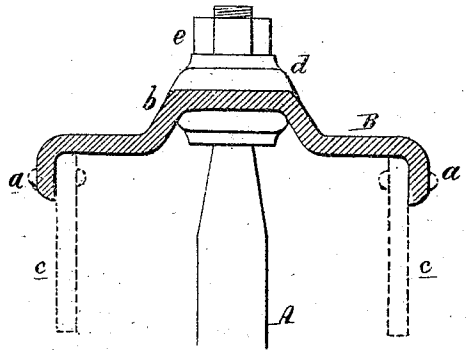


FIG. 4.

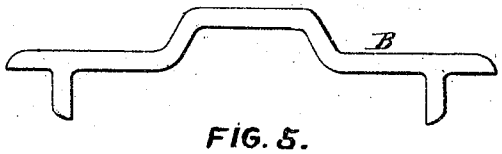


FIG. 5.

FIG. 2.

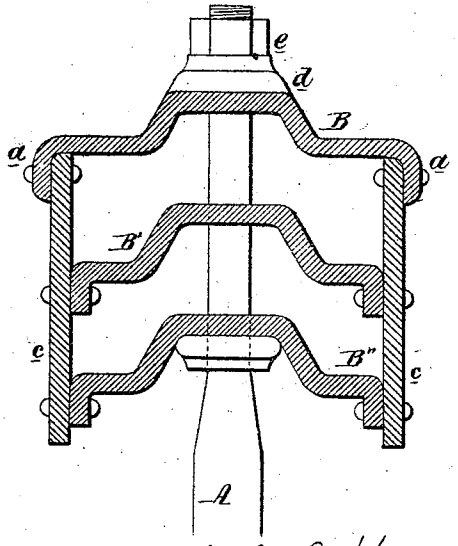
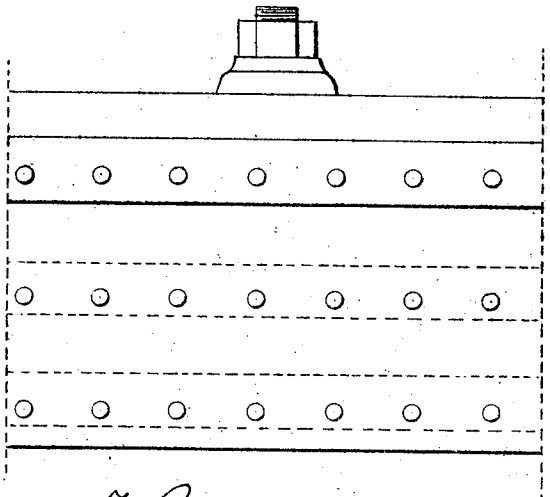


FIG. 3.



WITNESSES { J. B. Harding. Thos. McElroden

J. B. Mills and B. M. Smith by their Attys Newton and Son

UNITED STATES PATENT OFFICE.

THEODORE B. MILLS AND BYRON M. SMITH, OF IOLA, KANSAS.

IMPROVEMENT IN GIRDERS AND CHORDS FOR IRON BRIDGES.

Specification forming part of Letters Patent No. **132,975**, dated November 12, 1872; antedated November 11, 1872.

To all whom it may concern:

Be it known that we, T. B. MILLS and B. M. SMITH, both of Iola, county of Allen, State of Kansas, have invented an Improvement in Girders and Chords, &c., for Iron Bridges and other structures, of which the following is a specification:

Our invention consists of a bar rolled to the peculiar shape described hereafter, so as to be especially well adapted to bridge structures, although applicable to other purposes; also, of the combination of the said bar, when used as the upper chord of a bridge, with a washer so constructed as to prevent the rain from penetrating through the hole which receives the upper end of the post; also, of a compound beam or girder for bridges and other structures, the said girder being constructed in the peculiar manner described hereafter with the view to economy, strength, and simplicity of construction.

Figure 1 is a vertical section of the upper chord of a bridge, composed of our improved bar or girder; Fig. 2, a modification of Fig. 1; Fig. 3, a side view of Fig. 2; and Figs. 4 and 5, sections illustrating modifications of part of our invention.

In Fig. 1, A represents the post, and B the upper chord, of a truss-frame bridge, the chord-bars being rolled to the shape shown in the drawing—that is, with pendent flanges *a a* at the opposite edges—and on the top of the bar is a continuous rib, *b*, formed by the rolling of a channel beneath. While both the flanges and the rib add transverse strength to the bar the rib aids in performing another important duty—namely, that of sheltering the upper portion of the post and protecting it and the under side of the bar from the injurious effects of rain and snow.

It will be observed that a washer, *d*, intervenes between the nut *e* of the post and the rib *b* of the bar, and that the washer is so formed at the edge as to be a continuation of the sloping sides of the rib; hence the rain will be directed by the washer over the sides of the rib and cannot find a lodgement round the edge of the washer or penetrate through to the under side of the bar where the post passes through the same. Additional strength may be imparted to the bar by making the flanges *a a* deeper, or by riveting inside of these flanges plates or bars *c c*, as illustrated by dotted lines in Fig. 1.

The bar or girder B, although especially well adapted to bridge structures, is applicable to other purposes. Where great strength is required, however, I prefer the combination of bars illustrated in Figs. 2 and 3, where deep side plates *c c* are riveted to the flanges of the bar B, and to the flanges of additional bars B′ and B″ of a character similar to the upper bar B, so as to form a compound beam or girder of great strength compared with the amount of material used; and cheap, owing to the facility with which the several bars can be rolled and put together.

The girder may be used as a compression-chord for a truss-frame bridge; or, when properly curved, for the construction of the arches of a bridge; or it may be used as a simple girder for any other structures.

It will be seen that, by the arrangement described, no joints are exposed by which water can obtain access to the inside of the girder.

I claim as my invention—

1. A girder consisting of a bar, B, having flanges *a a* and plates *c c* overlapped by said flanges and riveted to the same, as and for the purpose set forth.

2. The combination of the bar or girder B, having a central rib, *b*, a nut, screw-rod, or post passing through the bar, and a washer, *d*, arranged beneath the nut of the post, and constructed so that its sides will extend beyond or be flush with the sides of the rib *b*, substantially as and for the purpose specified.

3. A girder composed of the flanged bar B, side plates *c c* riveted to the inner side of the flange of the bar B, and one or more intermediate bars, B, arranged entirely within the plates *c*, as set forth.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

THEODORE B. MILLS.
BYRON M. SMITH.

Witnesses to the signature of T. B. MILLS:
GEO. S. WEAVER,
H. A. ELLIS.

Witnesses to the signature of B. M. SMITH:
G. T. LOCKARD,
WALTER F. JOHNSON.