A. E. BROWN.

Compound Iron-Columns for Bridges.

No. 164,137. Patented June 8, 1875.

Fig 1

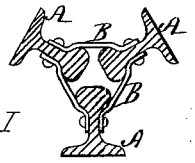
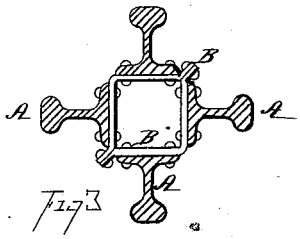
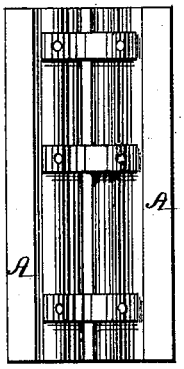


Fig 3





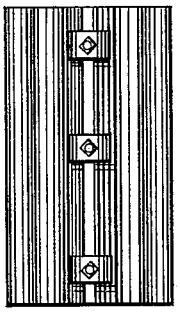
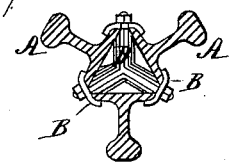
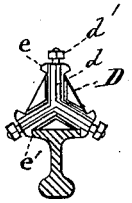
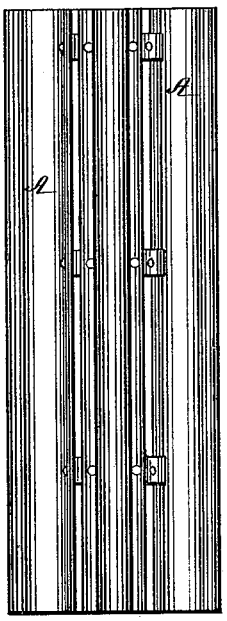
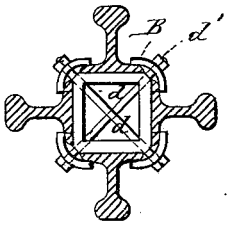


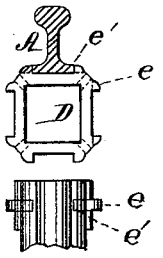
Fig 2











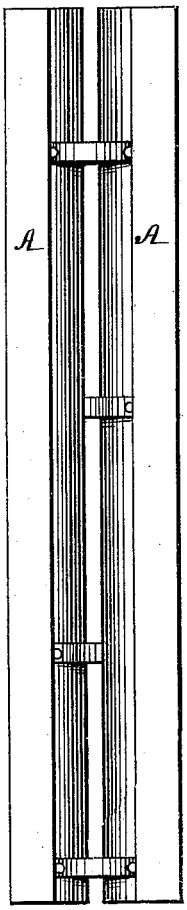
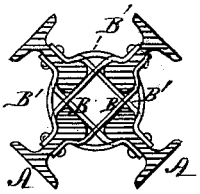


Fig 4



WITNESSES

Walter Miller

Wm Ewart

INVENTOR

Alexander E. Brown

By Legget & Legget

Attys

UNITED STATES PATENT OFFICE.

ALEXANDER E. BROWN, OF CLEVELAND, OHIO.

IMPROVEMENT IN COMPOUND IRON COLUMNS FOR BRIDGES.

Specification forming part of Letters Patent No. **164,137**, dated June 8, 1875; application filed February 15, 1875.

To all whom it may concern:

Be it known that I, ALEXANDER E. BROWN, of Cleveland, county of Cuyahoga, State of Ohio, have invented a new Improvement in Bridges; and declare the following to be a full, clear, and exact description thereof, such as will enable others skilled in the art to which my invention relates to make and use it, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to improvements in the compression-members of a truss, such as is employed in making railway-bridges, roof-trusses, &c., but more especially designed for bridge constructions.

My invention consists in combining with each other and with other forms of iron the ordinary railway T-rails, in the manner substantially as set forth and claimed.

In the drawings, Figure 1 shows three rails with their heads placed toward each other, but leaving an open space down through the length of the column between them, the same united snugly with metallic braces or straps. Fig. 2 shows three railway T-rails with their flanges adjacent to each other, inclosing a hollow space down through the center of the column, and it also represents a metallic stay-brace on the interior of the column in the open space. Fig. 3 represents four rails with their flanges placed adjacent to each other, inclosing a square space down through the center of the column. Fig. 4 represents a similar view, except that the heads of the rails are placed adjacent to each other, instead of the flanges.

In the construction of the compression-members of bridge-trusses and other trusses, as well as compression-members of other structures, great expense is incurred, because each different form of cross-section which may be required necessitates special machinery for its construction. I have discovered that railway T-rails of ordinary construction, and which may or may not have become worn out, so as not to be effectual in a railway-track, may be combined with each other in such a manner as to form the various styles of compression-members required in different structures.

This application forms one of a number of applications for Letters Patent that I have made for the purpose of securing various useful combinations of railway T-rails for this purpose.

The object of this invention is to form from the said railway T-rails hollow columns—that is, columns that have a central open space, the metal being thrown into the surface or shell surrounding this open space, whereby there is combined great strength with lightness.

In Fig. 1 three rails are shown with their heads turned toward each other. A are the rails. B are suitable metallic straps, whereby the said rails are firmly united at different lengths in the column, but leaving a space, C, extending centrally the whole length of the column.

In Fig. 2 the rolls are similarly arranged, except that the flanges, instead of the heads, are placed close together, so that they inclose a triangular space, C, between them.

It is evident from the drawings that the device shown in Fig. 1 is more open than that shown in Fig. 2, and the interior space C is more readily accessible for the purpose of painting to prevent oxidation. D in Fig. 2 is a metallic stay-brace of any kind, as, for instance, a casting. It is placed within the space C, and serves to hold the rails A in their relative positions. Bolts *d* and straps B, with the nuts *d'*, serve to firmly unite the rails together and to the piece D. It is evident that the piece D may be dispensed with, and, instead thereof, the rails may be united in a manner similar to the device shown in Fig. 1.

In Fig. 3 is represented a rectangular central space, C, bounded by four railway T-rails, with their flanges adjacent to each other. They are united by suitable straps B, and may or may not be provided with suitable stays, like the stay D in Fig. 2.

In Fig. 4 is presented a similar arrangement to that shown in Fig. 3, except that the heads are adjacent to each other instead of the flanges. Fig. 4 presents a more open form than Fig. 3, and is more readily accessible for the purpose of painting on the interior of the space C than the device shown in Fig. 3. The devices shown in Figs. 1 and 4 may likewise

be provided with stay-braces D, if desirable, the said braces being made to conform to the shape of the open space C.

It is thus evident that the forms here shown are not the only forms that can be made under this invention. Thus, there may be five, six, or any number of rails surrounding a central space, C. The forms here shown are simple of construction, and represent merely a few of the many forms in which the rails may be arranged.

By uniting railway T-rails in the manner described herein, the various hollow compression-members required in bridge or roof trusses, and in any other kind of structure, may be formed.

On the stay-brace D I prefer to form lugs *e*, which, by fitting into corresponding recesses or notches *e'* in the rail, serve, with the straps B and the nuts *d'*, to hold the whole structure snugly together.

The triangular form of brace suitable for the three-rail column, showing the lugs *e*, is represented at the bottom in Fig. 2.

When the four rails are employed, as in Fig. 3, the inner form of stay-brace D is represented as an open-frame casting. Bolts *d* pass through diagonally, and clamp the plates B firmly upon the angles of the column, thus binding the rails firmly together.

Lugs *e* and recesses *e'* are here employed in a manner similar to that above described. The bolts *d* do not pass through the column exactly at right angles to the axis of the column, but are inclined thereto just sufficiently far to permit the bolts to pass each other at the center; or, instead of inclining them, one bolt may be dropped down into a different plane from that containing the other bolt, so as to permit them to pass.

The sectional figure shown in Fig. 4 presents the column formed of four rails with their heads toward each other. They are strapped together by straps B uniting the rails, two and two. Straps B' then unite each rail with the rail next to it. It will be seen that the rails are prevented not only from falling apart, but the straps B' serve to maintain them in their relative positions.

What I claim is—

1. A compression-member of a bridge-truss or other structure, consisting of a hollow column formed by arranging railway T-rails about a central open space and fastening them rigidly together, substantially as and for the purpose described.

2. The column or hollow compression-member, consisting of the combination, with three or more railway T-rails, A, of the central stay-brace D and suitable fastenings, whereby the rails are bound snugly together, substantially as and for the purpose described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ALEXANDER E. BROWN.

Witnesses:
FRANCIS TOMNEY,
THOMAS B. HALL.