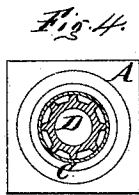
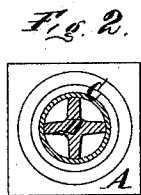
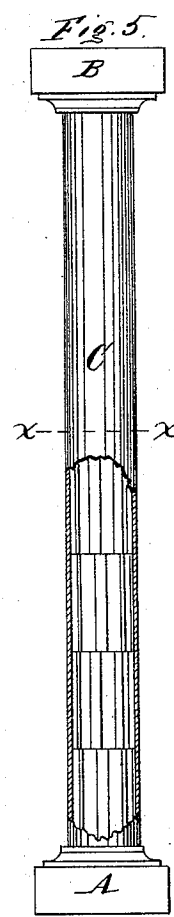
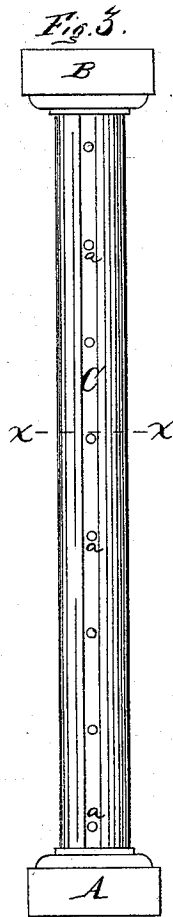
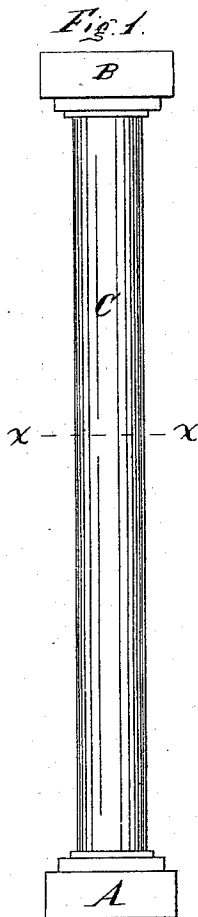


J. M. CORNELL.
Iron Columns.

No. 157,908.

Patented Dec. 22, 1874.



Witnesses
A. S. Wightman
John Keir.

Inventor
John M. Cornell
By Thos. H. How
Atty.

UNITED STATES PATENT OFFICE.

JOHN M. CORNELL, OF NEW YORK, N. Y.

IMPROVEMENT IN IRON COLUMNS.

Specification forming part of Letters Patent No. 157,908, dated December 22, 1874; application filed June 10, 1874.

To all whom it may concern:

Be it known that I, JOHN M. CORNELL, of the city, county, and State of New York, have invented certain Improvements in Pillars, of which the following is a specification:

It is well known to engineers that cast-iron offers a much greater resistance to compression than wrought-iron, while the latter possesses much the greater tensile strength. For this reason pillars not exceeding a certain number of diameters in length are stronger if made of cast-iron than if made of wrought-iron, while those exceeding that length may be relied on to support a heavier load if made of wrought-iron than if they were made of cast-iron, for the reason that any deflection of the cast-iron pillar is, in that case, liable to subject the side toward which it is deflected to a breaking tensile strain.

My invention relates to a construction of a pillar by which these respective advantages of cast and wrought iron over each other may be utilized in one and the same pillar, and a stronger pillar of the same weight and length may be produced than by the ordinary construction.

My invention consists, in part, in the construction and combination, hereinafter described, of the parts of a pillar; and, in part, in the combination, substantially in the manner hereinafter described, of cast and wrought iron in the production of a pillar or column.

Figure 1 is a side elevation of a pillar or column constructed according to and embodying my invention. Fig. 2 is a horizontal or cross section of the same at the line *x x*, Fig. 1. Fig. 3 is a side elevation of a pillar or column also containing my invention, but showing the outside shell of the pillar joined at the edges by rivets instead of being a welded tube. Fig. 4 is a horizontal or cross section of the same at the line *x x*, Fig. 2, showing a different form of core from that shown in Fig. 2. Fig. 5 is a side elevation, having a part of the outside shell broken away, of a pillar containing my invention, in which the core is made of several pieces of metal placed one upon the top of another. Fig. 6 is a horizontal or cross section of the same at the line *x x*, Fig. 5.

A is the base, and B the cap, of the pillar, which base and cap may be made of any suit-

able or desired form. C is the outside shell of the pillar, which I make of wrought-iron, and which shell may be a drawn or welded tube, as shown in Figs. 1 and 5, or with its edges secured together by rivets or bolts *a*, as shown in Fig. 3.

For small pillars, of a size of which welded tubes can be conveniently had, I prefer a welded tube; and for such pillars, as, for example, the struts and compression-chords of truss bridges and roofs, and wherever it is necessary to provide a column of small diameter and superior strength, the wrought-iron shell or envelope C may consist of an ordinary gas-pipe of the diameter and thickness required, while in larger work it may be readily formed of roll plate-iron, bolted, riveted, or welded at the joint or joints.

D is the core or inside portion of the pillar, which I prefer to make of cast-iron, and which should be made of cast-iron to secure the best results of my invention, though an advantage may be gained from the mode of construction herein described, even when wrought-iron is used for the core as well as for the outside shell.

Different forms for this core are shown in the several sectional figures; but when made of cast-iron I prefer either that shown in Fig. 4, or that shown in Fig. 6. In Fig. 5 this core is shown as being made in pieces of less length than the whole length of the pillar; and this may be necessary in some cases of extremely long pillars, and, when used in combination with the wrought-iron shell C, is admissible, though in most cases I prefer to cast this core in a single piece.

In fitting up the parts, care should be taken to so fit them that the cap shall bear alike on both the shell and the core of the pillar.

A wrought-iron core of the form shown in Fig. 2, or some equivalent form, may be used in combination with the shell C, and some advantage gained from such construction over the ordinary pillar; but, as before stated, to realize the best results the core should be of cast-iron.

The form shown for the outside shell of the pillar is cylindrical, and for nearly all purposes this form will probably be found to be the best; but other forms, such as square, oval,

triangular, or oblong, may be adopted when the desire for ornament, or some other circumstances, may require it.

It is, however, an essential part of this invention that the outer portion or shell C of the pillar shall fit closely to the inner portion or core D, so that neither portion can be materially deflected without deflecting the other, otherwise the advantages of this invention would fail to be substantially realized; and it is equally important that these parts should so fit each other directly or through some medium which shall offer the same, or substantially the same, resistance to deflection as themselves, as, if the core were made considerably smaller than the shell of the pillar, and a soft material, or one liable to disarrangement, (as, for example, plaster-of-paris,) were interposed between them, one portion of the column, either C or D, would be liable to be crippled without material aid from, or being properly sustained by, the other.

It is, furthermore, essential that the close

fitting of the outer and inner portions of the pillar shall be substantially continuous longitudinally, so that neither the outer shell C nor the core D shall in any part of its length be left without the support of the other.

I claim as my invention—

1. The combination, in a pillar or column, of the outside shell C and the flanged core D, the said shell and core being closely fitted to each other continuously longitudinally, or substantially so, substantially as hereinbefore set forth.

2. The combination of the wrought-iron shell C and the flanged core D, made of cast-iron, the said shell and core being closely fitted to each other continuously longitudinally, or substantially so, substantially as hereinbefore set forth.

JOHN M. CORNELL.

Witnesses:

THOMAS CROCKER,
H. W. REDFIELD.