

W. J. FRYER, Jr.
Iron Column.

No. 224,775.

Patented Feb. 24, 1880.

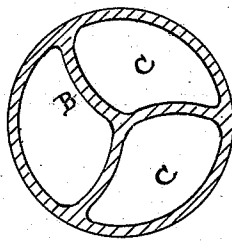


Fig. 2

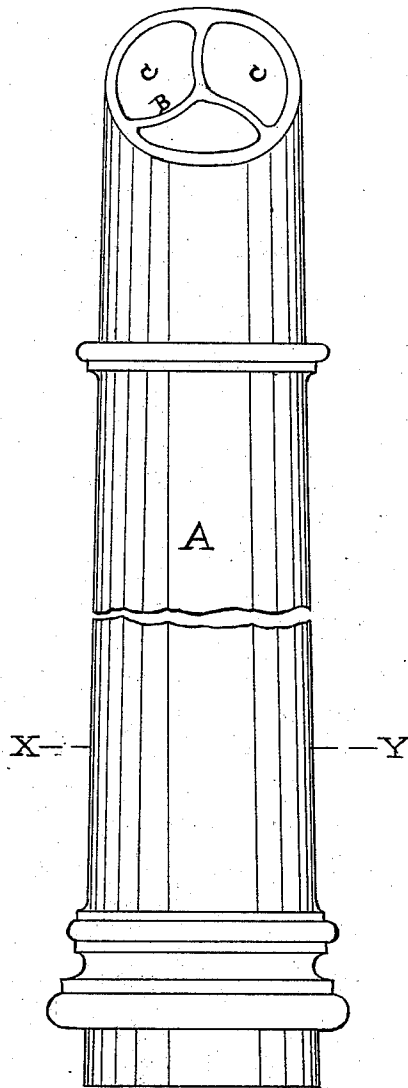


Fig. 1

WITNESSES:

Henry Richmond
Arthur Lawrence

INVENTOR:

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UNITED STATES PATENT OFFICE.

WILLIAM J. FRYER, JR., OF NEW YORK, N. Y.

IRON COLUMN.

SPECIFICATION forming part of Letters Patent No. 224,775, dated February 24, 1880.

Application filed October 6, 1879.

To all whom it may concern:

Be it known that I, WILLIAM J. FRYER, Jr., iron-founder, of No. 104 Goerck street, in the city of New York, county and State of New York, have invented a new and useful Improvement in Iron Columns, of which the following is a specification, reference being had to the accompanying drawings, in which—

Figure 1 is an elevation of my improved column, and Fig. 2 is a horizontal section on line X Y, Fig. 1.

A is the outer shell of the column. B B B are the curved internal webs running vertically with the column. C C C are the spaces or cells, which may be filled with plaster-of-paris or other non-conducting substances.

This invention relates to that class of tubular structures in which internal webs run lengthwise, as used for masts, columns, water and gas pipes, beams and girders, and other purposes where great strength is required.

My invention consists in making the internal webs slightly curved or corrugated, so that when made in cast-iron and forming one casting with the shell the webs can contract without drawing the periphery of the column out of truth. After the metal is poured into the mold the outer portion of the column (the shell) cools first, and the webs cool more slowly. The curved shape allows the slower cooling and shrinkage of the webs to take place without causing a tension or strain in the casting. If the outer shell be made of wrought-iron and the cast-iron or wrought-iron webs be bolted thereto, the curved webs may lengthen and straighten when the column is exposed to fire in a burning building.

Metal, when exposed to heat, obeys natural laws and expands, and when my column is undergoing fire in a burning building the shell will be heated and expanded, while the webs will be comparatively cool and unaffected. The webs, being curved, are simply drawn down somewhat straighter as the outer shell increases in diameter, and this without impairing their position, or their strength, or their ability to prevent the column from yielding to the influences of fire and bending or twisting or collapsing. When fire reaches one side of the column only, and that particular side expands more than the remainder, then the web

nearest the expanded side may be extended, while the other webs remain intact.

It will be almost impossible to communicate enough heat from the outer shell to the interior webs to affect their strength and resistance to bending. In addition, if the cells or spaces between the webs and the outer tube be filled with plaster-of-paris or other non-conducting substances, the outer tube may be cracked and split open by fire and water, and yet the webs covered by the filling will remain secure in their strength and upright position.

The filling may have one or more vertical openings of any shape in each shell, to save material and lighten the weight.

My practical construction of a column not only adds vast strength to the column itself under the most trying circumstances, but adds greatly to the security of life and property, and will give to firemen confidence in entering and working within a burning building where the floor-beams are supported by iron columns.

In molding my column I use three or more separate cores, generally using what are known as "dry-sand cores." Through each of these cores runs a sustaining-bar, the bars being a little longer than the cores. At the ends of the cores where the print comes I propose to use an iron plate with holes in the same corresponding with the positions of the bars, and these plates, one at each end, will hold the cores at their proper relative distances from each other for the flow of the metal between and around the same. The plates also allow the three or more cores to be lifted together as one core. Along the length of the cores, to keep them from sagging or coming too close together at any point, I use small wires or chaplets, and in this same manner keep the cores at their proper distances from the sides of the molds in the manner now well known to persons engaged in making castings.

In a round column I prefer to make three webs—in a square or oblong shaped column a greater number. The material may be cast-iron, or steel, or wrought-iron. I may have a tubular or solid central vertical line, which becomes the axis, from which radiating webs, made curved or corrugated, may proceed, the said webs being securely fastened to the external shell by bolts or rivets, or cast solid.

The webs may be kept somewhat shorter than the length of the external shell or tube, for the reason that fire or excessive loads generally cause the breaking of an ordinary column at or near the center of its length. The web can be made as a separate casting, or of plates fastened together and laid in the mold before the metal of the shell or outer portion of the column is poured in, and a connection thus made between the two by well-known devices. The outer shell, also, can be made up in sections or plates of wrought-iron or other metals, and bolted or riveted together, as wrought-iron columns are commonly made.

As columns having my improved device of curved or corrugated interior vertical webs will be made usually with dry-sand cores, their interior surfaces will be quite smooth and clean. I propose to coat them on the inside with coal-tar, &c., carefully keeping the liquid

from the outside of the column, which outside surface will be coated with the usual red lead or mineral paint, &c.

I claim as my invention—

1. A metal tube or column having curved or corrugated webs running vertically on the inside of same, substantially in the manner and for the purpose specified.

2. In combination with said curved or corrugated interior webs in tubular structures, a solid or hollow filling of plaster-of-paris or other non-conducting substances in the cells or spaces formed by said webs within the external tube, substantially in the manner and for the purposes specified.

WM. J. FRYER, JR.

Witnesses:

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