

J. H. LINVILLE.

Improvement in Wrought-Iron Columns.

No. 132,475.

Patented Oct. 22, 1872.

FIG 1

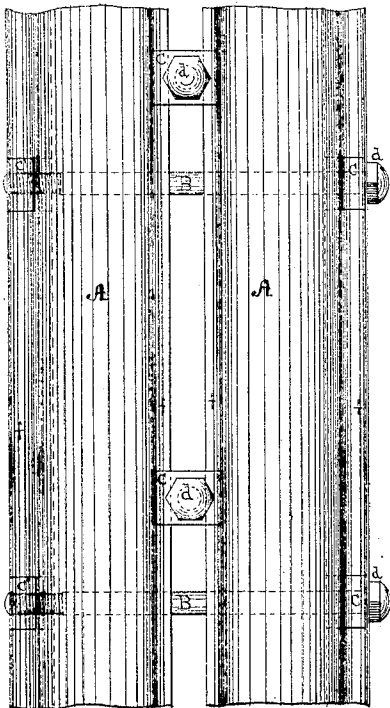


FIG 3

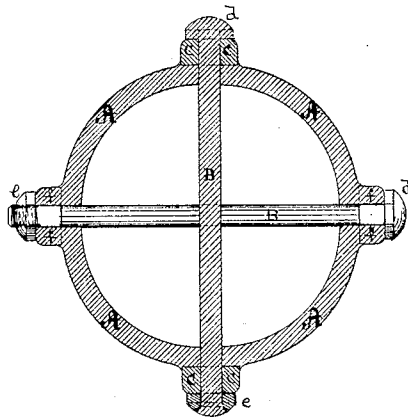


FIG 2

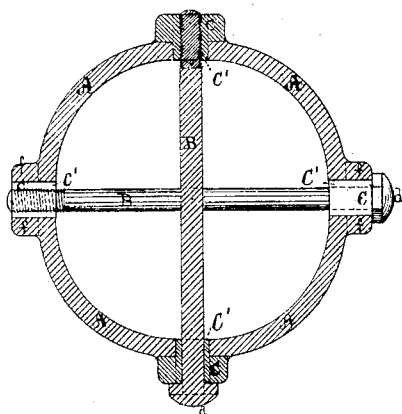
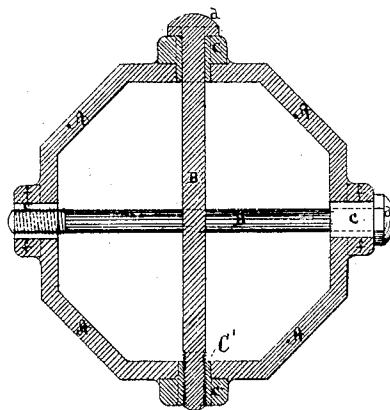


FIG 4



WITNESSES

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Fig 1

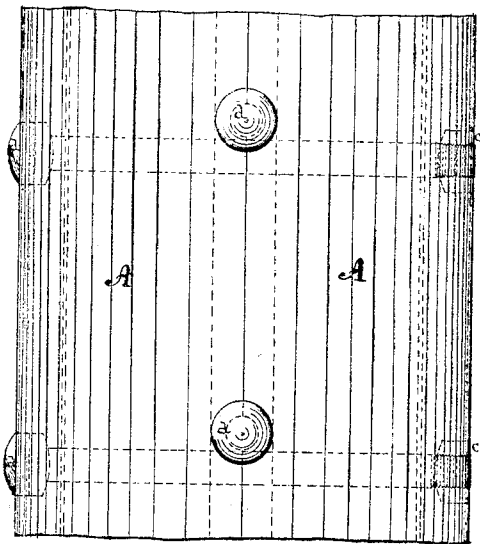


Fig 3

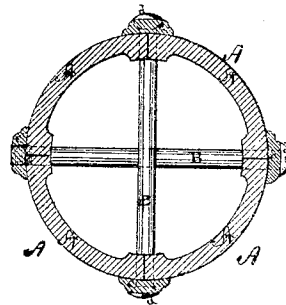


Fig 4

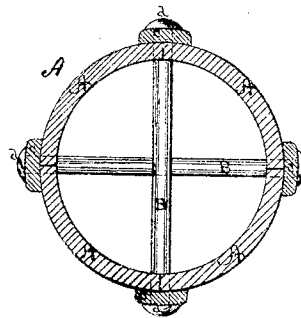


Fig 5

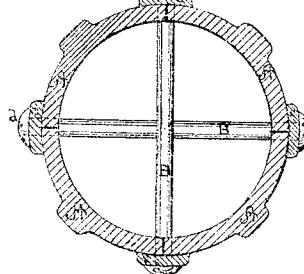
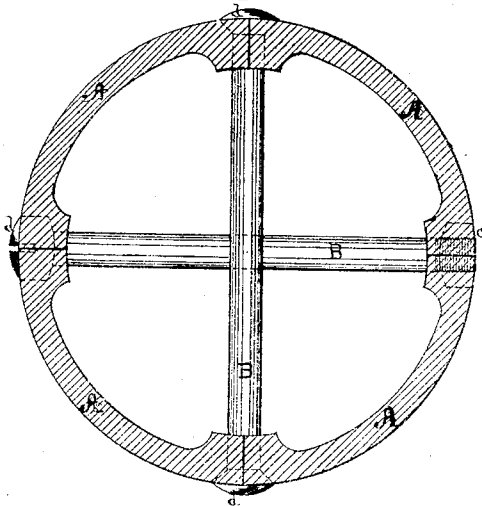


Fig 2



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JACOB H. LINVILLE, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN WROUGHT-IRON COLUMNS.

Specification forming part of Letters Patent No. 132,475, dated October 22, 1872.

To all whom it may concern:

Be it known that I, JACOB H. LINVILLE, of the city and county of Philadelphia, in the State of Pennsylvania, have invented certain new and useful Improvements in Metallic Columns, of which the following is a specification:

The object of my invention is to provide a tubular metallic column, strut, or girder which shall be suited to the various requirements of architectural and engineering constructions, and in which the segments of which it is composed shall be so combined with each other as to effectually resist the tendencies to distortion or collapse induced by external pressure. Moreover, my improved column is designed to be, and is, of economical construction, and is free from defects which obtain in many of the columns heretofore proposed or used.

My improvements consist in combining four or more metallic segment-bars to form a column, post, strut, or arch of circular, elliptical, or polygonal cross-section by a series of tie-rods, bolts, or rivets transverse to the axial line of the column, and extending through the same at the joints of the segment-bars, the members of the series being alternately arranged so as to cross each other, and, being secured at the joints of the segment-bars by means of nuts, gibs, or riveted heads, so as to clamp and hold the segment-bars firmly in position, the segment-bars being substantially arched in cross-section, and the bolts or rivets acting as tie-rods or cords to the series of arches of which the column is composed, as hereinafter more fully set forth.

In the accompanying drawing, Figure 1, Sheet 1, is a view in elevation of a portion of a tubular metallic column embodying my improvements; Fig. 2, Sheet 1, is a transverse section through the same; Fig. 3, Sheet 1, is a similar section, showing certain modifications of the same; Fig. 4, Sheet 1, is a similar section of an octagonal column; Fig. 1, Sheet 2, is an elevation of a portion of one of my improved columns having the heads and nuts of the tie-rods countersunk; Fig. 2, Sheet 2, is a transverse section of the same; and Figs. 3, 4, and 5, Sheet 2, are similar sections of my improved columns, showing, respectively, different forms of segment-bars, and also showing washer-plates or strips at their joints.

To construct my improved column I provide

four or more metallic segment-bars, A A, respectively rolled to the form of segments of a circle or a polygon, according to the form of cross-section of the column required. These segments are, by preference, rolled with ribs or fins *ff* upon their edges in order to provide a larger amount of bearing-surface for the ties by which the segments are united. The ribs may be formed either upon the inner or outer surfaces of the segment-bars, as convenience of construction dictates, and the segment-bars may be either plain or ribbed, grooved or corrugated. The segment-bars A A are united by a series of transverse tie-rods or bolts, B B, passing through the axis of the column and being arranged alternately so as to cross each other, thus affording an equal amount of resistance upon four or more longitudinal lines. In order to retain the segment-bars in position longitudinally the ribs *ff* are recessed to admit gibs C C, through which the tie-rods or bolts pass. The gibs may be provided with tongues or projections *C'* on their inner surfaces, which serve as spacing pieces to spread or swell the column by separating the bars, in order to enable the interior of the column to be painted, or for other purposes, as shown in Figs. 1 to 4, Sheet 1; and the gib upon the threaded end of each tie-rod is similarly threaded; to serve as a nut. In the columns shown in Figs. 1 to 5, Sheet 2, these spacing-pieces are not employed, the several segments, in these instances, abutting closely on their edges. Heads *d* are formed upon the tie-rods B for the application of a proper wrench, by means of which they are screwed into the threaded gibs or nuts, thus clamping the segments firmly in position by binding them against the gibs, or against the bolts, or against each other, as the case may be. If preferred, plain gibs may be used at each end of the tie-rods, and the segments be drawn up to a bearing by separate nuts *e*, as shown in Fig. 3, Sheet 1.

Figs. 1 and 2, Sheet 2, exemplify a construction in which both the head and nut of the bolt are countersunk, and no gibs are employed. This form of column is well adapted for ornamental architectural work. In Fig. 2, Sheet 2, a tie-rod is shown as secured by riveting its end instead of by a nut. In the column shown in Figs. 4 and 5, Sheet 2, rivets

are employed instead of screw-bolts, and strips or washer-plates *c* are used to cover the joints of the segment-bars. The longitudinal distances between the tie-rods will vary with the dimensions and ultimate resistance of the segment-bars employed, and can be readily determined by those skilled in bridge constructions.

In columns constructed in accordance with my improvements, the principle of a trussed arch is practically embodied. The tie-rods extending entirely through the column at the joints of the segments effectually prevent the segments from collapsing or spreading apart when exposed to strains, and by their relative alternate arrangement, the strains are equally distributed upon four or more lines equidistant from the axis of the column.

The gibs which fit in the recesses of the segment-bars, or the bolts themselves, in cases where gibs are not employed, prevent the longitudinal displacement of the segment-bars under any circumstances. The column is, furthermore, of simple construction, as the segment-bars are readily rolled of any desired form, and they can be more expeditiously put together than those that are united by flanges and riveting.

I am aware that metallic columns have been heretofore constructed composed of a series of longitudinal segments arranged around and secured to a series of internal distance pieces. One form of such a column is shown in the drawing attached to Letters Patent No. 34,183,

issued to myself and J. H. Piper, (assignees of myself,) and bearing date January 14, 1862. I do not claim in this patent a column in the construction of which internal rings, disks, or distance pieces are employed, but desire to confine my claims to the specific manner of construction and combination hereinbefore set forth, to wit: The uniting of the segments by transverse ties alternately crossing each other, and acting directly as counter resisting tie-rods to the arches formed by the curvature of the segments.

I claim as my invention—

1. The combination, in a tubular metallic column, strut, or girder, of four or more segment-bars, of substantially arched cross-section, and a series of transverse tie-rods, bolts, or rivets, which pass entirely through the column at the joints of the segment-bars, and clamp the segment-bars together, substantially as set forth.

2. The combination of the segment-bars, recessed upon their edges, the gibs fitting into the recesses of the segment-bars, and the tie-rods passing through the gibs and secured by screwing or riveting, substantially as and for the purpose set forth.

3. The gibs *C C* provided with tongues *C'*, in combination with the segment-bars and transverse tie-rods, substantially as and for the purpose set forth.

Witnesses: JACOB H. LINVILLE.
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WM. B. DAYTON.