A. BONZANO.

Columns.

No. 198,072 Patented Dec. 11, 1877.

Fig. 3.

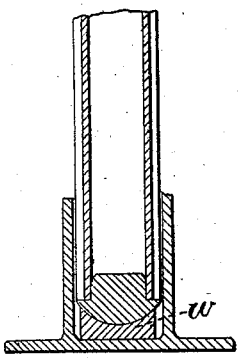


Fig. 1.

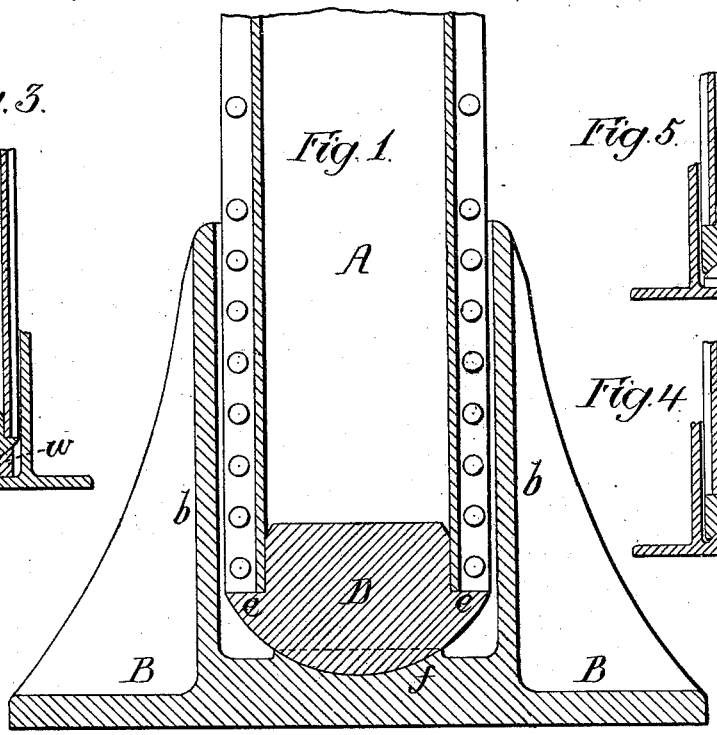


Fig. 5.

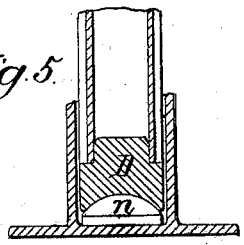


Fig. 4.

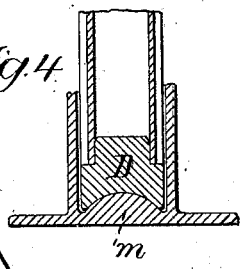


Fig. 6.

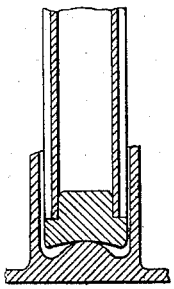


Fig. 2.

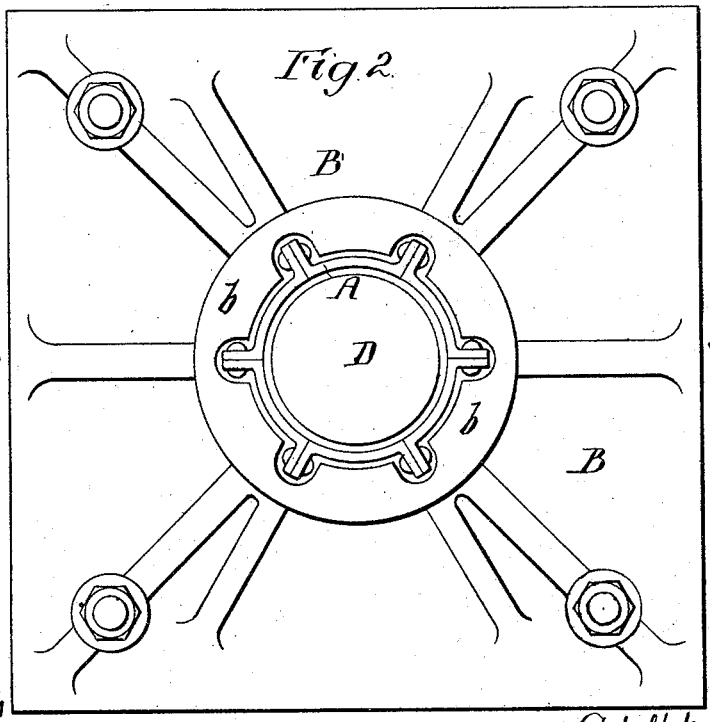
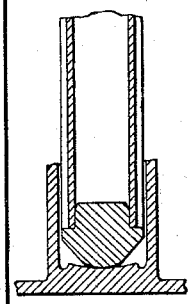


Fig. 7.



Witnesses
Henry Howson Jr
Harry Smith

Inventor
Adolphus Bonzano
by his Attorneys
Howson & Sons

UNITED STATES PATENT OFFICE.

ADOLPHUS BONZANO, OF PHŒNIXVILLE, ASSIGNOR TO HIMSELF, DAVID REEVES, WILLIAM H. REEVES, AND JOHN GRIFFEN, OF SAME PLACE, AND THOMAS C. CLARK, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN COLUMNS.

Specification forming part of Letters Patent No. **198,072**, dated December 11, 1877; application filed November 19, 1877.

To all whom it may concern:

Be it known that I, ADOLPHUS BONZANO, of Phœnixville, Pennsylvania, have invented a new and useful Improvement in Securing Columns to Foundations, of which the following is a specification:

The main object of my invention is to so combine a column with a bed-plate that the perfect axial bearing of the said column shall be assured, and that opportunity may be afforded for effecting a proper alignment of the column after the bed-plate is secured to its foundation.

In the accompanying drawing, Figure 1 is a vertical section of the lower portion of the column and base; Fig. 2, a plan view of Fig. 1, and Figs. 3, 4, 5, 6, and 7, vertical sections illustrating modifications of my invention.

The column A, Figs. 1 and 2, consists, in the present instance, of six segmental flanged bars, riveted together and constituting the well-known Phœnix column, for which Letters Patent No. 35,582 were granted to S. J. Reeves on the 17th day of June, 1862.

It should be understood, however, that my invention is applicable to any kind of column, round, square, octagonal, or other shape.

B is the bed-plate, on which is cast a sleeve or socket, *b*, for receiving the lower end of the column, to which the interior of the sleeve bears such relation that the column can be moved laterally in every direction in the sleeve to a limited extent.

The lower end of the column bears on the annular shoulder *e* of the foot D, the upper portion of which fits snugly within the column, the lower portion being convex, and, as shown in Fig. 1, being adapted to a concave recess, *f*, in the bed-plate at the bottom of the sleeve. In other words, the column has a ball-and-socket bearing on the said bed-plate.

The space between the column and interior of the sleeve is large enough for the proper alignment of the said column after the bed-plate has been firmly bolted to the foundation, and also for allowing for the subsequent fastening of the column in the sleeve by means of wedges, cements, or otherwise.

The most important result of my invention is the perfect axial bearing of the column, the whole lower end of which fits accurately to and must always bear uniformly on the portion *e* of the foot, even should the foundation-plate be out of level.

My invention also permits the proper alignment of the column, after the bed-plate has been firmly bolted to the foundation, without interfering with the accurate axial bearing of the said column.

In the modification shown in Fig. 3, a block, *w*, with upper concave surface adapted to the convex under side of the foot, is interposed between the latter and the bed-plate, in the bottom of the sleeve, the block being at liberty to move laterally to a limited extent, if necessary, for the proper adjustment of the column.

In the modification, Fig. 4, the under side of the foot D is concave, and adapted to a convex projection, *m*, cast on the bottom of the sleeve on the bed-plate.

In the modification, Fig. 5, the concave under side of the foot bears on the convex upper surface of a block, *n*, contained within the sleeve.

In order to insure the desired axial bearing of the column on the bed-plate under all circumstances, it is not essential that the foot should conform throughout to the bearing, as regards the concavity of one or the convexity of the other.

The under side of the foot may, for instance, be very slightly concave, and bear on a comparatively abrupt central projection in the sleeve or on a block in the sleeve. (See Fig. 6.) The pointed or slightly rounded under side of the foot may rest in the slightly concave bottom of the sleeve, but I prefer in all cases the ball-and-socket bearing shown in Fig. 1, 3, 4, and 5.

I claim as my invention—

1. The combination of a bed-plate and

sleeve with a column, a foot on which has a central bearing on the bottom of the said sleeve, all substantially as specified.

2. The combination of the bed-plate and its sleeve with a column having a ball-and-socket bearing within the sleeve, all substantially as set forth.

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

ADOLPHUS BONZANO.

Witnesses:

RICHARD L. GARDINER,

HARRY SMITH.