(No Model.)

J. S. ADAMS.

SKELETON TOWER.

No. 297,331. Patented Apr. 22, 1884.

Fig. 1.

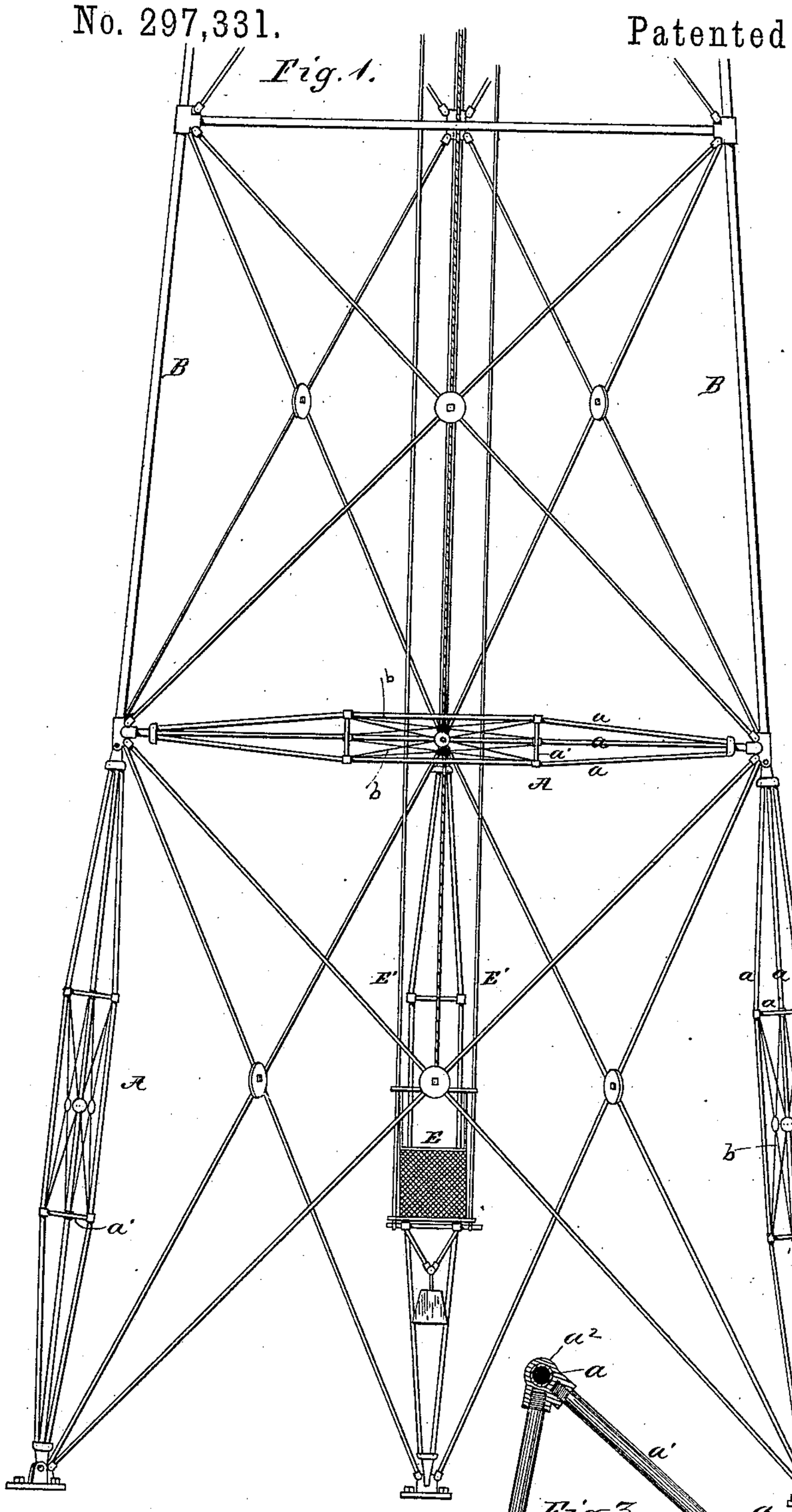

Fig. 2.

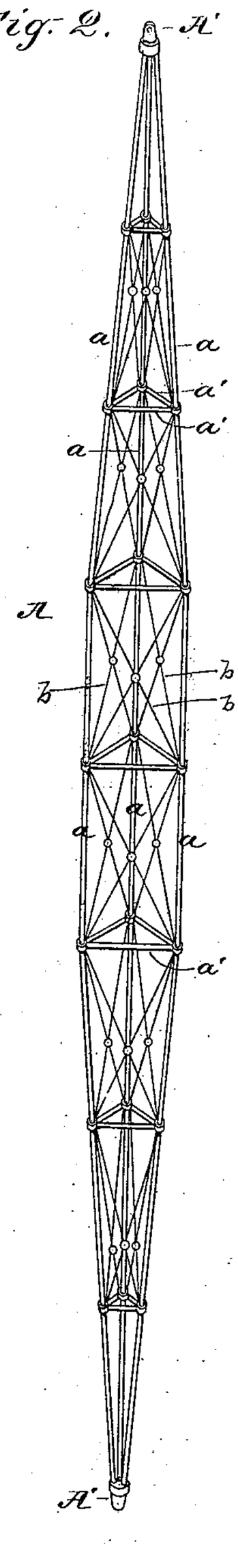

Fig. 3.

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SKELETON TOWER.

SPECIFICATION forming part of Letters Patent No. 297,331, dated April 22, 1884.

Application filed September 7, 1881. Renewed January 3, 1883. Again renewed March 17, 1884. (No model.)

To all whom it may concern:

Be it known that I, JOHN S. ADAMS, of Elgin, in the county of Kane and State of Illinois, have invented certain new and useful Improvements in Skeleton Towers; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to novel features of construction in a strut, support, or brace, more especially intended to be used in a class of skeleton iron structures, of which a general illustration is presented in Letters Patent of the United States No. 187,078, granted to me February 6, 1877.

It consists in a member composed of three or more longitudinal sub-members arranged at the angles of an open polyhedron thereby formed, said sub-members being united at their ends, substantially as will be hereinafter further explained, the object being to secure increased strength, while preserving desirable lightness and openness from the disposition of the metal described.

It also consists in other features of construction in the trussed member and in its combination with the step on which it rests when used as an upright in a skeleton iron tower.

In the lighting of cities by electricity and similar powerful means of illumination, it is proposed to erect towers of great height for the support of the illuminating devices. A tower of this description requires great breadth of base and great strength in its parts, particularly those composing the lower portions. It is also desirable that the lower portions of such tower should obstruct the view as little as possible. In a tower for this and similar purposes the lower section or sections will preferably be of considerable height; and in order to secure the necessary strength in the members of these sections I propose the composite construction thereof referred to, and described as follows:

In the drawings, Figure 1 is an elevation of the two lower sections of a skeleton iron tower containing my improved members. Fig. 2 is an enlarged elevation of a trussed member detached. Fig. 3 is a transverse section of the triangular trussed member shown in Fig. 2.

The same letter indicates the same part in all figures of the drawings.

A represents a trussed member of the skeleton tower, which member, as here shown, is composed of three longitudinal sub-members, *a a*, united at their extremities in a suitable casting or other terminal connection, A′. Between their ends the sub-members *a* are separated, being arranged in the angles of a regular polyhedron, and at suitable intervals they are connected by cross-pieces *a′*. These cross-pieces may be struts or ties, according to the situation and direction of strain upon the member containing them; but usually they will operate in the tower as "ties," and they will be hereinafter so called. Between adjacent ties, and between their points of conjunction and the adjacent ties, the sub-members *a a* will be straight, giving to the entire member A the doubly-tapering form shown in Fig. 2, being that of a polyhedron having bent angles. Diagonal ties or braces *b* may also be employed, as shown, to give greater rigidity to the member. The sub-members *a* will preferably be made in sections, joined in the several tie-connections a^2; but they may be made of continuous rods or tubes. Terminating at each end in a single piece or connection, A′, the member A, though composite, as described, is of such unitary character that it may be connected in any desired position in the structure without disturbing the relation of any of its components, wholly as though it were a single rod, bar, or tube.

By means of the trussed construction of the member A, the lower section or sections of the tower may be made of considerable altitude without sacrifice of strength, lightness, or openness in their supports.

It is obvious that the unitary trussed structure A may, as indicated in Fig. 1, be used for transverse as well as vertical work in towers, and also that its application is not limited to the special class of structures in which it is here shown.

In making use of trussed member A for the

lower uprights of a tower, as shown in Fig. 1, the lower terminal and connecting casting, A′, is formed with an aperture or eye, as seen in Fig. 1. The base piece or step, rigidly secured to the foundation, is provided with a corresponding apertured clevis, which admits the eye, and a bolt passing through the ports gives a pivotal connection of the upright with the base or foundation. By this means the upright may, while lying horizontally upon the ground, be hinged to the step on the foundation, and then raised at its outer end into position.

It is admitted that an essential feature of my invention consists in making each of the several sub-members *a* straight between any two adjacent points of attachment or connection, in which feature it differs from a similar trussed structure, wherein the sub-members are curved between their ends. This peculiarity in a tower is important, since compressive longitudinal strain would obviously tend to still further deflect rods or tubes already curved, and would be fatal to the purposes sought in such a tower—viz., maximum strength with a minimum weight of material in the structure.

In Fig. 1 of the drawings I have shown a depending elevator, which, with its guides and suspending devices, will form the subject of another patent.

I claim as my invention—

1. In a skeleton iron tower, the trussed member A, consisting of three or more sub-members, *a*, centrally spread and converging, and connected at their ends, and joined by cross-ties intermediate to their ends, said sub-members being straight between adjacent points of attachment, whereby longitudinal compressive strain upon the entire member A gives direct longitudinal compressive strain upon all parts of each sub-member, substantially as described.

2. In a skeleton iron tower, the combination, with the base piece or step, of the trussed member A, consisting of three or more sub-members spread centrally, converging at their extremities, straight between their connections, and joined by end connecting-pieces, A′, and intermediate ties, as set forth, the lower of said end pieces being provided with an eye, and connected with the base-piece, substantially as and for the purposes set forth.

3. A trussed skeleton member open at its center, triangular in cross-section, its members arranged to resist crushing, tensile, and transverse strains, constructed in sections with cylindrical, longitudinal, and transverse sub-members screw-threaded at their ends, connected by screw-threaded couplings, and trussed by diagonal adjustable tension brace-rods, the end sections of the longitudinal sub-members being connected to and diverging from unitary couplings at each end of the member, substantially as described and shown.

In testimony that I claim the foregoing as my invention I affix my signature in presence of two witnesses.

JOHN S. ADAMS.

Witnesses:
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