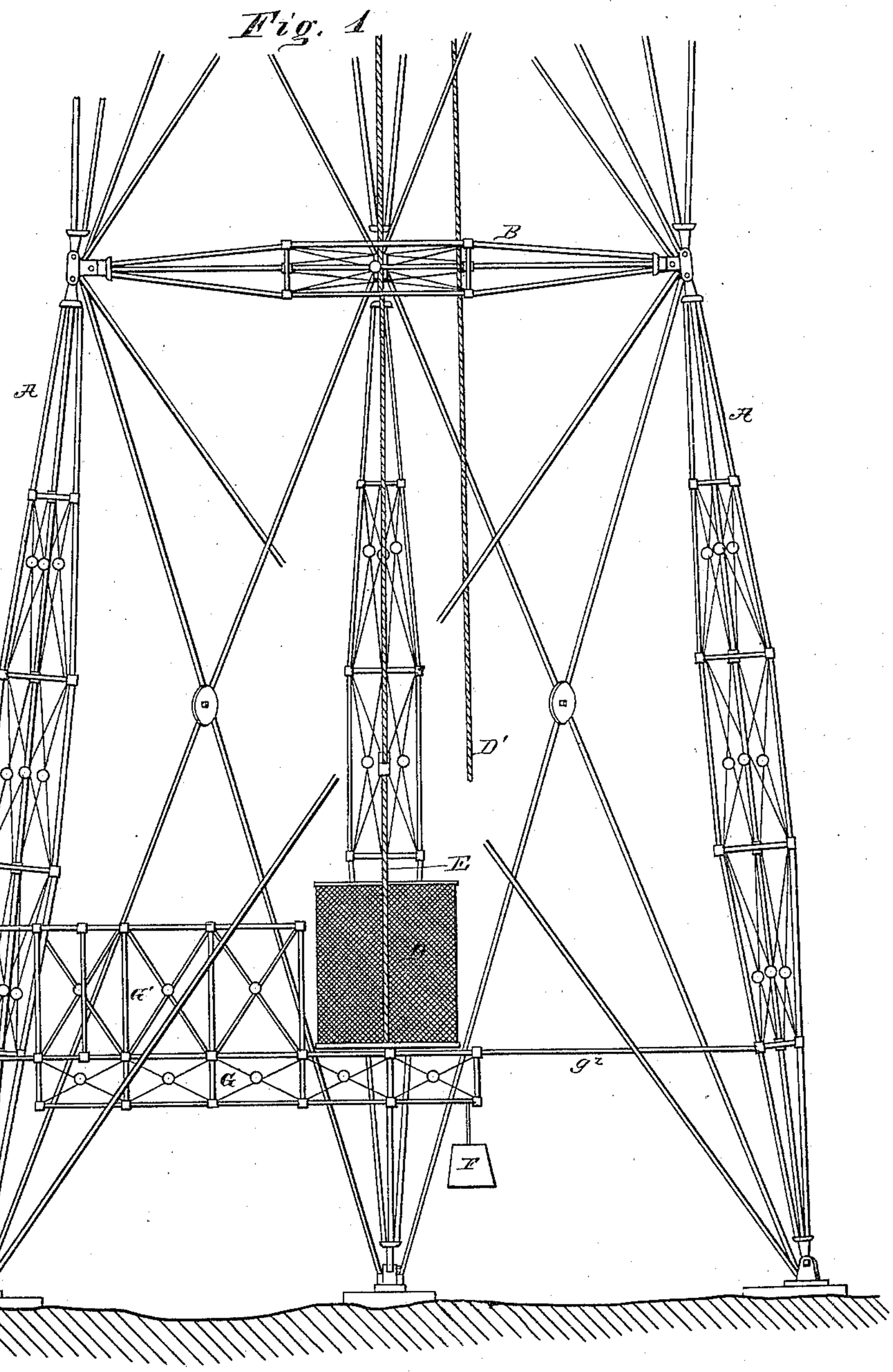
(No Model.) 2 Sheets—Sheet 1.

J. S. ADAMS.

SKELETON TOWER.

No. 306,374. Patented Oct. 14, 1884.

Fig. 1



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(No Model.) 2 Sheets—Sheet 2.

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Fig. 2.

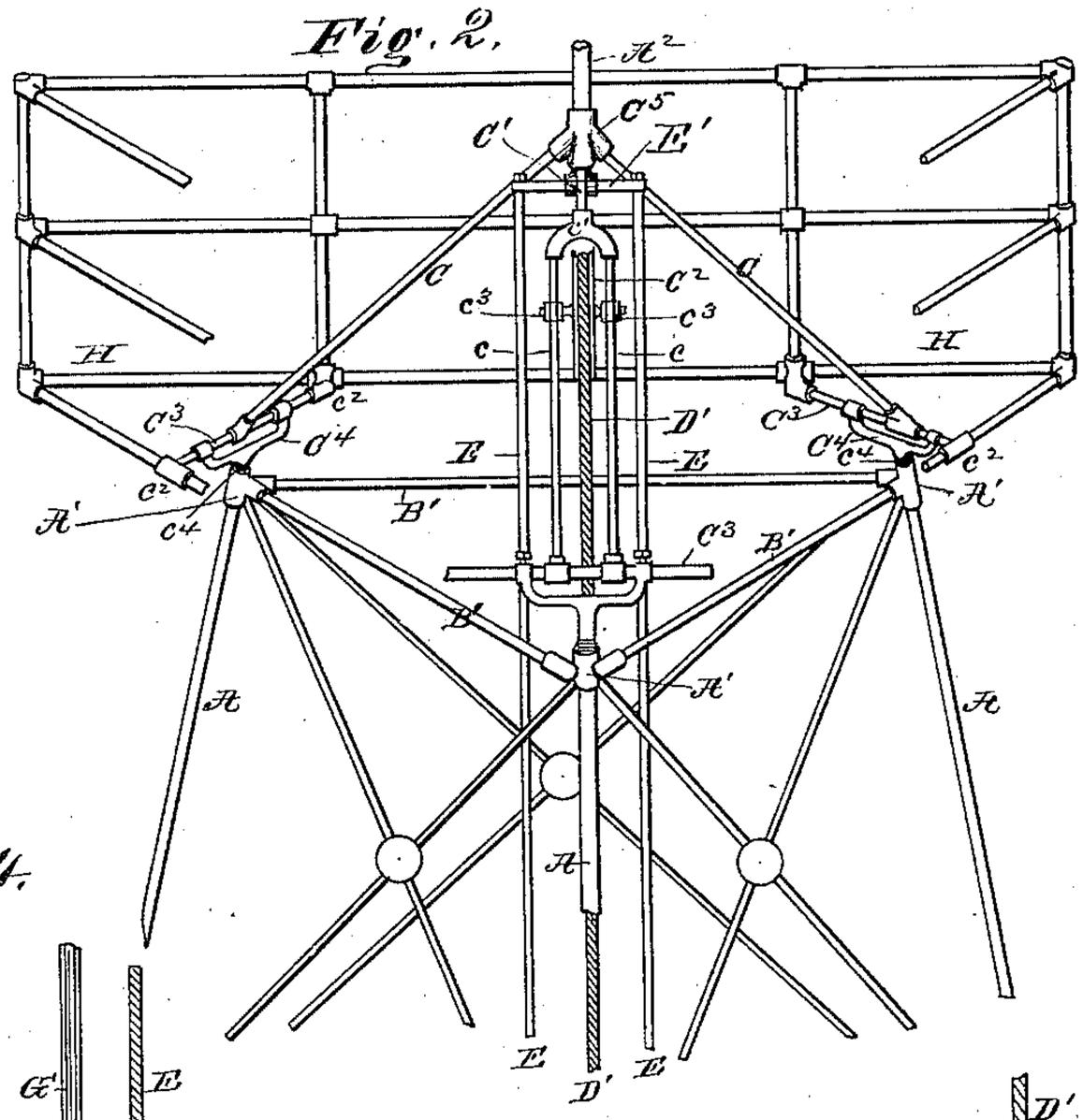


Fig. 4.

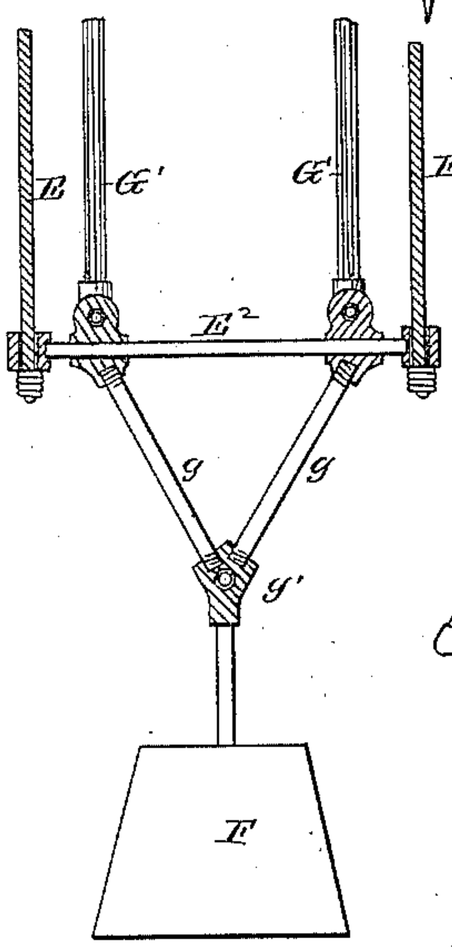


Fig. 3.

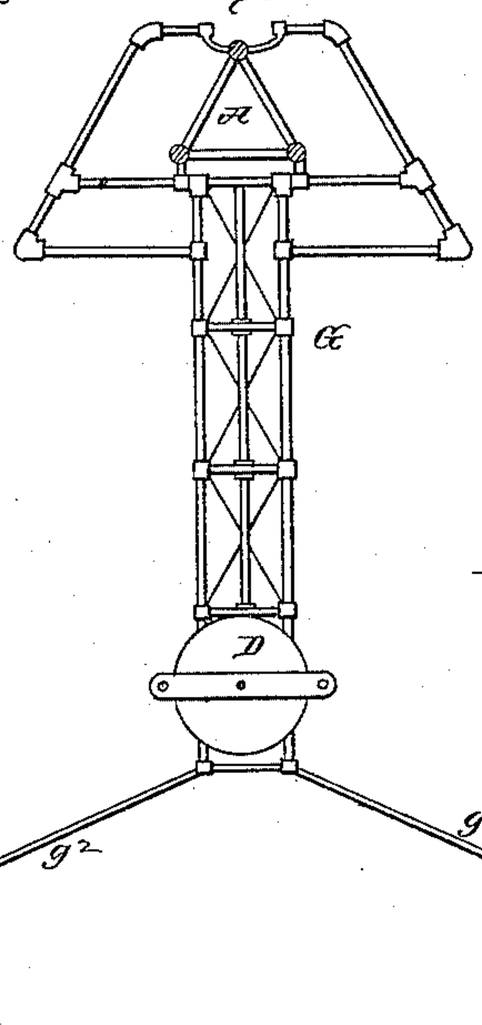


Fig. 5.

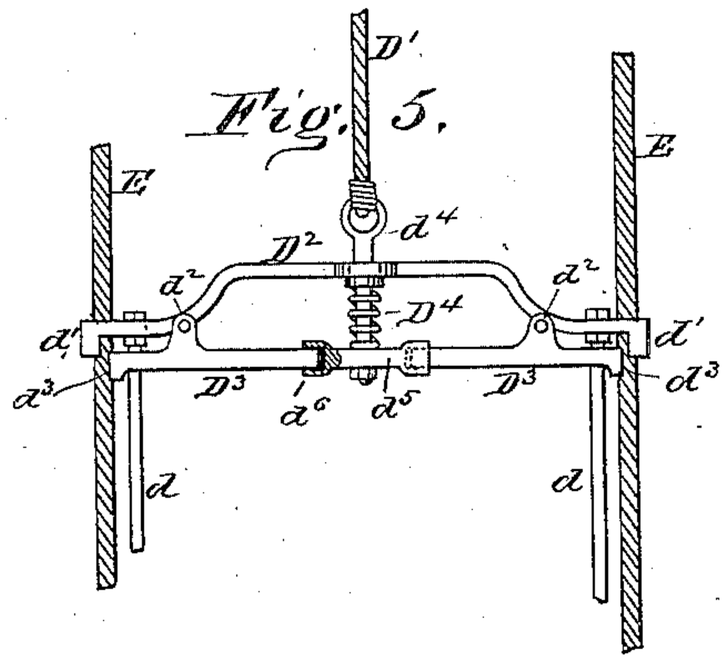
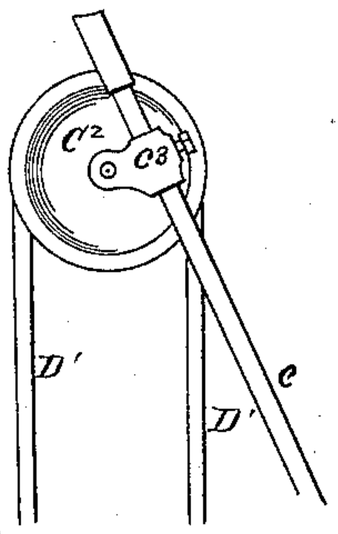


Fig. 6.



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UNITED STATES PATENT OFFICE.

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SKELETON TOWER.

SPECIFICATION forming part of Letters Patent No. 306,374, dated October 14, 1884.

Application filed May 11, 1882. Renewed March 26, 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 certain improvements in skeleton towers intended for the reception of hoisting apparatus; and it consists in the several features of construction, and in the various combinations of devices, hereinafter fully set forth, and designated in the claims.

In the accompanying drawings the invention is shown as applied to a skeleton tower of, say, from one hundred to three hundred feet in height, and suited to the support of an electric light. The tower may be supposed to be constructed of tubular iron, having connections of cast malleable iron. Figure 1 shows the base-sections of a triangular skeleton tower of the general description set forth in other patents granted to me. Fig. 2 is a perspective view of the upper portion of the tower, showing the devices for suspending the elevator and for the attachment of the upper landing-frame. Fig. 3 is a horizontal section of the tower above the lower elevator-landing, and showing the elevator-cab lowered. Fig. 4 is a vertical transverse section of the frame of the lower elevator-landing, illustrating the use of one of the transverse bars of said frame as the separating-bar for the elevator guide-ropes, and as being also attached to the weight by which said ropes are held taut. Fig. 5 is a detail showing a safety-clutch applied to the lifting mechanism of the cab, and adapted to operate in combination with the yielding or flexible ropes by which the cab is guided. Fig. 6 is a detail view showing the elevator-pulley in side elevation, together with one of the inclined standards supporting the same, and an adjustable bearing for the pulley.

A A represent the uprights or posts of a triangular tower, and B B the system of horizontal cross ties and braces which join the uprights to form a hollow skeleton structure of triangular pyramidal form.

C C′ are rods connected with the upper extremities of the uprights A, and inclined upward and inward therefrom to converge over the middle of the tower, forming, as here shown, a tripedal support for the elevator and its guides or ways.

D is the elevator-cab.

D′ is its suspending-rope.

E E are the rope or rod guides for the cab D.

E′ is a bar from which the ropes E are immediately suspended.

E^2 is a second bar, located at the lower end of the ropes E, by which the latter are held at a proper distance apart.

F is a weight attached to the bar E^2, by which the ropes E are held taut.

G is a raised platform or landing leading to the elevator-cab.

H is a frame for a landing and surrounding rail at the top of the tower.

The upper ends of the tower-uprights are connected by horizontal ties B B′, which prevent their spreading, being joined by means of suitable "fittings," A′. The feet of the converging inclined standards C rest upon the uprights A, being therewith joined, as here shown, by means of the transverse bars C^3 and the rather widely branched fittings C^4. At their upper ends the rods C unite in a fitting, C^5, which is also constructed to receive and sustain the central mast, A^2. (Shown broken off in Fig. 2.)

The object of the branched form of the connections C^4, as herein shown, is to more firmly and widely support the bars C^3, which pass through the former, as seen in Fig. 2, and which bars are extended to form supports for a landing and its surrounding guard-rail H. The platform of the landing will consist preferably of iron tubes, suitably joined and secured and arranged to rest upon the bars C^3; but said platform may consist of planks or slats arranged and secured in place in any suitable manner. One of the inclined standards, as C′, is made bifurcated, as clearly seen in Fig. 2, for the purpose of supporting the pulley C^2 between the legs *c c*, said legs having fitted and secured thereto the bearings c^3 for the pulley-shaft. A branched three-way casting, *c*′, connects the legs *c c* at their upper ends, and a short single rod or tube joins said

casting with the central elevated casting, C^5. The pulley C^2 will be arranged to suspend the cab D accurately in the middle of the tower.

From and beneath the casting C^5 the transverse horizontal bar E′ is supported, from the ends of which depend the ropes or rods E E, intended to serve as guides for the cab D.

Near the bottom of the tower, as seen in Fig. 1, a landing and walk, G, is provided at a suitable height to allow passage beneath it, leading from the center of the tower to one of the uprights A, with which its outer end is secured. When of considerable length, as will usually be the case in towers of great altitude, said walk may be strengthened by trusses. In this case it is shown as having trussed guard-rails G′, and also as having a suspended truss, $g\,g'$, of the sectionally triangular shape shown in Fig. 4. One of the transverse frame-pieces of this landing structure, as E^2, Fig. 4, gives attachment to the lower ends of the guide-ropes E, operating with the elevated bar E′ to hold them parallel with each other and in the same plane. Said ropes E, when thus connected, serve to sustain the inner end of the landing G and obviate the use of supports beneath it at this point.

In lofty towers the expansion and contraction of the ropes E from exposure to changes of temperature or other influences will be considerable. Since it is desirable to hold said ropes uniformly taut, it is therefore necessary that the means by which this is done shall be yielding.

In the case of skeleton towers constructed of tubular iron, as may be supposed to be the case in the drawings, the long platform G will rise and fall as the ropes E expand and contract, to practically meet this condition without the provision of hinged connections of such platform with the upright A; but, if preferred, such hinged connection may be provided. When for any reason it is not desirable to connect the platform with the guides E, the bar E^2 may be guyed to prevent rotation, and the desired tension of the guide-ropes may be obtained from the use of a special weight, (shown at F,) and should the platform when connected with the ropes be of insufficient weight, the special weight F may be added thereto and applied at any suitable point for the purpose.

The weight F or the platform G, when connected as described, and as shown in the drawings, is intended to represent any form of yielding force applied to the guide-ropes E and adapted to hold them taut by a practically uniform strain. Guys g^2 hold the inner end of the platform G in place laterally, and any suitable stair may be provided for reaching said platform from the ground.

For the purpose of checking the fall of the cab should the lifting-rope D′ break, the lifting-bar D^2 of the cab is apertured at its ends to surround the guide-ropes E, and the clamp-bars D^3 are applied in the usual or any approved manner, so as to be thrown out by the spring D^4, when released, into bearing upon the ropes E at d^3. Said clamp-bars D^3 are here shown as being severally pivoted to the lifting-bar at D^2, and as having loose sliding connection with the center piece, d^5, (as seen at d^6,) upon which the spring D^4 immediately bears.

The pivotal points d^2 and the bearing end faces d^3 of the clamping-bars D^3 are arranged in such relation, as indicated, that the latter will first throw the ropes E outward against the ends d' of the lifting-bar D^2, and will continue thereafter to bite the rope under strain from the falling cab until the latter is arrested.

While the general construction and mode of applying the clamping-bars D^3, as shown in the drawings, is not materially different from those seen in elevators having rigid or fixed guides, it is obvious that in combination with the yielding and flexible guides E, and with the opposing support afforded by the ends d' of the lifting-bar D^2, an entirely new action is obtained, depending on the yielding character of the guides E. The opposing bearings d' d^3 may of course be transposed, if desired.

As will be seen in Fig. 2, the fittings C^4 are screw-threaded into the fittings A′. By this means the converging bars C may be adjusted to suspend the cab and its guides accurately in the center of the tower.

If preferred, the threaded projections of the fittings C^4 may rest loosely in the fittings A′, and be provided with nuts, which rest on the latter, and which allow of the adjustment of the legs C at any time, if found desirable or necessary, after the tower is completed. In such adjustment the rods C^3 rotate in the fitting C^4, or the foot-pieces of the standards may rotate on said rods.

The mode of operating the elevator is only suggested in the drawings by the rope D′ trained over the pulley C^2; but other modes may be employed without departure from my invention. For example, the cab may be raised and lowered by known devices worked by the occupant, and operating in connection with the guides E, or in connection with a third rope or bar, also suspended and stationary. The use of such devices would dispense with the trained hoisting-rope D′ and the special devices by which the pulley C^2 is sustained, but would not effect the operation of parts retained.

Obviously a spring may be employed to give an automatic tension to the guides E substantially like but less perfect than that of the weight F. It is also plain that a spring or weight for this purpose may be connected with the guides at their upper ends, if for any reason such construction be preferred, the lower ends of said guides being fixedly held.

The platform or landing G, located between the tower-uprights, and at an elevation to allow passage beneath it, is made the subject of a separate application for patent.

I claim as my invention—

1. In combination with the uprights A of a

skeleton iron tower connected together, the inclined standards supported by said uprights and joined at their upper ends for the support of the elevator within the interior of the tower, substantially as described.

2. In combination with the converging standards forming the apex of the tower of the mast A^2, a suitable connecting-piece, C^5, and struts or rods C, connecting the mast and standards, whereby the mast is supported and stayed, substantially as described.

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

JOHN S. ADAMS.

Witnesses:
M. E. DAYTON,
W. C. ADAMS.