

(No Model.)

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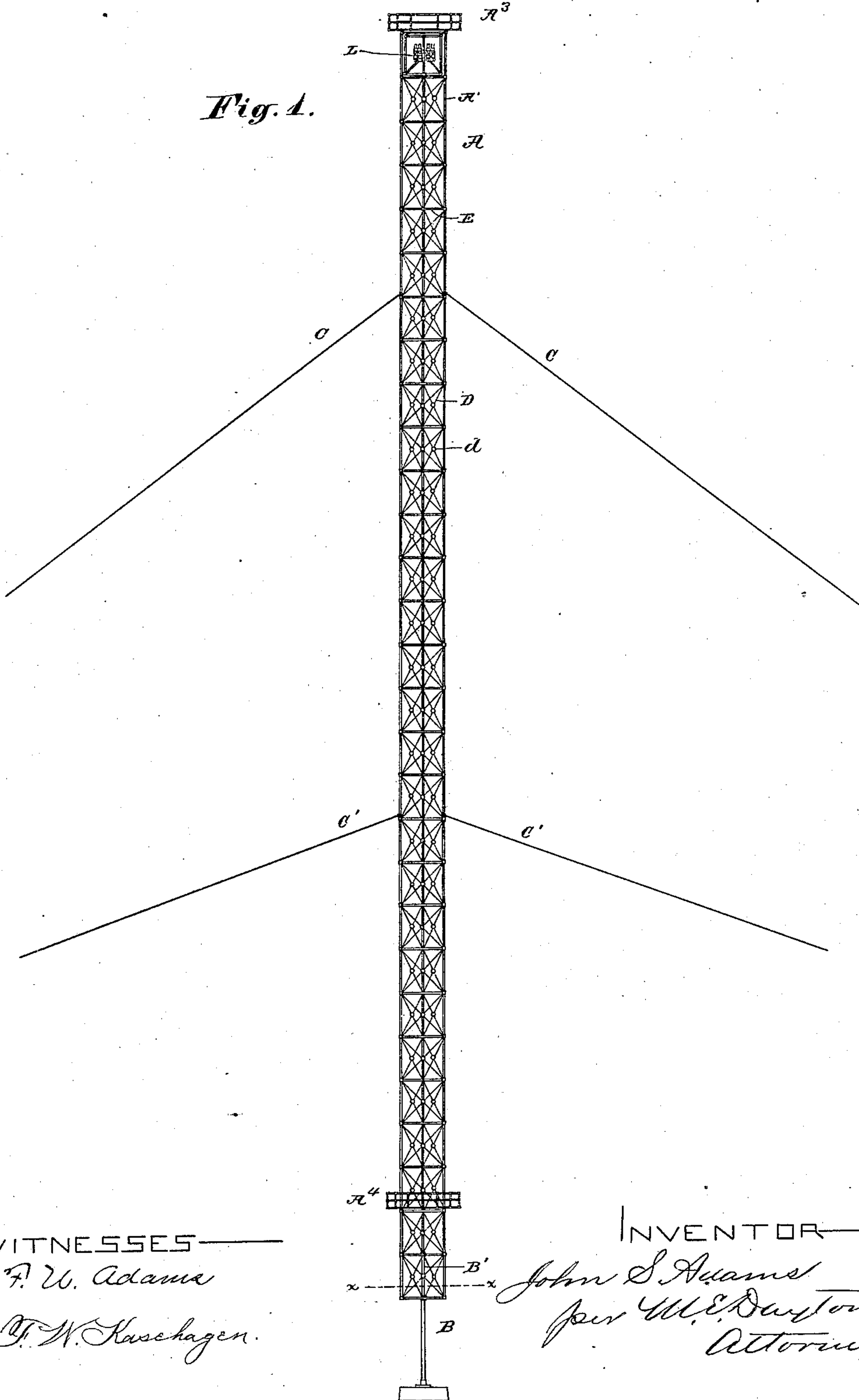
J. S. ADAMS.

ELECTRIC LIGHT TOWER.

No. 311,166.

Patented Jan. 27, 1885.

Fig. 4.



(No Model.)

5 Sheets—Sheet 2.

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Fig. 2.

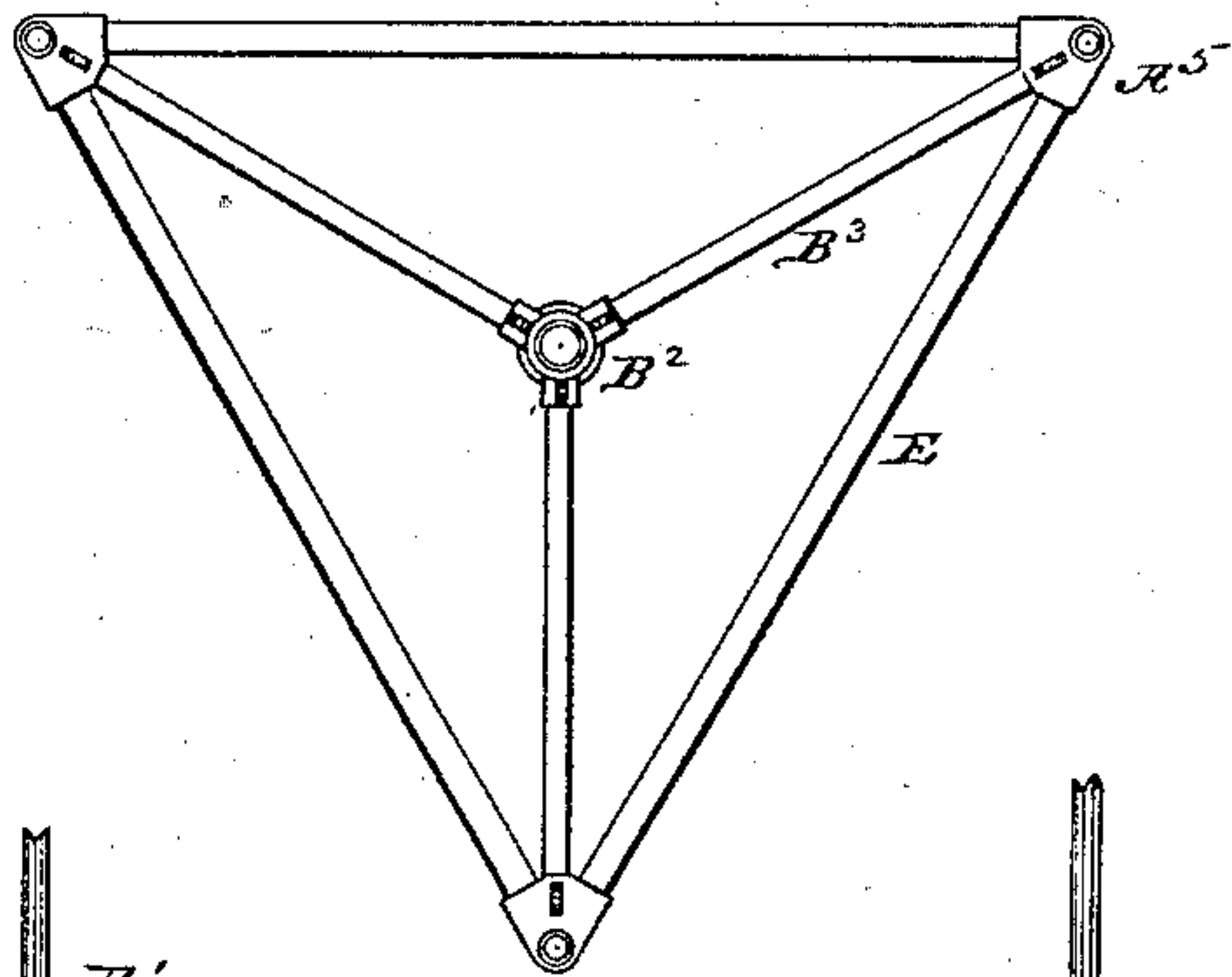
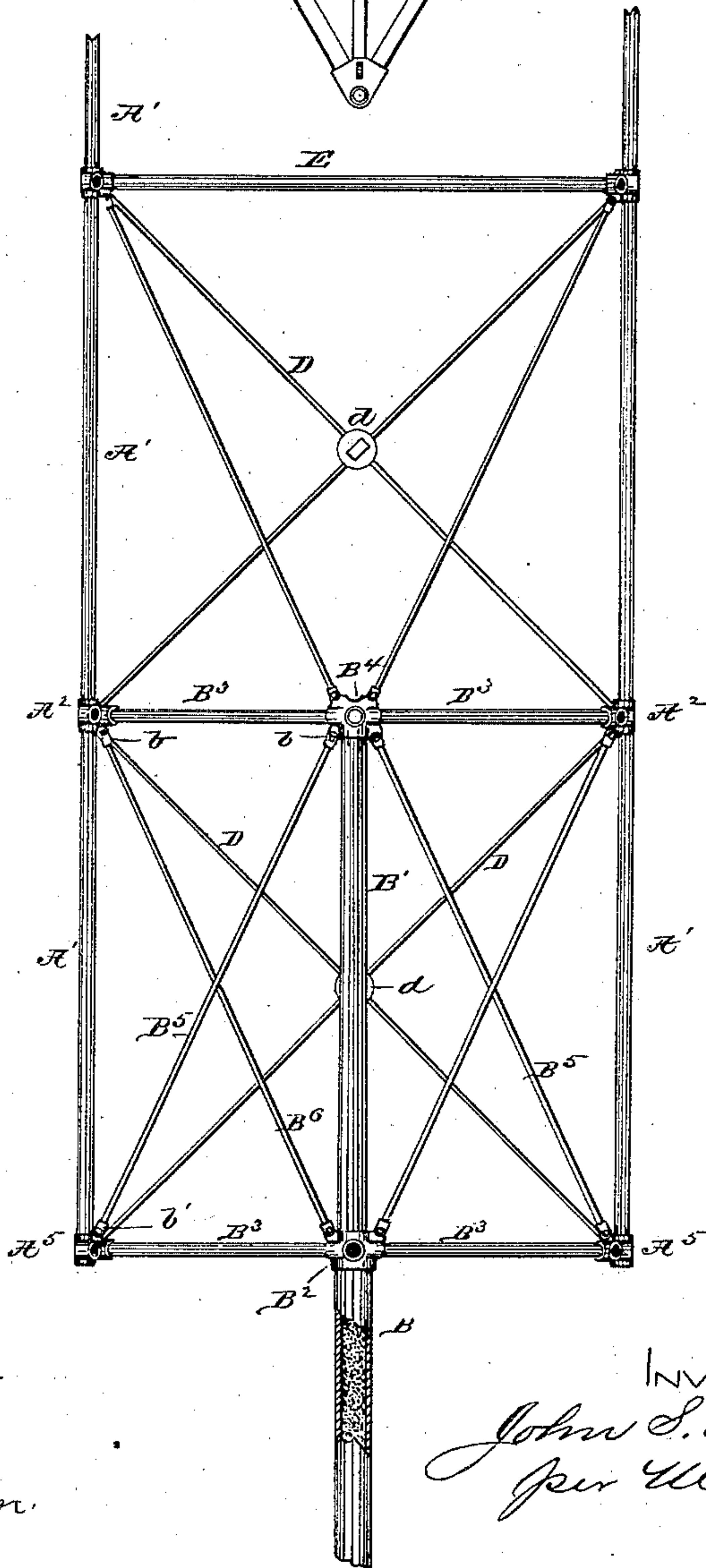


Fig. 3.



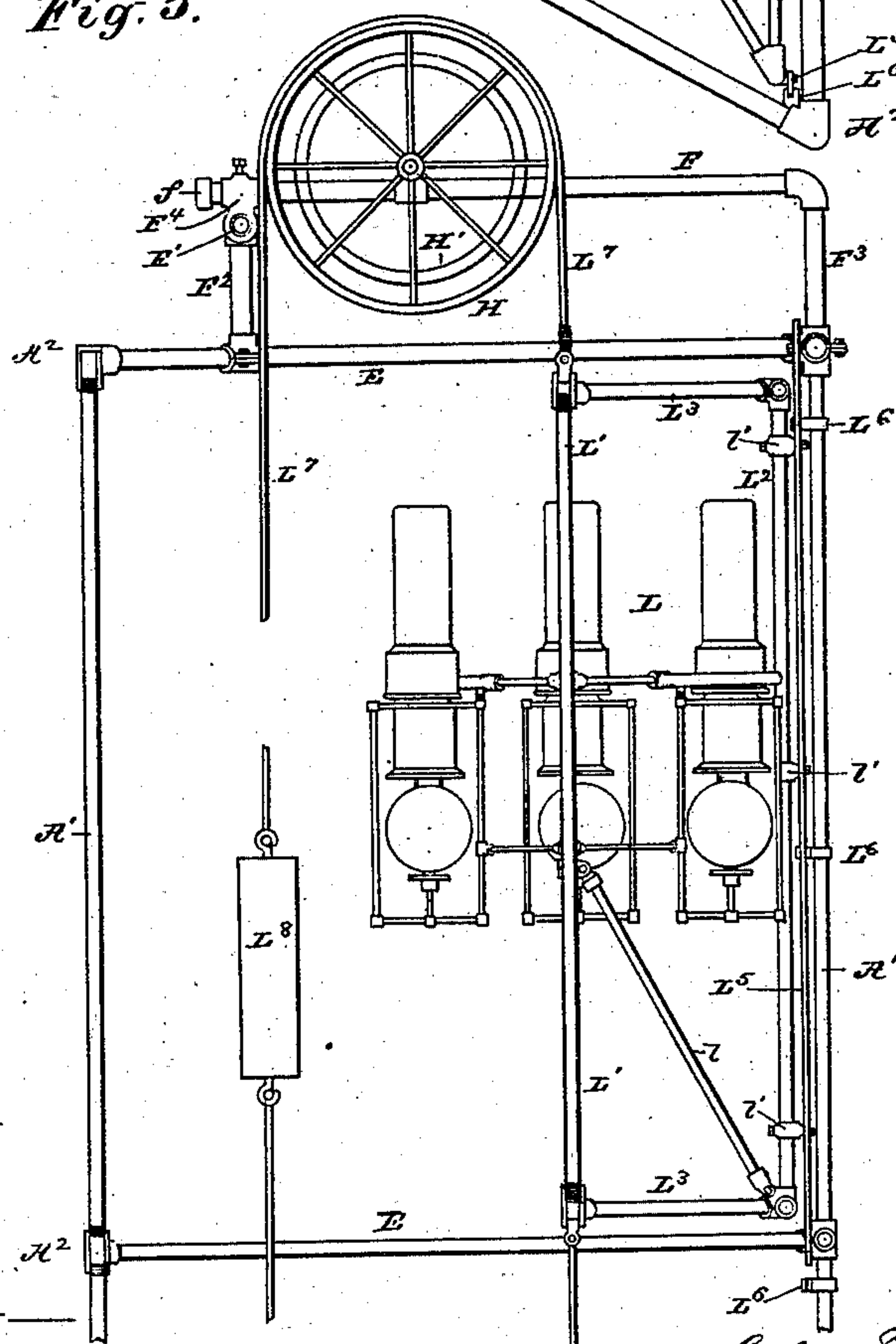
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5 Sheets—Sheet 3.

No. 311,166.

Patented Jan. 27, 1885.



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(No Model.)

5 Sheets—Sheet 4.

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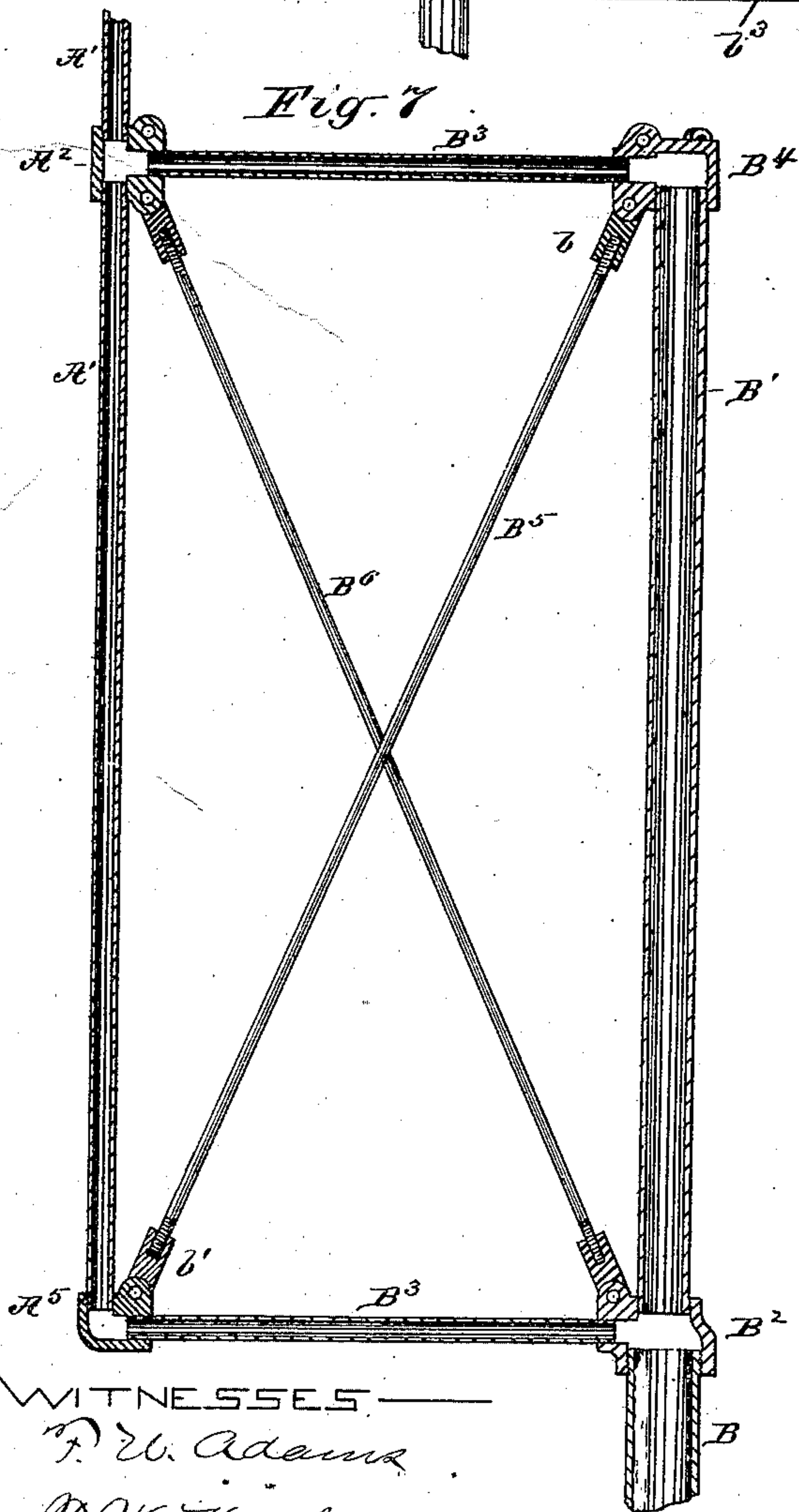
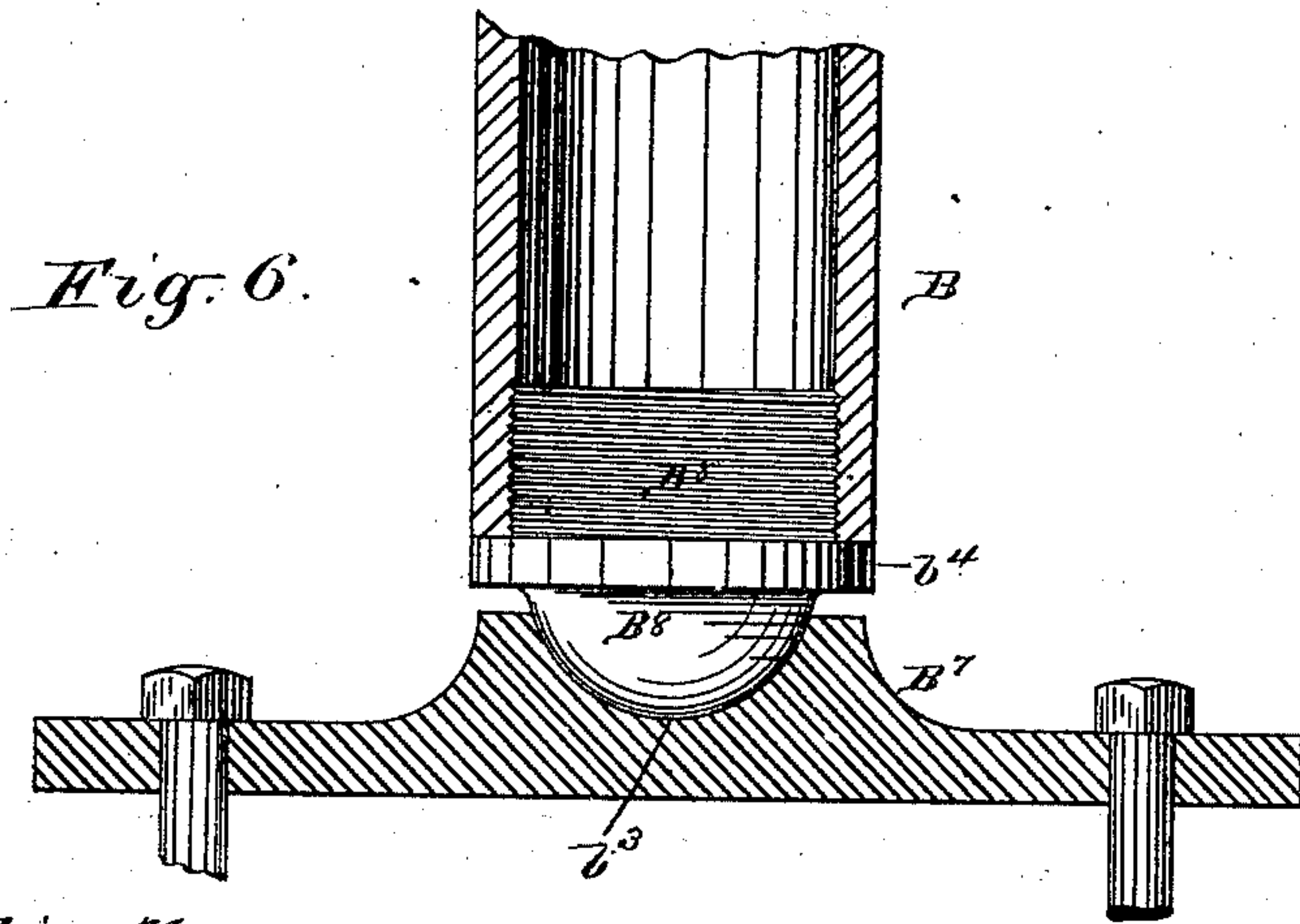


Fig. 8.

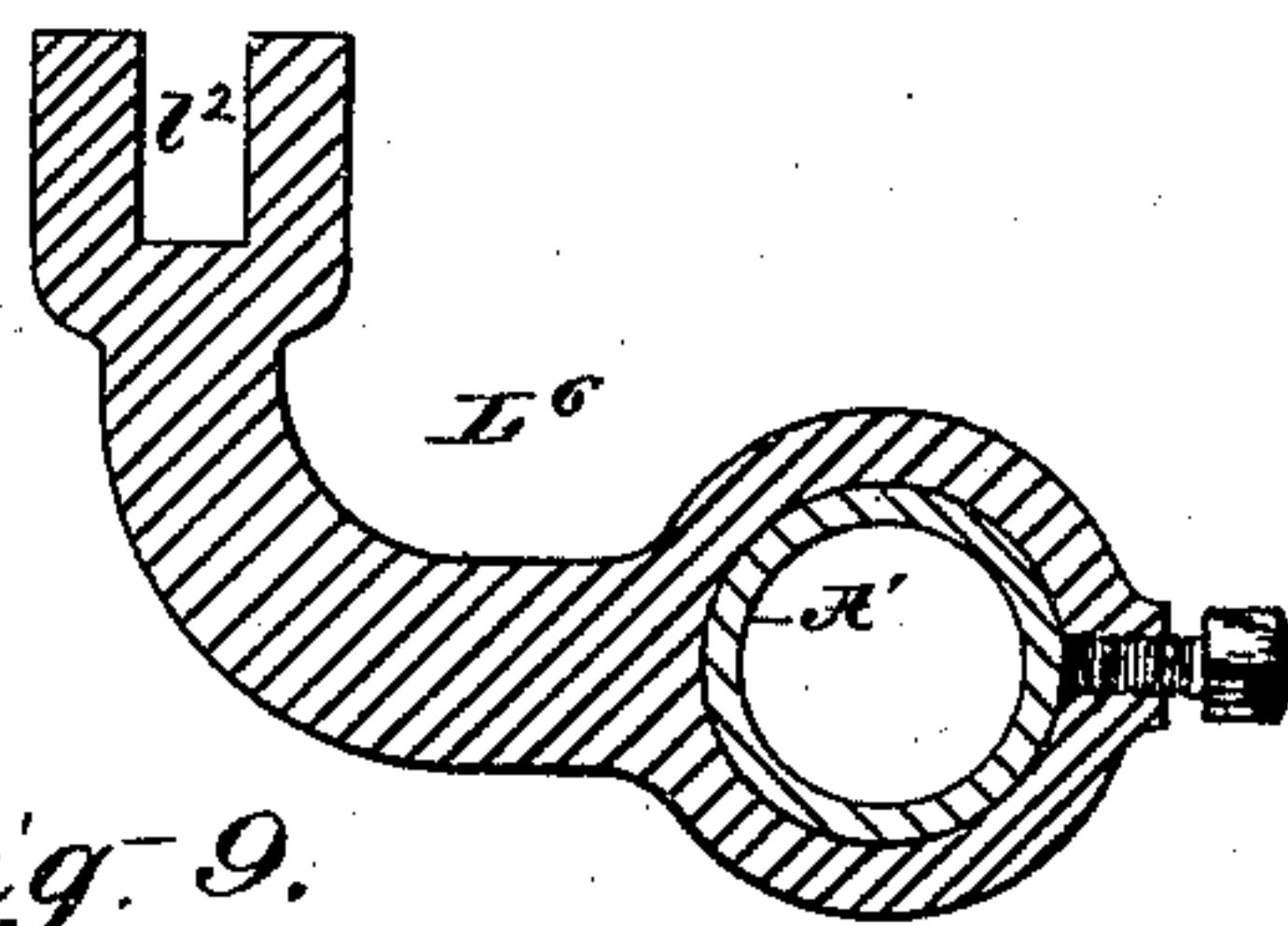
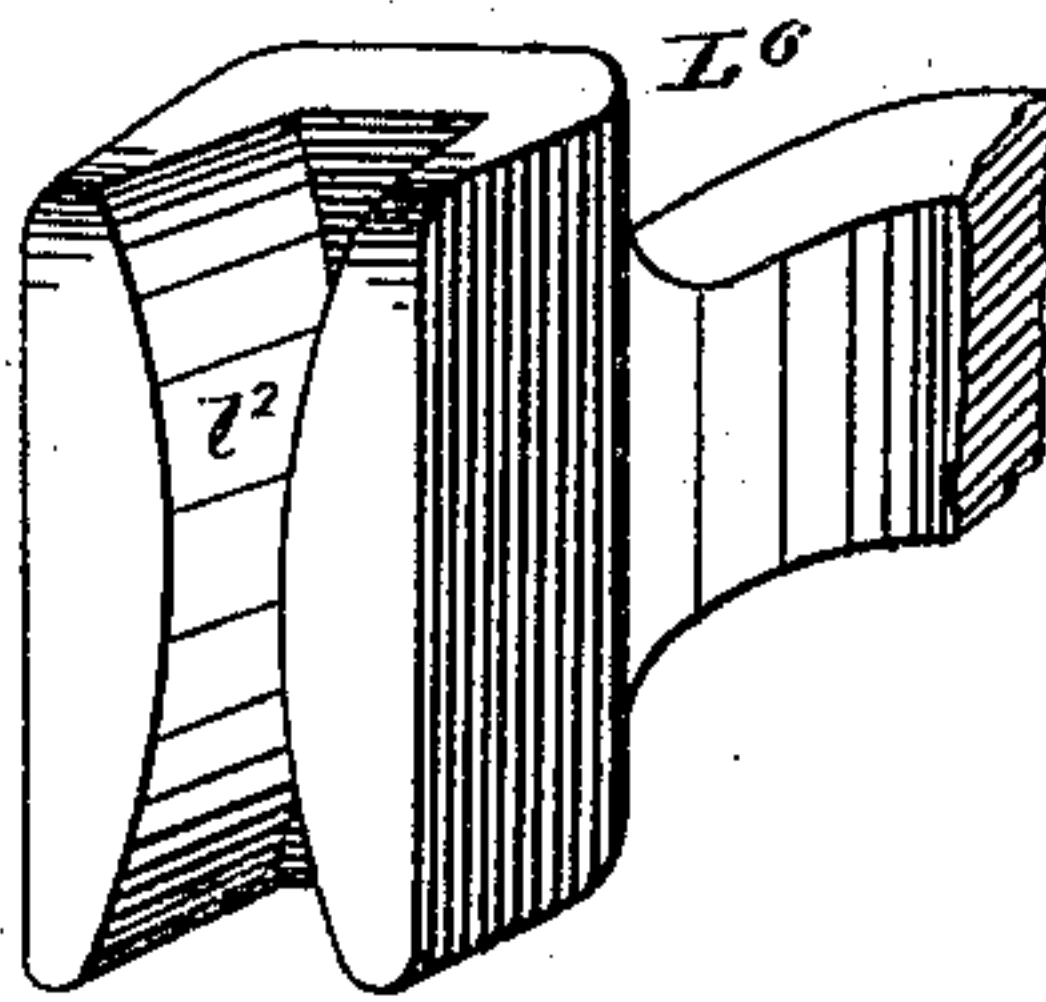


Fig. 9.



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(No Model.)

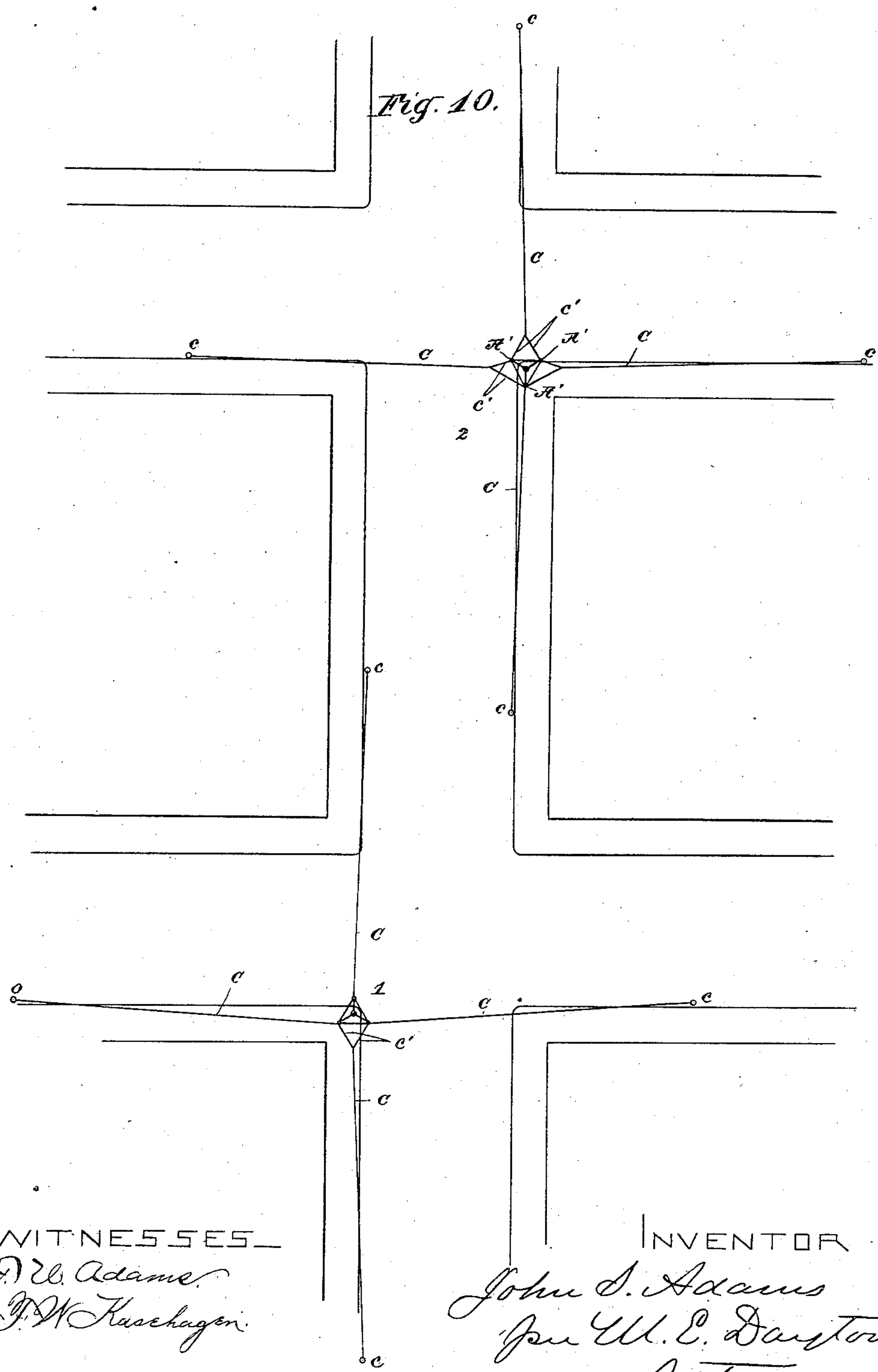
5 Sheets—Sheet 5.

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ELECTRIC LIGHT TOWER.

No. 311,166.

Patented Jan. 27, 1885.



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UNITED STATES PATENT OFFICE.

JOHN S. ADAMS, OF ELGIN, ILLINOIS, ASSIGNOR TO THE DETROIT IRON TOWER COMPANY, OF DETROIT, MICHIGAN.

ELECTRIC-LIGHT TOWER.

SPECIFICATION forming part of Letters Patent No. 311,166, dated January 27, 1885.

Application filed July 25, 1882. Renewed July 30, 1883. Again renewed June 30, 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
5 Improvements in Electric-Light 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
10 thereon, which form a part of this specification.

This invention relates to features of construction in skeleton iron towers intended more especially to support electric lights at a considerable elevation in cities and towns.

The nature and objects of the invention will more fully appear from the following description and claims.

In the drawings, Figure 1 is an elevation of
20 a tower containing my improvements. Fig. 2 is a plan view, enlarged, of the lower horizontal members of the tower, as shown by a section through $x x$ of Fig. 1. Fig. 3 is a fragmentary elevation of two lower sections
25 of the tower when supported by a central post, the near upright and horizontal members of the trussed portion being removed. Fig. 4 is a top view of the tower. Fig. 5 is a vertical section of the upper tower-section
30 through $y y$ of Fig. 4. Figs. 6, 7, 8, and 9 are details. Fig. 10 illustrates modes of connecting the guys with the tower.

Skeleton iron towers for the support of electric lights have heretofore been usually
35 made pyramidal in form, commonly triangular or quadrangular, and when located at street intersections have been arranged with their legs resting at the angles of the street-walks. This construction has usually re-
40 quired in the tower a greater breadth of base than is necessary for strength or permanence, and has not only made the tower more costly than it should be, but has obstructed the view in the street or shaded the neighboring win-
45 dows to an objectional degree. By the construction of the tower and the manner of its support, as here shown, these and other objections to the pyramidal form of tower are wholly obviated.

50 The first novel feature of the construction

consists in a trussed skeleton tower of prismatic form, or of uniform horizontal dimensions at all points of its height.

In the drawings the tower shown is a triangular prism. In dimensions the tower may
55 be of any required height and of such interior size as will only afford the necessary space to allow the lamps to be raised and lowered therein. A triangular tower having its sides eight
60 feet wide will ordinarily be of size sufficient for this purpose. The tower of this construction will be laterally supported by guys of suitable length, stayed at either the street surface or the roofs or other parts of neighboring
65 buildings. A tower so made may be of relatively light material, and, if desirable, it may, even when of considerable height, be located on the roof of a building. Usually, however, the tower will be situated in a street corner, and in this case it will be supported in a pecu-
70 liar manner.

The peculiar mode of supporting the trussed skeleton tower when located at a street corner or at a point where it is desirable to avoid obstruction to passage constitutes the second
75 novel feature of my invention, and consists in sustaining the tower in a raised position by means of a central post, which, in a street, will ordinarily rise from the corner of the walk. The tower will in this case be supported lat-
80 erally by guys extending to the ground or to neighboring buildings, as already described.

Other features of my invention relate to the manner of connecting the tower with the supporting-post, to the manner of seating the
85 post, to the construction of the lamp-carriage, and to the manner of guiding the carriage.

Referring to the drawings, A represents the trussed prismatic skeleton structure, and B B' is a central post or upright by which the said
90 trussed structure is upheld. C C' are guys leading from elevated points of the tower to the ground or other stationary anchorage.

The trussed portion of the tower, as herein shown, is triangular in horizontal section, hav-
95 ing equilateral sides; but it may be of other sectional form, if desired. The uprights A' are preferably composed of eight-foot lengths of tubular iron joined by suitable couplings, A'', which also receive the ends of horizontal
100

tubular girts E at each junction of the sections of the uprights. The panels or sections of the tower are trussed, to give the required rigidity, by means of diagonal brace-rods D, arranged in the planes of the uprights, and threaded into or otherwise connected with the couplings A". Said diagonals are also preferably locked to each other at their intersections by suitable clamping devices, d.

Within the tower a movable lamp-carriage, L, is arranged, together with suitable hoisting and guiding devices, as will be hereinafter explained, and the diagonals of the upper tower-section are omitted for the purpose of lessening the obstruction to the light from the lamps when raised.

A platform and rail, A"', may be applied to the tower-top, either for ornament or use, as shown.

A suitable platform and rail, A''', surrounds the tower near the bottom, or, say, twenty to thirty feet from the street, to the level of which the lamps are lowered, and from which they are dressed.

The supporting-post is preferably a single column, as shown, of extra heavy wrought-iron. It may advantageously consist of two sections, B and B', of which the lower, or B, is, say, sixteen feet in height, and, say, six or eight inches in diameter. The section B' may be of smaller size, and is rigidly coupled to the section B by any suitable form of coupling, B". From said coupling horizontal arms B³ project to the lower or terminal couplings, A⁵, on the uprights. The post is surmounted with a cap, B''', from which similar arms extend to the adjacent upright couplings A". These arms are not, however, relied on to sustain the weight of the tower. For this purpose diagonal suspension rods or ties B⁵ diverge from said cap B''' to the terminal castings A⁵, being right and left screw-threaded into clevises b b', pivoted to said connections, or otherwise constructed to give adjustment.

The tower may wholly hang by these suspension-rods, or struts B⁶ may diverge from the couplings B" to the next adjacent couplings, A", in aid of such suspension-rods; or the struts may be used by themselves; or suitable brackets may be placed beneath the horizontal arms B''' and secured to the post B beneath the trussed structure.

When the tower is supported by a post, as described, said post may be rigidly set at its foot, but, the guys being relied on to preserve its perpendicular position, I prefer to seat the same in a socket, whereby the post may preserve its axial relation to the tower whenever the latter sways from the vertical. This construction is shown in Fig. 6, wherein B' is a base forging or casting secured upon a suitable foundation, and provided with a cupped seat, b''', in which rests the foot B⁸ of the post B. Said foot may be a casting formed to set up into the tube B, and provided with an annular shoulder or flange, b''', upon which rests the tube.

To give greater security against the collapse of the tube B under all circumstances, it may, if desired, be filled with cement, as indicated at the broken portion in Fig. 3.

The lamp-carriage L consists of three uprights, L' L" L'', the first of which is intended to be supported in the axis of the tower and the others of which stand near two of the tower-uprights. These vertical portions of the lamp-carriage are joined at top and bottom by horizontal members L''' and L''', and the frame is strengthened by braces l, extending from the uprights L" to a higher point on the upright L'.

As a means of hoisting and lowering the lamp-carriage, an endless rope, L', is attached to the upper and lower ends of the central upright, L', and trained over a pulley, H. A weight, L⁸, connected in the hoisting-rope, as seen in Fig. 5, serves to counterbalance the weight of the lamps and their carriage. Said hoisting-rope extends to the vicinity of the platform A', and is there trained over a second pulley in a familiar manner.

In order to avoid weighting the tower unevenly or unnecessarily by the attachment thereto of stationary guide-bars for the lamp-carriage, I prefer to attach the guiding-bars L'''' to the uprights L" of the carriage, and to provide only guiding-lugs L⁶ at suitable intervals on the tower-uprights. Said guiding-bars consist of light flat iron strips supported by suitable arms, l', from the uprights L'', as seen in Figs. 4 and 5, and the guiding-lugs L⁶ are provided with recesses l'', Figs. 8 and 9, arranged in position to admit the bars L'''' as the carriage is raised or lowered. To provide for slight swaying and deflection of the tower these recesses in the guiding-lugs are made large enough to give free passage to the bars, and are spread at both their upper and lower ends, as shown in Fig. 9, to more readily admit said bars. The bars themselves may also be rounded off on their outer ends to better insure their ready admission to the recesses of the lugs L⁶. Said guiding-lugs should be located at such intervals that two of them on the same tower-upright will always be engaged with the contiguous bar L''''.

The lamps are arranged in a circular group about the carriage-upright L' by means of a central hub on said upright, provided with lateral arms which severally support the individual lamps in a familiar manner.

The hoisting-pulley H is mounted loosely on a horizontal shaft, the ends of which rest on the parallel bars F F, sustained, as here shown, at one end by short uprights F''' and at the other end by the uprights F'' and transverse bar F', through the medium of the couplings F'''. Being tubular, the bars F are capped at f to exclude water, and similar provision is made for the same purpose in the terminal couplings A" on the uprights.

As seen in Figs. 4 and 5, a second pulley, H', is provided on the same shaft with H, over which may be trained the counterbalanced

weight-cord of a hand passenger-elevator of a well-known description, running in the otherwise vacant angle of the tower, and operated by a rack fixed to the tower and cranked pin-
 5 ion on the cab. This cab, rack, and other attachments for this use are not shown.

The tower poised, as described, on its gravity-axis is desirably guyed in such manner as to prevent rotative movement thereof in case the
 10 tower is permitted to sway in some degree under wind-strain by expansion of the guys. For this purpose the guys should preferably be connected with the tower so as to draw in line with its axis. In the case of a triangular tower lo-
 15 cated at one corner of the streets intersecting at right angles, and having the guys stayed in the streets, as shown in Fig. 10, it will ordinarily be sufficient, to insure the desired result, to connect three of the guys directly with the
 20 three tower-uprights, as shown at 7, Fig. 10, and to connect the remaining or fourth guy to two adjacent tower-uprights by means of a yoke or links c' , which amounts practically to a bifurcation of the guy near its attachment to
 25 the tower. Such yokes or diverging links c' may be similarly employed to connect three of the four guys with the tower, so as to bring each of the guys directly in line with the gravity-axis of the tower, as plainly indicated
 30 at 2, Fig. 10.

It is a material advantage of the prismatic form of tower herein described that its corresponding members throughout may be made of the same dimensions, and therefore at mini-
 35 mum cost, while it may at any time be symmetrically heightened or lengthened, if desired, in the simplest manner possible, namely, by the addition of sections either to the top or bottom. Of course, if preferred, the tubes and
 40 connections in the lower part of the trussed structure may be of greater size than the upper ones; but generally this will not be necessary.

I claim as my invention--

45 1. As a means for lighting large areas, the combination of a lamp and a trussed skeleton tower of prismatic form for supporting the lamp, substantially as described.

2. A trussed skeleton tower of prismatic
 50 form, combined with guys for its lateral support, and with an interiorly-running elevator-carriage and suitable hoisting and guiding apparatus, substantially as described.

3. A tower for the support of electric lamps and similar purposes, consisting of a skeleton
 55 trussed structure supported clear of the ground by a central post, and laterally sustained by guys, substantially as described.

4. In a tower consisting of a trussed skeleton structure sustained clear of the ground by
 60 a central support, and laterally sustained by guys, said central support having rigid connection with the superposed structure, and having its foot flexibly seated on the foundation, substantially as described. 65

5. In combination, a hollow prismatic skeleton trussed tower, a central support up-
 holding said tower clear of the ground, guys for laterally sustaining the tower, and an interior elevator and hoisting apparatus, sub-
 70 stantially as described, and for the purposes set forth.

6. In a tower composed of a central base-support and a hollowed trussed skeleton structure supported thereby, suspending-rods B'''' ,
 75 connecting the top of the support with the bottom of the trussed structure, substantially as described.

7. In a tower composed of a central base-support and a hollow trussed structure sup-
 80 ported thereby, the combination, with said parts, of suspending-rods B'''' and horizontal arms B''' , whereby the base-support upholds and is rigidly joined to the superposed part of the tower, substantially as described. 85

8. In a tower having an interior elevator, said elevator provided with guiding-bars L'''' ,
 in combination with recessed guiding-lugs L^6 , attached to the tower, substantially as de-
 90 scribed.

9. In combination with a skeleton tower dependent upon guys for its lateral support, one or more of said guys connected with two adjacent tower-uprights by means of a yoke or links,
 95 c' , arranged to give draft upon said guy in the line of the tower-axis, 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,
 JESSE COX, Jr.