(No Model.) 2 Sheets—Sheet 1.

C. D. F. SMITH.

TOWER FOR ELECTRIC LIGHTS, &c.

No. 267,115. Patented Nov. 7, 1882.

Fig. 3.

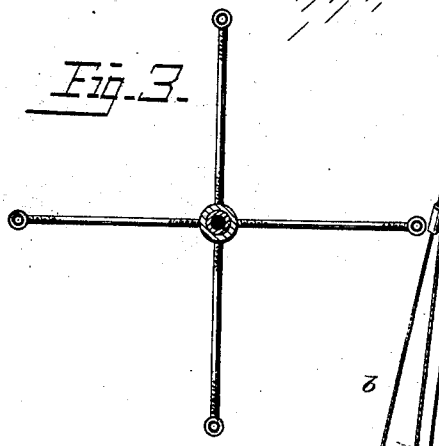


Fig. 4.

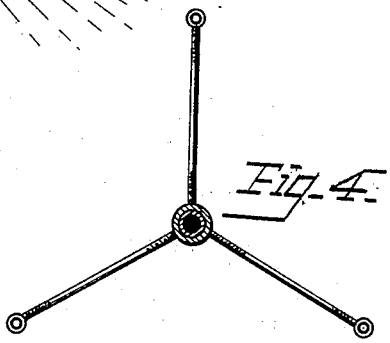
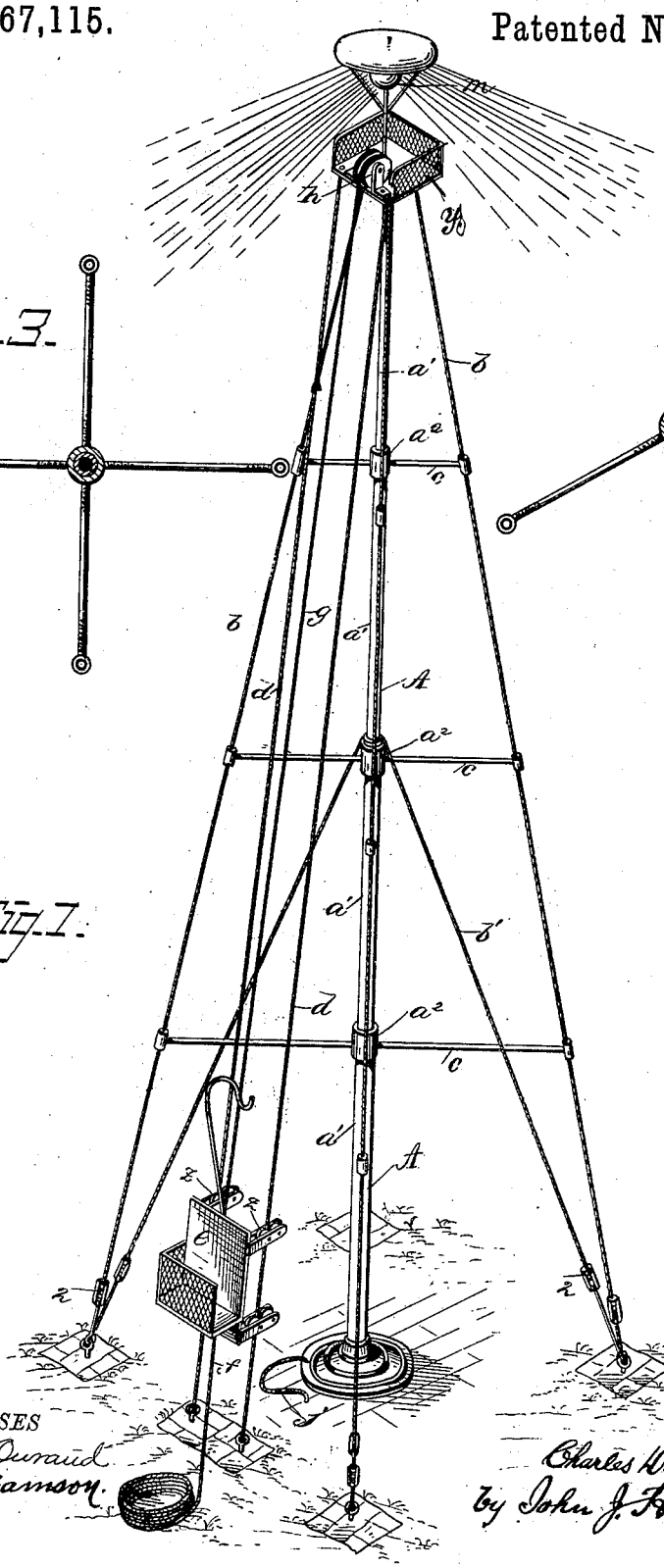


Fig. 1.



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C. D. F. SMITH.

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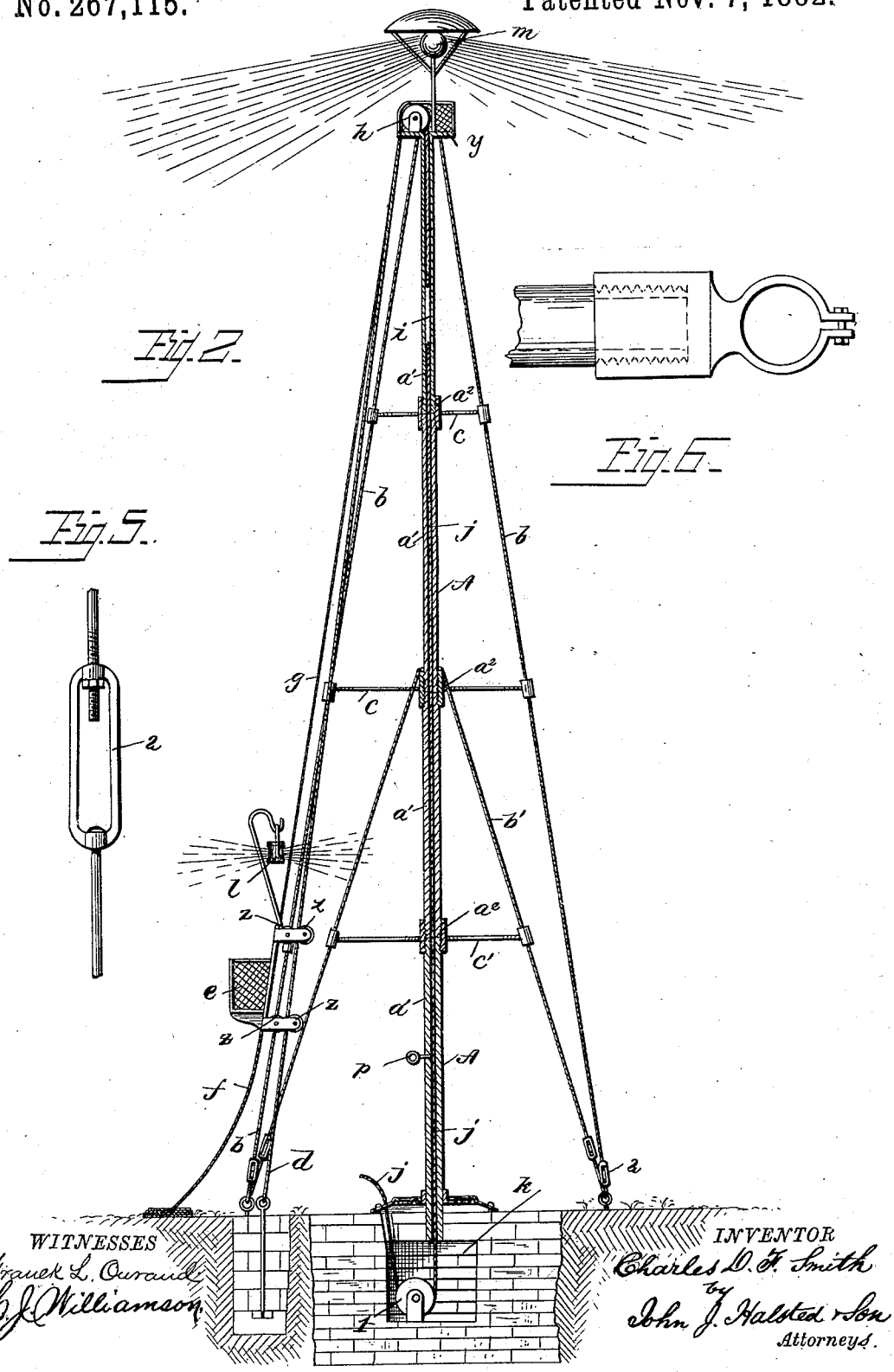

Fig. 2.

Fig. 6.

Fig. 5.

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UNITED STATES PATENT OFFICE.

CHARLES D. F. SMITH, OF AURORA, ILLINOIS.

TOWER FOR ELECTRIC LIGHTS, &c.

SPECIFICATION forming part of Letters Patent No. 267,115, dated November 7, 1882.

Application filed July 29, 1882. (No model.)

To all whom it may concern:

Be it known that I, CHARLES D. F. SMITH, of Aurora, in the county of Kane and State of Illinois, have invented certain new and useful Improvements in Towers for Electric Lights, &c.; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

My invention has reference to a mode of constructing in a cheap and yet secure manner a tower for supporting electric or other lights, signals, lookouts, &c., and also to a mode of raising and lowering persons to and from the top of such towers, and, if desired, raising the lights or signals and securing the same, when elevated, to the top thereof.

Figure 1 represents in perspective a tower showing my invention; Fig. 2, a vertical central section of the same; Figs. 3, 4, and 5, details, and Fig. 6 a detail showing one way of attaching a brace to a guy or stay.

Upon any suitable foundation, of a size sufficient for the weight to be sustained by it, and of a nature that will not be affected by frost, I erect a perpendicular tubular column, A, preferably composed of gas-pipe, of a diameter and thickness proportioned to the height required, and I connect the several lengths or sections a' of this pipe together by means of couplings, fittings, &c., a^2, in the usual manner of pipe-connections. This tube A forms the center of my tower, and this central tube may be composed of pipes all of which have the same diameter; but it is better that the lowermost one should have the greatest diameter and strength, and that the several sections should gradually diminish in diameter as they approach the top. This central tube forms the support for the lights and signals, and for the apparatus for working the same, and for other purposes, hereinafter mentioned; and when kept in its vertical position throughout its entire length, in the manner presently to be described, this single central tube will be found amply sufficient for such support. It is kept vertical by means of a system or combination of shrouds, stays, or guys, *b b'*, &c., and ties or braces *c c'*, &c. Three or more main stays or guys, *b*, are securely fastened, either to the top of the central tubular column or to a plate or bed secured to such top, and three or more shorter guys, *b'*, are fastened to the column at such other points below the top and above the ground as may be necessary to give stability to the structure and keep it vertical, and these guys or stays extend obliquely downward to the ground, and are there securely fastened or anchored at suitable distances from the central tube.

Some of the shorter or auxiliary stays, *b'*, may, if preferred, be fastened at their lower ends to the outer ends of the ties or braces, and I preferably make all the stays *b b'*, &c., of wire cable, to insure the requisite strength and durability, and each of them I provide with a turn-buckle or stretcher, 2, to permit them to be drawn taut, and kept so, thus securing the central tube in a perpendicular position.

In order still further to strengthen the central tube and prevent its being deflected from a vertical position, I fasten to it and to the stays or guys, at proper intervals of space, three or more rigid horizontal braces or ties, *c c'*, &c., preferably made of gas-pipe, and provided at their two ends with respectively a right-hand and a left-hand screw-thread, and one end of each of these ties is screwed into one of the couplings or fittings *x* on the central column, or otherwise firmly attached to the central column or tube, and its other end into a fitting fastened to the stays or guys, and they thus afford a means for perfectly bracing the central tube and strengthening it. A set of three or more of these rigid braces or ties may be attached, as described, so that each set may be, say, sixteen feet above the other, or at such distance, according to the height of the central tube or column, A, as may be necessary to give the column the requisite rigidity of position. In connection with this central tube, and as a permanent part of the construction, I secure to its top, or to its top plate or bed, *y*, two parallel cords, *d d*, preferably wire cable—say four feet apart from each other. These extend obliquely to the ground, and are firmly

anchored therein some distance from the column A, as shown. They must be parallel with each other for their entire length, and each may be provided with a turn-buckle or stretcher similar to those shown at 2, by means of which they can be made taut and kept so. These cords or cables form a track, upon which a carriage or car, *e*, can be run from the ground to the top of the tube or tower, and vice versa. This car has a double set of grooved wheels, *z*, one set running on the top or outside of the wire tracks and the other set upon the bottom or inside, and the grooves of these wheels so nearly encircle each wire of the track that the car cannot get off or "fly the track." The platform of this car should be level or horizontal, and the car is provided with a suitable railing to make it quite safe for a person to ascend and descend in it. The means for operating this car are preferably as follows:

Attached to the upper or forward end of the car is a cable, *g*, which extends upward to and over a grooved guide-wheel, *h*, on the top of the tower, thence to the open end of the tubular column, thence downward within this tube, and a counterbalance-weight, *i*, also within this central tube, is fastened to the end of this cable. The office and duty of this weight *i* are to counterbalance, as nearly as may be, the weight of the car with a man upon it, and also such articles as it may be desirable at times to carry up and down—such as signals, lights, &c., or material for repairs when needed.

To the rear or lower end of the car is attached a cable or rope, *f*, by which the car can be pulled downward from the top of the central columnar tube to the ground, either by hand or by a windlass. Another rope or cable, *j*, is attached to the lower end of the weight *i*, within the column A, and it extends downward to the lower end of such column, and thence under a grooved guide-wheel, 1, and thence to any convenient point where it may be used by hand or in connection with a windlass. Thus, by means of the two cables attached to the car, the one at its top and the other at its bottom, a man standing on the ground may work the car and its load up and down at will.

If desired, the car may be provided with a drum, suitable gears, and with a crank, and, a cable being fastened at the ground and wound around this drum and fastened at its other end at the top of the central tube, will afford a means whereby a man can ascend and descend with the car without assistance, at pleasure. A car thus arranged should be provided with a ratchet and pawl, so that it may be securely held at any point desired, whether going up or down.

If it be desired to raise and lower the light or signal for the purpose of cleaning and trimming, the car may be modified to suit the light only, and, to prevent either the car or the light being tampered with, the counter-balance may be fastened with a pin, as shown at *p*, and locked; or the car itself may be locked, if desired.

The pulley or wheel 1 is placed in a chamber, *k*, at the base of the tubular column, in any convenient manner or position, and its cord or cable *j* may then pass upward, as shown, to be within reach of an attendant.

In Fig. 2, *l* represents any light or signal which may be attached to the carriage.

In Figs. 1 and 2, *m* represents a light or signal attached to the tower, and not to the carriage.

From the above description it will readily be seen that the structure is cheap, simple, and capable of being reared to almost any desired height by adding tube upon tube to constitute the central and only column, and that its strength and steadiness may, by means of the diverging cables or guys *b b'*, the braces *c c'*, &c., and their tightening devices, be adjusted and controlled as required; that but little resistance is offered to the wind and storms; that all ladders, horizontal pins, or stepping devices for climbing are dispensed with; that the facility and safety of ascending and descending are such that there is no actual need of lowering and raising the lights or signals for renewing carbons or for cleaning, repairs, &c., though this may be done by means of the car, if desired; that the parallel inclined car-track not only does not interfere with any of the other parts of the construction, but that its inclined position, as well as the manner in which the car is attached to it, afford a degree of resistance against a too sudden descent in case of accident, which would not exist if this track were perpendicular; its inclined position also practically furnishes two more stays or guys for the central tube or column; and that the carriage is about or nearly in equipoise when the man and its load are upon it, while the counterpoise-weight and much of its cord or cable, as well as the cord or cable *j* beneath this weight, are for a great portion of the time protected within the tube.

These towers may be made three or four hundred feet in height, if desired, and are admirably adapted for lighting cities.

What I claim as new, and desire to secure as improvements in towers for electric or other lights, signals, &c., is as follows:

1. In combination with a tower adapted for elevated electric lights, &c., the parallel cable-tracks *d d*, secured at the base or ground, and also at the top of the tower, and forming a continuous straight track inclining toward the top of the tower, and a wheeled passenger-car adapted to run upon and hold to such tracks, substantially as shown and described.

2. In combination with the tubular tower, the inclined cable-tracks *d d*, and the car arranged to be run up and down thereon, the cord or cable *g* and the counterpoise *i*, placed within the tubular column and adapted to rise and fall therein.

3. In combination, the central tubular col-

umn, the inclined cable-tracks *d d*, the car *e*, cord or cable *g*, counterpoise *i*, cord or cable *j*, and pulley 1, substantially as and for the purposes set forth.

4. In combination, the tubular central column, the guys or stays *b b'*, and the horizontal braces or ties made and applied to the column and to the guys or stays, and adapted for adjustment, as set forth.

CHARLES D. F. SMITH.

Witnesses:
F. L. BARTLETT,
L. A. CONSTANTINE.