(No Model.)

# F. R. UPTON.

## LIGHTNING CONDUCTOR.

No. 315,679. Patented Apr. 14, 1885.

Fig. 1.

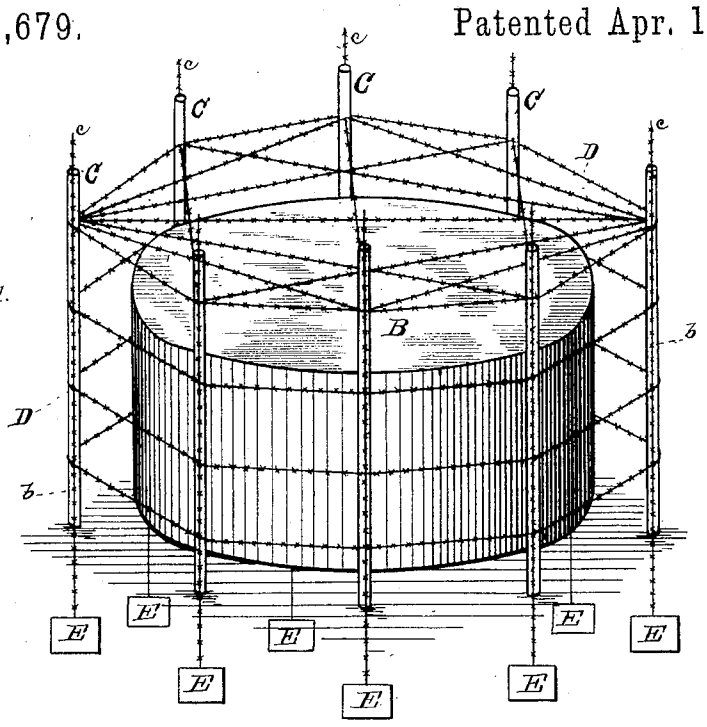



Fig. 2.

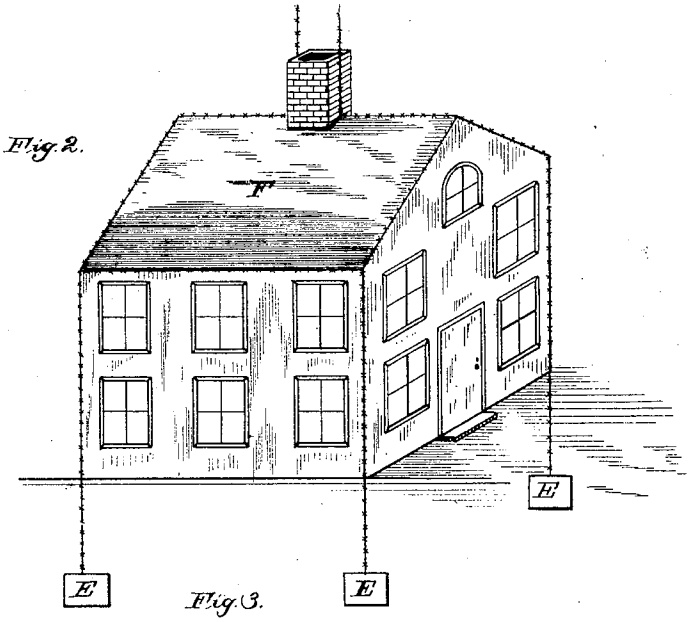



Fig. 3.

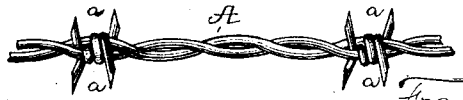
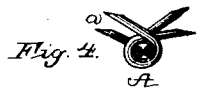



Fig. 4.




ATTEST:

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# UNITED STATES PATENT OFFICE.

FRANCIS R. UPTON, OF ORANGE, NEW JERSEY.

## LIGHTNING-CONDUCTOR.

SPECIFICATION forming part of Letters Patent No. 315,679, dated April 14, 1885.

Application filed June 25, 1883. (No model.)

*To all whom it may concern:*

Be it known that I, FRANCIS R. UPTON, of Orange, in the county of Essex and State of New Jersey, have invented a certain new and useful Improvement in Lightning-Conductors, of which the following is a specification.

My invention relates, generally, to the protection from lightning of structures of all characters, and more particularly to the protection of oil-tanks and other metallic structures.

The invention consists, first, in a barb-wire conductor of peculiar construction—that is to say, a barb-wire having the barbs projecting therefrom all on one side of a plane through the axis of the wire—this construction of lightning-conductor presenting all the barbs outwardly, and being more efficient in use, and also permitting of the convenient attachment of the conductor directly to a suitable support—such as a pole or a building or structure of any character; second, in the protection of an oil-tank or other metallic structure by surrounding it with a netting of barb-wire of any desired construction, the netting of barb-wire and the oil-tank or other metallic structure being grounded or provided with special earth-connections by which both the tank and the surrounding netting will be discharged.

While the peculiar construction of barb-wire lightning-conductor claimed hereinafter is preferred in carrying out the second feature of my invention, it is to be understood that I do not wish to be limited thereto, since barb-wire with barbs projecting on all sides may be employed.

In the accompanying drawings, forming a part hereof, Figure 1 is a view of an oil-tank protected by my lightning-conductor; Fig. 2, a view of a house similarly protected; Fig. 3, a plan view of a section of the barbed wire, and Fig. 4, a sectional view of the same.

My lightning-conductor is a wire, A, composed of one or more strands provided at short intervals with barbs *a*, projecting all on one side of a plane through the axis of the wire. This barbed wire may be of any of the constructions used for fences, or of any other suitable construction, and may be a single strand of wire with barbs attached thereto and projecting therefrom, as above, or it may be composed of two or more strands of wire twisted together and provided with barbs secured in the manner well understood in the manufacture of such material for fences. When the barbed-wire conductor is placed upon or around a structure of any kind and is well grounded, the numerous barbs serve to discharge the atmosphere surrounding the structure and reduce largely the difference of potential existing at that point, and hence decrease the tendency of the clouds to discharge through the structure to the earth. The barbed-wire conductor does not, like the ordinary lightning-conductor, discharge the atmosphere at its extremity only, but it does this efficiently throughout its length, each barb acting as a collector for this purpose. It also forms an exceedingly cheap lightning-conductor.

In the manufacture of barbed wire for lightning-conductors I prefer to turn the barbs so that they all project radially on one side of a plane passing through the axis of the wire, as shown in Fig. 4. By means of this construction all the barbs are made to project outwardly from the wire, which is a more efficient construction than one having the barbs projecting radially in all directions, and the wire can be conveniently laid directly upon and secured to a structure.

While I prefer, in carrying out the second feature of my invention, to use a barbed wire with the barbs projecting all outwardly, it will be understood that said second feature of my invention also contemplates the use of barbed wire with the barbs projecting radially in all directions therefrom.

To secure a better conducting-connection between the barbs and the strand or strands composing the wire, the barbs may be soldered thereto; but I do not consider this an essential feature of construction.

In Fig. 1, B is an oil-tank. This is surrounded by poles C, rising above the tank, which poles may be of wood or metal. The poles support a net-work, D, of barbed wire, extending over the tank, and also preferably around the sides of the same. All the wires are connected by soldering or binding with barbed wires *b*, extending to earth-plates E. If the poles are of metal, the earth-connection

may be through the poles alone; but it is desirable, even with metallic poles, to use other earth-connections.

Barbed wires may, if desired, be run up the poles and allowed to project above the same, as shown by *c*.

The oil-tank itself, or any other metallic structure that it is desired to protect, should have its joints all well formed, and preferably soldered, and the whole should be well grounded by connection with earth-plates E, as shown, so that no metallic portion of the structure will be disconnected from the ground. A circular conductor, connecting beneath the surface of the ground all the earth-plates of the wire-netting, may be used, if desired.

In Fig. 2, F is a house or other similar structure. The barbed wire is preferably laid along the projecting angles of the structure, as shown, and may be provided with upwardly-projecting ends.

The several vertical and horizontal parts of the wire are all secured together by soldering or binding, forming a net-work of barbed wire for discharging the surrounding atmosphere.

The vertical parts of the wire have good earth-connections.

What I claim is—

1. A lightning-conductor composed of barbed wire, with the barbs projecting all on one side of a plane through the axis of the wire, substantially as set forth.

2. The combination, with a building or support, of a lightning-conductor placed along or upon such building or support, and composed of barbed wire, with the barbs projecting all on one side of a plane through the axis of the wire, substantially as set forth.

3. The combination, with an oil-tank or similar metallic structure provided with earth-connections, of a surrounding metallic netting composed of barbed wire, and also grounded, substantially as set forth.

This specification signed and witnessed this 23d day of June, A. D. 1883.

FRANCIS R. UPTON.

Witnesses:
H. W. SEELY,
EDWARD H. PYATT.