No. 43,565. PATENTED JULY 19, 1864.

N. BRITTAN.

LIGHTNING CONDUCTOR.

2 SHEETS—SHEET 1.

Fig:1.

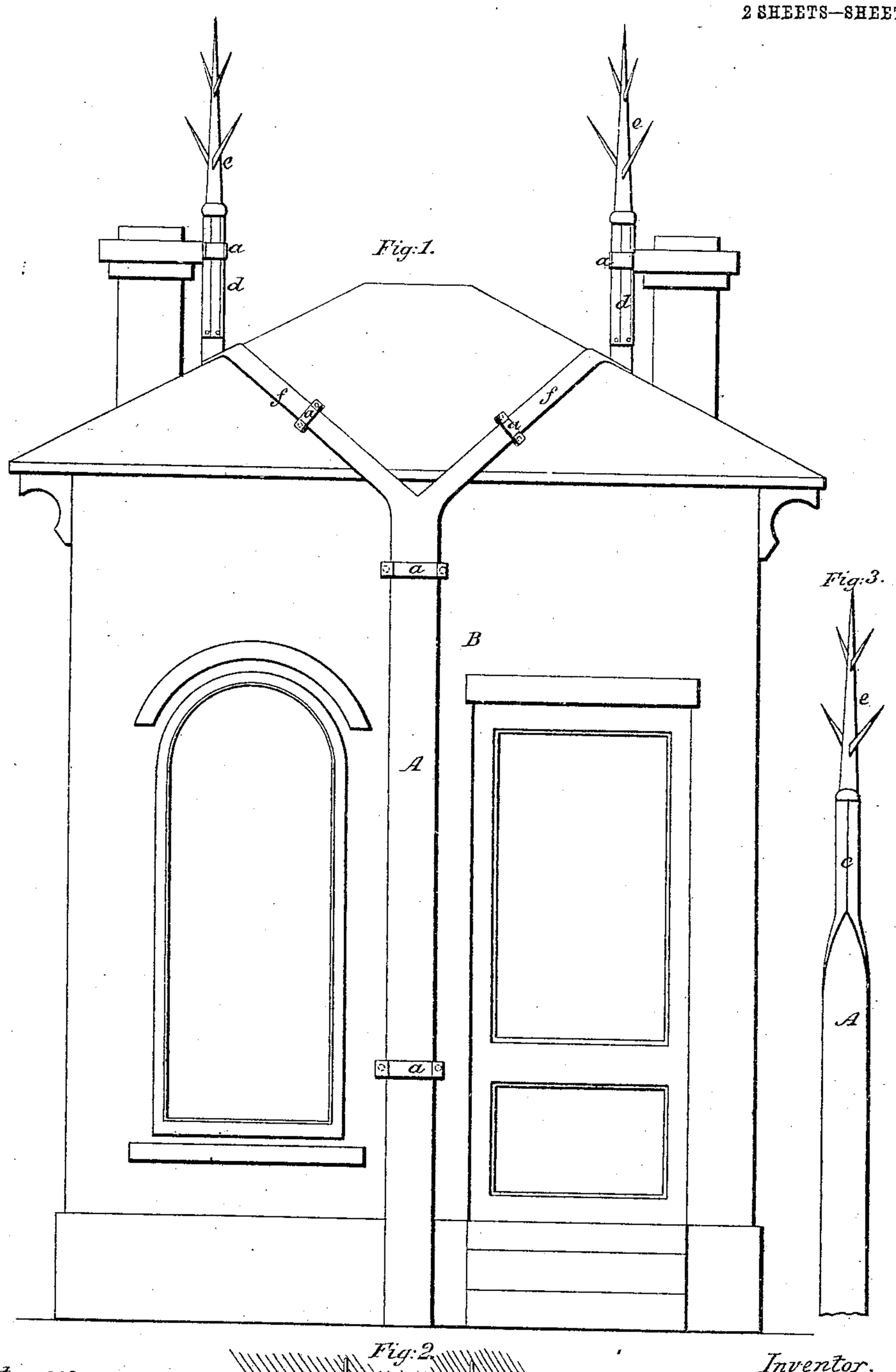
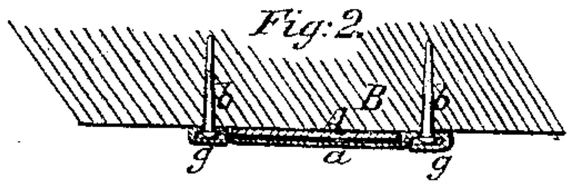


Fig:3.

Fig:2.



Witnesses:

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Henry Morris.

Inventor.

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2 SHEETS—SHEET 2.

Fig: 4.

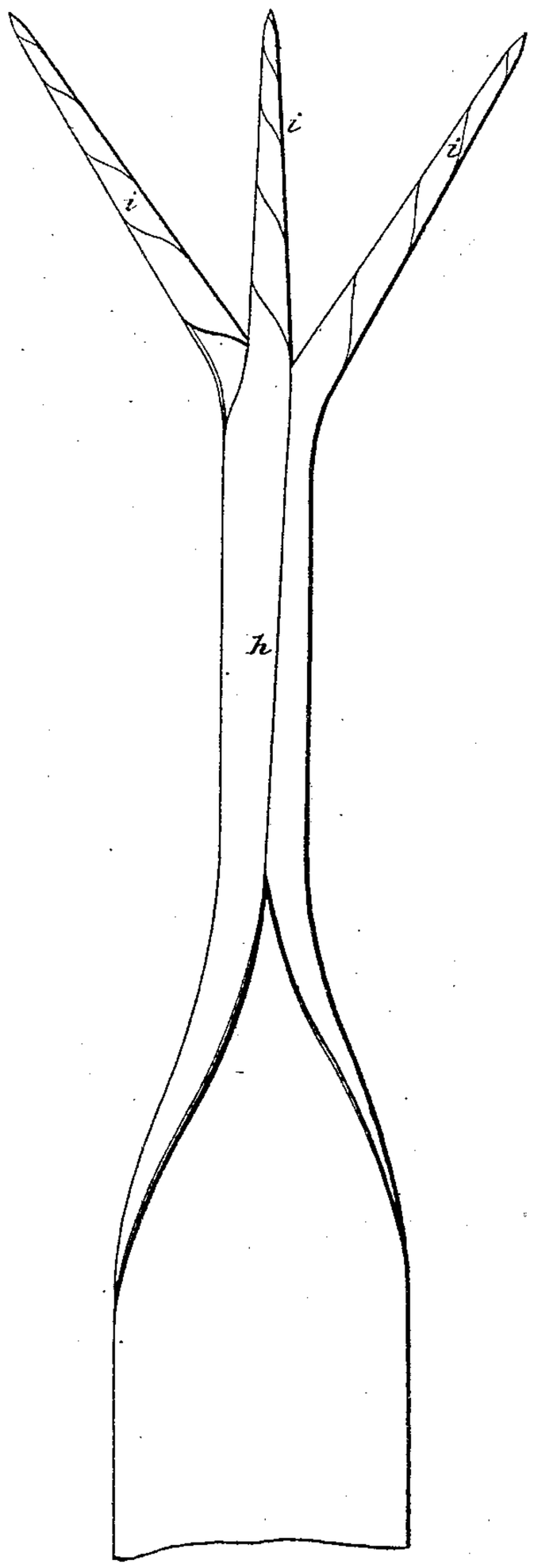

Fig: 5.

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UNITED STATES PATENT OFFICE.

N. BRITTAN, OF CHICAGO, ILLINOIS.

IMPROVEMENT IN LIGHTNING-CONDUCTORS.

Specification forming part of Letters Patent No. **43,565**, dated July 19, 1864.

To all whom it may concern:

Be it known that I, N. BRITTAN, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Lightning-Conductors; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is an elevation of a building with my improved lightning-conductor attached, the conductor being shown on a larger scale than the building. Fig. 2 is a transverse or horizontal section of the conductor, showing the mode of its attachment to the building. Figs. 3 and 4 represent elevations of the upper portion of a conductor, showing other modes of forming the tip or point. Fig. 5 is a side or edge view of a portion of a conductor, showing the mode of providing for its contraction.

Similar letters of reference indicate corresponding parts in the several figures.

This invention consists in a novel mode of forming the tip or joint of a conductor composed of a continuous strip of copper, as hereinafter described.

To enable others skilled in the art to make and use my invention, I will proceed to describe it with reference to the drawings.

A is the conductor, consisting of a flat strip of pure cold-rolled Lake Superior copper. This is made of a length sufficient to reach from the ground to the top of the building without any joint, and, owing to its flexibility, can be rolled up closely into a very small compass, so as to be convenient for transportation. The lower end is inserted into the ground to a suitable d h, or into a drain, well, or spring, and the st. p is laid close against every part of the building B over which it passes, and secured thereto at suitable distances by the flat copper strips *a a*, which are placed across it and nailed to the building, as shown at *b b* in Fig. 3, at the sides of the conductor. The ends of the strips are then turned back over the heads of the nails *b b*, as shown at *g g* in Fig. 2, to present a neat appearance.

The upper end of the conductor, which stands up above the building, may be rolled up into tubular form, as shown at *c* in Fig. 3, or have pieces of copper tubing riveted or otherwise attached, as shown at *d d* in Fig. 1, and the tubes *c* or *d* be fitted with solid metal tips *e e;* but I prefer the construction shown in Fig. 4, by which the tip or tips are made from the strip A itself. This mode of forming the tip or tips consists in reducing the upper end of the strip in taper form to a point, or in cutting it to produce two or more taper points or forks, rolling up the portion below the said taper portion or portions into the form of a tube, as shown at *h*, and coiling up the tapered portion or portions, as shown at *i i*, in spiral form to a point or points.

The seam on the tubular portion *h* should be brazed or soldered to give it stiffness, and the coiled portions *i i* may be also brazed or soldered for the same purpose.

The upper part of the strip may, if desired, be divided to form two or more separate branches, *f f*, as shown in Fig. 1, and each branch provided or constructed with one or more tips, *e;* or the strip may be made without branches and with a single tip, as shown in Fig. 2. To provide for the contraction of the flat strip at low temperatures without injury it may be corrugated at one or more points, as shown at *j j*, Fig. 5. The corrugations *j j* will open as the conductor contracts longitudinally, and close as it expands.

The advantages of copper as a conductor of electricity are too well known to require any remark here. By making it in the form of a broad flat strip it is caused to present a large conducting-surface; and by making it without a joint and perfectly continuous it is made to have a great advantage over other so-called continuous copper conductors. It is also generally allowed that a copper conductor is better not insulated from the building or structure it is to protect.

The attachment of the conductor in close contact with the structure throughout its whole length protects the structure from an ascending as well as from a descending stroke, and the transverse strips *a a* form the most effective mode of attachment for such conductor, as they do not impair the strength of the conductor nor interfere with its continuity, like nailing a strip to the building by driving nails

through the strip itself. They permit the contraction of the strip in cold weather without drawing upon the fastening, and they can be easily withdrawn to permit the removal of the conductor for painting or repairing the building, or to allow the conductor to be taken down altogether and put upon another structure, if desired.

A copper conductor of the above-specified form, attached to a structure, as herein described, costs but little, if any more, than an iron conductor attached by the usual methods.

I am aware that lightning-conductors have before been made of continuous flat strips of copper. This, therefore, I do not claim; but

What I claim as my invention, and desire to secure by Letters Patent, is—

A series of points or tips, *i i i*, formed of spiral coils, when the same are combined in one piece with a tubular portion, *h*, and a continuous flat strip, *f* A, all as herein described, and for the purposes specified.

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Witnesses:

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