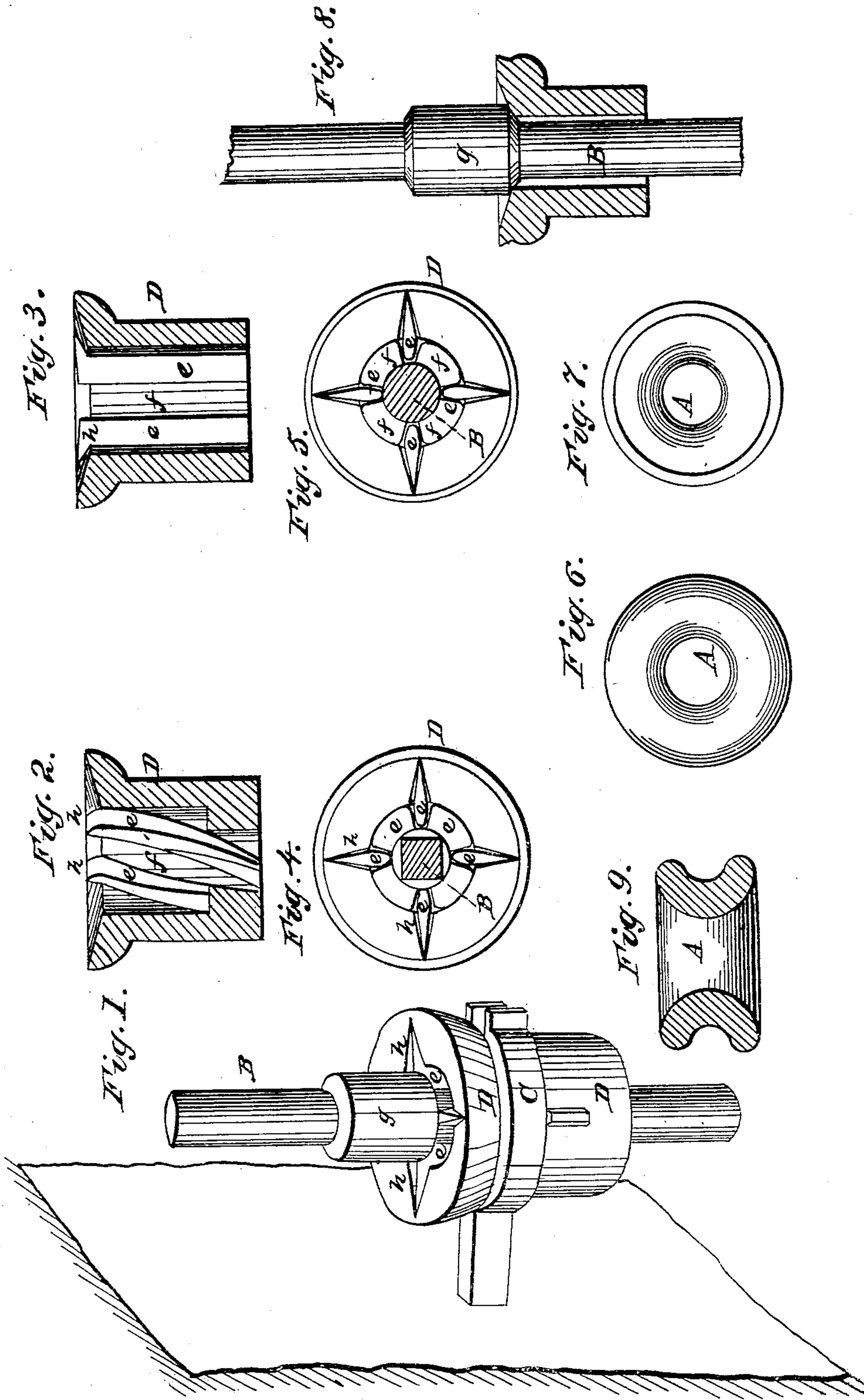


R. HICKOK.
Lightning-Rod Insulator.

No. 23,373.

Patented March 29, 1859.



UNITED STATES PATENT OFFICE.

RUSSEL HICKOK, OF FORT EDWARD, NEW YORK.

IMPROVED INSULATOR FOR LIGHTNING-RODS.

Specification forming part of Letters Patent No. **23,373**, dated March 29, 1859.

To all whom it may concern:

Be it known that I, RUSSEL HICKOK, of Fort Edward, in the county of Washington and State of New York, have invented certain new and useful Improvements in Insulating Lightning-Rods; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the annexed drawings, making a part of this specification, in which—

Figure 1 is a perspective view of my improved insulator, holding a part of a lightning-rod; Figs. 2 and 3, sectional elevations, and Figs. 4 and 5 plans, of two varieties of my improved insulators; and Figs. 6 and 7 plans, and Figs. 8 and 9 sectional elevations, of insulators which have been heretofore used or proposed, and upon which mine is an improvement.

The same letters refer to like parts in all the figures.

The insulator which is represented by Figs. 7 and 8, has been in very common and general use for many years, and consists of a single piece of glass or other suitable insulating material, with a central cylindrical opening, A, through which the lightning-rod B is inserted; and the one shown by Figs. 6 and 9 is a solid insulating-ring which has its interior surface convex next to the rod. Those insulators are attached to buildings by means of metallic clasps C, Fig. 1, or other suitable holders; but when either of those insulators is employed to hold the rod—if the insulator fits close to or holds the rod sufficiently steady, then, in that case, the thin space between the rod and insulator soon becomes filled with dusty matters in dry weather; and the rain which runs down on the rod in a thunder-storm fills in between the rod and insulator, and runs over outside so as to materially lessen or perhaps destroy the insulation of the rod, so that when the rod is struck by lightning a part or the whole of the discharge will be induced to leave the rod and enter the building at the insulator; or, so that the lightning will burst the insulator by suddenly expanding or repelling the water which fills the space between the insulator and the rod. Or, if the insulator fits so loosely around the rod that the space between will always remain open, so as to allow all the water which runs down on the rod to pass through the insulator freely, then, in such case, the rod will be

shaken about by the wind so as to greatly annoy persons dwelling in the house to which the rod is attached, and so as to sometimes break the insulators, or often loosen them in their holders, or otherwise lessen or destroy the stability of the rod.

Now, my invention consists in attaching lightning-rods to buildings through the intervention of peculiar insulators, D, each of which consists of a single piece of glass or other suitable insulating material which surrounds the rod B, and which has alternate ribs or projections, *e*, and grooves or spaces *f*, so arranged around its interior surface that while the ribs or projections hold the rod so closely as to prevent disagreeable or injurious shaking of the rod, there is also at the same time abundant room in the grooves or spaces *f*, between the ribs or projections *e*, for the water which runs down on the rod to pass freely through the insulator, and for the suddenly expanded or repelled air and water to escape from between the rod and insulator whenever a shaft of lightning descends the rod.

The exterior surface of the improved insulators D, which I employ, may be of the form shown in Fig. 1, or of any other desirable shape, and the insulators may be attached to buildings by means of the iron clasps C, or any other suitable holders. The number and form of the internal ribs or projections, *e*, may vary; but four is a good number.

When the insulator is to hold a round rod, its ribs or projections, *e*, may well be straight from end to end of the insulator, as represented in Figs. 3 and 5; but when the insulator is to hold a square or angular rod, I cast or make the insulator with the ribs *e* curved, as shown by Figs. 2 and 4, or with the ribs or projections so formed and arranged that only the angles of the rod can touch them, and consequently so that the square or angular rod can be freely turned around within the insulator without catching against the ribs or projections *e*, and so that an angular rod will not shake within the insulator any more in one position or place than in another. The insulators with curved ribs, Figs. 2 and 4, will, of course, hold round rods as accurately and well as they will angular ones.

Lightning-rods are now generally manufactured and transported in pieces of eight or ten

feet, more or less, in length, which are connected together generally by screw-couplings *g*, while putting up the rod; and it is often desirable, especially in putting up such a rod on the side of a high building, tower, or steeple, to have some of the couplings rest upon the tops of the insulators, so that the insulators will thereby sustain the whole or a part of the weight of the rod; but, whenever a coupling, *g*, rests upon the top of such insulators as are represented by Figs. 6, 7, 8, and 9, the coupling closes the passage, as shown in Fig. 8, which water on the rod might otherwise have through the insulator, and also prevents the escape at the top of the insulator of the air which is suddenly expanded within the insulator whenever a thunderbolt descends the rod. I therefore generally cast or make the improved insulator *D*, which I use, with projections *h* upon its upper end around the central opening for the rod, so that the coupling *g* shall rest only upon those projections, as represented in Fig. 1, leaving spaces between the projections *h* for the water which runs down

on the rod to pass through into the insulator, and for suddenly expanded air and water to escape out under the coupling between those projections.

The manner of casting or molding the improved insulator *D* in one piece of glass or other suitable insulating material upon a core and within molds does not require a detailed description, for it will be obvious to all who are skilled in making analogous articles.

Having thus described the construction of my improved insulator for lightning-rods, what I claim as new, and desire to secure by Letters Patent, is—

A lightning-rod insulator made in one piece, so as to support and insulate the rod, and also leave open spaces for water to pass through it, and for air, when suddenly expanded, to escape from within it, as herein set forth.

RUSSEL HICKOK.

Witnesses:

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