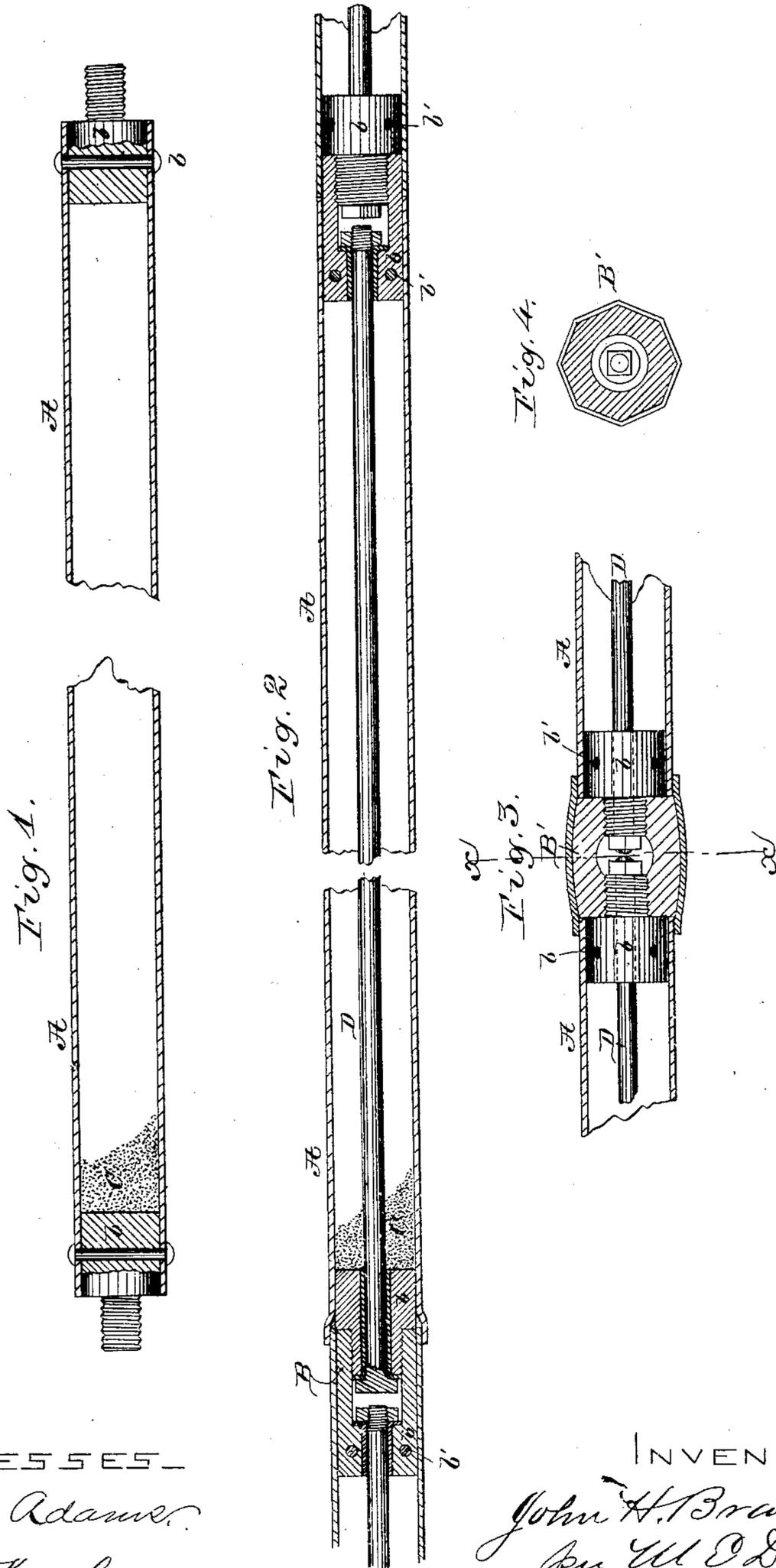


(No Model.)

J. H. BRANDON.
LIGHTNING ROD.

No. 270,379.

Patented Jan. 9, 1883.



WITNESSES
J. W. Adams.
J. H. Kasehagen.

INVENTOR
John H. Brandon
per W. E. Dayton
Attorney

UNITED STATES PATENT OFFICE.

JOHN H. BRANDON, OF CHICAGO, ILLINOIS.

LIGHTNING-ROD.

SPECIFICATION forming part of Letters Patent No. 270,379, dated January 9, 1883.

Application filed May 26, 1882. (No model.)

To all whom it may concern:

Be it known that I, JOHN H. BRANDON, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Lightning-Rods; 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 thereon, which form a part of this specification.

This invention relates to copper lightning-rods, and has special reference to that class of such rods in which copper is used in a thin sheet in order to give a maximum surface. Copper in this form has been used heretofore, more commonly as a sheath or covering for an interior iron body or core of such size as to fill the sheath, but has sometimes been used by itself, either in the form of a simple cylindrical tube or of a tube or sheet compressed to give longitudinal flanges, either straight or spiral.

In the use of an iron rod or core immediately covered with sheet-copper the core adds great weight and expense to the rod without increasing its efficiency. It is, moreover, found that by galvanic or other action both the copper and the iron are injured from contact or electric connection, the former being rendered brittle and the latter soon corroding or disintegrating so as to be greatly impaired in strength. In the use of the copper tubular rod without a core the rod lacks rigidity, and is liable to be collapsed and broken in handling.

It is the object of this invention to provide a construction in a strictly copper rod, or in a rod in which the copper in sheet form is relied on as the conductor, whereby desirable strength and rigidity may be secured, and the copper may be held in the tubular form originally given it. It also has for its object to provide suitable means for connecting tubular sheet-copper rods, so as to give necessary strength and continuity of the conducting-surfaces.

In the accompanying drawings, Figure 1 is a longitudinal section of a lightning-rod embodying my improvements. Fig. 2 is a longitudinal section of a modification of the same. Fig. 3 is a view in axial section of one form of coupling or burr by which the rod-sections are

joined, and Fig. 4 is a cross-section of the same on the line *x x* of Fig. 3.

In the drawings, A represents a section or length of a cylindrical tubular copper lightning-rod, and B a coupling connecting adjacent sections. For the purpose of holding the tube in its original form and of imparting thereto such rigidity as will insure it against collapsing, it is filled with resin or other similar or suitable substance, C, which, while giving the stiffness required, allows it to be readily curved or bent to such shape as may be desired when fitting it to a building. The coupling B consists of plugs *b* which will generally be of inferior metal, secured within the ends of the tubes by rivets *b'*, or other suitable means, said plugs being fitted to join by nipple-and-socket construction; or, if both adjacent plugs be provided with nipples, a right-and-left-threaded coupling-nut, *B'*, may be used to join them, as shown in Fig. 3.

Fig. 2 shows a modification of my invention in which a relatively-small central metal core, D, is inserted within each length of copper rod and surrounded by a filling, C. Said core or rod D is also shown secured to the plugs *b* at opposite ends thereof. By such connection the rod D serves to tie the couplings of the same length of rod together, and to give greater tensile strength to a number of sections joined together, the copper shells and the rivets by which the couplings are secured thereto thus being relieved of the weight of the sections of rod below. As the resin or other filling C serves the purpose of stiffening the rod, the interior metal core will usually be required to resist only a tensile strain, and so may be very light and inexpensive; but it may be relied on to co-operate with the surrounding filling to give rigidity to the rod as a whole, and may therefore be of any size admitting the filling C between the same and the outer shell. When such central rod is used the filling C should be practically a non-conductor, and the tie-rod is also preferably insulated from the coupling-plugs, or the latter are insulated from the shell by any suitable means. By such insulation of the tie-rod or core D it is preserved from all effects of contact or connection with the copper and retains its original strength. The metal core D is shown as

being secured to the coupling-plugs *b b* by a head at one end and a nut at the other, which permits due tension to be given to said rod after the plugs *b* are inserted in the ends of the copper tube. When the plugs *b* of adjacent lengths of rod directly join by being made one with a threaded nipple and the other with a correspondingly-threaded socket, care should be taken to provide that the copper tubes should intimately join one with the other, and to this end one may preferably extend beyond the shoulder of the plug, and may either meet or overlie the contiguous tube, as shown in Fig. 2, a close union being more readily made between said tubes if their junction is not coincident with that of the plugs. If the plugs be both provided with nipples and joined by a coupling-nut, *B'*, the latter is preferably covered with a copper sheath, *C'*, which may similarly overlap the adjacent tubes, as shown in Fig. 3. By means of a nut thus covered with copper continuity is given to the conducting-surface throughout the length of the rod when several lengths or sections are joined. This is not essential to my invention as embodied in other features of construction, as a coupling-nut of inferior metal may be used without a copper covering, through which alone or through which and the plugs *b*—in this case uninsulated from the copper—the current may find continuous passage throughout the length of the coupled rod.

If desired, the metal cores *D* may be threaded at their ends and serve as nipples for a coupling-nut; but in this case said nut should have its surface in electric connection with the adjacent copper tubes, and should be cut off from such connection with the core-rods *D*. By the sectional figure 4 the central part of the nut *B'* is shown of angular form, to facilitate the use of a wrench therewith.

So far as the structural features of my invention are concerned, it is immaterial whether the conducting substance be of copper or of

other material, and as I know of no non-metallic substance which can be practically used as a filling for the conducting-tube from which injury can result to the copper, the word "non-metallic" will serve as a compact expression for the substances meant to be embraced in the claim for such filling.

I claim as my invention—

1. A section of lightning-rod consisting of an exterior shell of high conductivity provided with a non-metallic filling and terminal couplings, substantially as described, and for the purposes set forth.

2. A section of lightning-rod consisting of an exterior shell of high conductivity, and a central metal rod materially smaller than the shell interior and insulated therefrom, substantially as described.

3. In a section of lightning-rod, the combination, with an outer conducting-shell, of an insulated central metal core and coupling-plugs at the opposite ends of the rod-section joined by said metal core, substantially as described.

4. In a section of lightning-rod, the combination of an outer conducting-shell, an inner non-conducting filling, coupling-plugs at the opposite ends of the rod-section, and a central metal tie-rod provided with a head at one end and a nut at the other and passed through the plugs, substantially as described.

5. In combination with the copper tubes of a lightning-rod, a coupling-nut provided with an outer covering of copper, arranged to have intimate contact with the adjacent tubes for the purpose of giving continuity of conducting-surface, substantially as described.

In testimony that I claim the foregoing as my invention I affix my signature in presence of two witnesses.

JOHN H. BRANDON.

Witnesses:

M. E. DAYTON,
W. C. ADAMS.