

M. G. MITCHELL.  
LIGHTNING CONDUCTOR.  
APPLICATION FILED SEPT. 9, 1911.

1,129,358.

Patented Feb. 23, 1915.

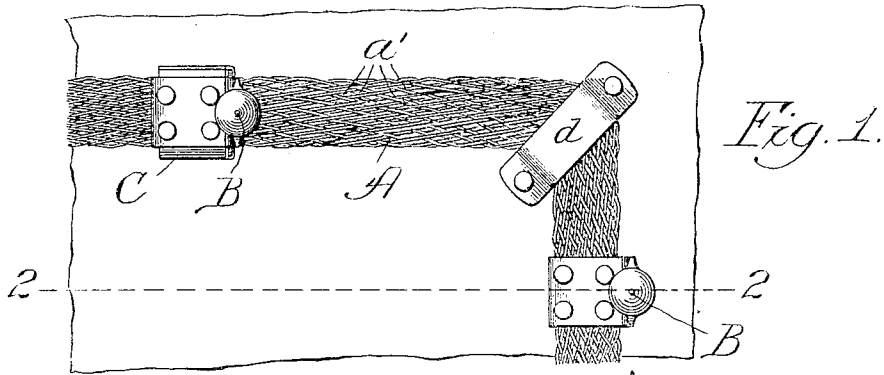


Fig. 3.

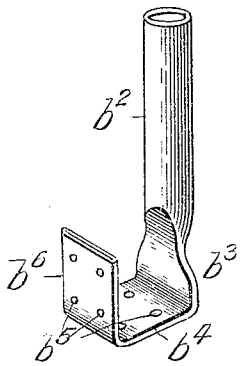


Fig. 2.



Fig. 5.

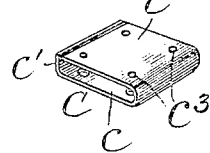


Fig. 4.

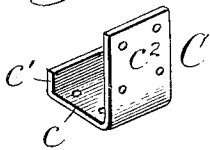
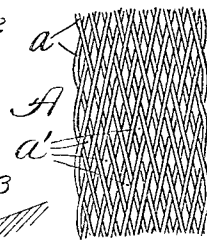


Fig. 6.



Witnesses:  
John Anders  
H. J. Bull

Inventor:  
Melvin J. Mitchell  
By Frank Welch  
his Attorney

# UNITED STATES PATENT OFFICE.

MELVIN G. MITCHELL, OF SOUTH BEND, INDIANA, ASSIGNOR, BY MESNE ASSIGNMENTS, TO NATIONAL-STANDARD COMPANY, OF NILES, MICHIGAN, A CORPORATION OF MICHIGAN.

## LIGHTNING-CONDUCTOR.

1,129,358.

Specification of Letters Patent.

Patented Feb. 23, 1915.

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*To all whom it may concern:*

Be it known that I, MELVIN G. MITCHELL, a resident of South Bend, in the county of St. Joseph and State of Indiana, have invented certain new and useful Improvements in Lightning-Conductors, of which the following is a full, clear, and exact description.

The invention relates to lightning-conductors, adapted to be connected to buildings to prevent them from being damaged or struck by lightning.

One object of the invention is to provide an improved lightning-conductor of high efficiency and conductivity, which is organized to prevent excessive rise in temperature when subjected to heavy currents of high frequency, such as those to which a lightning-conductor is subjected to in use.

By experiments and comparative tests, it has been determined that a conductor consisting of a cable organized or constituted of a number of strands of wire braided together so that there will be spaces between the strands, or such as results from an open-work weave, the wires will be exposed to the air to promote circulation, and consequently the rise in temperature, particularly that resulting from heavy current of high frequency, will be materially less than that which results in a solid cable or tape, and the invention designs to provide an improved lightning-conductor in which this characteristic is utilized to increase the efficiency and conductivity of the lightning-conductor.

A still further object of the invention is to provide an improved distributor point and means for conveniently attaching the same to a building and to the lightning-conductor.

The invention consists in the several novel features hereinafter set forth and more particularly defined by claims at the conclusion hereof.

In the drawings; Figure 1 is a plan of an improved conductor and distributor-points, the same being connected to an inclined roof of a building. Fig. 2 is a section taken on line 2—2 of Fig. 1. Fig. 3 is a perspective of a portion of the distributor-point. Fig. 4 is a perspective of the attaching-clip or bracket before it has been bent to fit against the conductor. Fig. 5 is a perspective of the same after it has been

bent. Fig. 6 is a detail of a portion of the conductor.

The conductor A is formed of a number of wires *a* which are braided together with the wires separated from one another laterally, so as to leave air or circulating spaces *a'* between the wires and through the conductor. The general form of the conductor is flat, to extend over a comparatively wide area and the wires are formed of a metal, such as copper, which has a high efficiency in conducting electrical energy. In practice, it has been discovered that in a conductor thus organized of wires which are separated from one another and with air spaces between them, circulation is promoted, which renders the conductor as an entity of high efficiency and conductivity for heavy current of high frequency and will prevent marked rise in temperature as compared with a solid conductor, because of the greater exposed surfaces of the wire of the strands whereof the conductor is organized.

Distributor-points B are connected to the conductor at suitable intervals and each comprises a hollowed tapered point *b*, a tubular body-portion *b'*, and a tubular base-portion *b''* all connected together, body-portion *b'* being extended into the lower tapered portion *b* and into the tubular *b''*. Base-portion *b''* is formed of a tubular piece of metal, the lower portion of which is flattened out as at *b''* and this flat portion is perforated at *b''*, and is bent into angular shape and comprises a bottom-portion *b''* and a tongue *b''* for convenience in connecting the point to the conductor A and attaching it to a building. A clip or bracket C is formed of a strip of metal bent to form a bottom *c*, a side *c'* and a top *c''* between which the conductor A and a flat portion *b''* of the distributor-point is laid. The bottom or top of clip or bracket C are perforated as at *c''*. The bottom-portion *b''* of the point is laid upon the conductor, the top tongue *c''* of clip C is then bent over the bottom-portion *b''*, and tongue *b''* of the distributor-point is bent over the top of said clip. The distributor-point clip C and the conductor are all secured together and to the building by nails *b* driven through the tongue *b''*, the top-tongue of the clip *c''*, conductor A, and bottom *c* of the clip. This device serves as simple means for connecting the distributor-point to the

conductor and for securing the distributor-point and conductor to a building.

The manner of attachment thus far described is that employed when a point is 5 attached to a conductor extending upwardly on an inclined roof or surface. By flexing the flattened portion  $b^3$  about the point where it enters clip C, the distributor may be readily adjusted so that it will be correctly positioned with respect to a vertical 10 line. This particular flattened feature of the distributor point provides a construction which is comparatively rigid and serves to hold the point in its correct position when 15 so adjusted, and which may be readily adjusted according to the angle of the structure to which it is secured. It also provides convenient means of attachment to a building and by driving nails or screws through 20 the base of the distributor and clip, as described, the necessary contact between the point and the conductor will be established. It will be understood that the distributor-points are formed of suitable conducting 25 material, such as copper or copper alloy, which permits the face portion to be bent or adjusted as desired and provides a wide contact surface for engaging a flat conductor. In applying the connections, the 30 top or clip C may be flexed so as to leave an opening through which the conductor A and flattened portion of the distributor may be laid into the channel in the bracket or clip so the conductor may be secured conveniently at any desired points. The clip 35 C is formed of material which can be flexed and is a conductor such as copper.

When the distributor-point is to be connected to a laterally extending portion of 40 the conductor as indicated at the right hand of Figs. 1 and 2, the flattened U-shaped portion of the distributor-point may be placed around the conductor and the tongue  $b^6$  bent over the top of the conductor, and nails 45 driven through the portions of the distributor above and below the conductor, and through the latter, so that the flattened portions will be securely attached to the building and connected to the conductor, and the 50 flat portions of the base of the distributor will be disposed so that the distributor-point may be flexed laterally to bring the point in truly vertical position. The conductor A may be secured to the building by metallic 55 strips  $d$  where necessary.

The point is tubular and has a flattened base which provides a comparatively rigid conductor which permits adjustment of the

point to a truly vertical position, and facilitates connection to the conductor-cable. 60 The attaching-means is simple in construction and serves to firmly connect the conductor and base of the distributor-point together and to secure them to a structure or building. 65

The invention is not to be understood as restricted to the details set forth since these may be modified by the skilled mechanic within the scope of the appended claims without departing from the spirit and scope 70 of the invention.

Having thus described the invention, what I claim as new and desire to secure by Letters Patent is:

1. In lightning conductors, the combination of a conductor, a distributor point having a flattened and bendable base portion, said bent portion extended into contact with one side of said conductor and again bent into a tongue to overlie said contact portion, 80 and securing means passing directly through said conductor, base portion and tongue to secure said conductor and base portion together and to a support.

2. In lightning-conductors, the combination of a distributor-point comprising a flat flexible base portion, a substantially flat conductor, and a clip through which the conductor and base portions are extended, said clip having a flexible tongue adapted to be 90 folded over said base portion for securing the base-portion and conductor together.

3. In lightning-conductors, the combination of a distributor-point having a base portion, a conductor in contact with said 95 base-portion, a clip having a channel therein and a flexible portion adapted to be bent into position to hold the said base-portion and conductor in contact, and means for securing the clip, base-portion and the conductor to a structure. 100

4. In lightning-conductors, the combination of a distributor-point having a base portion, with a tongue thereon, a conductor in contact with said base-portion, a clip having a channel therein and a flexible portion 105 adapted to be bent into position to hold said base-portion and conductor in contact, the tongue on said base portion being foldable over the flexible portion of the clip, and 110 means for securing the clip, base-portion and the conductor to a structure.

MELVIN G. MITCHELL.

Witnesses:

GEO. L. FAUROTÉ,  
A. W. SORTORE.