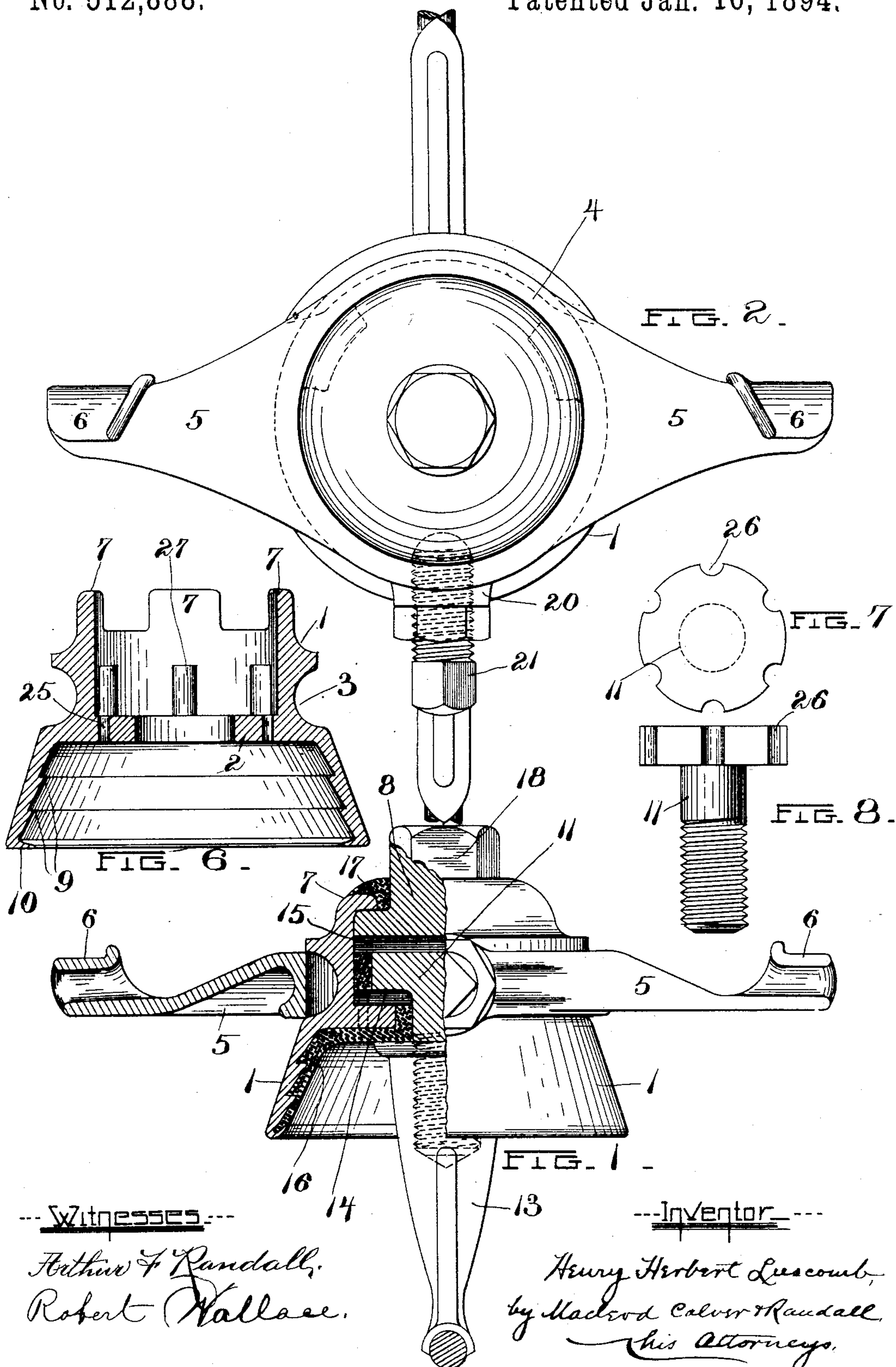


H. H. LUSCOMB.  
TROLLEY WIRE INSULATOR.

No. 512,888.

Patented Jan. 16, 1894.



---Witnesses---

Arthur F. Randall,  
Robert Wallace.

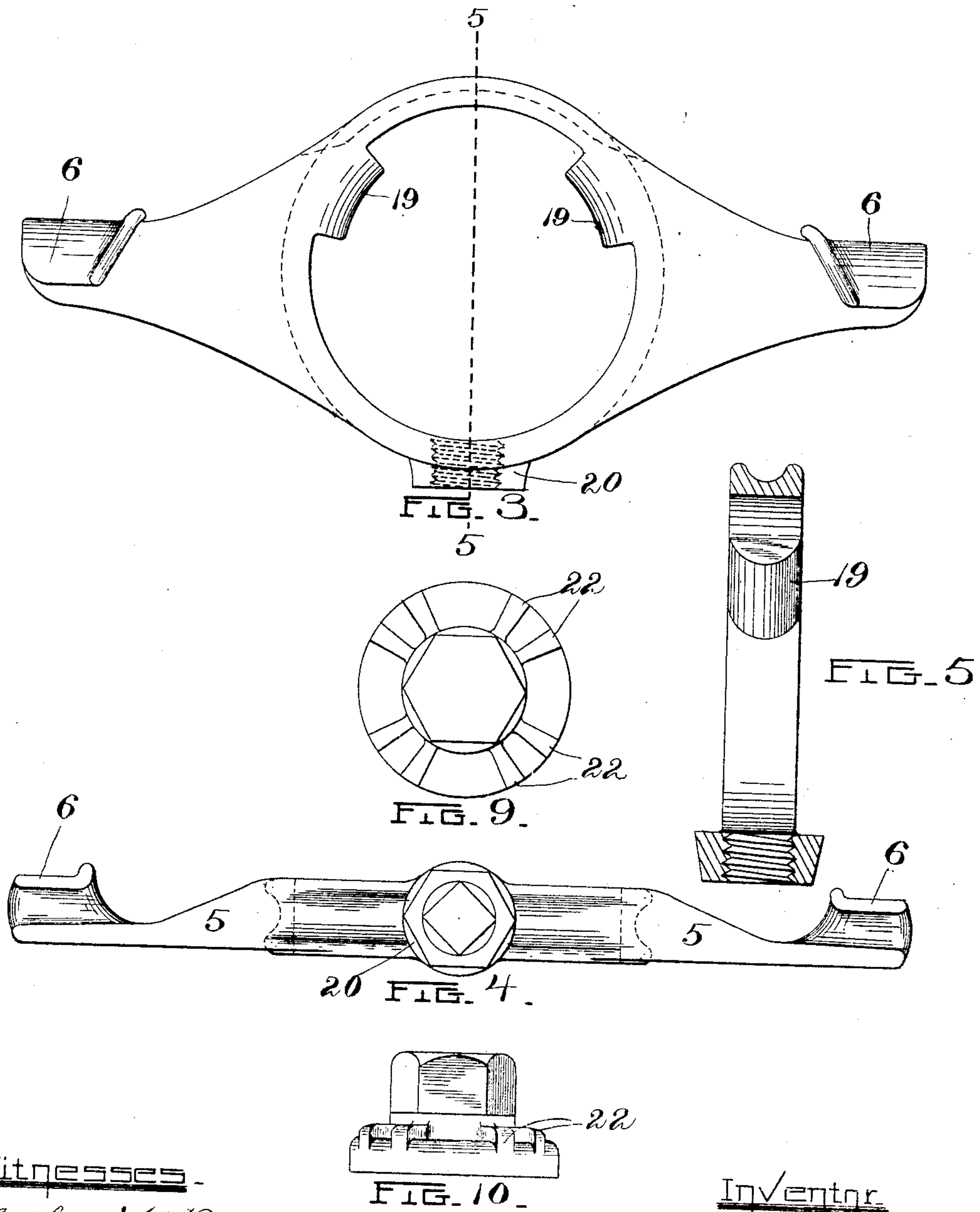
---Inventor---

Henry Herbert Luscomb,  
by Macrod Calver Randall,  
his Attorneys.

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his Attorneys



# UNITED STATES PATENT OFFICE.

HENRY HERBERT LUSCOMB, OF HARTFORD, CONNECTICUT.

## TROLLEY-WIRE INSULATOR.

SPECIFICATION forming part of Letters Patent No. 512,888, dated January 16, 1894.

Application filed October 18, 1893. Serial No. 488,494. (No model.)

*To all whom it may concern:*

Be it known that I, HENRY HERBERT LUSCOMB, a citizen of the United States, residing at Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Insulators, of which the following is a specification, reference being had therein to the accompanying drawings.

10 My invention has for its object to provide an improved electrical insulator and it relates more particularly to insulators such as are employed for insulating and supporting overhead conductors for electric railways.

15 My invention consists in an insulator of improved construction hereinafter more fully set forth and the novel features of which are pointed out in the claims which are appended hereto and made a part hereof.

20 The invention will be fully understood from the following description reference being had to the accompanying drawings, in which—

Figure 1 is a view of my insulator in elevation, partially broken away for greater clear-  
25 ness. Fig. 2 is a plan view thereof. Fig. 3 is a plan view of the yoke having arms by means of which connection is made with the span wire. Fig. 4 is an edge view of the same. Fig. 5 is a section thereof on line 5—5 Fig. 3.  
30 Fig. 6 is a section of the case or bell of the insulator detached. Figs. 7 and 8 are views in plan and side elevation of the connection hereinafter referred to. Figs. 9 and 10 are similar views of the cap hereinafter referred to.

35 In insulators of the class referred to it is desirable that the interior parts should be thoroughly protected from the entrance of moisture; that the device should be strong and durable and of high insulative quality;  
40 that the downwardly projecting portions nearest the line of the trolley wire should be so constructed as to withstand a blow such as might be given by a misplaced trolley-wheel without injury to the insulator; that the in-  
45 sulator should be so constructed as to be readily removed and replaced, if desired, without the necessity of removing any other portions of the construction, and that the ear may be attached and secured in place to coincide  
50 with the line of the trolley wire regardless of the angle at which the trolley wire crosses the span wire. These objects I have endeavored

to obtain in the construction which embodies my present invention and I will now proceed to describe the same having reference to the 55 accompanying drawings.

The metallic case of the insulator is shown at 1, and consists of a body portion and a skirt or flaring downwardly projecting part which is adapted to shed moisture and to oth- 60 erwise protect the insulator. An inwardly projecting flange 2 located at the base of the body of the body portion serves to retain the portions of the insulator within the bell in place. The body of the bell is provided ex- 65 teriorly with an annular groove 3 which receives the yoke 4 to which the arms 5 are secured. The arms 5 are provided with upwardly projecting curved portions 6 of the usual form at their extremities to receive the 70 span wire, said wire passing around one side of the yoke portion 4 in a groove provided therein to receive said span wire. It will thus be observed that the span wire does not touch the bell or case 1 of the insulator. 75 The top of the bell or case is provided with a series, preferably four, of upwardly projecting portions 7, which are adapted to be bent over the cap 8 when placed within the top of the case, and serve to retain said cap in place. 80 The interior of the skirt of the case is provided with a series of annular grooves or notches shown at 9 and the lower edge 10 of said skirt is adapted to be bent inwardly upon the layer or mass of composition which 85 is employed to cover the interior of the skirt and to close the joint around the connection 11. The notches 9 and the inwardly turned edge 10 serve to secure in place the layer or mass of composition which covers the 90 interior of the skirt. The connection 11 consists of a bolt having a head of irregular shape and having its downwardly projecting end screw-threaded in order that it may be screwed into a threaded socket in the ear 95 which connects with the trolley wire. The shank of the connection projects downwardly through the hole in the bottom of the case and is of less diameter than said hole. Before the connection 11 is placed within the 100 case, a series of sheets of mica 14 which are cut to proper shape to fit the interior of the case are strung on said bolt underneath the head thereof. The connection 11 is then



placed within the case and another series of sheets of mica 15 which are also shaped to fit the interior of the case are placed on top of the said connection. The cap 8 is then placed within the case on top of the mica 15 and the upwardly projecting portions 7 are bent over the edges of the cap, compressing the parts within the case and holding them firmly in place. For the purpose of filling the space between the head of the connection and the adjacent wall of the case, a series of holes 25 are provided in the flange 2 and by means of a punch or similar instrument inserted through these holes openings are made through the mica 14 thus opening a series of passages into the space referred to between the head of the connection and the wall of the case. A mass of insulating composition which is prepared in a plastic condition and which will set and harden is then forced through the holes filling the space around the head of the connection and serving to insulate the same from the case. This composition also fills the holes leading to the said space around the head of the connection and is continued in the form of a layer around the interior of the skirt. Before the composition hardens the edge 10 of the skirt is bent inwardly as shown in Fig. 1 onto the composition, thus serving to retain it securely in place and also serving to protect it thoroughly from an accidental blow from the trolley. The layer of composition will also extend up to the shank of the connection 11 and into the space between the edge of the flange 2 and said shank. This layer of composition is shown at 16. Any of the well-known insulating compositions which may be used in a plastic condition and will then set and harden may be employed.

In order to finish the top of the insulator and prevent the lodgment of moisture or the like around the top of the cap 8, I fill the space around the turned over ends of the portion 7 with a mass of insulating composition 17 which may be of the same composition which is employed for the interior of the skirt. As it is desirable that the connection 11 shall not twist or turn relatively to the case 1, the head of the connection is preferably of irregular shape or provided with vertical notches 26 or grooves and the interior of the case is roughened or provided with corresponding vertical grooves 27 or projections so that when the plastic composition which surrounds the head of the connection hardens the connection will be rigid relatively to the case. The top 18 of the cap 8 is shaped to receive a wrench as shown so that the insulator may be turned to screw the connection into the ear. The cap 8 is also provided with ribs 22 between which are spaces which receive the turned over ends of the projections 7. In this way the cap 8 is locked relatively to the case 1 and cannot be rotated or moved within the case relatively thereto so that these turned over projections 7 not only serve to

hold the cap in place vertically within the case but also serve to prevent its rotation relatively to the case.

The yoke 4 is provided with preferably two inwardly projecting parts 19 which are adapted to engage with the annular groove 3 in the body of the same. At one side of the yoke a boss or projection 20 is provided through which a threaded hole passes to receive a set screw 21. The yoke is of such a size that when the set screw 21 is withdrawn it may be passed over the case 1 into the groove 3. The set screw 21 is then inserted and screwed in until its inner end bears in the groove 3 when the arms and yoke are firmly secured to the insulator. As will be clear by loosening the set screw the insulator may be turned relatively to the arms and both the arms and the insulator may be adjusted to coincide with the position of the span and trolley wires. If the insulator requires to be replaced it is only necessary to withdraw the set screw 21, free the insulator from the yoke and arms and unscrew it from the ear; another insulator may then be inserted and the parts again secured without disturbing any other portions of the construction.

What I claim is—

1. An insulator comprising a case, a connection within said case, insulating material surrounding said connection and insulating the same from said case, a cap within said case having recesses therein and projections on said case which are bent over said cap and received in the said recesses therein, substantially as set forth.

2. An insulator comprising a case having a skirt thereon, a connection within said case, insulating material surrounding said connection and insulating the same from said case and a layer of insulating material on the inner surface of said skirt, said skirt having the edge thereof turned inwardly over the edge of the layer of insulating material whereby said layer is protected from injury substantially as set forth.

3. An insulator comprising a case, a connection within said case, insulating material surrounding said connection and insulating the same from said case, a cap within said case and means for locking said cap rigidly to said case, the proximate portions of said connection and said case being of irregular shape whereby the connection is prevented from rotating within the said case, substantially as set forth.

4. An insulator comprising a case having an exterior annular groove, a connection within said case, insulating material interposed between said connection and said case, and means for securing said parts together in combination with a yoke and means for securing said yoke to its support, said yoke having projections engaging said annular groove to secure said yoke and case together, substantially as set forth.

5. An insulator comprising a case having



an exterior annular groove, a connection with-  
in said case, insulating material interposed  
between said connection and said case, and  
means for securing said parts together in  
5 combination with a yoke and means for se-  
curing said yoke to its support, said yoke hav-  
ing projections engaging said annular groove  
and having a set screw by means of which it

may be rigidly secured in said annular groove,  
substantially as set forth. 10

In testimony whereof I affix my signature in  
presence of two witnesses.

HENRY HERBERT LUSCOMB.

Witnesses:

WM. A. MACLEOD,  
ROBT. WALLACE.