(No Model.)

F. M. ZIMMERMAN.

INSULATING TROLLEY WIRE SUPPORT.

No. 524,232. Patented Aug. 7, 1894.

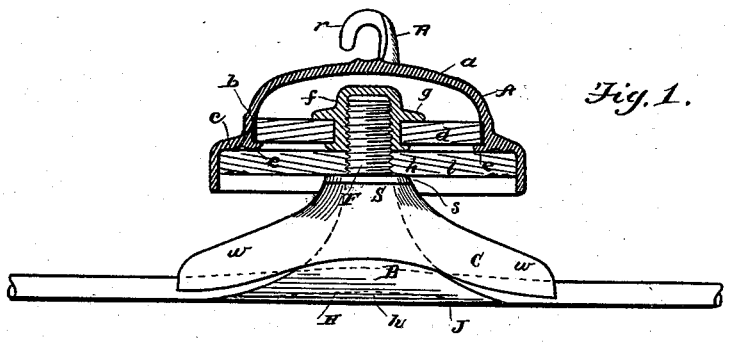

Fig. 1.

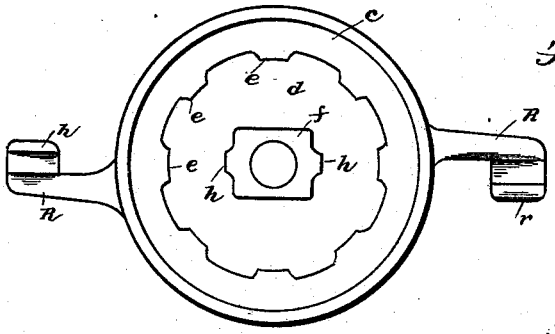

Fig. 2.

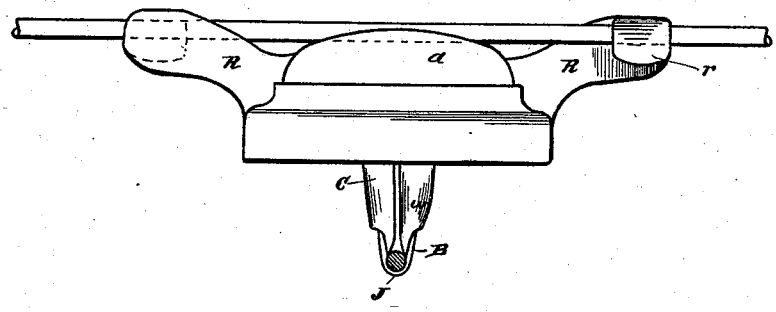

Fig. 3.

WITNESSES
F. Clough.
M. A. Reeve.

INVENTOR
Frank M. Zimmerman.
By Parker & Burton
Attorneys.

UNITED STATES PATENT OFFICE.

FRANK M. ZIMMERMAN, OF DETROIT, MICHIGAN.

INSULATING TROLLEY-WIRE SUPPORT.

SPECIFICATION forming part of Letters Patent No. 524,232, dated August 7, 1894.

Application filed November 2, 1893. Serial No. 489,814. (No model.)

To all whom it may concern:

Be it known that I, FRANK M. ZIMMERMAN, a citizen of the United States, residing at Detroit, county of Wayne, State of Michigan, have invented a certain new and useful Improvement in Insulating Trolley-Wire Supports; and I declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

This invention relates to insulating supports for trolley wires or other uninsulated electric conducting wires, and has for its special object the production of an insulating support that, while being a perfect insulator, will support the electric conducting wire very firmly against the strain placed upon it by the running of a trolley under or over it, and it also supports the wire by means such that the trolley has perfect freedom of movement along the wire in passing the support.

In the drawings, Figure 1 shows the support in sectional elevation. Fig. 2 is a plan of the insulating part as seen from below, the lower insulating plate being removed. Fig. 3 is an end elevation.

The entire support is made of the insulating cap A, a stirrup B, and a saddle C. The insulating part A is made with an outer cup shaped or cap shaped shell *a*, provided with suitable internal ledges *b* and *c*, to hold the plates of insulating material, *d* and *l*. Of these plates of insulating material, there are two or more, the inner one of which, *d*, is placed against the ledge *b*, and is held in place against it by a number of lugs *e* that are bent over the edge of the disk *d* after it has been placed against the ledge *b*. The insulating disk *d* is provided with a central perforation, within which is secured the screw threaded nut *f*. This nut is secured to the disk *d* in the same way that the disk *d* is secured in the cap *a;* that is, the nut *f* is surrounded with a circumferential flange *g* above the disk, and with a flange or lugs *h* that are bent outward over the disk *d*, and burnished or hammered down to hold the disk tightly between the lugs *h* and the flange *g*. The insulating disk *l* rests against the flange *c*, and is held in place by a collar *s* on the saddle piece C. It is preferably provided with one or more grooves on its lower side and just inside its outer edge, which prevent the inflow of water or rain drops from the outside of the insulator toward or to the saddle or stirrup.

The saddle piece C is made with two depending wings, *w*, *w*, each of which is provided with a groove on its under side, within which the upper half of the bight of wire to be held by it rests. The grooved part between the extreme ends of the wings *w w* rise quite sharply upward, so that the contact part of the wings with the wire is confined to a small portion at each end.

The stem or body part F of the saddle C is provided with a perforation terminating at its upper end with a flat tabular part S that forms a shoulder around the screw rising from the stirrup part, and serves to support the disk *l* and hold that disk firmly in place against the ledge *c*.

The stirrup piece B is made of a single piece of metal bent into a loop, the ends of the part together forming a split screw F, and the lower part, which may be considered as a head of the split screw, being drawn out into a long cross head having a cross slot within which is received the wire. The extreme ends of the cross head H are worked to a thin edge, from which within the slot the metal rises in a curve, for the double purpose of giving strength to the stirrup and of forcing the wire threaded through the stirrup to bend slightly over the curve *h'* and under the gripping ends of the wings *w w*. This form of grip effectually prevents the line wire from slipping endwise through the stirrup. The split form of the screw threaded bolt part of the stirrup permits the stirrup to be placed on the wire without difficulty and without it being necessary to draw the wire through it. It also enables me to use a stirrup whose gripping part is unbroken at its point of contact with the wire, thus enabling me to make the surface of the support that comes in contact with the running trolley very smooth, so as to produce no obstruction.

The curved form of the inner surface of the stirrup causes the wire that is supported by it to bend upward in a short bight as it passes over the stirrup, and the under side of the stirrup J being straight, produces a practically smooth, straight surface for the trolley to travel upon in passing the support.

The parts are held together by the screw F and the nut *f*, and these are screwed firmly together after the stirrup has been put in place and before the entire insulating support is finally caught onto the cross wires commonly used to hold the trolley wire in its elevated position.

From each side of the insulating cap *a* extends an arm R, terminating with a hook *r*, one of these hooks being turned to one side and the other to the opposite side of its respective arm. The plane of the hooks is slightly below the upper surface of the cap A, and a shallow groove crosses the upper surface of the cap A, and after the cap has been screwed down to place on the bolt F, the entire insulator is attached to an elevated wire crossing the trolley wire by hooking the hooks *r* over the wire and gripping the wire between the hooks and the upper surface of the cap.

The double insulated disks *d* and *l* form a very complete protection against the loss of electricity under all circumstances, especially do they insulate it against leakage produced by the moisture incident to wet weather.

Inasmuch as I am enabled to use in the construction of this insulator a plate for the disk *l*, which, while a good insulator, has not sufficient strength to withstand the wear required; and for the plate *d*, a material which has the requisite strength and has the requisite insulating properties while dry, but which is liable to lose its insulating properties or become deteriorated if subjected to wet. The insulating disk *l* keeps the inner and stronger disk *d* dry, and prevents its deterioration from moisture, and enables me to utilize its qualities of strength in sustaining the strain upon it in holding the saddle and stirrup in place.

What I claim is—

1. In an insulating trolley wire support, the combination of an outer shell, a central screw threaded nut secured to, but spaced from, said shell by an insulating disk, a supporting stirrup engaging with said nut, and a saddle piece adapted to form a grip therewith, substantially as described.

2. In an insulating wire support, the combination of an outer shell, a central screw threaded nut secured to, but spaced from, the shell by an insulating disk, a stirrup piece having a long supporting part extending along the wire, and having its sides bent upward and terminating in threaded parts, each part forming the half of a split bolt, a perforated saddle piece adapted to be traversed by the split bolt thus formed, and to be held in place by the interaction of the split bolt and insulated nut, substantially as described.

3. In an insulating trolley wire support, the combination of a cup provided with interior ledges and with lugs *e* adapted to be turned over and secured upon an insulating disk *d*, and an interiorly threaded screw *f* provided with an exterior flange *g*, and the lugs *h* adapted to be turned over an insulating disk, and a stirrup terminated bolt adapted to engage said nut and support the trolley wire therefrom, substantially as described.

4. In a trolley wire support, the combination of a shell *a*, a central screw threaded nut secured to but spaced from the shell *a* by an insulating disk, a second insulating disk adapted to be held to the shell *a* but spaced from the first mentioned insulating disk, and a wire gripping support adapted to engage with said nut, substantially as described.

In testimony whereof I sign this specification in the presence of two witnesses.

FRANK M. ZIMMERMAN.

Witnesses:
CHARLES F. BARTON,
MARION A. REEVE.