No. 676,881. Patented June 25, 1901.

H. ETHERIDGE.

SELF LOCKING INSULATOR AND PIN.

(Application filed May 9, 1901.)

(No Model.)

Fig. 1.

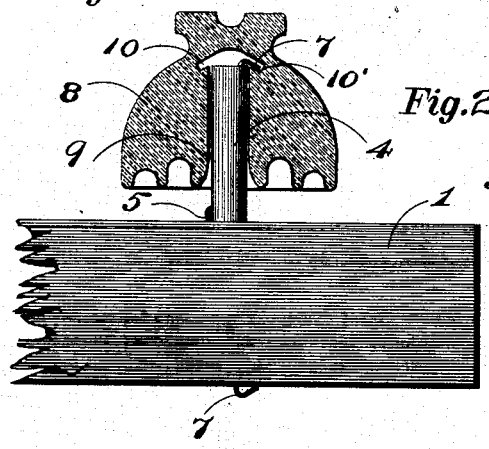


Fig. 2.

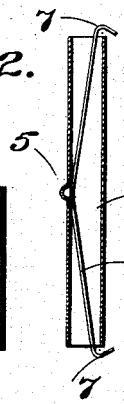


Fig. 3.

Fig. 4.

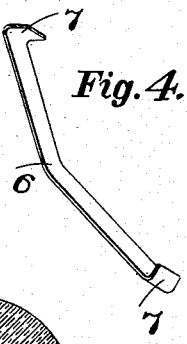


Fig. 5.

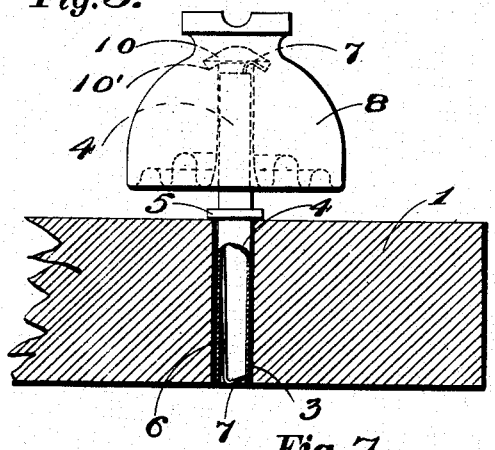


Fig. 6.

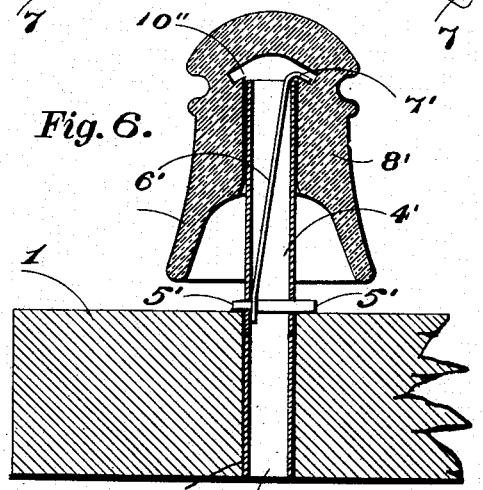


Fig. 7.

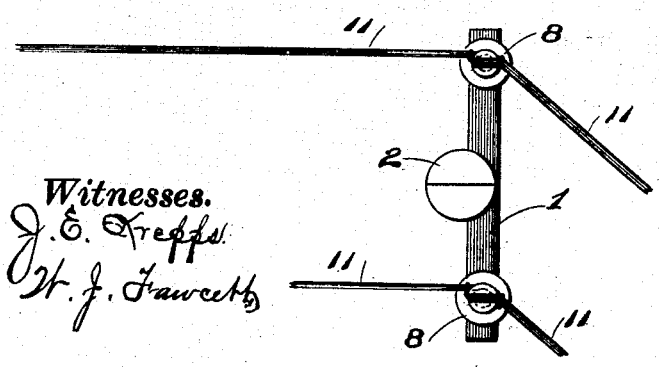
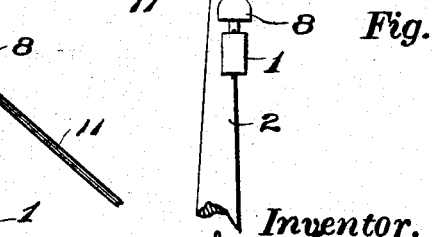


Fig. 8.



Witnesses.
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UNITED STATES PATENT OFFICE.

HARRY ETHERIDGE, OF McKEESPORT, PENNSYLVANIA.

SELF-LOCKING INSULATOR AND PIN.

SPECIFICATION forming part of Letters Patent No. 676,881, dated June 25, 1901.

Application filed May 9, 1901. Serial No. 59,376. (No model.)

To all whom it may concern:

Be it known that I, HARRY ETHERIDGE, a subject of the King of Great Britain, residing at McKeesport, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Self-Locking Insulators and Pins; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings, which form a part of this specification.

This invention relates to new and useful improvements in insulators and pins.

The invention has reference to the class of pins and insulators such as are used on commercial telegraph, telephone, electric light, and power lines, wherein great strength is required, particularly at curves and grades or dips; and the object of my invention is to provide a form of insulator and pin that will not only be self-locking, strong, durable, and quickly applied, but will also permit the insulator to freely rotate on the pin, so as to yield to the great strain placed thereon at all angles and positions of the line-wires.

In the accompanying drawings I have shown an insulator and pin by which my object may be attained, in which—

Figure 1 is a side elevation of my improved self-locking insulator and tube-pin in position upon a portion of a cross-arm, said insulator being shown in section. Fig. 2 is a vertical longitudinal sectional view through the tube-pin, showing the locking-spring therein. Fig. 3 is a perspective view of the tube-pin, having the locking-spring removed. Fig. 4 is a perspective view of the locking-spring. Fig. 5 is a side elevation of a portion of a cross-arm in section and having my improved insulator and tube-pin arranged therein, said pin being partly in section to illustrate the manner of releasing the locking-spring. Fig. 6 is a side elevation of a portion of a cross-arm in section having my improved insulator and tube-pin arranged thereon, said pin being shown in section to show a variation in the locking-spring. Fig. 7 is a plan view of a pole and cross-arm having my improved insulator thereon and showing the wires connected thereto. Fig. 8 is a side elevation of a pole and cross-arm having my improved insulator and tube-pin thereon and showing the wires connected thereto.

In said drawings the numeral 1 designates a form of cross-arm mounted upon a suitable pole 2, said cross-arm being provided with a vertical opening 3 to receive the insulator-pin.

The insulator-pin consists of a metal tube 4, upon the body of which is formed or secured a suitable projection or shoulder 5 to engage the upper surface of the cross-arm around said opening.

A bow-spring or lock 6, having the angularly-disposed hooked ends 7 formed thereon, is provided to engage within the tubular pin. This spring is of such length that the hooked portions will pass over the ends of the tube and is of such curvature or of such shape that the central portion of the body will be engaged against the inner wall of the tube at the opposite side to the hooks.

The insulator 8 is provided with a central opening 9, which terminates in a shoulder or annular recess 10. This recess at the shouldered portion 10′ is preferably formed at the same angle as that given to the hooks upon the end of the locking-spring.

To attach the pin to a cross-arm, the spring-lock is forced into said tubular pin until both the ends spring out over the edges of the tube, as at Fig. 2. The pin is then forced down into the cross-arm opening (the hooked end of the spring-lock being forced laterally to permit the entrance of the tube) until the shoulder engages the upper surface of said arm and until the end of the tube is flush with the under side, when the pressure will be released upon the spring, thereby causing the hooked end to spring outward over the edge of the opening and effectually locking the pin to the cross-arm. After the pin has been placed in position on the cross-arm the insulator is then forced down over the upper end of the pin until the edge of the pin comes flush with the edge of the recess or shoulder 10′, and the pressure being then relieved at that end of the spring the hooked end thereof will be forced into the recess, effectually locking the insulator to the pin and at the same time permitting the insulator to be rotated in either direction without becoming detached.

To remove the pin and insulator from the cross-arm, the lower hooked end of the locking-spring is forced inwardly past the edge of the opening in the cross-arm. The spring-lock is then forced slightly upward to prevent the hooked end slipping beyond the tube edge, as shown at Fig. 5. Raising the insulator will then withdraw the spring from the pin, after which the pin may be easily withdrawn from the cross-arm.

At Fig. 6 I have shown a modified form of locking-spring and pin-shoulder, also a different style of insulator, in which 4′ is the tubular pin, through the body of which is placed a small pin 5′ to act as a shoulder or stop when forcing the pin in the cross-arm. In this case the spring is intended only as a lock between the insulator and pin, and consists of a flat spring 6′, secured at its lower end to the interior of the pin, and is provided with a hook 7′ at its upper end. This hook engages within a groove 10″ in the insulator 8′, as in the other form. In this case the pin is driven into the cross-arm, and when it is desired to remove the insulator 8′ from said pin it is necessary to insert a rod or tool up through the pin to force the spring from its locking position, when the insulator may be removed.

It will be observed that when the cross-arms of a pole are provided with my improved insulators and pins in rounding a curve with the wires 11, as shown at Fig. 7, the insulators are free to rotate or adjust themselves to the strain and surging that occurs in the lines when they are being erected, also expansion and contraction as well as the swaying of the wires, which in the ordinary form of insulators has a tendency to unscrew or bind them so tightly on the pins as to cause breaking. It will also be observed that where "dips" occur in the line, as shown at Fig. 8, the tendency is to pull the insulator off of the pin or both from the cross-arm; but my invention is admirably adapted against such occurrences by virtue of the self-locking tendency of both, as referred to in the former part of this specification. Again, insulators and pins constructed in this manner will withstand severe strains at any angle or position and are much more durable than those now in use.

The detail parts of my improved tube-pin and insulator may be modified in various ways—such as forming a tongue upon the tube or cutting or attaching parts to act as a shoulder, altering the form of groove in the insulator, spring, &c.—without departing from the principle involved.

Having thus fully shown and described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A self-locking insulator and pin, comprising a tubular pin, one end of which is adapted to enter an opening in the cross-arm, or support, a shoulder or stop on said pin to limit the entrance thereof in said opening, an insulator having an opening formed partly therethrough to engage over said pin, and a means of locking said insulator to said pin whereby said insulator may freely rotate thereon without vertically increasing or decreasing its position.

2. A self-locking insulator and pin, comprising a tubular pin, one end of which is adjusted to enter an opening in the cross-arm or support, a shoulder or stop on said pin to limit the entrance thereof in said opening, a means of locking the pin in said support, an insulator having an opening extending partly therethrough to engage over said pin, and a means of locking said insulator to said pin whereby said insulator may freely rotate thereon without vertically increasing or decreasing its position.

3. A self-locking insulator and pin, comprising a tubular pin, one end of which is adapted to enter an opening in the cross-arm, a shoulder, or stop on said pin to limit the entrance thereof in said arm, an insulator having an opening therein to engage over said pin, an annular groove or shoulder in said insulator-opening, and a spring arranged in said pin which is provided with a hook, or angular projection to engage in the shoulder or groove in said insulator.

4. A self-locking insulator and pin, comprising a tubular pin, one end of which is adapted to enter an opening in the cross-arm, a shoulder or stop on said pin to limit the entrance thereof in said arm, an insulator having an opening therein to engage over said pin, an annular groove or shoulder in said insulator-opening, a spring arranged in said pin which is provided with hooks or angular projections to engage in the shoulder or groove of said insulator and said cross-arm.

In testimony whereof I have hereunto affixed my signature in the presence of two subscribing witnesses.

HARRY ETHERIDGE.

Witnesses:
EDWIN WINTERS,
GEO. B. HERWICK.