

No. 795,520.

PATENTED JULY 25, 1905.

J. S. LAPP, A. S. WATTS & W. T. GODDARD.

STRAIN INSULATOR.

APPLICATION FILED MAR. 8, 1905.

Fig. 1.

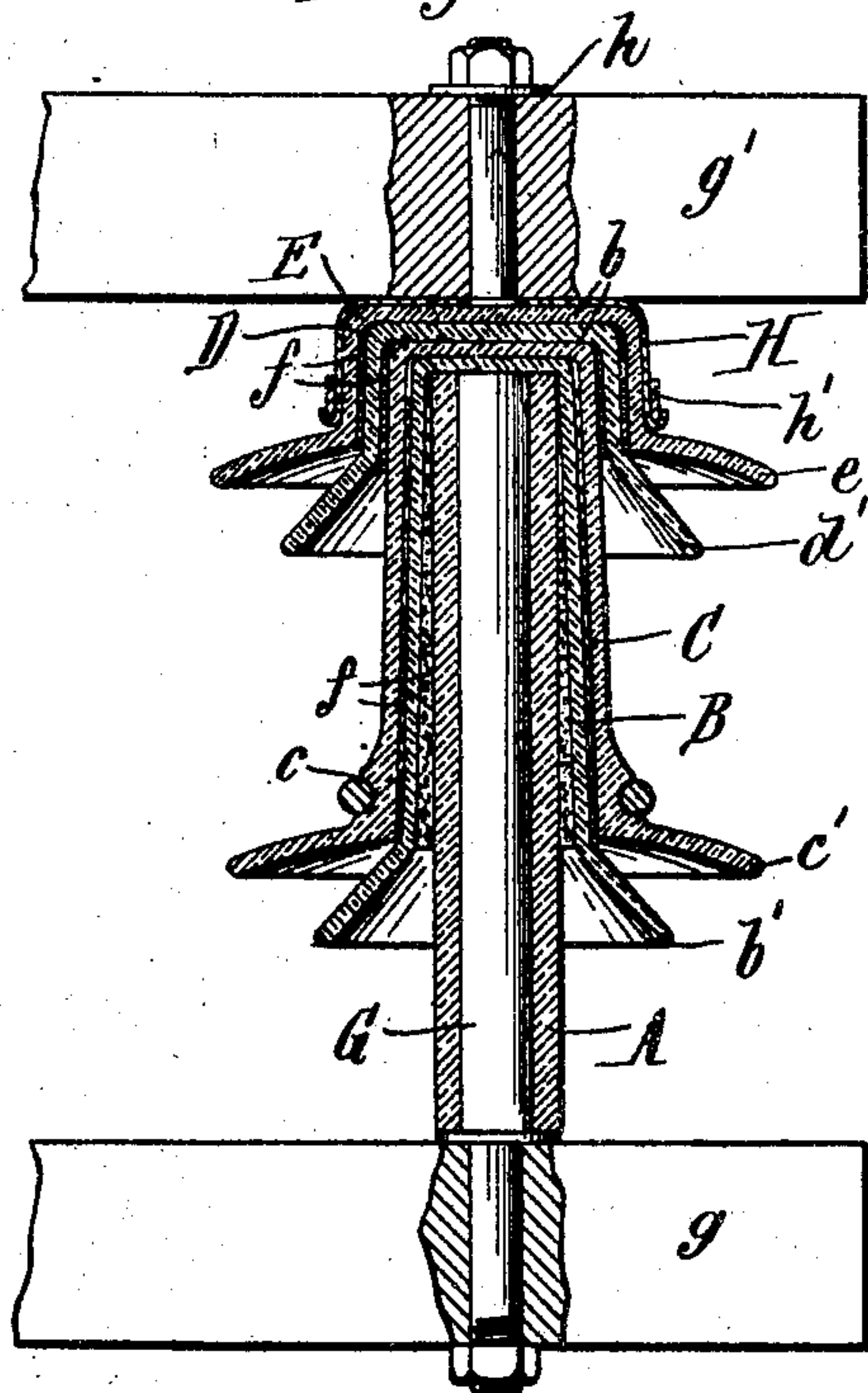


Fig. 3.

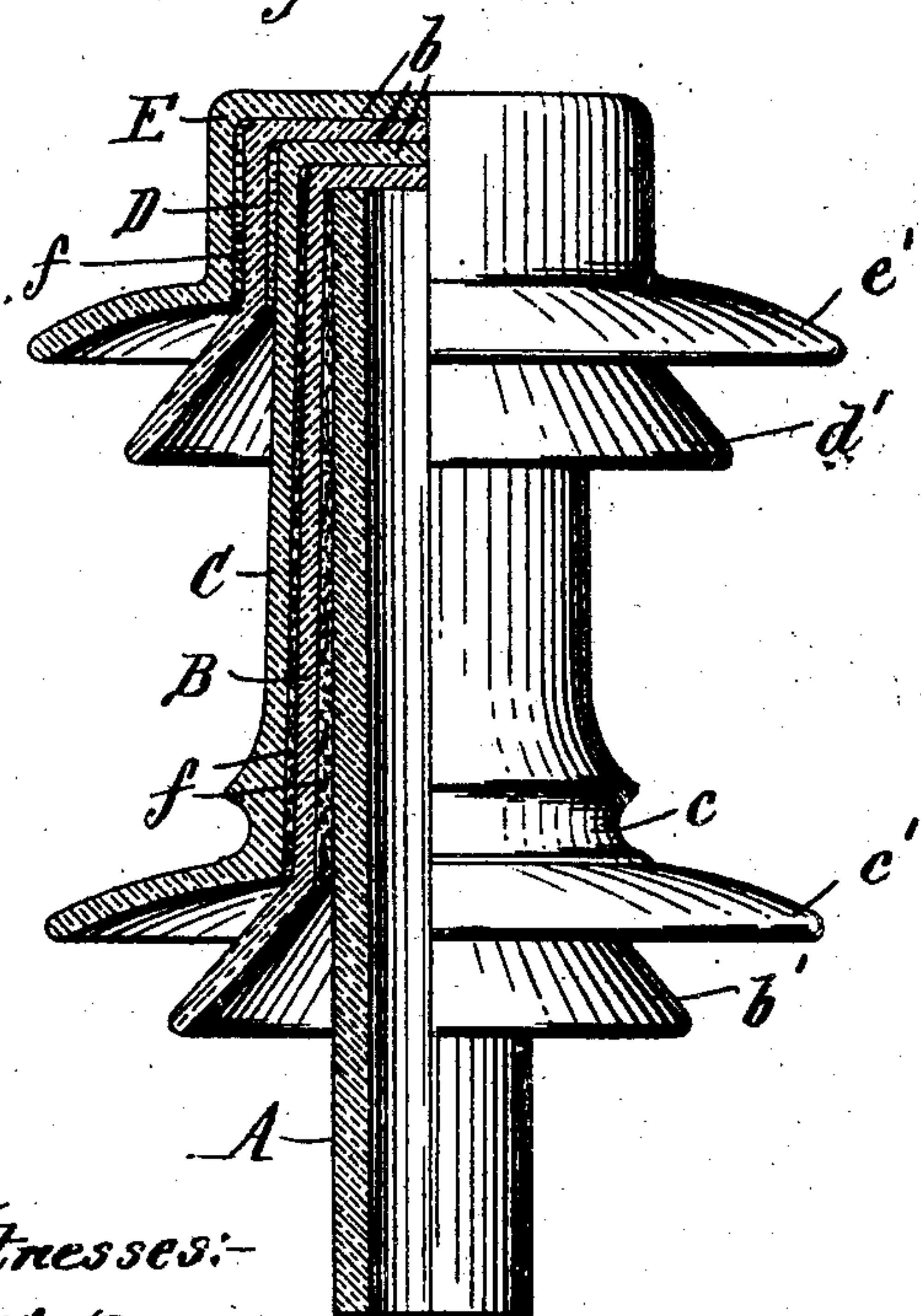
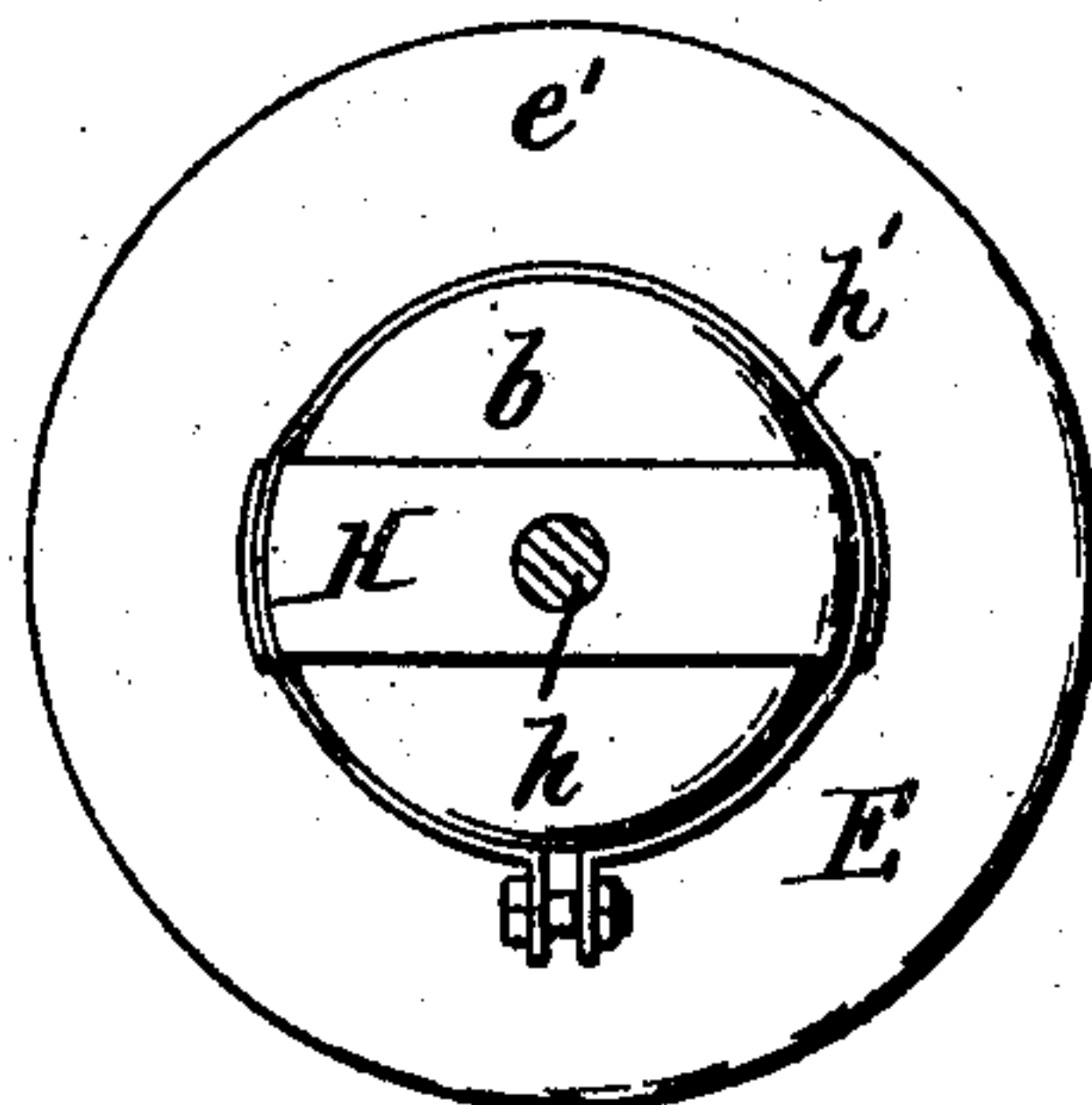


Fig. 2.



Witnesses:-

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# UNITED STATES PATENT OFFICE.

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## STRAIN-INSULATOR.

No. 795,520.

Specification of Letters Patent.

Patented July 25, 1905.

Application filed March 6, 1905. Serial No. 248,593.

*To all whom it may concern:*

Be it known that we, JOHN S. LAPP, residing at Rochester, in the county of Monroe, and ARTHUR S. WATTS and WALTER T. GODDARD, residing at Victor, in the county of Ontario, State of New York, all citizens of the United States, have invented a new and useful Improvement in Strain-Insulators, of which the following is a specification.

This invention relates to strain-insulators for high-potential electrical conductors. These strain-insulators are used for "dead-ending" on curves and elsewhere for holding live conductors of high voltage which are under excessive tension, and the insulator has ordinarily been supported between parallel cross-arms of the pole by a pin passing through the insulator and secured at its opposite ends to the cross-arms. The pin being secured at opposite ends affords great strength, and the pull on the insulator is transferred directly to the pole.

The objects of this invention are to produce a strain-insulator which affords the maximum efficiency, both electrical and mechanical; to make a multipart strain-insulator which is free from glazed joints and is capable of enlargement to suit the highest commercial voltages and in which the several parts can be made of substantially uniform thickness throughout, and to provide an insulator which is closed at the top and incloses and protects the holding-pin without sacrificing the advantages of the ordinary strain-insulator secured at opposite ends.

In the accompanying drawings, Figure 1 is a sectional elevation of a strain-insulator embodying the invention and portions of the supporting-arms to which the same is secured. Fig. 2 is a plan view of the insulator, showing the attaching-bolt for its upper end in section. Fig. 3 is a detached view, on an enlarged scale, of the insulator, one-half in longitudinal section and one-half in elevation.

Like letters of reference refer to like parts in the several figures.

The insulator is made of several separate parts or pieces of porcelain or analogous suitable insulating material, the number of which may be more or less, depending on the desired capacity and strength of the insulator. The insulator shown in the drawings comprises an inner tube A and four surrounding hollow-bell or petticoat pieces B C D E. The

petticoat-pieces are all cup-shaped, having tubular body portions open at their lower ends and closed at their upper ends by heads or tops *b* and are nested or arranged one within the other with their heads bearing flat upon each other. In the insulator illustrated the two inner petticoat-pieces B and C have relatively long bodies, and the body of the piece C is provided with an encircling conductor-groove *c*, while both of the pieces B and C have flaring lower ends or petticoats *b'* *c'* below the conductor-groove. The other pieces D and E have shorter bodies with flaring lower ends or petticoats *d'* *e'* located above the conductor-groove. The several petticoat-pieces are of substantially uniform thickness throughout, enabling perfect ones to be economically manufactured, and they are preferably connected permanently by cement (indicated at *f*) between the body portions. This manner of connecting the parts affords the necessary strength and glazed joints are eliminated.

G represents the insulator-pin, which is secured to the lower cross arm or support *g* in any usual or suitable manner and extends up into the pin-hole in the inner tube A. The pin does not extend through the top of the insulator; but the cylindrical end of the latter is securely fastened to the upper cross arm or support *g'* by some suitable independent attaching device. The device illustrated for this purpose consists of a metal strap H, secured by a bolt *h* to the cross-arm and having depending legs, which straddle and are clamped to the upper end of the insulator by a split clamping-band *h'*, encircling the insulator, and legs of the strap H above the out-turned lower ends of said legs. This attaching device is simple and effective; but other means could be employed for fastening the closed upper end of the insulator to the upper cross arm or support.

The cupped petticoat-pieces having the closed upper ends or heads not only inclose the supporting-pin and protect it from the weather, but the resulting insulator for voltages exceeding approximately forty thousand volts is stronger without glazing the pieces together than an insulator of the old type, in which the upper flange or petticoat is formed by a ring-shaped piece glazed to the open upper end of the tubular body. Any desired number of the petticoat-pieces can be



combined, thus making it possible to readily produce different insulators suited to different voltages and strains. The described construction provides a cylindrical end securing portion above the upper petticoats which is formed of a plurality of thicknesses, and is therefore strong and cannot be readily crushed or broken under strain.

We claim as our invention—

1. A strain-insulator comprising upper and lower flaring portions of insulating material connected by a body portion of insulating material to which the conductor is attached between said flaring portions, said insulator having an open lower end to receive the holding-pin and a closed upper end and having a securing portion above the upper flaring portion, substantially as set forth.

2. A strain-insulator comprising a plurality of nested pieces having closed upper ends and open flaring lower ends, one of said pieces having a conductor-groove encircling its body between its flaring lower end and the flaring lower end of the surrounding piece, and the outer piece providing a securing portion above its flaring portion, substantially as set forth.

3. A strain-insulator comprising a tubular inner piece providing a pin-hole, and a plurality of surrounding nested petticoat-pieces having closed upper ends and open flaring lower ends, one of said petticoat-pieces having a conductor-groove encircling its body be-

tween its flaring lower end and the flaring lower end of the surrounding piece, and the outer piece providing a securing portion above its flaring portion, substantially as set forth.

4. The combination with separated supports, of an insulator composed in whole of insulating material located between said supports and having an open lower end, a closed upper end, and a conductor-groove between its ends, a pin secured to one of said supports and extending into the insulator, and means connecting the end of the insulator to said other support, substantially as set forth.

5. The combination with separated supports, of an insulator composed in whole of insulating material located between said supports and having an open lower end, a closed upper end, and a conductor-groove between its ends, a pin secured to one of said supports and extending into the insulator, and an attaching device fixed to the other support and clamped about the closed upper end of the insulator, substantially as set forth.

Witness our hands this 24th day of February, 1905.

JOHN S. LAPP.  
ARTHUR S. WATTS.  
WALTER T. GODDARD.

Witnesses:

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W. A. HIGINBOTHAM.