No. 805,788. PATENTED NOV. 28, 1905.

S. L. FOSTER.

ELECTRIC STRAIN INSULATOR.

APPLICATION FILED JAN. 16, 1905.

Fig. 1.

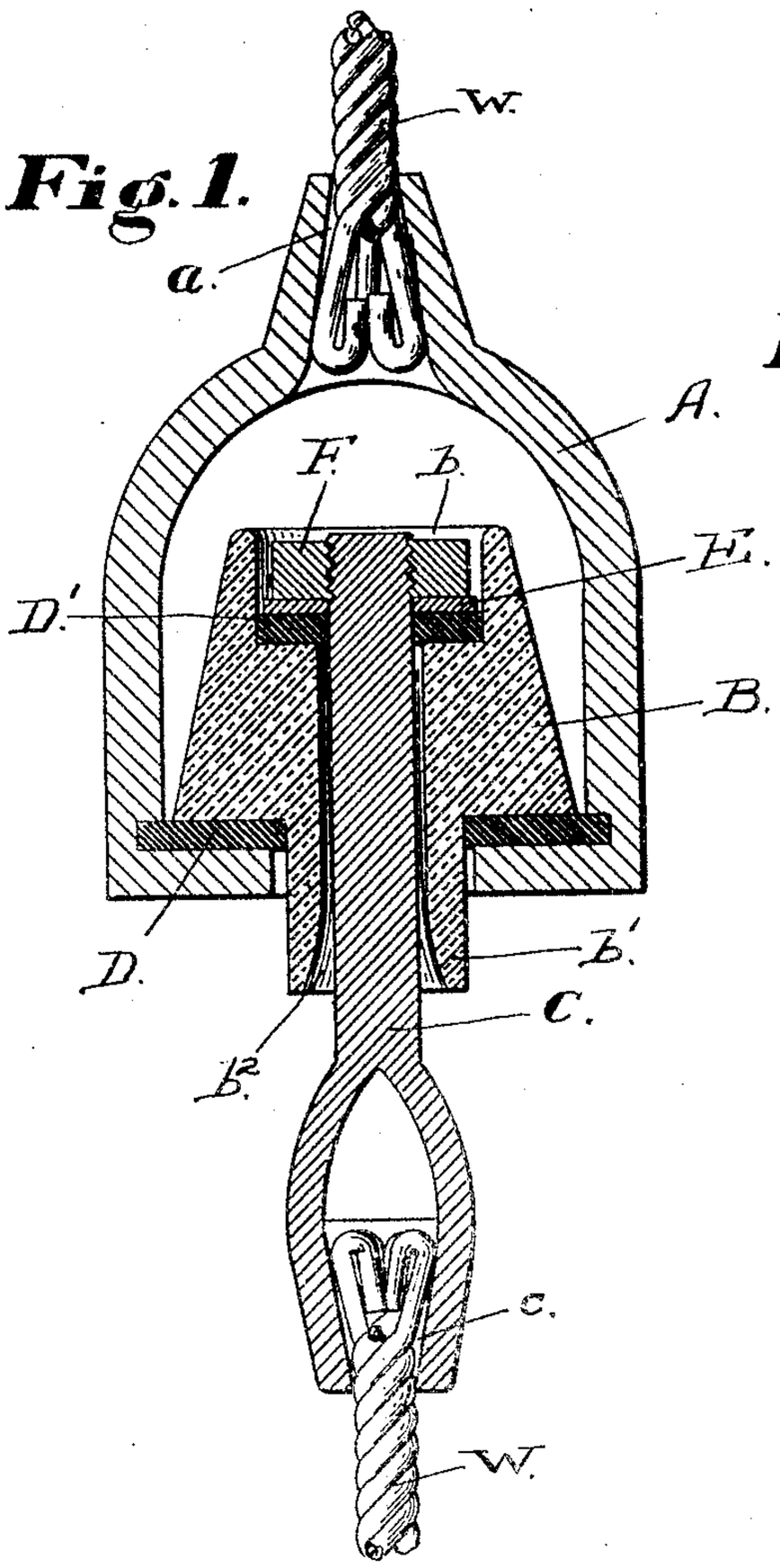


Fig. 2.

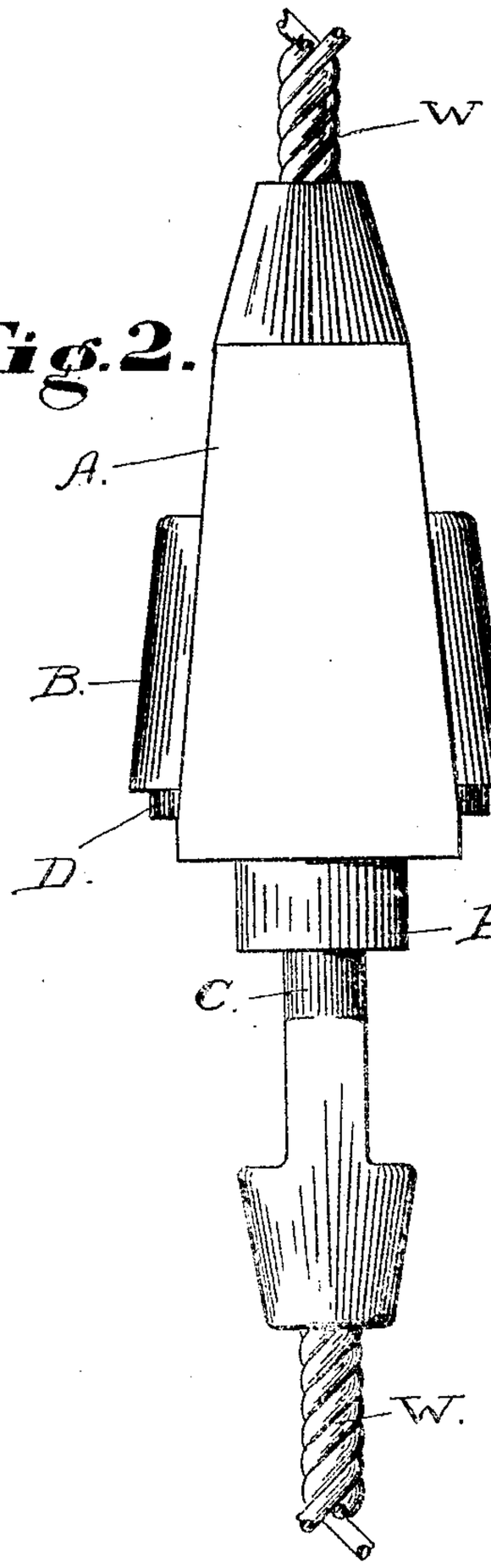
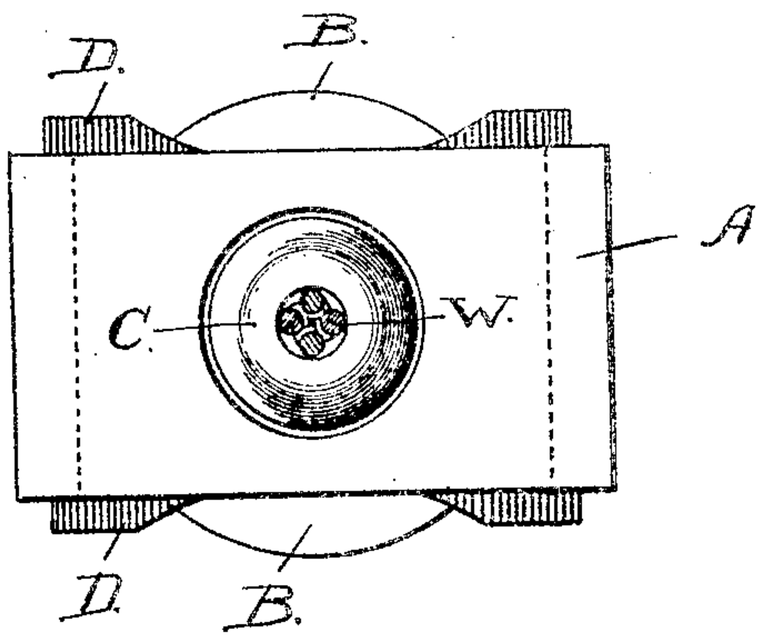


Fig. 3.



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ELECTRIC STRAIN-INSULATOR.

No. 805,788. Specification of Letters Patent. Patented Nov. 28, 1905.

Application filed January 16, 1905. Serial No. 241,239.

To all whom it may concern:

Be it known that I, SAMUEL L. FOSTER, a citizen of the United States, residing in the city and county of San Francisco, State of California, have invented certain new and useful Improvements in Electric Strain-Insulators, of which the following is a specification.

My invention relates to the class of strain-insulators used with guy or supporting wires or cables or electrical conductors to separate electrically the part of the wire, cable, or conductor on one side of the insulator from the part of the wire, cable, or conductor on the other side of the insulator.

The objects of my invention are to provide a more durable insulating substance under compression than has formerly been used in insulators of this character, to dispose this insulation in a more visible and accessible position, and to arrange it so that it can be readily replaced or renewed, to so construct the insulator as to reduce to a minimum the tendency to deterioration in the conductors when attached to it, and, finally, to so construct the insulator as to reduce to a minimum the labor cost for attaching the guy or supporting cables or electrical conductors to the insulator.

To these ends my invention consists in the novel construction and arrangement of the strain-insulator, which I shall hereinafter more fully describe by reference to the accompanying drawings, in which—

Figure 1 is a vertical section of the insulator. Fig. 2 is a side elevation of the same. Fig. 3 is a plan view from below.

Similar letters refer to similar parts throughout the several views.

The general form of the proposed strain-insulator is that of an electrically-insulated turnbuckle in which the body A is a metallic one of an open-sided or link-like character in order to render visible and accessible the parts partially inclosed by said body. The body A is formed with a flat base, centrally perforated, as shown in Fig. 1, said base furnishing a broad stable bearing for the insulating-block, while the perforation provides for the projection through the base of the body of the extension of said insulating-block. The insulation consists of a solid block B of porcelain, stone, glass, or other vitreous incombustible moisture-proof insulating material. This insulation is here shown of the shape of the frustum of a cone, having the upper end recessed at *b* for the nut F, metal washer E, and cushioning-washer D′ of the metal bolt C. The base of the cone B is formed with a cylindrically-shaped extension *b′*, integral with the cone and of the same insulating material and having its center line an extension of the center line of the cone, both cone B and cylinder *b′* being bored along the line of their center lines with a hole b^2 for the passage of the bolt C. The object of this hollow cylindrical extension *b′* of the insulation B is to insulate the bolt C from the link-like or open-sided metallic body A of the device where said bolt passes through it.

In order to prevent crushing or chipping of the brittle insulating material B, the strain-insulator is provided with resilient washers D and D′ of a durable character—such as creosoted wood, asbestos, "fiber," &c.—the latter placed under the metal washer E of the nut F of the bolt C and the former placed between the base of the cone B and the flat base of the body A of the strain-insulator.

The metal parts of the proposed strain-insulator are preferably made of galvanized malleable iron, although I do not limit myself to this, as any other unoxidizable metal may be used.

In the early history of electric strain-insulators more or less cubical or cylindrical blocks of porcelain or glass were used, in which both the wires to be insulated from each other were kept separated from contact with each other and were wrapped around the outside of the blocks in grooves cut at right angles to each other or in which one wire was wrapped around the outside of the block and one passed through a hole in the block in a direction at right angles to the plane of the eye in the other wire. This form of construction gave too short "creeping" distance for the escape of the electric current from wire to wire and while answering when used with heavily-insulated wires proved unsatisfactory with bare cables or wires in which the insulated covering was broken, which rapidly oxidized under the electrolytic action of the electric current and the atmospheric moisture that was deposited on these strain-insulators in foggy climates. In contradistinction to this it will be noted that my strain-insulator allows for great increase in length of this creeping distance between wire and wire. Again, in all prior forms of strain-insulators for attaching the wires or cables to the insulator there were furnished two eyes at either end or two grooves, through or around which the wires or cables had to be passed and then made firm by being wrapped

many times around itself. The labor of wrapping the wires solidly at these two points is a considerable item, often amounting to as much as the cost of the insulator. To remedy this difficulty, I provide as the best form of connection the countersunk hole *a* in the end of the body A and the countersunk hole *c* in the outer end of bolt C. These reduce the labor of making the wire or cable firm to a minimum, for it is only necessary to pass the cable W through the small end of the countersunk hole, bend the several strands composing it back on themselves, put a strain on the cable, and it wedges itself into the countersunk hole firmly without further labor. Later in the art porcelain and glass were "improved" upon by the use of some of the many mechanical chemical mixtures of insulating and cohesive substances made into shape under heavy pressure, but which all ultimately disintegrate under exposure to the atmosphere and become porous and unsatisfactory electrically for the purpose intended. These mixtures become plastic under a heat that is not excessive and allow the concealed metal parts of the strain-insulator to come into electrical contact. It is impossible to tell by visual examination when these last-described types of insulators have become electrically defective, as the essential parts are covered by the compound. The result is frequently heavy and continuous leakages of electric current and too often accidents to workmen or outsiders innocently touching wires supposed to be insulated by the really defective strain-insulators.

A very valuable feature of my invention is the fact that the insulating material used is both incombustible and at all times visible.

The usual types of strain-insulators are useless when their internal construction has failed electrically, and they are not susceptible of repair except by those possessed of the necessary chemical knowledge of the manufacture and manipulation of these mixtures. In my invention, on the contrary, the insulation is well protected and is very unlikely to suffer from electrical failure; but in case this should occur its condition is visible at all times, and the insulator is susceptible of ready, rapid, and cheap repair by the most ordinary skill, so as to equal its original condition, and this, too, without the necessity of disconnecting and reconnecting the wires or cables involved, as is the case with all prior types of strain-insulators.

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

1. An electric strain-insulator consisting of an open, link-like metallic body having a flat centrally-perforated base, a metallic bolt passing into said body through its perforated base and insulated therefrom, a nut on the inner end of the bolt, and an apertured insulating-block under compression between the nut and the flat base of the body, said block having a tapering wall terminating in an enlarged flat base.

2. An electric strain-insulator consisting of an open, link-like metallic body having a flat centrally-perforated base, a metallic bolt passing into said body through its perforated base and insulated therefrom, a nut on the inner end of the bolt, an insulating-block under compression between the nut and the flat base of the body, said block having a recess in its upper end for the reception of said nut, a cushion-washer within said recess between the nut and the upper end of the block, and a cushion-washer between the lower end of the block and the flat base of the body.

3. An electric strain-insulator consisting of an open, link-like metallic body having a flat centrally-perforated base, a metallic bolt passing into said body through its perforated base and insulated therefrom, a nut on the inner end of the bolt, and an insulating-block having a tapering wall terminating in an enlarged flat base and being under compression between said nut and the flat base of the body, said block having an extension from its lower end projecting through the perforated base of the body and electrically separating the bolt therefrom.

4. An electric strain-insulator consisting of an open, link-like metallic body having a flat centrally-perforated base, a metallic bolt passing into said body through its perforated base and insulated therefrom, a nut on the inner end of the bolt, an insulating-block having an enlarged flat base engaging over the base of said body and an extension therebelow projecting through the perforated base of the body and electrically separating the bolt therefrom, a cushion-washer between the upper end of the block and the nut, and a cushion-washer between said base of the block and the flat base of the body.

5. An electric strain-insulator consisting of an open link-like metallic body having a flat centrally-perforated base, and having in its other end a countersunk hole extending therethrough and communicating with the open space between said link portion of the frame, a cable secured within said hole, a metallic bolt passing into said body through its perforated base, said bolt having in its outer end a countersunk hole communicating with an open space thereabove, a cable secured within said hole, a nut on the inner end of the bolt and an insulating-block under compression between the nut and the flat base of the body, said block having an extension from its lower end projecting through the flat base of the body and electrically separating the bolt therefrom.

6. An electric strain-insulator consisting of an open, link-like metallic body having a flat centrally-perforated base, and having in its

other end a countersunk hole for the cable connection, a metallic bolt passing into said body through its perforated base, said bolt having in its outer end a countersunk hole for the cable connection, a nut on the inner end of the bolt, an insulating-block under compression between the nut and the flat base of the body, said block having an extension from its lower end projecting through the flat base of the body and electrically separating the bolt therefrom, a cushion-washer between the upper end of the block and the nut, and a cushion-washer between the lower end of the block and the flat base of the body.

In witness whereof I have hereunto set my hand.

SAMUEL L. FOSTER.

Witnesses:

J. COMPTON,

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