No. 619,974. Patented Feb. 21, 1899.

C. B. MARTIN.

RAIL INSULATOR.

(Application filed Nov. 8, 1898.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

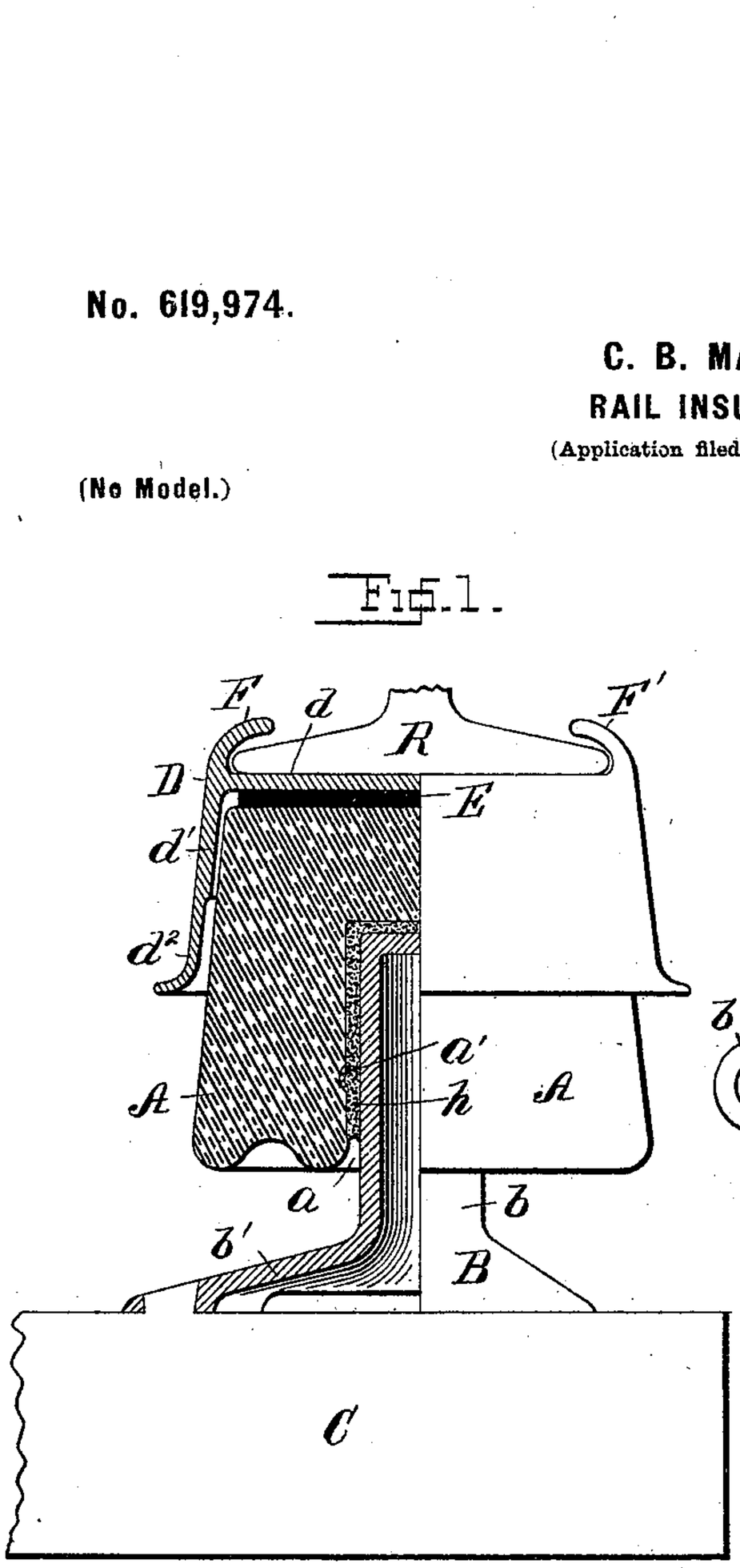


Fig. 2.

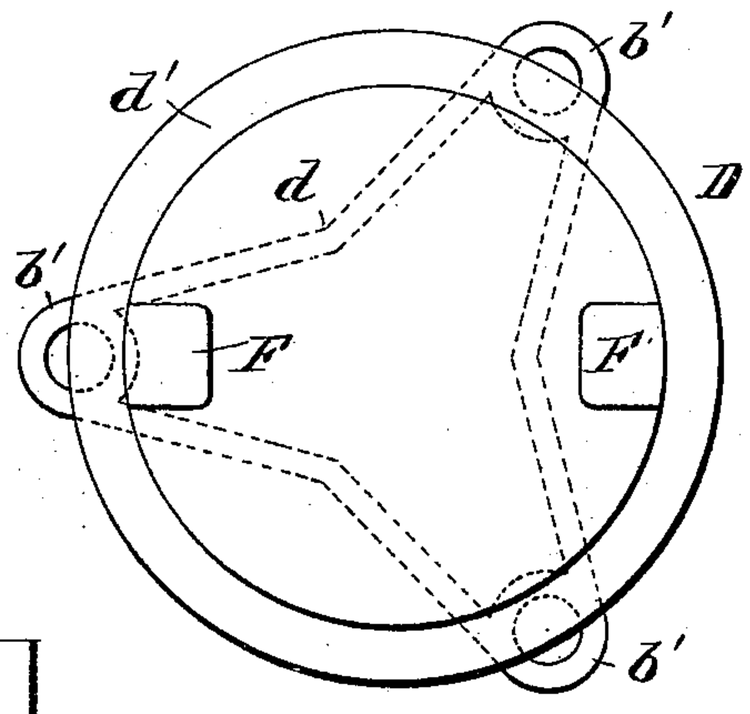


Fig. 3.

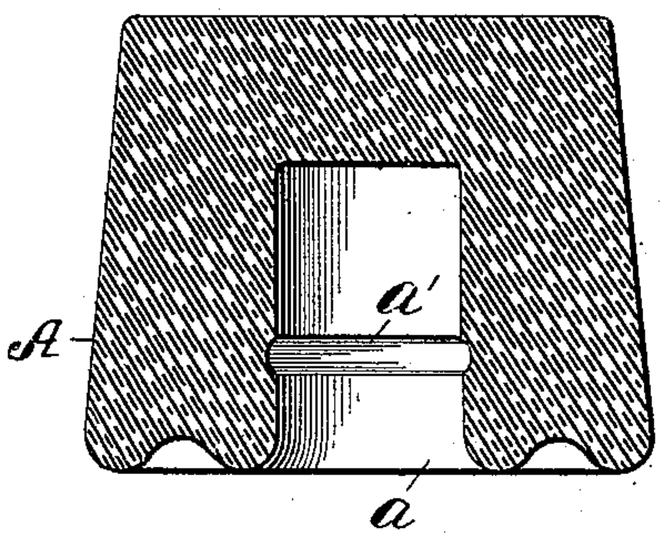
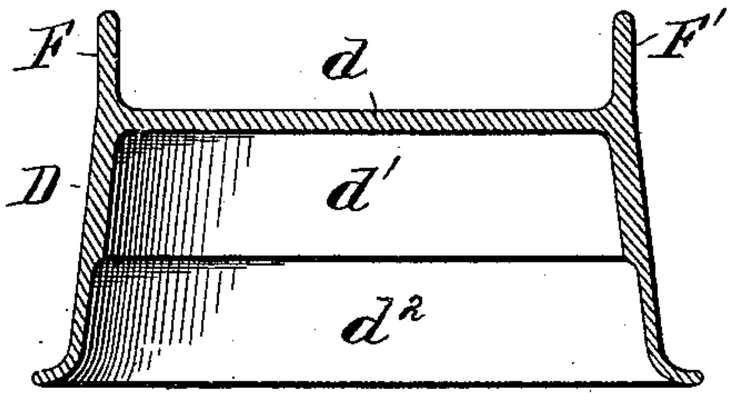


Fig. 4.



WITNESSES

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H. A. Hammond

INVENTOR

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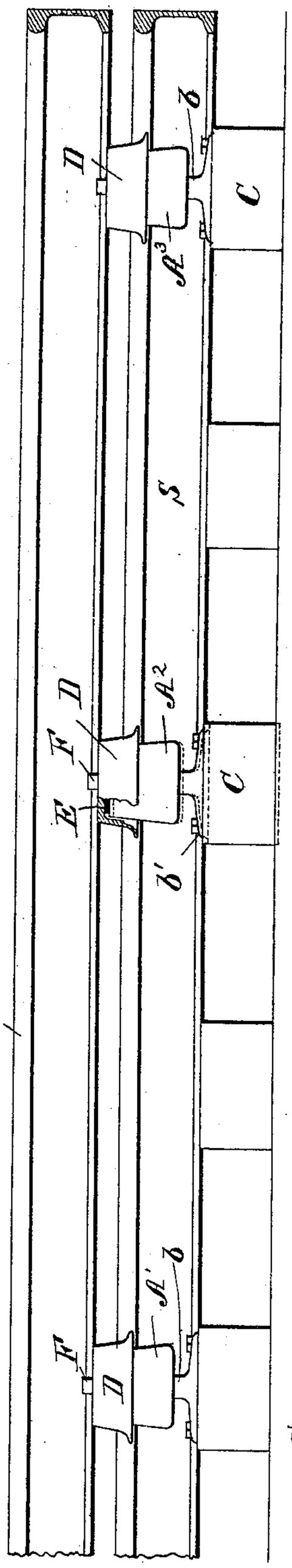

FIG. 5.

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UNITED STATES PATENT OFFICE.

CHARLES B. MARTIN, OF NEW YORK, N. Y.

RAIL-INSULATOR.

SPECIFICATION forming part of Letters Patent No. 619,974, dated February 21, 1899.

Application filed November 8, 1898. Serial No. 695,821. (No model.)

To all whom it may concern:

Be it known that I, CHARLES B. MARTIN, a citizen of the United States, residing at New York, (Brooklyn,) in the county of Kings and State of New York, have invented certain new and useful Improvements in Rail-Insulators, of which the following is a specification.

This invention relates to improvements in rail-insulators, and is particularly intended for the insulation of the contact-rail in third-rail electric-railway systems. In such systems it has heretofore been considered necessary to fasten the rail firmly to the insulator. This has resulted in frequent ruptures of the insulator by reason of the violent tensile strains on same produced by the yielding under the weight of passing trains of the cross-ties to which the insulators are fastened. As each pair of car-wheels passes a tie to which an insulator is secured it depresses same, and as the next adjacent insulators on each side will not in general be depressed at the same time the bottom of the insulator, which is fastened to the tie, is pulled away from the top, which is fastened to the contact-rail, and the consequence is that the insulator-body is often ruptured. To avoid this, I so arrange the parts that the contact-rail rests on the insulator by its own weight, and the insulator is free to fall away from the rail to a limited extent under the circumstances above specified. For this purpose I provide a cap which rests or is supported freely on the top of the insulator and engages with the rail by lugs or projections. Other features of my invention relate to the special construction and arrangement of this cap, whereby the insulating value of the construction is improved, and to other details of construction, as hereinafter set forth and claimed.

In the accompanying drawings, which form a part of this specification, Figure 1 shows my improved insulator half in section and half in elevation, a part of the rail and cross-tie being also shown. Fig. 2 is a top view of the insulator without the rail. Fig. 3 is a sectional view of the insulator-body. Fig. 4 is a sectional view of the cap. Fig. 5 is a side view of a track system with my insulator applied thereto, one of the same being shown partly in section.

The insulator-body A consists of any suitable insulating material—such as glazed earthenware, artificial stone, or similar material—and has the form of a cylinder, slightly tapering toward the top and with a central socket a in its bottom to receive the stem in shank b of the supporting-tripod B, whose feet b' are adapted to be fastened to the tie (indicated at C in Fig. 1) in any suitable manner. Cement is run into the space between the stem b and socket a, as indicated at h, and the said socket has an annular groove a', which the cement enters to form a fillet which locks the two parts together.

The bell-shaped cap D has a flat top d, a dependent flange d', having a slightly-flaring cylindrical form, and an outwardly-flaring skirt or lower rim d^2 on said flange. The cylindrical portion of the bell is a little larger than the body of the insulator which it surrounds, so as to fit loosely therein. As a consequence the cylindrical portion of the cap cannot make contact with the cylindrical part of the insulating-body A except along a line of contact, thus giving a minimum of contact for development of leakage. Furthermore, at its lower portion the bell falls away still more from the insulator to form the skirt d^2, which is not normally at any point in contact with the insulator, but is near enough to same to prevent overturning of the insulator-cap by excessive lateral strains on the contact-rail. Moreover, this skirt shields the part of the insulator-body immediately within same from the deposition of moisture, giving a zone of dry surface across which leakage is substantially prevented.

A cushion or pad E, of rubber or rubber cloth insertion material or of leather, is preferably placed on top of the insulator-body A, and the cap is set down on this pad, so that the cap does not come in direct contact with the insulator except possibly along a line of contact for a short distance on one side, and in many cases there would be no contact at all. The rubber being non-hygroscopic and being thoroughly protected from moisture by the cap, the maximum of insulating effect is thus obtained. The elasticity or cushioning effect of the rubber is also of some value in deadening the hammering effect of the cap on the insulator.

The top of the cap is provided with lugs

F F′, which are adapted to extend up on each side of the bottom flange of the rail R and to maintain same in place laterally without, however, gripping the rail tightly or preventing its longitudinal movement, such as may result from expansion and contraction. The cap D is preferably made of malleable metal, such as malleable iron, so that the lugs F F′ may be bent down after the rail is in place, as shown in Fig. 1, so as to more securely hold the rail from lateral displacement or overturning. In some cases, however, this may not be necessary.

It will be observed from the above that the cap is not fastened to the insulator-body, but is only supported thereon in such a manner as to prevent lateral displacement, so that even when the cap is arranged to grip the rail the vertical movement of the insulator away from the rail will not result in any strain on the insulator-body, but will result only in the insulator-body falling away from the cap. This is illustrated in Fig. 5, where S represents one of the track-rails, and C the ties, and wherein three insulators $A' A^2 A^3$ are shown supporting a single contact-rail R. As any set of train-wheels passes over a cross-tie which supports any one of the insulators, as A^2, the latter drops with the tie, as indicated in dotted lines in said figure, while the cap and the contact-rail remain in normal position.

The insulators described interposed between the third rail and its supporting-ties prevent lateral movement of the third rail and also support the same vertically; but as the third rail rests freely on said insulators it is possible for any one of the insulators to drop away from the third rail or, in other words, to have a vertical movement relatively thereto, leaving said rail supported on the other insulators.

In stating that the insulators prevent lateral movement I do not mean that they absolutely bind the rail, but only that lateral movement to any substantial extent is prevented, the rail, however, being preferably held with sufficient looseness to enable the expansive and contractile movements thereof.

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

1. A rail-insulator comprising an insulating-body, and a bell-shaped cap surrounding same, and supported freely thereon, but capable of vertical movement relatively thereto, and provided with means on its top for engaging with the rail to be supported.

2. A rail-insulator comprising an insulating-body, a bell-shaped cap surrounding same loosely, so as to be mostly out of contact therewith, said cap being supported only at its top on the said insulating-body, and being capable of vertical movement relatively thereto, and said cap being provided with upwardly-extending lugs adapted to engage with the rail.

3. In combination with a rail, an insulator therefor comprising an insulating-body, a bell-shaped cap surrounding same loosely and freely supported thereon, said cap being provided with lugs loosely engaging the rail.

4. In a third-rail electric-railway system, the combination with the track-rails and the cross-ties, of a contact-rail and insulators therefor comprising supports attached to the cross-ties, and insulating-bodies interposed between the contact-rail and the support, and supporting the contact-rail loosely, to allow the cross-tie and attached supports to move vertically relatively to the contact-rail, but prevent lateral movement of said rail.

5. A third-rail insulator comprising a support attached to the railroad-tie, an insulating-body attached to the support, and a cap supported freely on the insulating-body and having lugs adapted to engage the third rail.

6. A rail-insulator comprising a support, an insulator-body attached thereto, an elastic insulating-cushion resting on said body, and a bell-shaped cap resting on said cushion and loosely surrounding the insulator-body, and provided with means for engaging with the rail.

7. In a third-rail electric-railway system, the combination with the track-rails and third rails, and the ties supporting said rails, of insulators interposed between the third rail and the ties supporting same, the said third rail resting freely on said insulators so as to be capable of vertical movement relatively to the supporting-ties, and means for preventing lateral movement of the third rail, substantially as set forth.

8. In a third-rail electric-railway system, the combination with the track-rails, the third rail, and ties supporting said rails, of insulators interposed between said third rail and its supporting-ties and permitting relative vertical movement of said parts while preventing lateral movement thereof.

9. A rail-insulator comprising an insulator-body, a bell-shaped cap supported thereon and surrounding same, said cap having a lower portion of larger internal diameter, so as to be normally altogether out of contact with the insulator-body.

CHARLES B. MARTIN.

Witnesses:
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M. V. BIDGOOD.