

(No Model.)

F. N. BELL.  
ELECTRICAL CONNECTOR.

No. 539,024.

Patented May 14, 1895.

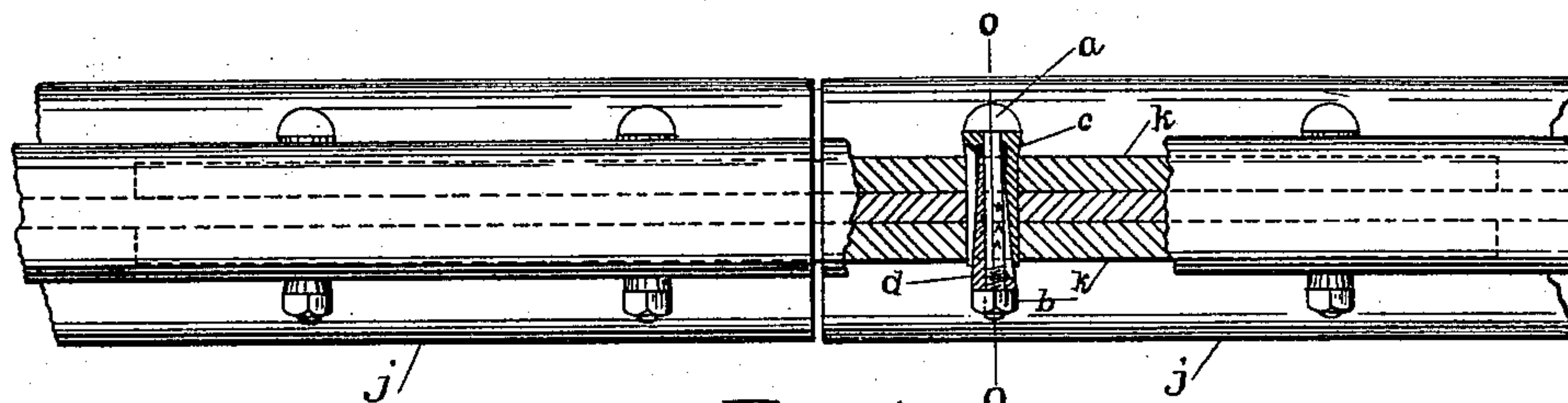


Fig. 1.

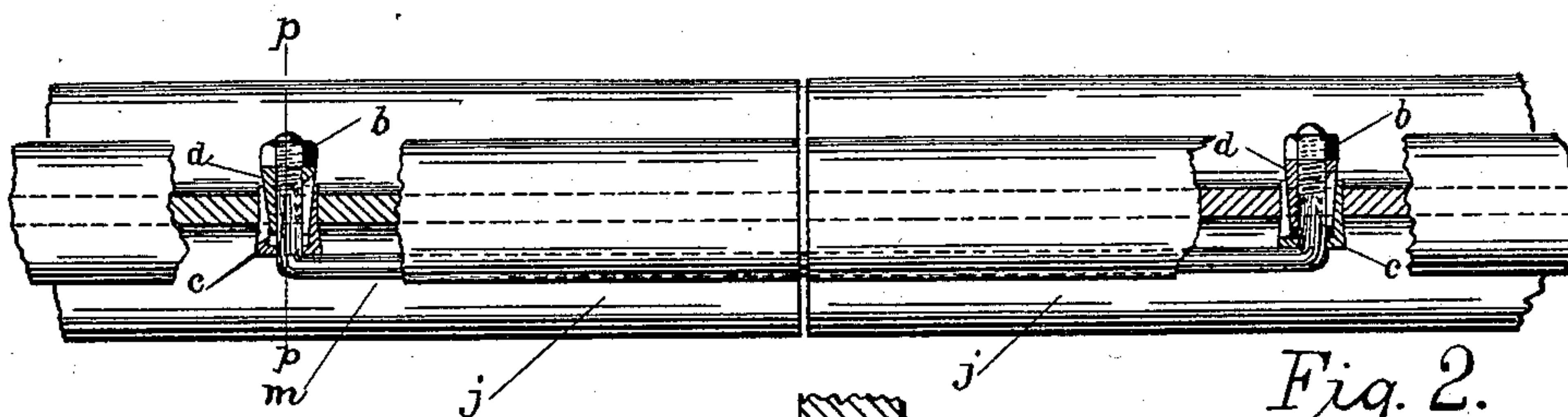


Fig. 2.

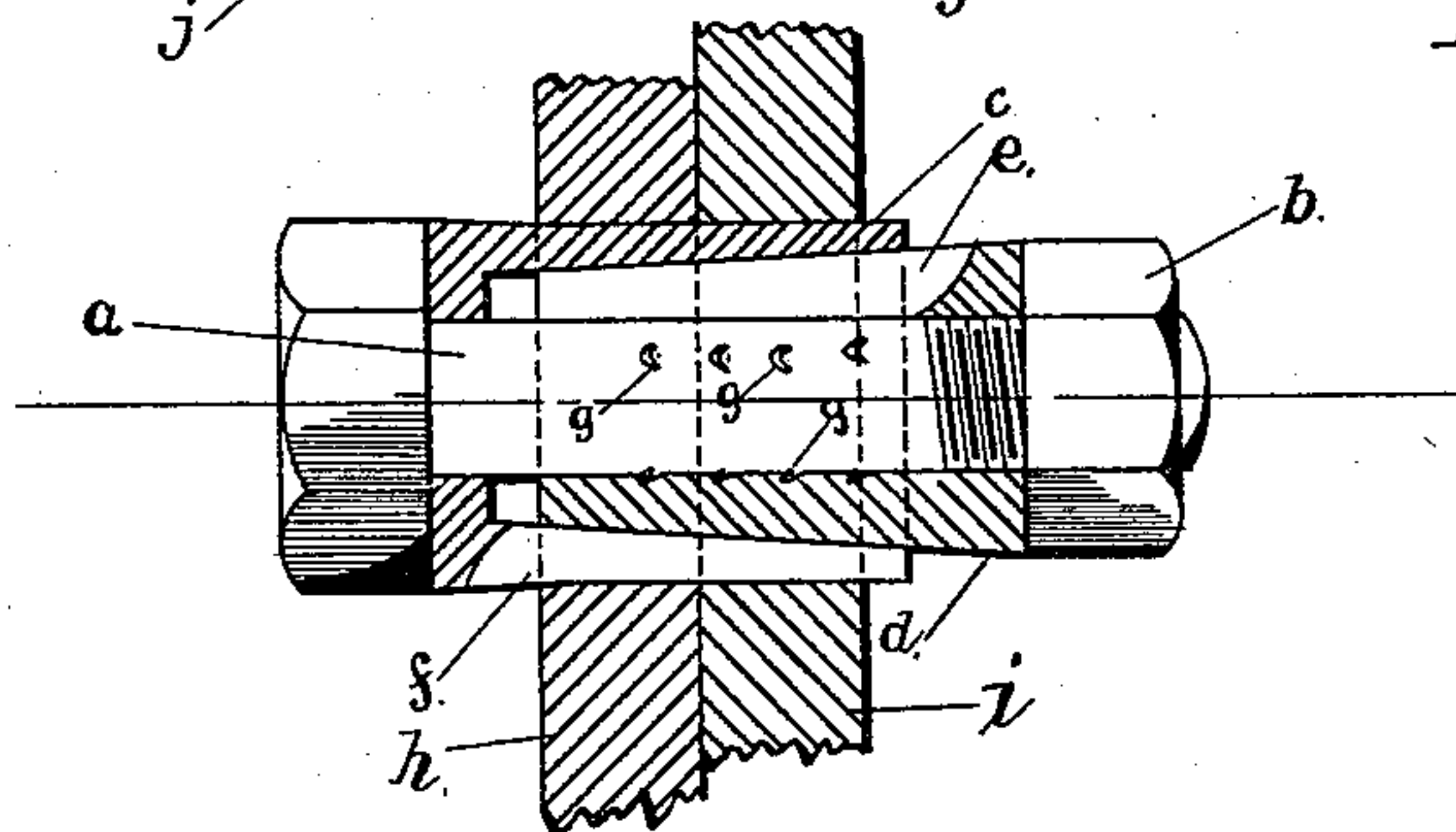


Fig. 3.

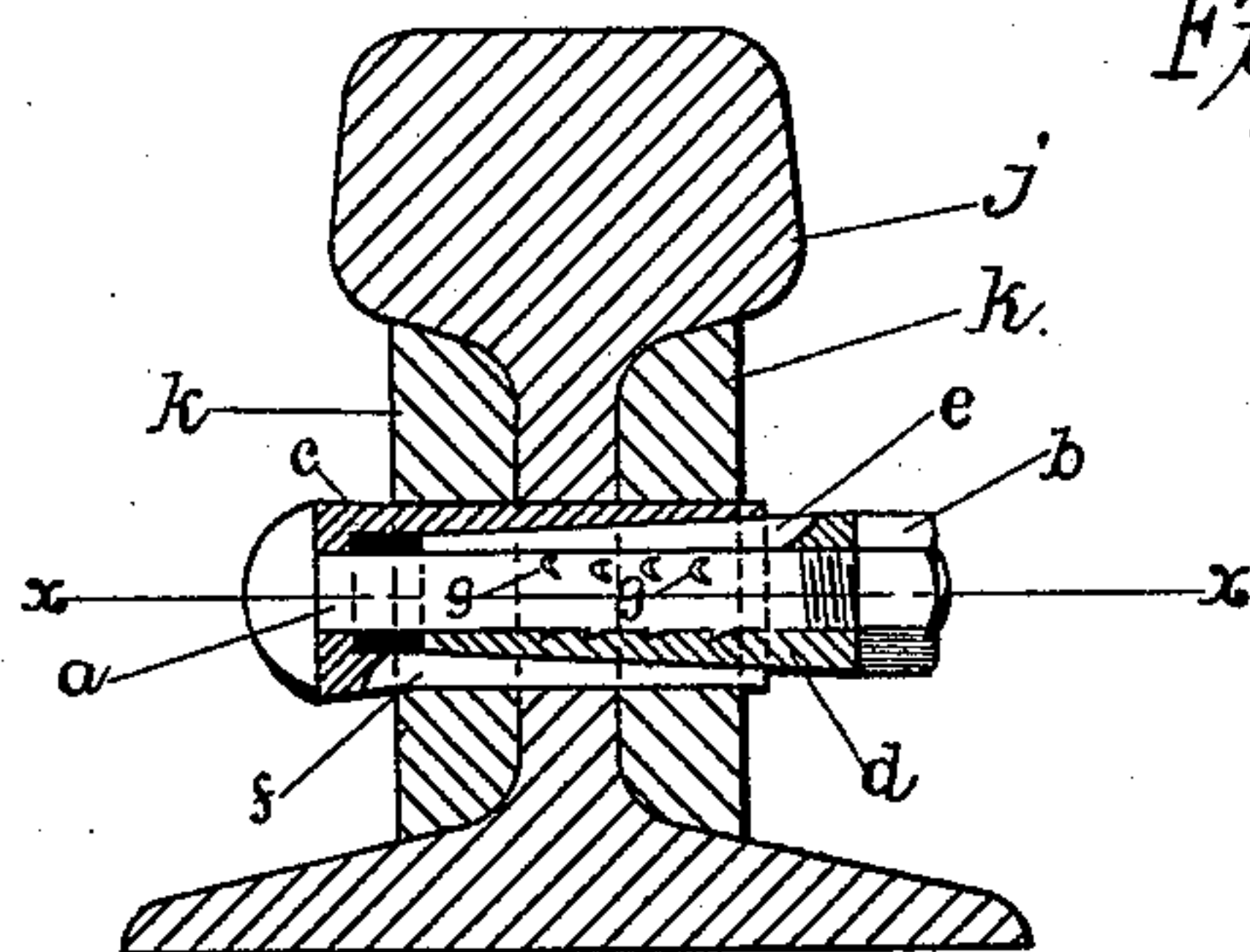


Fig. 4.

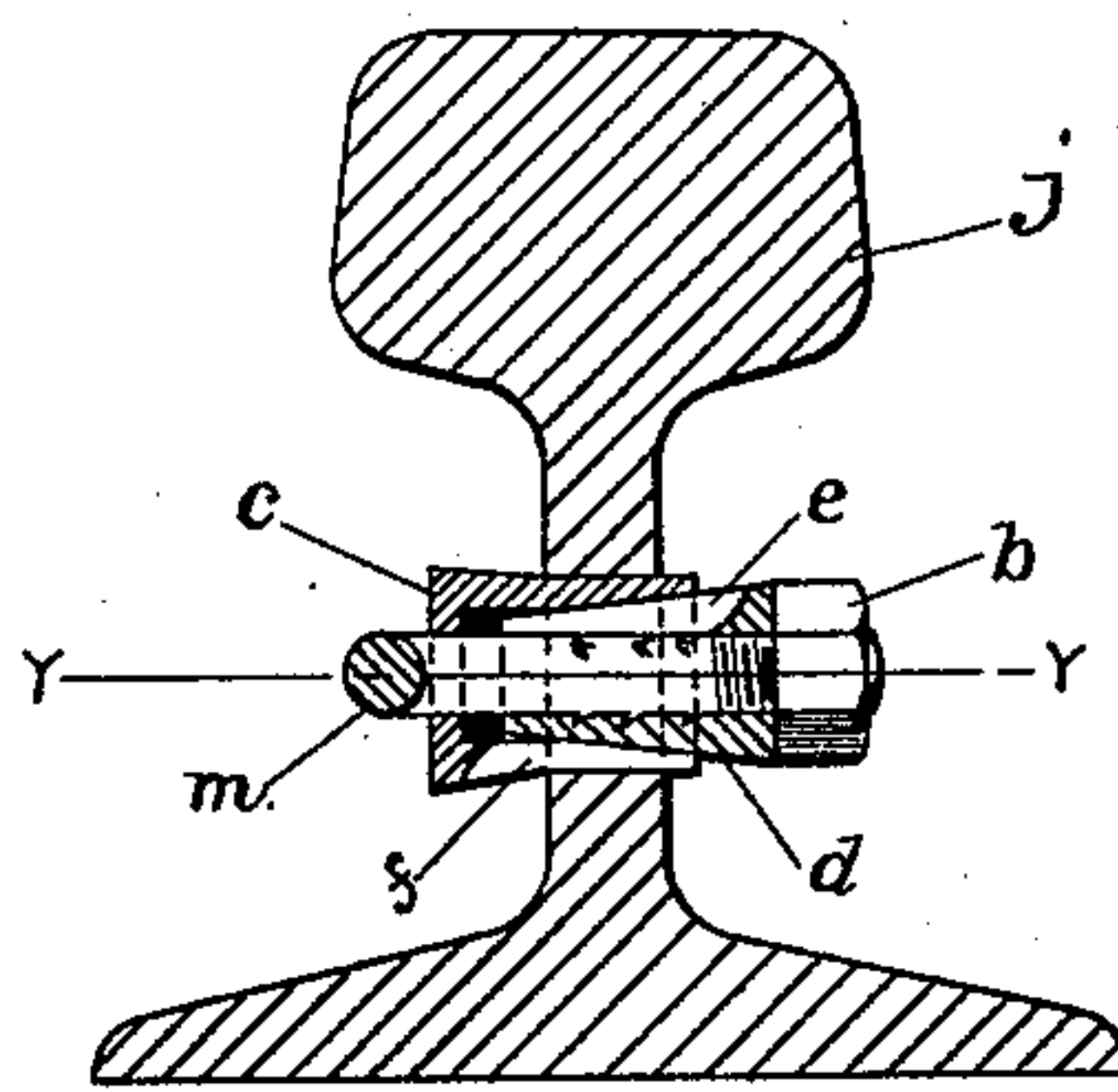


Fig. 5.

Witnesses.  
Fred. B. Reynolds  
E. H. Carroll.

Inventor.  
Frank N. Bell



# UNITED STATES PATENT OFFICE.

FRANK N. BELL, OF MILFORD, MASSACHUSETTS.

## ELECTRICAL CONNECTOR.

SPECIFICATION forming part of Letters Patent No. 539,024, dated May 14, 1895.

Application filed July 28, 1894. Serial No. 518,858. (No model.)

*To all whom it may concern:*

Be it known that I, FRANK N. BELL, a citizen of the United States, residing at Milford, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Electrical Connectors; and I do 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 appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates in a minor degree to bolt locks, but bears a much more important and intimate mechanical relationship to electrical connectors, as an improvement in which class of devices it is especially designed. Its objects are to secure a perfectly firm and even metallic contact throughout the length and against the entire interior surface of the bore in the web of the rails surrounding the invention; to provide against the separation of the parts by the jarring of ordinary service, and to afford ready and reliable means of taking up wear or looseness from any cause.

My invention consists, particularly, of an ordinary headed bolt with a threaded end and nut, an outer split thimble of metal and an inner split sleeve. Upon the surface of the bolt are formed raised points or jagged projections which are pressed into the inner sleeve, the various parts being thus additionally secured in position and the desired contact maintained. In lieu of a bolt, and forming the necessary metallic union between the ends of abutting rails, I use a rod having its ends threaded and provided with nuts, said rod being nicked near the ends as in the case of the bolt, and a short length at each end of the rod bent at approximately right angles with the remainder, to be passed through the split thimbles as more minutely described hereinafter.

In the accompanying drawings like letters represent corresponding parts in the several views.

Figure 1 is a plan of a rail-joint with part of a horizontal section view of my connector in position passing through fish-plates and web. This section follows the line *xx* in Fig.

4. Fig. 2 is a plan and in part a horizontal section of two rail ends joined web to web by a rod bent for use with my device. This section is upon the line *yy*; Fig. 5. Fig. 3 is a larger part sectional view of the bolt-connector. Fig. 4 is a view, partly in vertical section, upon the line *oo* of Fig. 1; and Fig. 5, a similar vertical cut following the line *pp* of the second figure.

First to be described is the outer split thimble, *c*. The exterior and interior surfaces of this piece form truncated cones with bases at opposite ends of the thimble. The base of the outer and the smaller end of the inner conical surface are closed to a central aperture admitting the bolt. The wall of the piece is split longitudinally upon as many lines and to such length as will permit the desired expansion from pressure.

The interior of the inner sleeve or thimble, *d*, fits the bolt, while its exterior possesses a taper corresponding to the interior of the thimble, *c*, although of slightly greater average diameter. Sleeve, *d*, is split lengthwise as in the case of *c*. The bolt is in common form and in practice the surface is nicked or ruptured raising, as in Fig. 3, the jagged projections, *g g*. It will be observed that in using the connecting rod with my invention the bends in the rod act in the same manner as the head of the bolt in the relations of the parts.

In combining the members above described, bolt, *a*, or the perpendicular rod-ends pass through the base of thimble, *c*, said thimble being thrust into the orifice bored in the rail for its reception. The smaller end of the sleeve, *d*, which encircles the bolt, is inserted and pressed well into the hollow of the outer thimble and the nut screwed on the bolt beyond *d*. The head of the bolt being held fast, the nut is set up and an obvious compound pressure exerted along the entire bore in the rail and between the inner surface of the sleeve, *d*, and the bolt. The projections, *g g*, are forced into *d*, and the parts thus maintained in proper position even when the nut is taken off. By the co-operation of the parts as above detailed I obtain and maintain a reliable and adequate contact between metal surfaces for the passage of current electricity without loss by heating, a consideration of paramount im-



portance in every day electric railway practice.

Having thus sufficiently described my invention, what I claim, and desire to protect by Letters Patent, is—

1. In an electrical connector, an outer thimble having one end closed to a centrally located bolt hole, the walls of said thimble being split, upon one or more lines, in the direction of the length, an inner sleeve or thimble having a tapering exterior surface and adapted to enter the hollow of said outer thimble and to expand the same upon being subjected to end pressures from a screw-bolt or bent connecting rod passing through said thimble and sleeve, substantially as shown and described for the purpose set forth.

2. In an electrical connector, an outer thimble having one end closed to a centrally located bolt hole, the exterior surface of the said thimble tapering from said partly closed end and the interior surface tapering toward said end, the wall of the thimble being split lengthwise upon one or more lines, an inner sleeve or thimble provided with a tapering exterior surface corresponding to the interior taper of the said outer thimble but of slightly longer mean

diameter, the said inner sleeve split upon one or more lines through part of its length and adapted to enter and expand said outer thimble upon receiving end pressure from the bolt, the whole constructed substantially as shown and described for the purpose set forth.

3. An electrical connector consisting of an outer split thimble, *c*, having oppositely tapering exterior and interior surfaces, the inner split sleeve, *d*, having a tapering exterior adapted to enter and expand the said thimble, *c*, upon receiving end pressure from a bolt or angle rod having ruptures or jagged projections, *g g*, raised from its surface and forced into the inner surface of sleeve, *d*, when the parts are pressed together, serving to hold the device in position even if the nut is unscrewed, the whole constructed and arranged substantially as shown and described for the purpose set forth.

In testimony whereof I affix my signature in presence of two witnesses.

FRANK N. BELL.

Witnesses:

CHARLES A. BLAISDELL,  
ADOMIAM J. WILKINSON.