

No. 750,509.

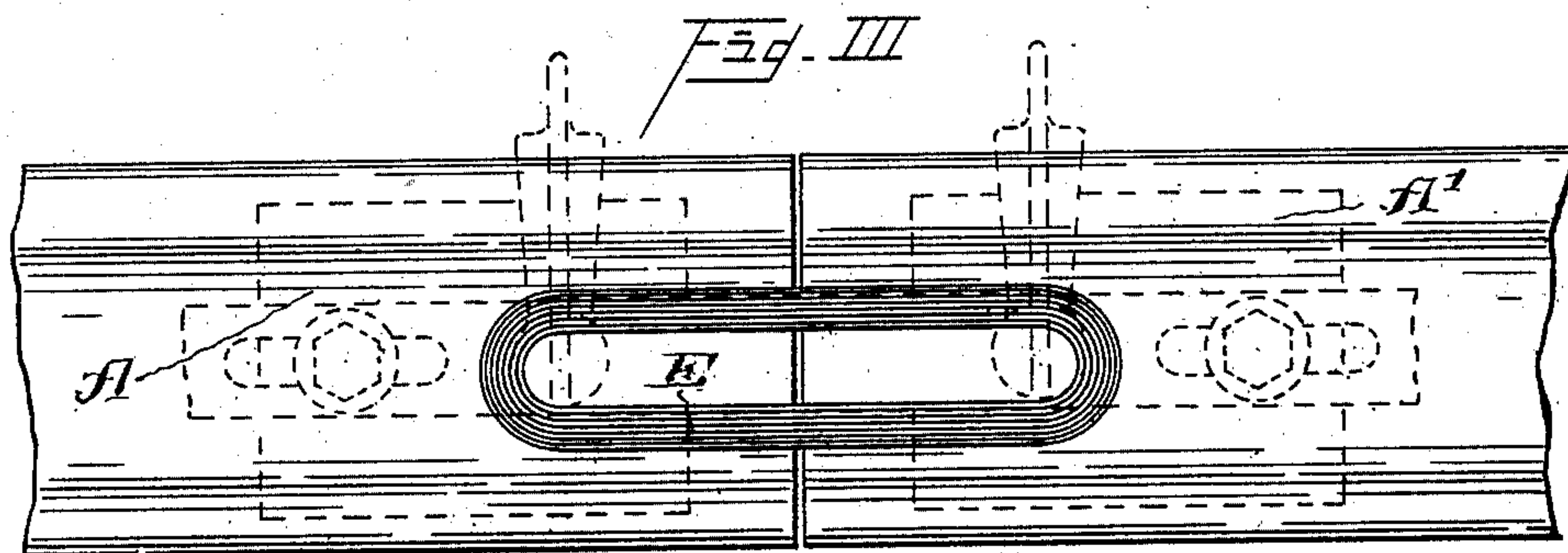
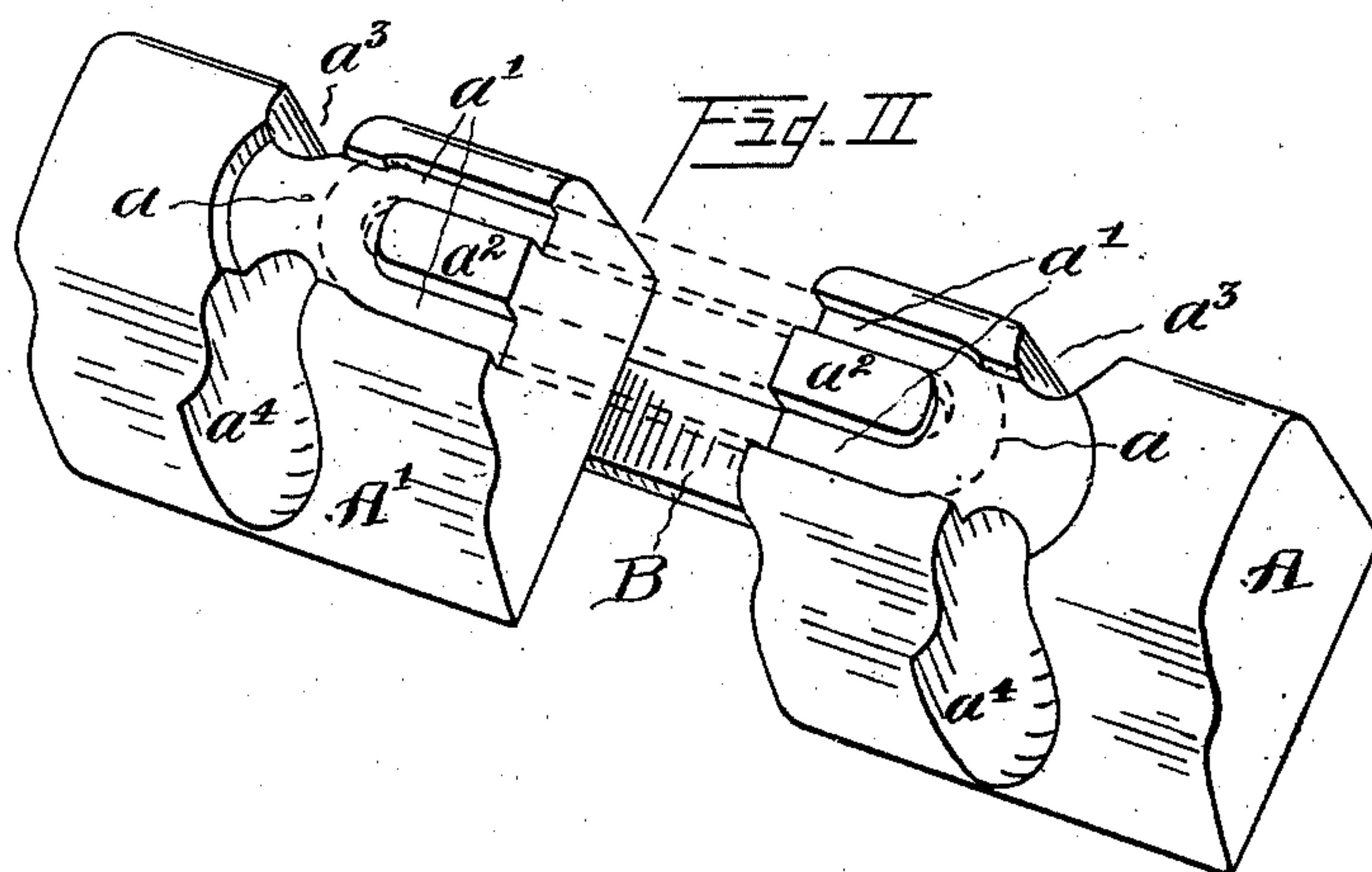
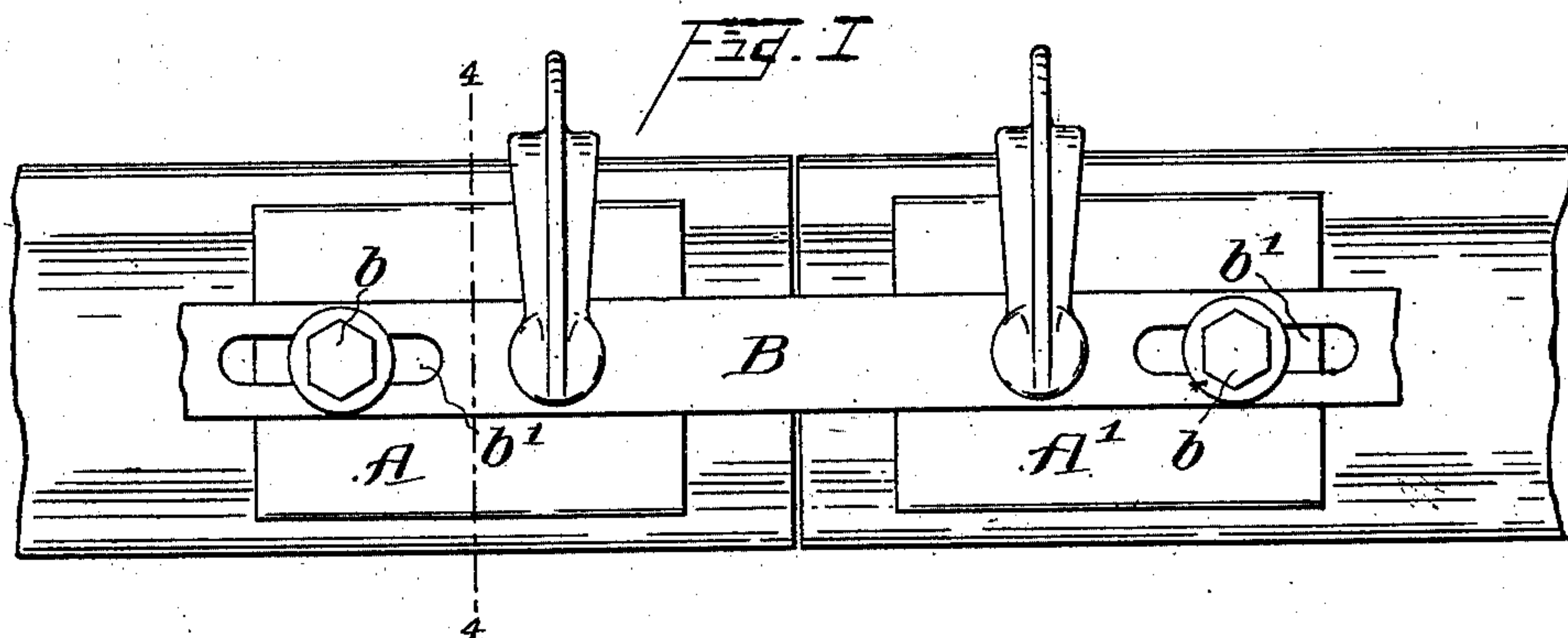
PATENTED JAN. 26, 1904.

W. H. WHERRY.  
ELECTRICAL CONDUCTOR.

APPLICATION FILED NOV. 3, 1902. RENEWED OCT. 1, 1903.

NO MODEL.

2 SHEETS—SHEET 1.



Witnesses:

A. L. Lord.  
W. Merkel.

Inventor.

W. H. Wherry  
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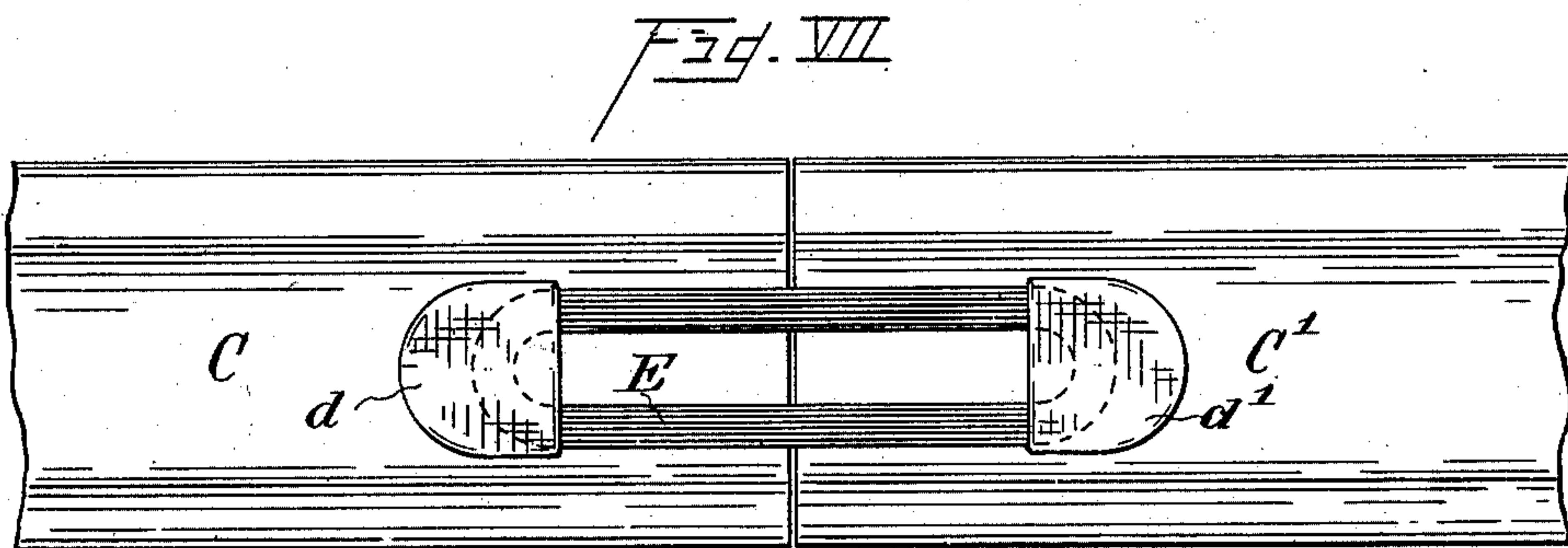
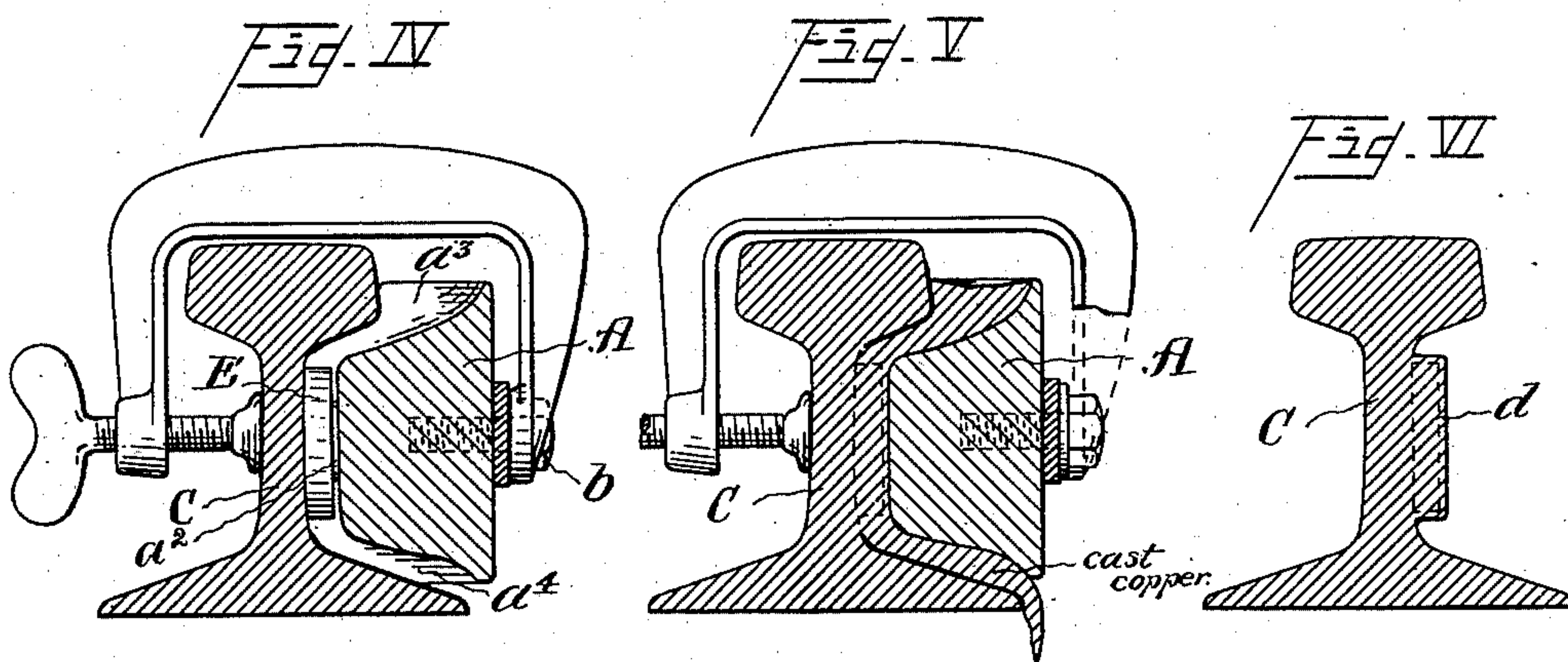
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2 SHEETS—SHEET 2:



Witnesses:

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# UNITED STATES PATENT OFFICE.

WILLIAM H. WHERRY, OF CLEVELAND, OHIO.

## ELECTRICAL CONDUCTOR.

SPECIFICATION forming part of Letters Patent No. 750,509, dated January 26, 1904.

Application filed November 3, 1902. Renewed October 1, 1903. Serial No. 175,324. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM H. WHERRY, a citizen of the United States, and a resident of Cleveland, county of Cuyahoga, and State of Ohio, have invented a new and useful Improvement in Electrical Conductors, of which the following is a specification, the principle of the invention being herein explained and the best mode in which I have contemplated applying that principle, so as to distinguish it from other inventions.

My invention relates to electrical conductors.

Said invention consists of means hereinafter fully described, and specifically set forth in the claims.

The annexed drawings and the following description set forth in detail certain means embodying the invention, such disclosed means constituting but one of various mechanical forms in which the principle of the invention may be used.

In said annexed drawings, Figure I represents a side elevation of two abutting rail ends, showing the mold for casting the bond-terminals upon the rails secured thereon. Fig. II represents a perspective view of said mold. Fig. III represents a side elevation of said rail ends, showing a bond-loop in position thereon ready for union with the rails, the mold being shown in dotted lines in proper position for casting. Fig. IV represents a vertical transverse section taken upon the plane represented by line 4 4 in Fig. I. Fig. V represents a similar section, showing the mold filled with copper united with the rail. Fig. VI represents a similar section with the mold removed and showing the bond-terminal trimmed. Fig. VII represents a side elevation of the rail ends and completed and finished bond.

Referring to the drawings by letters, C and C', Fig. VII, indicate the two abutting rail-sections. *d* and *d'* indicate the two terminals of the copper connector cast integral with the sides of the respective rail-sections. A loop of copper wire E is made in one of the many forms in which copper is used to form a conductor between the terminals of a copper connector, such as a single wire, a flexible strand,

a plurality of flexible strips or wires, or a cable, &c., such conducting strips or wires being connected integrally with the terminals at the time of the casting of the latter. In case it is desired to secure a definite line of demarcation between the cast copper and the exterior steel or to cast the copper upon a definite area of the steel refractory material may be used in the well-known manner for utilizing non-fusible substances to cover these exposed parts of the steel, which should be protected from the molten metal. A mold can be fitted over the steel where it is desired to cast the copper, such mold having proper sprues, which may be at the top and bottom to allow of the entrance and escape of molten copper, which is preferably allowed to run continuously through the mold until the steel becomes heated, softer, and more porous, and an intimate and permanent union is effected between the copper and the steel, the two metals forming an alloy when the desired quantity of molten copper is retained upon the steel and allowed to cool. The molten copper that escapes from the bottom of the mold can be reheated and again used. The length of time the molten copper should be let run and the amount of copper allowed to run through the mold depend upon the copper and the steel which it is desired to unite. It may often be found advisable to heat and soften the steel by means other than that of letting the copper run for a sufficient time to accomplish these ends, such as a hot blast or any other well-known method of heating a metal. The mechanical devices of first cleansing the surface of the steel by emery or other means and also of nicking it with a hard tool will both be found serviceable in obtaining a more intimate contact of the metals.

Although my improved process can be used upon all occasions where it is desired to cast copper to steel, it will be found peculiarly applicable in casting rail-bonds integral with steel rails.

By "copper wire" I mean a single wire, a flexible strand, a plurality of flexible, flat, or round wires, or any other shape or number of connectors that may be used to electrically unite two rails.



The mold illustrated consists, preferably, of two duplicate cast-iron parts A and A', joined by a bar B, secured to such parts by means of screws *b b* passing through elongated slots *b' b'*, whereby the distance between the molds may, as will be readily understood, be changed or adjusted to correspond with different lengths of bonds. Each such mold part is formed to snugly fit between the under surface of the rail-tread and the upper surface of the rail-flange, as shown in Figs. IV and V, and against the web. The inner surface thereof is provided with a terminal-recess *a* and loop-recess *a'*, the latter in the particular form illustrated being divided by a projection *a<sup>2</sup>*. Recess *a'* is adapted to receive the end of the bond-loop, which snugly fits therein, so as to prevent metal from flowing therethrough, such recess being of a depth equal to the thickness of the loop. The outer end of projection *a<sup>2</sup>* is rounded to fit the interior curved surface of such loop. A loop located in the mold is shown in dotted lines in Fig. II, whereby it is seen the loop projects a short distance into recess *a*. Communicating at the top and bottom, respectively, with each recess *a* are two sprues *a<sup>3</sup>* and *a<sup>4</sup>*, the sprue *a<sup>3</sup>* being somewhat enlarged at its outer end to facilitate the pouring of the copper therein. The recess *a* is made slightly deeper than recess *a'*. Before applying such described mold to the rails the interior surfaces of the recesses and sprues are covered with a material which will prevent the union or sticking of the copper to the mold. A suitable substance for this purpose is clay mixed in liquid form commonly called "clay-wash." A loop is now laid in the mold, as indicated in said Fig. II. That part of the surface of the rail-web upon which the terminals are to be cast—that is, the surface immediately behind the recess *a* when the mold is in place—is now prepared as above described. The mold is now placed in position against the rail ends and securely clamped thereto by any suitable means. Copper is

now poured through sprue *a<sup>3</sup>* into recess *a*, from whence it flows out of sprue *a<sup>4</sup>*. After such flowing of copper has sufficiently heated the rail-web it is stopped by plugging up the lower end of sprue *a<sup>4</sup>* and permitted to set. After setting the mold is removed. The copper terminal formed by recess *a* will now be found to be intimately united with the rail and alloyed therewith, said terminals inclosing the ends of the wire, though not necessarily the face of the wire farthest removed from the rail. The superfluous metal above and below the terminal is now cut off, leaving the bond completed and trimmed, as shown in Figs. VI and VII.

Other modes of applying the principle of my invention may be employed instead of the one explained, change being made as regards the mechanism herein disclosed, provided the means stated by any one of the following claims or the equivalent of such stated means be employed.

I therefore particularly point out and distinctly claim as my invention—

1. An electrical conductor, consisting of two conductors, a length of wire to serve as an electrical connector between said two conductors, and cast-metal terminals interposed between the wire and the conductors, said terminals inclosing the ends of the wire, each terminal being cast integral with the wire and a conductor.

2. An electrical conductor, consisting of two conductor-rails, a length of wire to serve as an electrical connector between said conductor-rails, and cast-metal terminals interposed between said wire and conductor-rails, each terminal cast integral with the wire, and alloyed with a conductor-rail.

Signed by me this 1st day of November, 1902.

WILLIAM H. WHERRY.

Attest:

D. T. DAVIES,  
A. E. MERKEL.