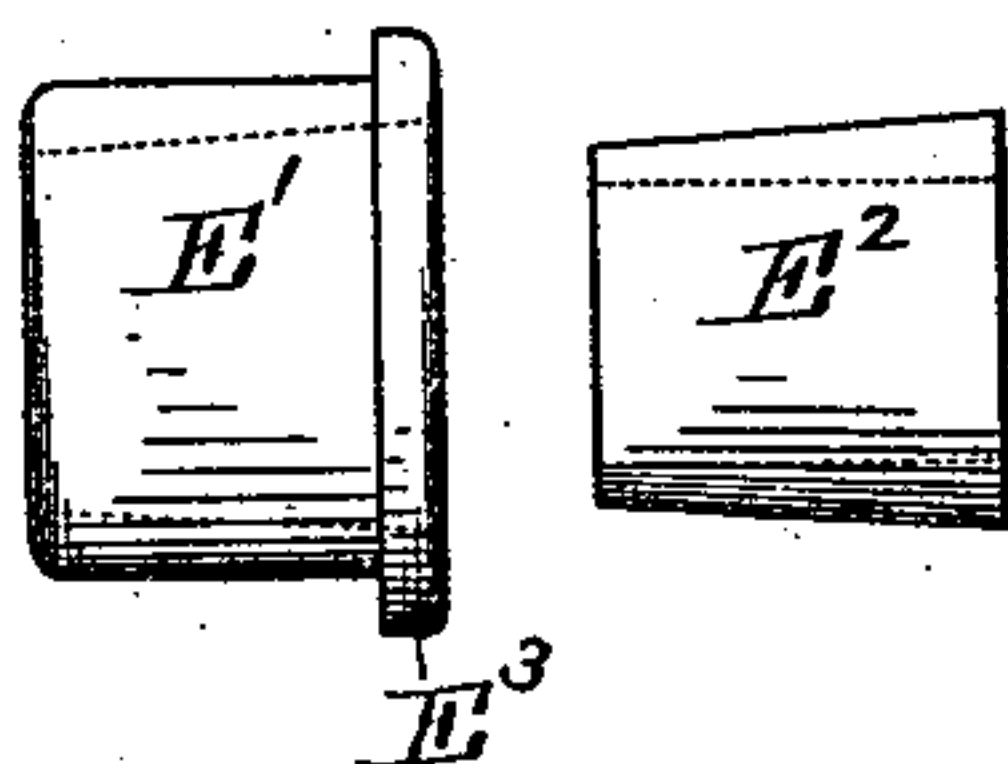
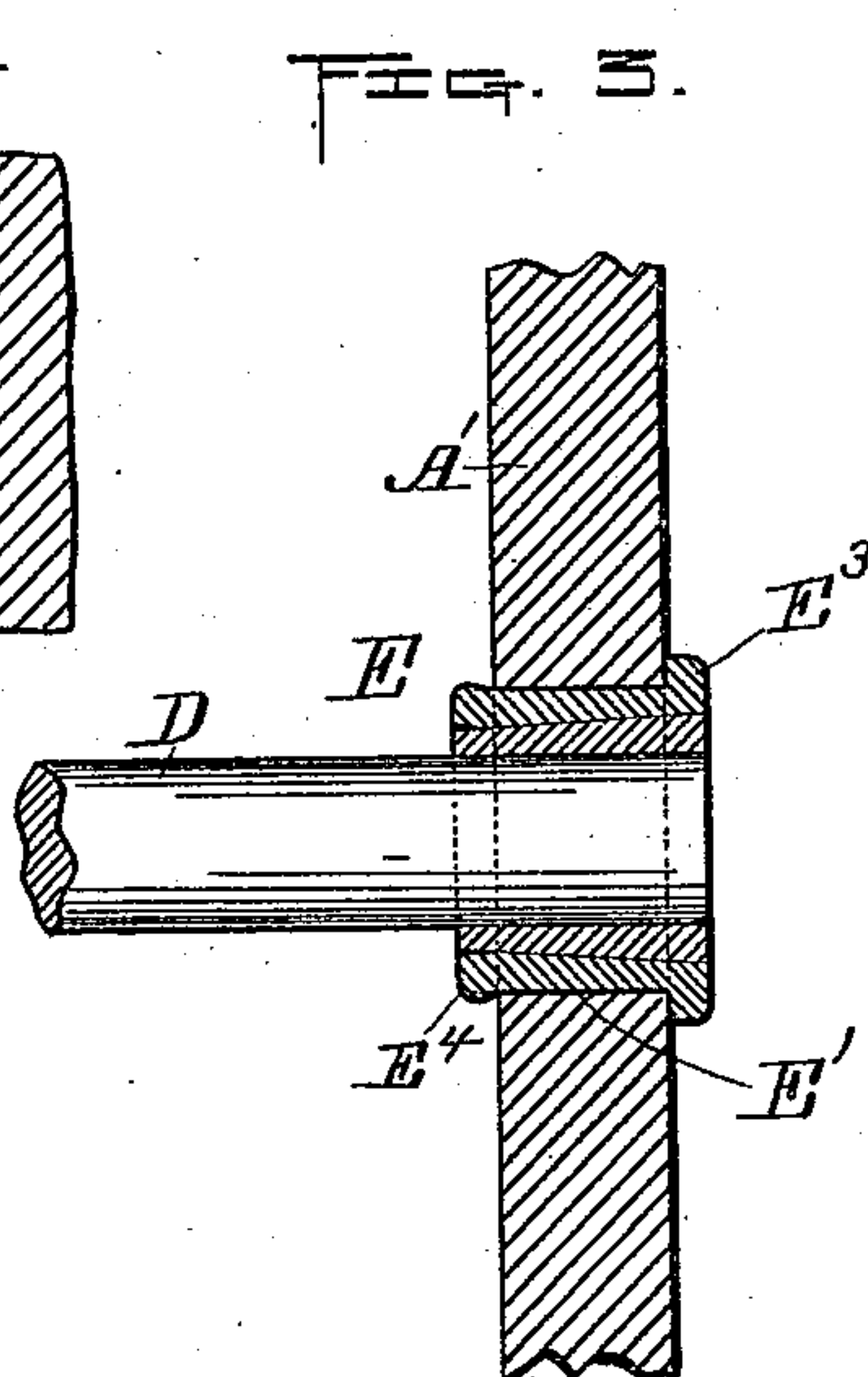
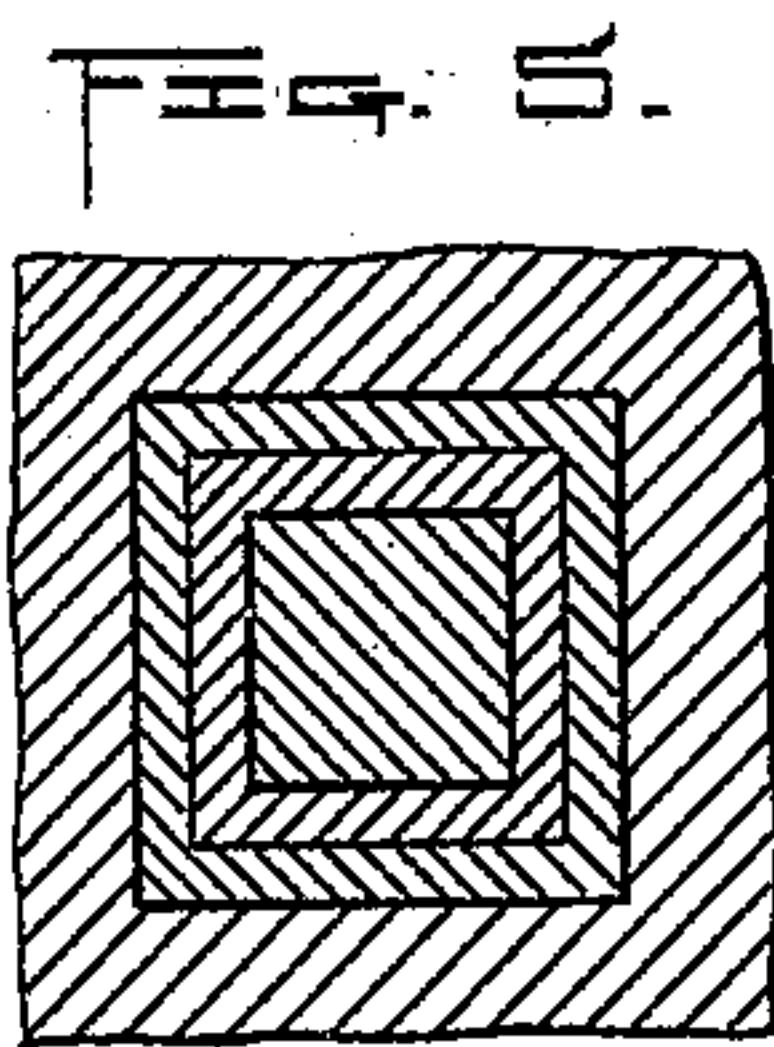
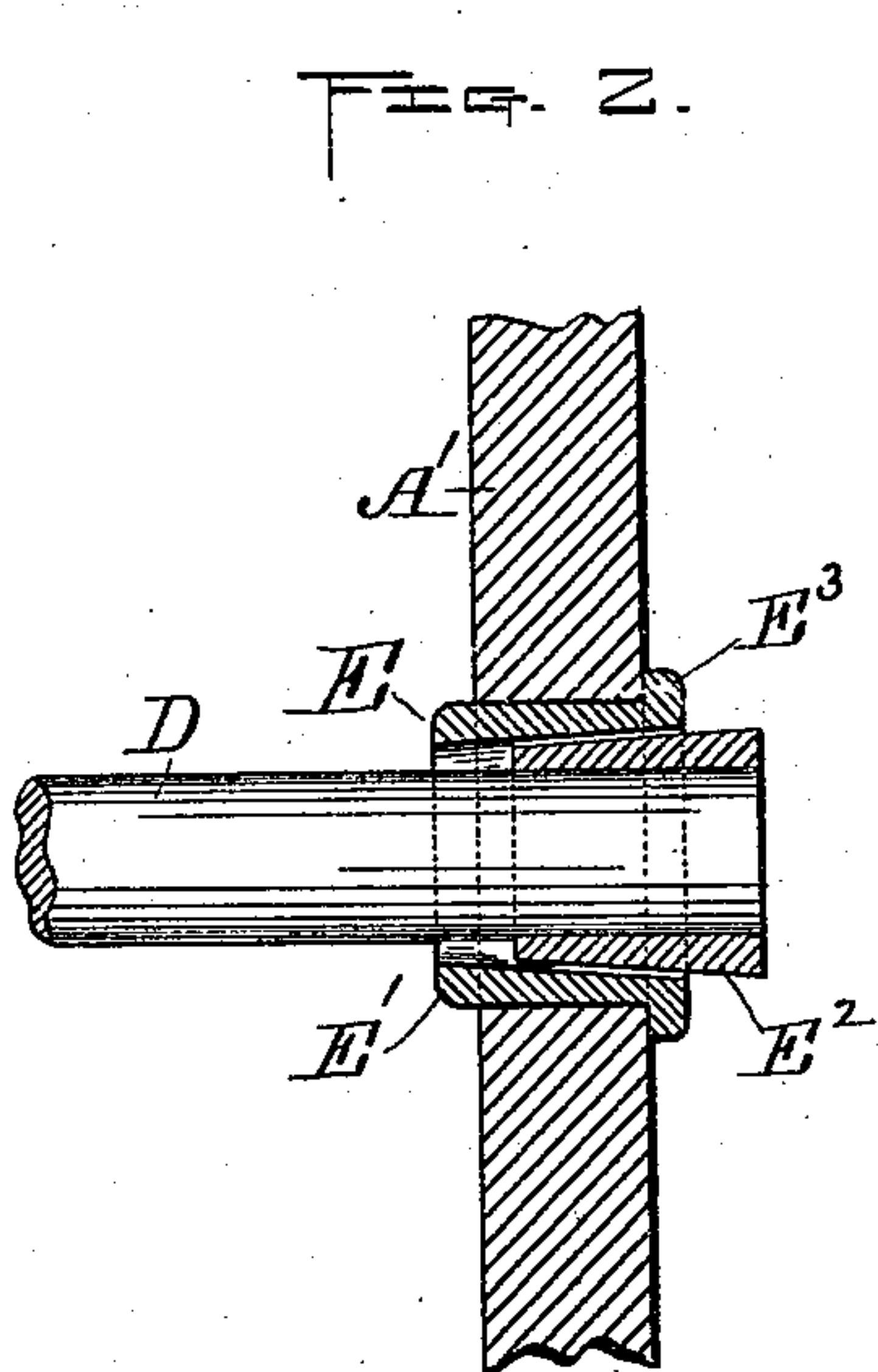
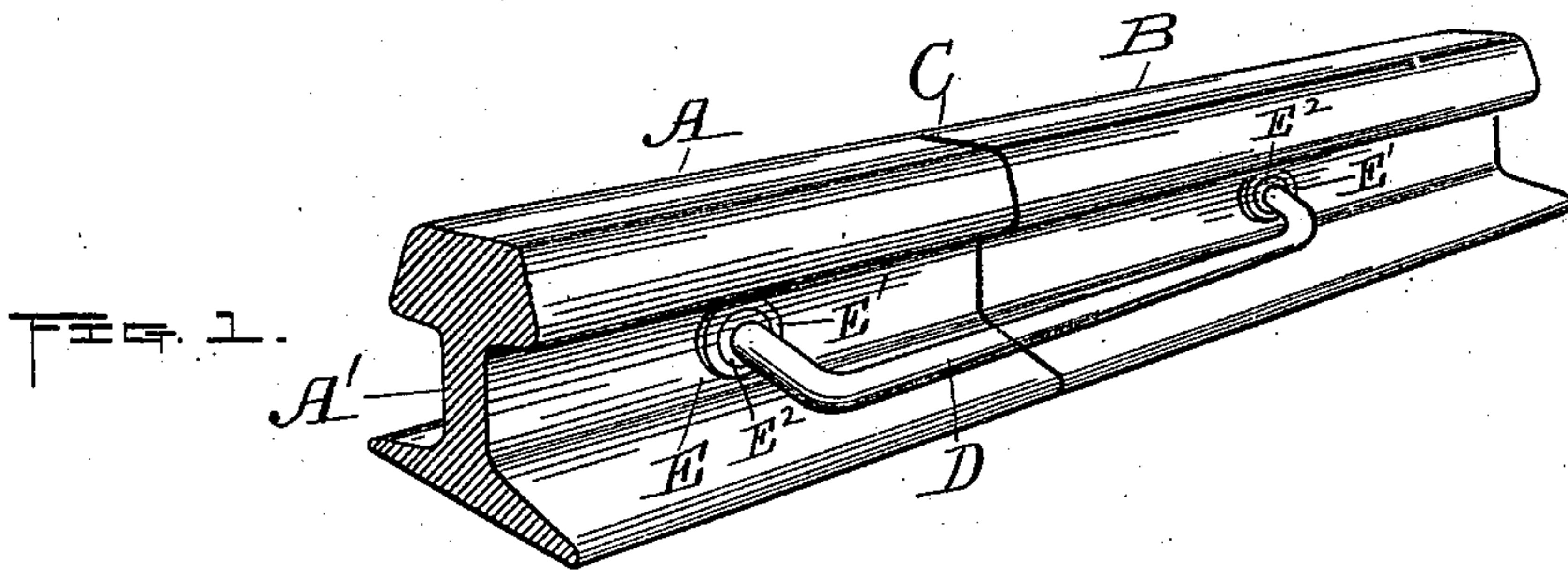


(No Model.)

W. H. WIGGIN.  
ELECTRIC RAIL BOND.

No. 551,021.

Patented Dec. 10, 1895.



Witnesses,

Walter B. Nourse.  
C. Forrest Nourse.

Inventor,

William H. Wiggin.  
By A. A. Barker. Atty



# UNITED STATES PATENT OFFICE.

WILLIAM H. WIGGIN, OF WORCESTER, MASSACHUSETTS.

## ELECTRIC RAIL-BOND.

SPECIFICATION forming part of Letters Patent No. 551,021, dated December 10, 1895.

Application filed May 22, 1895. Serial No. 550,189. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM H. WIGGIN, of the city and county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Electric Rail-Bonds; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, forming a part of this specification, in which—

Figure 1 represents my said improved rail-bond applied to two sections of rail at each side of the abutting ends or joint thereof, as in practice. Fig. 2 represents upon an enlarged scale a transverse section through the rail-flange and my improved bond device for securing the end of the copper connecting-rod in position in said rail with the parts fitted in said rail-flange ready to be driven into position, as will be hereinafter more fully described. The following figures are also upon the same enlarged scale. Fig. 3 represents a similar view to that shown in Fig. 2, with the parts driven into position to complete the bond at one end of the aforesaid copper connecting-rod. Fig. 4 represents detached side views of the two collars or sleeves employed in making my improved bond, the construction and application of which will be hereinafter explained; and Fig. 5 shows a modification in the construction hereinafter described.

The object of my invention is to produce a rail-bond for electric-railroad rails which shall be simple in construction, easily applied, and whereby a perfect bond or contact between the connecting-rod and rail-flange may be obtained at a nominal expense.

It consists in combining with the ends of said connecting-rod and rail-flange an outer sleeve or collar adapted to fit in the rail-flange opening, and which is inserted from the outside toward the inside of the rail or in the direction toward the connecting or bond rod, and provided with an annular outwardly-projecting flange or rim at one end adapted to bear against the rail-flange, and also having a funnel-shaped longitudinal opening converging in the direction toward said body of the connecting-rod, and an inner sleeve or collar adapted to fit over the end of the connecting-rod and made conical-shaped upon the outside to correspond with and fit into the

funnel-shaped longitudinal opening of the aforesaid outer sleeve or collar, the bond being effected by driving the said inner conical-shaped sleeve or collar into the outer one, as will be hereinafter more fully set forth.

To enable others skilled in the art to which my invention appertains to better understand the nature and purpose thereof, I will now proceed to describe it more in detail.

In the drawings, A B represent two sections of railroad-rail with their ends abutting, as is indicated by the line C.

D indicates the usual copper connecting-rod, whose ends are connected to the rail-flange A' or other portions of the rails by means of the bond device E. Said device consists of the outer sleeve or collar E' and the inner sleeve or collar E<sup>2</sup>, previously alluded to. The sleeve or collar E' is made of the same outside transverse diameter as the diameter of the opening in the rail-flange A' and cylindrical in shape, while its longitudinal opening is funnel-shaped—that is, larger at one end than the other—with its smallest or converging end toward the body of the connecting-rod. It is also provided at its outer end with the annular transverse flange or rim E<sup>3</sup>, which is adapted to bear against the rail-flange when fitted therein, as is shown in Figs. 2 and 3 of the drawings, the purpose thereof being to hold said sleeve or collar E' against longitudinal movement in the operation of driving the inner sleeve or collar E<sup>2</sup> into the same, as hereinafter described. Said inner sleeve or collar is made about the same length as the outer one, with its longitudinal opening or bore of cylindrical shape to fit the end of the connecting-rod and cone-shaped upon the outside corresponding to the shape of the funnel-shaped opening in the outer sleeve or collar E' and a trifle large, so that a very tight fit may be obtained by driving it into said outer sleeve or collar. Both sleeves or collars, it will be understood, are in practice made of copper or other suitable electric conducting material, preferably copper.

In making the bond the outer sleeves or collars E' are first fitted into the rail-flange openings with their annular flanges E<sup>3</sup> against the sides of said rail-flange, as is indicated in the drawings. The ends of the connecting-rod D (which have previously been bent, as



required) are next inserted through said outer sleeves or collars and the inner sleeves or collars  $E^2$   $E^2$ , fitted thereon. Said ends, with said sleeves or collars thereon, are then drawn  
 5 back to bring the outer cone-shaped sides of the inner sleeves or collars into the funnel-shaped openings of the outer sleeves or collars until they come in contact and fit therein. By now taking a hammer and striking the  
 10 ends of the connecting-rods and inner sleeves or collars together said inner sleeves or collars are driven tight into the outer sleeves or collars, as is indicated in Fig. 3, making very close joints between the rail-flange, sleeves  
 15 or collars, and connecting-rod, as will be obviously seen, the bonds of the inner sides of the outer sleeves or collars and of the outer sides of the inner sleeves or collars causing a very tight connection by the aforesaid driving operation, in fact, in practice the joints  
 20 being so perfect as to be hardly perceptible to the naked eye when the cross-section is cut through the aforesaid parts after having been thus united.

25 The outer sleeves or collars are preferably made a little longer than the thickness of the rail-flange, so as to project a short distance beyond the face of said rail-flange, as is shown in Figs. 2 and 3. Therefore, when the inner  
 30 sleeve or collar is driven in, as previously described, said projecting ends of the outer sleeves or collars are forced and bent outward a little, as is indicated at  $E^1$  in Fig. 3, and serve to hold said sleeves or collars very se-  
 35 curely in the rail-flange.

As will be apparent, my improved rail-bond is instantly available for any length of bond wire or rod by simply cutting said rod or wire to the desired length. Practically no ma-  
 40 chine-work is required in its construction, aside from cutting the said wire or rod to the desired length, and the bond may be easily and expeditiously applied to the rail. It may also be conveniently packed for transporta-  
 45 tion.

I am aware that numerous rail-bonds of a similar nature have been patented and applied to use, and I therefore limit my invention to the specific construction and arrange-  
 50 ment of parts herein set forth, and pointed out in the claims.

I prefer in practice to make the bond col-

lars or sleeves  $E^1$   $E^2$  of round shape in cross-section; but as the same principle may be carried out by the employment of other shapes  
 55 in cross-section I do not limit myself thereto. In Fig. 5 I have shown the same of square form in cross-section, the rail-opening and rod conforming thereto.

What I claim, and desire to secure by Letters Patent, is—

1. An electric rail-bond comprising a bond-wire or rod and four loose sleeves or collars, two at each end thereof, each set of said sleeves or collars consisting of an outer sleeve  
 65 or collar having a tapered hole converging in the direction toward the body of the bond-wire or rod and an outwardly projecting, annular flange or rim at the opposite end from said bond-wire or rod, adapted to fit against  
 70 the rail-flange when the sleeve or collar is fitted in the opening in said rail-flange, and an inner sleeve or collar having a straight opening adapted to fit the end of the bond-wire or rod, and made taper-shaped upon the outside  
 75 corresponding to and fitting in the tapered opening of the outer sleeve or collar, with the transverse outside diameter of the inner sleeve or collar, a trifle larger than the opening in the outer sleeve or collar, substantially  
 80 as and for the purpose set forth.

2. In an electric rail-bond, the combination, with the supporting rail, having suitable apertures formed therein, of the outer sleeves or collars, shaped upon the outside, to fit said  
 85 apertures in the rails; with taper-shaped holes converging in the direction toward the bond-wire or rod, and provided with the annular, laterally projecting end flanges or rims, adapted to fit against the side of the rail when  
 90 fitted in the aforesaid apertures; the inner sleeves or collars, having straight openings and fitting over the ends of the bond-wire or rod also made tapering upon the outside, to correspond with and fit into the tapered open-  
 95 ings of the outer sleeves or collars, and made a trifle larger than said tapered openings, and the connecting rod or wire whose ends fit in the aforesaid inner sleeves or collars, substantially as and for the purpose set forth.

WILLIAM H. WIGGIN.

Witnesses:

A. A. BARKER,  
 C. F. WESSON.