

No. 673,829.

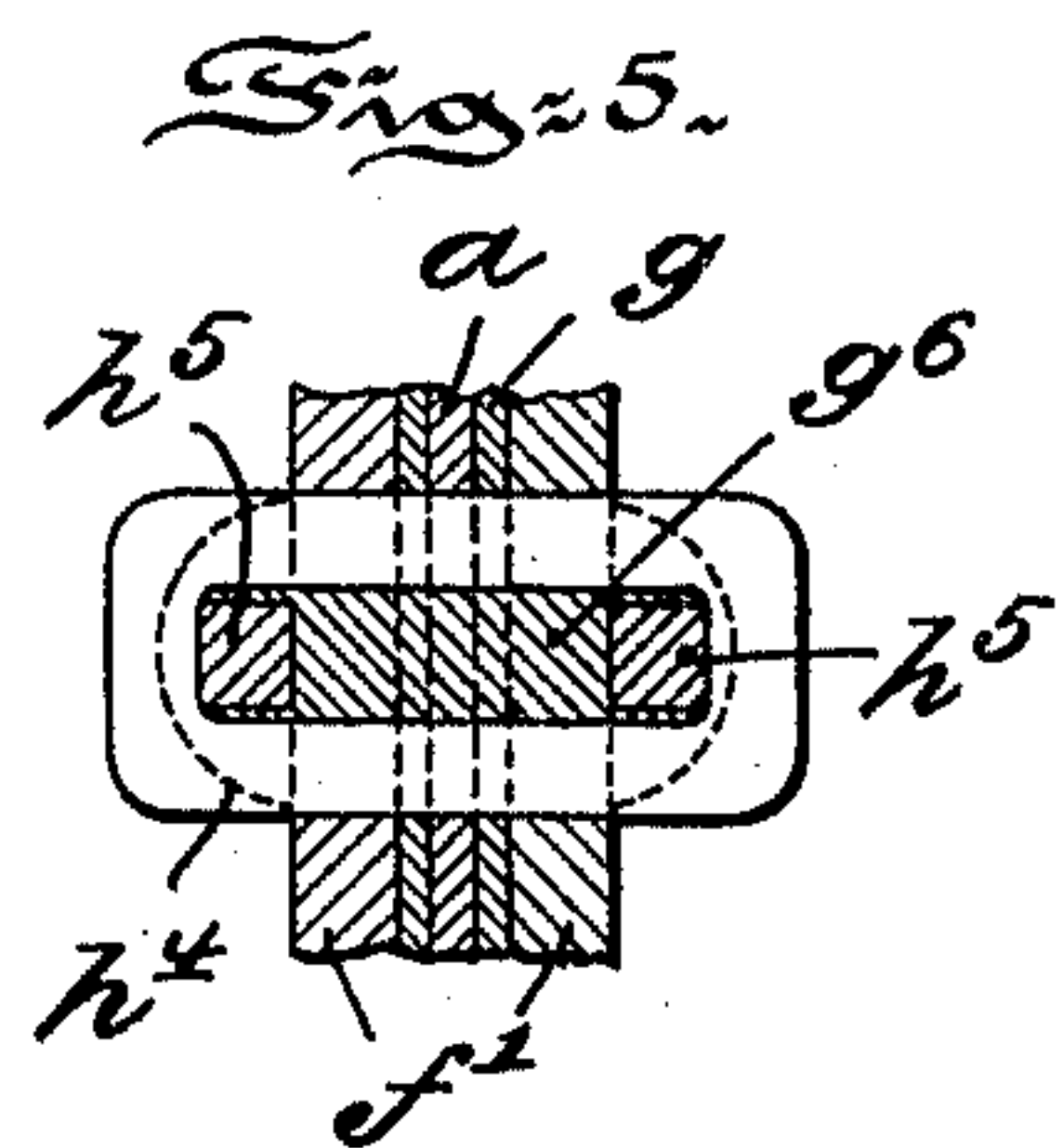
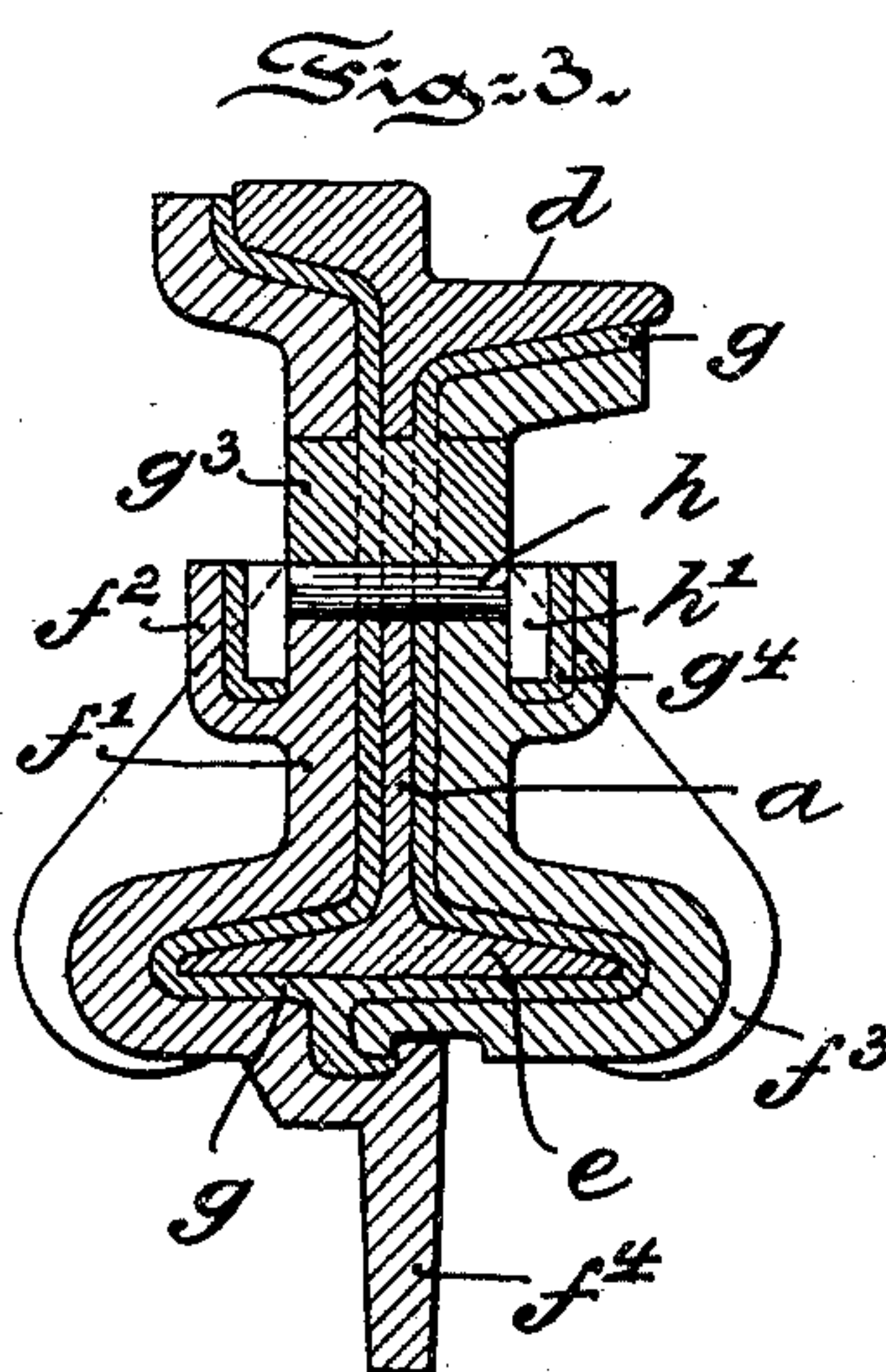
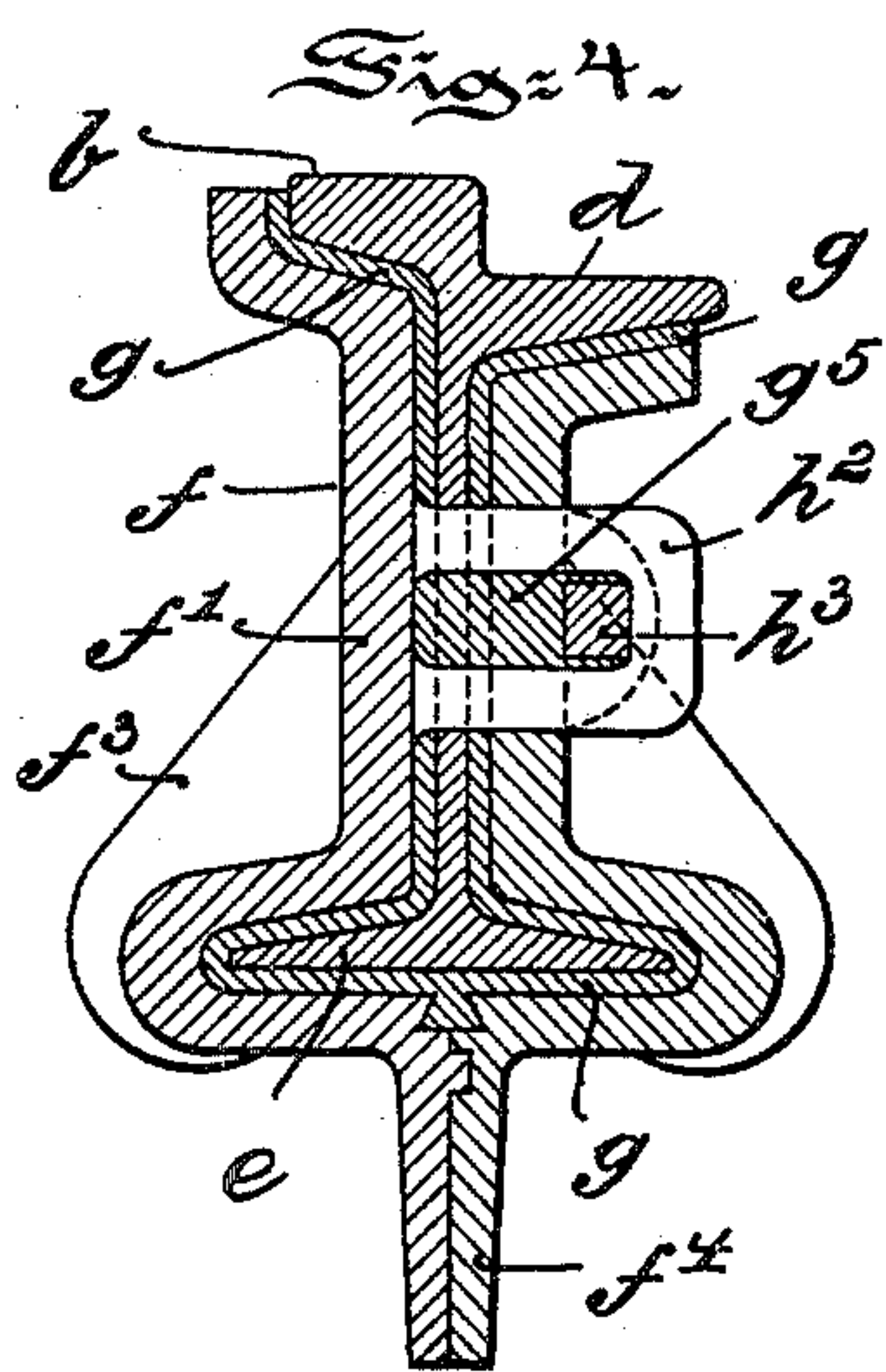
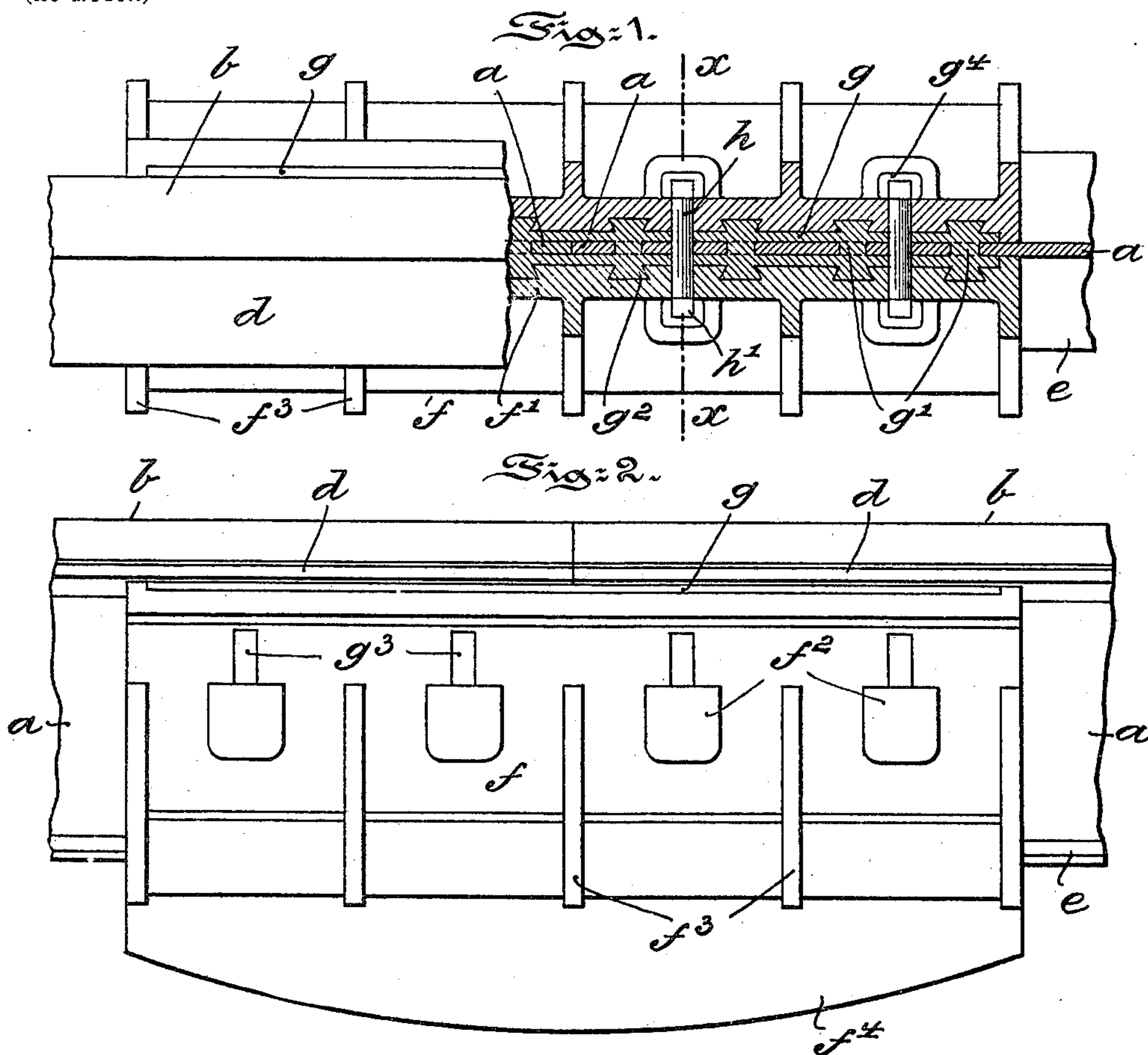
Patented May 7, 1901.

C. B. VOYNOW.

RAIL JOINT.

(Application filed Dec. 14, 1900.)

(No Model.)



Witnesses:  
 Wilhelm Vogt  
 Thomas M. Smith

Inventor:  
 Constantine B. Voynow,  
 by J. Walter Dwyer  
 Attorney.



# UNITED STATES PATENT OFFICE.

CONSTANTINE B. VOYNOW, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR  
OF ONE-HALF TO HENRY B. NICHOLS, OF SAME PLACE.

## RAIL-JOINT.

SPECIFICATION forming part of Letters Patent No. 673,829, dated May 7, 1901.

Application filed December 14, 1900. Serial No. 39,820. (No model.)

*To all whom it may concern:*

Be it known that I, CONSTANTINE B. VOYNOW, a citizen of the United States, residing at the city of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Rail-Joints, of which the following is a specification.

My invention has relation to a rail-joint for the contiguous ends of meeting rails.

Heretofore the simplest form of joint for meeting ends of rails consisted of fish-plates arranged on either side of the rail and abutting under the head and against the foot of the rail-sections, the fish-plates being firmly clamped to the rail-sections by bolts or similar means. The disadvantages of this form of joint are well known and an enumeration of the same is unnecessary. It has also been suggested that the joint between the meeting rails be made by casting a comparatively large mass of metal to the under face of the head, to the web, and to the foot of the rail-sections, the rail-sections being heated, so that a form of welded union between the cast mass and the rail-sections would result. In practice it has been found that such a joint is defective in that the contiguous head or tread portions of the rail-sections are distorted and form either a concave or convex continuation of the rail-heads. Where the continuation was convex, it was necessary to grind down the protuberance; but where the continuation was concave no adequate means for remedying the defect has thus far been suggested. Besides, the intense heat anneals the ends of the rails. It has also been suggested to provide a rail-joint by mounting the meeting ends of the rail-sections in an inclosure or mold and holding the same therein by bolts or tightening devices during the pouring of a molten mass around or about the rail-sections to join them and by the fusion of such a mass with the rail-sections within the inclosure to make an integral structure of the rail-sections, cast material, and mold. The objections to such rail-joints in the main are similar to those hereinabove explained, and, moreover, in practice it has been demonstrated that it is next to impossible to attain a fusion-point sufficiently high in such operations, and, besides,

machinery for such operations must be used of an exceedingly complicated character and cumbersome form, and even with such it requires expert mechanical skill to operate the same to obtain any results, and far from being satisfactory.

The principal object of my present invention is to provide a simple and perfect joint for the meeting ends of rail-sections; and to this end the invention consists, primarily, of a box wherein the meeting ends of the rails are inclosed and the box becomes a fixture with the rails, and between the interior of which box and the inclosed rails a space or chamber is formed, into which a suitable material is introduced to constitute a bed, in which the rail-sections are supported to fill out all irregularities formed on the surface of the rails and the box, the box constituting the support for the bed, as well as for the rail-sections.

My invention further consists of a rail-joint constructed and arranged in substantially the manner hereinafter described and claimed.

The nature and scope of my present invention will be more fully understood from the following description, taken in connection with the accompanying drawings, forming part hereof, in which—

Figure 1 is a top or plan view of a rail-joint embodying main features of my invention, a portion of the rails and joint being illustrated in horizontal section to more clearly show the construction and arrangement of the joint. Fig. 2 is a side elevational view of Fig. 1. Fig. 3 is a cross-sectional view taken on the line *xx* of Fig. 1. Fig. 4 is a view similar to Fig. 3, but illustrating a modified form of fastening securing the box in operative position with respect to the rail-sections; and Fig. 5 is a horizontal view of a still further modified form of fastening.

Referring to the drawings, in which my improved joint is illustrated as applied to sections of tram-rails, *a a* represent the contiguous webs of the sections, and *b* the tread, *d* the tram, and *e* the foot, of each rail. Inclosing the web *a* and foot *e* of the rail-section is a box or shell *f*, which, as illustrated in the drawings, is preferably made in two pieces or halves, although it may be formed from a single piece or casting without de-



parting from the spirit of my invention. When placed in position so as to inclose the rail-section, it becomes, with the rail-sections, a fixture of the structure, within which the metal lining is inserted for not only compensating for irregularities in the construction of the rail-sections, but also in the box or shell, and thereby forming by the construction of the said two elements—to wit, the box or shell and lining—a perfect support for the contiguous meeting ends of the rail-sections. The box or shell  $f$  fits under the tread  $b$ , foot  $e$ , and tram  $d$  of the rail-sections, abutting only at certain points against the rail-sections as a retained fixture of the structure, there being a space formed between the box and the adjacent inclosed parts of the rail-sections into which a bed, filler, or lining  $g$  is introduced in any suitable manner. This bed, filler, or lining  $g$  may consist of metal—such, for instance, as zinc, type-metal, Babbitt metal, or the like—or it may consist of other materials, such as sulfur or the like. At various portions of the rail-sections the webs  $a$  are shown as perforated to permit the bed, filler, or lining  $g$  to penetrate the webs, as illustrated in Fig. 1, and, if desired, the walls of the shell or box  $f$  may be vertically recessed to form dovetailed slots into which the material may enter to form dovetailed locking ends  $g^2$ . The bed, filler, or lining  $g$ , as clearly illustrated in Figs. 3 and 4, completely surrounds the foot  $e$  of each rail-section. It covers both faces of the web  $a$ , and it also lies under the tread  $b$  and tram  $d$  of the rail-sections. The box or shell  $f$ , with the bed, filler, or lining  $g$ , serves to maintain the rail-sections in a fixed relative position to each other.

To prevent either longitudinal or lateral movement of the rail-sections in the box or shell and for securely maintaining the box or shell in required relationship to the said sections, several forms of tying the box or shell  $f$  to said rail-sections have been illustrated. Thus in Figs. 1 and 3 the webs  $a$  and the vertical walls  $f'$  of the box  $f$  have both been transversely recessed to permit of the passage and seating of an inverted-U-shaped bolt  $h$ . The heads  $h'$  of these bolts  $h$  rest when the bolts are in position against the outside of the vertical walls  $f'$  of said box, and also rest in cups  $f^2$ , formed on said walls. When the filler or lining is introduced between the box and rail-sections, it fills the transverse recess with a plug  $g^3$  of the filler or lining, and it also fills the space between the heads of the bolts  $h$  and the cups  $f^2$ , as clearly illustrated at  $g^4$  in Fig. 3, thereby preventing any movement of the plug  $g^3$ . By virtue of this arrangement all torsional or longitudinal movement of the rails is taken up by the bolts  $h$  and the box or shell  $f$ , and the strain is therefore upon said bolts and box. Unless the bolts or box break no disarrangement of the rails in the box can take place.

In Fig. 4 another means of fastening or ty-

ing the rails in the box or shell  $f$  is illustrated. In this form a staple  $h^2$  projects from the inner face of one vertical wall  $f'$  of the box and traverses a slot or recess formed in the web  $a$  and the other wall  $f'$  of the said box and projects sufficiently beyond said other wall  $f'$  to permit of the introduction of a wedge  $h^3$  between the said wall and the rounded or square end of the staple. When the bed, filler, or lining  $g$  is introduced between the shell and the rail-sections, it floats into, fills out, and surrounds, as at  $g^5$ , the recess in the web  $a$  and the other wall  $f'$ , through which the staple  $h^2$  was passed, thereby completely locking the said wedge  $h^3$  in the staple and against the box or shell  $f$ .

In Fig. 5 still another form of fastening is illustrated, which consists of a link  $h^4$ , passed through a slot formed in both walls  $f'$  and the web  $a$ , and two wedges  $h^5$ , passed respectively between the ends of the link  $h^4$  and a wall  $f'$  of the box  $f$ . In this form the rest of the recess or slot not occupied by the link  $h^4$  is filled out by the bed or filler  $g$ , as at  $g^6$ , which surrounds the wedges  $h^5$ , as in Fig. 5, and thereby securely locking them in position and against movement. The sides  $f'$  of the box  $f$  may, if desired, be reinforced or strengthened by angular fins or ribs  $f^3$ , and its base also strengthened by a rib or fin  $f^4$ .

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

1. In a rail-joint, the combination with the meeting ends of rail-sections and a box or shell in which said ends are wholly or in part inclosed, of a bed, filler or lining adapted to be introduced into the space between the box and rail-sections to completely separate the parts of the sections within the box from the adjacent parts of said box, said bed, filler or lining contacting with the box and with the rail-sections and consisting of a material of a lower welding, fusing or melting point than the metal of either the box or the rail-sections.

2. In a rail-joint, the combination with the meeting ends of rail-sections and a box or shell, wherein the said ends are wholly or in part inclosed, of a bed, filler or lining adapted to be introduced into the space between the box and rail-sections to completely separate the parts of the sections within the box from the adjacent parts of said box, said bed, filler or lining contacting with the box and with the rail-sections and consisting of a material of a lower welding, fusing or melting point than the metal of either the box or of the rail-sections, and means extending through the box and rail-sections to prevent longitudinal movement of the rail-sections in the box.

3. In a rail-joint, the combination with rail-sections and a box or shell shaped to conform to the exterior of the web, foot and under-head portions of said rail-sections, a bed, filler or lining consisting of a substance or material whose welding, fusing or melting point is



lower than the metal of either said box or shell or rail-sections, and said bed, filler or lining contacting with said web, foot and underhead portions of said rail-sections to form  
5 a support for said rail-sections within said box or shell.

4. In a rail-joint, the combination of rail-sections, a box or shell having its interior shaped to inclose the web, foot and underhead portions of said rail-sections, and abutting only at certain portions, and a bed, filler  
10 or lining consisting of a substance or mate-

rial whose welding, fusing or melting point is lower than the metal of either said box or shell or rail-sections, and said bed, filler or lining separating those parts which do not  
15 abut.

In testimony whereof I have hereunto set my signature in the presence of two subscribing witnesses.

CONSTANTINE B. VOYNOW.

Witnesses:

J. WALTER DOUGLASS,  
THOMAS M. SMITH.