

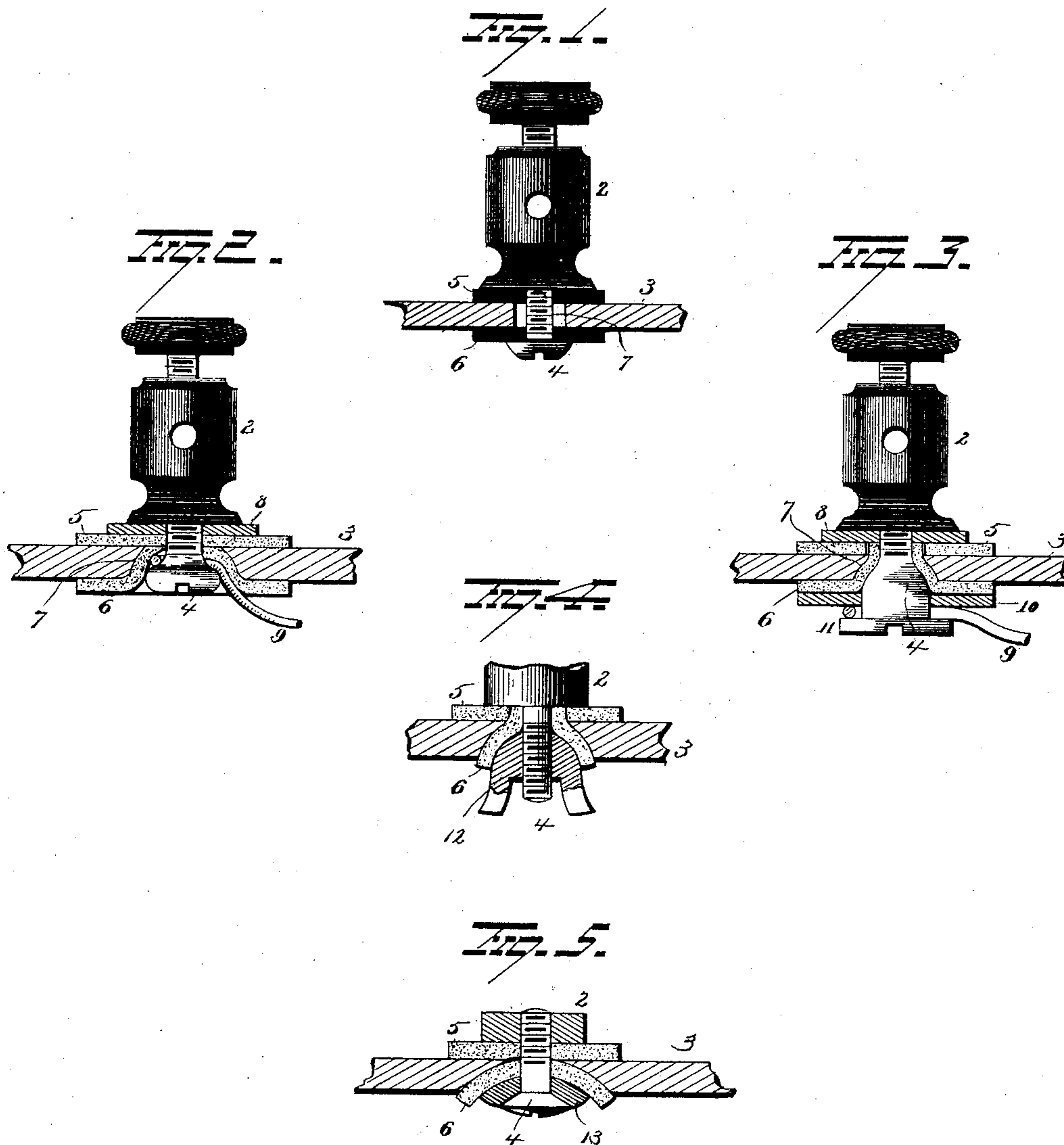
(No Model.)

T. E. ADAMS.

INSULATING CLAMP FOR ELECTRIC CONDUCTORS.

No. 371,161.

Patented Oct. 11, 1887.



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INSULATING-CLAMP FOR ELECTRIC CONDUCTORS.

SPECIFICATION forming part of Letters Patent No. 371,161, dated October 11, 1887.

Application filed July 11, 1887. Serial No. 243,992. (No model.)

To all whom it may concern:

Be it known that I, THOMAS E. ADAMS, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful
5 Improvements in Insulating-Clamps for Electric Conductors; and I do hereby 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
10 to make and use the same.

My invention relates to a new and improved insulating-clamp for electric conductors; and its object is to provide such means as will insure perfect insulation at all times, and which
15 will not deteriorate under the action of heat generated in the conductors by the passage of currents of great strength, or by the sparks which frequently occur when the circuit is broken or made during the passage of such
20 currents. The ordinary practice is to separate the two metallic structures by washers of insulating material and to clamp the same together by a screw, which must necessarily be insulated at least from one of the metallic
25 pieces by said washers, while it is usually in electrical connection with the piece into which it is screwed. With this construction the screw usually passes tightly through the washers, but quite loosely through and out of contact
30 with one of the metal pieces. So long as this relation is maintained the insulation is also maintained; but if it happens that the screw becomes loose, as it frequently does, the two metal pieces, together with the washers, will
35 shift and the screw will come into contact with the piece from which it should be insulated, thus destroying the insulation. To obviate this defect a sleeve or thimble of hard rubber is sometimes inserted into the piece through
40 which the screw passes; but this construction is expensive and becomes easily ineffective by the heating effect of the sparks, which soon destroy the rubber. These difficulties are entirely overcome by my invention, which in-
45 volves the use of a flexible highly-refractory insulating material for washers and such peculiar shapes and dimensions of the parts to be connected and of the connecting parts as will convert one of the washers into a com-
50 bined thimble and washer. All this will more

fully appear from the following detailed description of my invention, in which reference is made to the accompanying drawings, which form a part thereof, and in which—

Figure 1 is an elevation, partly in section, 55 of a binding-post secured to a metallic base as ordinarily constructed; Figs. 2, 3, 4, and 5, like views of various forms of my invention.

In Fig. 1 there is an ordinary binding-post, 2, secured to a metal base, 3, by a screw, 4, 60 which passes loosely through the base and screws into the binding-post. Two washers, 5 and 6, of insulating material, one on each side of the base-plate, separate the binding-post and the screw from the base, and it will be 65 seen that there is an air-space between the screw-spindle and the walls of the bore in the base-plate. In this condition the insulation of the binding-post from the base-plate is perfect; but if it happens that the screw becomes 70 loose, or that by the heating action of the current, or by sparks, the washers become thinner, the binding-post will, in the handling of the apparatus, eventually shift sidewise and the screw-spindle will make contact with the 75 walls of the bore in the base-plate. As stated above, a thimble or sleeve of hard rubber is sometimes inserted into the bore of the base-plate, which is designed to prevent this accident, and the objectionable features of such 80 construction have also been indicated.

Fig. 2 illustrates my improved construction as applied to a binding-post secured to a base-plate. I employ washers of flexible highly-refractory insulating material—such as as- 85 bestus or asbestos cloth—although one of the washers may be rigid and may be made of soapstone, mica, or other like refractory material, as will presently appear. The opening 7 in the base-plate is much larger than neces- 90 sary to accommodate the spindle of screw 4, and is on its lower side made flaring, as indicated, to conform to the shape of the head of screw 4, which is conical or rounded on the side toward the base-plate. Washer 5 is of 95 ordinary shape and dimensions. The hole through the same is just large enough to allow the screw to pass through it rather tightly, and this washer may be made of rigid refractory material, as above explained. Washer 6 100

must be made of soft flexible material which is highly refractory and a good insulator of electricity. I have found asbestos cloth to possess these qualities in a high degree; but any other substance having like qualities may be employed, and will be the equivalent of asbestos for the purposes of my invention. This washer is of such size that when applied to the under side of the base-plate and forced into the flaring cavity 7 by the head of screw 4 it will extend through said cavity into contact with washer 5, and will practically form a lining to the cavity and a sleeve or thimble to the screw, as clearly shown in the drawings. Thus the structure marked with the numeral 6 is a combined insulating washer and thimble, which securely insulates the screw, and consequently the binding-post, from the base-plate. Should the screw become loose, which cannot always be prevented, the binding-post cannot shift upon the base-plate, and there is no possibility of its ever coming into contact with the binding-post. The compressibility of the combined thimble and washer 6 has the additional advantage that it will allow the screw 4 to be driven home with great force, so that a loosening of the same will not likely occur. This is an important advantage over a rigid thimble or a thimble made separate from the washer, as will be readily understood by those skilled in the art.

If so desired, a metal washer, 8, may be placed between the binding-post and insulating-washer 5, and this construction will be usually employed if washer 5 is made of such soft compressible material as asbestos cloth, and if the base of the binding-post or other structure is smaller or only slightly greater than the opening in the base-plate. A conducting-wire, 9, may be connected with the binding-post by bending the end of it into a ring or eye and passing the screw 4 through the latter. The wire thus becomes partly embedded in the material of washer 6, as indicated in the drawings.

In Fig. 3 the construction is slightly modified. The hole in washer 5 is made larger than necessary to admit the spindle of screw 4, so that the end of the sleeve or thimble portion of washer 6 may pass through the same and separate washer 5 from the screw. An additional metal washer, 10, placed upon washer 6, may also be employed, and the conducting-wire may be clamped between said metal washer and a flange, 11, upon the screw-head.

In Fig. 4 a metallic post, 2, which may be a part of a cut-out or any other electrical apparatus, is shown as having the screw 4 formed with it. In such cases a nut, 12, is employed to secure the device to the base-plate. This nut is shaped to conform approximately to the shape of the cavity in the base-plate, as shown, so as to force the central portion of washer 6 through said cavity.

Fig. 5 shows a metal piece, 2, secured to

the base-plate, with a metal washer, 13, interposed between washer 6 and the head of screw 4. The metal washer in this instance is shaped to conform approximately to the shape of the cavity in the base-plate, and it performs the same function as the heads of screws 4 in the constructions shown in Figs. 2 and 3, and as the body of nut 12 in Fig. 4. This is, in fact, the preferable construction, since the washer 6 is thereby not strained or torn by the turning of a metal structure upon it, and similar washers may be employed with advantage in the constructions shown in Figs. 2, 3, and 4.

In the preceding description I have set forth several specific embodiments of my invention; but it will be understood that I am not limited by the exact details of construction shown and described, since the same may be indefinitely varied without departing from the fundamental idea upon which it is based.

Having now fully described my invention, I claim and desire to secure by Letters Patent—

1. As a means for clamping together and insulating from each other two pieces of metal or other conducting substance, the combination of an insulating-washer of refractory material placed between the metal pieces, with a second insulating-washer of flexible refractory material extending through one of the pieces and into contact with the first washer, and a clamping device passing through the washers and pieces, substantially as described.

2. The combination of two metal pieces separated by an insulating-washer of refractory material, with a second insulating-washer of flexible refractory material applied to the outer face of one of the pieces and extending through and lining an opening in said piece, and a clamping device passing through the washers and pieces, substantially as described.

3. The combination of two metal pieces separated by an insulating-washer of refractory material, and a second insulating-washer of flexible refractory material applied to the outer face of one of the pieces and extending through and lining a flaring opening in said piece, with a clamping device in electrical connection with one piece and insulated from and adapted to the flaring opening in the other, substantially as described.

4. The combination of a metal piece adapted to receive a screw and a second metal piece separated from the first by an insulating-washer of refractory material, with a second insulating-washer of flexible refractory material lining the flaring opening and extending into contact with the first washer, a metal or other rigid washer shaped to fit the insulating-lining, and a screw passing through the pieces and washers, substantially as described.

5. The combination, with a metal piece having a flaring opening, of a clamping-screw passing through said opening, and a combined washer and thimble of flexible insulating ma-

terial in the flaring opening, separating the metal piece from the screw, substantially as described.

5 6. The combination, with a metal piece having a flaring opening, of a clamping-screw passing through said opening, and a combined insulating-washer and thimble of flexible refractory material, substantially as described.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

THOMAS E. ADAMS.

Witnesses:

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