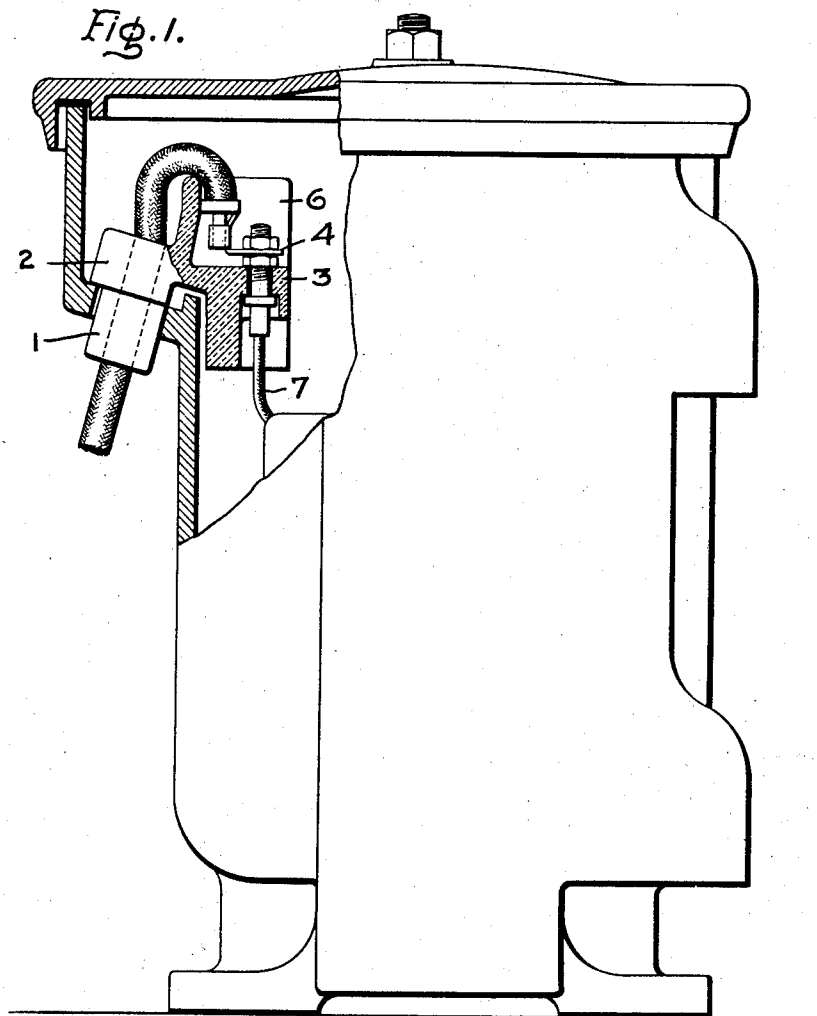
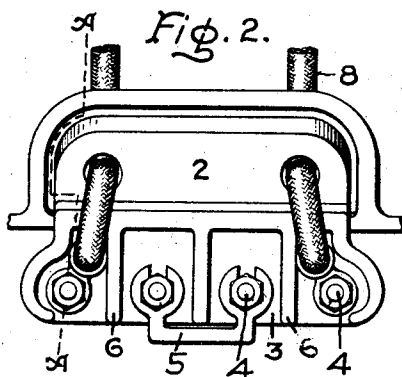
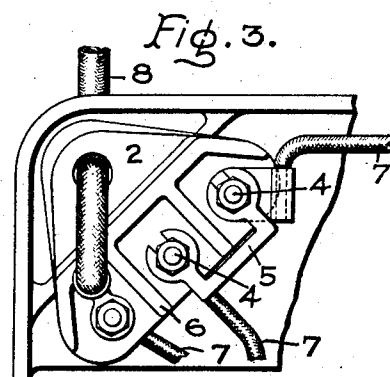


S. E. JOHANNESEN.
 TRANSFORMER BUSHING AND TERMINAL BOARD.
 APPLICATION FILED FEB. 6, 1912.

1,075,573.

Patented Oct. 14, 1913.



Witnesses:

Marcus L. Byng.
 J. Ellis Elen

Inventor:

Svend E. Johannesen,
 by: *Alfred Davis*
 His Attorney.

UNITED STATES PATENT OFFICE.

SVEND E. JOHANNSEN, OF PITTSFIELD, MASSACHUSETTS, ASSIGNOR TO GENERAL ELECTRIC COMPANY, A CORPORATION OF NEW YORK.

TRANSFORMER BUSHING AND TERMINAL BOARD.

1,075,573.

Specification of Letters Patent.

Patented Oct. 14, 1913.

Application filed February 6, 1912. Serial No. 675,782.

To all whom it may concern:

Be it known that I, SVEND E. JOHANNSEN, a citizen of the United States, residing at Pittsfield, county of Berkshire, State of Massachusetts, have invented certain new and useful Improvements in Transformer Bushings and Terminal Boards, of which the following is a specification.

My invention relates to combined bushings and terminal boards for electrical transformers.

One of its objects is the cheapening of the cost of production of transformers by cheapening the cost of production of the terminal board and bushings and by reducing the labor required for their assembly in the transformer.

Another object is the provision of suitable means for holding the terminal board in place.

Heretofore in transformers the terminal boards to which the ends of the windings and the leading-in wires are brought and at which the interconnections are made, and the bushings for the leading-in wires have been constructed in separate pieces. The bushings have been supported by the casing through which the leading-in wires pass. The terminal boards have been separately placed and have been supported in various positions, often on the core. I propose to construct the terminal board and one or more bushings in one piece; the cost of production of the combined piece is less than the sum of the costs as separate pieces. The whole may be placed in position at a cost in labor hardly exceeding the cost for locating a bushing alone, and it is unnecessary to further provide for attaching the terminal board.

In the drawings, which form a part of this specification, are illustrated two constructions embodying my invention.

Figure 1 is an elevation of a transformer casing broken away to show a combined terminal board and bushing, the latter being partly in section on the lines A, A of Fig. 2. Fig. 2 is a plan view of a combined terminal board and bushing with two leading-in wires, all located in a transformer casing wall. Fig. 3 is a plan view of another combined terminal board and bushing with one leading-in wire, the whole located in the corner of a transformer casing.

In Fig. 2 my invention is embodied in a

construction wherein the bushing accommodates two leading-in wires. The bushing part, 1, has the general rectangular shape of the bushings now in common use, and is provided with a collar, 2, to hold the same in position. The bushing portion is adapted to reach through and beyond the casing wall. For the terminal board portion I extend the top of the bushing in such a direction that when the bushing is in position, the extension is toward the center of the casing as shown in the figures, particularly Fig. 1. This extension, 3, will in each case be of a design suitable for the particular use to which it will be put as a terminal board. I have shown in Figs. 2 and 3 two terminal board designs. The terminals 4 to which are attached the leads 7 and the leading-in wires 8, are separated from each other by barriers 6. Connecting links 5 make the necessary connections between the various leads and leading-in wires. The combined board and bushing is made of any suitable material and is formed in any desirable way. Porcelain and other compositions are now employed for similar articles and are pressed to form; these materials and this method of construction are quite suitable for the constructions I have here illustrated. My invention, however, I do not regard as limited to a construction made from one piece of material or a construction made by a single operation.

The construction shown in Fig. 3 differs from that shown in Fig. 2 merely in design. This construction is in general triangular in shape to adapt it for use in the corner of a casing or tank. But one leading-in wire comes through this bushing, which, in this case, is circular.

It will be apparent that the advantages of cheapness of production and of suitable location of the terminal board are obtained in the constructions described above and may be obtained in other constructions involving my invention.

What I claim as new and desire to secure by Letters Patent of the United States, is:

1. A combined terminal board and bushing for electrical transformers comprising a projecting bushing portion adapted to project through the wall of the transformer casing and an extension therefrom provided with terminals for connection to the transformer windings and the external lead or

leads and with means for interconnecting the windings and the lead or leads as required.

2. The combination with a transformer casing having an opening in the wall thereof, of a combined terminal board and bushing comprising a bushing portion projecting outward through the opening in the casing wall, an extension therefrom extending toward the center of the casing and having a shoulder engaging the wall of the casing in proximity to the opening therethrough, and terminals for connection to the transformer windings and the external lead or leads and means for interconnecting the same, mounted on said extension.

3. The combination with a transformer casing provided with an opening in the wall thereof, of a combined terminal board and

bushing comprising a bushing portion projecting outward through the opening in the casing wall, an extension therefrom extending toward the center of the casing and having a shoulder, substantially surrounding the bushing portion and engaging the wall of the casing in proximity to the opening therethrough, and terminals for connection to the transformer windings and the external lead or leads and means for interconnecting the same, mounted on said extension.

In witness whereof, I have hereunto set my hand this 1st. day of Feb., 1912.

SVEND E. JOHANNESSEN.

Witnesses:

CORLISS E. LEE,
ROBERT J. CONNOR.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."