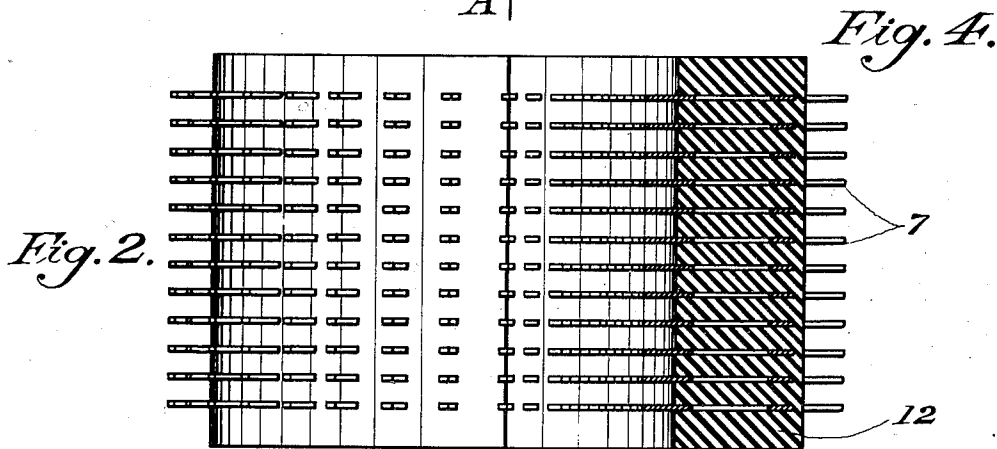
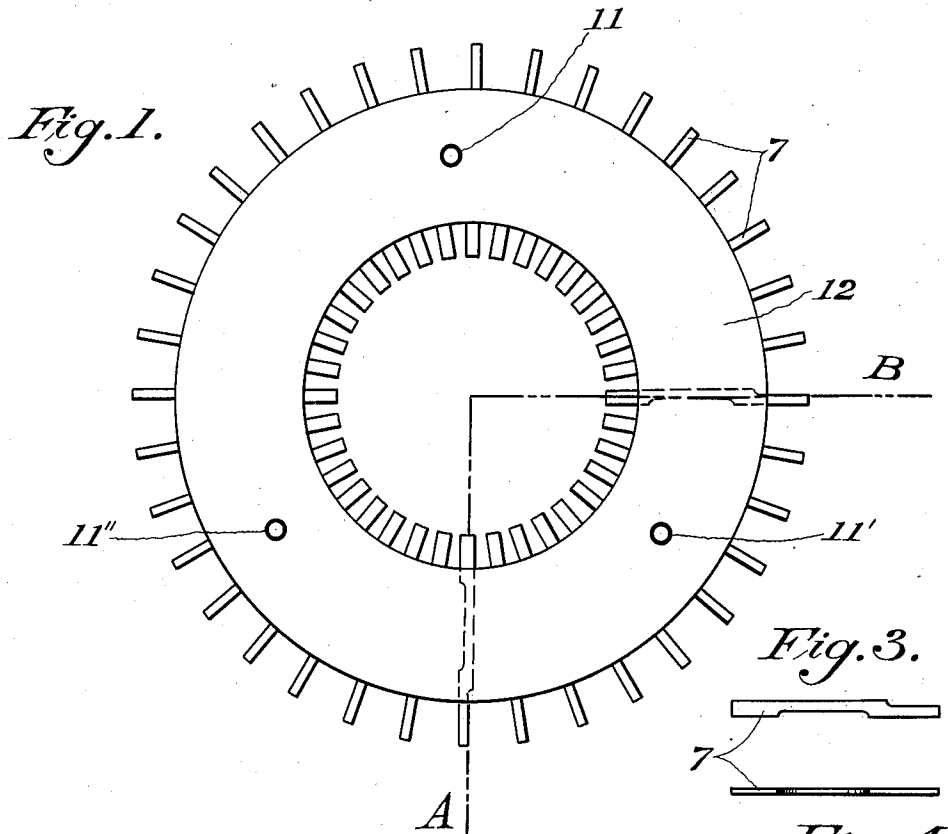


G. W. LORIMER.
ELECTRICAL CONTACT BANK AND PROCESS OF MAKING SAME.
APPLICATION FILED APR. 24, 1907.

1,019,166.

Patented Mar. 5, 1912.

3 SHEETS—SHEET 1.



Witnesses:

Isaac E. Prado
Harish L. Smith

George W. Lorimer,
Inventor.

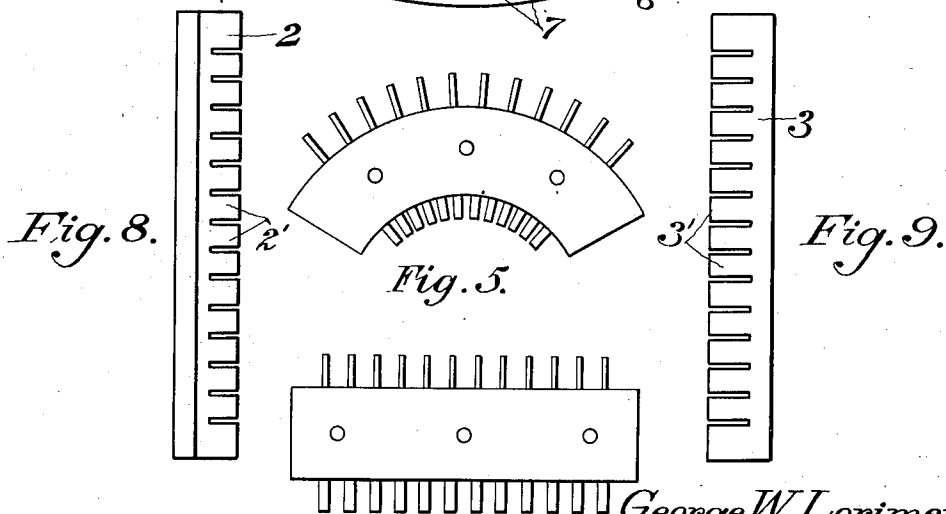
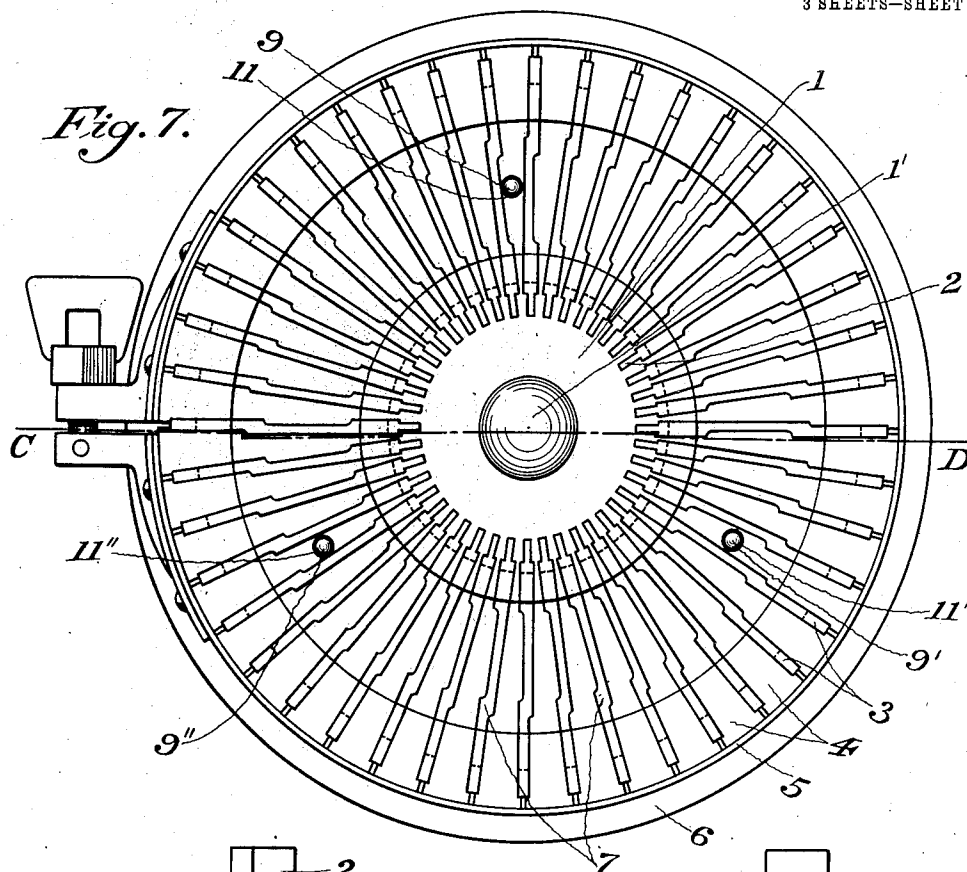
by McMeen & Miller
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Witnesses:
Harold C. Prado
Harriet L. Smith

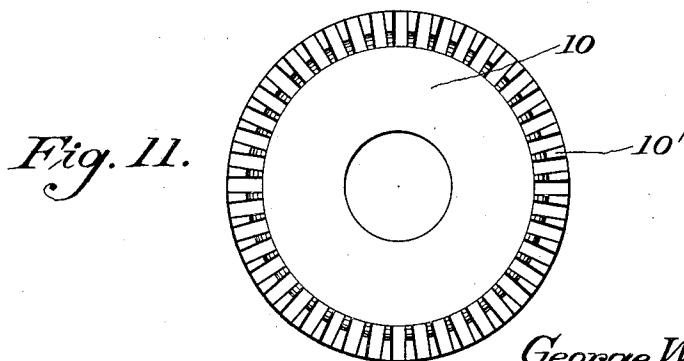
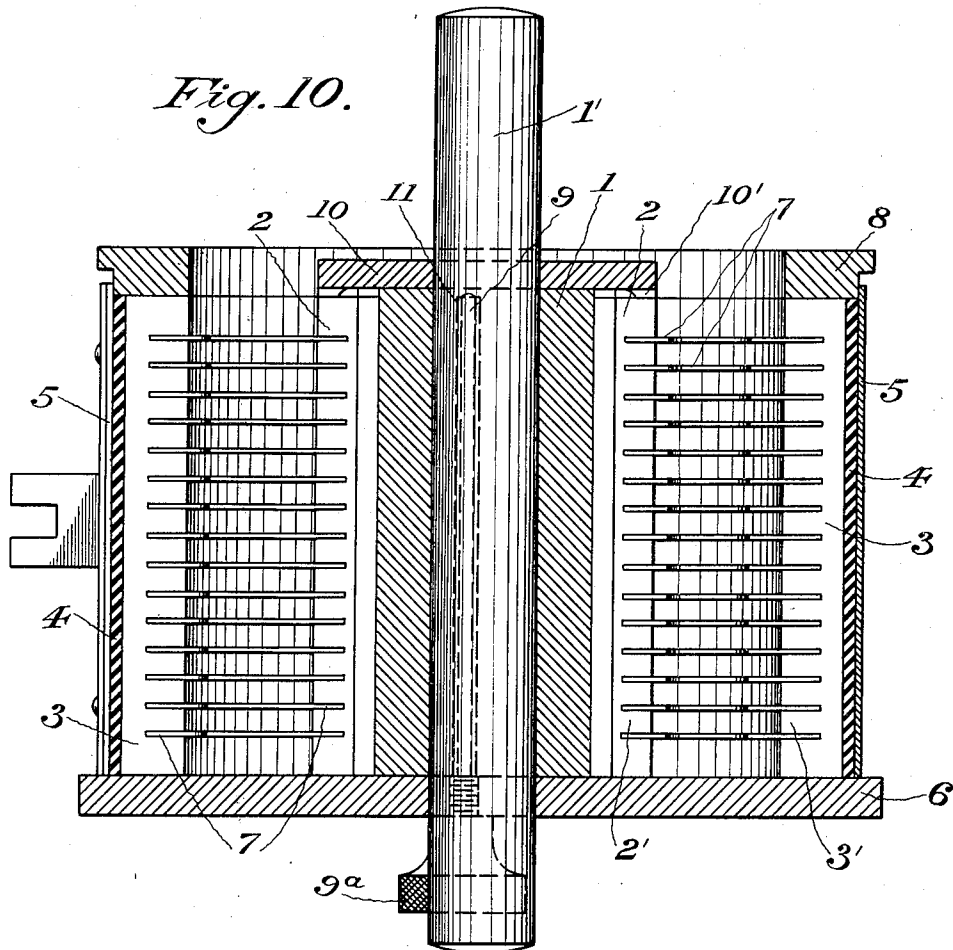
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3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

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WESTERN ELECTRIC COMPANY, A CORPORATION OF ILLINOIS.

ELECTRICAL CONTACT-BANK AND PROCESS OF MAKING SAME.

1,019,166.

Specification of Letters Patent.

Patented Mar. 5, 1912.

Application filed April 24, 1907. Serial No. 370,046.

To all whom it may concern:

Be it known that I, GEORGE W. LORIMER, a citizen of the United States of America, and a resident of Piqua, county of Miami, and State of Ohio, have invented a new and useful Improvement in Electrical Contact-Banks and Processes of Making Same, of which the following is a specification.

My invention comprises a casting designed particularly for use in automatic telephone exchanges, the commonly accepted name for the finished product being "bank of contacts", and the process of making same.

My invention produces a solid casting of insulating material having embedded in it, in the desired positions, the desired number of "contacts", the mold being specifically designed to facilitate its removal from the cast product without injury either to the product or to the mold. In the operation of removal from the cast product, the mold is separated into its parts and the parts separately removed and reassembled, when the mold is again ready for another cast to be made from it; thus one mold may serve for a plurality of casts, and give continuous service. After being cast the casting is saturated as required with insulating and moisture proof substances.

Having reference to the accompanying drawings, I describe, first, the casting desired and, second, the means for producing it.

Figure 1 is a plan of an annular contact-bank consisting of a casting of insulating material, such as plaster of Paris, having embedded in it in vertical and horizontal rows a large number of electrical contact pieces, each of which extends entirely through the casting, projecting both inside and outside. Fig. 2 is an elevation of the electrical contact-bank shown in Fig. 1, the contact-bank being sectioned on the line A—B, whereby the outer surface of the casting is shown at the left of the vertical central line, the inner surface of the casting is shown between the vertical central line and the wall at the right, and the wall at the right is shown in section, with the embedded contact clips on that plane. Fig. 3 is a plan view of the clip used for the embedded contact pieces of Fig. 1. Fig. 4 is an edge view of the clip of Fig. 3. Fig. 5 is a plan of a contact-bank in which the contacts are disposed in a limited arc instead of in a com-

plete circle as in Fig. 1. Fig. 6 shows a rectilinear contact-bank; Fig. 7 is a plan view of the mold for making the casting of Fig. 1, the inserted clips being shown in place, ready for pouring the plaster of Paris in which, when the mold is removed, the clips are to remain embedded. Fig. 8 is a detail of a clip holding toothed bar for the inner wall of the mold of Fig. 7. Fig. 9 is a detail of a clip-holding toothed bar for the outer wall of the mold of Fig. 7. Fig. 10 is a sectional view of the mold of Fig. 7, taken on the line C—D of Fig. 7. Fig. 11 is a view of the under surface of the cap plate 10 of Fig. 10.

Contact-banks of the types shown in Figs. 1, 5 and 6 are used in automatic telephone equipment to terminate conductors in such a manner that a movable conductor-terminal under proper control may be caused to rest in electrical connection with any contact in the contact-bank, or that a set of movable conductor-terminals under proper control may be caused to rest in electrical connection with any set of contacts in the contact-bank. To this end, the contact-pieces in the contact-bank are arranged in horizontal and vertical rows, that a movable terminal may pass along a row, either horizontally or vertically as the construction of the contact bank may require, and may stop in electrical connection with any contact-piece of that row. Fig. 2 illustrates the arrangement of contact-pieces in the contact-bank with this use in view, the design of this contact-bank being such that movable terminals carried upon a shaft at the axis of the annular contact-bank may be carried around the layers of contact-pieces by the revolution of the axial shaft.

Figs. 7 and 10 represent in assembly and section the mold for casting the product illustrated in Fig. 1. An inner cylindrical wall is presented by the surface of the cylinder 1, the surface of this cylinder being slotted to hold the bars 2; when the bars are in place in the slots of the cylinder a cylindrical surface is presented which is smooth except for the openings between the teeth 2' of the bars 2. The cylinder 1 has a central rod 1' which serves at the same time as a handle and as a guide in assembling the mold. An outer surface for forming the casting is presented by the assembly of toothed bars 3 and space bars 4 within the

clamping band 5, as shown most clearly in Fig. 7. The mold is assembled upon the base plate 6. The central cylinder 1 is placed in position by means of the guide 5 formed by the lower end of the central rod 1' passing through a central opening in the base plate 6. Pairs of toothed bars, 2 and 3, facing each other as the bar 2 of Fig. 8 faces the bar 3 of Fig. 9 in the sheet of drawings, are filled with clips or contact pieces 7, the inner end of each clip being placed between two teeth of the bar 2 and the other end of the clip being placed between the corresponding teeth of the bar 3, as shown most clearly in Fig. 10. The pairs of bars thus filled with clips are placed in position in the partially assembled mold by inserting the bars 2 in the slots of the cylinder 1, thus completing the cylinder and at the same time bringing the bars 3 into position. The spaces between the bars 3 are filled with space bars 4, as shown most clearly in Fig. 7 and the whole is bound together by the clamping band 5. A mold for the annular casting thus is formed by the inner and outer walls as described, the space between them being closed by the base plate 6, upon which both inner and outer walls rest. The cap plate 10 and cap ring 8 are placed in position as shown in Fig. 10, extending the walls of the mold to provide a greater latitude in filling the mold to the proper height, and to assist to some extent in holding in place the elements of the two walls of the mold. The cap plate 10 has upon its under surface teeth 10' registering with the bars 2; this detail is shown in Fig. 11. The rods 9 9' 9'' are passed through the base plates 6 and screwed into place; upon each of these rods is placed the sleeves 11 11' 11'' of insulating material. The mold is now ready to pour. A liquid capable of subsequent hardening into an insulating solid, such as fluid paste of plaster of Paris, is poured into the mold, forming the cast 12 of Fig. 1, in which the clips 7 are embedded, the clips being irregular in outline to prevent their possible loosening and withdrawal as might occur if the clips were of a simple geometrical shape. The cast being thus completed, the mold is removed in the following manner: The cap plate 10 and cap ring 8 are lifted off; the rods 9 9' 9'' are removed by means of knurled heads 9^a; the base plate 6 is lifted off; the cylinder 1 is forced out of the cast, leaving behind it the bars 2; the bars 2 are taken from the inner ends of the contact-pieces one by one; the clamping ring 5 is loosened and removed, the spacing bars 4 thus are released and are removed and lastly the bars 3 are taken from the outer ends of the contact pieces, leaving the cast free from the mold and

leaving all parts of the mold in condition for reassembly for another cast. The clips 7 remain a part of the cast product, as do also the insulating tubes 11 11' 11''. The holes through the tubes 11 11' 11'' furnish means for mounting the contact-bank by means of rods or screws, and the insulating tubes constitute insulating bushings for those holes to prevent any accidental contact between any clip 7 and a mounting element which might be of conducting material. The casting thus produced is ready for service if the substance used in pouring the cast is such as to be a permanent insulating medium under the conditions in which it will be placed in service, as would be the case were the casting of almost any of the many substitutes for hard rubber, or of a resinous compound, etc.; in the use of such a medium as, for example, plaster of Paris, the casting if put into service as it comes from the mold would retain moisture and would also absorb moisture from the air and soon would become unfit for service due to the conductivity of the dampened mass of plaster of Paris forming the insulation between the contact pieces. At the same time, plaster of Paris is a desirable substance to use for the body of the cast because of its cheapness and its ease of working. To obtain the advantages of plaster of Paris in the process of manufacture of the cast, and to eliminate its disadvantages in service, I treat it after it is cast by immersing it in a mixture of paraffin and Brazilian wax heated to a temperature higher than 212 degrees Fahrenheit. While in this bath all the moisture in the plaster cast is evaporated by the high temperature and the mixture of paraffin and Brazilian wax permeates the cast, filling all the interstices. When the casting emerges from this bath, it is a permanently insulating solid and has the power of resisting moisture necessary to the continuance of its insulating properties.

I claim:

The process of making an electrical contact bank which consists of casting a body of plaster of Paris having conducting contact pieces embedded therein and then immersing the cast in a mixture of paraffin and Brazilian wax at a temperature above the boiling point of water whereby all water in the cast is evaporated and driven out and the cast becomes saturated with the mixture described, substantially as described.

Signed by me at Piqua, county of Miami, State of Ohio, in the presence of two witnesses.

GEORGE W. LORIMER.

Witnesses:

GEORGE A. VAUGIER,
LEE R. DRAKE.