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PATENTED FEB. 28, 1905.

B. A. BEHREND.
FRAME FOR DYNAMO ELECTRIC MACHINES.
APPLICATION FILED NOV. 6, 1903.

2 SHEETS—SHEET 1.

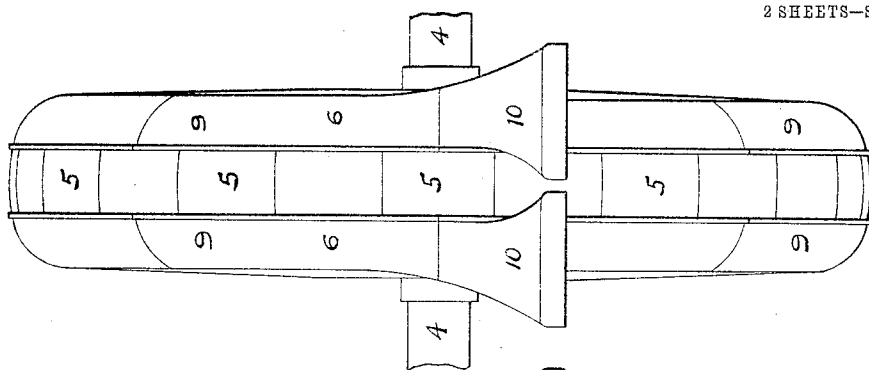


Fig. 2.

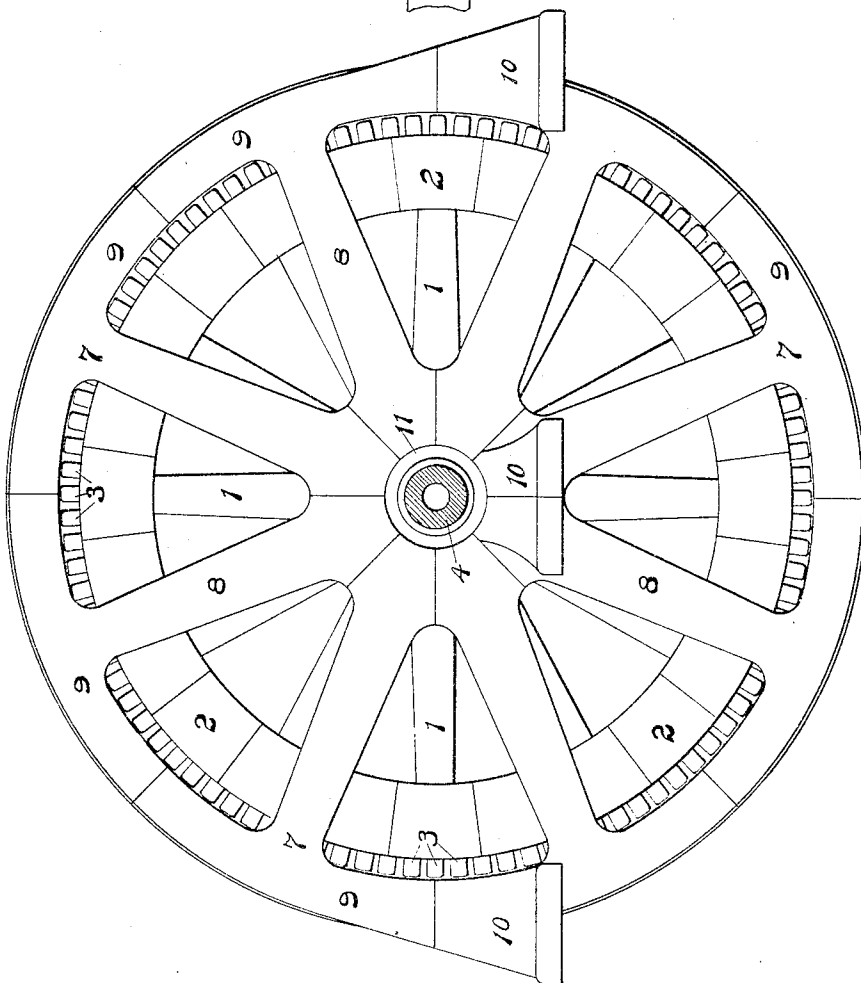


Fig. 1.

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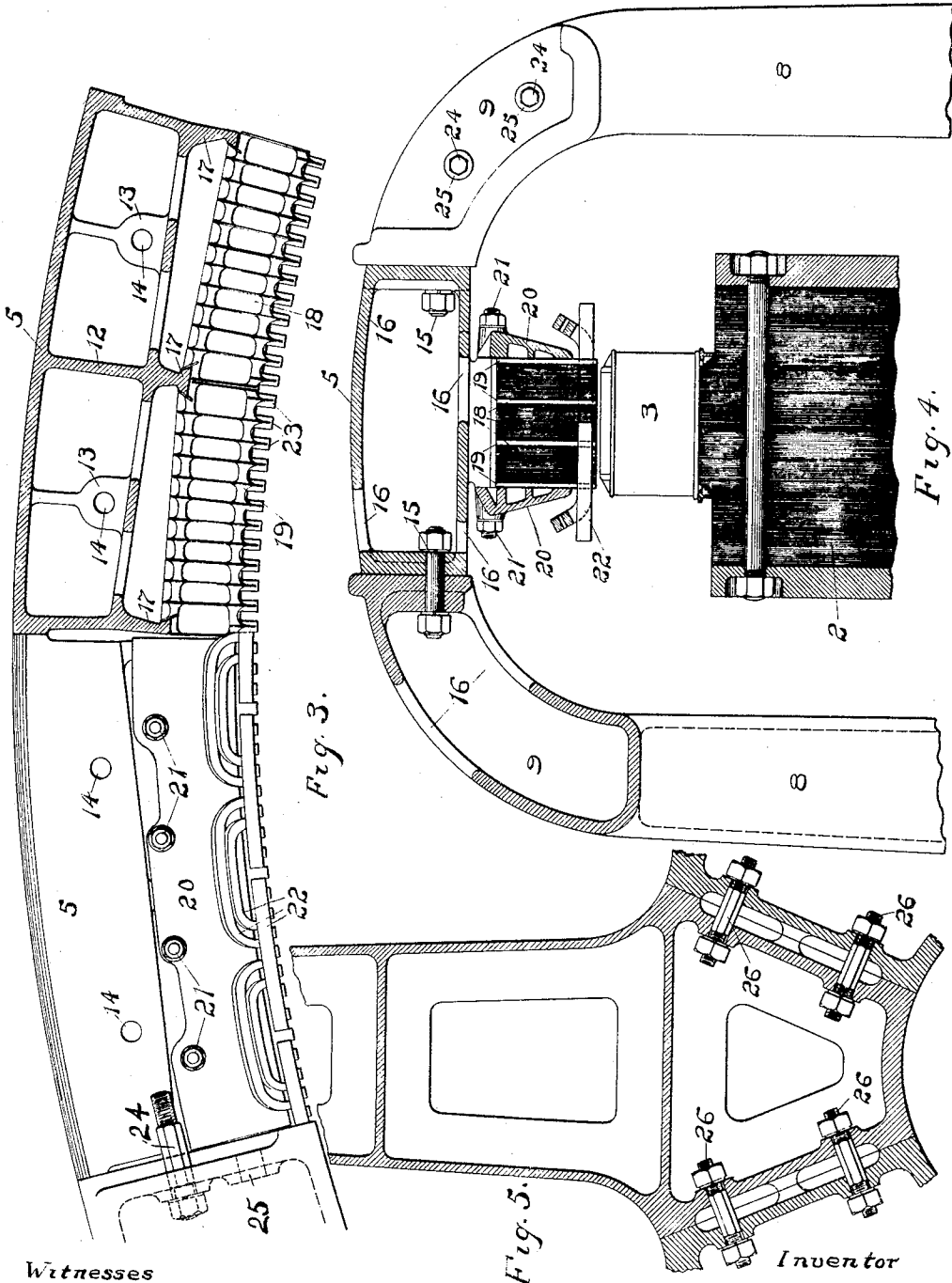
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2 SHEETS—SHEET 2.



Witnesses

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Fig. 5.

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UNITED STATES PATENT OFFICE.

BERNARD A. BEHREND, OF NORWOOD, OHIO, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE BULLOCK ELECTRIC COMPANY, A CORPORATION OF OHIO.

FRAME FOR DYNAMO-ELECTRIC MACHINES.

SPECIFICATION forming part of Letters Patent No. 783,409, dated February 28, 1905.

Application filed November 6, 1903. Serial No. 180,036.

To all whom it may concern:

Be it known that I, BERNARD A. BEHREND, a citizen of the United States, residing at Norwood, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Frames for Dynamo-Electric Machines, of which the following is a full, clear, and exact specification.

My invention relates to dynamo-electric machinery, and particularly to the construction of the frames of large units.

In the design of very large units it is not only necessary to consider the problems involved in the design of smaller machines, but the design with reference to the shipping of the parts, their erecting and assembling, and proper support of the enormous weights must be specially considered; also, as the diameter of large units is very great in comparison with their depth any construction by which the diameter is reduced without correspondingly reducing the capacity is very advantageous. By my invention the difficulties as to shipping and erecting have been overcome and the advantage of a comparatively small diameter obtained.

By my construction the stationary frame is made up of two shields or end frames provided with pedestals, which shields act as a support for the main frame, which is clamped between them. The shields and main frame may be subdivided into segments to a degree which the size of the machine requires. Since the shields or end frames support the main frame, the latter need not be designed as a supporting-yoke, but only of such strength as to take the weight of the laminations and windings carried thereby. For this reason the outside diameter of the machine is greatly reduced compared with what would be necessary if the main frame of the machine also served as a supporting-yoke.

The features of my invention and novelty thereof will be more fully set forth in the following description and claims annexed thereto.

In the accompanying drawings, which show

the preferred form of my invention, Figure 1 is an end view, and Fig. 2 a side view, of the machine as a whole. Fig. 3 is an enlarged view of a portion of the main frame, partly in section and with the side shield removed. Fig. 4 is an enlarged sectional view of a portion of the stationary frame, the section being taken on a plane passing through the axis; and Fig. 5 is an enlarged section of a portion of one of the arms of the supporting-shields, taken at right angles to the axis and showing the manner in which the arms are bolted together.

In the construction disclosed the machine is represented as an alternator with the revolving field and stationary armature; but it is evident that the construction could be equally well applied to direct-current machines and that the field may be stationary and armature revolve.

In the drawings the revolving field is shown as made up of the arms 1 and segments 2, carrying the poles 3. The shaft is shown at 4 and is independently supported by pedestals. (Not shown.) The main frame of the armature is built up of segments 5, placed end to end and supported between the two shields or end frames 6 6. In the present instance each shield is made up of parts 7, each of which is composed of a single arm 8 and a segmental portion 9. Certain of the parts 7 have integral therewith pedestals 10, which act to support the shields, which in turn form the entire support for the main frame. In the present case each shield is provided with three pedestals, the outer pedestals being each carried by a single segment and the central pedestal being jointly formed on the inner ends of two arms 8. An opening 11 is formed in each shield, through which the shaft 4 passes with ample clearance.

The method of assembling and bolting the parts together is illustrated in Figs. 3, 4, and 5 of the drawings. The segments 5 are made up in box form, with stiffening-ribs 12. Two bosses 13 are formed on each side of the segment 5 and provided with holes 14 to receive

the bolts 15, which bolt the segments to shield 6. Each segment 9 is built up in skeleton form and drilled to receive the bolts 15. Near each bolt 15 are formed openings 16 in the segments 5 and 9 for access to the bolts and to serve also for ventilation. These openings are not shown in Figs. 1 and 2 on account of the small scale to which they are drawn. Each segment 5 has inner projecting ribs 17, upon which are dovetailed the laminations 18 and separators 19. These parts are clamped together by the side plates 20 and through-bolts 21, and the windings 22 are carried between the teeth 23, as usual. The segments 9 are bolted end to end by bolts 24 passing through holes 25 in the end walls of the segments. The arms 8 are of skeleton form and bolted at their inner ends to each other by bolts 26. (Shown in Fig. 5.) The joining faces of the arms 8 and ends of the segments 9 have only a portion thereof in actual contact, clearance being left behind them to permit tightening of the differential bolts 26 and 24.

In assembling and erecting the machine the revolving field and shaft are first set in position. The shields are then assembled and set in place, after which the segments 5 are bolted in place between the shields. It is therefore evident that by the manner of construction shown I have overcome the difficulty as to shipment of parts and have greatly simplified their manner of erection. I do not wish it to be understood that the structure disclosed is the only manner in which my invention may be carried out, as various changes in form of the parts and method of connecting could be used without departing from the essential features of my invention.

I claim as my invention—

1. In a dynamo-electric machine, a stationary frame comprising two end shields, and a main frame supported between them, said main frame comprising segmental supports placed end to end and laminæ supported by

said segmental supports, substantially as described. 45

2. In a dynamo-electric machine, a stationary frame comprising two end shields, and a main frame supported between them, said main frame comprising segmental supports of skeleton form placed end to end and laminæ supported by said segmental supports, substantially as described. 50

3. In a dynamo-electric machine, a stationary frame comprising two end shields, and a main frame supported between them, said main frame comprising segmental supports placed end to end and having internal extensions and laminæ carried by said extensions, substantially as described. 60

4. In a dynamo-electric machine, a stationary frame comprising two end shields, and a main frame supported between them, said main frame comprising segmental supports of skeleton form placed end to end and having internal projecting ribs and laminæ carried by said ribs, substantially as described. 65

5. In a dynamo-electric machine, a stationary frame comprising two end shields, and a main frame supported between them, said main frame comprising segmental supports of skeleton form placed end to end and having internal projecting ribs, laminæ carried by said ribs, and side plates bolted outside said laminæ, substantially as described. 75

6. In a dynamo-electric machine, a stationary frame comprising two end shields and a main frame supported between them, each of said shields being provided with outer and central pedestals which serve as a support for the stationary frame. 80

In testimony whereof I affix my signature in presence of two witnesses.

BERNARD A. BEHREND.

Witnesses:

L. K. SAGER,
SANFORD KLEIN.