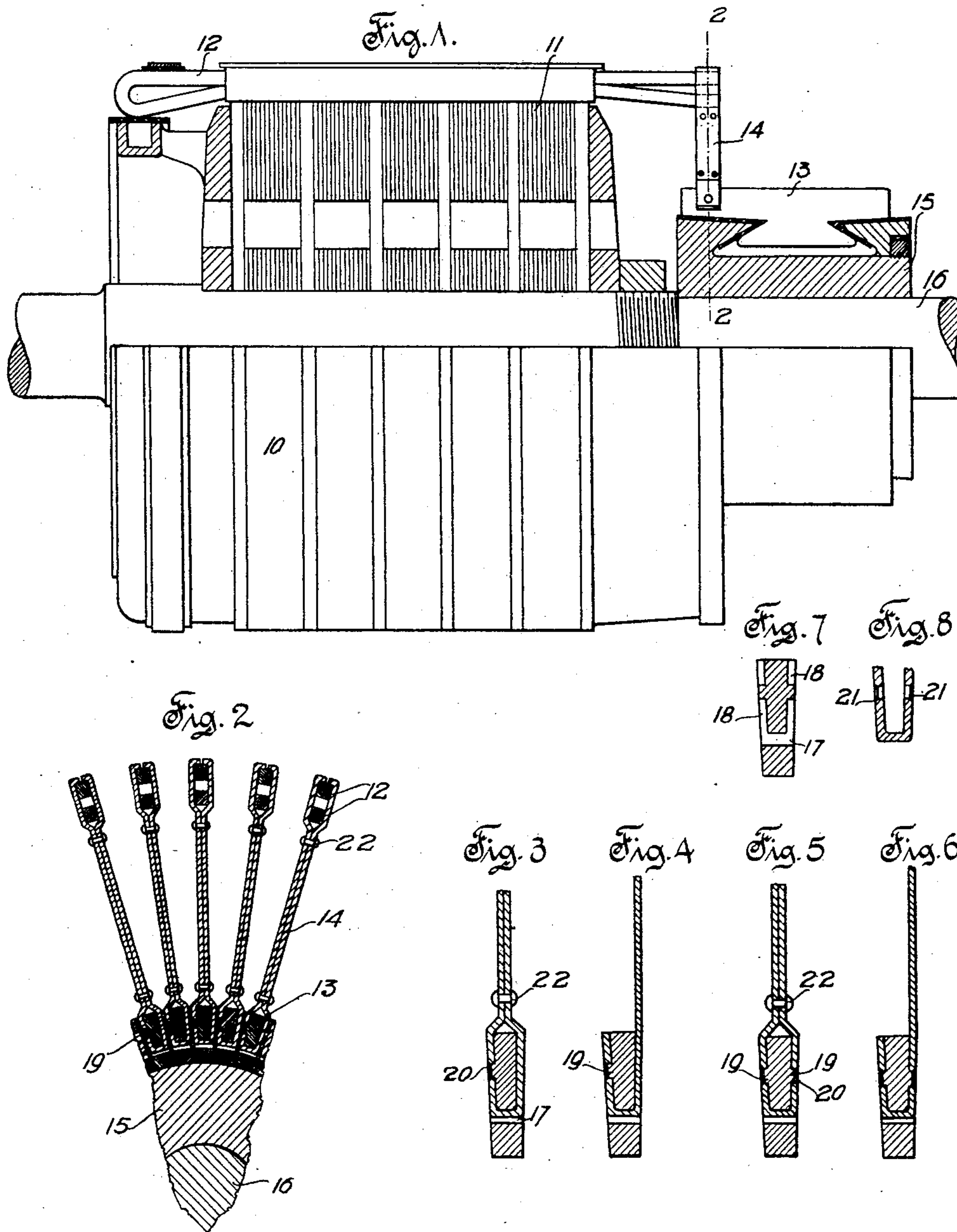


C. E. LORD.  
COMMUTATOR BAR AND LEAD.  
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969,892.

Patented Sept. 13, 1910.



Witnesses:  
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# UNITED STATES PATENT OFFICE.

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## COMMUTATOR BAR AND LEAD.

969,892.

Specification of Letters Patent. Patented Sept. 13, 1910.

Application filed December 21, 1908. Serial No. 468,625.

*To all whom it may concern:*

Be it known that I, CHARLES E. LORD, a citizen of the United States, residing at Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented certain new and useful Improvements in Commutator Bars and Leads, of which the following is a full, clear, and exact specification.

My invention relates to dynamo-electric machines and particularly to the construction of the commutators of such machines and the fastening means between the commutator bars or segments and the armature leads or commutator connectors.

It is of prime importance in making connections between the commutator bars and the armature coil leads, to secure perfect electrical contact and a considerable degree of mechanical strength. Furthermore, from a commercial standpoint, it is essential that the connections should be made without the expenditures of much time and labor.

The object of my invention is to provide a connection between the commutator bars and connectors which will have the requisite mechanical and electrical properties, and to simplify the method of making the connections. With this end in view I provide a commutator bar having an aperture and grooves which communicate with said aperture and an integral lug or projection in one or each of said grooves, and a connector passing through said aperture and seated or resting in said grooves and riveted to the said bar by said lug or projection.

In another aspect my invention comprises the method of fastening a commutator connector to a segment, which consists in forming an aperture in the bar, and grooves on opposite sides of said bar and communicating with said aperture, and a lug in one or each groove, then threading through the aperture and seating in the grooves, a connector having an opening or openings to receive the lug or lugs, and then expanding or riveting the lug or lugs whereby the connector and segment will be held firmly together.

In the accompanying drawing, Figure 1 is an elevation, partially in section, of an armature equipped with my invention; Fig. 2 is a partial sectional elevation on the line 2—2 of Fig. 1, and shows a plurality of commutator segments having leads attached in accordance with my invention; Fig. 3 is a de-

tail section similar to a portion of Fig. 2, on an enlarged scale; Figs. 4, 5, and 6 are sections similar to Fig. 3 showing modifications of my invention; Fig. 7 is a section of a commutator segment showing the aperture and communicating grooves and lugs in said grooves; and Fig. 8 is a section of connector showing the rivet holes countersunk.

The armature 10 is provided with a laminated core 11 and armature coils 12, connected to the commutator segments 13 by the leads or connectors 14. The commutator is mounted on the sleeve 15 which is fastened to the shaft 16 in the customary manner.

In carrying out my method certain steps or operations are required to fasten the segments to the armature leads or connectors. Each commutator bar is provided, in a single step or operation, by means of dies, with an aperture 17 and grooves 18, and near the center of one or each groove with a lug, projection, or rivet 19 adapted to fit into an opening in the armature lead. The aperture 17 is to be sufficiently large to freely permit the conductor being passed through it. The grooves are to be of a depth just equal to the thickness of the lead or connector. A connector or lead 14 which is provided with a hole or holes 20, is then passed through the aperture 17 and fitted into the grooves 18 so that each rivet or projection 19 enters its corresponding opening 20. The opening 20 is preferably countersunk at its outer face as at 21 to provide for the spreading of the head of the rivet. The connector or lead and segment are next riveted together by swaging or expanding the end of the projection or rivet. The expanded end of the lug or rivet occupies the countersunk portion 21 of the opening 20. In the preferred form of my invention the connector or lead forms a loop through the commutator bar and both ends of the lead are attached to an armature conductor. To make the structure more rigid I prefer to rivet or clamp together, as at 22, the adjacent portions of each looped connector or lead. The construction herein illustrated and described embodies a connection, both electrical and mechanical, which has all the requisite properties and which can be thoroughly depended upon to perform its duties in a satisfactory manner. Furthermore, it will be seen that the method of manufacture



is extremely simple and that little time and labor are required.

I aim in the appended claims to cover all modifications and changes which do not  
5 involve a departure from the spirit of the invention.

What I claim as new is:—

1. The combination with a commutator bar having grooves and an aperture communicating therewith, of a connector passing through said aperture and setting in  
10 said grooves.

2. The combination of a commutator bar having grooves and an aperture communicating therewith and provided with an integral lug in one of said grooves, with a connector provided with an opening into which said lug projects, said lug being upset or expanded, riveting said connector to  
15 said bar.

3. The combination of a commutator bar having grooves and an aperture communicating therewith and provided with an integral lug in one of said grooves, and a connector passing through the aperture and setting in said grooves, the connector being  
25

provided with an opening, into which said lug projects and in which said lug is expanded to rivet the bar and connector together.

4. A commutator bar having grooves and an aperture communicating therewith, said grooves being on opposite sides of said bar.

5. The combination of a commutator bar having grooves and an aperture communicating therewith, a connector passing through said aperture and setting in said grooves forming a loop, and means for clamping said connector together beyond  
35 said loop.

6. A commutator bar having grooves and an aperture communicating therewith, said grooves being on opposite sides of said bar, and said commutator bar being provided with integral lugs, one in each groove.

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

CHARLES E. LORD.

Witnesses:

CHAS. L. BYRON,  
GEO. B. SCHLEY.