No. 856,422. PATENTED JUNE 11, 1907.

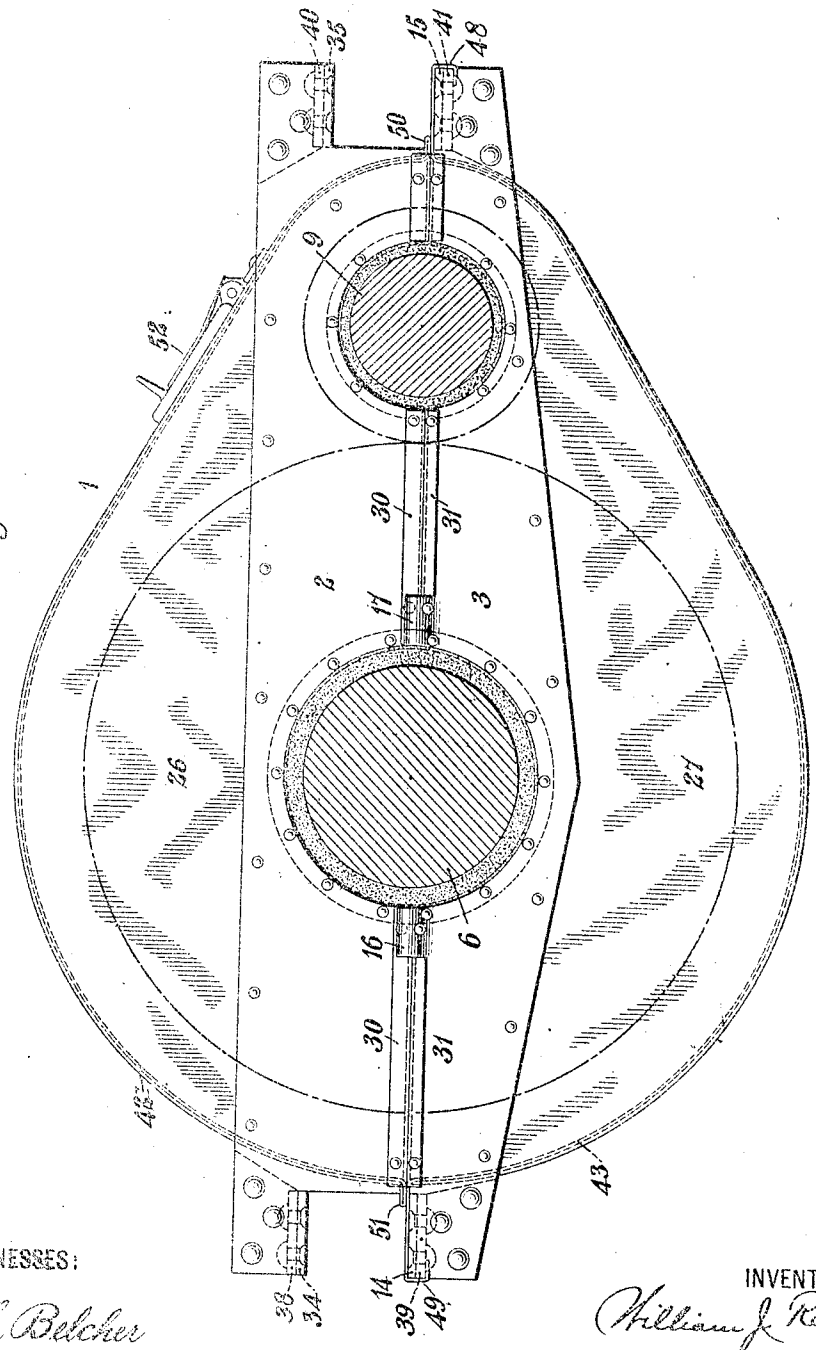
W. J. REICH.

GEAR CASE.

APPLICATION FILED JUNE 3, 1905.

2 SHEETS—SHEET 1.

Fig. 1.



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No. 856,422. PATENTED JUNE 11, 1907.

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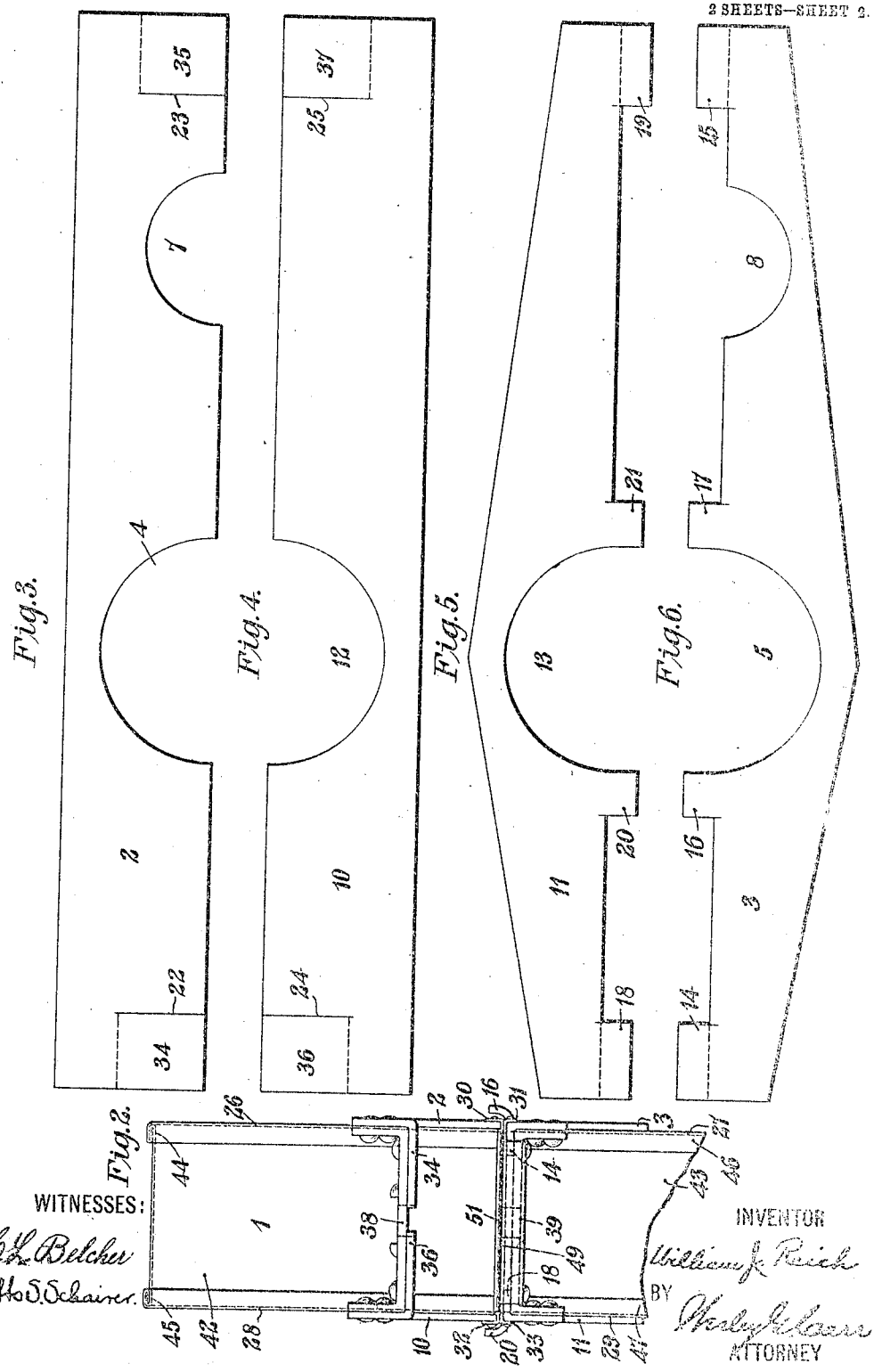
APPLICATION FILED JUNE 2, 1906.

2 SHEETS—SHEET 2.



UNITED STATES PATENT OFFICE.

WILLIAM J. REICH, OF WILKINSBURG, PENNSYLVANIA, ASSIGNOR TO WESTINGHOUSE ELECTRIC & MANUFACTURING COMPANY, A CORPORATION OF PENNSYLVANIA.

GEAR-CASE.

No. 856,422. Specification of Letters Patent. Patented June 11, 1907.

Application filed June 2, 1905. Serial No. 263,495.

To all whom it may concern:

Be it known that I, WILLIAM J. REICH, a citizen of the United States, and a resident of Wilkinsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Gear-Cases, of which the following is a specification.

My invention relates to gear cases employed for inclosing and protecting the gear wheels and pinions used for transmitting power at reduced speeds from railway motor armatures to the truck axles of the vehicles in connection with which they are used.

The object of my invention is to provide a gear case which shall be simple and inexpensive in construction, light in weight and durable in service.

Heretofore it has been the usual practice to construct railway motor gear cases of malleable iron castings though it has been also proposed to manufacture them of pressed steel. The malleable iron castings which have been usually employed have been of undesirable weight and liable to breakage in service, and pressed steel gear cases have been difficult and expensive to manufacture.

In the accompanying drawings, Figure 1 is a view in side elevation of a gear case constructed in accordance with my invention, the armature shaft and the truck axle being shown in section. Fig. 2 is an end elevation of a portion of the gear case shown in Fig. 1. Fig. 3 is a side elevation of one of the upper blanks used in making the gear case. Fig. 4 is a side elevation of the other upper blank. Fig. 5 is a side elevation of the lower blank for the same side as the upper blank shown in Fig. 4, and Fig. 6 is a side elevation of the lower blank for the same side as the blank shown in Fig. 3.

The gear case 1 which is constructed in accordance with my invention is or may be of the usual form or contour but it is built up of a plurality of metal plates which will be now described in detail without the intention, however, of limiting the invention to devices or parts of the exact form or dimensions shown in the drawings.

At the side next the motor armature the case is provided with two plates 2 and 3 of comparatively thick sheet metal, preferably steel; these plates, the blanks for which are shown, respectively, in Figs. 3 and 6, are severally provided with approximately semi-circular recesses 4 and 5 to fit over the truck axle 6 and with smaller approximately semi-circular recesses 7 and 8 to fit over the armature shaft 9. The opposite side of the gear case is provided with two similar plates 10 and 11 the blanks for which are shown, respectively, in Figs. 4 and 5 of the drawings but as the armature shaft does not project through this side of the gear case, the blanks are provided with only the semi-circular recesses 12 and 13 for the truck axle 6. The blank 3 is provided with upwardly projecting lips 14 and 15 at its respective ends and with similar lips 16 and 17 adjacent to the recess 5. The blank 11 is similarly provided with lips 18 and 19 adjacent to its ends and lips 20 and 21 adjacent to its recess 13. The blank 2 is provided with a transverse cut 22 that extends inward for a considerable distance from its lower edge adjacent to one end and a similar cut 23 adjacent to its other end. The blank 11 is similarly provided with cuts 24 and 25 adjacent to its respective ends.

The body portion of the gear case comprises two plates 26 and 27 of thin sheet metal such, for example, as terne plate at the side provided with plates 2 and 3 and with similar plates 28 and 29 at the opposite side. The adjacent edges of the thin plates 26 and 27 are bent over the edges of the plates 2 and 3 as indicated at 30 and 31 and are riveted thereto. The adjacent edges of the plates 28 and 29 are bent or folded over the corresponding edges of the plates 10 and 11 as indicated at 32 and 33 and are riveted thereto. The plates 26 and 27 and 28 and 29 are also securely riveted to the corresponding plates 2 and 3 and 10 and 11 along their respective upper and lower edges, at their ends and around the openings formed by the recesses 4 and 5, 7 and 8 and 12 and 13.

The lips 16 and 17 and 20 and 21 are bent outward slightly so as to project along side the corresponding plates 2 and 10. The portions 34, 35, 36 and 37, formed respectively, by the cuts 22, 23, 24 and 25, are bent-over substantially at right angles to the side faces of the plates, and the lips 14, 15, 18 and 19 are similarly bent-over at right angles to the side faces of the plates. To the bent-over portions 34 and 36 and also to the adjacent, unbent portions is riveted a

channel piece 38. To the bent-over lips 14 and 18 and to the adjacent unbent portions at the same end is riveted a similar channel piece 39 and at the opposite end, the case is provided with similar channel pieces 40 and 41.

The curved or peripheral portion of the gear case comprises an upper sheet metal strip 42 which may be terne plate or other thin material and a lower strip 43 of like or similar material. The meeting edges of the strip 42 and the plates 26 and 28 are folded together as indicated at 44 and 45 and the meeting edges of the strip 43 and plates 27 and 29 are similarly folded together as indicated at 46 and 47 and these joints are preferably soldered in order to make them oil tight. The respective ends of the strip 43 are folded around the ends of the bracing structure as indicated at 48 and 49 and the edges of the upper strip 42 are folded so as to rest upon the corresponding portion of the strip 43 as indicated at 50 and 51. The upper side of the gear case may be provided with a hinged door 52 in order that a suitable lubricant may be applied to the gears without dismembering the casing.

It will be understood from the foregoing description that the principal portions of the gear cases are of exceptionally thin, light weight metal and that the side plates of heavy metal that are riveted to the thin plates, are of sufficient rigidity to provide suitable supporting connections at the ends and to also preserve the form of the gear case under such strains as it may meet in service.

The form of the device and its structural details may, of course, be varied within considerable limits without departing from my invention.

I claim as my invention.

1. A gear case for railway motors comprising a body portion, made up of thin metal plates, having their meeting edges folded together and side plates of heavier metal riveted to the thin side plates.

2. A gear case for electric railway motors comprising side and edge plates of thin sheet metal, suitably fastened together at their edges and re-inforcing side plates of thicker metal riveted to the thin side plates.

3. A gear case for electric railway motors comprising side and edge plates of thin sheet metal, fastened together at their meeting edges and side plates of heavier metal riveted to the thin side plates and having bent-over end sections and re-inforcing bars or plates therefor.

4. A gear casing for electric railway motors comprising thin sheet metal sides and edge plates, having their meeting edges folded together and side plates of heavier metal riveted to the thin side plates and having re-inforcing plates riveted to their ends.

5. A gear casing comprising side plates and top, bottom and end plates of thin, sheet metal and side plates of relatively thick material riveted to the thin side plates.

6. A gear casing comprising four plane side plates and two curved plates for the top, bottom and ends, all of thin sheet metal, and four re-inforcing side plates of relatively thick material that are riveted to the thin side plates.

7. A gear casing composed of thin metal plates the meeting edges of which are folded together and re-inforcing plates of relatively thick material that are riveted to the side plates of thin material.

8. A gear casing comprising side and peripheral plates of sheet metal and re-inforcing and supporting plates of relatively thick material that are riveted to the thin side plates and project beyond the ends thereof.

9. A gear casing comprising side and peripheral plates of sheet metal and a relatively thick re-inforcing plate riveted to each thin side plate along both of its edges.

10. A gear casing comprising side and peripheral plates of sheet metal and relatively thick and rigid re-inforcing plates that extend along the adjacent edges of each pair of side plates and both edges of which are riveted thereto.

11. A gear casing comprising edge plates of thin sheet metal and four side plates of thin sheet metal provided with a corresponding number of relatively narrow re-inforcing plates of thick, rigid material that are riveted to the respective thin plates adjacent to their contiguous edges.

In testimony whereof, I have hereunto subscribed my name this 27th day of May, 1905.

WILLIAM J. REICH.

Witnesses:
BIRNEY HINES,
J. C. MORSE.