C.R.B.

General Electric Company

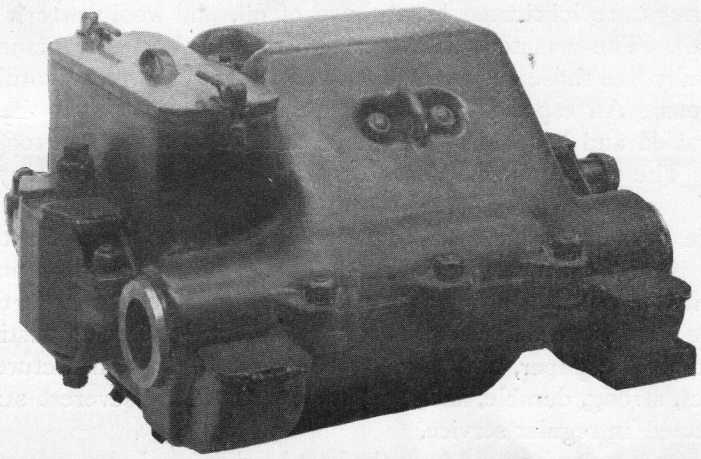
RAILWAY DEPARTMENT.

Bulletin No. 4095. **Feb. 1, 1897.**

GE-51 RAILWAY MOTOR.

Steam vs. Electricity is the subject of debate of the engineering societies at the present time and the actual substitution of electricity for steam as a motive power on suburban and elevated roads is fast assuming larger proportions. Already many large suburban branches of steam roads and a number of elevated roads are operated entirely by electricity. The General Electric Company in anticipation of this new phase of electric railway work commenced at an early date to design and develop and is today prepared to furnish every kind of apparatus for the complete electrical equipment of suburban railways previously using steam.

The large amount of reliable data we have compiled from exhaustive tests on electric railways operated on steam railway schedules with heavy trains, and the thorough study of the



THE GE-51 RAILWAY MOTOR.

problem made by our large and fully equipped engineering corps, together with the high degree of skill we have attained in the designing of railway motors, has enabled us to promptly present to the trade a full line of motors and controlling mechanism for heavy electric service.

Incidentally it may be stated that we are prepared to make estimates and furnish engineering advice gratis to prospective purchasers of our apparatus.

The GE–51 railway motor has been especially designed for high speed suburban and elevated railway work. It has a capacity of 80 H.P., rated according to our standard basis of a rise of 75° Centigrade above the temperature of the surrounding air after one hour's run at rated load.

With this and other motors a large number of gear reduction combinations may be used, thus affording a wide range of speed and tractive effort. For high speed work a gear reduction of 1 to 1.74 is used and at the present time trains of 25 to 30 tons equipped with two GE–51 motors having this gear reduction are operated at speeds of from 40 to 45 miles an hour with success.

The motor may be readily adapted to slow speed work, such as snow plows, freight locomotives and the like, by the use of larger gear reductions, which we are prepared to furnish.

The electric brake is satisfactorily installed with the GE–51 motor equipments. On the standard gauge track however, the motor takes up all of the available room between the wheel hubs on the axle and it is necessary to have double truck cars for the brake equipment, the motors being placed on one truck and the electric brakes on the other. With special dished wheels the brakes may be mounted on the same axle as the motor.

The GE–51 two-motor equipment with the electric brakes includes the B7 brake controller, while the same equipment without electric brakes requires the ordinary K13 controller. Both of these controllers are models of our controller design and workmanship, being durable and neat and occupying but a small space on the car platforms.

In general appearance the GE–51 motor resembles a GE–1000. The field frame is composed of two steel castings parted horizontally, but in this motor the frame castings are extended to the back so as to envelope the car axle. From the illustration it will be noted that a large opening is provided allowing easy access to the motor for the adjustment of the brushes and the inspection of the interior. The motor, when closed, is dust-proof and waterproof. For the removal of any foreign substance that may become lodged in the bottom of the motor a handhole is provided—this is in the bottom of the frame at the commutator end, and has a cover bolted on the outside.

A very important and novel feature of the GE–51 motor appears in the bearings. The large size axle bearings are lubricated by the use of oil, and wool waste is packed in the oil reservoir underneath. The armature bearings are lubricated in like manner and all of the bearings are essentially like those designed for steam railway service according to Master Car Builders' specifications. An especial feature of the armature bearing is the adjustment. The armature may be raised and lowered by means of the set screws at the top and bottom of the armature bearings. The range of axle diameters for which the motors may be fitted is from 4″ to 5″.

The armature construction is in accordance with the standard adopted in all the GE motors—that is, it is of the drum wound, iron-clad type, with machine-wound interchangeable armature coils. The slots in the core are made sufficiently large to permit thorough insulation of the coils and the insulating materials used are selected only after exhaustive tests have been made with every lot of wire, paper, cloth and tape used in their manufacture. The completed armature is compact, strong, durable, and able to withstand the severest strains to which the motor may be subjected in regular service.

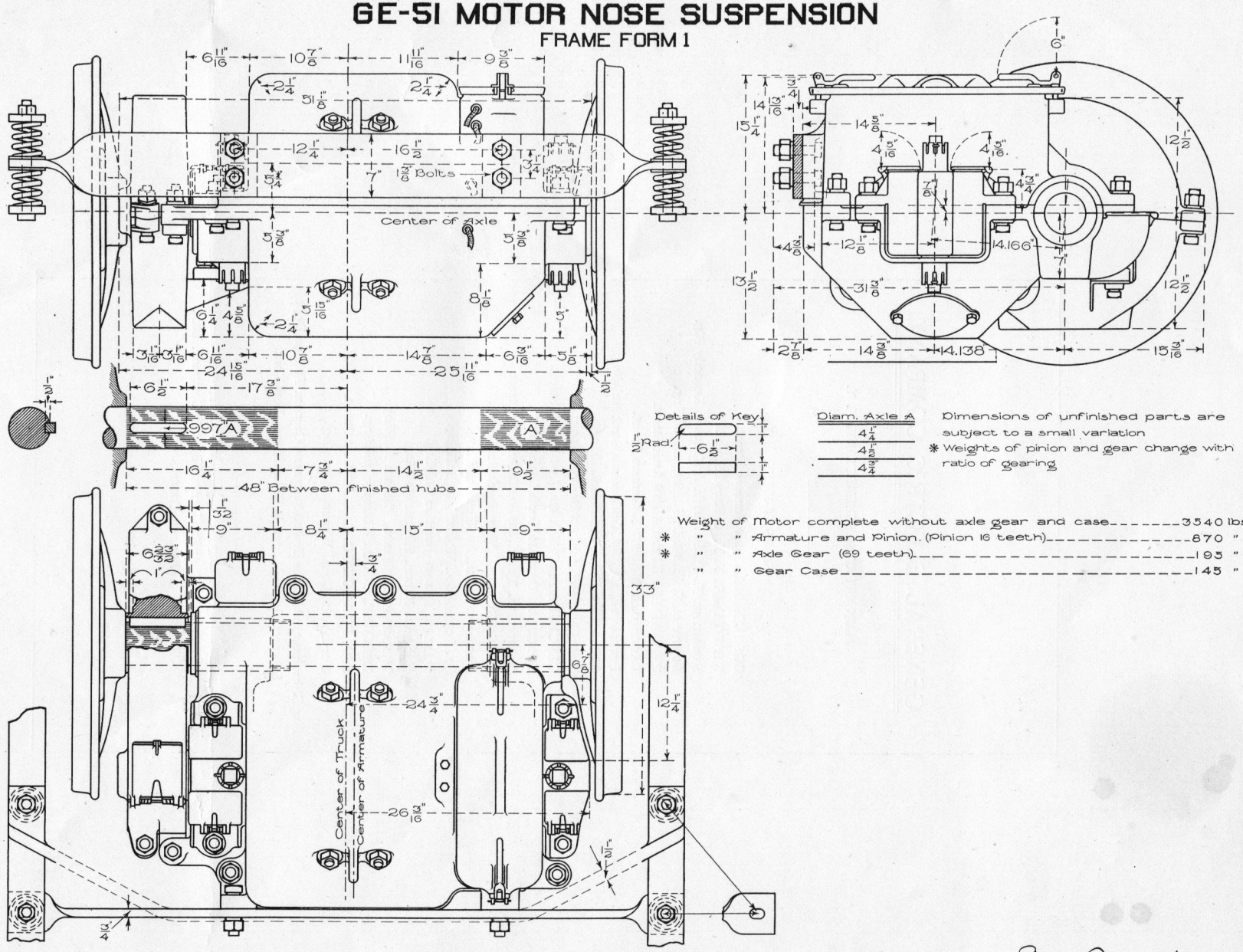
The commutator is manufactured from the best hard-drawn Lake copper and consists of 111 segments $1\frac{1}{4}$″ in depth; this will allow for considerable wear before refilling of the commutator is necessary. The bearing length of the commutator is $4\frac{1}{2}$″ and the diameter $11\frac{5}{8}$″. There is a groove encircling the commutator near where the leads enter, which facilitates the removal of the leads. The large diameter and length of the commutator ensures rapid radiation of heat.

The brush-holders are of the standard type, each holder containing two brushes $\frac{5}{8}$″ thick, 2″ wide and $2\frac{1}{2}$″ long. To prevent ridges forming on the commutator the brushes are staggered.

The weight of the motor complete and of the separate parts are given on the accompanying diagram No. 13286.

GE-51 MOTOR NOSE SUSPENSION

FRAME FORM 1



Details of Key

Diam. Axle A
4 1/4"
4 5/16"
4 3/4"

Dimensions of unfinished parts are subject to a small variation

* Weights of pinion and gear change with ratio of gearing

Weight of Motor complete without axle gear and case ------- 3540 lbs.
* " " Armature and Pinion. (Pinion 16 teeth) ------- 870 "
* " " Axle Gear (69 teeth) ------- 195 "
" " Gear Case ------- 145 "

Checked by E. D. Priest

Engineering Dept.

Approved by E. W. Rice Jr.
Chief Engineer.

No. 13286 Supersedes D. S. 374.

General Electric Co.

Nov. 16, '96.
C.S.K.

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For all business outside the United States and Canada: Foreign Dept., Schenectady, N. Y., and 44 Broad Street, New York.

For Canada, address Canadian General Electric Company, Ltd., Toronto, Ontario.