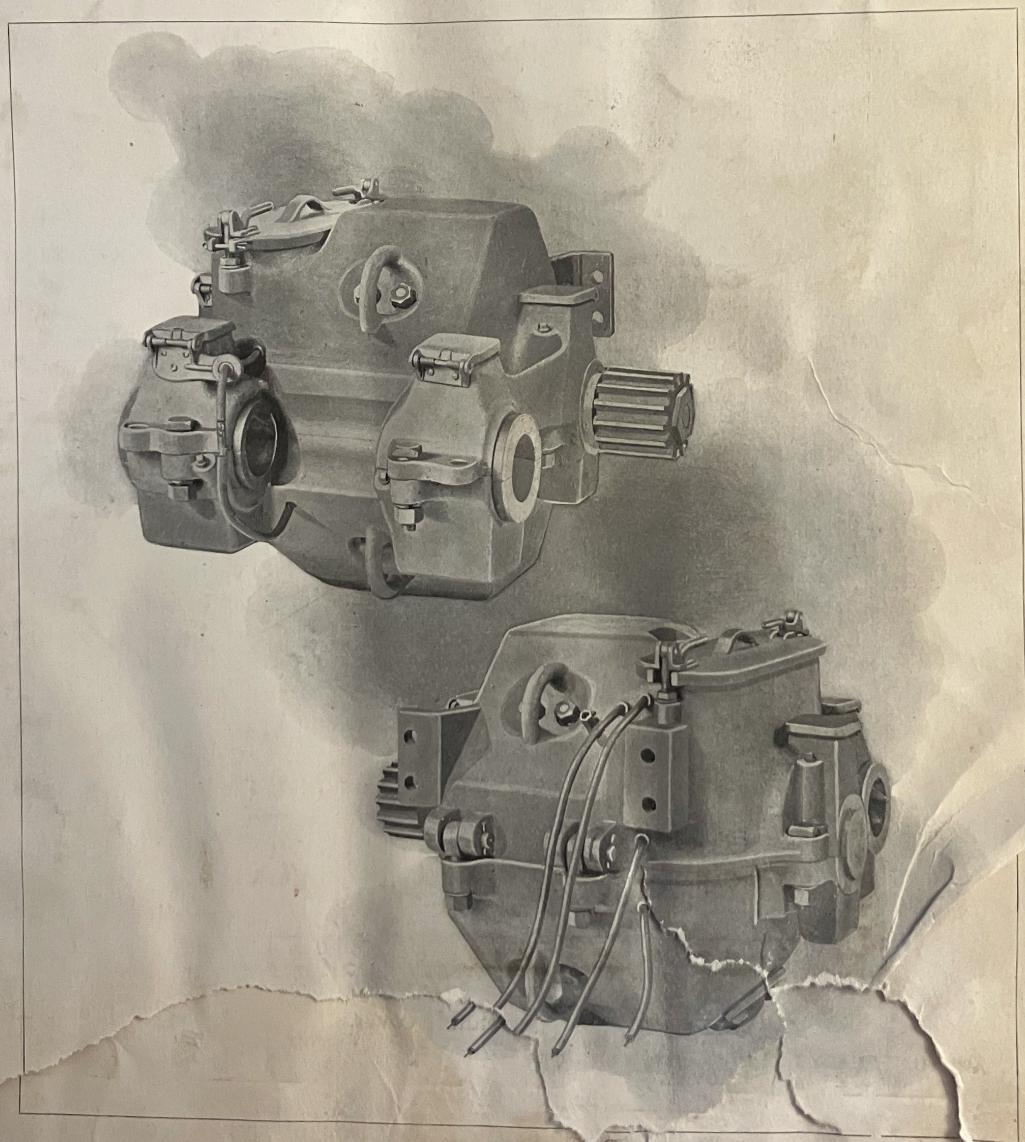
General Electric Company

RAILWAY DEPARTMENT.

August 28, 1899. **Bulletin No. 4200.**

THE GE-60 RAILWAY MOTOR.

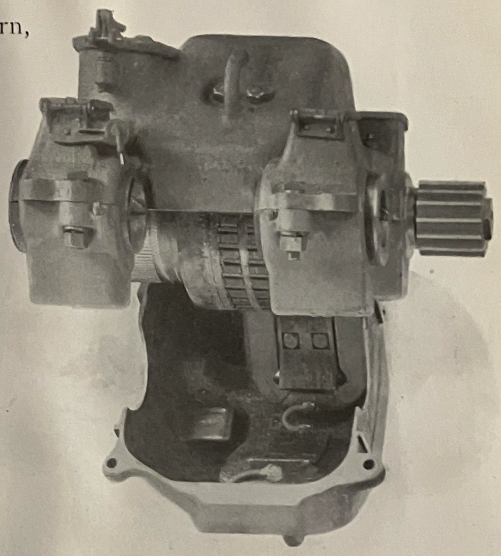


THE GE-60 RAILWAY MOTOR--FRONT END AND REAR END.

THE GE-60 RAILWAY MOTOR.

The extensive use of electric railways in locations demanding narrow gauge tracks has led the General Electric Company to design and manufacture a new moderate capacity narrow gauge motor, known as the GE–60.

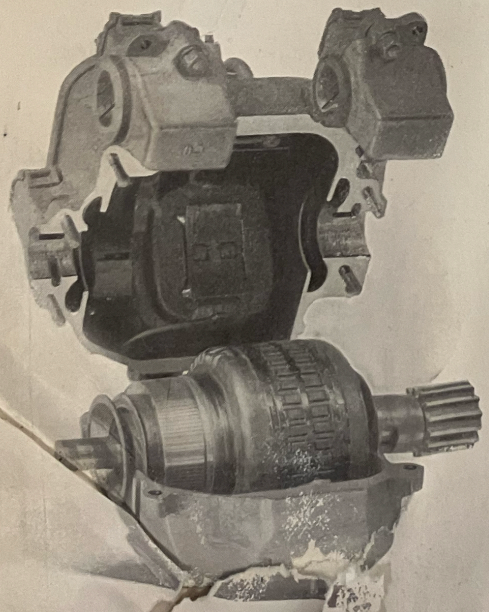
This motor can be provided with two-turn, three-turn, four-turn or six-turn armature, depending upon the voltage and the character of the service required. Four and six-turn armatures are ordinarily used on 500 volt circuits, and the two and three-turn armatures on circuits of lower voltage. The motor is adapted to a minimum gauge of 35½″ with or without electric brakes, but with electric brakes a special wheel is required.



LOWER FRAME DROPPED-SHOWING ARMATURE IN POSITION.

RATING.

On 500 volt circuits, the GE–60 railway motor with four-turn armature will develop 27 H.P., and with six-turn armature, 19 H.P., the output being based on our standard rating; that is, a maximum rise of 75° C. in the temperature of the winding after a run of one hour at full rated load, the temperature of the surrounding air not exceeding 25° C.



ARMATURE READY FOR

BEARINGS.

The armature and axle [illegible] shells of [illegible]le thickness to insure stiffness and lined with Babbit[illegible] [illegible]s to m[illegible] it compact and tight.

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The bearings are designed for the use of oil, which is fed to the shaft from oil wells in the caps by means of felt wicks, and grease which reaches the bearing from the grease box over each bearing through a slotted opening in the top of the lining.

The armature bearings, which are built on the outboard principle, are $2\frac{3}{4}'' \times 7\frac{1}{2}''$ at the pinion end and $2\frac{1}{2}'' \times 5\frac{5}{8}''$ at the commutator end. The supports for the upper parts of the linings are cast as parts of the upper half of the magnet field, and a large recess is cored between the inner end of the lining and the frame, to accommodate the combined thrust collar and oil guard. The design of the oil guard practically prevents oil or grease from working into the motor frame.

The lower half of the armature bearing is supported by a cap bolted to the upper frame, an opening being provided to allow free egress to the lubricant after it has passed through the bearing.



PARTS OF THE GE-60 RAILWAY MOTOR.

The extension pieces cast on the top frame project over and partly enclose the axle bearings which are bolted to their under sides.

POLE PIECES AND FIELD COILS.

The pole pieces are built up from thin soft iron laminations, riveted together and bolted to the frame by through bolts with nuts on the outside.

The four field coils are placed at an angle of 45° from the horizontal and are held in place by pressed steel flanges or spool holders which are clamped by the pole pieces. The coils are wound with asbestos covered wire, and when completed are further insulated with wrappings of varnished cloth and tape. The insulation of the coils is subjected to a high potential test of 4000 volts alternating current.

The leads from the field are so arranged that they are easily removable, and they need not be disconnected inside of the magnet frame when the lower half of the frame is dropped.

The iron-clad type armature is built up of iron laminations, japanned, and securely keyed to the shaft, and [illegible] iron heads also keyed to the shaft. The armature core has [illegible] winding consists of 111 coils,

ARMATURE.

the number of turns per coil varying with the requirements of each case. The coils are made up in sets of three, and each set is formed and thoroughly insulated before it is placed in the slots of the armature core.

The coils are insulated with specially prepared tape and cloth which have high insulating qualities, and are practically impervious to moisture.

The terminals of each coil are brought directly into the commutator and soldered so as to properly connect the coils to each other and at the same time form the connections between the windings and the commutator. They are so arranged that any coil or number of coils can be easily removed and replaced with new coils when necessary. The coils are held in place in the slots and on the ends of the core by bands of tinned steel wire, held together by clips and soldered.

The end windings are thoroughly protected by canvas, and at the pinion end they are further protected by a flange which extends past the windings and prevents injury from careless handling.

The pinion is of steel and is bored for a taper fit on the shaft. The gear is also steel, and both gear and pinion have a $4\frac{1}{2}''$ face and 3″ pitch. They are protected by a dust-proof case of malleable iron which is securely bolted to the top half of the magnet frame.

COMMUTATOR.

The commutator has 111 hard drawn copper segments, insulated with carefully selected mica and securely clamped to a malleable iron shell. The segments are slotted at the back to receive the armature wires. The diameter of the commutator is 10″ and the wearing length is $2\frac{15}{16}''$, with a maximum wearing depth of 1″, measured at the front end. The cone clamping insulations are of the best quality of mica, built up and pressed hard and compact. The mica between the segments is of a somewhat softer quality, so that in service it will wear down evenly with the copper segments.

The insulation of the completed commutator is tested with 4000 volts between the segments and the shell and 400 volts between adjacent segments.

BRUSH-HOLDERS.

The two brush-holders are of cast brass. The brushes slide in finished ways in each holder and are pressed against the commutator by independent pressure fingers, which give a practically uniform pressure throughout the working range of the brushes. The brush-holders are clamped to a hard-wood yoke, which is bolted to the top of the magnet frame and can be removed through the opening in the frame over the commutator.

All the leads from the motor to the cables are brought out through rubber bushed holes in the magnet frame at the front of the motor.

SUSPENSION.

The GE–60 m[illegible]tor is a [illegible]d for us[illegible] with [illegible]ther nose or yoke suspension, four bolts being provided on the fron[illegible] end of [illegible]notor f[illegible]r atta[illegible]ng the suspension bar.

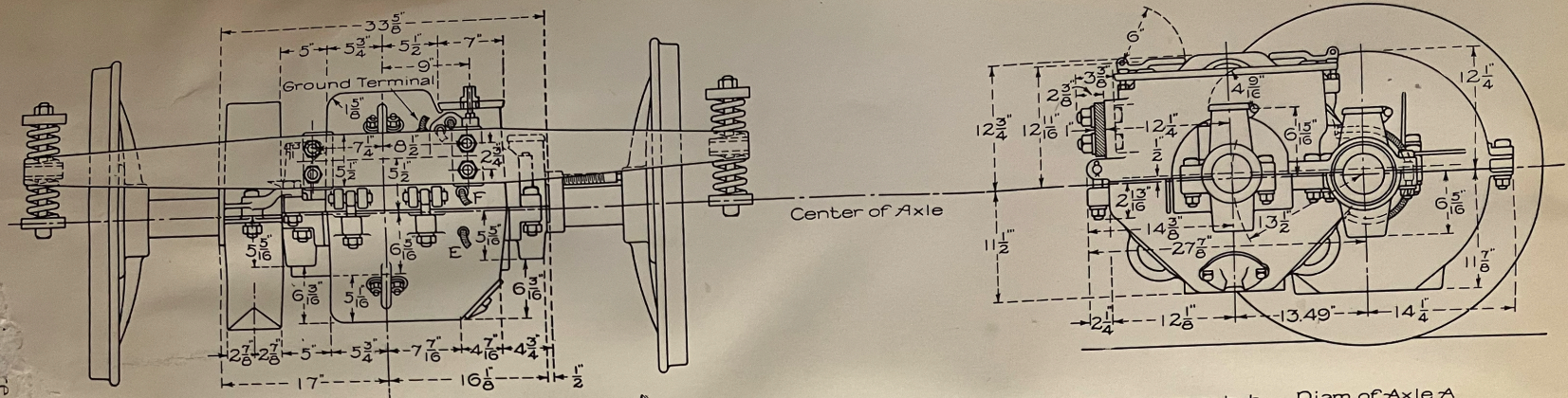
When the mo[illegible]r is mo[illegible] on 3″ whe[illegible] the clearance between the bottom of the motor frame and the [illegible] of the rail[illegible] [illegible] clearance [illegible]tween the bottom of the gear case and the top of the rails, with the [illegible]ion [illegible]5″.

Data relati[illegible]o weight[illegible] [illegible]re given on the accompanying diagram.

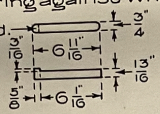
[illegible]s to m[illegible]

GE-60-A MOTOR YOKE SUSPENSION

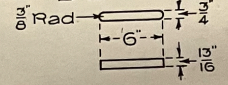
GE-60-A MOTOR YOKE SUSPENSION



Details of Key with gear hub not bearing against wheel



Details of Key with gear hub bearing against wheel



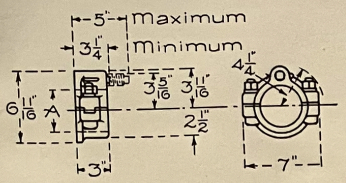
Diam. of Axle A
3 3/8"
3 7/16"
4

* Dimensions of unfinished parts are subject to a small variation.
* Weights of pinion and gear change with ratio of gearing.

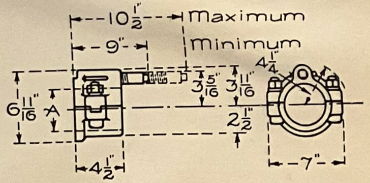
Weight of Motor complete without axle gear and case	1400 Lbs
* " " Armature and Pinion (14 teeth)	410 "
* " " Axle Gear (67 teeth)	140 "
" " Gear Case	125 "

Adjustable Axle Collars.

For 36" Meter and 42" gauge.



For 4'-8 1/2" gauge



Checked E. D. Priest

Engineering Dept.

Approved E. W. Rice Jr.
Chief Engineer

General Electric Company

19 Sept. '98.
C.S.H.

No. 13506