# Electric Company Schenectady, N.Y.

June, 1920

\*Bulletin No. 58355

# PARTS OF CR 9145 TYPE RG RESISTORS FORMS A, A1/3, A1/2, A2/3, A3/4, A5/6, A1, A2, A3 AND A4

### SELECTION OF GRIDS

Pattern numbers and size numbers cast on each of the grids permit easy identification in the store room, and selection from the following table may be made accordingly. Also the name plate on each complete resistor gives a rating which signifies the size or sizes of grids and likewise the quantity of each contained in the resistor. Example: "CR 9145 Type RG-7A18-T-7A18" contains 36 number 7 grids, all connected in series. The full significance of the rating is explained under the subject of "Nomenclature," page 4.

The following table indicates the catalog numbers corresponding to the various pattern numbers and size numbers. Always order by catalog numbers.

### GRIDS

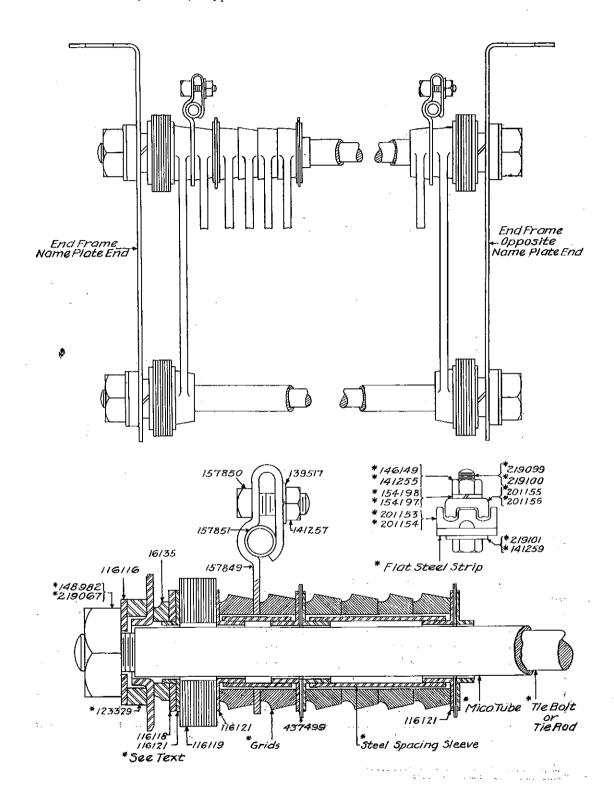
Cat. No.	Size No.	Pattern No.	Resistance per Grid at 25 Deg. C.	Approx. Wt. in Lb. per 100
60580	1	803574-XE	0.0095	224
60532	3	803574-R	0.0145	190
60534	5	803574-T	0.0215	171
60536	7	803574-V	0.032	126
60538	9	803574-XA	0.049	112
60539	10	803574-XB	0.049	104
60541	12	803574-XH	0.074	92
177154	14	1652431-A	0.105	112
179296	15	1652431-B	0.062	126

### FRAME PARTS

Resistor Form Stamped on Name Plate	Max. No. of Grids Lugs 5% In. Thick	Max. No. of Grids Lugs <sup>15</sup> / <sub>32</sub> In. Thick	End Frame Name Plate End	End Frame End Opposite Name Platc	Tie Rod for Grids	Tie Bolt for Grids	Mica Tube	Tie Rod for Frames	Spacing Collar Between Nut and Frame	Square Nut for Tie Bolt	Hexagon Nut for Tie Rod
			Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.
A.	36	48	123327	123328		116115	116122		123329	219067	
A 1/4	14	18	224376	224376		161252	224384	224378		219067	148982
A 1/2	18	24	224376	224376		116115	224385	457188		219067	148982
A 3/9	22	29	224376	224376		224381	224386	224379		219067	148982
A 3/4	26	34	224376	224376		224382	224387	224380		219067	148982
Αē	30	40	224376	224376		224383	224388	455187		219067	148982
<b>A</b> 1	56	74	123327	123328	192866		192867		123329		148982
A2	56	74	123327	192865	192866		192867		123329		148982
АЗ	28	36	123327	123328		161252	161253	1	123329	219067	
A4	48		123327	123328	1422497		1425996		123329		148982

NOTE.—Data subject to change without notice. \* Supersedes in part Bulletin No. 58823.

58355-2 Parts of CR 9145 Type RG Resistors



# PARTS COMMON TO ALL FORMS LISTED IN THIS BULLETIN

	Description
116116	Steel plate washer back of nut $\binom{11}{15}$ in, by 134 in, by 0.102 in, shorardized)
16135	National lock washer ( $\frac{39}{32}$ in. by $1\frac{1}{37}$ in. by $\frac{7}{32}$ in. thick)
116118	Steel washer back of No. 16135 (15 in, by 2 in, by 0.114 in, sherardized)
116119	Mica spacing collar (1/2 in. by 21/2 in. by 0.625 in.)
116121	Cupped washer (1/2 in, hole)
437499	Mica washer between grids ( $\frac{1}{8}$ in. by $2\frac{1}{4}$ in. by 0.03 in.) Steel washer between grids when steel spacing sleeve is omitted ( $\frac{1}{8}$ in. by 2 in. by 0.025 in.)
1408312	Steel washer between grids when steel spacing sleeve is omitted (1/8 in. by 2 in. by 0.025 in.)
116125	Steel spacing sleeve 18 in. long
116126	Steel spacing sleeve 1/2 in long
116127	Steel spacing sleeve 11/8 in. long
116128	Steel spacing sleeve $1\frac{9}{3}$ in long
116129	Steel spacing sleeve $1\frac{7}{16}$ in. long
116129	Steel spacing sleeve 118 in long
116131	Steel spacing sleeve 1¾ in. long
116132	Steel spacing sleeve 216 in. long
116132	Steel spacing sleeve $2\frac{1}{32}$ in, long
	Steel spacing sleeve 23 in. long
116134	Steel spacing sleeve 2/8 in long
116135	Steel spacing sleeve $2\frac{1}{16}$ in, long
116136	Steel spacing sleeve 3 in. long
116137	Steel spacing sleeve 5 m. tong
116138	Steel spacing sleeve $3\frac{1}{5}$ in. long
201209	Steel spacing sleeve 378 in. long
116139	Steel spacing sleeve $4\frac{1}{4}$ in. long
116140	Steel spacing sleeve 4 1/8 in. long
116141	Connection strip for grids
	Steel spacer between grids, opposite connection strip and terminal
116145	Terminal with terminal bushing, clamping bolt, nut and washer
157849	Clamping bolt for terminal (\% in16, 1 in. sq. h. sherardized)
157850	Nut for clamping bolt (3% in16, ¼ in. thick, hex. st'd, sherardized)
141257	Nut for clamping boit (% in10, ½ in. thick, nex. st u, sherardized)
139517	Spring lock washer for nut $(\frac{13}{32}$ in. by $\frac{25}{32}$ in. by 0.0625 in.)
157851	Terminal bushing for terminal
	SPECIAL TERMINALS FOR LOCOMOTIVE SERVICE
192870	
	Flat steel strip, drilled for terminal connection, bushar or punched copper tube cable terminal connection (3 % in. long, 1/12 in. bolt hole)
192868	connection (3¾ in. long, $\frac{13}{32}$ in. bolt hole)
192868 192869	connection (3¾ in. long, $\frac{13}{12}$ in. bolt hole)  Plat steel strip, drilled for terminal connection, busbar or punched copper tube cable terminal connection (4½ in. long, $\frac{13}{12}$ in. bolt hole)  Plat steel strip, drilled for terminal connection, busbar or punched copper tube cable terminal connection (4½ in. long, $\frac{13}{12}$ in. bolt hole)
192869	connection (3¾ in. long, $\frac{13}{12}$ in. bolt hole)  Plat steel strip, drilled for terminal connection, busbar or punched copper tube cable terminal connection (4½ in. long, $\frac{13}{12}$ in. bolt hole)  Plat steel strip, drilled for terminal connection, busbar or punched copper tube cable terminal connection (4½ in. long, $\frac{13}{12}$ in. bolt hole)
	connection (3¾ in. long, ⅓ in. bolt hole).  Plat steel strip, drilled for terminal connection, busbar or punched copper tube cable terminal connection (4½ in. long, ⅓ in. bolt hole).  Plat steel strip, drilled for terminal connection, busbar or punched copper tube cable terminal connection (4½ in. long, ⅓ in. bolt hole).  Steel spacer between grids, opposite flat steel strip  Large terminal for cables, consists of two clamps with ⅓ in. bolt, nut and washers (may be brought out at either top or bottom of resistor).
192869 116145	connection (3¾ in. long, ⅓ in. bolt hole).  Plat steel strip, drilled for terminal connection, busbar or punched copper tube cable terminal connection (4½ in. long, ⅓ in. bolt hole).  Plat steel strip, drilled for terminal connection, busbar or punched copper tube cable terminal connection (½½ in. long, ⅓ in. bolt hole).  Steel spacer between grids, opposite flat steel strip  Large terminal for cables, consists of two clamps with ⅓ in. bolt, nut and washers (may be brought out at either top or bottom of resistor).  Small terminal for cables, consists of two clamps with ⅓ in. bolt, nut and washers (may be brought terminal for cables, consists of two clamps with ⅙ in. bolt, nut and washers (may be brought).
192869 116145 207549 207550	connection (3¾ in. long, ⅓ in. bolt hole).  Plat steel strip, drilled for terminal connection, busbar or punched copper tube cable terminal connection (4½ in. long, ⅓ in. bolt hole).  Plat steel strip, drilled for terminal connection, busbar or punched copper tube cable terminal connection (4½ in. long, ⅓ in. bolt hole).  Steel spacer between grids, opposite flat steel strip  Large terminal for cables, consists of two clamps with ⅓ in. bolt, nut and washers (may be brought out at either top or bottom of resistor).  Small terminal for cables, consists of two clamps with ⅓ in. bolt, nut and washers (may be brought out at either top or bottom of resistor).
192869 116145 207549 207550 201153	connection (3¾ in. long, ⅓ in. bolt hole).  Flat steel strip, drilled for terminal connection, busbar or punched copper tube cable terminal connection (4½ in. long, ⅓ in. bolt hole).  Flat steel strip, drilled for terminal connection, busbar or punched copper tube cable terminal connection (4½ in. long, ⅓ in. bolt hole).  Steel spacer between grids, opposite flat steel strip  Large terminal for cables, consists of two clamps with ⅓ in. bolt, nut and washers (may be brought out at either top or bottom of resistor).  Small terminal for cables, consists of two clamps with ⅓ in. bolt, nut and washers (may be brought out at either top or bottom of resistor).  Large clamp for cable, drilled for ⅓ in. bolt.
192869 116145 207549 207550 201153 201154	connection (3¾ in. long, ⅓ in. bolt hole).  Plat steel strip, drilled for terminal connection, busbar or punched copper tube cable terminal connection (4½ in. long, ⅓ in. bolt hole).  Plat steel strip, drilled for terminal connection, busbar or punched copper tube cable terminal connection (½ in. long, ⅓ in. bolt hole).  Steel spacer between grids, opposite flat steel strip  Large terminal for cables, consists of two clamps with ⅓ in. bolt, nut and washers (may be brought out at either top or bottom of resistor).  Small terminal for cables, consists of two clamps with ⅓ in. bolt, nut and washers (may be brought out at either top or bottom of resistor).  Large clamp for cable, drilled for ⅓ in. bolt.  Large clamp for cable, drilled for ⅓ in. bolt.
192869 116145 207549 207550 201153 201154 201155	connection (3¾ in. long, ⅓ in. bolt hole).  Plat steel strip, drilled for terminal connection, busbar or punched copper tube cable terminal connection (4½ in. long, ⅓ in. bolt hole).  Plat steel strip, drilled for terminal connection, busbar or punched copper tube cable terminal connection (½½ in. long, ⅓ in. bolt hole).  Steel spacer between grids, opposite flat steel strip  Large terminal for cables, consists of two clamps with ⅓ in. bolt, nut and washers (may be brought out at either top or bottom of resistor).  Small terminal for cables, consists of two clamps with ⅓ in. bolt, nut and washers (may be brought out at either top or bottom of resistor).  Large clamp for cable, drilled for ⅓ in. bolt.  Large clamp for cable, drilled for ⅓ in. bolt.  Small clamp for cable, drilled for ⅓ in. bolt.
192869 116145 207549 207550 201153 201154	connection (3¾ in. long, ⅓ in. bolt hole).  Plat steel strip, drilled for terminal connection, busbar or punched copper tube cable terminal connection (4½ in. long, ⅓ in. bolt hole).  Plat steel strip, drilled for terminal connection, busbar or punched copper tube cable terminal connection (½½ in. long, ⅓ in. bolt hole).  Steel spacer between grids, opposite flat steel strip  Large terminal for cables, consists of two clamps with ⅓ in. bolt, nut and washers (may be brought out at either top or bottom of resistor).  Small terminal for cables, consists of two clamps with ⅓ in. bolt, nut and washers (may be brought out at either top or bottom of resistor).  Large clamp for cable, drilled for ⅓ in. bolt.  Large clamp for cable, drilled for ⅓ in. bolt.  Small clamp for cable, drilled for ⅓ in. bolt.  Small clamp for cable, drilled for ⅙ in. bolt.
192869 116145 207549 207550 201153 201154 201155	connection (3¾ in. long, ⅓ in. bolt hole).  Plat steel strip, drilled for terminal connection, busbar or punched copper tube cable terminal connection (4½ in. long, ⅓ in. bolt hole).  Plat steel strip, drilled for terminal connection, busbar or punched copper tube cable terminal connection (½ in. long, ⅓ in. bolt hole).  Steel spacer between grids, opposite flat steel strip  Large terminal for cables, consists of two clamps with ⅓ in. bolt, nut and washers (may be brought out at either top or bottom of resistor).  Small terminal for cables, consists of two clamps with ⅓ in. bolt, nut and washers (may be brought out at either top or bottom of resistor).  Large clamp for cable, drilled for ⅓ in. bolt.  Large clamp for cable, drilled for ⅓ in. bolt.  Small clamp for cable, drilled for ⅓ in. bolt.  Small clamp for cable, drilled for ⅓ in. bolt.  Clamping bolt for Nos. 201153, 201155 (⅓ in13, 2¼ in. hex. h. sherardized).
192869 116145 207549 207550 201153 201154 201155 201156 219099	connection (3¾ in. long, ⅓ in. bolt hole).  Plat steel strip, drilled for terminal connection, busbar or punched copper tube cable terminal connection (4½ in. long, ⅓ in. bolt hole).  Plat steel strip, drilled for terminal connection, busbar or punched copper tube cable terminal connection (½½ in. long, ⅓ in. bolt hole).  Steel spacer between grids, opposite flat steel strip  Large terminal for cables, consists of two clamps with ⅓ in. bolt, nut and washers (may be brought out at either top or bottom of resistor).  Small terminal for cables, consists of two clamps with ⅓ in. bolt, nut and washers (may be brought out at either top or bottom of resistor).  Large clamp for cable, drilled for ⅓ in. bolt.  Large clamp for cable, drilled for ⅓ in. bolt.  Small clamp for cable, drilled for ⅓ in. bolt.  Small clamp for cable, drilled for ⅓ in. bolt.  Clamping bolt for Nos. 201153, 201155 (⅓ in13, 2¼ in. hex. h. sherardized).  Clamping bolt for Nos. 201154, 201156 (⅙ in16, 1⅓ in. hex. h. sherardized).
192869 116145 207549 207550 201153 201154 201155 201156 219099 219100	connection (3¾ in. long, ⅓ in. bolt hole).  Plat steel strip, drilled for terminal connection, busbar or punched copper tube cable terminal connection (4½ in. long, ⅓ in. bolt hole).  Plat steel strip, drilled for terminal connection, busbar or punched copper tube cable terminal connection (½½ in. long, ⅓ in. bolt hole).  Steel spacer between grids, opposite flat steel strip  Large terminal for cables, consists of two clamps with ⅓ in. bolt, nut and washers (may be brought out at either top or bottom of resistor).  Small terminal for cables, consists of two clamps with ⅓ in. bolt, nut and washers (may be brought out at either top or bottom of resistor).  Large clamp for cable, drilled for ⅓ in. bolt.  Large clamp for cable, drilled for ⅓ in. bolt.  Small clamp for cable, drilled for ⅓ in. bolt.  Small clamp for cable, drilled for ⅓ in. bolt.  Clamping bolt for Nos. 201153, 201155 (⅓ in13, 2¼ in. hex. h. sherardized).  Clamping bolt for Nos. 201154, 201156 (⅙ in16, 1⅓ in. hex. h. sherardized).
192869 116145 207549 207550 201153 201154 201155 201156 219099 219100 219101	connection (3¾ in. long, ⅓ in. bolt hole).  Plat steel strip, drilled for terminal connection, busbar or punched copper tube cable terminal connection (4½ in. long, ⅓ in. bolt hole).  Plat steel strip, drilled for terminal connection, busbar or punched copper tube cable terminal connection (½½ in. long, ⅓ in. bolt hole).  Steel spacer between grids, opposite flat steel strip  Large terminal for cables, consists of two clamps with ⅓ in. bolt, nut and washers (may be brought out at either top or bottom of resistor).  Small terminal for cables, consists of two clamps with ⅓ in. bolt, nut and washers (may be brought out at either top or bottom of resistor).  Large clamp for cable, drilled for ⅓ in. bolt.  Large clamp for cable, drilled for ⅓ in. bolt.  Small clamp for cable, drilled for ⅓ in. bolt.  Small clamp for cable, drilled for ⅓ in. bolt.  Clamping bolt for Nos. 201153, 201155 (⅓ in13, 2¼ in. hex. h. sherardized).  Clamping bolt for Nos. 201154, 201156 (⅙ in16, 1⅓ in. hex. h. sherardized).  Washer for No. 219099 (⅓ in. by 1⅓ in. by 0.125 in. sherardized).
192869 116145 207549 207550 201153 201154 201155 201156 219099 219100 219101 141259	connection (3¾ in. long, ⅓ in. bolt hole).  Plat steel strip, drilled for terminal connection, busbar or punched copper tube cable terminal connection (4½ in. long, ⅓ in. bolt hole).  Plat steel strip, drilled for terminal connection, busbar or punched copper tube cable terminal connection (½ in. long, ⅓ in. bolt hole).  Steel spacer between grids, opposite flat steel strip  Large terminal for cables, consists of two clamps with ⅓ in. bolt, nut and washers (may be brought out at either top or bottom of resistor).  Small terminal for cables, consists of two clamps with ⅓ in. bolt, nut and washers (may be brought out at either top or bottom of resistor).  Large clamp for cable, drilled for ⅓ in. bolt.  Large clamp for cable, drilled for ⅓ in. bolt.  Small clamp for cable, drilled for ⅓ in. bolt.  Small clamp for cable, drilled for ⅓ in. bolt.  Clamping bolt for Nos. 201153, 201155 (⅓ in13, 2¼ in. hex. h. sherardized).  Clamping bolt for Nos. 201154, 201156 (⅙ in16, 1⅓ in. hex. h. sherardized).  Washer for No. 219099 (⅓ in. by ⅓ in. by 0.125 in. sherardized).  Washer for No. 219100 (⅓ in. by ¾ in. by 0.0625 in. sherardized).
192869 116145 207549 207550 201153 201154 201155 201156 219099 219100 219101 141259 146149	connection (3¾ in. long, ⅓ in. bolt holc).  Flat steel strip, drilled for terminal connection, busbar or punched copper tube cable terminal connection (4½ in. long, ⅓ in. bolt hole).  Flat steel strip, drilled for terminal connection, busbar or punched copper tube cable terminal connection (4½ in. long, ⅓ in. bolt hole).  Steel spacer between grids, opposite flat steel strip  Large terminal for cables, consists of two clamps with ⅓ in. bolt, nut and washers (may be brought out at either top or bottom of resistor).  Small terminal for cables, consists of two clamps with ⅓ in. bolt, nut and washers (may be brought out at either top or bottom of resistor).  Large clamp for cable, drilled for ⅓ in. bolt.  Large clamp for cable, drilled for ⅓ in. bolt.  Small clamp for cable, drilled for ⅓ in. bolt.  Small clamp for cable, drilled for ⅓ in. bolt.  Clamping bolt for Nos. 201153, 201155 (⅓ in13, 2¼ in. hex. h. sherardized).  Clamping bolt for Nos. 201154, 201156 (⅙ in16, 1⅓ in. hex. h. sherardized).  Washer for No. 219099 (⅓ in. by 1¾ in. by 0.0625 in. sherardized).  Nut for No. 219099 (⅓ in13, hex. st'd, sherardized).
192869 116145 207549 207550 201153 201154 201155 201156 219099 219100 219101 141259	connection (3¾ in. long, ⅓ in. bolt hole).  Plat steel strip, drilled for terminal connection, busbar or punched copper tube cable terminal connection (4½ in. long, ⅓ in. bolt hole).  Plat steel strip, drilled for terminal connection, busbar or punched copper tube cable terminal connection (4½ in. long, ⅓ in. bolt hole).  Steel spacer between grids, opposite flat steel strip  Large terminal for cables, consists of two clamps with ⅓ in. bolt, nut and washers (may be brought out at either top or bottom of resistor).  Small terminal for cables, consists of two clamps with ⅓ in. bolt, nut and washers (may be brought out at either top or bottom of resistor).  Large clamp for cable, drilled for ⅓ in. bolt.  Large clamp for cable, drilled for ⅓ in. bolt.  Small clamp for cable, drilled for ⅓ in. bolt.  Small clamp for cable, drilled for ⅓ in. bolt.  Clamping bolt for Nos. 201153, 201155 (⅓ in13, 2¼ in. hex. h. sherardized).  Clamping bolt for Nos. 201154, 201156 (⅗ in16. 1⅓ in. hex. h. sherardized).  Washer for No. 219099 (⅓ in. by ⅓ in. by 0.0625 in. sherardized).  Nut for No. 219009 (⅓ in13, hex. st'd, sherardized).  Nut for No. 219100 (⅙ in16, hex. st'd, sherardized).
192869 116145 207549 207550 201153 201154 201155 201156 219099 219100 219101 141259 146149	connection (3¾ in. long, ½ in. bolt hole).  Plat steel strip, drilled for terminal connection, busbar or punched copper tube cable terminal connection (4½ in. long, ½ in. bolt hole).  Plat steel strip, drilled for terminal connection, busbar or punched copper tube cable terminal connection (4½ in. long, ½ in. bolt hole).  Steel spacer between grids, opposite flat steel strip  Large terminal for cables, consists of two clamps with ½ in. bolt, nut and washers (may be brought out at either top or bottom of resistor).  Small terminal for cables, consists of two clamps with ¾ in. bolt, nut and washers (may be brought out at either top or bottom of resistor).  Large clamp for cable, drilled for ½ in. bolt.  Large clamp for cable, drilled for ½ in. bolt.  Small clamp for cable, drilled for ½ in. bolt.  Small clamp for cable, drilled for ½ in. bolt.  Clamping bolt for Nos. 201153, 201155 (½ in13, 2¼ in. hex. h. sherardized).  Clamping bolt for Nos. 201154, 201156 (¾ in16, 1¼ in. hex. h. sherardized).  Washer for No. 219099 (½ in. by 1¾ in. by 0.0625 in. sherardized).  Nut for No. 219100 (¾ in13, hex. st'd, sherardized).  Nut for No. 219100 (¾ in16, hex. st'd, sherardized).  Sorting lock washer for No. 146149 (¼ in. by 1½ in. by ½ in. thick).
192869 116145 207549 207550 201153 201154 201155 201156 219099 219100 219101 141259 146149 141255	connection (3¾ in. long, ⅓ in. bolt hole).  Plat steel strip, drilled for terminal connection, busbar or punched copper tube cable terminal connection (4½ in. long, ⅓ in. bolt hole).  Plat steel strip, drilled for terminal connection, busbar or punched copper tube cable terminal connection (4½ in. long, ⅓ in. bolt hole).  Steel spacer between grids, opposite flat steel strip  Large terminal for cables, consists of two clamps with ⅓ in. bolt, nut and washers (may be brought out at either top or bottom of resistor).  Small terminal for cables, consists of two clamps with ⅓ in. bolt, nut and washers (may be brought out at either top or bottom of resistor).  Large clamp for cable, drilled for ⅓ in. bolt.  Large clamp for cable, drilled for ⅓ in. bolt.  Small clamp for cable, drilled for ⅓ in. bolt.  Small clamp for cable, drilled for ⅓ in. bolt.  Clamping bolt for Nos. 201153, 201155 (⅓ in13, 2¼ in. hex. h. sherardized).  Clamping bolt for Nos. 201154, 201156 (⅗ in16. 1⅓ in. hex. h. sherardized).  Washer for No. 219099 (⅓ in. by ⅓ in. by 0.0625 in. sherardized).  Nut for No. 219009 (⅓ in13, hex. st'd, sherardized).  Nut for No. 219100 (⅙ in16, hex. st'd, sherardized).

## 58355-4 Parts of CR 9145 Type RG Resistors

### NOMENCLATURE

Each resistor has a significant rating depending on the size, number and connections of its grids.

Each resistor is designated by the symbol CR 9145 RG followed by a group or groups of symbols separated by dashes, the symbols in each group consisting of three parts, viz.:

(1) A figure indicating the size and capacity of the grids in the group.

(2) A letter indicating the way in which the grids are connected within the group: "Λ" indicating that the grids are connected in series; "B" that two grids are connected in multiple, the sets in series; "C" indicating three grids in multiple, the sets in series; "D" indicating four grids in multiple, the sets in series

(3) A figure indicating the number of grids in the group.

Illustrating the above, CR 9145 RG-7A18-T-7A18 is a resistor containing 36 No. 7 grids, all connected in series.

CR 9145 RG-7B18-T-7B18 is a resistor composed entirely of No. 7 grids connected two in multiple and containing 36 grids. CR 9145 RG-7C18-T-7C18 indicates that the same grids are used, but that they are connected three in multiple and the sets in series.

Referring to the example of ratings given above, the "T" indicates that connection is made at the top of the box between the left- and right-hand groups of grids. If connection is made at the bottom of the box the letter "T" is replaced by "Y."