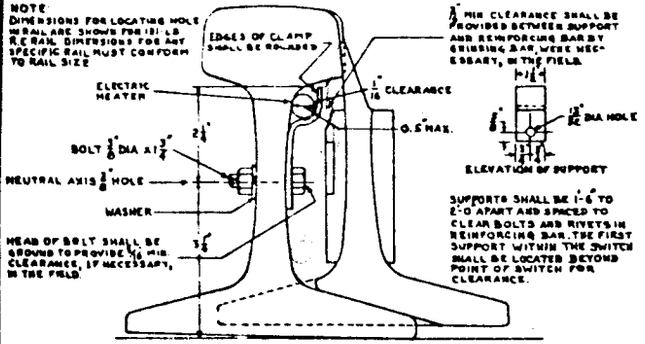
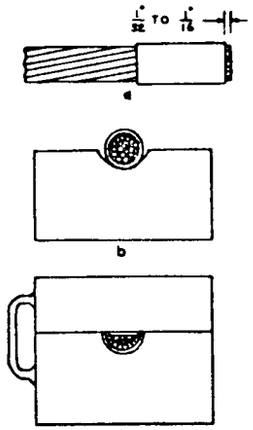
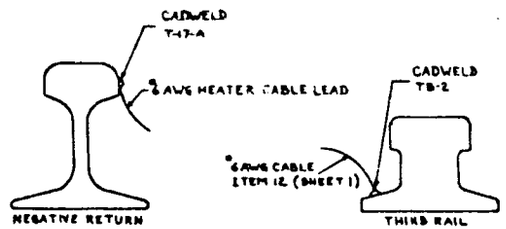
NOTE
DIMENSIONS FOR LOCATING HOLE IN RAIL ARE SHOWN FOR 131 LB R.E. RAIL. DIMENSIONS FOR ANY SPECIFIC RAIL MUST CONFORM TO RAIL SIZE



APPLICATION OF TUBULAR TYPE ELECTRIC HEATER
FIG. A



DETAILS FOR FORMING CADWELD TERMINALS
FIG. G



APPLICATION OF CADWELD CONNECTIONS
(SEE NOTES 6 & 7, SHEET 1 OF THIS DWG.)
FIG. F

SPECIAL INSTRUCTIONS - SEE FIG. G

1- CABLE AND SLEEVE MUST BE BRIGHT, CLEAN, AND DRY.
2- LET CABLE EXTEND 1/32 TO 1/16 BEYOND END OF SLEEVE (AS SHOWN IN a).
3- PLACE CABLE AND SLEEVE IN HAMMER DIE (AS SHOWN IN b).
4- FORM CABLE AND SLEEVE IN HAMMER DIE TO MAKE TERMINAL (AS SHOWN IN c).

NOTES

1- ORDERING INFORMATION: HEATER, ELECTRIC, TUBULAR TYPE, IN ACCORDANCE WITH LATEST EDITION OF AAR ELECTRICAL SECTION MANUAL, SECTION III, CHAPTER 7, PART 4, SPECIFICATION FOR TUBULAR TYPE ELECTRIC HEATERS FOR TRACK SWITCHES. ACTIVE LENGTH (SPECIFY ONE FOOT LESS THAN LENGTH OF SWITCH) - 500 WATTS PER FOOT FOR ONE HALF OF HEATER AND 300 WATTS PER FOOT FOR OTHER HALF AT (SPECIFY 430, 460, OR 230) VOLTS, (SPECIFY WITH OR WITHOUT MOUNTING SUPPORTS, BOLTS, ETC.) FOR (SPECIFY SIZE RAIL). INCLUDE ALL TESTS IN ABOVE SPECIFICATION INCLUDING TESTS #28.

2(a)- (HEATERS FOR MOVABLE POINT FROGS, A-C POWER SUPPLY) ORDERING INFORMATION: SAME AS 1 EXCEPT THE ACTIVE LENGTH OF HEATERS SHALL BE NO LONGER THAN TWICE THEIR CENTER SWITCH-POINT LENGTHS, PLUS THE DISTANCE BETWEEN THE TWO FACING CENTER SWITCH POINTS MINUS SIX FEET. HEATERS SHALL BE RATED 500 WATTS PER FOOT FOR THEIR ENTIRE ACTIVE LENGTH AT ONE HALF RATED VOLTAGE (FOR SERIES CONNECTION)

2(b)- (HEATERS FOR MOVABLE POINT FROGS, D-C POWER SUPPLY) ORDERING INFORMATION: SAME AS 2(a) EXCEPT HEATERS SHALL BE RATED 500 WATTS PER FOOT FOR THEIR ENTIRE LENGTH AT 450 VOLTS (FOR PARALLEL CONNECTION).

3- RATED VOLTAGE OF HEATERS FOR TRACK SWITCHES, A-C SUPPLY, SHALL BE 460 (PREFERRED) OR 230. RATED VOLTAGE OF HEATERS FOR TRACK SWITCHES, D-C SUPPLY, SHALL BE 600.

4- FOR TRACK SWITCHES THE ACTIVE PART OF THE HEATER SHALL EXTEND APPROXIMATELY TWO FEET AHEAD OF THE POINT OF SWITCH (THE FIRST 12 INCHES OF SHEATH IS INACTIVE). THE HIGHER WATTAGE (500 WATTS PER FOOT) END OF THE HEATER SHALL BE INSTALLED TOWARD THE POINT OF SWITCH. THE WORD POINT IS STAMPED ON THE HIGHER WATTAGE END OF HEATER. THE LOWER WATTAGE (300 WATTS PER FOOT) END OF THE HEATER SHALL EXTEND BACK TOWARD THE HEEL BLOCK ENDING SHORT OF THE HEEL BLOCK. THE CABLE LEAD SHALL BE TAKEN UNDER THE HEEL BLOCK THEN UNDER THE RAIL BASE TO THE TERMINAL BOX.

5- THE HEATERS SHALL BE LOCATED AS HIGH AS PRACTICABLE ON THE INSIDE OF THE WEB OF THE STOCK RAIL (SEE FIG. A). THE HEATERS SHALL BE INSTALLED SO THAT THE INFORMATION STAMPED ON THE TERMINAL HOUSING OR ON THE HEATER SHEATH SHALL BE LOCATED APPROXIMATELY 45 DEGREES FROM THE VERTICAL AXIS OF THE RAIL POINTING UPWARD.

6- HEATERS SHALL BE SECURED TO THE WEB OF THE RAIL BY MEANS OF HEATER SUPPORTS SPACED 18" TO 24" APART. TO CLEAR BOLTS AND RIVETS IN REINFORCING BAR, IT WILL BE NECESSARY IN SOME CASES TO GRIND THE SWITCH POINT AND REINFORCING BAR TO ALLOW A MINIMUM CLEARANCE OF 3/16 (SEE FIG A) ONE HEATER SUPPORT SHALL BE LOCATED ON RAIL JUST AHEAD OF THE POINT OF SWITCH.

7- SPECIAL SUPPORTS SHALL BE PROVIDED FOR ATTACHING TERMINAL HOUSING TO RAIL WHERE SEPARABLE HOUSINGS ARE USED (SEE FIG. B) ON SWITCH POINT WHERE NEAREST JOINT BAR DOES NOT PERMIT, THE HEATING ELEMENT SHALL EXTEND BEYOND THE SWITCH POINT THE MAXIMUM DISTANCE PERMITTED BY FIELD CONDITIONS, MOUNTING TERMINAL HOUSING AT THE FIRST JOINT BAR BOLT AS INDICATED IN FIG. C.

8- ALL SUPPORTS SHALL BE SECURED BY MEANS OF 3/8 CORROSION RESISTANT BOLT, LOCKWASHER, AND SELF-LOCKING NUT (EVERDUR 1015 BRONZE OR EQUAL). BOLT HOLE SHALL BE 3/8 DRILLED IN THE WEB OF THE RAIL AT THE NEUTRAL AXIS (SEE FIG. A). IF REQUIRED THE HEAD OF THE SUPPORT BOLT SHALL BE GROUND TO PROVIDE 1/16 CLEARANCE BETWEEN BOLT HEAD AND REINFORCING BAR OF THE SWITCH POINT (SEE FIG. A). A HEATER SUPPORT SHALL BE PLACED AGAINST BOTH ENDS OF THE ANTI-CREEP COLLAR OR SPLICE, WHERE USED, TO PREVENT LONGITUDINAL MOVEMENT OF HEATERS DUE TO VIBRATION OR EXPANSION AND CONTRACTION. WHERE ANTI-CREEP COLLARS OR SPLICES ARE NOT USED AN ANTI-CREEP CLAMP SHALL BE USED AT THE MIDPOINT OF THE HEATER FIRM AGAINST THE HEATER.

9- AT MOVABLE POINT FROGS IN AREA OF KNUCKLE REINFORCING, TO PERMIT INSTALLATION OF HEATER, PORTION OF CLIP MARKED FOR TRACK BOLT SHOULD BE REMOVED.

10- CABLE LEADS BETWEEN HEATER AND TERMINAL BOXES SHALL BE SO LOCATED AS TO MINIMIZE POSSIBLE DAMAGE. LEADS SHALL BE ENCASED IN 3/4 RUBBER HOSE WHERE POSSIBLE.

11- TERMINAL BOXES SHALL BE LOCATED AS CLOSE AS POSSIBLE TO THE ENDS OF THE HEATERS, PREFERABLY OUTSIDE OF TIES, WITH TOP OF BOX APPROXIMATELY AT THE LEVEL OF THE TOP OF TIE.

12- IN JUNCTION AND TERMINAL BOXES, WHERE IT IS PRACTICABLE, CABLES SHALL BE TERMINATED BY APPLYING PROPER SIZE BURNDY KYLUGS, OR EQUAL.

13- EACH GROUP OF HEATERS SERVING A TRACK SWITCH SHALL BE PROVIDED WITH SUITABLE FAULT PROTECTION, PREFERABLY THERMAL BREAKERS. THE PROTECTIVE UNITS SO PROVIDED SHALL BE HOUSED IN A WEATHER-PROOF BOX LOCATED AS CLOSE AS POSSIBLE TO THE CENTER OF THE LOAD.

14- FEEDER CABLES FROM POWER LOCATION AS INDICATED ON SHEET 1 OF THIS DRAWING ARE TYPICAL, THEY SHALL BE ARRANGED TO MEET THE CONDITIONS IN THE FIELD.

15- IN A-C ELECTRIFIED TERRITORY POWER SUPPLY AND APPARATUS SHALL BE IN ACCORDANCE WITH SPECIFICATIONS C.E. 500, PART X, PARAGRAPH 1002 AND C.E. 501, PART XI. IN NON-ELECTRIFIED TERRITORY APPARATUS SHALL BE APPROVED BY THE CHIEF ENGINEER.

BILL OF MATERIAL FOR FIG. F			
ITEM	PART NUMBER	NO REQ.	DESCRIPTION
1	M-2000	1	T-17-A WELDER
2	M-248	1	MOLD ONLY
3		1	#25 CARTRIDGE
4	3-471	1	SLEEVE
5	3-428	1	HAMMER DIE
6	3-177	1	TB-2 WELDER
7	3-177-1	1	MOLD ONLY
8		1	#25 CARTRIDGE
9	3-471	1	SLEEVE
10	3-428	1	HAMMER DIE

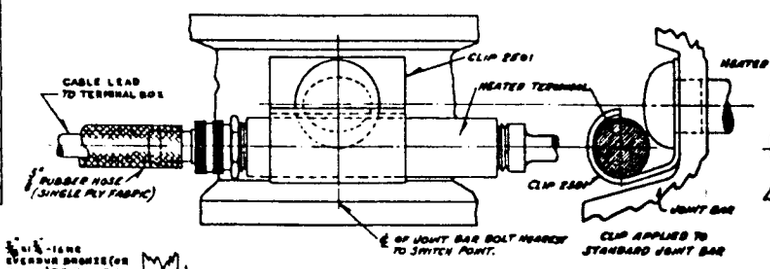


FIG. C

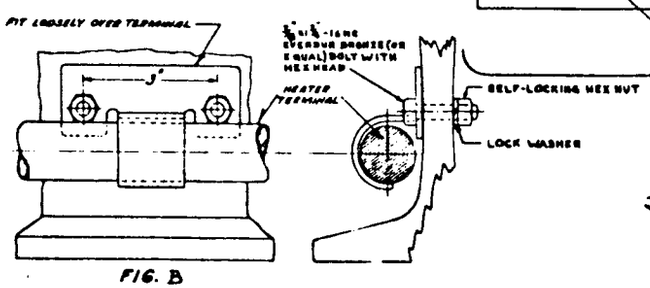


FIG. B

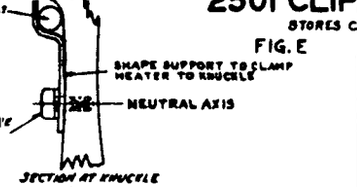
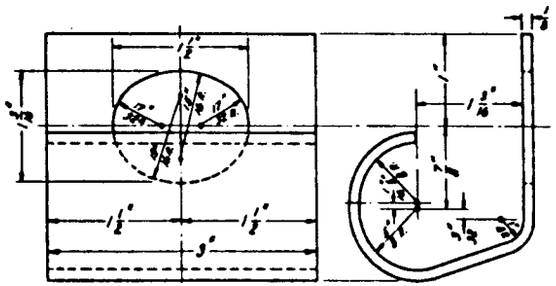


FIG. D



2501 CLIP GALV. STEEL
STORES CAT. REF. NO. 1C-318
FIG. E

C- JAN. 6, 1961
FOR REVISION NOTES SEE SHEET 1
THIS SHEET WAS REVISED
APPROVED: [signature]

SHEET 2 OF 2 SHEETS

S-250-C

THE PENNSYLVANIA RAILROAD
STANDARD
ELECTRIC SWITCH HEATERS
DETAILS AND NOTES

OFFICE OF CHIEF ENGINEER, PHILA., PA., DECEMBER 19, 1950.

Approved
[signature]
Assistant Chief Engineer-Signals

Approved
[signature]
Chief Engineer