

WIRING

SUPPORTS - BENDING AND FORMING - CLIPPING - SEWING

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2. GENERAL2.2 Service Interruptions2.1 Scope

2.11 This section covers the requirements and methods to be used when installing power wire supports, and when supporting, clipping or sewing power wire. It supplements the more detailed clipping and sewing information in the Cabling Handbook and is to be used with other sections of the 6 series.

2.21 When clipping and sewing over working equipment it is necessary to provide temporary protection to prevent clips, tools, etc., from damaging equipment or otherwise affecting service.

2.22 When working on live equipment, tape the handle of the R-3209 Cable Sewing Needle with friction tape. Do not force the blade of the needle blindly into openings as this practice continues to

account for injured personnel, service interruptions, damage to wire insulation and burned tools. Do not use the 284 Chicago Needle near unprotected live equipment.

2.221 When sewing forms in electrically hazardous locations where protection is not practical, a job-made tool may be useful for fishing twine through blind spots. The tool, a non-conductive type Chicago needle, may be fashioned from an RM-552417 3/4" fiber tube or an RM-552448 1" fiber tube as shown in Figure 1. The needle may be made by cutting away the majority of the tube on one end to leave a blade section approximately 1/2" to 3/8" wide. Finish by drilling a 1/8" hole through the end.



FIG. 1 JOB-MADE INSULATED CHICAGO NEEDLE (PAR. 2.221)

3. INSTALLING EQUIPMENT

3.1 The required tools and supplies are shown in Section 6A.

4. POWER WIRE SUPPORTS

4.1 Auxiliary Framing

4.11 Install auxiliary framing in accordance with the general equipment requirements as given in the Erecting, Aligning and Mounting Handbook. In power plants no lateral bracing to the ceiling is necessary, except as may be specified in earthquake areas or on disaster control jobs.

4.12 Over generator bays having the added supporting effect of bus bars, the span between framing supports may be 12' -0". If the span exceeds 12' -0" provide supports to the ceiling. If space is left for an ultimate machine and the span exceeds 12' -0", install supports to the ceiling which may be removed when the machine is added.

4.2 Cable Rack

4.21 Install cable rack, in general, in accordance with the general equipment requirements as given in the Erecting, Aligning and Mounting Handbook.

4.22 Cable rack shall be supported in power plants, in general, by resting on frameworks or on auxiliary framing, but isolated runs over areas without framework or auxiliary framing may be supported directly to the ceiling.

4.23 When regular ladder type cable rack is used in an inverted manner (power wire adjacent to the open side of the channel cross strap) each channel cross

strap shall be provided with a P-68616 Fiber Detail or two layers of RM-591862 Gray Sheet Fiber. On channel cross straps where the power wire is unsecured the fiber shall be fastened with two or more bands of sewing twine.

4.3 Sleeves

4.31 Use sleeves made of smooth iron pipe for wires through walls or floors where it is not feasible to extend a cable rack. Floor or walls should be repaired as necessary. Seal each end of the sleeve as directed by the conduit sealing information in this handbook.

4.32 Use bushings such as grommets, chase nipples and insulating bushings as protection for leads passing through thin wooden or metal sections of cabinets, panels, shelves, etc.

4.4 Fiber Tubes

4.41 Secure fiber tubes, containing excess ammeter leads, to the panel with wire form clips which are covered herein.

5. SUPPORTING POWER WIRE AND CABLE

5.1 In Conduit

5.11 Support leads in vertical conduit runs at the intervals listed in the following table. Pull boxes shall be installed at the various points of support as determined by the largest size lead and all leads entering the pull box from below shall be supported. Place a Russell and Stoll support (Figure 2), Adalet (similar to Figure 2) or O.Z. support (Figure 3) on the upper end of the conduit and use the inserts to hold the wire or wires in place.

Size of Lead	Maximum Vertical Distance Between Supports
No. 14-0	100 feet
00-0000	80 feet
250,000-350,000 CM	60 feet
400,000-500,000 CM	50 feet
550,000-750,000 CM	40 feet
800,000 CM	35 feet

5.12 When installing a Russell and Stoll support or Adalet support the collar is screwed on the end of the riser, the wires are then pulled in, the inserts dropped into socket of collar and the split tapered grip bushing placed over the individual wires which pull the grips into place by their weight. Slack between supports shall be allowed for the contraction and expansion of the wires. (Figure 2)

5.13 When installing an O.Z. support the collar is screwed on the end of the conduit, the cables are then pulled in, the wedging plug inserted and pushed down tight, as shown in Figure 3.

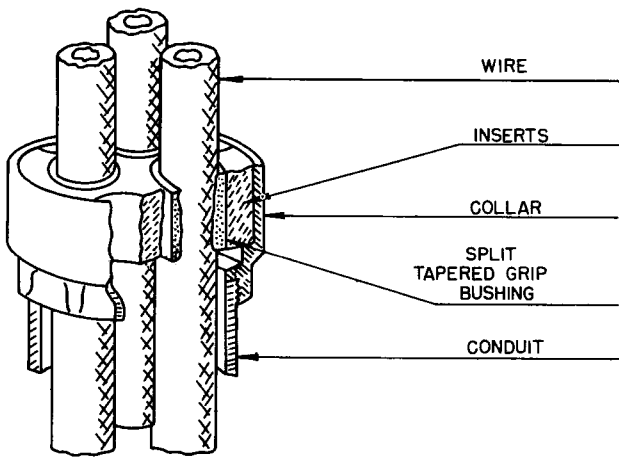


FIG. 2 RUSSELL AND STOLL SUPPORT
(PARS. 5.11, 5.12)

5.2 In Raceways and Tile Ducts

5.21 Support leads in vertical raceways and tile ducts at the intervals given in Paragraph 5.11 by Russell and Stoll, Adalet or O.Z. supports located in steel plates over the ducts. See Figure 3.

5.3 Securing Vertical Runs

5.301 Vertical power cable runs shall be made on cable racks no greater than 20 inches wide and should not exceed an ultimate pile-up of 7 inches.

5.302 When vertical power cable runs are added to existing vertical runs, check the routing drawings to determine if a 20 foot minimum horizontal run or horizontal loop is required at intervals not exceeding three floors.

5.303 Vertical runs on cable rack shall be secured by sewing and clipping and by clamping details as outlined in the following paragraphs.

5.304 Clamps referred to herein are per ED-91127-70 and ED-91129-70. These drawings or equivalent information are furnished with job papers and show an arrangement for supporting power wire and cable on cable racks. They detail the assembly of the clamps which consist of bolted-type stops on each side of the cables and a clamping bar tightened against the cables as shown in Figure 4.

5.305 The height of a stop (Figure 4) is ample for one 800,000 CM wire. The depth and arrangement of a layer of leads will depend on local conditions and will be limited by the ability of the stops to hold the arrangements from spreading and the depth must be enough to permit the clamping bars to hold the leads sufficiently tight.

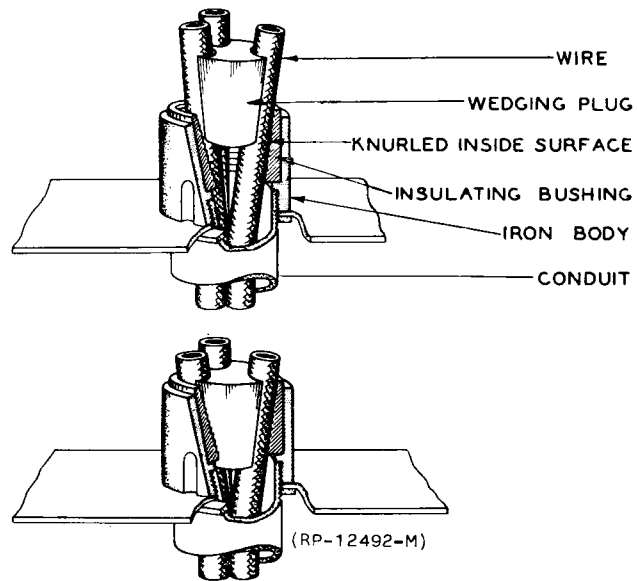


FIG. 3 O.Z. WIRE SUPPORT
(PARS. 5.11, 5.13, 5.21)

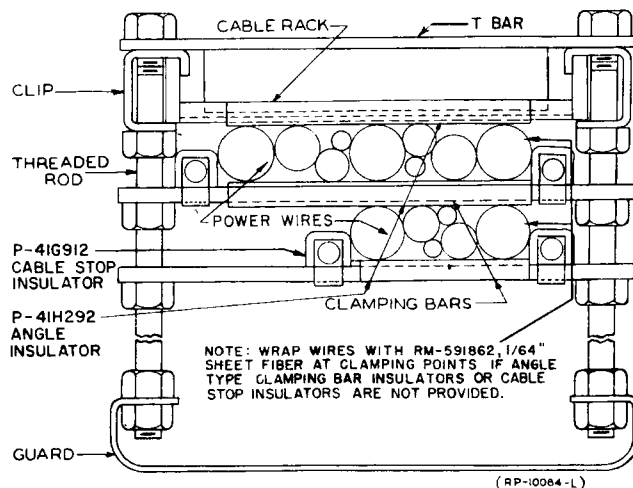


FIG. 4 CLAMPING DETAILS FOR A VERTICAL
POWER WIRE RUN (PARS. 5.304-5.307)

5.306 When leads are to be added to a partly filled clamp (Figure 4) they should first be run on the outside of the clamp and then placed in position underneath the clamps by removing one clamp at a time beginning at the top. This is to prevent slippage of the original leads.

5.307 Insulate the cables from the clamping bar using an angle type clamping bar insulator furnished or by wrapping the cables with one layer of RM-591862 1/64" sheet fiber at the clamping bar as shown in Figure 4.

5.308 When installing one clamp per floor locate it near the ceiling. When installing two clamps per floor locate the first just above the floor cable hole sheathing and the other about halfway up to the ceiling but in no case less than seven feet above the floor.

5.309 The vertical distance corresponding to a "floor" is usually thought of as the distance from the basement ceiling to the first floor ceiling or equivalent.

5.310 Enclosures for vertical runs of power wire and cable are areas not kept readily accessible to personnel, that is, in small rooms or areas exclusively for pipes, cable rack risers, etc. Exposed vertical runs are runs passing through cable hole slots such as found in terminal and switch rooms.

5.311 Enclosed vertical cable runs where the wire on the horizontal portion of the run is not secured require two clamps per floor with no additional clipping or sewing required.

5.312 Enclosed vertical cable runs where the wire on the horizontal portion of the rack is secured require two clamps per floor where three or more floors are involved in which case no sewing or clipping is required. Where the run is through one or two floors no clamps are required, however, the wires must be clipped or sewed at every cable rack strap.

5.313 Exposed vertical cable runs where the wire on the horizontal portion of the run is not secured require one clamp per floor for any number of floors. In addition clip or sew at each alternate cable rack strap.

5.314 Exposed vertical cable runs where the wire on the horizontal portion of the run is secured require one clamp per floor where three or more floors are involved. In addition clip or sew at each alternate cable rack strap. When the cable run is through one or two floors no clamps are required, however, the wires must be clipped or sewed at every cable rack strap.

5.4 Securing Inverted Runs

5.41 Install auxiliary supports for inverted horizontal runs as covered in the Cabling Handbook.

5.42 All inverted runs shall be clipped or sewed at every strap.

5.5 Power Wire and Armored Cable in Number 5 Crossbar Frames

5.51 Where armored cable enters the top of the frame uprights, permanently support each cable with a P-40F228 Support Clip when provided, otherwise, support each cable with a 2" length of wooden dowel. See Figure 5.

5.511 Before securing the clip or the dowel, lift the cable sufficiently to relieve the strain from the last point of support. Exercise care so as not

to pull the cable against apparatus mounted in the base of the frame. The P-40F228 clip does not need to be oriented as shown in Figure 5.

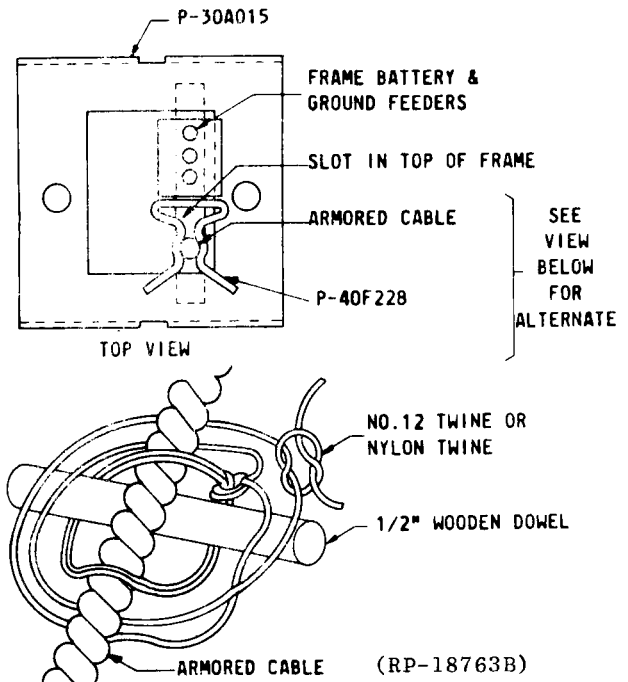


FIG. 5 METHOD OF SUPPORTING AC POWER SERVICE CABLES IN NUMBER 5 CROSSBAR FRAMES (PAR. 5.51)

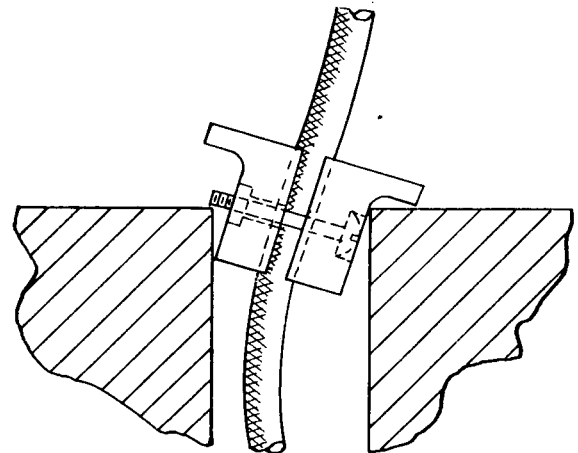


FIG. 6 ACCEPTABLE METHOD OF POSITIONING CLAMP ASSEMBLY ON FRAME BATTERY AND GROUND FEEDERS (PAR. 5.512)

5.512 The frame battery and ground feeder clamp assembly should be seated in the hole provided on top of the frame whenever possible. However it is acceptable if the clamp is positioned as shown in Figure 6. The purpose of the clamp is to prevent the power wire from rubbing against the sharp edges on the top of the frame and to give vertical support

for the weight of the cable. If the clamp cannot be positioned to prevent the power wire from resting against this sharp edge, the wire must be taped or otherwise protected by fiber.

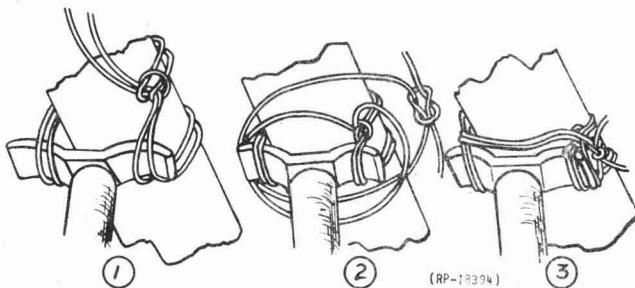


FIG. 7 SECURING INTERTIER WIRES ON BATTERY STANDS (PAR. 5.61)

5.6 Form Supports

5.61 On battery stands, racks, cabinets etc., where P-408832 or P-69690 form supports are used secure wires as shown in Figure 7. Where more than two 1/0 wires, or combinations of wire equivalent in size, are to be fastened to these supports secure the first group as shown in Figure 7 and fasten the remaining wires with a Chicago stitch located close to the first stitch.

5.62 On power panels support alarm leads, power wires, etc., against panels with nylon wire form clips. (See Figure 8.)

5.63 The 8 clips listed in Table A cover 17 sizes of wire forms. The smallest is 1/16" for single 20 gauge alarm leads and the largest will support a form 1 1/2" in diameter.

5.64 Secure the wire and clip to the panel with the self tapping screw and washer furnished. Drill the panel to accept the screw with a wheel drill equipped with a No. 31 drill. Exercise care to prevent the drill from emerging through the front of the panel. A job-made wooden spacer placed on the drill bit will predetermine the drilling depth. For the adjustable clips, when using any size but the largest adjustment, trim off the portion not used from the adjustable end. See Figure 8.

5.65 The clip mounting screw may be located at either side of, or over or under the wire form; however, when the form is located near the edge of a panel the screw shall be located on the same panel.

5.66 When fastening forms, cables or wires to panels the following spacing is recommended.

5.661 Small forms at intervals of approximately 12" with a clip at the end of the forms.

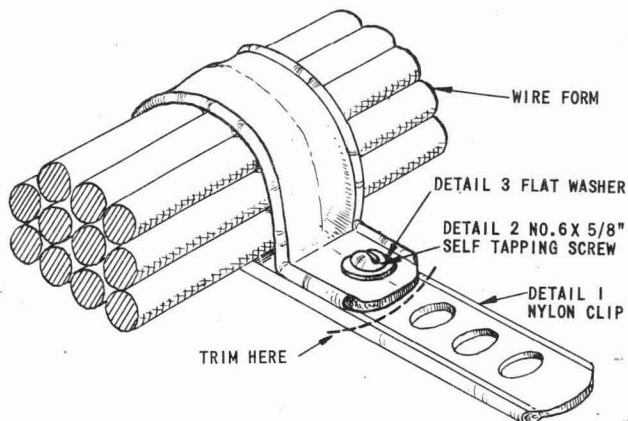
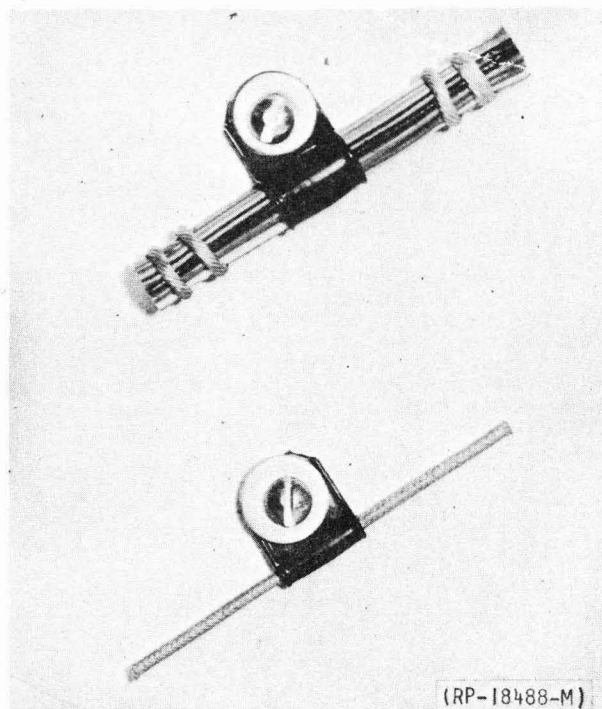


FIG. 8 ASSEMBLY OF NYLON WIRE FORM CLIPS (PARS. 5.62, 5.64)

5.662 Larger forms and cables at approximately 18". Whenever a branch leaves the main form place an additional clip at the point where it breaks off.

5.663 Single wires at intervals of 6" to 12" with additional clips at corners and near terminal connections.

NOTE: Since the spacing of the clips for securing forms to panels is not covered by specific requirements, the clamps furnished on shop-wired panels may not conform with the above spacing. Additional wire form clips need not be used unless the forms are not adequately supported.

TABLE A

SINGLE SCREW SUPPORTED "WIRE
FORM CLIPS." (PAR. 5.63)

Code Number	Form Diam- eter Inches	Packet Consists of Quantities Indicated of the Following:		
		Det.1- Clip	Det.2- Self Tapping Screw	Det.3- Washer
R-3269	1/16	3	3	3
R-3270	3/32	3	3	3
R-3271	1/8	3	3	3
R-3273	3/16	3	3	3
R-3274	1/4	3	3	3
R-3275 Adj.	5/16, 3/8, 7/16, 1/2	1	1	1
R-3276 Adj.	5/8, 3/4, 7/8, 1	1	1	1
R-3277 Adj.	1-1/8, 1-1/4, 1-3/8, 1-1/2	1	1	1

5.7 Unsecured Wires

5.71 Power wires need not be secured on bar type cable rack equipped with screens or ladder type with horns and screens. Secure power wires at the point where wires leave cable rack.

5.72 When power wires are not normally secured as on bar-type cable rack without screens, P-452565 power cable rack, brackets and supports, excessive time spent in forming may be saved by securing with a stitch or band.

5.73 Except as noted on applicable drawings, power wire from racks or conduit to supports on framework or to terminals, need only be secured when the absence of a band, Chicago stitch or modified Chicago stitch would result in an unworkmanlike appearance.

5.8 Unsupported Wires

5.81 Power wires leaving cable racks and supports and entering switchboards, frames, racks and other equipment shall not be unsupported for a distance greater than 2 feet for power wire No. 0 or smaller and 3 feet for power wire No. 00 or larger except as follows.

5.811 No additional support is required where wires pass from cable rack to cable rack through a floor and ceiling opening.

5.812 No intermediate support is required where power wire drops from cable racks onto battery posts, C.E.M.F. cells and details at battery stands and racks. It is mandatory that the leads be dressed in such a manner that securing the lug or connector will not place a strain on the terminating detail or apparatus.

6. BENDING AND FORMING

6.1 Radii of Bends

6.11 The minimum bending radius of power wire is given in the following table.

Size of Wire or Cable	Minimum Radius To Inside Edge	
	Braided Rubber Covered	Varnished Cloth
14 Stranded	1/8"	
14 Solid	1/4"	3/4"
12-10	1/2"	1"
8-4	1"	1-3/4"
2-0	1-1/2"	2-3/8"
00-0000	3-1/2"	4"
300,000-500,000 CM	5"	5-5/8"
600,000-800,000 CM	7"	7"

Stranded wire No. 14 and smaller may be bent to a radius of 1/8".

6.12 The minimum bending radius of armored cable is 5 times the diameter of the cable measured on the inner side of the bend.

6.13 The minimum bending radius of lead covered cable, measured on the inner bend of the cable, is 10 times the diameter.

6.14 The minimum bending radius for two conductor parallel cable bent on the flat is three times the minor axis of the cable and bent edgewise is ten times the major axis.

6.15 The minimum bending radius for round cable is four times the diameter of the cable. Measure on the inner side of the bend.

6.2 Power Wire Bending

6.21 Avoid bending wires sharply, twisting or kinking wires when forming as this will damage the insulation.

6.22 Install wires so that bends are made on radii that are equal to or greater than the minimum bending radii permitted.

6.23 To aid in forming and placing the inside bend, a template may be made from a quadrant or corner of a piece of fiber, cardboard or similar insulating material. With a compass pivoting at the corner, scribe arcs equal to the minimum bending radii. Refer to Figure 10. Bend the inside wire of a run (or the wire having the sharpest bend) to conform to, or fall outside of, the curvature of the template. Refer to Figure 11.

6.24 Fasten the wire to the cable rack with a strap at about the point where the bend is to start, to prevent movement in the straight part of wire.

6.25 Bend the wire along the arc with a second strap, moving this strap along and loosening it as the wire is bent to make a gradual curve. See Figure 9.

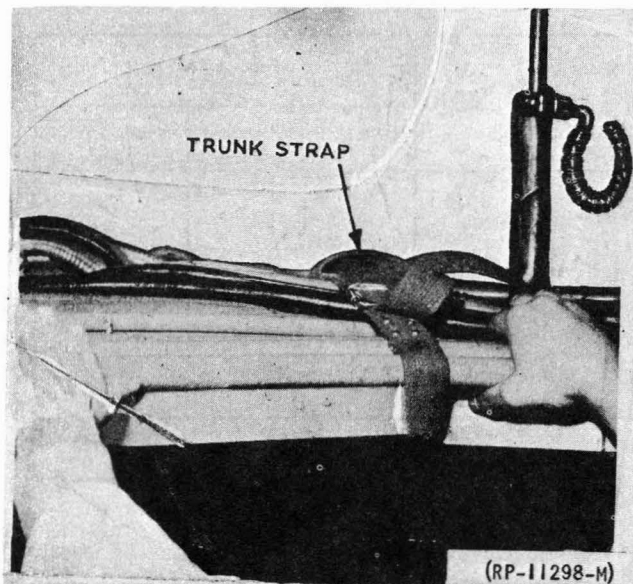


FIG. 9 BENDING POWER WIRE USING AN R-2118 TRUNK STRAP (PAR. 6.25)

6.26 In congested places where there is not sufficient space to obtain the proper leverage on the free end of the wire, secure a third strap to the free end and bend the wire by loosening and tightening the straps if necessary.

7. CLIPPING

7.1 When to Clip

7.11 Power wire is usually fastened to ladder type cable rack by clipping.

7.12 Conditions arise, however, when clipping may not be practicable or where clipping constitutes a service hazard in which case see paragraph under "sewing".

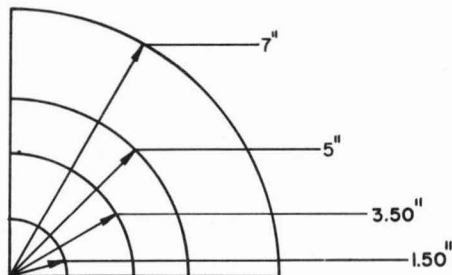


FIG. 10 TEMPLATE LAYOUT (PAR. 6.23)

7.121 Clipping may not be possible where the irregular size of the wires make it difficult and uneconomical to obtain a satisfactory arrangement. Where cables are not at right angles to the supports it is not possible to secure by clipping.

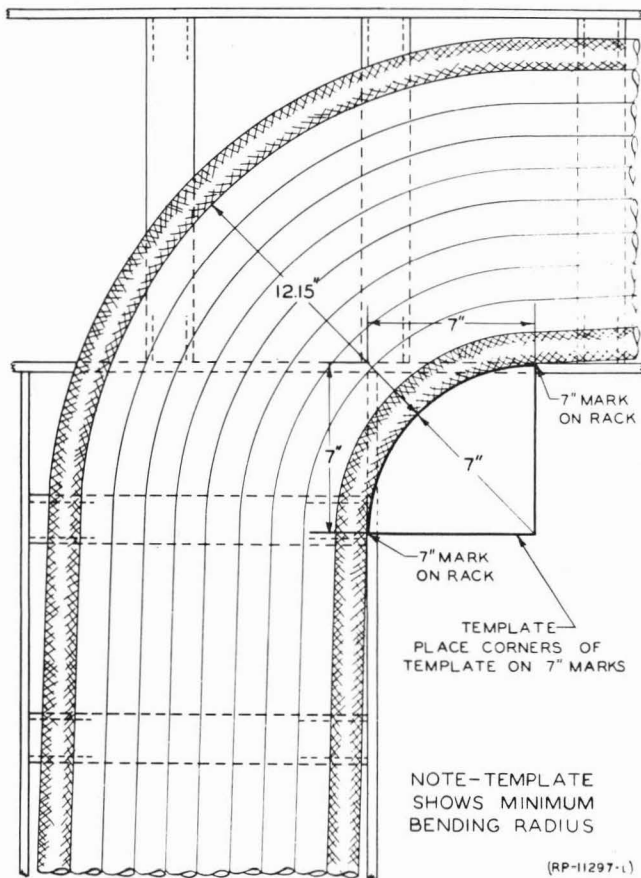


FIG. 11 USING TEMPLATE TO CONTROL BENDING RADIUS (PAR. 6.23)

7.122 No clipping should be initiated or continued within the power room. Using metal clips over motor-generator sets, open top rectifiers, power boards, generator control bays, etc., is considered hazardous. Other portions of the cable rack may become a hazardous location when equipment is added.

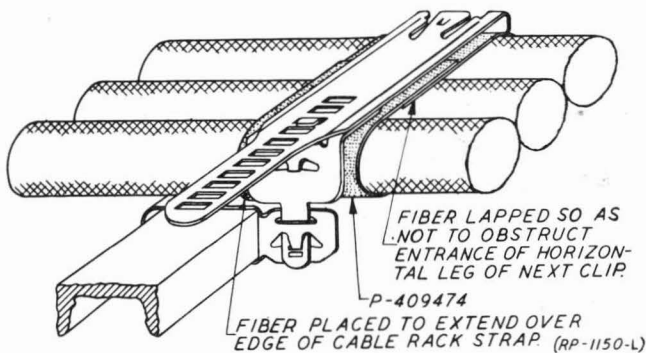
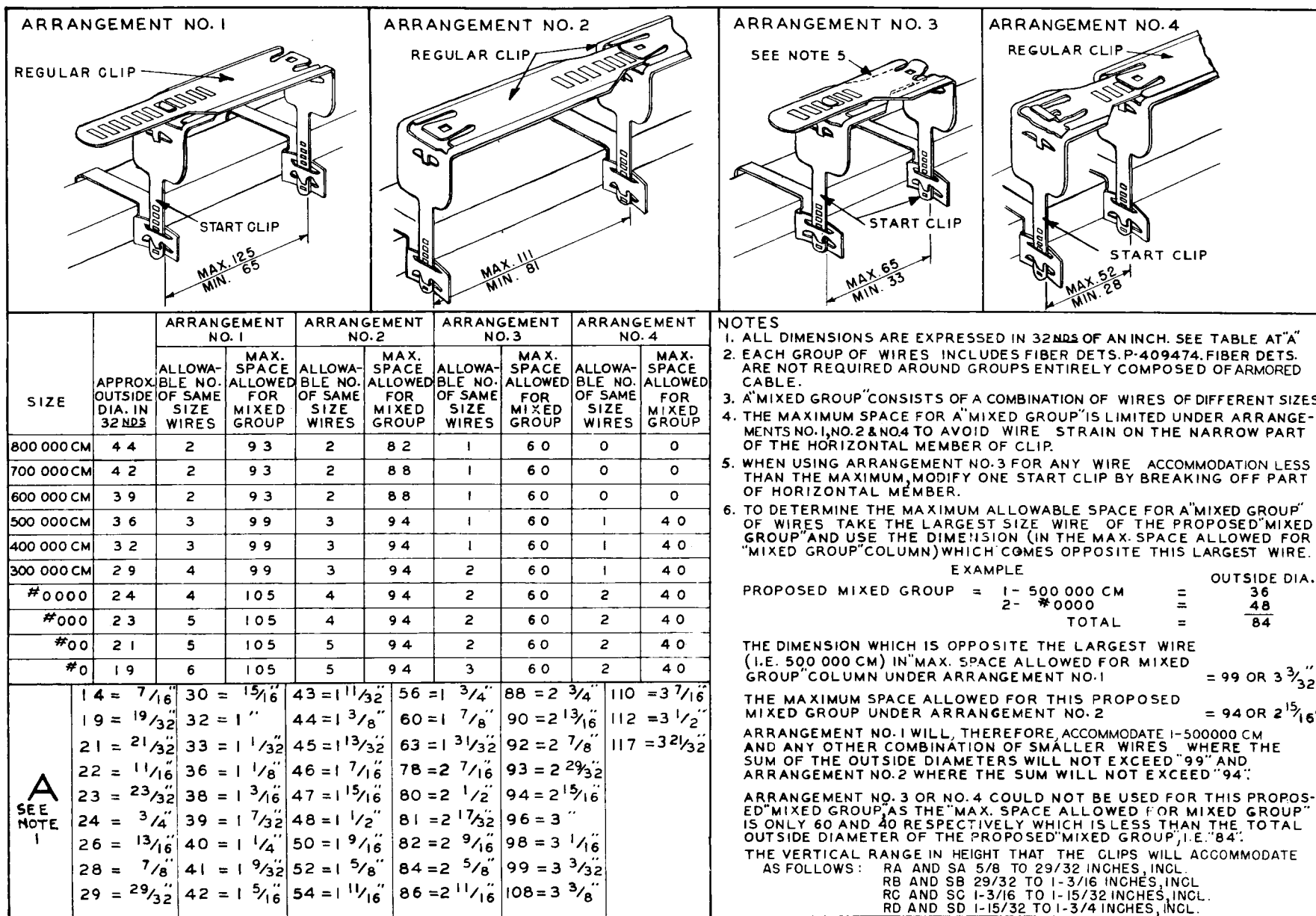


FIG. 12 PROTECTION OF POWER WIRES AT CLIPS (PARS. 7.21, 7.32-7.34)



(RP-9660-0)

FIG. 13 FLAT-TYPE CLIP ARRANGEMENT - GROUPING ARRANGEMENT (PARS. 7.21, 7.43)

7.123 No clipping shall be initiated or continued over motor-generator sets and battery stands and racks when such equipment is located in switch rooms and terminal rooms.

7.2 Clipping Procedures

7.21 Clip all power wire in the same manner as outlined for switchboard cable in the Cabling Handbook except as covered herein for additional protection and grouping arrangements. See Figures 12 and 13.

7.22 When there is insufficient cross section of wire to fill the last clip, these wires should be temporarily tied with sewing twine. They would not normally need protection from the clips on which they rest since on subsequent orders they would be removed and protection provided.

7.3 Wire Protection

7.31 Protect power wires from contact with clips by wrapping each group with strips of sheet fiber at each clipping point.

7.32 Gray fiber protection details (P-409474 insulator) are furnished as standard equipment. Dimensions are 9" x 1-3/8". If necessary these details may be made of 1/64" gray sheet fiber, RM-591862. See Figure 12.

7.33 Wrap the fiber around the cables so as not to interfere with the placing of clips, as shown in Figure 12. Bend fiber across the grain.

NOTE: A short piece of tape may be used to hold the ends of the fiber detail together if it is desired to have both hands free in placing the adjustable flat-type clip.

7.34 Place the fiber on the first layer so that it extends over the edge of the cable rack strap sufficiently to hold the fiber close underneath the cables. See Figure 12.

7.35 Protect all wire of a mixed group of power and switchboard cable under one clip as though the clip contained only power wire. This also applies when power wire and cable are in the same group with armored cable.

7.36 If wires are not fully protected because previously installed insulators have been disturbed, this shall be corrected before subsequent layers are clipped.

7.4 Amount and Where Required

7.41 Wires shall be clipped on the straight horizontal sections of ladder-type cable rack. Use flat-type clips at every third cable rack strap except runs composed entirely of 400,000 CM or larger which may be clipped at every fourth cable rack strap.

7.42 When adding wires to an existing horizontal run the frequency of clipping (spacing of straps) should be retained.

7.43 Wires may be grouped as shown in Figure 13.

7.44 Securing vertical runs is covered under Paragraph 5.3.

7.5 Armored Wire and Cable

7.51 Adjustable flat-type clips may be used on horizontal racks where armored cables are smaller than 1/0 and of uniform size. Clip at every third strap unless other wire and cable are clipped more often. If the cables tend to bulge or hang over edge of rack when clipped in the regular manner they should be clipped at every strap.

8. SEWING

NOTE: See tool protection under Service Interruptions.

8.1 When to Sew

8.11 Wires and cables which are usually fastened to ladder type cable rack are clipped.

8.12 There are instances where clipping is not permitted or not practicable in which case the wires are sewed. See Paragraph 7.1.

8.13 Sew portions of cable runs where present or future cable splices are specified, or where the cables are not at right angles to the supports and the angle is such as to make clipping impracticable.

8.14 On vertical runs sewing should be used only where clipping is not possible (armored wire and cable excepted).

8.15 Power feeders on support brackets in main and cross aisles need not be sewn except as noted on applicable drawings.

8.16 Cabling space on J86324 Battery Distributing Fuse Boards is intended to be a raceway and sewing shall be limited to that required for sufficient support and that necessary to prevent strain from being placed on lugs and studs.

8.17 It is satisfactory to sew to wire and cables previously clipped. When permanently sewing to previously clipped runs, it is not required to provide protection from the clips.

8.2 Amount and Where Required

8.21 Comply with the following Tables B and C for sewing all sizes of power wires and armored wire and cable. The requirements apply to uniform size leads. Varying sizes shall be sewed individually (Example: 1 300,000 CM and 1 No. 0) or the smaller sizes shall be bundled to equal about the size of the larger and sewed as two of equal size (Example: 5 No. 14's and 1 No. 0). When adding cable to an existing horizontal run the frequency of sewing (spacing of straps) should be retained.

8.22 Sew wires approximately every 9" on the vertical and 18" on the horizontal when securing them to auxiliary framing or to supporting details provided for this purpose. Where job drawings cover methods of securing cable to supporting details, such as along crossbar frames, at battery stands, etc., the drawings are to be followed.

TABLE B

SEWING HORIZONTAL RESTING RUNS
(PARS. 8.21, 8.25, 8.42)

Size of Wires	Sew at Strap	No. of Twine Strands	Ultimate No. of Layers	Wires per Stitch
800,000-400,000	Alternate	4★	Any number	2
350,000-No. 0	"	2	"	2
No. 1-No. 6	Every	2	"	4
No. 8-No. 14	"	2	"	Any number bundled not formed
1-to 4-Conductor Armored Cable;				
No. 1 to 14	"	2	"	2
0 to 500 MCM	Alternate	4	"	2
★ Except where superimposed on cable runs sewed with two strands, in which case two strands may be used.				

TABLE C

SEWING VERTICAL OR INVERTED HORIZONTAL RUNS
(PARS. 8.21, 8.25, 8.42)

Size of Wires	Note 1 Sew at Strap	No. of Twine Strands	Ultimate No. of Layers	Wires per Stitch
800,000-300,000	Sew in accordance with Paragraphs 5.310 thru 5.42	4★	Any number	1
No. 0000-No. 1		4★	Over 3	1
" " "		2	3 or less	1
No. 2-No. 6		2	Any number	2
No. 8-No. 14		2		Any number bundled not formed
1-to 4-Conductor Armored Cable;				
No. 1 to 14	Every	4	"	2
0 to 500 MCM	"	4	"	2
NOTE 1: On vertical runs do not sew at cable rack straps where clamps are provided.				
★ Except where superimposed on cable runs sewed with two strands, in which case two strands may be used.				

8.23 When sewing to prefabricated 90° turndowns, sew at every third cable strap. Protection (channel fiber) need not be used on the cross straps, however, if wire without a fabric or metal covering is used see paragraph 8.5.

8.24 Use No. 12 twine for permanent sewing.

8.25 Select the allowable number of wires to be placed under each stitch and sew with the number of strands shown in Tables B and C.

8.26 Leaving a space of approximately 3/4" between the wires and the outer edge of the cable rack stringers will avoid interference with stitches by the weld at the junctions of cross straps and stringers.

8.3 Forms

8.31 Group wires to be run for several feet on panels into a wire form and sew unless distributing rings or wiring strips are provided. When making up a form preparatory to sewing, arrange the wires so as to avoid appreciable crossovers and wires dressing out to apparatus from opposite side or the middle of the form.

8.32 Groups of small wires may be contained by using individual bands or by sewing with a lockstitch. When banding, place the bands approximately 4" apart. Where breakoffs occur more frequently than 4", the form may be sewed using a lockstitch. Use two strands of sewing twine for forms over 3/4" in diameter. Use one strand of sewing twine for forms 3/4" and smaller in diameter.

8.4 Armored Wire and Cable

8.41 Armored wire and cables No. 0 and larger and runs with various sizes shall, in general, be sewed. Vertical runs of all sizes shall be sewed. Separate armored wire and cable from clipped power wire as necessary to accomplish sewing.

8.42 See Paragraph 8.21 and Tables B and C for sewing requirements for armored cables. See Paragraph 5.6 for support of armored cable in No. 5 Crossbar frame uprights.

8.43 A single armored cable or one layer of armored cables in the same run with other cables shall be sewed with the same frequency of stitches as required for other wires in the run that are sewed.

8.44 The outer layers of cables of small diameter which may tend to bulge or sag should be sewed at closer intervals.

8.45 Twisted conductors from armored cables need not be untwisted when sewed into forms, even though the forms include untwisted leads.

8.5 Wire Without a Fabric or Metallic Covering

8.51 All rubber or plastic covered cordage, cable, and power conductors that do not have an outer fabric or

→ metallic covering, require added protection from twine used for temporary trying, banding or sewing. Provide encircling strips of fiber approximately 1" wide under the twine. Use two layers of RM-591862 1/64" gray sheet fiber, or one layer of P-409474 1/32" insulator.

→ Arrowed lines indicate new or changed information.

┌ Vertical line at side of paragraphs indicates requirements.

Manager, Product Engineering

Reason for Reissue:

- (1) To add information on the protection of Cable Sewing Needle and the use of job-made insulated Chicago needle. (pars. 2.22, 2.221 and Figure 1)
- (2) To add information on the protection of cables from inverted channel cross straps on ladder type cable racks. (par. 4.23)
- (3) To add information on ultimate pile-up of vertical power cable runs. (par. 5.301)
- (4) To provide information on running power wires on bar type cable racks equipped with screens and ladder type racks with horns and screens. (par. 5.7)
- (5) To add information on strain relief of terminating detail on power wire. (par. 5.812)
- (6) To add minimum bending radius for No. 14 stranded wire to table. (par. 6.11)
- (7) To provide information on partially filled clips. (par. 7.22)
- (8) To provide additional information on sewing to previously clipped runs. (par. 8.17)
- (9) To add information on sewing to pre-fabricated 90° turndowns. (par. 8.23)
- (10) To clarify containing of groups of small wires. (par. 8.32)

Replaces Section 6C dated 8-16-62.