

SUPPORTING AND POSITIONING FORMS.

This E.I. describes methods to support and position forms and to insulate and treat wood and metal surfaces.

1. INSULATION AND TREATMENT OF WOOD AND METAL SURFACES.

1.1 In no circumstance will any cable or form of wires be laced on or to untreated metal surfaces; the practices listed below must be used according to the circumstances.

1.2 Treatment of Metal Surfaces. The surfaces of posts, rods, brackets or channels must be treated by one of the following:-

- (i) painted with two coats of a suitable insulating enamel;
- (ii) coated with an approved baked enamel;
- (iii) fitted with a plastic sheath or suitable insulating collar;
- (iv) wrapped with plastic tape;
- (v) fitted with paper-based insulating material shaped to the channel or other support.

1.3 Timber Surfaces. Cable forms or forms of wire must not touch any untreated wooden surface, and wires must not be drawn through rough surfaced holes. Only first grade kiln-dried and seasoned timber is to be used for installation work.

1.4 Treatment.

- (i) All holes through which wires pass must be countersunk and burnished.
- (ii) Timber must be sealed with either varnish, shellac, lacquer or other approved moisture-sealing coatings.

2. SUPPORTING FORMS.

2.1 Posts, Brackets, Rods and Channels are the main types of supports for anchoring forms.

The methods to be used when supporting forms by either wood or metal surfaces are shown in drawings in this E.I. Details about some of these follow.

2.2 Posts are provided on equipment frames. They are long enough to support the number of cable forms which feed the apparatus. A typical post is in Fig. 1.

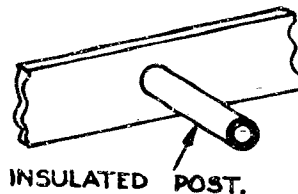


FIG. 1. POST.

2.3 Brackets are provided on equipment shelves, etc., to support shelf forms and terminal blocks. Typical brackets are in Fig. 2.

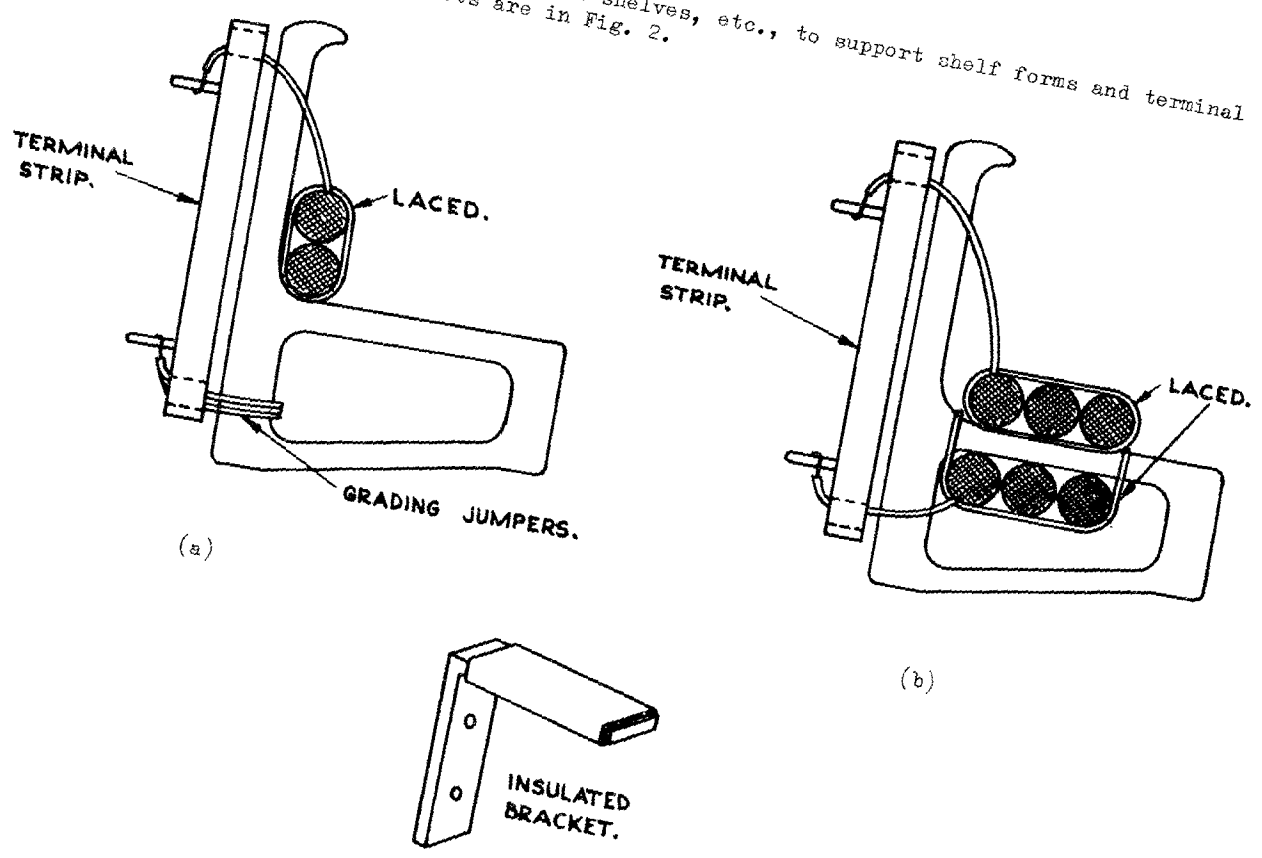


FIG. 2. BRACKETS.

2.4 Rods are provided on equipment racks to support forms which are terminated on strips of equipment such as relays, fuse and jack strips, ringing supply, lamp panels and other allied equipment. See Fig. 3.

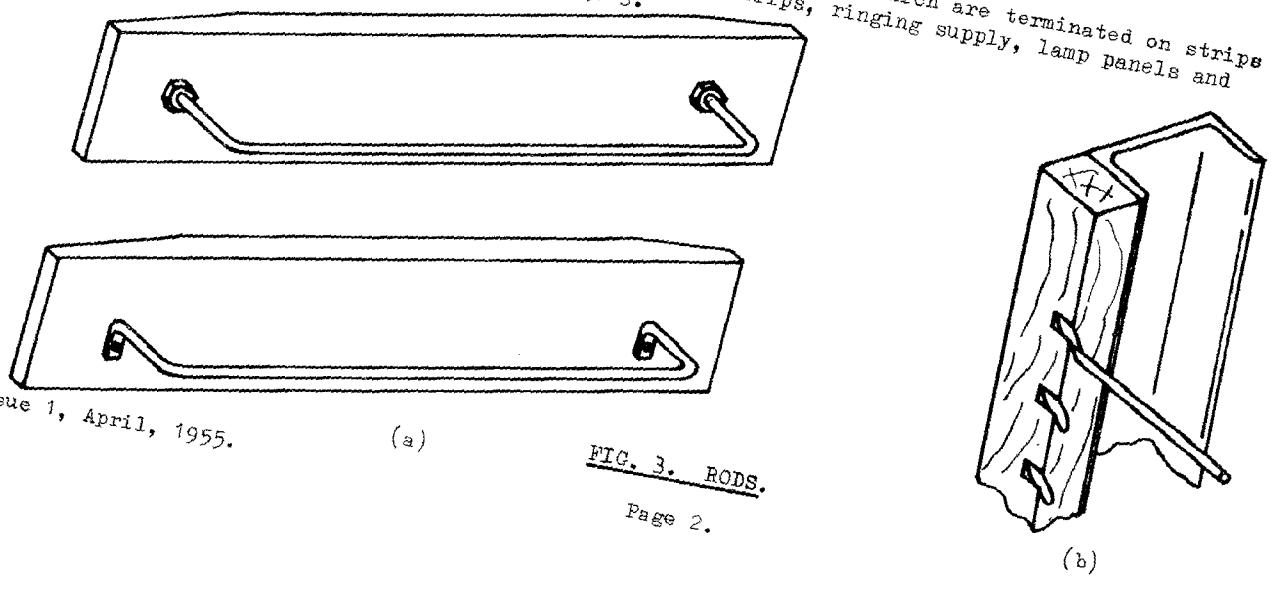
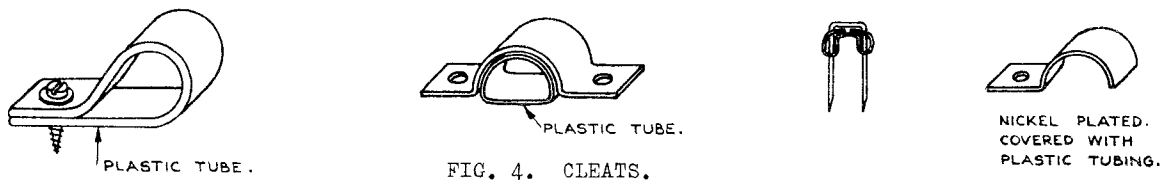


FIG. 3. RODS.

- 2.5 Channels form part of M.D.F's and other frame structures and may be used to support forms.
- 2.6 Forms may be cleated by one of the methods in Fig. 4.



3. LOCATING CABLE FORMS ON APPARATUS.

- 3.1 When wiring internal plant equipment, switchboard wires which are formed from cables are fed to the apparatus before terminating. The two main wiring practices used are:-

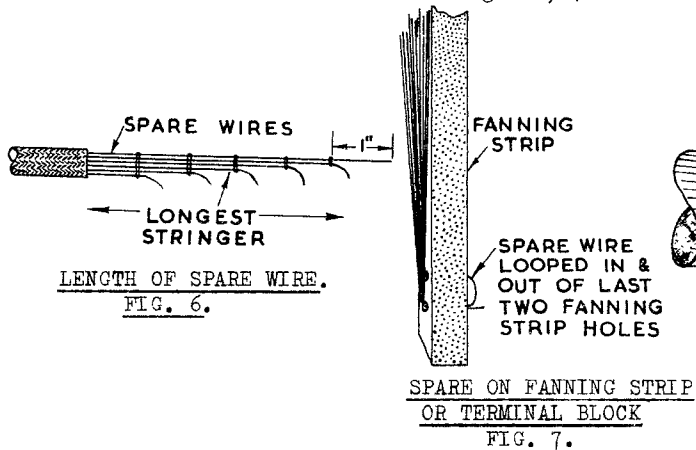
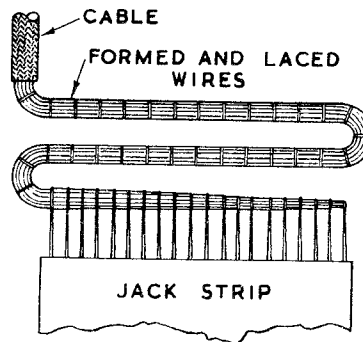
Hard Wiring: which is the termination of the wires from a butted or formed cable, or from a form of wires, direct on to units of equipment - jacked-in equipment excepted. Typical examples are meter plates, relay plates, fuse panels, etc. When hard wiring practices are used, forms are supported either on brackets, posts or rods.

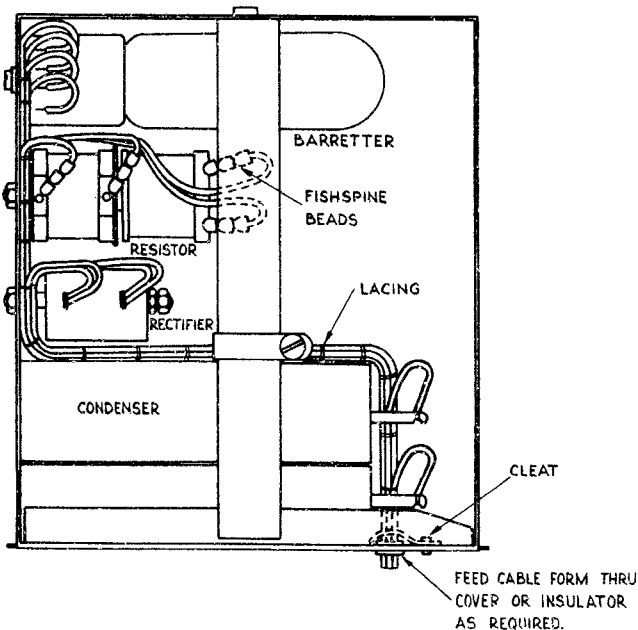
Fanning of Wires: is the terminating practice where the forms are fed through fanning strips or terminal blocks, etc.

- 3.2 Positioning of Forms. Hard-wired forms are completely laced to the point where the stringers leave the form and the laced forms tied as required to the posts, brackets or rods on the apparatus.

- 3.3 Flexible Forms are used to permit access to Test Jack Fields on M.D.F's, etc., and are shaped as shown in Fig. 5.

- 3.4 Spare Wires in Cables. Where provision is made in switchboard cables for a spare set of wires, they shall be cut at least 1" longer than the longest stringer and the wires located and positioned on a fanning strip, grading strip, terminal block or in formed wires as shown in figs. 6, 7 & 8.





WIRING CONDENSERS AND RESISTANCE SPOOLS.
FIG. 9.

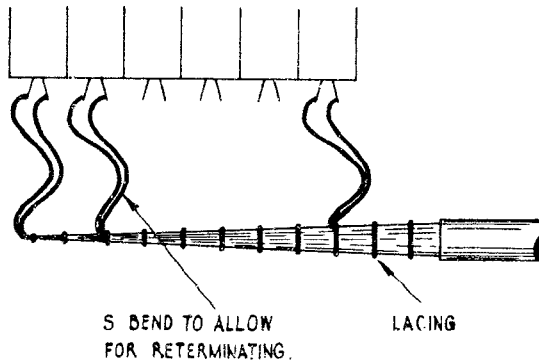
3.7 Forms from Butted Cables without Lacing. Terminating on arrestors, fuse strips, terminal blocks, grading strips, shelf wiring positions, etc., requires a stringer length not exceeding 4" longer than the direct path to the last terminating point.

4. FANNING OF WIRES.

4.1 Form wires, which are fed through fanning holes, can be either laced or fanned without lacing. Where forms can be directly fanned to the appropriate holes, lacing is not required (Fig. 11.) Where forms cannot be arranged as shown in Fig. 11, then the form may be laced as shown in Figs. 12 & 13. When fanning strips are provided in a vertical plane, the butt of the cable or cables serving one or more fanning strips will be in line with -

- (i) the top of the fanning strip (or group of strips) in the case of cable feeding downward; or
- (ii) the bottom of the fanning strip (or group of strips) in the case of cable feeding upward.

4.2 To provide sufficient length of skinner when forms are laced, the nearest cable will be in such a position that the butt is at least $2\frac{1}{2}$ " back from the first fanning hole to which the cable is directed. See Fig. 12.



SHAPING OF STRINGERS.
FIG. 10.

3.5 Movable Apparatus. The length of stringer for terminating on movable apparatus, see Fig. 9. such as condensers, resistance spools, etc., must permit -

- (i) at least two removals and reterminations;
- (ii) the removal of any piece of apparatus for inspection.

3.6 Forms from Wires Only. When preparing forms on forming boards the stringer length to be allowed for subsequent termination will be 1" greater than the terminating length plus $\frac{5}{8}$ " allowance for shaping of the stringers. The length of stringer after termination from this junction with the main form will be $\frac{5}{8}$ " longer than the direct path distance. The slack formed by this "over-length" must be taken up by shaping of the stringer, see Fig. 10.

4.3 Where lacing is not done, the butt can be brought against the fanning strip as in Fig. 11.



FANNED WITHOUT LACING.
FIG. 11.

4.4 Where one cable serves two or more fanning strips the wires will be fed out at points opposite the strips with which they are associated and the main form laced only between these points. The remaining stringers feeding into the fanning hole are not laced. See Fig. 13.

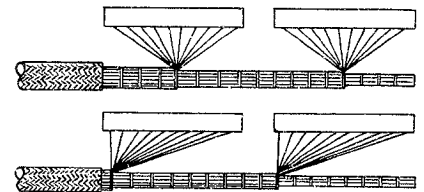


LACED FORM.
FIG. 12.

5. JOINTING SWITCHBOARD WIRES.

5.1 Wires must not be joined without the approval of the Officer-in-Charge; wire joints must be made as in Fig. 14 and the following:-

Unwind the covering of both wires and clean them; lay side by side, and solder. Sharp edges of wire or points of solder must not be left after the joints are made. Rewind the coverings around the wire, one overlapping the other. Apply melted wax and/or roll the covering with the fingers to make a neat and tidy joint.



LACED FORMS.
FIG. 13.

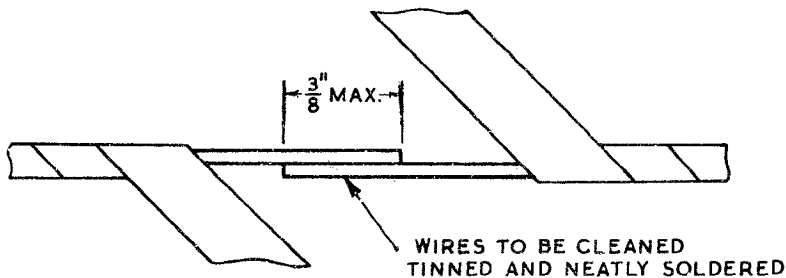
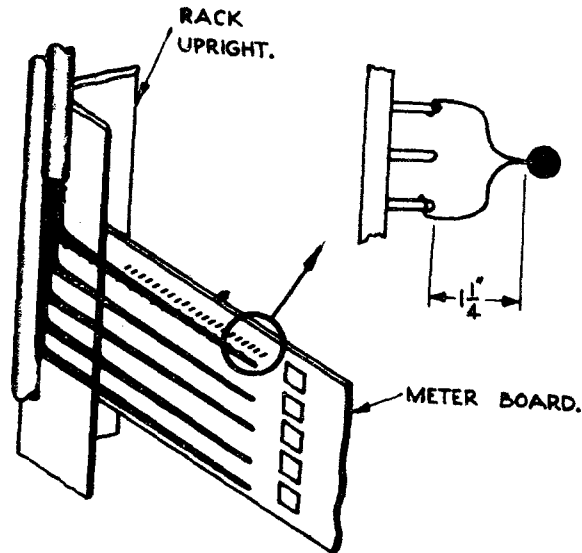


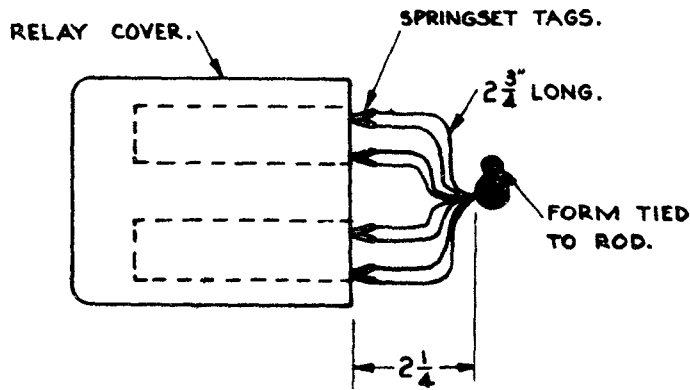
FIG. 14 JOINTING WIRES.

6. MISCELLANEOUS APPLICATIONS.

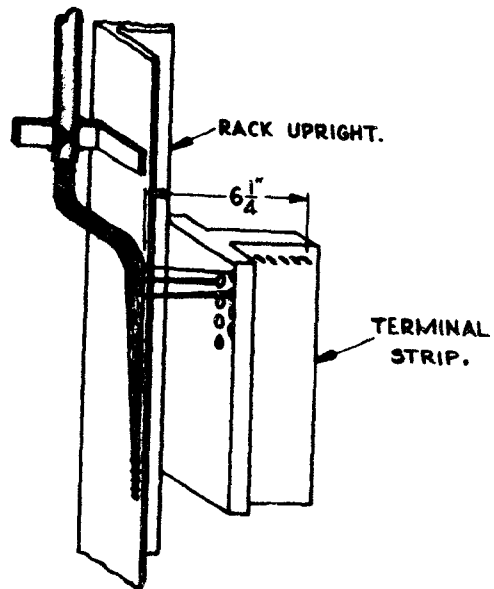
6.1 Fig. 15 shows miscellaneous application of fanning out and supporting forms.



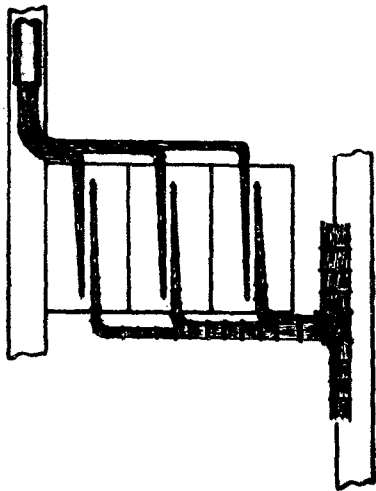
(a) Meter Plate



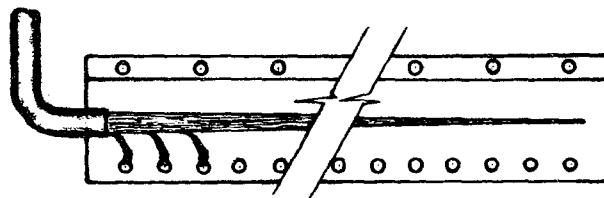
(b) Relay Mounting.



(c) Uniselector - I/C and O/C



(d) Access - Rear View.



(e) T.D.F. Strip.

FIG. 15. MISCELLANEOUS APPLICATIONS OF FANNING OUT AND SUPPORTING FORMS.

END.
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