

IEEE Guide on Terminology for Tools and Equipment to Be Used in Live Line Working

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An American National Standard

**IEEE Guide on Terminology for Tools and
Equipment to Be Used in Live Line Working**

Sponsor

**Transmission and Distribution Committee of the
IEEE Power Engineering Society**

Approved January 3, 1989

IEEE Standards Board

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Foreword

(This Foreword is not a part of ANSI/IEEE Std 935-1989, IEEE Guide on Terminology for Tools and Equipment to Be Used in Live Line Working.)

This standard has been prepared by IEC Technical Committee No. 78: Tools for Live Line Working.

A first draft of this document was discussed during the inaugural meeting of this Technical Committee held in Paris in 1976.

Drafts were discussed at the meetings held in Stockholm in 1978, in Budapest in 1979, and in Philadelphia in 1980. As a result of the latter meeting, a draft, Document 78 (Central Office) 4, was submitted to the National Committees for approval under the Six Months' Rule in February, 1980.

Amendments, Document 78 (Central Office) 7, were submitted to the National Committees under the Two Months' Procedure for approval in April, 1981.

The National Committees of the following countries voted explicitly in favor of publication:

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IEEE Guide on Terminology for Tools and Equipment to Be Used in Live Line Working

1. Introduction

1.1 Scope. This standard applies to terminology for tools and equipment used in live line working. This standard is not intended to be a dictionary giving detailed definitions of all the terms used in live line working, but only the necessary details, without indications of their components and their methods of use, to permit identification of the tools and equipment and to standardize their names.

Terms used in this guide represent the terms normally used in North America. English terms in the IEC Publication 743 (1983), Terminology for Tools and Equipment to Be Used in Live Working, will typically use the word *pole* instead of *stick* and *tenon* instead of *tongue*. It should also be noted that there are other tools available and presently in use that are not shown in this guide.

1.2 General Terms

1.2.1 Difference between Insulated and Insulating Tools

1.2.1.1 Insulated Tool. A tool made of conductive material and fully or partly covered by insulating material.

1.2.1.2 Insulating Tool. A tool essentially made of insulating material.

1.2.2 Insulating Tool Components

1.2.2.1 End Fitting. Part (generally metallic) permanently fitted to the ends of insulating tube or rod.

1.2.2.2 Foam. An insulating material composed of closed polyurethane cells. Its purpose is to prevent the ingress and migration of moisture.

1.2.2.3 Rod. Solid rod composed of synthetic insulating material, normally reinforced.

1.2.2.4 Tube. Composed of synthetic insulating material, normally reinforced, the interior of which may be filled or hollow.

1.2.3 Types of Tools and Insulating Assemblies

1.2.3.1 Auxiliary Arm Assembly. Support

tools arranged to form an auxiliary arm, to lift conductors off their insulators.

1.2.3.2 Hand Stick. Used to operate on network components at a distance. It is subjected only to the loads imposed by the worker.

- Examples: (1) universal hand stick
(2) wire cutting stick

1.2.3.3 Insulating or Insulated Hand Tools. Constructed of insulating material or of conductive material (e.g., metal) primarily for mechanical strength, and then coated or covered with insulating material to protect the worker from electrical contact and to avoid flashovers.

1.2.3.4 Mast Assembly. Various support sticks and tools arranged in a swivel-boom-type configuration assembled in place on a structure that, for example, may be used to

- (1) lift a string of insulators out of their position to facilitate changing damaged units;
(2) lift conductors off their insulators.

1.2.3.5 Support Stick. Used to hold or move conductors and equipment.

- Examples: (1) tension stick
(2) suspension link stick
(3) conductor support stick
(4) swivel boom

1.2.3.6 Trolley Roll Layout. Various support tools assembled with support stricks, saddles, trolley wheels, pole-clamps, and insulator forks.

1.2.3.7 Working Stick. Consists of insulating tube and/or rod with end fittings.

The two types are

- (1) hand stick
(2) support stick

1.2.4 Tools and Accessories. Tools and accessories that can be attached to the end fitting of universal sticks and that are used to perform various operations.

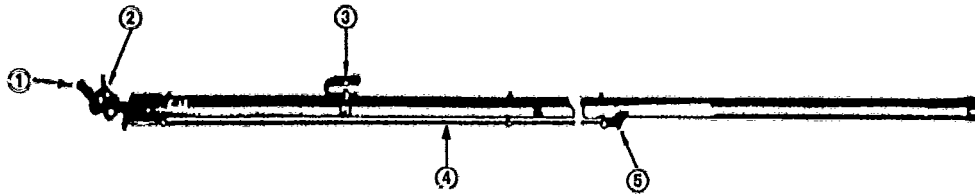
1.2.5 Protective Covers. Generally made of insulating materials, they are used to cover live or non-energized elements in order to avoid accidental contact.

They may be rigid or flexible and either shaped or in sheets.

2. Insulating Sticks

2.1 Hand Sticks

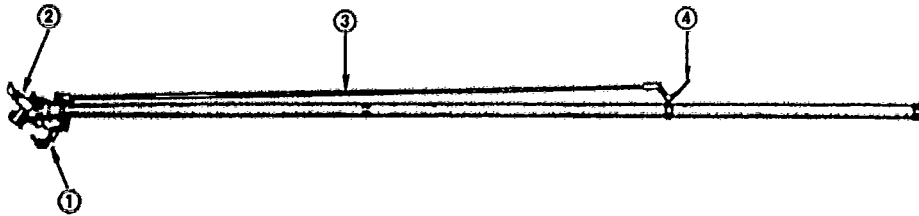
2.1.1 All-Angle Cog Wrench. Used with removable sockets to install and remove bolts and nuts.



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- ① Head
- ② Gear
- ③ Hanger hook
- ④ Control rod
- ⑤ Operating handle

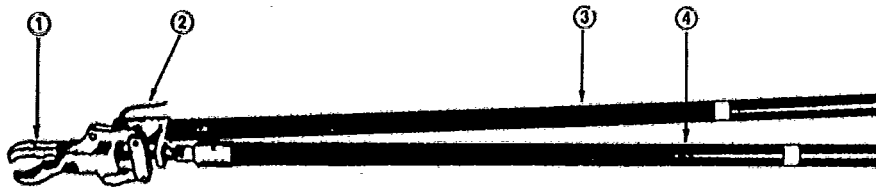
2.1.2 Clip-on Ammeter Stick. A tool to which a clip-on ammeter is attached.



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- ① Operating pin
- ② Ammeter clamp
- ③ Control rod
- ④ Operating lever

2.1.3 Cotter Key Plier Stick. Used to grip, hold in place, or remove various small pieces.



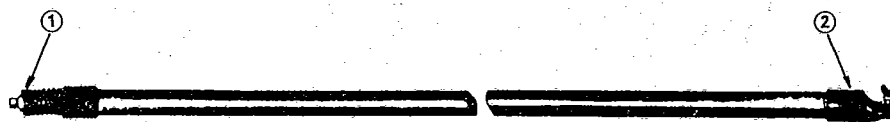
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- ① Jaw
- ② Hanger hook
- ③ Support handle
- ④ Operating handle

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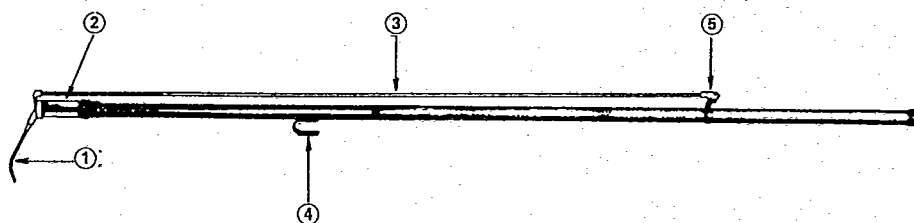
2.1.4 Flexible Insulated Wrench. Used with removable sockets to hold, install, and remove bolts and nuts.



- ① Flexible socket wrench head
- ② Universal splined-head

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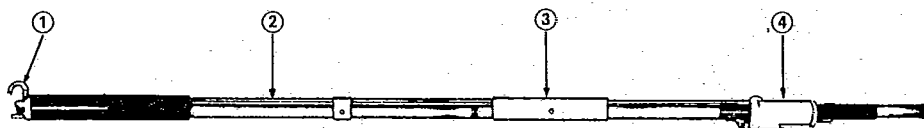
2.1.5 Insulating Oiler Stick. Used to apply a lubricant or rust penetrant.



- ① Spout
- ② Oil reservoir
- ③ Control rod
- ④ Hanger hook
- ⑤ Operating handle

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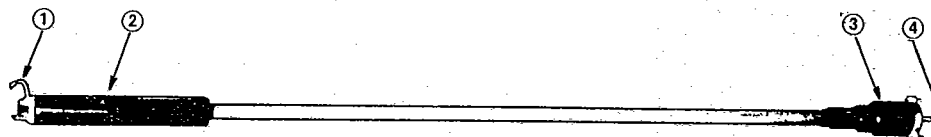
2.1.6 Retractable Hook Stick. Used to install, remove, or handle live-line clamps and various accessories equipped with an eye.



- ① Hook
- ② Operating rod
- ③ Hand position sleeve
- ④ Sliding hand grip

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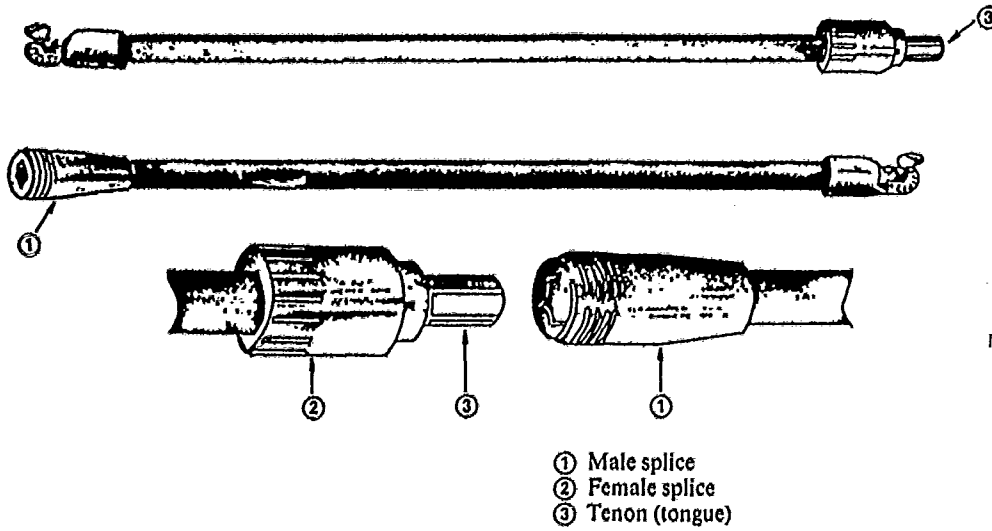
2.1.7 Retractable Hook Stick Extension. Attached to the retractable hook stick to provide a longer reach.



- ① Engaging hook
- ② Protective sleeve
- ③ Socket
- ④ Eye

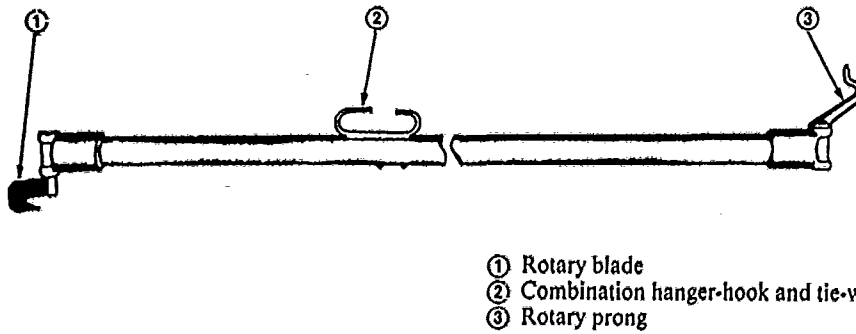
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2.1.8 Spliced Universal Hand Stick. Made of one or more elements spliced together.



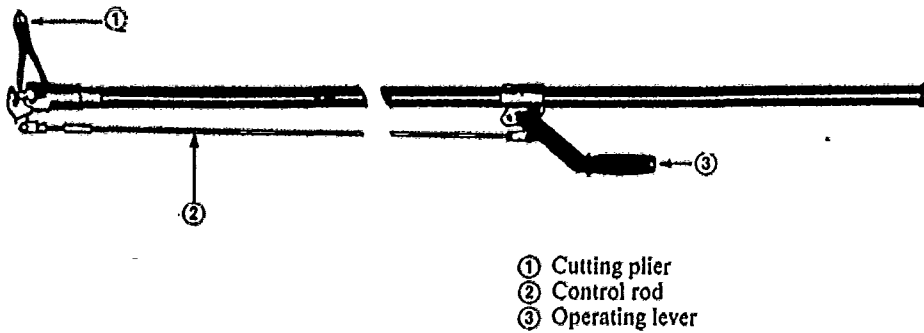
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2.1.9 Tie Stick. Used to install or remove tie wires.



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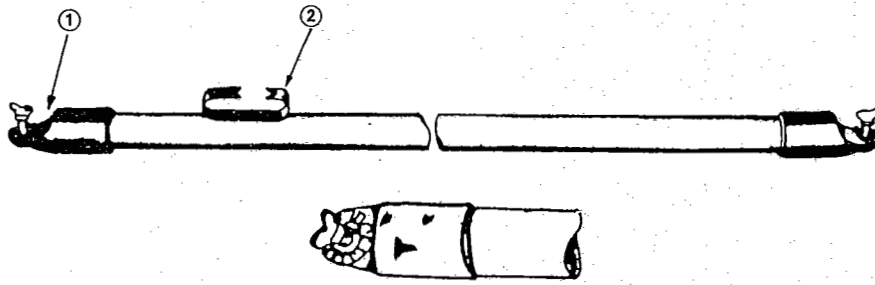
2.1.10 Tie Wire Cutter. Used to cut tie wires.



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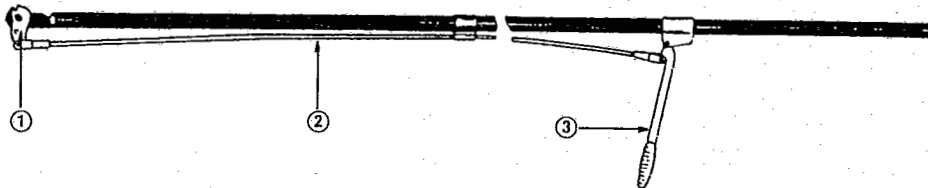
2.1.11 Universal Hand Stick. A tool to the end of which universal tools can be attached.



- ① Splined end-fitting
- ② Combination hanger-hook and tie-wire

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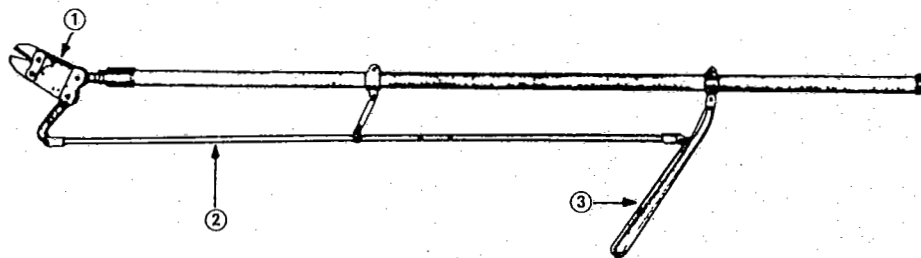
2.1.12 Wire Cutter Stick. Used to cut conductors or blinding wires.



- ① Cutting head
- ② Control rod
- ③ Operating handle

Lever-type (light duty)

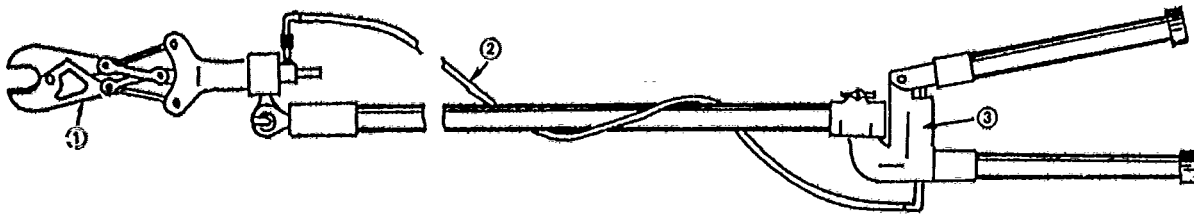
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- ① Cutting head
- ② Control rod
- ③ Operating handle

Lever-type (medium duty)

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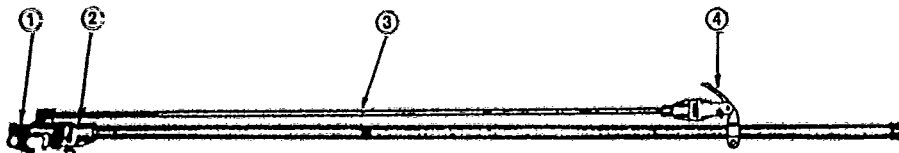


- ① Cutting head
- ② Flexible hose
- ③ Hydraulic pump

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Hydraulic

2.1.13 Wire Holding Stick. Used to hold conductors or wire during operations.

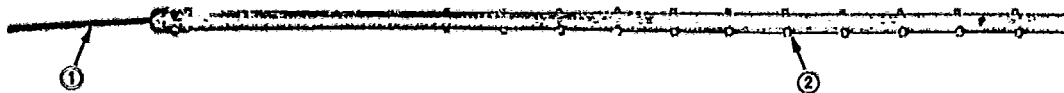


- ① Adjustable jaw
- ② Adjustable tilting head
- ③ Control rod
- ④ Locking lever

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2.2 Support Sticks

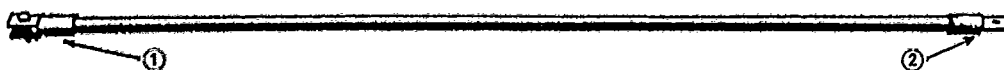
2.2.1 Adjustable Strain Stick. A support tool that, with various accessories, can be used to lift or tension wires.



- ① Screw
- ② Metal adjustment-pin

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2.2.2 Clevis/Tongue Stick. A support tool used with appropriate attachment and/or adapters to perform various operations.



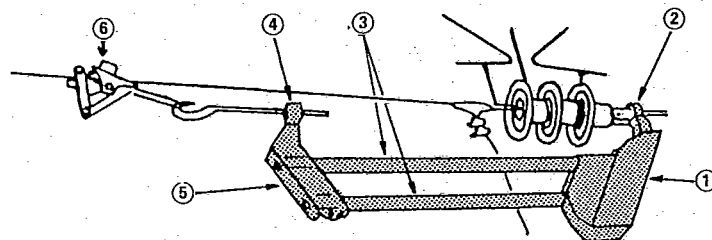
- ① Clevis
- ② Tenon (tongue)

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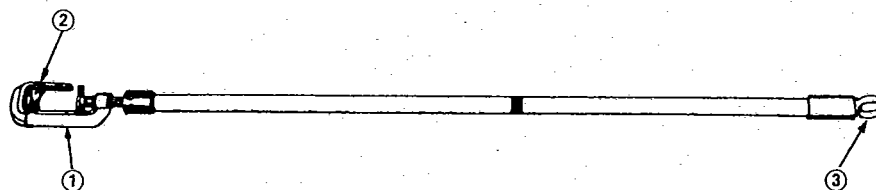
2.2.3 Deadend Tool. Used to hold the tension of a conductor, in order to replace a deadend string of insulators.



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- ① Flange (with insulated cover)
- ② Hook
- ③ Poles (sticks)
- ④ Jacking-screw
- ⑤ Flange
- ⑥ Automatic come-along clams (wire grips)

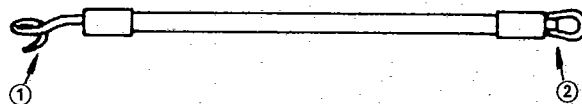
2.2.4 Roller Link Stick. A link stick equipped with a roller that allows its movement along the conductor.



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- ① Head
- ② Roller
- ③ Swivel eye (butt-ring)

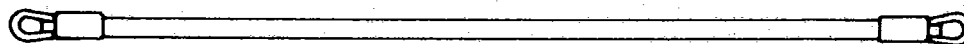
2.2.5 Spiral Link Stick. A tension link stick equipped with a spiral link at one end.



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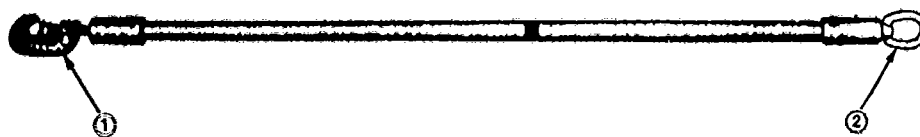
- ① Spiral link
- ② Swivel eye (butt-ring)

2.2.6 Swivel Link Stick. A tension link stick equipped with a swivel eye at one or both ends.



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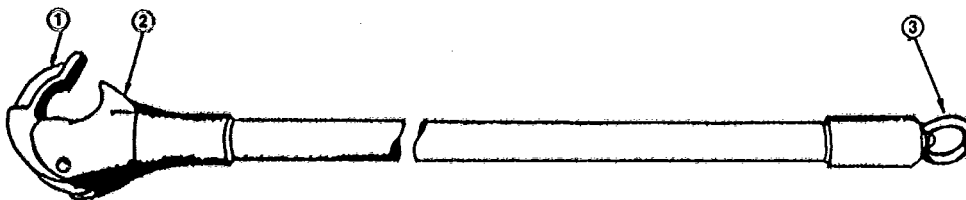
2.2.7 Tension Link Stick. Used to apply tension to a component (or conductor).



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- ① Jaws
- ② Swivel eye (butt-ring)

2.2.8 Wire Support Stick. Used to position or move a conductor.



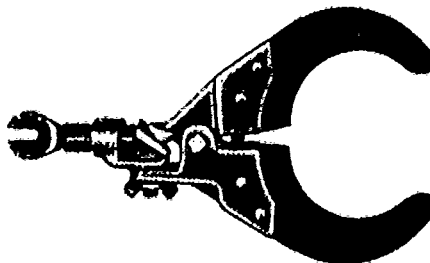
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- ① Movable jaw
- ② Fixed jaw
- ③ Swivel eye (butt-ring)

3. Universal Tool Fittings

3.1 Splined End-Tools

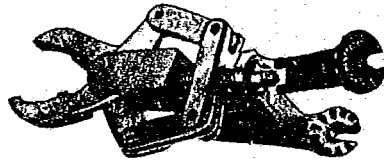
3.1.1 Adjustable Insulator Fork. Used to control insulators during their installation or removal. May have insulated adjustable jaws.



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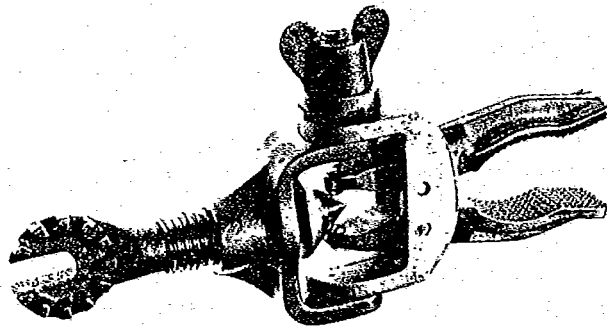
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3.1.2 Adjustable Pliers. Used to grip small parts.



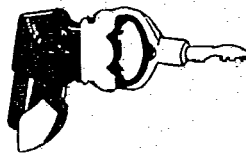
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3.1.3 All-Angle Pliers. Used to hold various loose parts adjustable to various angles.



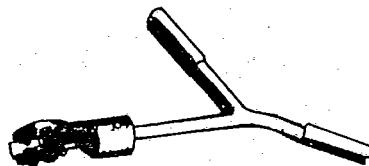
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3.1.4 Ammeter Holder. Used to hold a clip-on ammeter.



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3.1.5 Anti-Interference Braid Applicator. Used to install antistatic braids between the pin of the insulator and the conductor clamp.



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3.1.6 Ball Socket Adjuster. Used to hold a ball socket during connection and disconnection.

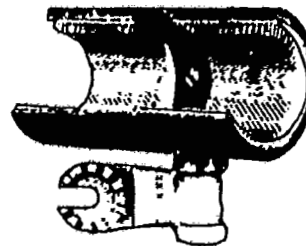


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3.1.7 Conductor Cleaning Brush. Used to clean conductors.



V-shaped



Semi-tubular

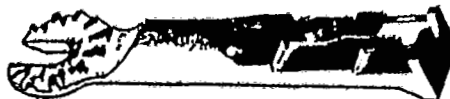
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3.1.8 Conductor Sander. Used to polish the conductor surface.



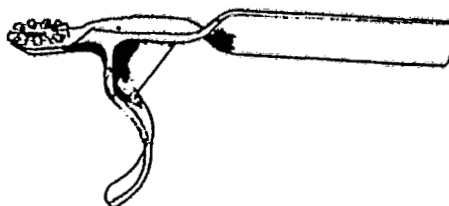
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3.1.9 Cotter Key Installer. Used to install split pins, cotter keys, etc.



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3.1.10 Cotter Key Installer-Remover. Used to install or remove split pins, cotter keys, etc.



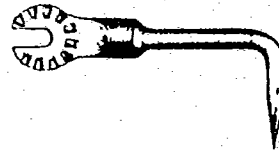
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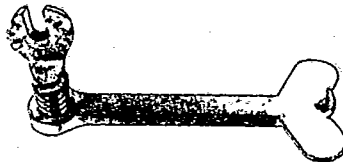
3.1.11 Cotter Key Remover. Used to pull cotter keys from fittings or hardware.



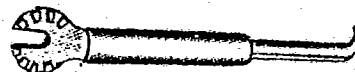
Spiral type



Fine-point type



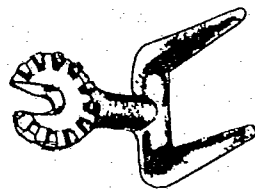
Cam type (pry type)



Snap-out type

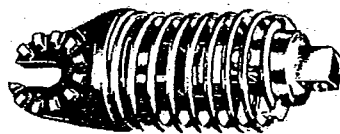
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3.1.12 Fixed Double-Prong Head. Used to manipulate tie wire or equipment.



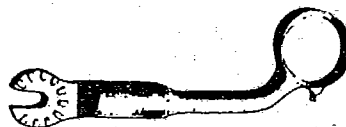
IEC 743

3.1.13 Flexible Wrench Head. Used with removable socket to tighten or loosen nuts and bolts.



IEC 743

3.1.14 Formed Wire Tool. Used to install and remove formed or pre-formed tie wire.

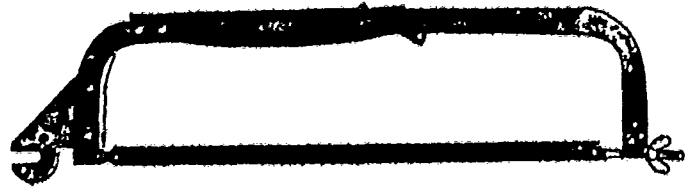
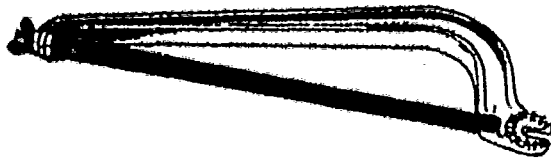


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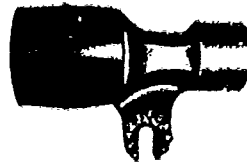
IEEE GUIDE ON TERMINOLOGY FOR TOOLS AND

3.1.15 Hack Saw. Used for sawing any metal part.



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3.1.16 Hammer. Used to impact equipment as required.



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3.1.17 Holding Fork. Used to hold components in position when using other tools.



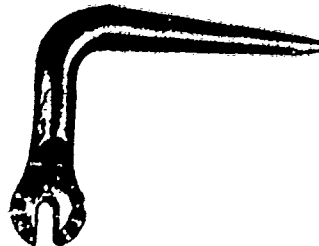
IEC 743

3.1.18 Insulator Ball Guide. Used to engage or disengage the ball of a ball socket fitting.



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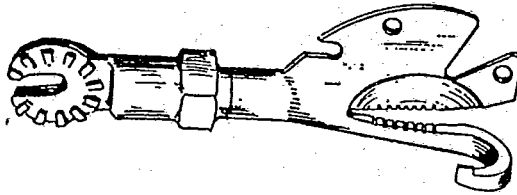
3.1.19 Locating Drift. Used to align two holes or to push a pin.



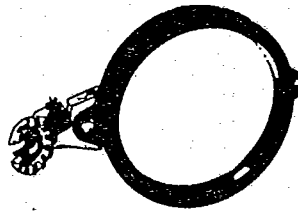
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EQUIPMENT TO BE USED IN LIVE LINE WORKING

3.1.20 Mechanical Hand. Used as a hand as pliers for forming tie wires.

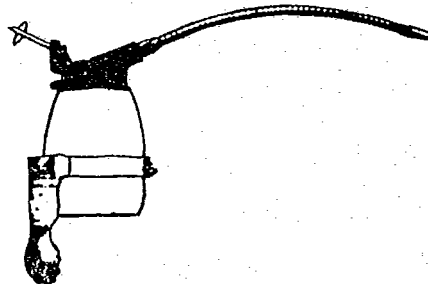


3.1.21 Mirror. Attached to a universal hand stick; used to inspect parts that are not directly visible.



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3.1.22 Oilcan. Used to apply a lubricant or rust penetrant.



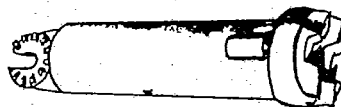
IEC 743

3.1.23. Pin Holder. Used to hold a pin.



IEC 743

3.1.24 Positive Grip Clamp Stick Head. Used to hold any component equipped with an eye.



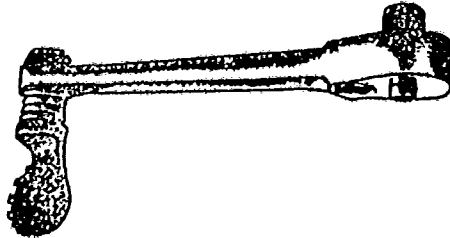
IEC 743

3.1.25 Pruning Saw. Used to trim tree branches.



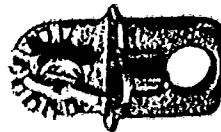
IEC 743

3.1.26 Ratchet Wrench. Used with removable sockets to tighten or loosen nuts and bolts.



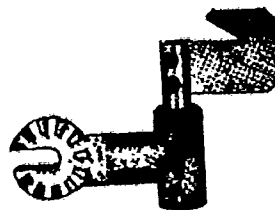
IEC 743

3.1.27 Retractable Hook Stick Adaptor. Device used to adapt a retractable hook stick to permit the attachment of universal accessories.



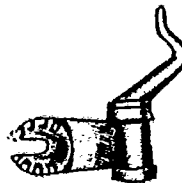
IEC 743

3.1.28 Rotary Blade. Used to manipulate tie wires.



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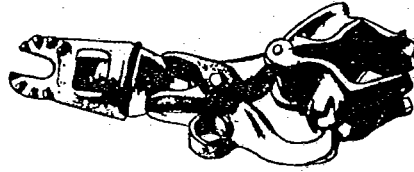
3.1.29 Rotary Prong. Used to manipulate tie wires or insulating blankets.



IEC 743

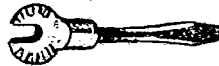
EQUIPMENT TO BE USED IN LIVE LINE WORKING

3.1.30 Screw Clamp. Used to grip and position an insulator cap by its adjustable jaws.



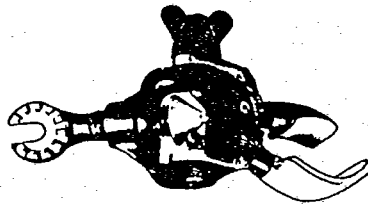
IEC 743

3.1.31 Screwdriver. Used to tighten or loosen screws.



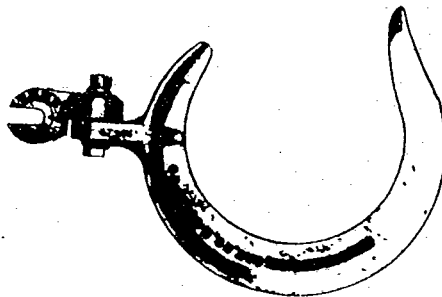
IEC 743

3.1.32 Self-aligning Fuse Puller. Used to grip, remove, and install fuses.



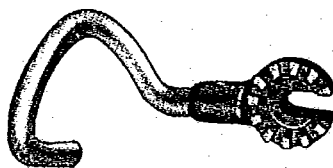
IEC 743

3.1.33 Shepherd's Hook. Used to guide insulators.



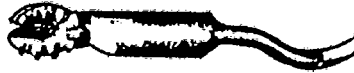
IEC 743

3.1.34 Spiral Disconnect. Used to handle various types of equipment fitted with eyes.



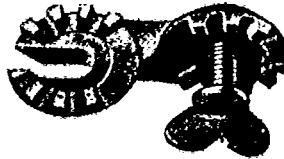
IEC 743

3.1.35 Tie Wire Cutter. Used to snap tie wire.



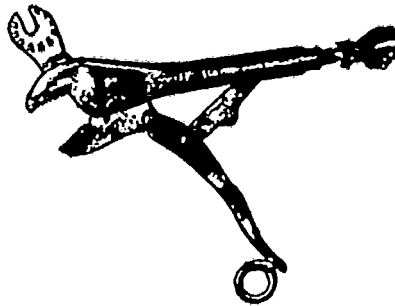
IEC 743

3.1.36 Universal Adaptor. Used to change the angle of attachment on a universal hand stick.



IEC 743

3.1.37 Vice Grip Pliers. Used to hold various parts.

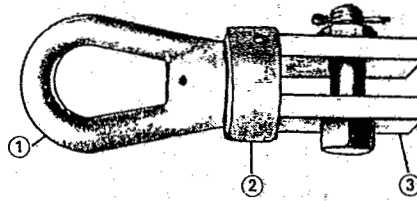


IEC 743

3.1.38 Wrench. Used to hold nuts and bolts.

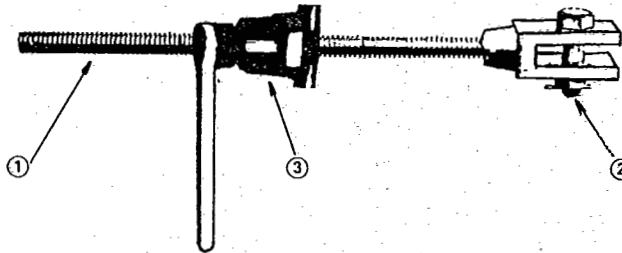


IEC 743

3.2 Clevis and Tongue Tools**3.2.1 Clevis Eye Attachment.** Used to convert a tongue stick into a support stick.

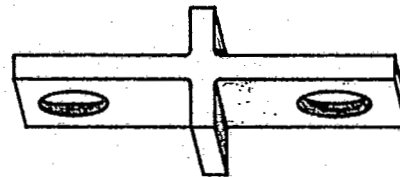
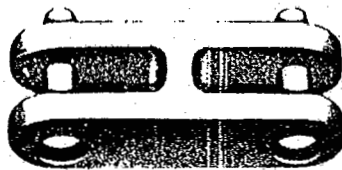
- ① Eye
- ② Swivel
- ③ Clevis

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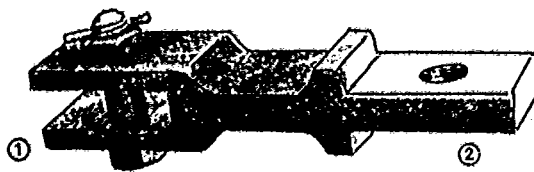
3.2.2 Clevis Screw Adapter. Used in conjunction with a ratchet to apply and release mechanical loads.

- ① Screw
- ② Clevis
- ③ Ratchet

IEC 743

3.2.3 Clevis-Tongue Adapter. Used to convert a clevis-tongue stick into a clevis-clevis or tongue-tongue stick.

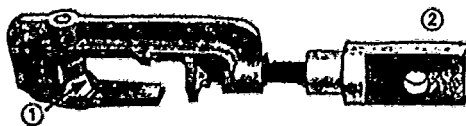
3.2.4 Clevis-Tongue Extension. Used to extend a clevis end stick.



- ① Clevis
- ② Tongue attachment

IEC 743

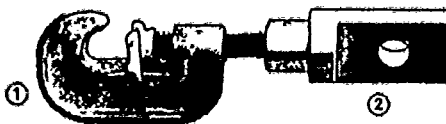
3.2.5 Roller-Tongue Attachment. Used to convert a clevis-tongue stick into a roller link stick.



- ① Roller
- ② Tenon (tongue) attachment

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3.2.6 Strain Link Tongue Attachment. Used to convert a clevis stick into a strain link stick.



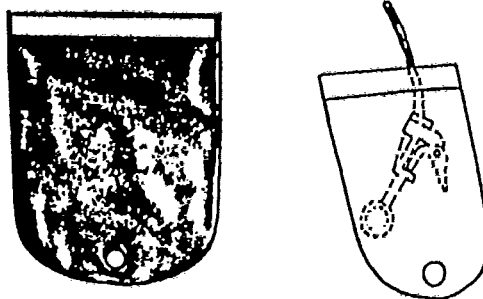
- ① Strain head
- ② Tongue attachment

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4. Insulating Covers and Similar Assemblies

4.1 Shaped Covers

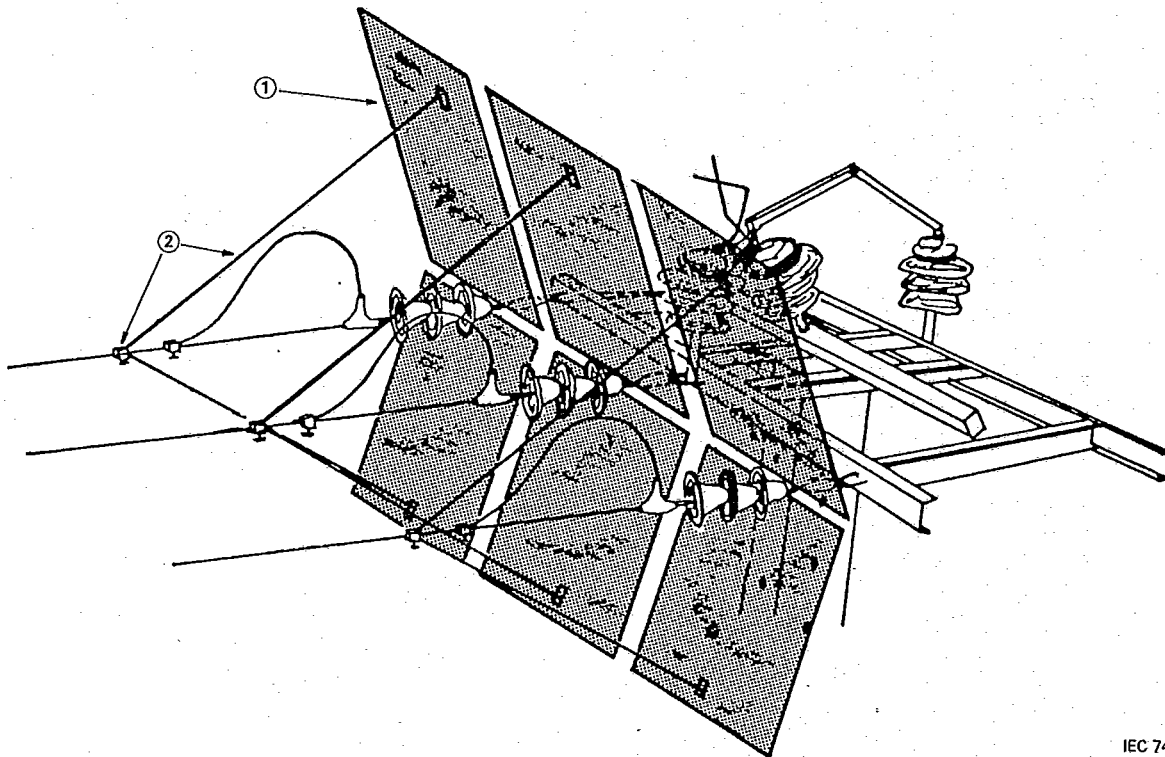
4.1.1 Bag. Made of insulating material to cover conductive fittings.



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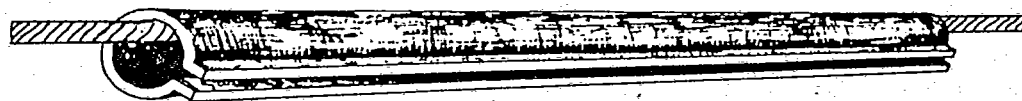
4.1.2 Barrier. Made of insulating material and generally used to limit the work zone.



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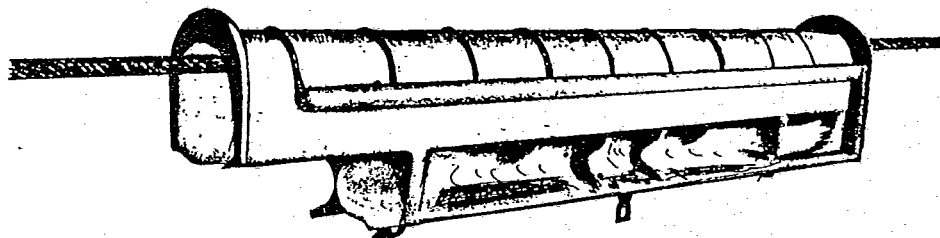
- ① Barrier
- ② Fixing devices

4.1.3 Conductor Cover. Made of insulating material and used to insulate conductive parts. It can be of a flexible or rigid type, according to the material used.



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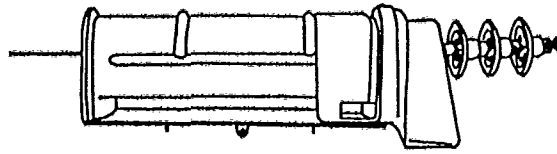
Flexible type — line hose



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Rigid type — line guard

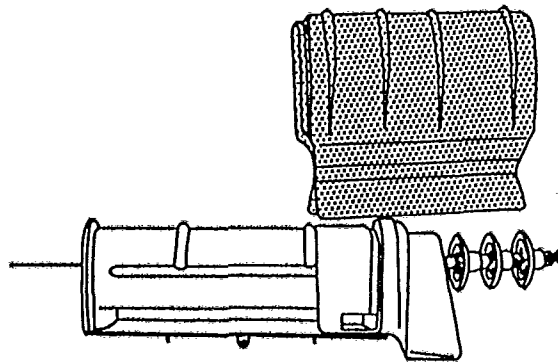
4.1.4 Dead-End Clamp Cover. Insulating cover used to cover dead-end clamps.



Rigid type

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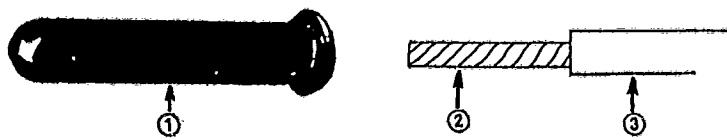
4.1.5 Dead-End Cover. Insulating cover used to cover dead ends.



Rigid type

IEC 743

4.1.6 End-Cap. Made of rubber or synthetic material and used to insulate the exposed ends of an insulated conductor.



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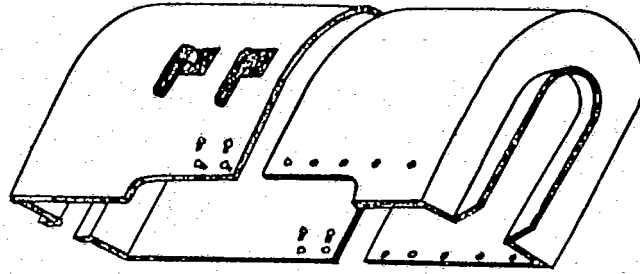
- ① End-cap
- ② Bare wire
- ③ Insulation

EQUIPMENT TO BE USED IN LIVE LINE WORKING

4.1.7 Pin-type Insulator Cover. Insulating cover used to cover pin-type insulators.



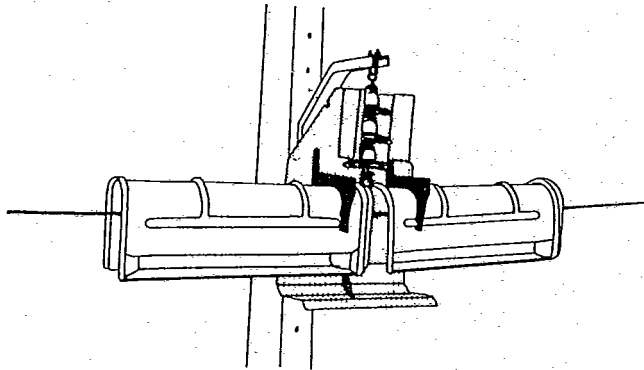
Flexible type



Rigid type

IEC 743

4.1.8 Suspension String Cover. Insulating cover used to cover suspension insulator strings.



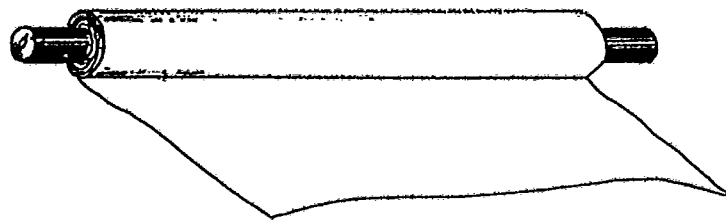
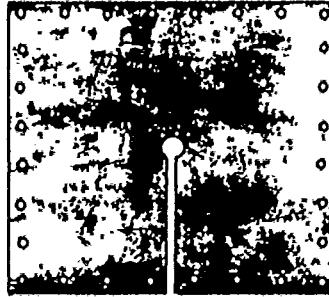
Rigid type

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4.2 Blanket (Flexible Cover). Made of rubber or synthetic materials, used to insulate conductors or metallic parts, energized or not.



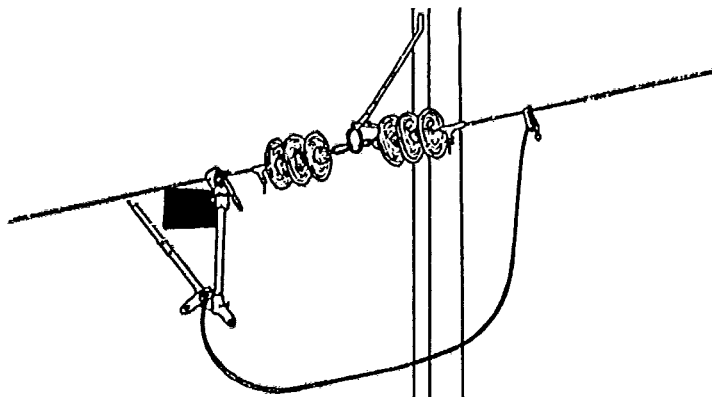
Flexible cover

IEC 743

5. Bypassing Equipment

5.1 Shunting Equipment

5.1.1 Loadbreak. Single-phase switch used to connect or disconnect a circuit under load.



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EQUIPMENT TO BE USED IN LIVE LINE WORKING

5.1.2 Shunting Fork. A metal fork fitted to an insulating stick and used to

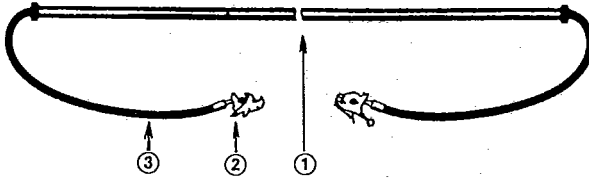
- (1) bypass a fuse
- (2) open or close under load



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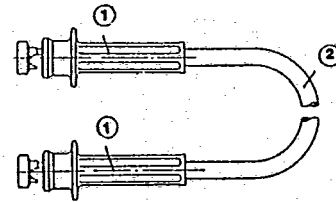
5.2 Shunt

5.2.1 Bypass Jumper. Generally made of single-core insulated cable, used during the maintenance of various types of apparatus. May be covered by a rigid tube.



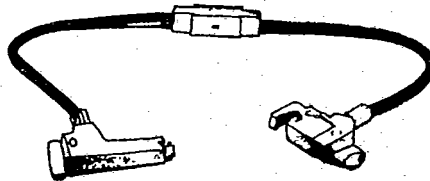
- ① Supporting tube
- ② Connector
- ③ Flexible insulated cable

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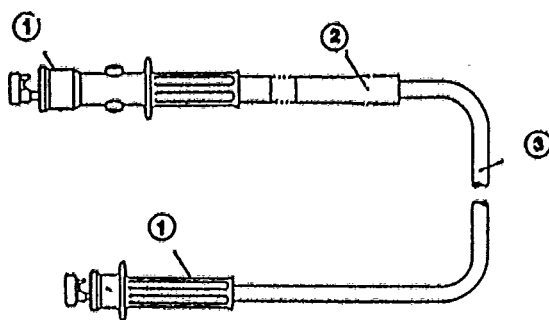
- ① Insulated clamp
- ② Jumper cable

5.2.2 Fused Bypass Jumper. Single-core insulated cable fitted with a fuse and used during the repair of a fuse or the maintenance of various types of apparatus.



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5.2.3 Load Pickup Jumper. Single-core insulated cable, fitted on one end with an insulated clamp and on the other with an insulated clamp containing contacts that can be opened or closed. The contacts can be closed to pick up a load, but it has no load break rating.

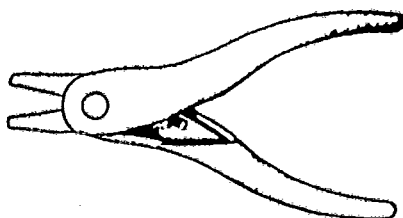


- ① Insulated clamp
- ② Operating handle for load pick-up
- ③ Jumper cable

6. Small Individual Hand Tools

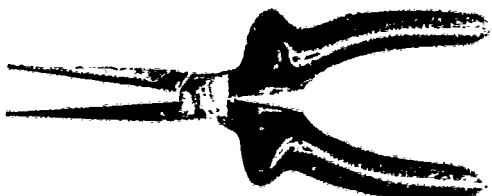
6.1 Insulating Equipment

6.1.1 Cutting Nipper. A tool with metal cutting edges.



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6.1.2 Flat or Round Nose Pliers. Used for handling a conductor.



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6.1.3 Lever. Used to open the sheath of cable or to pry the covering off conductors.



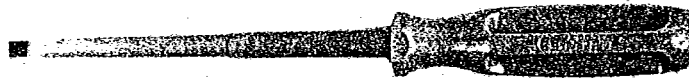
IEC 743

6.1.4 Punch. A tool with a metal point used to break solid insulating material.

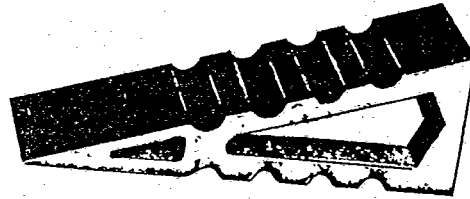


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6.1.5 Screwdriver. A tool with metallic end fitting, used to install and remove screws.



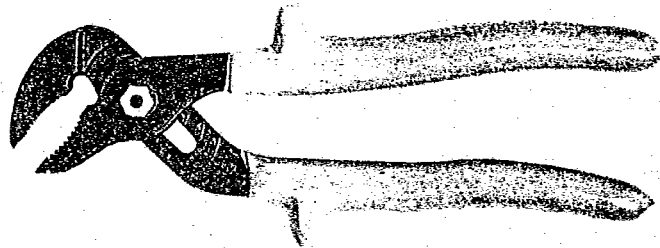
6.1.6 Wedge. Used to separate the phase conductors of a cable.



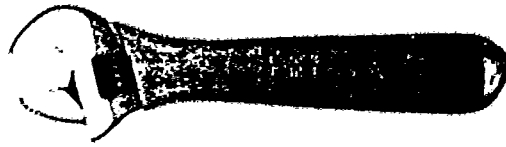
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6.2 Insulated Equipment

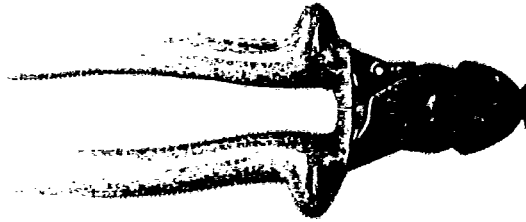
6.2.1 Adjustable Pliers. Used to handle, tighten, or loosen various pieces.



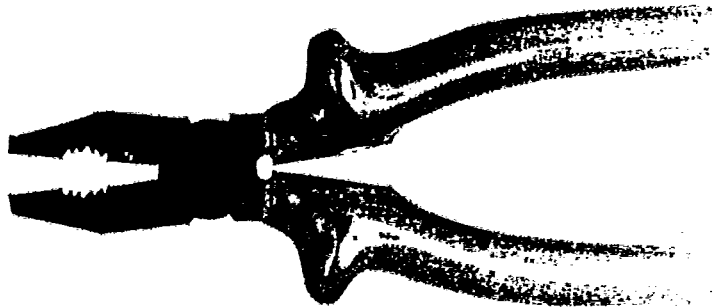
6.2.2 Adjustable Wrench, Open End. Used to tighten or loosen nuts and bolts.



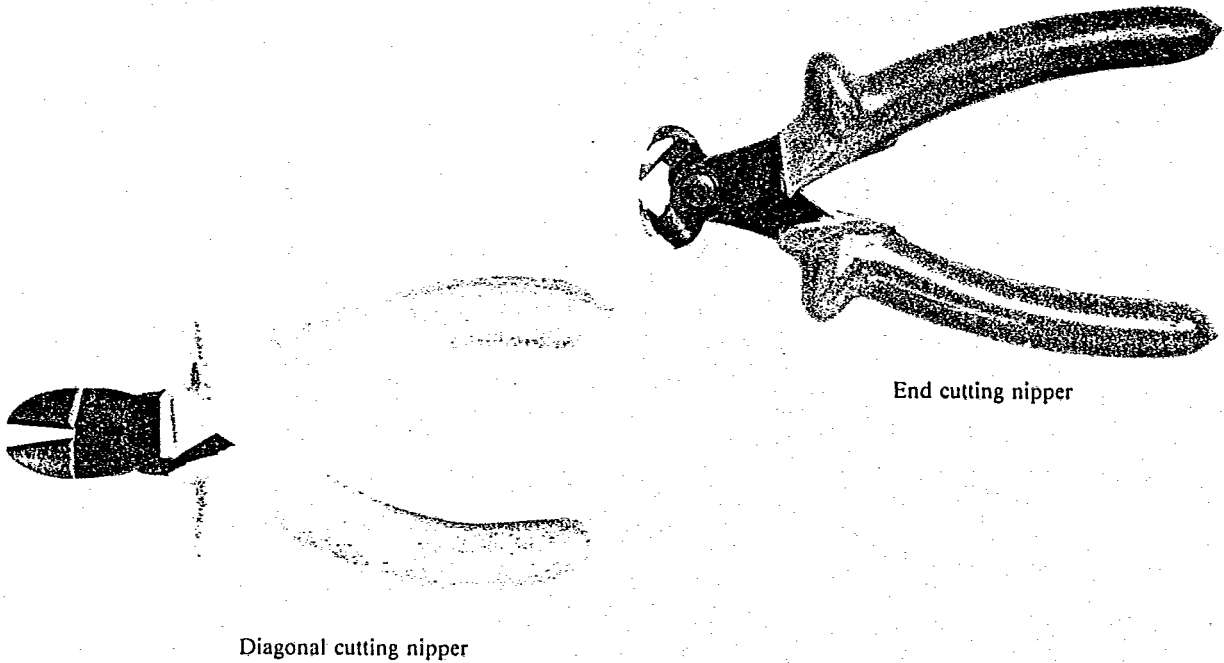
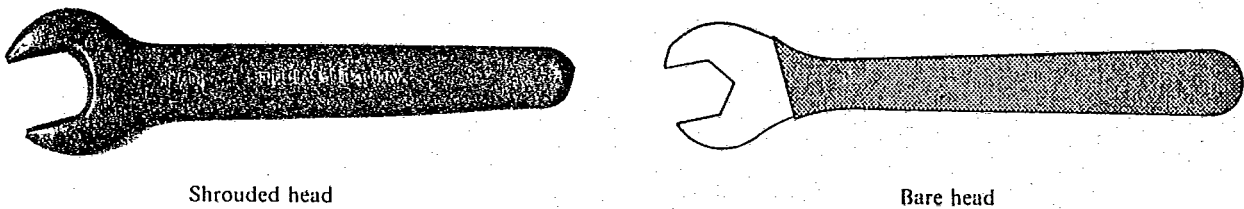
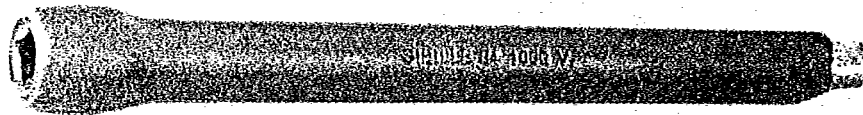
6.2.3 Cable Cutter. Used to cut cables.



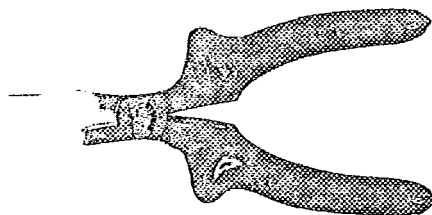
6.2.4 Combination Pliers. Used to hold various pieces or to cut wire.



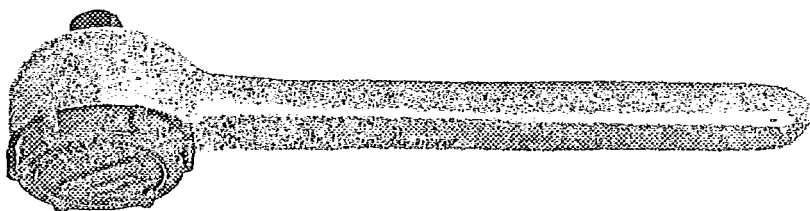
EQUIPMENT TO BE USED IN LIVE LINE WORKING

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Std 935-1989**6.2.5 Cutting Nipper. Used to cut.****6.2.6 Open End Wrench, Single Head. Used to tighten and loosen nuts and bolts.****6.2.7 Extension Bar. A covered metal device made to be inserted between ratchet drive handle and socket.**

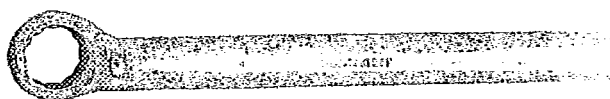
6.2.8 Long-Nose Pliers with or without Side Cutter. Used to grip or tighten components, or to cut.



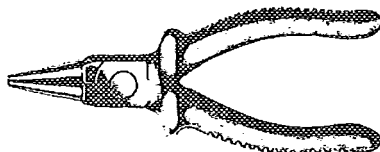
6.2.9 Ratchet Handle, Reversible or Not. Drive ratchet used to hold a socket to tighten or loosen screws, nuts, and bolts.



6.2.10 Box End Wrench, Single End, Deep Offset or Not. Used to tighten and loosen nuts and bolts.



6.2.11 Round-Nose Pliers. Used to hold or bend components.

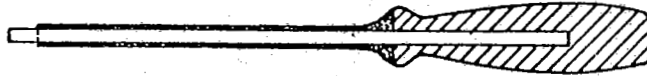


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ANSI/IEEE
Std 935-1989**6.2.12 Screwdriver.** Used to install or remove screws. It may have different shapes of ends.

Straight edge



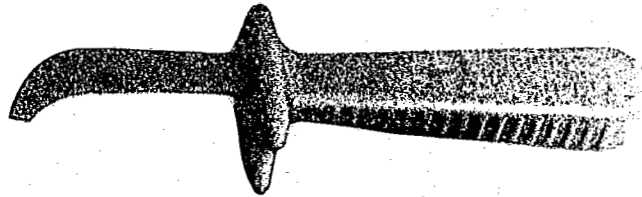
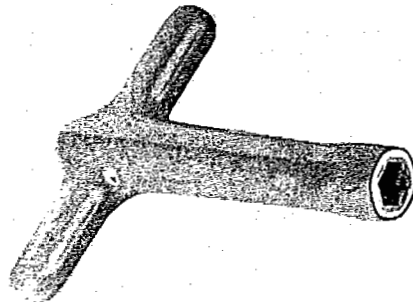
Philips-end



Square end



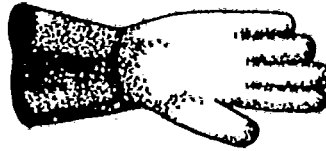
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6.2.13 Nut Driver, Spin Type. Used to tighten or loosen screws, nuts, and bolts.**6.2.14 Stripping Knife.** Used to strip insulation from conductors.**6.2.15 Tee Wrench.** Used to tighten or loosen screws, nuts, and bolts.

7. Personal Equipment

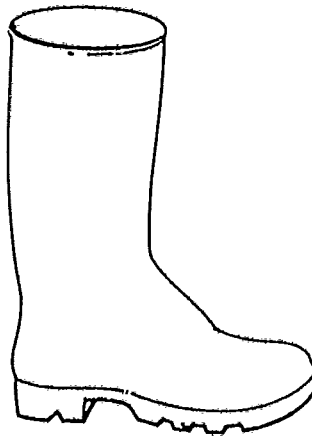
7.1 Mechanical Protection

7.1.1 Insulating-Glove Protector. Used for mechanical protection of insulating gloves.



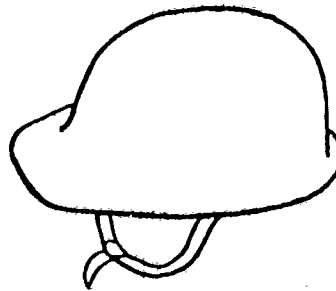
IEC 743

7.1.2 Safety Boots. Equipped with safety toes and toughened puncture-resistant non-slip soles.



IEC 743

7.1.3 Safety Helmet. Made of synthetic material, equipped with a chin strap and adjustable headband.

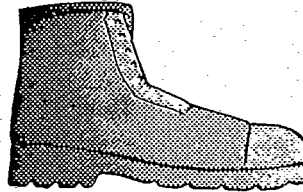


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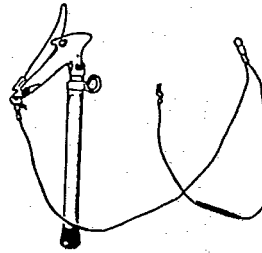
7.1.4 Safety Shoes. Equipped with safety toes and toughened puncture-resistant non-slip soles.



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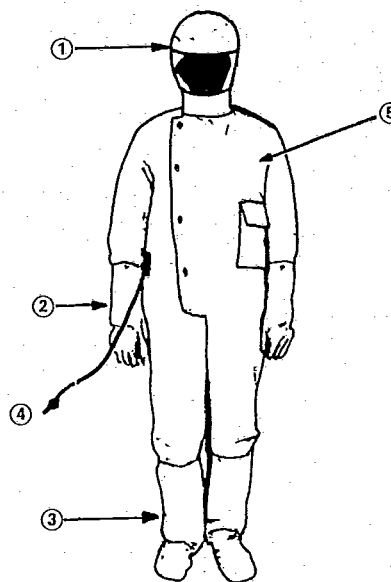
7.2 Electrical Protection

7.2.1 Bonding Lead. Metallic connection used by the worker to connect or disconnect his conductive clothing, grid, or screen, to or from a conductive part of an installation.



IEC 743

7.2.2 Conductive Clothing. Made of natural or synthetic material, interwoven with a conductive thread; used to shield workers from the effect of electric fields.



- ① Hood
- ② Gloves
- ③ Shoes
- ④ Bonding lead
- ⑤ Suit (one or two pieces)

IEC 743

7.2.3 Insulating Arm Sleeves. Made of rubber or synthetic material, used for electrical protection of the worker's arms.



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7.2.4 Insulating Boots. Made of insulating material with non-slip soles, used for the electrical protection of the worker's feet.

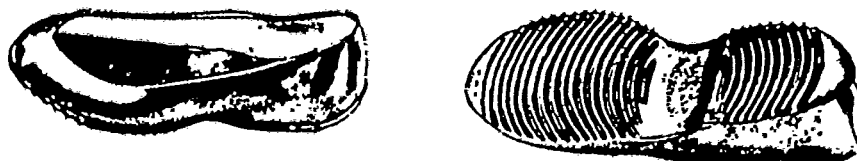
7.2.5 Insulating Clothing. Made of insulating material, used for electrical protection of the worker's body.

7.2.6 Insulating Gloves. Made of rubber or synthetic material, used for the electrical protection of the worker's hands.



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7.2.7 Insulating Overshoes. Made of supple insulating material with non-slip soles, used for the electrical protection of the worker's feet.



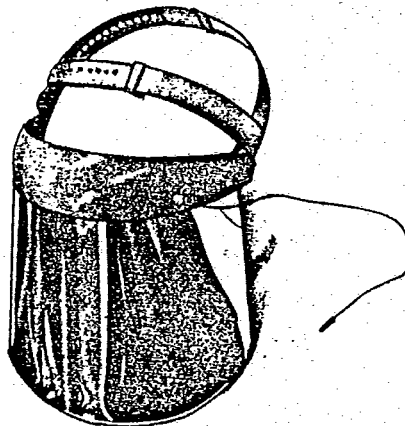
IEC 743

EQUIPMENT TO BE USED IN LIVE LINE WORKING

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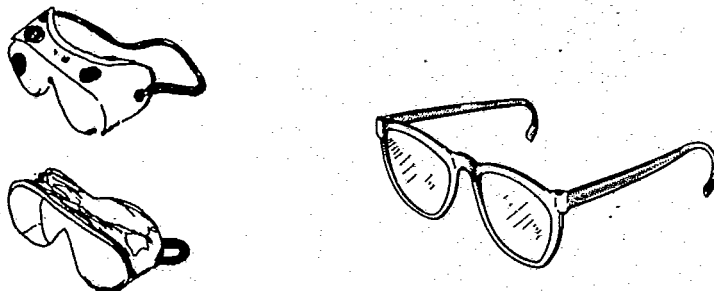
7.3 Miscellaneous

7.3.1 Face Shield. Protection for the complete face. The shield may be clear or tinted, to afford protection from ultraviolet light in the event of an electrical flash.



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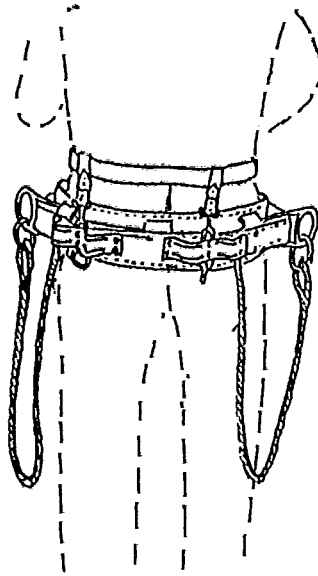
7.3.2 Safety Spectacles and Goggles. Spectacles and goggles with shatter-proof lenses and frames of synthetic material. The lenses may be clear or tinted to afford protection from ultraviolet light in the event of an electrical flash.



IEC 743

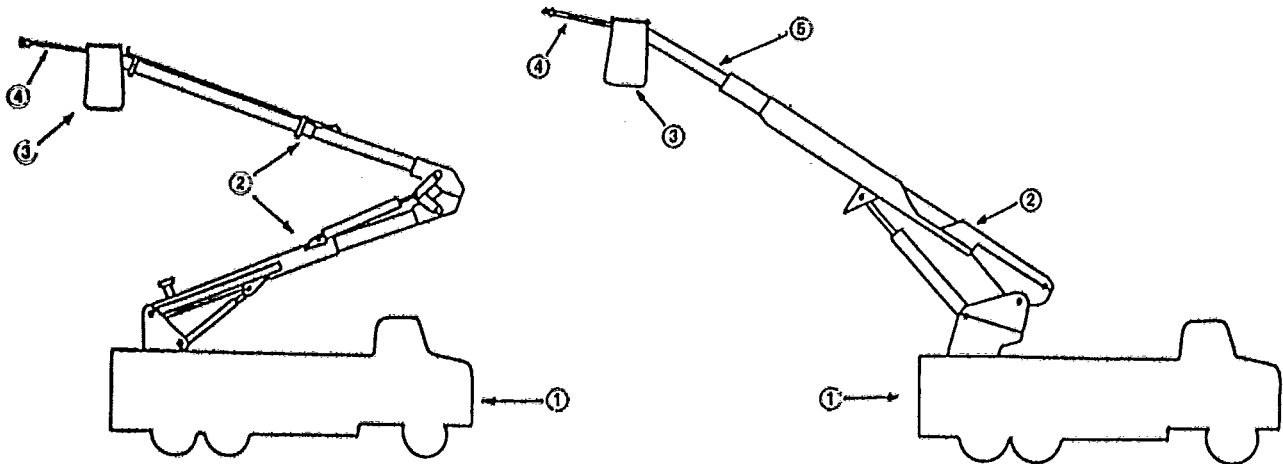
8. Equipment for Positioning a Worker

8.1 Body Belt. Made of leather or synthetic material, equipped with adjustable safety strap or a sling, or both.



IEC 743

8.2 Bucket Truck with Insulating Boom. Comprising an insulating boom equipped with one or two buckets. It may be mounted on a vehicle and used to position a worker.

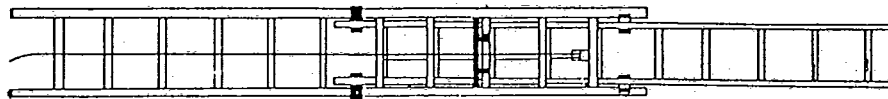


- ① Carrying vehicle
- ② Articulated arm (boom)
- ③ Bucket
- ④ Lifting arm (jib)
- ⑤ Telescopic arm (boom)

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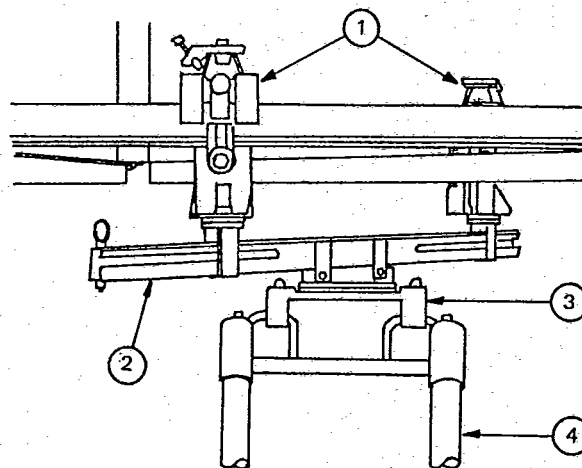
EQUIPMENT TO BE USED IN LIVE LINE WORKING

8.3 Extension Ladder. A ladder that can be lengthened by the use of sliding parts that fit into each other.



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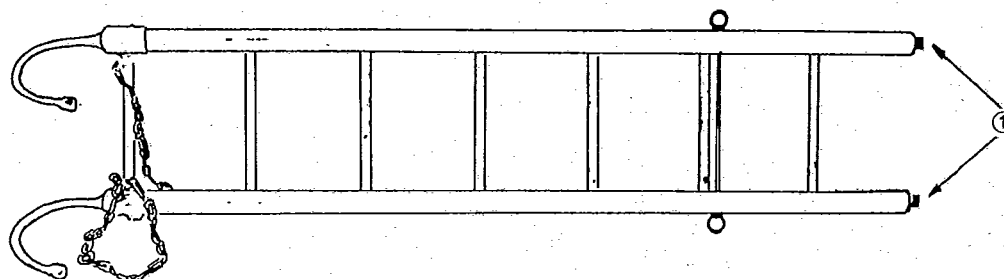
8.4 Girder Saddle Suspension Attachment. A metal accessory, attached to a structure, that is used to suspend a seat, ladder, etc.



- (1) Girder clamp (saddle)
- (2) Adjusting groove
- (3) Double-hook traverse pivot
- (4) Ladder

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8.5 Hook Ladder. Equipped with permanent or removable hooks that can be rigid or rotatable.

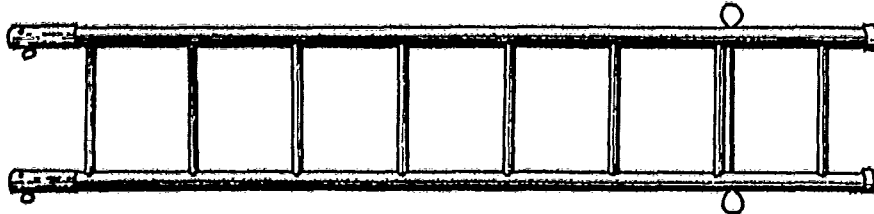


IEC 743

- ① Splice fittings

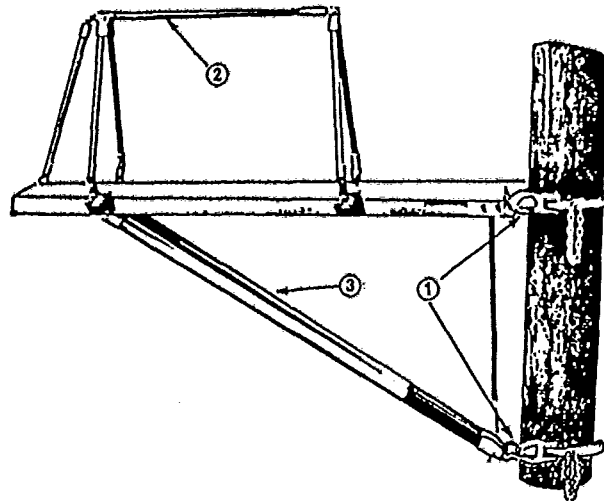
8.6 Insulating Ladder. Made of insulating material.

8.7 Ladder Extension. An additional section that can be spliced to another ladder.



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8.8 Platform. Constructed of reinforced synthetic material or wood. It is attached to a support to position a worker.

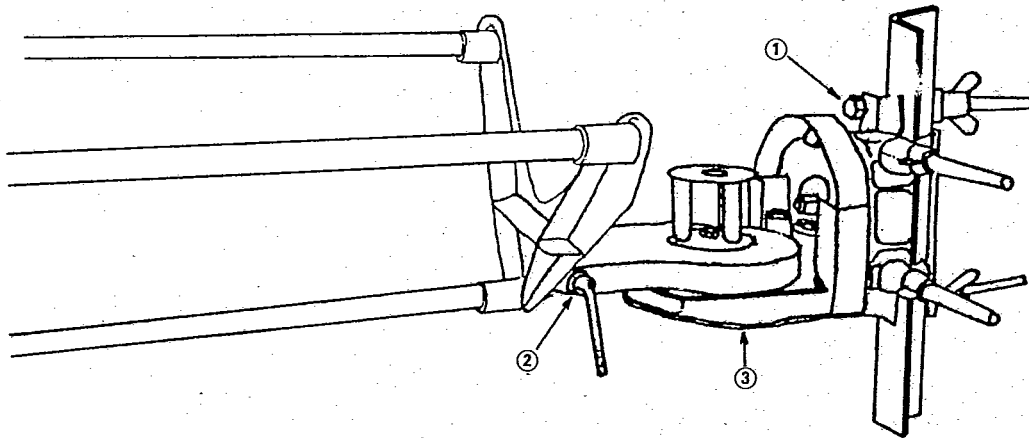


- ① Chain binder
- ② Safety rail
- ③ Support arm

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EQUIPMENT TO BE USED IN LIVE LINE WORKING

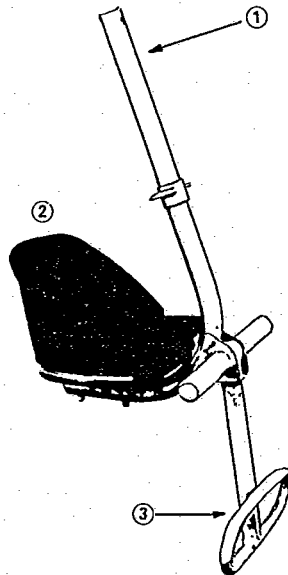
8.9 Platform Pivot Attachment. A metal accessory, fixed to a structure, that allows a platform or beam to be moved into a working position.



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- ① Tower-type saddle
- ② Platform pivot
- ③ Adjustable mounting-bracket

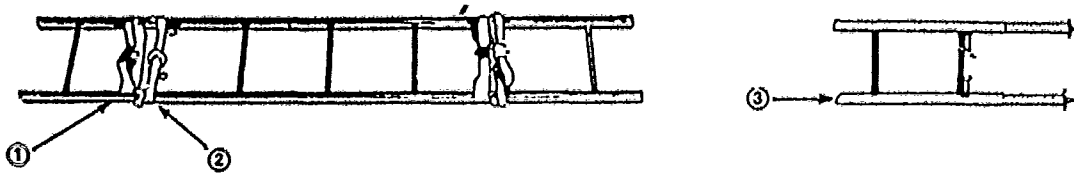
8.10 Seat. Suspended from a girder saddle to position a worker.



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- ① Support pole (stick)
- ② Seat
- ③ Foot-rest

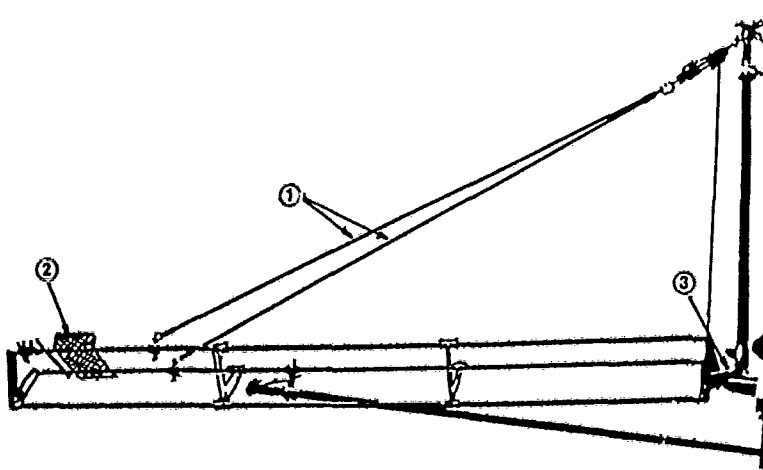
8.11 Spliced Ladder. Constructed of sections made of metal or synthetic material spliced together.



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- ① Stile (rail)
- ② Attachment strap
- ③ Bottom section (with adjustable feet)

8.12 Triangular Beam. Constructed of insulating tubes and attached to a structure with saddles and rope blocks. It is used to position a worker.



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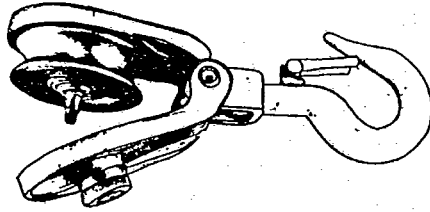
- ① Support pole (stick)
- ② Seat
- ③ Platform pivot attachment (details in Sub-clause 8.9)

EQUIPMENT TO BE USED IN LIVE LINE WORKING

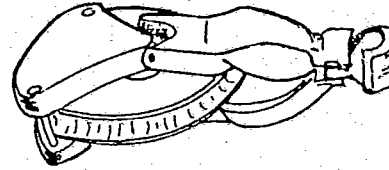
9. Handling and Anchoring Equipment

9.1 Rope, Sling, Rope Block, and Accessories

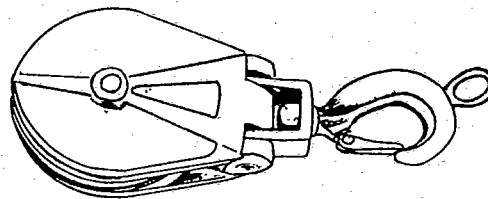
9.1.1 Block. Used in rigging to guide a rope or support a load.



Snatch block



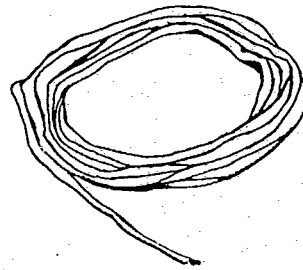
Running block



Block with a gripping ring on the hook

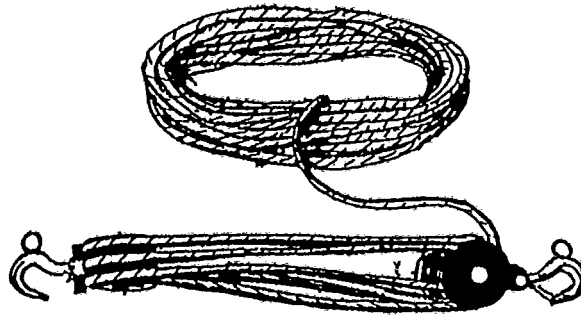
IEC 743

9.1.2 Rope. Made of insulating or non-insulating material.



IEC 743

9.1.3 Rope Block. Device used with rope for handling, lifting, or rigging operation.

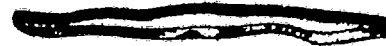


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9.1.4 Sling. A rigging and handling accessory.



Double-eye type

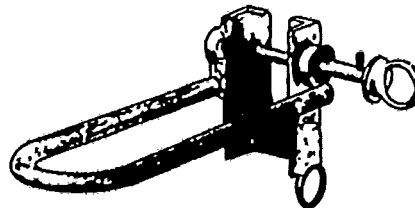


Endless type

IEC 743

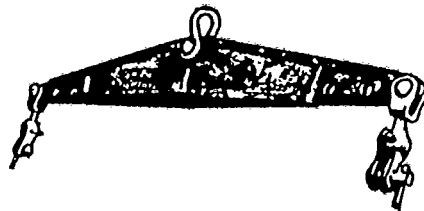
9.2 Yokes and Accessories

9.2.1 Anchor Clamp Bracket. Used when relieving mechanical tension at a dead-end string.



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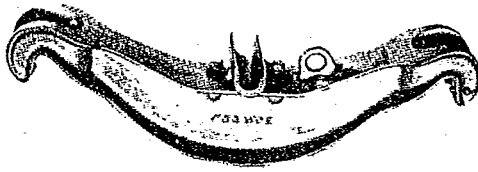
9.2.2 Lifting Yoke. Usually made of metal, used in lifting.



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9.2.3 Tool Yoke. A metal tool used with strain carriers to relieve mechanical tension on insulators.



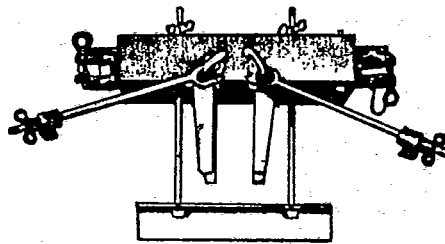
Double stick yoke



Single stick yoke

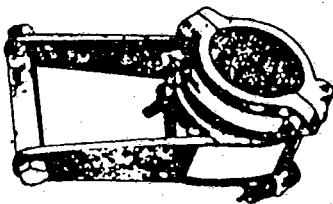
IEC 743

9.2.4 Tower Arm Yoke. A metal tool fixed to a tower to provide an attachment for lift sticks.

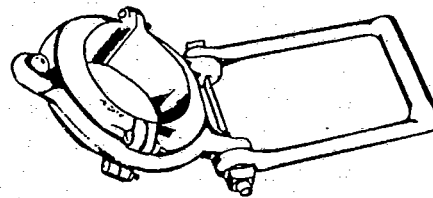


IEC 743

9.2.5 Stirrup, Stick Support. A metal accessory fitted to a support stick to provide a point of attachment.



Rigid stirrup

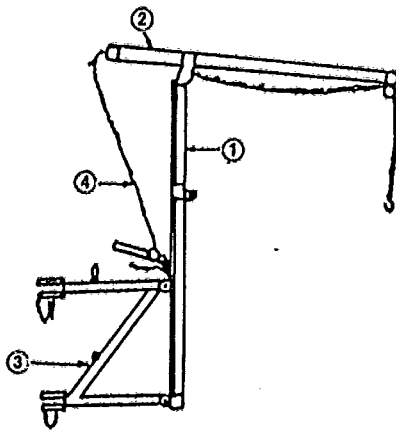


Swivel stirrup

IEC 743

9.3 Gin

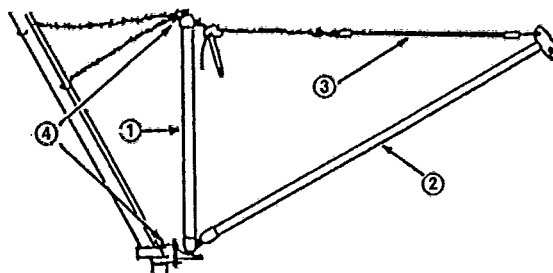
9.3.1 Assembly, Gin. Assemblies used on structures or supports to handle various pieces of equipment.



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- ① Mast
- ② Boom
- ③ Support devices
- ④ Chain hoist (pull lift)

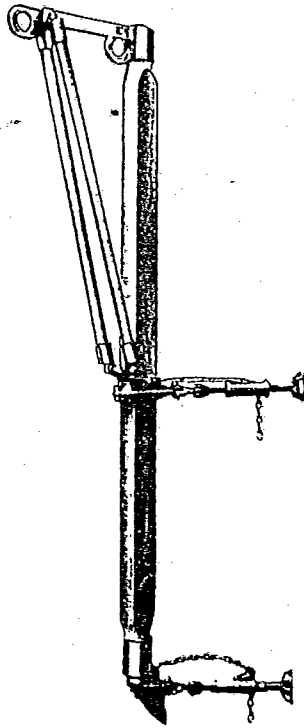
Type A



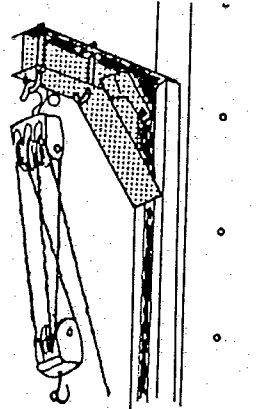
IEC 743

- ① Mast
- ② Boom
- ③ Suspension link stick
- ④ Points of attachment (to the support)

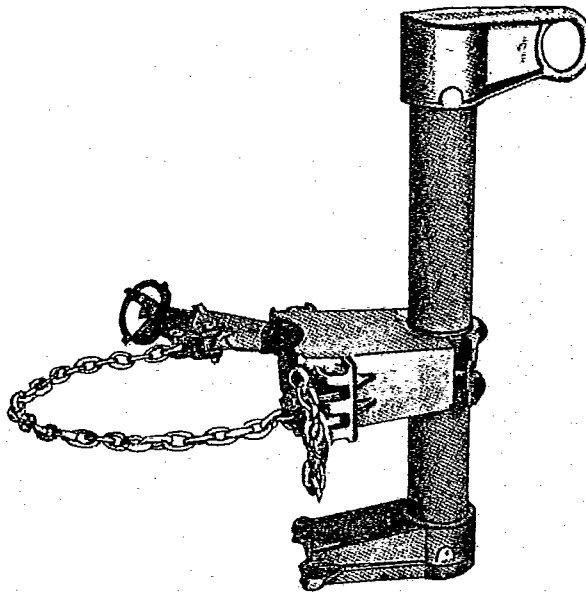
Type B



Type C



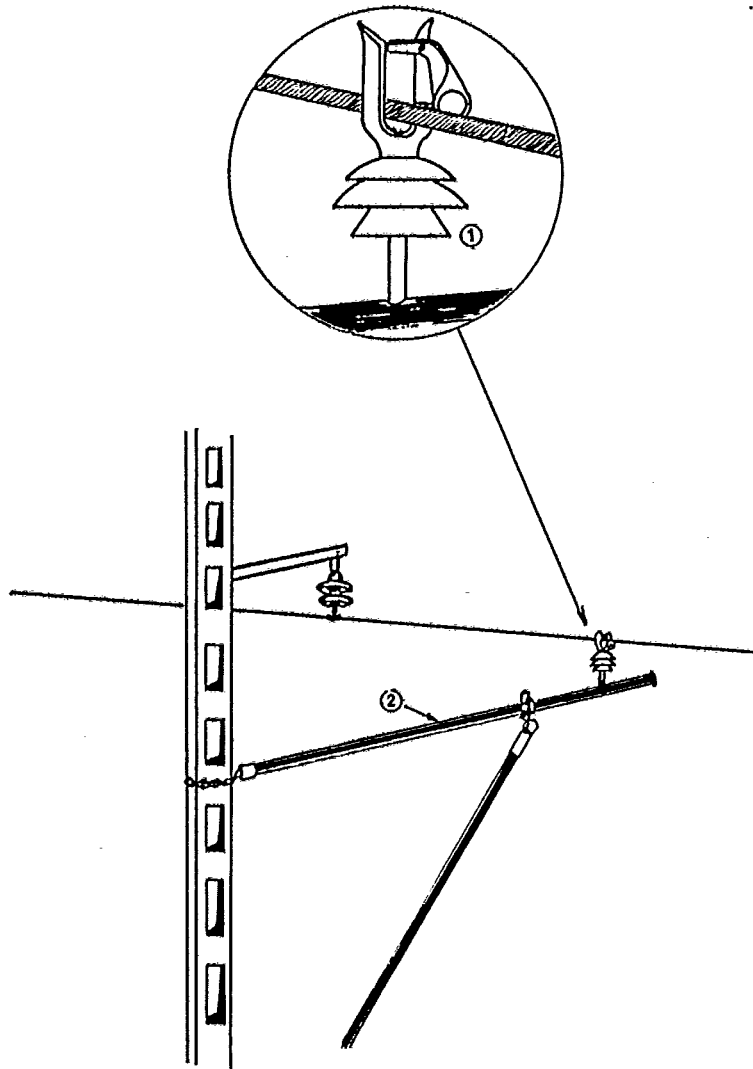
Type D



Type E

IEC 743

9.3.2 Auxiliary Arm. A pole assembly used a temporary support for conductors or bypass cables.



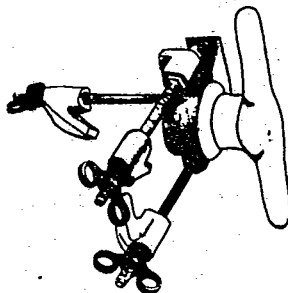
IEC 743

- ① Insulator with mechanical wire holder
- ② Auxiliary arm

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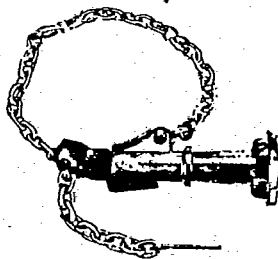
9.4 Saddles and Accessories

9.4.1 Block Saddle. A metal accessory attached to a tower member and used for securing ropes.



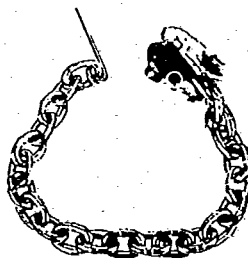
IEC 743

9.4.2 Chain Binder. A metal accessory used to secure pole saddles. It is used to attached various types of support equipment.



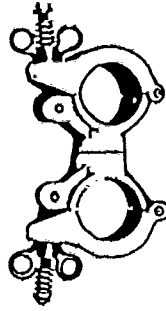
IEC 743

9.4.3 Chain Extension. Used to extend the length of a chain binder.



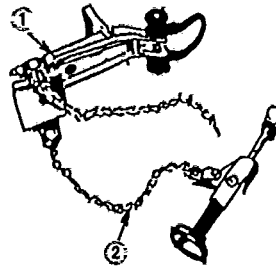
IEC 743

9.4.4 Double-Stick Clamp. Used to hold two sticks together.



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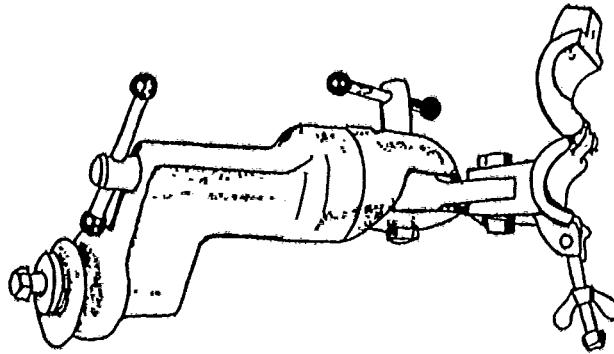
9.4.5 Lever Lift with Chain Binder. A metal accessory attached to a support and used with a support stick to raise or lower a conductor.



- ① Lever lift
- ② Chain binder

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9.4.6 Locking Stick Clamp. Used with a support stick or saddle, to hold or guide a stick, includes locking device.

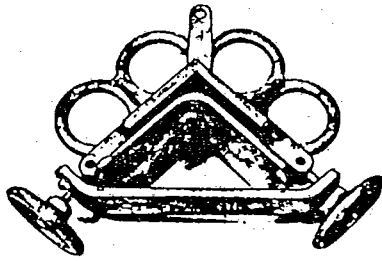


IEC 743

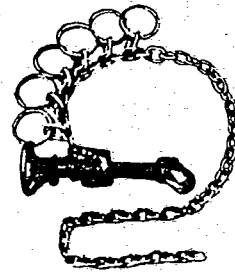
EQUIPMENT TO BE USED IN LIVE LINE WORKING

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9.4.7 Rope-snubbing Bracket. A metal accessory attached to a support and used to provide a point of attachment for blocks or ropes.



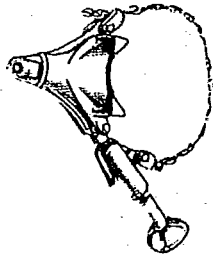
Tower-type bracket



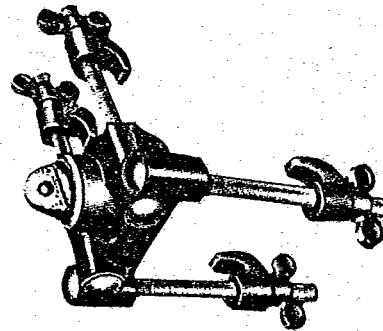
Pole-type bracket

IEC 743

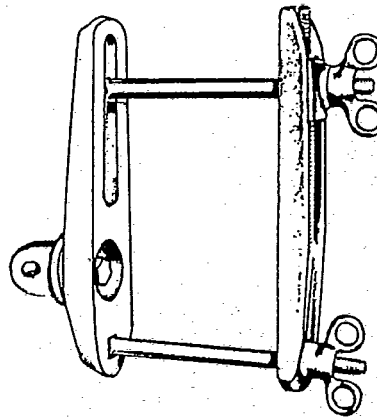
9.4.8 Saddle. A metal accessory to hold or guide a wire support stick.



Pole-type saddle



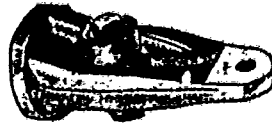
Tower-type saddle



Crossarm-type saddle

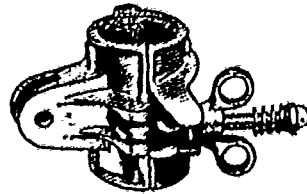
IEC 743

9.4.9 Saddle Extension. Used with a stick saddle to increase clearance.



IEC 743

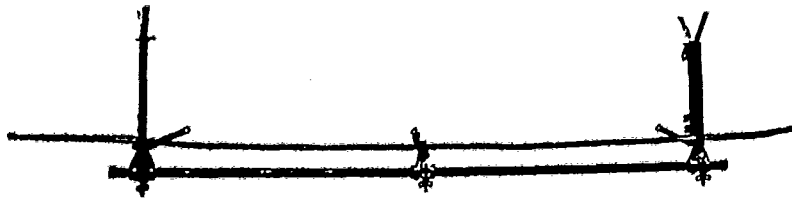
9.4.10 Stick Clamp. Used with a support stick or saddle to hold or guide a stick.



IEC 743

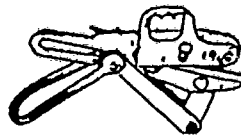
9.5 Miscellaneous

9.5.1 Antivibration Jumper Installing Tool. Composed of an insulating tube and metallic forks, is used with insulated ropes to handle an antivibration device.



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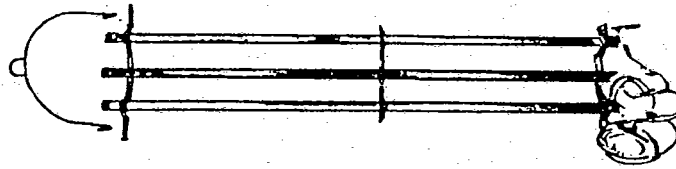
9.5.2 Automatic Wire Grip. Used as an anchor on a conductor.



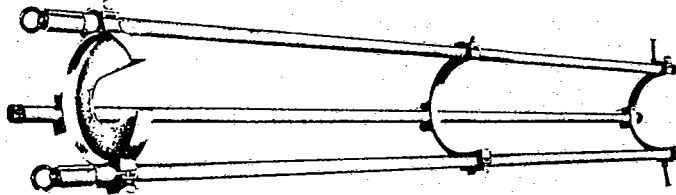
IEC 743

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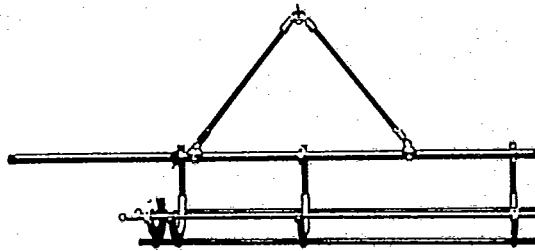
9.5.3 Insulator Cradle. Constructed of insulating tubes to facilitate the handling of an insulator string.



Combination cradle



Standard cradle



Side-opening cradle

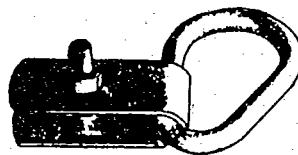
IEC 743

9.5.4 Insulator Fork. A synthetic or metal tool used to handle an insulator string.



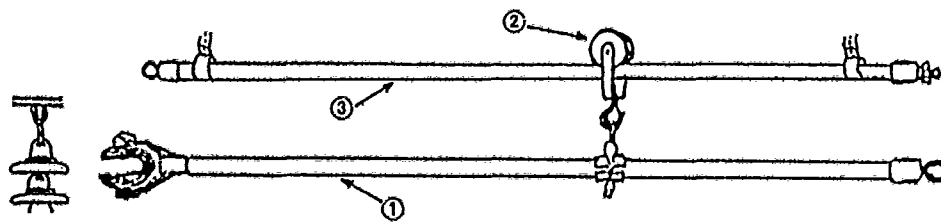
IEC 743

9.5.5 Offset Eye. Used to provide a rigging eye when attached to the butt-ring of a stick.



IEC 743

9.5.6 Trolley Stick Assembly. Assembly of sticks, used to position and remove suspension insulators.



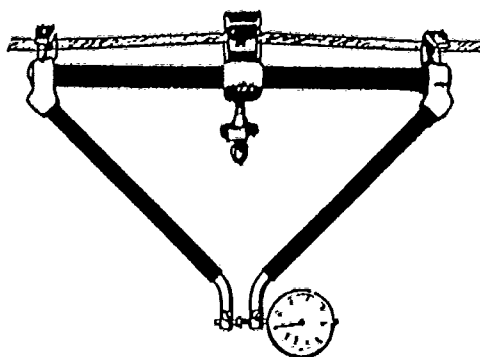
IEC 743

- ① Insulator-fork pole (stick)
- ② Trolley wheel
- ③ Trolley pole (stick)

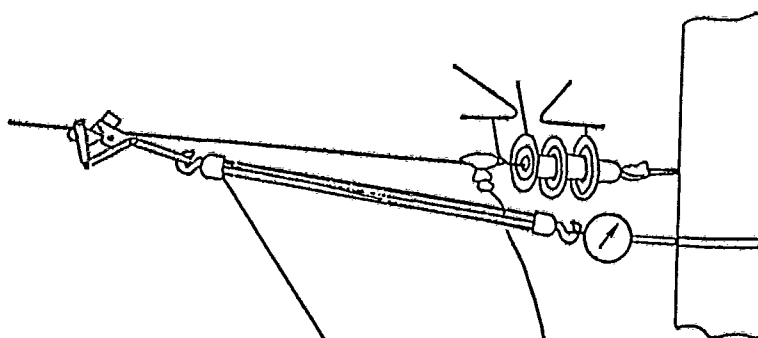
10. Measuring and Testing Equipment

10.1 Mechanical Measurements

10.1.1 Dynamometer. Used to measure the mechanical tension or variation of mechanical tension of a wire, in using calculator or conversion table.



Type A



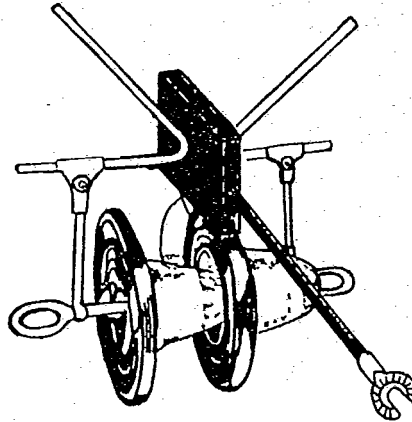
Type B

IEC 743

EQUIPMENT TO BE USED IN LIVE LINE WORKING

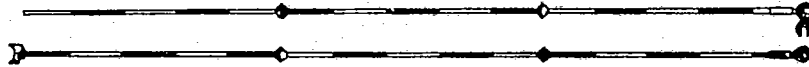
ANSI/IEEE
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10.1.2 Gap Gauge. Made of insulating material and fitted to a universal hand stick to check and set the gap clearance of arcing horns.



IEC 743

10.1.3 Measuring Pole or Stick. An insulating pole or stick used to measure lengths or clearances.



IEC 743

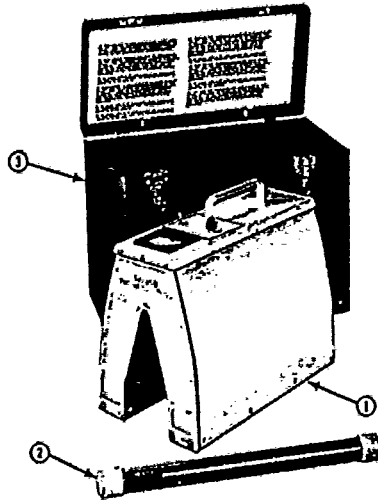
10.1.4 Wire Gauge. A universal hand-tool attachment used to measure the diameter of a wire.



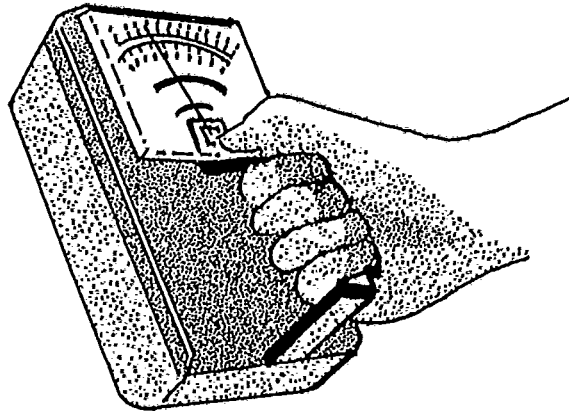
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10.2 Electrical Measurements

10.2.1 Live Line Tool Testers. Used to check conductivity of insulating tools and materials.



- ① Tester
- ② Material under test
- ③ Instrument case

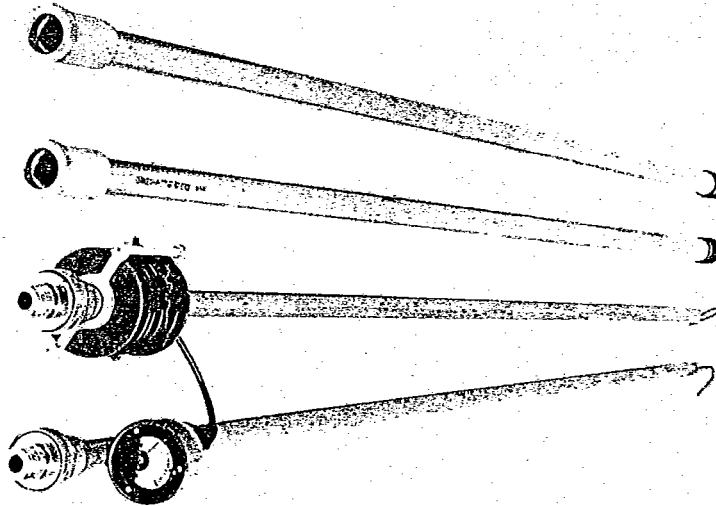


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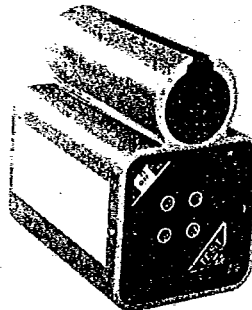
EQUIPMENT TO BE USED IN LIVE LINE WORKING.

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Std 935-1989

10.2.2 Phasing Tester. Attached to universal hand stick, used to check phasing and voltage.



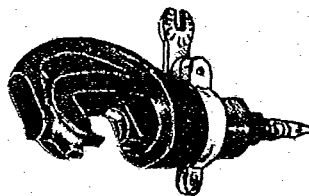
10.2.3 Voltage Detector. Used to detect the presence or absence of line voltage.



11. Hydraulic and Miscellaneous Equipment

11.1 Hydraulic Equipment

11.1.1 Hydraulic Compression Head. Used to compress various sleeves and connectors.

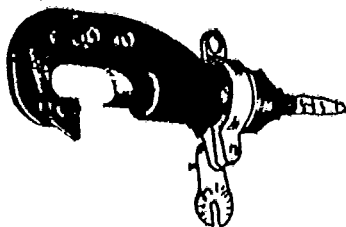


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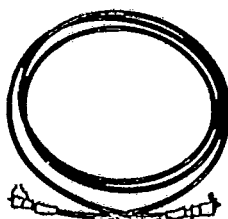
IEEE GUIDE ON TERMINOLOGY FOR TOOLS AND

11.1.2 Hydraulic Cutter Head. Used to cut wires when operated by a hydraulic pump.



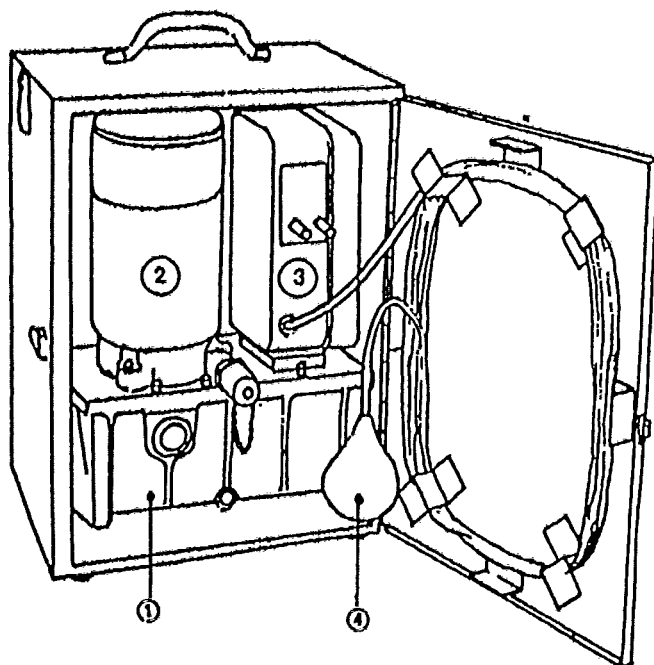
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11.1.3 Hydraulic Hose. Flexible hose for hydraulic equipment.



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11.1.4 Hydraulic Pump. Used to generate hydraulic pressure for appropriate tools.



- ① Oil reservoir
- ② Motor pump
- ③ Connection box
- ④ Operating bulb

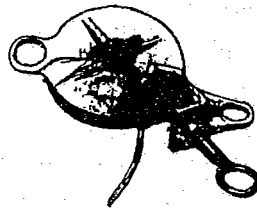
Electric motor pump



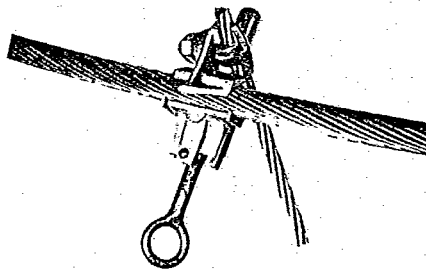
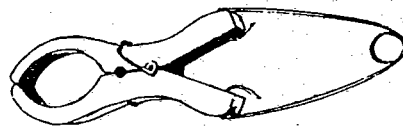
Foot pump

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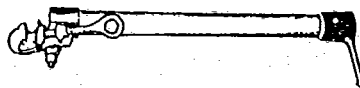
EQUIPMENT TO BE USED IN LIVE LINE WORKING

11.2 Miscellaneous Equipment**11.2.1 Armor Tape Winder.** Used to apply metallic tape on wires.

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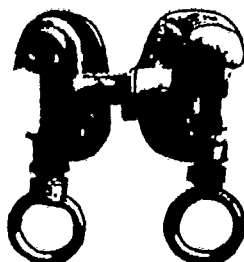
11.2.2 Hot Line Clamp. Used to connect a tap wire to a conductor.**11.2.3 Insulating Blanket Clothes Pin.** A clamp with a spring used to hold insulating blankets in position.

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11.2.4 Insulating Hanger. A tube with a mechanical connector on one end and a metal hanger-bar on the other end, used temporarily when handling jumpers.

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11.2.5 Tieback Connector. Used to secure the tail of a conductor.

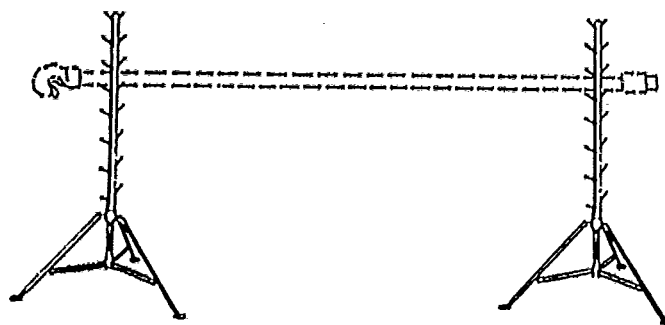


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11.2.6 Tie Wire. Used to secure a wire to an insulator.

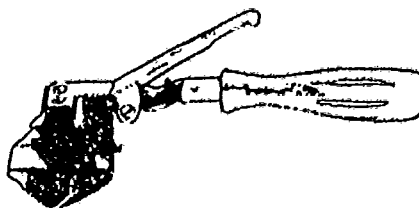


11.2.7 Tool Rack. Used to support poles in clear conditions.



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11.2.8 Wire Stripper. Used to strip insulation from conductors.



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