

RULES AND REQUIREMENTS OF THE NATIONAL AND NEW YORK BOARD OF FIRE UNDERWRITERS FOR THE INSTALLATION OF ELECTRIC LIGHT AND POWER.

AS RECOMMENDED BY

THE UNDERWRITERS' INTERNATIONAL ELECTRIC ASSOCIATION,
JANUARY, 1894.

The use of wire-ways for rendering concealed wiring permanently accessible, is most heartily indorsed and recommended; and this method of accessible concealed construction is advised for general use.

Architects are urged, when drawing plans and specifications, to make provision for the channelling and pocketing of buildings for electric light or power wires, and in specifications for electric gas lighting to require a two-wire circuit, whether the building is to be wired for electric lighting or not, so that no part of the gas fixtures or gas piping be allowed to be used for the gas-lighting circuit.

CENTRAL STATIONS.—CLASS A.

For Light or Power.

The rules under this class, not being of special interest to architects, are omitted.

CLASS B.—ARC (SERIES) SYSTEMS.

Over 300 Volts.

10. Outside Conductors.—All outside, overhead conductors (including services):

(a) Must be covered with some *approved* insulating material, not easily abraded, firmly secured to properly insulated and substantially built supports, all tie wires having an insulation equal to that of the conductors they confine.

(b) Must be so placed that moisture cannot form a cross connection between them, not less than a foot apart, and not in contact with any substance other than their insulating supports.

(c) Must be at least seven feet above the highest point of flat roofs, and at least one foot above the ridge of pitched roofs over which they pass or to which they are attached.

(d) Must be protected by *dead insulated guard irons or wires* from possibility of contact with other conducting wires or substances to which current may leak. Special precautions of this kind must be taken where sharp angles occur or where any wires might possibly come in contact with electric light or power wires.

(e) Must be provided with petticoat insulators of glass or porcelain. Porcelain knobs or cleats and rubber hooks will not be approved.

(f) Must be so spliced or joined as to be both mechanically and electrically secure without solder. The joints must then be soldered, to insure preservation, and covered with an insulation equal to that on the conductors.

11. Service Blocks :

(a) Must be covered over their entire surface with at least two coats of waterproof paint.

(b) Telegraph, telephone, and similar wires must not be placed on the same cross-arm with electric light or power wires.

INTERIOR CONDUCTORS.

12. All Interior Conductors :

(a) Must be covered where they enter buildings from outside terminal insulators to and through the walls, with extra waterproof insulation, and must have drip loops outside. The hole through which the conductor passes must be bushed with waterproof and non-combustible insulating tube or hard rubber tube, slanting

upward toward the inside. The tube must be sealed with tape, thoroughly painted, and securing the tube to the wire.

(b) Must be arranged to enter and leave the building through a double contact service switch, which will effectually close the main circuit and disconnect the interior wires when it is turned "off." The switch must be so constructed that it shall be automatic in its action, not stopping between points when started, and prevent an arc between the points under all circumstances; it must indicate on inspection whether the current be "on" or "off," and be mounted in a non-combustible case, and kept free from moisture and easy of access to police or firemen.

(c) Must be always in plain sight, and never encased, except when *required* by the inspector.

(d) Must be covered in all cases with an *approved* non-combustible material that will adhere to the wire, not fray by friction, and bear a temperature of 150° F. without softening.

(e) Must be supported on glass or porcelain insulators, and kept rigidly at least eight inches from each other, except within the structure of lamps or on hanger boards, cut-out boxes, or the like, where less distance is necessary.

(f) Must be separated from contact with walls, floors, timbers, or partitions through which they may pass, by non-combustible insulating tube or hard rubber tube.

(g) Must be so spliced or joined as to be both mechanically and electrically secure without solder. They must then be soldered to insure preservation, and covered with an insulation equal to that on the conductors.

LAMPS AND OTHER DEVICES.

13. Arc Lamps.—In every case:

(a) Must be carefully isolated from inflammable material.

(b) Must be provided at all times with a glass globe surrounding the arc, securely fastened upon a closed base. No broken or cracked globes to be used.

(c) Must be provided with an *approved* hand switch; also an automatic switch that will shunt the current around the carbons should they fail to feed properly.

(d) Must be provided with reliable stops to prevent carbons from falling out in case the clamps become loose.

(e) Must be carefully insulated from the circuit in all their exposed parts.

(f) Must be provided with a wire netting around the globe, and an *approved* spark arrester above to prevent escape of sparks, melted copper or carbon, where readily inflammable material is in the vicinity of the lamps. It is recommended that plain carbons, not copper plated, be used for lamps in such places.

(g) Hanger boards must be so constructed that all wires and current-carrying devices thereon shall be exposed to view, and thoroughly insulated by being mounted on a waterproof, non-combustible substance. All switches attached to the same must be so constructed that they shall be automatic in their action, not stopping between points when started, and preventing an arc between points under all circumstances.

11. Incandescent Lamps in Series Circuits having a Maximum Potential of 300 Volts or Over :

(a) Must be governed by the same rules as for arc lights, and each series lamp provided with an *approved* hand-spring switch and automatic cut-out.

(b) Must have each lamp suspended from a hanger board by means of a rigid tube.

(c) No electro-magnetic device for switches and no system of multiple-series or series multiple lighting will be approved.

(d) Under no circumstances can series lamps be attached to gas fixtures.

CLASS C.--INCANDESCENT (LOW PRESSURE) SYSTEMS.

300 Volts or Less.

OUTSIDE CONDUCTORS.

15. Outside Overhead Conductors :

(a) Must be erected in accordance with the rules for arc (series) circuit conductors.

(b) Must be separated not less than 12 inches, and be provided with an *approved* fusible cut-out, that will cut off the entire current as near as possible to the entrance to the building and inside the walls.

16. Underground Conductors :

(a) Must be protected against moisture and mechanical injury, and be removed at least two feet from combustible material when brought into a building, but not connected with the interior conductors.

(b) Must have a switch and a cut-out for each wire between the underground conductors and the interior wiring when the two parts of the wiring are connected.

These switches and fuses must be placed as near as possible to the end of the underground conduit, and connected therewith by specially insulated conductors, kept apart not less than two and a half inches.

(c) Must not be so arranged as to shunt the current through a building around any catch-box.

INSIDE WIRING.

GENERAL RULES.

17. At the entrance of every building there shall be an *approved* switch placed in the service conductors by which the current may be entirely cut off.

18. Conductors :

(a) Must have an *approved* insulated covering, and must not be of sizes smaller than No. 14 B. & S , No. 16 B. W. G., or No. 4 E. S. G , except that in conduit installed under Rule 22, No. 16 B. & S., No. 18 B. W. G., or No. 4 E. S. G. may be used.

(b) Must be protected when passing through FLOORS ; or through walls, partitions, timbers. etc., in places liable to be exposed to dampness, by waterproof, non-combustible, insulating tubes, such as glass or porcelain.

Must be protected when passing through walls, partitions, timbers, etc., in places not liable to be exposed to dampness, by *approved* insulating bushings specially made for the purpose.

(c) Must be kept free from contact with gas, water, or other metallic piping, or any other conductors or conducting material which they may cross (except high potential conductors), by some continuous and firmly fixed non-conductor creating a separation of at least one inch. Deviations from this rule may sometimes be allowed by special permission.

(d) Must be so placed in crossing high potential conductors that there shall be a space of at least one foot at all points between the high and low tension conductors.

(e) Must be so placed in wet places that an air space will be left between conductors and pipes in crossing, and the former must be run in such a way that they cannot come in contact with the pipe accidentally. Wires should be run *over* all pipes upon which con-

densed moisture is likely to gather, or which by leaking might cause trouble on a circuit.

SPECIAL RULES.

19. Wiring not Encased in Moulding or Approved Conduit :

(a) Must be supported wholly on non-combustible insulators, constructed so as to prevent the insulating coverings of the wire from coming in contact with other substances than the insulating supports.

(b) Must be so arranged that wires of opposite polarity, with a difference of potential of 150 volts or less, will be kept apart at least two and one-half inches.

(c) Must have the above distance increased proportionately where a higher voltage is used, unless they are encased in moulding or approved conduit.

(d) Must not be laid in plaster, cement, or similar finish.

(e) Must never be fastened with staples.

In Unfinished Lofts, between Floor and Ceilings, in Partitions, and Other Places.

(f) Must have at least one inch clear air space surrounding them.

(g) Must be at least ten inches apart when possible, and should be run singly on separate timbers or studding.

(h) Wires run as above immediately under roofs, in proximity to water tanks or pipes, will be considered as exposed to moisture.

(i) Wires must not be fished for any great distance, and only in places where the inspector can satisfy himself that the above rules have been complied with.

(j) Twin wires must never be employed in this class of concealed work.

20. Mouldings :

(a) Must never be used in concealed work or in damp places.

(b) Must have at least two coats of waterproof paint or be impregnated with a moisture repellent.

(c) Must be made of two pieces, a backing and capping, so constructed as to thoroughly encase the wire, and maintain a distance of one half inch between conductors of opposite polarity, and afford suitable protection from abrasion.

21. Special Wiring :

In breweries, packing houses, stables, dye-houses, paper and pulp mills, or other buildings specially liable to moisture, or acid or

other fumes liable to injure the wires or insulation, except where used for pendants, conductors—

(a) Must be separated at least six inches.

(b) Must be provided with an *approved* waterproof covering.

(c) Must be carefully put up.

(d) Must be supported by glass or porcelain insulators. No switches or fusible cut-outs will be allowed where exposed to inflammable gases or dust, or to flyings of combustible material.

(e) Must be protected when passing through floors, walls, partitions, timbers, etc., by waterproof, non-combustible, insulating tubes, such as glass or porcelain.

22. Interior Conduits : *

(a) Must be continuous from one junction box to another, or to fixtures, and must be of material that will resist the fusion of the wire or wires they contain, without igniting the conduit.

(b) Must not be of such material or construction that the insulation of the conductor will ultimately be injured or destroyed by the elements of the composition.

(c) Must be first installed as a complete conduit system, without conductors, strings, or anything for the purpose of drawing in the conductors, and the conductors then to be pushed or fished in. The conductors must not be placed in position until all mechanical work on the building has been, as far as possible, completed.

(d) Must not be so placed as to be subject to mechanical injury by saws, chisels, or nails.

(e) Must not be supplied with a twin conductor or two separate conductors, in a single tube, unless the said two separate conductors or twin conductor, having an approved insulation, are enclosed in a complete, fully insulated, continuous iron conduit, and are in circuits installed as per table of Capacity of Wires (see Section 25), for currents not to exceed 100 amperes.

(f) *Must have all ends closed* with good adhesive material, either at junction boxes or elsewhere, whether such ends are concealed or exposed. Joints must be made air-tight and moisture-proof.

(g) Conduits must extend at least one inch beyond the finished surface of walls or ceilings until the mortar or other similar material be entirely dry, when the projection may be reduced to half an inch.

* The object of a tube or conduit is to facilitate the insertion or extraction of the conductors, to protect them from mechanical injury, and, as far as possible, from moisture. Tubes or conduits are to be considered merely as raceways, and are not to be relied on for insulation between wire and wire or between the wire and the ground.

23. Double Pole Safety Cut-outs :

(a) Must be in plain sight or enclosed in an *approved* box, readily accessible.

(b) Must be placed at every point where a change is made in the size of the wire (unless the cut-out in the larger wire will protect the smaller).

(c) Must be supported on bases of non-combustible, insulating, moisture-proof material.

(d) Must be supplied with a plug (or other device for enclosing the fusible strip or wire) made of non-combustible and moisture-proof material, and so constructed that an arc cannot be maintained across its terminals by the fusing of the metal.

(e) Must be so placed that on any combination fixture no group of lamps requiring a current of six amperes or more shall be ultimately dependent upon one cut-out. Special permission may be given *in writing* by the inspector for departure from this rule in case of large chandeliers.

(f) All cut-out blocks must be stamped with their *maximum* safe-carrying capacity in amperes, and *when installed* must be marked with the current they are intended to carry.

24. Safety Fuses :

(a) Must all be stamped or otherwise marked with the number of amperes they will carry indefinitely without melting.

(b) Must have fusible wires or strips (where the plug or equivalent device is not used), with contact surfaces or tips of harder metal, soldered or otherwise, having perfect electrical connection with the fusible part of the strip.

(c) Must all be so proportioned to the conductors they are intended to protect, that they will melt before the maximum safe-carrying capacity of the wire is exceeded.

25. Table of Capacity of Wires :

It must be clearly understood that the size of the fuse depends upon the size of the smallest conductor it protects, and not upon the amount of current to be used on the circuit. Below is a table showing the safe carrying capacity of conductors of different sizes in Birmingham, Brown & Sharp, and Edison gauges, which must be followed in the placing of interior conductors :

BROWN & SHARP.		BIRMINGHAM.		EDISON STANDARD.	
Gauge No.	Amperes.	Gauge No.	Amperes.	Gauge No.	Amperes.
0000.....	175	0000.....	175	200.....	175
000.....	145	000.....	150	180.....	160
00.....	120	00.....	130	140.....	135
0.....	100	0.....	110	110.....	110
1.....	95	1.....	95	90.....	95
2.....	70	2.....	85	80.....	85
3.....	60	3.....	75	65.....	75
4.....	50	4.....	65	55.....	65
5.....	45	5.....	60	50.....	60
6.....	35	6.....	50	40.....	50
7.....	30	7.....	45	30.....	40
8.....	25	8.....	35	25.....	35
10.....	20	10.....	30	20.....	30
12.....	15	12.....	20	12.....	20
14.....	10	14.....	15	8.....	15
16.....	5	16.....	10	5.....	10
18.....	3	18.....	5	3.....	5
		20.....	3	2.....	3

26. Switches :

(a) Must be mounted on moisture-proof and non-combustible bases, such as slate or porcelain.

(b) Must be double pole when the circuits which they control supply more than six 16-candlepower lamps, or their equivalent.

(c) Must have a firm and secure contact ; must make and break readily and not stop when motion has once been imparted by the handle.

(d) Must have carrying capacity sufficient to prevent heating.

(e) Must be placed in dry, accessible places and be grouped as far as possible, being mounted—when practicable—upon slate or equally non combustible back boards. Jack-knife switches, whether provided with friction or spring stops, must be so placed that gravity will tend to open rather than close the switch.

FIXTURE WORK.

27. (a) In all cases where conductors are concealed within or attached to gas fixtures, the latter must be insulated from the gas-pipe system of the building by means of *approved* joints. The insulating material used in such joints must be of a substance not affected by gas, and that will not shrink or crack by variation in temperature. Insulating joints with soft rubber in their construction will not be approved.

(b) Supply conductors, and especially the splices to fixture wires,

must be kept clear of the grounded part of gas pipes, and where shells are used the latter must be constructed in a manner affording sufficient area to allow this requirement.

(e) When fixtures are wired outside, the conductors must be so secured as not to be cut or abraded by the pressure of the fastenings or motion of the fixture.

(d) All conductors for fixture work must have a waterproof insulation that is durable and not easily abraded, and must not in any case be smaller than No. 18 B. & S., No. 20 B. W. G., No. 2 E. S. G.

(c) All burrs or fins must be removed before the conductors are drawn into a fixture.

(f) The tendency to condensation within the pipes should be guarded against by sealing the upper end of the fixture.

(g) No combination fixture in which the conductors are concealed in a space less than one-fourth inch between the inside pipe and the outside casing will be approved.

(h) Each fixture must be tested for "contacts" between conductors and fixtures, for "short circuits," and for ground connections before the fixture is connected to its supply conductors.

(i) Ceiling blocks or fixtures should be made of insulating material: if not, the wires in passing through the plate must be surrounded with hard rubber tubing.

28. Arc Lights on Low Potential Circuits:

(a) Must be supplied by branch conductors not smaller than No. 12 B. & S. gauge.

(b) Must be connected with main conductors only through double pole cut outs.

(c) Must only be furnished with such resistances or regulators as are enclosed in non-combustible material, such resistances being treated as stoves.

Incandescent lamps must not be used for resistance devices.

(d) Must be supplied with globes and protected as in the case of arc lights on high potential circuits.

29. Electric Gas Lighting:

When electric gas lighting is to be used on the same fixture with the electric light.

(a) No part of the gas piping or fixture shall be in electrical contact with the gas lighting circuit.

(b) The wires used with the fixtures must have a non-inflammable insulation, or, where concealed between the pipe and shell of the fixture, the insulation must be such as required for fixture wiring for the electric light.

(c) The whole installation must test free from "grounds."

(d) The two installations must test perfectly free from connection with each other.

30. Sockets :

(a) No portion of the lamp socket exposed to contact with outside objects must be allowed to come into electrical contact with either of the conductors.

(b) In rooms where inflammable gases may exist, or where the atmosphere is damp, the incandescent lamp and socket should be enclosed in a vapor-tight globe.

31. Flexible Cord :

(a) Must be made of conductors, each surrounded with a moisture-proof and a non-inflammable layer, and further insulated from each other by a mechanical separator of carbonizable material. Each of these conductors must be composed of several strands.

(b) Must not sustain more than one light, not exceeding 50-candlepower.

(c) Must not be used except for pendants, wiring of fixtures, and portable lamps or motors.

(d) Must not be used in show windows.

(e) Must be protected by insulating bushings where the cord enters the socket. The ends of the cord must be taped, to prevent fraying of the covering.

(f) Must be so suspended that the entire weight of the socket and lamp will be borne by knots under the bushing in the socket, and above the point where the cord comes through the ceiling block or rosette, in order that the strain may be taken from the joints and binding screws.

(g) Must be equipped with keyless sockets as far as practicable, and be controlled by wall switches.

[Classes D and E, relating to Alternating System and Electric Railways, are here omitted.]

MISCELLANEOUS.

44. *a.* The wiring in any building must test free from grounds ; *i.e.*, each main supply line and every branch circuit shall have an insulation resistance of at least 25,000 ohms, and should have an insulation resistance between conductors and between all conductors and the ground (not including attachments, sockets, receptacles, etc.) of not less than the following :

Up to	10 amperes.....	4,000,000
"	25 "	1,600,000
"	50 "	800,000
"	100 "	300,000
"	200 "	160,000
"	400 "	80,000
"	800 "	22,000
"	1,600 "	11,000

All cut-outs and safety devices in place in the above.

Where lamp sockets, receptacles, and electroliers, etc., are connected, one-half of the above will be required.

(b) Ground wires for lightning arresters of all classes, and ground detectors, must not be attached to gas pipes within the building.

(c) Where telephone, telegraph, or other wires connected with outside circuits are bunched together within any building, or where inside wires are laid in conduit or duct with electric light or power wires, the covering of such wires must be fire resisting, or else the wires must be enclosed in an air-tight tube or duct.

(d) All conductors connecting with telephone, district messenger, burglar alarm, watch clock, electric time, and other similar instruments, must be provided near the point of entrance to the building with some protective device which will operate to shunt the instruments in case of a dangerous rise of potential, and will open the circuit and arrest an abnormal current flow. Any conductor normally forming an innocuous circuit may become a source of fire hazard if crossed with another conductor, through which it may become charged with a relatively high pressure.

(e) The following formula for soldering fluid is suggested :

Saturated solution of zinc.....	5 parts.
Alcohol.....	4 parts.
Glycerine	1 part.

ADDENDA.

Underground Conductors (see Rule 16) :

Must end outside of the main walls of the building, and not be brought into a building where it is possible to avoid it; and when brought into the building, or any vault or area connected with same, must be removed at least *two* feet from all combustible material, and kept free and clear of contact with any conducting material.

Testing :

The rules and all existing regulations of the local authorities in reference to the stringing of wires must be strictly observed.

DEFINITIONS.

DEFINITIONS OF THE WORD "APPROVED" AS USED IN THE RULES FOR ELECTRIC WIRING.

Rule 10. Outside Conductors :

Section *a*. Insulation that will be *approved* for service wires must be solid, at least $\frac{3}{8}$ of an inch in thickness, and covered with a substantial braid. It must not readily carry fire, must show an insulating resistance of one megohm per mile after two weeks' submersion in water at 70° F., and three days' submersion in lime water, with a current of 550 volts and after three minutes' electrification.

Rule 12. Interior Conductors :

Section *d*. Insulation that will be *approved* for interior conductors must be solid, at least $\frac{3}{8}$ of an inch in thickness, and covered with a substantial braid. It must not readily carry fire, must show an insulating resistance of one megohm per mile after two weeks' submersion in water at 70° F., and three days' submersion in lime water, with a current of 550 volts and after three minutes' electrification.

Rule 13. Arc Lamps :

Section *c*. The hand switch to be *approved*, if placed anywhere except on the lamp itself, must comply with the requirements for switches on hanger boards as laid down in new Section *g* of Rule 13.

Rule 13. Arc Lamps :

Section *f*. An *approved* spark arrester is one which will so close the upper orifice of the globe that it will be impossible for any sparks thrown off by the carbons to escape.

Rule 15. Outside Overhead Conductors :

Section *b*. An *approved* fusible cut-out must comply with the sections of Rules 23 and 24 describing fuses and cut-outs.

Rule 17 :

The switch required by this rule to be *approved* must be double pole, must plainly indicate whether the current is "on" or "off,"

and must comply with Sections *a*, *c*, *d*, and *e* of Rule 26 relating to switches.

Rule 18. Conductors :

Section *a*. In so-called "concealed" wiring, moulding, and conduit work, and in places liable to be exposed to dampness, the insulating covering of the wire, to be *approved*, must be solid, at least $\frac{3}{4}$ of an inch in thickness, and covered with a substantial braid. It must not readily carry fire, must show an insulating resistance of one megohm per mile after two weeks' submersion in water at 70 F., and three days' submersion in lime water, with a current of 550 volts and after three minutes' electrification.

For work which is *entirely* exposed to view throughout the whole interior circuits, and not liable to be exposed to dampness, a wire with an insulating covering that will not support combustion, will resist abrasion, is at least $\frac{1}{16}$ of an inch in thickness, and thoroughly impregnated with a moisture repellent, will be *approved*.

Rule 18. Conductors :

Section *b*, second paragraph. Except for FLOORS, and for places liable to be exposed to dampness, Glass, Porcelain, *metal-sheathed* Interior Conduit, and Vulea Tube, when made especially for bushings, will be *approved*. *The two last named will not be approved if cut from the usual lengths of tube made for conduit work, nor when made without a head or flange on one end.*

Rule 21. Special Wiring :

Section *b*. The insulating covering of the wire to be *approved* under this section must be solid, at least $\frac{3}{16}$ of an inch in thickness, and covered with a substantial braid. It must not readily carry fire, must show an insulating resistance of one megohm per mile after two weeks' submersion in water at 70 F., and three days' submersion in lime water, with a current of 550 volts after three minutes' electrification, and must *also* withstand a satisfactory test against such chemical compounds or mixtures as it will be liable to be subjected to in the risk under consideration.

Rule 23. Double Pole Safety Cut-outs :

Section *a*. To be *approved*, boxes must be constructed, and cut-outs arranged, whether in a box or not, so as to obviate any danger of the melted fuse metal coming in contact with any substance which might be ignited thereby.

Rule 27. Fixture Work :

Section *a*. Insulating joints to be *approved* must be *entirely* made of material that will resist the action of illuminating gases, and will not give way or soften under the heat of an ordinary gas

flame. They shall be so arranged that a deposit of moisture will not destroy the insulating effect, and shall have an insulating resistance of 250,000 ohms between the gas-pipe attachments, and be sufficiently strong to resist the strain they will be liable to in attachment.

Notice of the Approval of Certain Wires and Materials, and the Interpretation of Certain Rules.

Rule 4. Switch-boards :

Section *a*. Special attention is called to the fact that switch-boards should not be built down to the floor, nor up to the ceiling, but a space of at least eighteen inches, or two feet, should be left between the floor and the board, and between the ceiling and the board, in order to prevent fire from communicating from the switch-board to the floor or ceiling, and also to prevent the forming of a partially concealed space very liable to be used for storage of rubbish and oily waste.

Rule 5. Resistance Boxes :

Section *a*. The word "frame" in this section relates to the entire case and surrounding of the rheostat, and not alone to the upholding supports.

Rule 9. Resistance Boxes :

Section *a*. The word "frame" in this section relates to the entire case and surrounding of the rheostat, and not alone to the upholding supports.

Class B :

Any circuit attached to any machine, or combination of machines, which develop over 300 volts difference of potential between any two wires, shall be considered as a high potential circuit and coming under that class, unless an *approved* transforming device is used, which cuts the difference of potential down to less than 300 volts.

Rule 10. Outside Conductors :

Section *f*. All joints must be soldered, even if made with the McIntyre or any other patent splicing device. This ruling applies to joints and splices in all classes of wiring covered by these Rules.

Rule 15. Outside Overhead Conductors :

Section *b*. The cut-out required by this section must be placed so as to protect the switch, required by Rule 17.

Rule 16. Underground Conductors :

Section *b*. The cut-out required by this section must be placed so as to protect the switch.

Rule 22. Interior Conduits :

The American Circular Loom Co.'s Tube, the *metal-sheathed* Interior Conduit Tube, and the Vulca Tube are approved for the class of work called for in this rule.