Jan. 25, 1955 L. E. STINSON 2,700,712

LINE CUTOUT CLAMP

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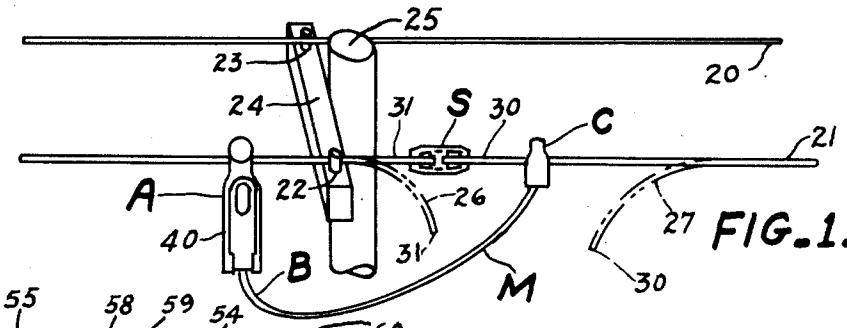


FIG. 1.

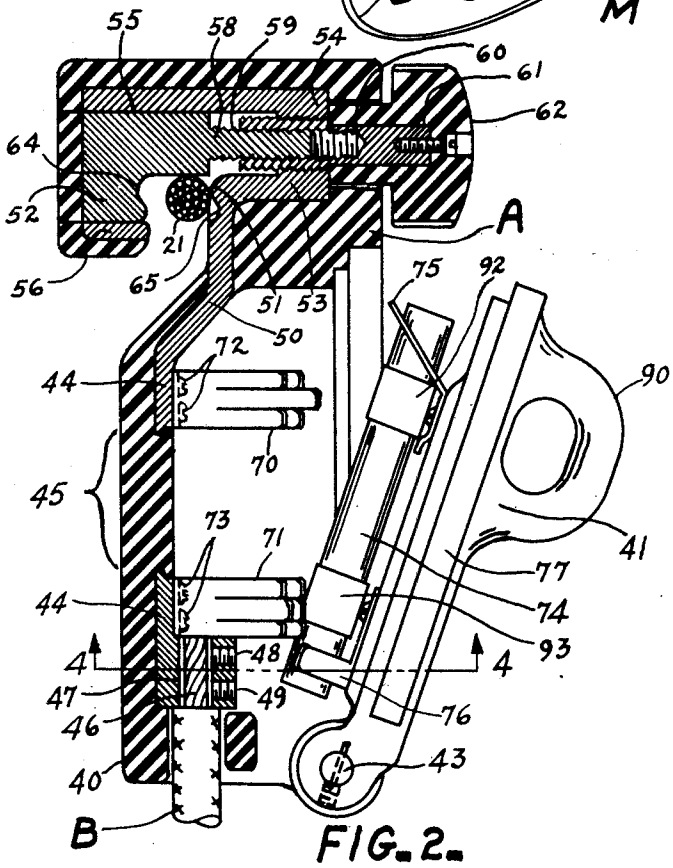


FIG. 2.

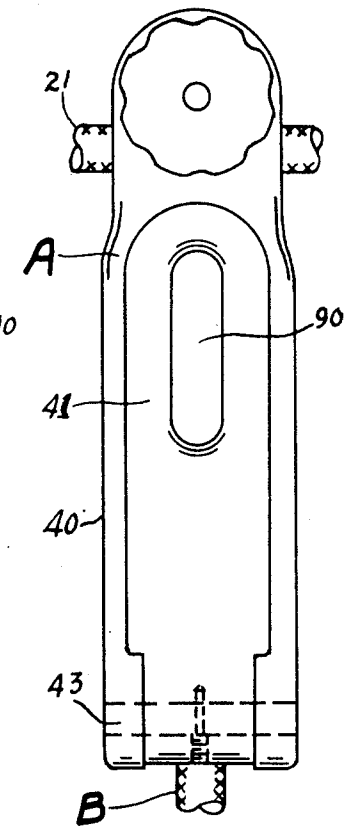


FIG. 3.

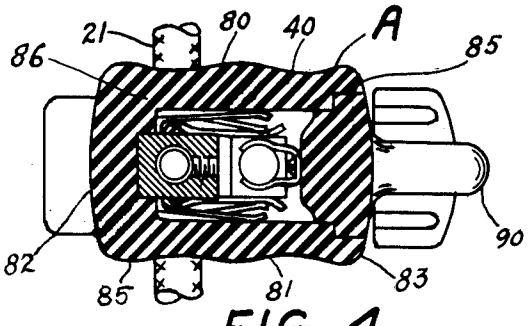


FIG. 4.

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LINE CUTOUT CLAMP

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12 Claims. (Cl. 200—115.5)

This invention relates to line connectors for use in emergency repair of electric lines in a live circuit.

Heretofore, the usual type of line connector has included a pair of threaded clamps joined by a short length of rubber insulated wire, the clamps also being covered, so far as practical, with thick rubber insulation.

When an electric line, extending between poles, has broken, the repairman has usually climbed the pole nearest the break and installed a well known type of connecting automatic line splice on an end of the broken section of the line. The automatic line splice is arranged to grip and hold at each opposite end thereof a wire inserted therein and it is the insertion of the end of the other section of the broken line that is the difficult and dangerous portion of the repair. Since the live circuit may carry from 2,300 volts up to 10,000 volts that can be safely handled, a line connector has been threadedly clamped on each opposite side of the break to bypass all of the current and permit the repairman to insert the end of the broken section in the automatic line splice without being injured or killed. After such insertion, the automatic line splice retains both broken ends of the line and the line connector is removed.

Usually such breaks occur during a rain storm, often at night, and the threaded clamps of the line connectors now in use tend to create arcs when being clamped in place, much to the discomfort and danger of the repairman. The repairman may also become even more nervous, and his work more inaccurate and inefficient, by reason of his knowledge that he holds a line connector in his insulated gloves which is about to complete a high voltage circuit which may arc in his face and which he must nevertheless tighten into place by a slow operating fine threaded knob.

The principal object of this invention is to provide a line connector, easily handled by a repairman, and having at least one of its clamps provided with means for opening the circuit therethrough during its installation to reconnect a live circuit.

Another object of the invention is to provide a line connector which can also be provided with a fusible element for temporary installations requiring a fuse.

Still another object of the invention is to provide in a line connector at least one clamp having a quick acting coarse threaded connection capable of being tightened on a line in about 6½ turns or less.

A further object of the invention is to provide a novel clamp housing for a line connector clamp which incorporates both a pivoted contact arm and a threaded clamp and can be easily handled by a repairman in a precarious perch under storm conditions.

Still another object of the invention is to provide a line connector of simple durable construction which closes a live circuit after being clamped in place rather than as soon as it touches the live circuit thereby avoiding arcing and danger to the repairman.

In the drawing, Fig. 1 is a perspective view of the line connector of this invention in use.

Fig. 2 is a side view, partly in section, of a line connector clamp constructed in accordance with the invention.

Fig. 3 is a front view of the clamp shown in Fig. 2, and

Fig. 4 is an end view of the clamp shown in Fig. 2, in section on line 4—4 of Fig. 2 and with the circuit therethrough closed.

In Fig. 1, a typical line connector installation is

illustrated such as may occur when one of the two main electric lines **20** and **21** breaks due to a storm or otherwise. Lines **20** and **21** are tied in on insulators **22** and **23** on the cross arm **24** of a pole **25**. As indicated in dotted lines, one broken section **26** of line **21**, may hang down from insulator **22** and the other broken section **27** of line **21** usually rests on the ground, or hangs in the trees, creating a dangerous hazard. An automatic line splice S, of a well known type is usually slipped over the end of the broken section **26** and it then becomes the task of the repairman to insert the end **30** of the other broken section **27** in the opposite end of the automatic line splice S to repair the line.

At present, line connectors are used which include a pair of identical clamps such as C of a well known type, joined by a connector line similar to line B, to by-pass all of the 2,300 to 10,000 volts in line **21**. One clamp C is attached to the broken section **27** of line **21** and the other clamp C is attached in rear of the end **31** of the other broken section **26** of line **21**. Usually an arc occurs as soon as the second clamp C is engaged around the line **21**, since the circuit is then completed, and the arcing usually continues while the lineman seeks to threadedly tighten the fine threads of the clamp to make a connection that will not vibrate loose.

The line connector M of this invention comprises a connector clamp C, a connector wire or line B, and a cutout clamp A and arcing is thereby avoided. A preferred embodiment of cutout clamp A is shown in Figs. 2, 3 and 4 and includes an elongated housing **40** having a housing cover **41** pivoted thereto at **43**. An electric conductor **44** extends longitudinally within housing **40** and is provided with a break at **45**, intermediate thereof, which break may be of various lengths, but is preferably about 2⅛ to 2¼ inches in length.

One terminal end **46** of conductor **44** includes a recess **47** for the end of the connector line B which is held therein by set screws such as **48** and **49**. The other terminal end **50**, of conductor **44** forms a stationary clamping jaw **51** and preferably also extends around a movable clamping jaw **52** as at **53**, **54**, **55** and **56**.

Movable jaw **52** is mounted to slide within the portions **53**, **55** and **56** of conductor **44** and is provided with a post **58** having coarse exterior threads **59**, which is ½—13 right hand thread, engaged in the course interior threads **60** of a sleeve-like member **61** which has a ¾—10 left hand exterior thread, screwed into **54**. The member **61** is attached to a knurled knob **62**. The clamping mechanism is so arranged that by turning knob **62** about 6½ turns the movable jaw **52** is caused to move from its open position to its closed position to firmly grasp a main live electric line such as **21** between jaws **52** and **51**. Jaw **52** is preferably curved at **64** to form a recess for receiving line **21** and jaw **51** is preferably curved at **65** to receive the curved portion **64**.

In view of the break **45** in conductor **44**, it will be apparent that no circuit is completed between connector line B and main line **21** when jaw **52** has been tightened against jaw **51** and that therefore no arcing can take place. Means for closing the break **45** in conductor **44** are provided which in the embodiment shown comprises an electric conducting contact arm attached to the inside of housing cover **41**. Preferably two pairs of resilient fingers **70** and **71** are provided, one on each opposite side of break **45** and each attached to conductor **44** by screws such as **72** and **73**. Each pair of fingers such as **70** and **71** is adapted to receive the squared portion **92** and **93** of a slidable tube **74** of the solid or fusible type well known in the art. The tube **74** is slidably mounted in fuse holders **75** and **76** fixed to the inside **77** of housing cover **41**. Thus when cover **41** is opened it carries with it tube **74** thereby breaking the circuit between fingers **70**, **71**. Line connector M is installed with cover **41** open to avoid any possibility of arcing. After line **21** has been firmly engaged in jaws **52** and **51**, cover **41** is closed which positions tube **74** in fingers **70** and **71** and completes the circuit across break **45** and through line connector M.

It should be noted that cutout clamp A is of a cross sectional area which permits it to be grasped in one hand of a repairman, it being generally rectangular in cross section with its narrower sides **82**, **83** about three inches

or less in width and its wider sides **80** and **81** about five inches in width. Preferably, also, the exterior of the clamp A is corrugated as at **85** to facilitate grasping the same, and the major portion of the exposed surface of both housing **40** and cover **41** is covered with a thick layer of electrical insulation **86**.

A looped element, or handle **90**, is provided on cover **41** whereby the cover can be opened and closed by the fingers or by a hooked pole well known in the art. The loop **90** is preferably positioned proximate the knurled knob **62** in position to interfere somewhat with rotating the knob **62** by hand. The presence of loop **90** thus serves as a warning to the repairman that the cover **41** is closed and the circuit complete through line connector M, thus indicating the desirability of opening the circuit before seeking to turn knob **62**.

In operation, the clamp A with cover **41** open is tightened on broken section **26**, then clamp C is tightened on broken section **27**. Cover **41** is then closed to by-pass the live current in main line **21**, without arcing, whereupon the end **30** and **31** of broken section **26** and **27** is inserted in the automatic line splice S to complete the repair. Clamps A and C are then removed for other use. If it is desired to protect a transformer with a fuse after its cutout has been destroyed, it is only necessary to slidably substitute a fusible tube for the solid fuse **74** in fuse holders **75** and **76**, whereupon the fusible tube will break the circuit at a predetermined voltage in a well known manner, thus protecting the transformer until permanent repairs can be made.

I claim:

1. A portable line connector for connecting one broken section of a live electric main line with the other broken section thereof, said line connector comprising the combination of a first connector clamp of insulated conductor material for removably engaging one broken section of said live electric line; a second connector clamp of insulated conductor material for removably engaging the other broken section of said live electric line; a connector line of insulated conductor material joining said clamps and completing an electric circuit therethrough from one broken section of said main line to the other broken section thereof and manually operable switch means including a contact arm pivotally mounted on one of said connector clamps for opening the circuit through said line connector during installation on said main line.

2. A combination as specified in claim 1 wherein the connector clamp having said pivoted contact arm is provided with coarse threaded clamping mechanism for quickly attaching the same to a section of said live electric main line.

3. A combination as specified in claim 1 wherein the connector clamp having said switch means includes a fuse tube as its pivoted contact arm for opening the circuit therethrough at a predetermined voltage.

4. A combination as specified in claim 1 wherein said switch means includes a cover pivoted to said clamp and said contact arm is a fuse removably retained in fuse holders on said cover to complete the circuit through said clamp when said arm is in closed position.

5. A combination as specified in claim 1 wherein the connector clamp having said switch means is provided with a turning knob for threadedly attaching the clamp to a main line and the pivoted arm is provided with an upstanding loop for closing the same, said loop being proximate said knob to interfere with manually turning the knob when the cover is in closed position.

6. A line connector clamp for use in attaching a connector line to a live electric main line, said clamp comprising an elongated housing of a cross sectional area small enough to be grasped by hand; an electric conductor extending longitudinally within said housing and having a break intermediate thereof, one terminal end of said conductor being arranged to receive, conductively connect with, and hold an end of said connector line and the opposite terminal end of said conductor forming a conductive stationary clamping jaw; a movable clamping jaw conductively connected to said stationary jaw and carried by said housing opposite said stationary clamping jaw; manually operable means for moving said movable jaw toward said stationary jaw to grasp said main electric line therebetween and conductively connect therewith and electric conducting means pivotally mounted on said housing for closing the break in said conductor to complete a circuit from said connector line, through said clamp conductor, said means and said jaws, to the main line grasped in said jaws.

7. A line connector clamp as specified in claim 6 wherein said manually operable means includes a turning knob and a coarse fast traveling right and left hand threaded connection between said turning knob and movable jaw.

8. A line connector clamp as specified in claim 6 wherein said electric conducting means includes a solid fuse removably mounted on the inside of a housing cover of insulating material and includes a housing cover pivoted to said housing.

9. A line connector clamp as specified in claim 6 wherein said manually operable means includes a knob for threadedly advancing said movable jaw and said electric conducting means includes a pivoted cover on said housing, said cover having a looped handle element in position to interfere with the manual turning of said knob when the cover is in closed position.

10. A line connector clamp as specified in claim 6 plus a pair of resilient fingers of electric conducting material, one on each side of the break in said electric conductor, for receiving said pivotally mounted electric conducting means and conductively connecting the same across the break in said conductor.

11. A line connector clamp for use in attaching a connector line to a live electric main line, said clamp comprising an elongated insulated housing of a cross sectional area small enough to be grasped by hand; an electric conductor extending longitudinally within said housing and having a break intermediate thereof; a course threaded clamp on said housing at one terminal end of said conductor for grasping said live electric main line and conductively connecting the same with the adjacent end of said conductor; a connector line fixed to the other terminal end of said electric conductor within said housing and conductively connecting the same with said connector line; a cover extending longitudinally of, and pivoted, to said housing and a conductive member, removably mounted along the inside of said cover coextensively with the break in said conductor for closing the break in said conductor to complete a circuit thereacross when said cover is closed.

12. A clamp as specified in claim 11 wherein said conductive member is a sliding tube fuse mounted in spaced-apart, resilient fuse holders on said cover, and said electric conductor includes a pair of resilient fingers on each side of said break each pair of fingers adapted to receive one of the opposite ends of said fuse and conductively connect the fuse across the break in the conductor.

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