Jan. 20, 1942. T. F. JOHNSON 2,270,807

BOLTED CONNECTING CLAMP FOR LINE CONDUCTORS

Filed Jan. 31, 1941

Fig.1

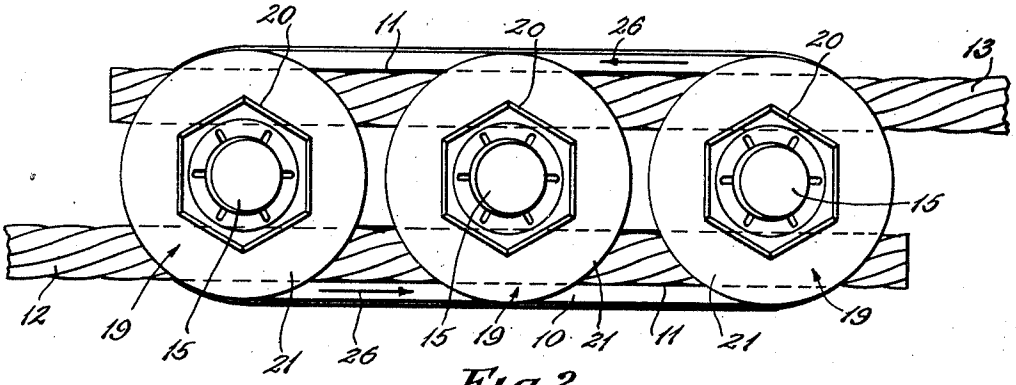


Fig.2

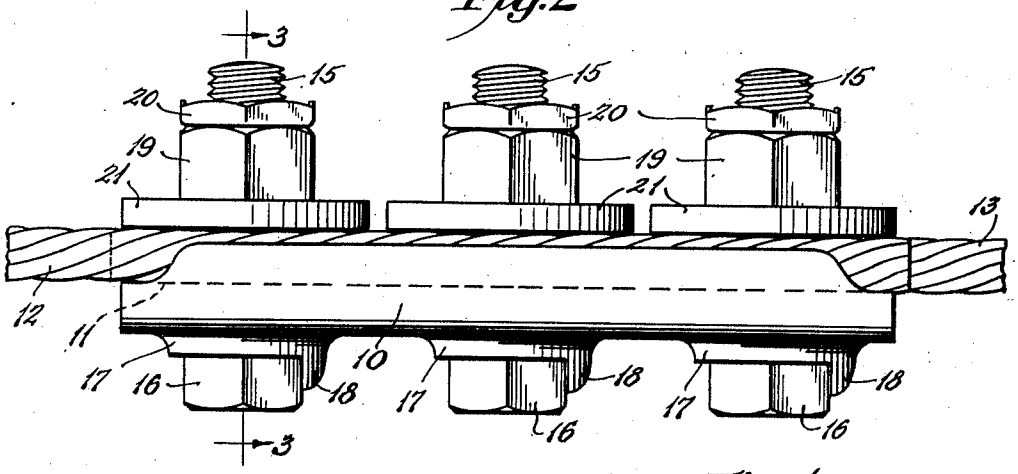


Fig.3

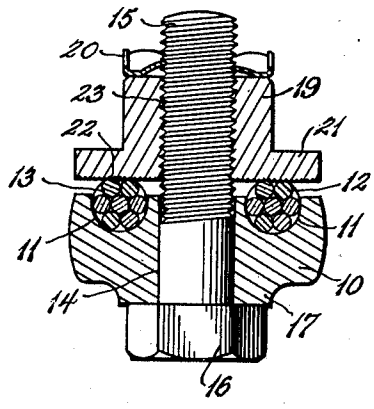


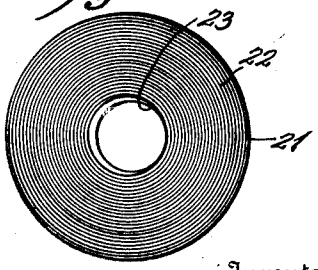
Fig.5



Fig.6



Fig.4



Inventor

T. F. Johnson

By

A. D. Adams

Attorney

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BOLTED CONNECTING CLAMP FOR LINE CONDUCTORS

Tomlinson F. Johnson, Atlanta, Ga.

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5 Claims. (Cl. 287—78)

This invention relates to bolted connecting clamps for line conductors and aims, among other objects, to provide an improved clamp positively to connect the ends of conductors.

Another object is to provide a clamp wherein positive electrical connection between the conductors is made even when the conductors have corroded surfaces.

A further object is to provide a clamp so constructed as to grip the conductor more firmly when strain is placed on the conductors.

Other aims and advantages of the invention will appear in the specification, when considered in connection with the accompanying drawing, wherein:

Fig. 1 is a top plan view of a clamp embodying the invention;

Fig. 2 is a side elevation thereof;

Fig. 3 is a sectional view taken on the line 3—3 of Fig. 2;

Fig. 4 is a bottom plan view of one of the clamping members; and

Figs. 5 and 6 are fragmentary bottom plan views of modified clamping members.

In connecting the ends of electrical conductors, it is necessary to provide both good mechanical and electrical connections. The most conventional means is to clamp the ends of the conductors between complementary members, thus depending on compression alone to secure the mechanical and electrical connection. In some instances, the clamping members have projections or prongs to bite into the conductors.

It is well known that corrosion occurs on all transmission line conductors and it appears that the higher the voltage, the greater the corrosion. If clamps are bolted to such corroded conductors, the flow of current will cause burning and the clamp will loosen and finally drop the line conductor. It is not always practicable or possible to clean the conductors before applying the clamps, with the result that they are a constant source of trouble.

The present invention seeks to overcome this difficulty by providing a clamp in which a sufficient area on the conductors will be cleaned automatically by abrading action during application of the clamp.

Referring particularly to the drawing, the improved clamp is there shown as including an elongated, rigid body member 10 having parallel grooves 11 in one face to receive the ends of the conductors 12 and 13 to be connected together. The grooves are of substantially the same width but of less depth than the diameter of the conductors so that the conductors snugly fit in the grooves and project slightly above the top face of the body. The body is here shown as having a plurality of spaced vertical bolt openings 14 between the grooves adapted to receive clamping bolts 15. The bolts are inserted through the body from the bottom with their heads 16 engaging bosses 17 on the bottom of the body. The bolts may have ordinary hexagonal or square heads so that one side thereof may abut lugs 18 on each boss to prevent the bolts from turning.

To clamp the conductors to the body there is shown a nut 19 on each bolt 15 together with an ordinary lock nut 20. Each nut has an enlarged, integral flange 21 of a diameter sufficiently large to bridge the two conductors and extend slightly beyond them. In order to clean sufficient contact areas on the top surface of the conductors, the lower face of each flange is roughened so that, as the nut is tightened, the rough under surface of the flange which directly engages the conductor will act as an abrasive. This roughened surface may assume various forms, but it is preferably in the form of a spiral groove 22 conveniently made by "facing off" the flange in a lathe and employing a coarse cross feed. This may be done while the nut is "chucked" to form the screw threaded opening 23 therethrough. Thus, the lower rough face will be square with the axis of the opening and consequently equal pressure will be applied to both conductors. Moreover, the spiral ridge or land will sink into the conductors and make good contact therewith.

Other forms of rough surfaces are contemplated such as those made by radial grooves 24 shown in Fig. 5 and straight parallel grooves 25 in Fig. 6. Also, the surface may be roughened without grooves, such as would be formed by sand casting. In any event, the idea is to provide a surface sufficiently rough to cause abrasion of the conductors as the nuts are rotated and thereby cut through any corroded surface on the conductor to make good electrical contact therewith. The body 10 will preferably be sand cast and the bottoms of the grooves left rough because, as the conductors will probably be moved slightly longitudinally as the first nut is tightened, an abrading action will also take place on the underside of the conductors.

In order to make the nuts self tightening, the conductors are inserted in the grooves as shown in Fig. 1, the upper conductor 13 coming from the right being at the top of the clamp and the lower conductor 12 coming from the left being at the bottom of the clamp. If desired, arrows 26 may

be cast in the body to indicate the proper method of inserting the conductors. In the present instance, right hand screw threads are employed and thus the nuts are tightened by rotating them clockwise. Therefore, after the joint is completed, any strain placed on the conductors tending to separate them, will cause the nuts to be turned clockwise and further tighten them. Instead of using bolts and nuts, the holes 14 may be screw threaded and the nuts 19 may be formed as integral heads on bolts screwed into the holes from the top.

From the foregoing description, it will be apparent that a clamp has been provided which will effectively and positively connect the ends of conductors both mechanically and electrically. The parts may be manufactured at little cost conveniently by casting them and they may readily be assembled.

Obviously, the present invention is not restricted to the particular embodiment thereof herein shown and described. Moreover, it is not indispensable that all the features of the invention be used conjointly, since they may be employed advantageously in various combinations and sub-combinations.

What is claimed is:

1. A clamp for connecting electric conductors comprising, in combination, an elongated, rigid body member having parallel conductor receiving grooves; and rotatable, screw threaded clamping members associated with the body, each having a flange presenting a surface directly engaging both of the conductors, said surface having a spiral groove whereby said grooved surface abrades the conductors as the clamping member is tightened.

2. A clamp for connecting electric conductors comprising, in combination, an elongated, rigid body member having parallel conductor receiving grooves; screw threaded bolts extending through the body between the conductor grooves; and rotatable clamping nuts associated with the bolts having spirally grooved surfaces engaging both conductors, whereby said surfaces abrade the conductors as the clamping means are tightened.

3. A clamp for connecting electric conductors comprising, in combination, an elongated, rigid body member having parallel conductor receiving grooves; screw threaded bolts extending through the body between the conductor grooves; means on the body engageable with said bolts to prevent relative rotation thereof; and clamping nuts on said bolts each having a spirally grooved surface directly engaging both of the conductors, whereby good electrical contact with the conductors is made when the clamping nuts are tightened.

4. A clamp for connecting electric conductors comprising, in combination, an elongated, rigid body member having parallel conductor receiving grooves; screw threaded bolts extending through the body between the conductor grooves; rotatable clamping means associated with the bolts having roughened surfaces engaging both conductors whereby said surfaces abrade the conductors as the clamping means are tightened, the ends of said conductors being inserted from opposite directions between the rotatable clamping means and the body and in a direction opposite to the tightening direction of rotation of the clamping means.

5. A clamping nut for connecting pairs of electrical conductors comprising, in combination, a head having a flange at its base and presenting a conductor engaging surface, said surface having a spiral groove of small pitch cut therein to provide ridges adapted to clean and cut into the engaged surfaces of the conductors.

TOMLINSON F. JOHNSON.