

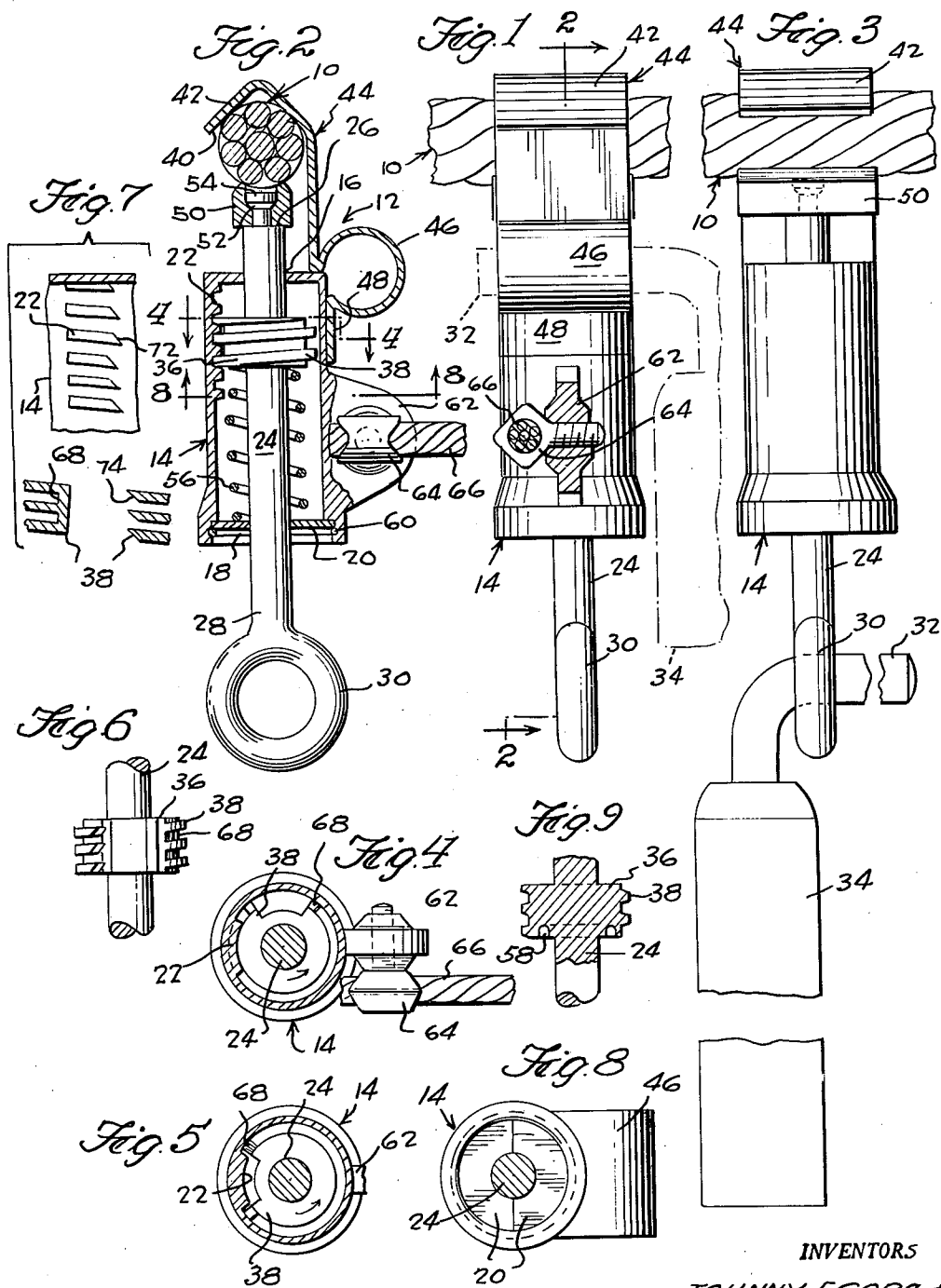
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J. F. GORC ET AL

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HOT LINE CLAMP

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INVENTORS

JOHNNY F. GORC &
BY BETTY A. GORC

McMorris, Berman & Davidson
ATTORNEYS

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HOT LINE CLAMP

Johnny F. Gorc, Box 746, Palmer, Alaska, and Betty Anne Gorc, Palmer, Alaska; said Betty Anne Gorc assignor to said Johnny F. Gorc

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The present invention relates to a hot line clamp for mechanically and electrically connecting electrical lines together.

Presently in use and previously proposed have been hot line clamps of various types. Generally, such clamps that have been proposed or are in use employ a pair of opposed jaws movable toward and away from each other and engageable with a line in which there is high voltage for the purpose of connecting another line or wire to the line.

It has been found that high voltage lines change in diameter due to heating and cooling effects and the conventional type of hot line clamp is not entirely satisfactory when employed with a high voltage line which changes in diameter for any reason. Most of the clamps in use or proposed have a second jaw movable toward a first jaw and secured thereto by a threaded shank. In order to draw the jaw up tightly on the line, the shank must be threaded with relatively fine threads. This requires considerable time to rotate the shank to the jaw-engagement position and when the clamp is to be repeatedly attached to and detached from the high voltage line, there is considerable time lost in the attaching and detaching of the clamp. Further, the heating effect of the line and subsequent change in diameter serves to loosen such a clamp as has been in use previous to the present invention and collusion takes place between the jaws and the line with resultant sparking and wire of the clamp and damage to the line.

An object of the present invention is to provide a hot line clamp which does not loosen when the line expands and contracts in diameter due to heating effects.

Another object of the present invention is to provide a hot line clamp which requires a minimum length of time for attachment to and detachment from a hot line, and one which requires a minimum of skilled labor for attachment to the hot line.

A further object of the present invention is to provide a hot line clamp which is sturdy in construction, simple in structure, one economical to manufacture and assemble, and one which is commercially feasible.

These and other objects and advantages of the present invention will be fully apparent from the following description when taken in conjunction with the annexed drawing, in which:

FIGURE 1 is an elevational view of the hot line clamp of the present invention, shown installed upon a hot line, the upper end portion of an electrician's hot stick being shown in dotted lines in supporting relation with respect to the clamp;

FIGURE 2 is a view in section taken on the line 2-2 of FIGURE 1;

FIGURE 3 is an elevational view, as viewed from the reverse side of FIGURE 1;

FIGURE 4 is a sectional view taken on the line 4-4 of FIGURE 2, showing the interrupted screw threads in disengaged position;

FIGURE 5 is a fragmentary sectional view showing the threads in engaged position;

FIGURE 6 is a fragmentary elevational view of the shank intermediate portion showing the threads thereon;

FIGURE 7 is an exploded plan view of the housing threads and shank threads; and

FIGURE 8 is a bottom plan view;

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FIGURE 9 is a sectional view of the assembly shown in FIGURE 6.

Referring in greater detail to the drawing in which like numerals indicate like parts throughout the several views, the reference numeral 10 designates generally a line having high voltage therein.

The clamp of the present invention is designated generally by the reference numeral 12 and it comprises an upstanding closed ended hollow housing 14 having an upper end 16 and a lower end 18 closed by a split washer 20.

A portion of the inner surface of the housing 14 is provided with relatively steeply pitched threads constituting an interrupted screw, as at 22 in FIGURES 2, 4, 5, and 7.

A shank extends loosely through the housing 14, as at 24 in FIGURE 2, and has a portion adjacent one end 26 exteriorly of the closed end 16 of the housing 14. The shank 24 has a portion adjacent the other end 28 exteriorly of the other closed end 18 of the housing 14. A ring 30 is carried on the shank end 28 and is adapted to have inserted therein the bent rod element 32 on the upper end of an electrician's hot stick 34, as shown in FIGURE 3.

The portion of the shank 24 within the housing 14 carries an enlarged portion 36 having its periphery provided with interrupted screw threads thereon which mate with the threads 22 of the inner wall of the housing 14, the threads being designated in FIGURES 2, 4, 5, and 7 by the numeral 38.

Upon rotation of the shank 24 in the hands of a user, the threads 38 are brought into engagement with and disengaged from the threads 22 on the housing inner wall.

A first jaw 40 is formed by an inverted V-shaped strap end portion 42 carried by the upper end of the housing 14, formed from an end portion of a strap 44 which is provided with a loop portion 46 adjacent the upper end of the housing 14 and another end portion 48 is fixedly secured by welding or other means to the side of the housing 14, as in FIGURE 2.

The strap loop portion 46 is adapted to receive the rod element 32 on the stick 34, as shown in dotted lines in FIGURE 1.

The jaw 40 overlies and is spaced from the end 26 of the shank 24 and is fixedly supported by the housing 14.

A second cooperating jaw 50 embodying a collar is carried on the end 26 of the shank 24 and is rotatable about the shank 24 as an axis, the underface of the jaw 50 having a bore 52 loosely receiving the head 54 on the upper end 26 of the shank 24.

Means is provided by the present invention for moving the second jaw 50 toward the first jaw 40 upon disengagement of the shank screw threads 38 with the housing screw threads 22. This means consists in spring means operatively connected to the shank 24 and housing 14 biasing the jaw 50 toward the first jaw 40.

Specifically, the spring means consists in a coil spring 56 circumposed about the portion of the shank 24 between the shank portion 36 and the closed end of the housing 14. One end of the spring 56 bears against the underface of the shank portion 36, which is undercut as at 58 in FIGURE 9, and the other end of the spring 56 bears against the split washer 20 which is detachably secured in the lower end of the housing 14 by means of a snap ring 60 of conventional construction.

A boss 62 projects from one side of the housing 14 inwardly of and adjacent the lower end thereof and carries a connector stud 64 of conventional construction in which is embedded one end portion of a line or wire 66 which, when the clamp 12 is on the line 10, will be electrically in circuit with the line 10.

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screw formed by the threads 38 on the shank 24 is a stop 68 which prevents rotation of the shank 24 in the counterclockwise direction after the threads 38 have become disengaged from the threads 22, as shown in FIGURE 5.

In use, the housing 14 is held in one hand and the other hand of the user applies a pulling force to the shank 24 to compress the spring 56 and to shift the jaw 50 away from the jaw 40. The shank 24 is then given a partial rotary turn in the clockwise direction to engage the threads 38 with the threads 22. This holds the shank 24 so that the jaws 40 and 50 are separated and may be positioned on opposite sides of the line 10, the housing 14 being supported on the hot stick 34 which is formed of conventional insulating materials.

After the jaws 40 and 50 receive therebetween the line 10, the stick 34 is given a quarter turn in the counterclockwise direction which disengages the threads 38 from the threads 22 and permits the spring 56 to extend the shank 24 upwardly to the position in which the jaw 50 engages the line 10, then shank 24 is turned one half a turn in a clockwise direction resulting in engaging the threads 38 with the threads 22 and locking the jaw 50 in position on the line 10.

This electrically connects the wire 66 in circuit with line 10 and the stick 34 is then disengaged from the ring 30 and the clamp 12 is left upon the line 10 as either a temporary or permanent connection of the wire 66 to the line 10.

A feature of the invention resides in the fact that each of the threads 22 and threads 38 have sloping faces as at 72 and 74, respectively, which permit ready engagement of the threads 38 with the threads 22 when the shank 24 is pulled so as to compress the spring 56.

The clamp 12 may be positioned on the line 10 by insertion of the rod element 32 and the loop portion 46 of the strap 44 and then the rod element 32 shifted to the ring 30 if desired for release of the shank 24 from the cocked position to the position in which the jaws 40 and 50 complete the electrical circuit between the housing 14 and the line 10 and to lock the threads 38 and the threads 22 together, holding the jaw 50 in position.

Upon increase or decrease in the diameter of the line 10 due to heating effects or other causes, the loop 46 will yield allowing the jaw 40 to move toward and away from the line 10. This will save the line 10 from damage at the particular point where the clamp 12 is attached and will permit arcing of the electric current between the jaws and the line 10 to loosening of the jaws on the line 10.

What is claimed is:

1. A hot line clamp comprising a closed ended hollow housing, a portion of the inner surface of said housing being provided with an interrupted screw, a shank extending loosely through said housing and having a portion adjacent one end exteriorly of one of the closed ends of said housing, there being an interrupted screw on the portion of said shank within said housing and engageable and disengageable with the interrupted screw on the inner surface of said housing in response to rotation of said shank in clockwise and counterclockwise directions, a first jaw embodying an inverted V-shaped strap end portion overlying and spaced from said one end of said shank and fixedly supported by said housing, a second cooperating jaw embodying a collar on said one end of said shank and movable toward and away from said first jaw, and means operatively connected to said shank and housing for moving said second jaw toward said first jaw upon disengagement of said shank screw with said housing screw.

2. A hot line clamp comprising a closed ended hollow housing, a portion of the inner surface of said housing being provided with an interrupted screw, a shank extending loosely through said housing and having a portion adjacent one end exteriorly of one of the closed ends of said housing, there being an interrupted screw on

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the portion of said shank within said housing and engageable and disengageable with the interrupted screw on the inner surface of said housing in response to rotation of said shank in clockwise and counterclockwise directions, a first jaw embodying an inverted V-shaped strap end portion overlying and spaced from said one end of said shank and fixedly supported by said housing, a second cooperating jaw embodying a collar on said one end of said shank and movable toward and away from said first jaw, and spring means operatively connected to said shank and housing biasing said second jaw toward said first jaw upon disengagement of said shank screw with said housing screw.

3. A hot line clamp comprising a closed ended hollow housing, a portion of the inner surface of said housing being provided with an interrupted screw, a shank extending loosely through said housing and having a portion adjacent one end exteriorly of one of the closed ends of said housing, there being an interrupted screw on the portion of said shank within said housing and engageable and disengageable with the interrupted screw on the inner surface of said housing in response to rotation of said shank in clockwise and counterclockwise directions, a first jaw embodying an inverted V-shaped strap end portion overlying and spaced from said one end of said shank and fixedly supported by said housing, a second cooperating jaw embodying a collar on said one end of said shank and movable toward and away from said first jaw, a coil spring circumposed about the portion of said shank between said shank screw and the other closed end of said housing and having one end bearing against said screw and having the other end bearing against said other housing end biasing said second jaw toward said first jaw upon disengagement of said shank screw with said housing screw.

4. A hot line clamp comprising a closed ended hollow housing, a portion of the inner surface of said housing being provided with an interrupted screw, a shank extending loosely through said housing and having a portion adjacent one end exteriorly of one of the closed ends of said housing and having a portion adjacent the other end exteriorly of the other of the closed ends of said housing, there being an interrupted screw on the portion of said shank within said housing and engageable and disengageable with the interrupted screw on the inner surface of said housing in response to rotation of said shank in clockwise and counterclockwise directions, a first jaw embodying an inverted V-shaped strap end portion overlying and spaced from said one end of said shank and fixedly supported by said housing, a second cooperating jaw embodying a collar on said one end of said shank and movable toward and away from said first jaw, means operatively connected to said shank and housing for moving said second jaw toward said first jaw upon disengagement of said shank screw with said housing screw, and means on the other end of said shank for attachment thereto of an electrician's hot stick.

5. A hot line clamp comprising a closed ended hollow housing, a portion of the inner surface of said housing being provided with an interrupted screw, a shank extending loosely through said housing and having a portion adjacent one end exteriorly of one of the closed ends of said housing, there being an interrupted screw on the portion of said shank within said housing and engageable and disengageable with the interrupted screw on the inner surface of said housing in response to rotation of said shank in clockwise and counterclockwise directions, a first jaw embodying an inverted V-shaped strap end portion overlying and spaced from said one end of said shank and fixedly supported by said housing, a second cooperating jaw embodying a collar on said one end of said shank and movable toward and away from said first jaw and rotatable about said shank as an axis, and means operatively connected to said shank and housing for mov-

ing said second jaw toward said first jaw upon disengagement of said shank screw with said housing screw.

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