

- [54]
- CABLE CLAMP WITH LOCKING MEANS**

3,406,372 10/1968 Lawlor..... 339/266 R

- [75] Inventor: **Robert E. Lawlor**, Huntington Beach, Calif.

FOREIGN PATENTS OR APPLICATIONS

1,188,953 4/1970 Great Britain 339/266 R

- [73] Assignee: **Electro-Clamp Corporation, Beverly Hills, Calif.**

Primary Examiner—Joseph H. McGlynn

- [22] Filed: Oct. 30, 1972

- [21] Appl. No.: 302,136

- [57] ABSTRACT

- [52] **U.S. Cl.**..... **339/266 R**, 24/125 K, 24/132 R

A connector of the hinging clamp type, with alignable bores to receive the end of a cable (e.g. conductor) which is securely clamped between the jaws when they are rotatably adjusted to closed position, is provided with mating locking rib and keeper notch in which the rib is received in the closed position, thus to lock the jaws in securely gripping engagement with the conductor.

- [51] Int. Cl. H01r 9/10

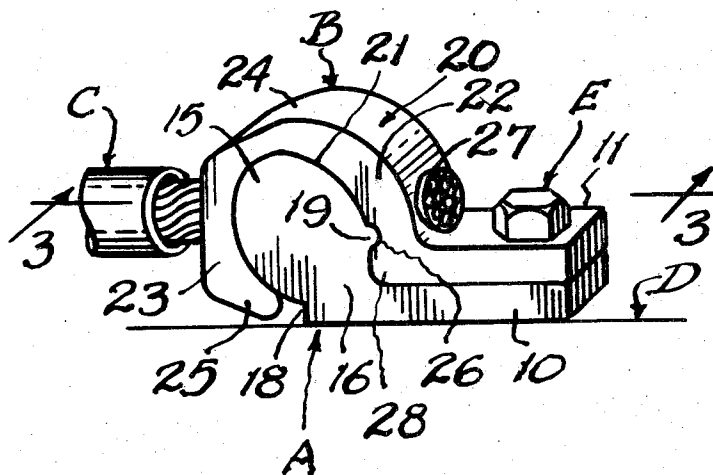
- [58] **Field of Search**..... 339/266; 24/115 G, 125 K,
24/132 R, 132 AA, 132 AB, 132 AC, 132
LS, 132 WL, 135 K

- [56]
- References Cited**

UNITED STATES PATENTS

3,169,818 2/1965 Tracy..... 339/266 R

10 Claims, 8 Drawing Figures



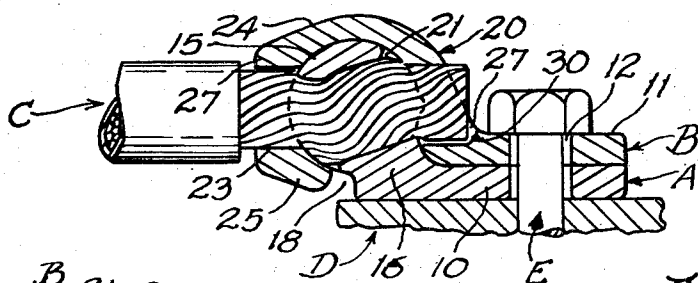


FIG. 2

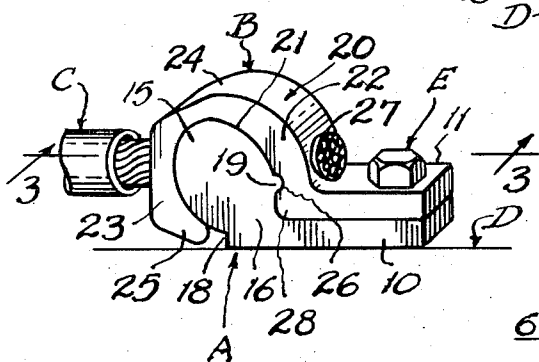


FIG. 1

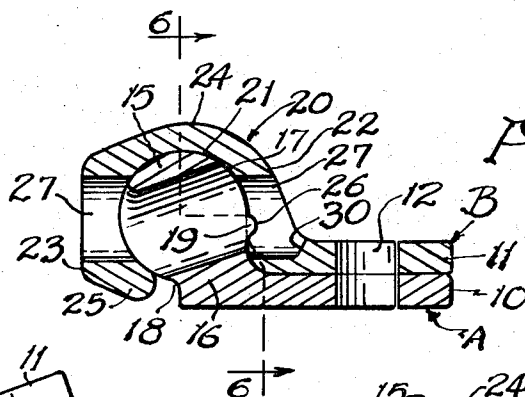


FIG. 3

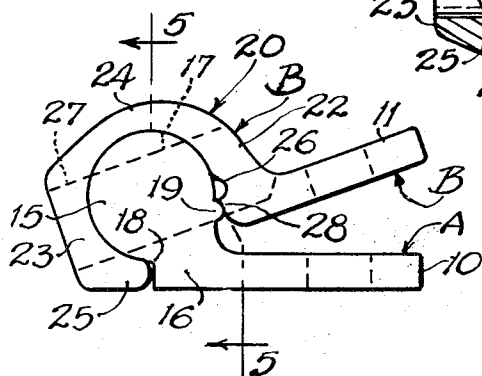


FIG. 4

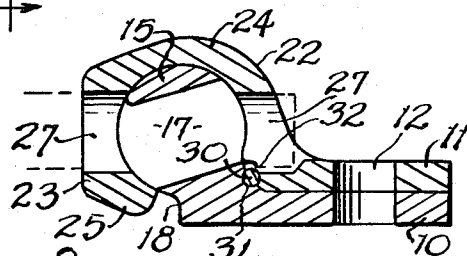


FIG. 8

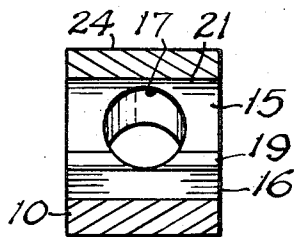


FIG. 5

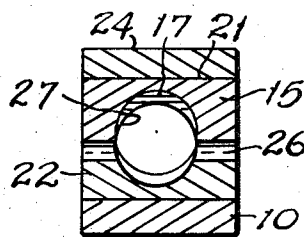


FIG. 6

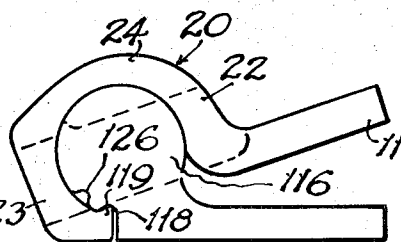


FIG. 7

CABLE CLAMP WITH LOCKING MEANS

BACKGROUND OF THE INVENTION

Electrical terminals of the hinging clamp type, operable in closed position to securely clamp the bared end of a conductor, and adapted to be secured to a support so as to be held in the locked position, are known in the art and are disclosed in the following prior patents:

Lawlor	3,138,422	June 23, 1964
Lawlor et al.	3,351,889	Nov. 7, 1967
Lawlor	3,406,372	Oct. 15, 1968
Beaudion	3,437,979	Apr. 8, 1969
Lawlor	3,477,060	Nov. 4, 1969

To avoid the possibility of the conductor becoming disconnected from the terminal through loosening of the fastener, and to maintain the terminal locked to the conductor during the installation of the terminal to a support, it has become apparent that some means for locking the jaws together is desirable. The present invention has as its object to provide a cable connector of the clamping type which not only has a means for locking its jaws together, but also has positive means to determine an open position in which bores in the respective jaws are aligned so as to facilitate insertion of the bared end of a conductor or other cable through the aligned bores.

SUMMARY OF THE INVENTION

These objects are attained in a cable clamp (e.g., terminal) comprising male and female jaws hingedly connected by a cylindrical head on the male jaw rotatably engaged in a cylindrical socket in the female jaw; one of the jaws having a transverse locking rib which is receivable in a keeper notch in an adjacent portion of the other jaw; these locking elements being located adjacent one extremity of an arcuate yoke of the female jaw, which yoke forms the socket which receives the head of the male jaw. Thus in operating the clamp from open to closed position and vice versa, an interference between the locking rib and one end of the female jaw yoke, is forcibly overcome by spreading the two sides of the yoke, and the one side of the yoke will spring back to effect secure locking engagement between the rib and the notch.

These and other objects will become apparent in the ensuing specification and appended drawing, in which:

FIG. 1 is a perspective view of a terminal embodying the invention, with a conductor clamped therein;

FIG. 2 is a longitudinal sectional view of the same;

FIG. 3 is a longitudinal sectional view of the terminal in closed, locked position, omitting the showing of a conductor;

FIG. 4 is a side view of the terminal in open position;

FIG. 5 is a cross-sectional view taken on line 5—5 of FIG. 4; and

FIG. 6 is a cross-sectional view taken on line 6—6 on FIG. 3.

FIG. 7 shows a modified form of the invention; and

FIG. 8 shows another locking terminal.

Referring now to the drawing in detail, I have shown therein, as an example of one form in which the invention may be embodied, a solderless electric terminal comprising, in general, a male jaw A, and a female jaw B adapted to receive and clamp an electrical conductor

C and to be secured to a support D by means of a screw or bolt E. Jaws A and B have respective attachment tails 10 and 11 which have respective apertures 12 through which fastener E may be inserted and secured in or to the support D. Tails 10 and 11 are of flat plate form and are adapted to come together in flat face-to-face contact as indicated in FIG. 1.

Male jaw A consists of the tail 10, a cylindrical head 15 joined to a neck 16 rising integrally from tail 10, a cylindrical bore 17 piercing the head 15 in the median vertical longitudinal plane of jaw A, and a locking rib 19 extending transversely of said plane at the back side of head 15 in a plane parallel to tail 10 and approximately at the cylindrical axis of head 15. The back of neck 16 is generally normal to the plane of tail 10, and the front side of head 15 protrudes forwardly from neck 16, overhanging a transverse recess 18. Bore 17 is inclined downwardly and forwardly with reference to the plane of tail 10 at an angle of between 15° and 30° (e.g., approximately 20°) which is substantially equal to the angle of opening between tails 10 and 11 in the open position shown in FIG. 4.

Female jaw B consists of the tail 11 and an open socket yoke 20 of approximately 270° arcuate extent, having a transverse cylindrical socket 21, loosely fitted around male jaw head 15 and rotatable thereon between its closed position shown in FIGS. 1-3 and its open position shown in FIG. 4. Yoke 20 includes an arm 22 rising substantially vertically from tail 11, a forward arm 23 diametrically opposite arm 22, and a crown 24 bridging between arm 22 and finger 23. Arm 23 extends vertically downwardly from crown 24 and terminates in a free end having a finger 25 extending beneath the head 16 into recess 18 which extends back just far enough to receive the finger 25 when jaw B is hinged to its open position. In the forward face of arm 22 is a transverse keeper notch 26 adapted to receive locking rib 19 in the closed position of the jaw B, as shown in FIG. 3. A bore 27 extends through arms 22 and 23, parallel to tail 11, substantially through the center of socket 21, so as to be aligned with the bore 17 of head 15 when jaw B is in its open position, as indicated in FIG. 4. The lower area of bore 27 is recessed below the upper surface of tail 11 to a point just beyond the arm 22, where a stop shoulder 30 defines the end of the bore (FIG. 3).

In the open position of jaw B (FIG. 4) a latch projection 28 at the junction of arm 22 and tail 11, immediately below keeper notch 26, will rest on the upper side of locking rib 19 so as to hold the jaw B in the open position, while the tip 25 of arm 23 will extend into recess 18 substantially into engagement with neck 16, so as to limit opening movement of jaw B substantially at the position shown in FIG. 4. Thus the jaw B is held in an open position in which the respective ends of bore 27 will be aligned with bore 17 so that the bared end of conductor C can be inserted through the two bores to a limit position determined by engagement of its forward end against the shoulder 30. The jaw B may then be closed upon jaw A by application of downward pressure against tail 11 sufficient to overcome an interference engagement which exists between latch projection 28 and locking rib 19 in the open position of the jaw. In forcing the projection 28 past locking rib 19, the arms 22 and 23 will be sprung apart slightly. As the projection 28 clears the rib 19, it will spring back to a position engaged beneath rib 19 so as to lock the jaws to-

gether in the closed position as shown in FIGS. 1 and 3. In this position the closed terminal, with conductor C securely clamped between its jaws, can be attached to a support D by inserting fastener E through holes 12 and anchoring it in body D.

The closing movement of jaw B will cause the bores 17, 27 to become misaligned angularly so as to distort the bared end of conductor C as indicated in FIG. 2, with gripping engagement thereof at opposite ends of bore 17.

FIG. 7 illustrates that the locking elements 119 and 126 respectively, may be located on the opposite side of the yoke and head of female and male jaws B and A respectively from the locations shown in the other figures; also that the locking element may be in the form of a transverse inwardly turned lip 119 on the free end of the yoke 120, and the keeper notch 126 may be in the head, respectively. In the open position of the jaws the rib 119 is engaged in a recess 118 at the junction of neck 116 and the respective end of tail 10, to latch the jaws in the open position. The rib 119 is engageable in the notch 126 to lock the jaws in the closed position in which the tails 10 and 11 are in flat face-to-face engagement with one another.

FIG. 8 illustrates a modified form of terminal in which a lock pin 30 can be inserted into mating notches 31 and 32 in male and female jaws A and B respectively below cable C, in the closed position thereof so as to lock them in their closed position. Pin 30 is of hard aluminum and is driven in with light force.

I claim:

1. A clamp type cable connector comprising:
 - a male jaw including an attachment tail;
 - a transversely extending cylindrical trunnion head projecting from said tail normal to its plane at one end thereof;
 - a reduced neck joining said head to said tail;
 - and a bore extending through said head with its axis in a medial longitudinal plane of said male jaw
- a female jaw including an attachment tail;
- a socket yoke comprising diametrically opposed arms joined by a bridging crown, one of said arms being integrally joined to an end of said female jaw tail and projecting normally therefrom to said crown, the other arm projecting from said crown toward the extended plane of said female jaw tail; said crown toward the extended plane of said female jaw tail;
- said arms cooperatively defining a cylindrical socket of more than 180° circumferential extent within which said head is received for limited relative hinging movements of said jaws between open and closed positions;
- said jaws having matable locking elements one of which is a transverse keeper notch in one of said jaws and another of which is a transverse, projecting rib receivable in said notch in the closed position

- tion of said jaws;
- and a cable-receiving bore extending diametrically through the arms of said yoke with its axis in said medial longitudinal plane of said male jaw;
- said bore of the yoke being alignable with said bore of the head in the said open position of the jaws.
- 2. An cable connector as defined in claim 1; said locking elements being located adjacent the respective junctions between said tails and said head and yoke respectively.
- 3. A cable connector as defined in claim 1; said one locking element being an inwardly turned transverse lip on the free end of said yoke; said other locking element being a transverse notch in said male jaw head.
- 4. A cable connector as defined in claim 1, said socket yoke having resiliency such as to provide for enforced spreading of said arms during movements of said jaws between open and closed positions, and such as to spring-load said locking elements into mating interengagement to lock said jaws in said closed position.
- 5. A cable connector as defined in claim 4; said keeper notch being located in the yoke of said female jaw;
- said rib being disposed on the head of said male jaw.
- 6. An cable connector as defined in claim 5; said keeper notch being in said one yoke arm adjacent its junction with said female jaw tail.
- 7. An cable connector as defined in claim 6; said junction having a latch projection defining one side of said keeper notch;
- said projection being engageable in a recess between said rib and said male jaw tail in said closed positions of the jaws.
- 8. An cable connector as defined in claim 7; said projection resting on said rib in the open position of said jaws, whereby to support the jaws in said open position.
- 9. An cable connector as defined in claim 4; said other yoke arm terminating in a finger extending said yoke beyond an 180° circumferential extent thereof;
- said finger being receivable in a recess beneath said head at the end of said male jaw tail adjoining said neck and engageable against said neck in said open position of the jaws, whereby to limit the opening movement of said jaws.
- 10. An cable connector as defined in claim 9; said finger having a flat outer face and being tapered so that said outer face will lie substantially in the plane of the face of said tail which is mounted against a support, when said jaws are in open position.

* * * * *

UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,801,952 Dated April 2, 1974

Inventor(s) Robert E. Lawlor

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Column 3, lines 46-48, delete "said crown toward
the extended plane of said female jaw tail."

Signed and sealed this 4th day of February 1975.

(SEAL)
Attest:

McCOY M. GIBSON JR.
Attesting Officer

C. MARSHALL DANN
Commissioner of Patents