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DETACHABLE CLAMP FOR MOUNTING AN ELECTRICAL DEVICE ON A CONDUCTOR

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Fig. 1

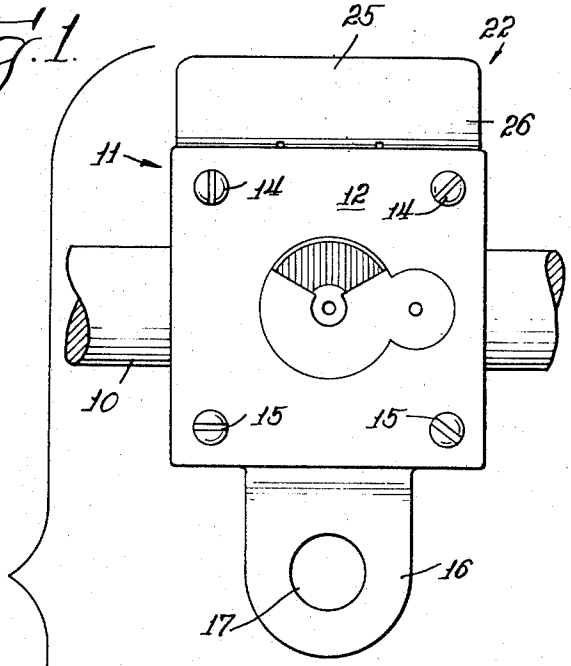
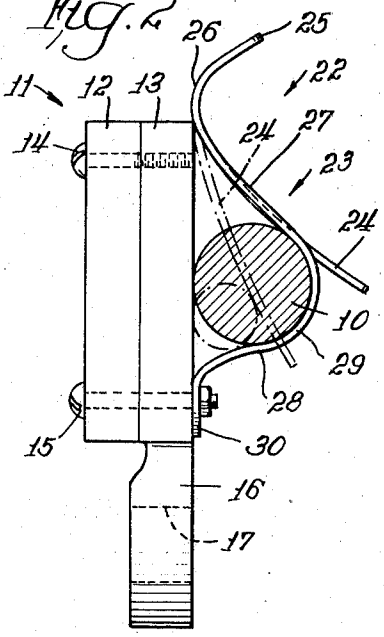



Fig. 2



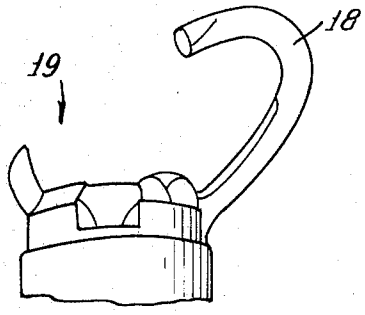




Fig. 2A

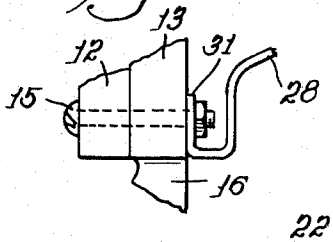



Fig. 4

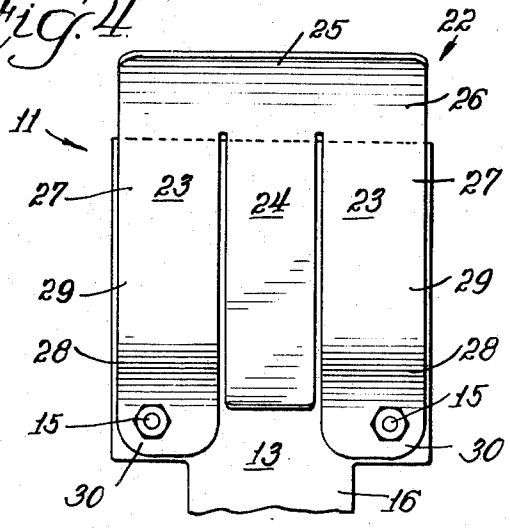
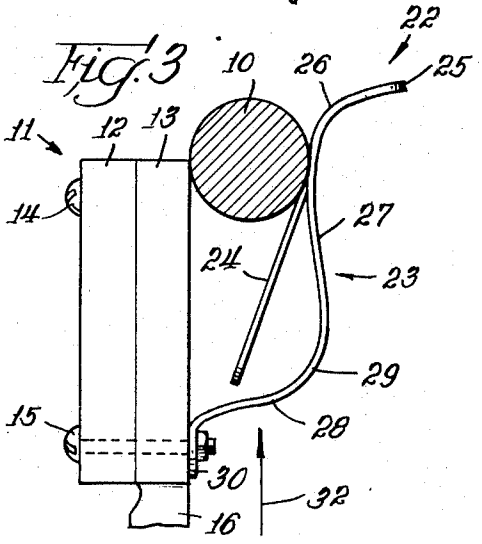



Fig. 3



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DETACHABLE CLAMP FOR MOUNTING AN ELECTRICAL DEVICE ON A CONDUCTOR

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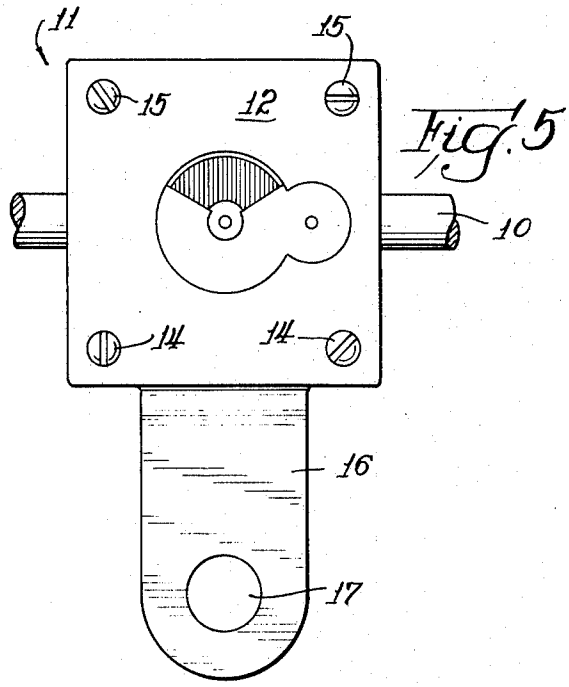



Fig. 5

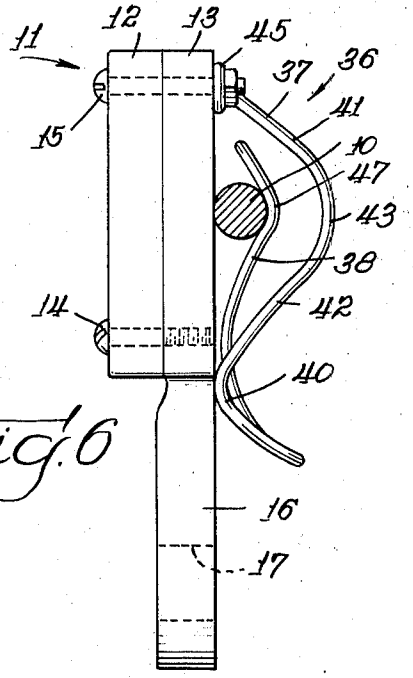



Fig. 6

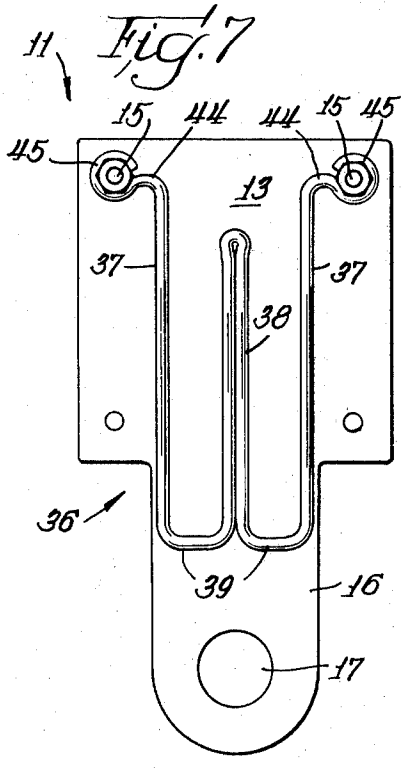



Fig. 7

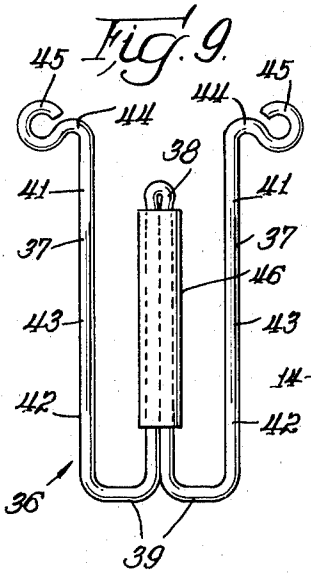



Fig. 9

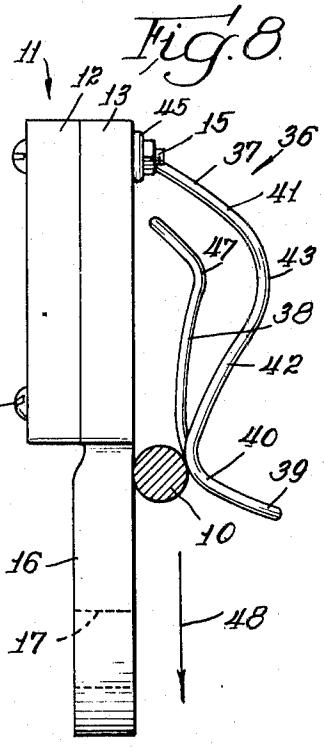



Fig. 8

United States Patent Office 3,485,468
Patented Dec. 23, 1969



3,485,468

# DETACHABLE CLAMP FOR MOUNTING AN ELECTRICAL DEVICE ON A CONDUCTOR

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Filed Mar. 6, 1968, Ser. No. 711,075
Int. Cl. F16l 3/08; F16g 11/00; A44b 21/00
U.S. Cl. 248—74 8 Claims

## ABSTRACT OF THE DISCLOSURE

For securing a current responsive device to a current carrying conductor, a resilient clamp of plastic or spring wire is secured to the device and arranged for ready attachment to and detachment from the conductor.

Among the objects of this invention are: To provide for clamping a current responsive device or the like to a current carrying conductor the diameter of which may vary over a relatively wide range or to a similar device in a new and improved manner; to arrange for application and removal of the device to and from the conductor by manipulation of a live line tool; to form the clamp of one piece plastic or of spring wire; to employ a generally E-shaped configuration for the clamp with the end sections bowed to receive the conductor in the bights thereof and secured at their distal ends to the device with the intermediate section arranged to react against the conductor; to arrange for the intermediate section to urge the conductor against one branch of each of the end sections; to surround the intermediate section with a friction sleeve for the purpose of reducing slippage between the device and the conductor; to provide a bowed part intermediate the ends of the intermediate section to center the conductor in the bight thereof; and to provide a reverse turn entrance section at the section of the E-shaped configuration.

According to this invention a one piece E-shaped clamp of plastic sheet or spring wire has the distal ends of U-shaped end sections fastened to a current responsive device or the like with the back portion of the E-shape reversely curved to provide an entrance for a conductor or the like between this back portion and a surface of the device. The intermediate portion of the E-shape is arranged to react against the conductor and clamp it against the surface of the device or against it and against adjacent branches of the U-shaped end sections. A friction sleeve is telescoped over the intermediate section to reduce slippage between it and the conductor.

In the drawings: FIG. 1 is a view, in front elevation, of a device, such as a current responsive device, constructed as shown in my application Ser. No. 653,971, filed July 17, 1967, provided with a clamping member constructed in accordance with this invention. FIG. 2 is a view, in side elevation, of the construction shown in FIG. 1, the conductor being shown in section. FIG. 2A shows a modification of a portion of the clamping member. FIG. 3 is a view, similar to FIG. 2, but showing how the current responsive device is applied to the conductor. FIG. 4 is a view, in rear elevation, of the current responsive device and shows the construction of the clamping member. FIG. 5 is a view, similar to FIG. 1, showing a current responsive device having a slightly longer arm and arranged to be provided with a clamping member of somewhat different construction. FIG. 6 is a view, in side elevation, of the construction shown in FIG. 5, the conductor being shown in section. FIG. 7 is a view, in rear elevation, of the current responsive device shown in FIG. 5, the clamping member being shown. FIG. 8 is a view, similar to FIG. 6, and shows the manner in which the current responsive device is applied to the conductor. FIG. 9 shows a modification of the clamping member provided with a friction sleeve.



Referring to FIGS. 1–4 of the drawings, the reference character **10** designates a conductor arranged to carry current, either alternating or direct, and to be energized at voltages ranging upwardly from 115 volts to several thousand volts. For indicating when a predetermined current flow has taken place in the conductor **10** a current responsive device, indicated generally at **11**, is arranged to be applied to the conductor in such position that it can be influenced by the magnetic field generated there around as the result of current flow therethrough. The current responsive device **11** comprises plates **12** and **13** of suitable plastic material that are arranged to house the mechanism of the current responsive device. They are arranged to be secured together by screws **14** and bolts **15**. An arm **16** extends laterally from the plate **13** and is provided with an eye **17** for receiving a hook **18** of the live line tool that is indicated, generally, at **19**. The live line tool **19** is of conventional construction and is employed for manipulating the current responsive device **11** and applying it to or removing it from the conductor **10**.

This invention has to do particularly with the provision of an E-shaped resilient clamping member that is indicated, generally, at **22** and is arranged to detachably secure the current responsive device **11** to the conductor **10**. The clamping member **22** is formed of plastic sheet material which may be polyethylene, nylon, one of the fluoro carbons or the like. The clamping member **22** includes U-shaped end sections **23** and an intermediate section **24** with these sections being joined by a back section **25**, thereby providing the E-shaped configuration. The back section **25** is formed to provide a reverse turn entrance portion **26** for the purpose of facilitating application of the assembly to the conductor **10**. Each of the end sections **23** has arms **27** and **28** with a bight **29** therebetween for receiving the conductor **10** therein as shown in FIG. 2. Laterally extending distal ends **30** of the arms **28** are apertured for receiving the bolts **15** which serve to secure the E-shaped clamping member **22** in the rear side of the current responsive device **11**. Alternatively, as shown in FIG 2*a*, the distal ends of the arms **28** can be provided with inturned ends **31** for receiving the bolts **15**.

When the current responsive device **11** is to be applied to the conductor **10**, the live line tool **19** is secured thereto and the assembly is moved in the direction indicated by the arrow **32** in FIG. 3 to position the reverse turn entrance portion **26** in engagement with the conductor **10**. Continued movement in this direction forces the resilient E-shaped clamping member **22** to flex about the laterally extending distal ends **30** of the arms **28** so that the conductor **10** is positioned between the back section **25** and the rear surface of the current responsive device **11**. The movement in the direction of the arrow **32** continues until the conductor **10** is located within the bights **29** of the arms **27** and **28** in which position the intermediate section or resilient finger **24** reacts against it and holds it in position against the arms **28** of the end sections **23**. The final position of the conductor **10** depends upon its diameter as is apparent from a consideration of FIG. 2. The live line tool **19** then is detached and the current responsive device **11** is held in position on the conductor **10** by the resilient action of the clamping member **22** and particularly by the resilient action of the intermediate section or resilient finger **24**.

In FIGS. 5–9 there is illustrated, generally at **36**, an E-shaped resilient clamping member that is formed of spring wire. Preferably the spring wire is non magnetic in character when the clamping member **36** is employed in connection with the current responsive device **11** as mounted on the current carrying conductor **10**. The current respon-

sive device **11** is similar in construction to that shown in the preceding figures except that the arm **16** is somewhat longer for a purpose that will be apparent presently.

The E-shaped clamping member **36** includes U-shaped end sections **37** and an intermediate section **38**, these sections being commonly joined by a back section **39** which provides a reverse turn entrance portion **40** to facilitate application to the conductor **10**. Each end section **37** includes arms **41** and **42** that are joined at a bight **43**. Laterally extending distal ends **44** of the arms **41** terminate in loops **45** through which the bolts **15** project. It will be noted that the bolts **15** are positioned at the upper end of the current responsive device **11** rather than at the lower end as illustrated in FIGS. 1–4.

With a view to reducing slippage between the conductor **10** and the intermediate section **38** of the clamping member **36** a friction sleeve **46**, FIG. 9, is telescoped thereover. The friction sleeve **46** may be formed of rubber-like material such as neoprene.

In order to center the conductor **10** with respect to the current responsive device **11** the intermediate section **38** of the clamping member **36** is bowed as indicated at **47**. In this embodiment of the invention the conductor **10** is urged against a rear surface of the current responsive device **11** at a position opposite the bight of the bowed portion **47** and this position remains the same within a substantial range of diameters for the conductor **10**. However, the bights **43** in the end sections **37** readily accommodate the conductor **10** therein.

When the current responsive device **11** is to be applied to the conductor **10**, the live line tool **19** is attached and the assembly is moved in the direction indicated by arrow **48**. The reverse turn entrance portion **40** engages the conductor **10** and is moved away from the rear surface of the current responsive device **11** as indicated in FIG. 8. The movement of the assembly in the direction of the arrow **48** continues until the conductor **10** is in the bowed portion **47** as shown in FIG. 6. The live line tool **19** then is disconnected from the current responsive device **11** which is left in place on the conductor **10**.

As pointed out the spring wire clamping member **36** is formed of non magnetic spring wire when used for holding the current responsive device **11** in position on the conductor **10**. When it is desired to reduce the magnitude of the current flow required to operate the device **11**, the clamping member **36** is formed of magnetic material. This provides a magnetic circuit that extends partially around the conductor **10** and increases the available magnetic flux for a given current flow.

While the clamping members **22** and **36** have been described as being particularly applicable for attaching and detaching a current responsive device to a conductor, it will be understood that these clamping members can be employed for other applications. For example the clamping members **22** and **36** can be secured to stationary supports such as a wall and arranged to receive the shank of a tool such as the handle of a hammer, etc. Also the clamping members **22** and **36** can be mounted horizontally rather than vertically.



What is claimed as new is:

**1.** Means for detachably clamping a current responsive device to electric current carrying conductors of varying diameters comprising

an E-shaped resilient clamping member having the end sections of U-shape, each end section having the distal end of one of its branches extending laterally for fastening to said device, adapted to receive said conductor in the bight thereof in overlying relation to said device, and having a reverse turn portion at the distal end of the other of its branches forming the back section of said E-shape to facilitate application to said conductor, and

the intermediate section of said E-shaped clamping member extending from said back section for juxtaposition to said device and overlying said conductor to clamp it against said device.

**2.** Clamping means according to claim **1** wherein said intermediate section of said E-shaped clamping member is arranged to react against said conductor to urge it against the inner sides of said one branch of said end sections.

**3.** Clamping means according to claim **1** wherein said E-shaped resilient clamping member is formed of plastic material.

**4.** Clamping means according to claim **1** wherein said E-shaped resilient clamping member is formed of spring wire.

**5.** Clamping means according to claim **1** wherein a friction sleeve is telescoped over said intermediate section of said E-shaped clamping member.

**6.** Clamping means according to claim **1** wherein said intermediate section of said E-shaped clamping member is bowed intermediate its ends to center said conductor in the bight thereof.

**7.** The clamping means according to claim **1** wherein said E-shaped resilient clamping member is formed of non magnetic spring wire.

**8.** The clamping means according to claim **1** wherein said E-shaped resilient clamping member is formed of magnetic spring wire.


**References Cited**

UNITED STATES PATENTS

| | | | |
|---|---|---|---|
| 2,323,454 | 7/1943 | Chambers | 211—41 X |
| 2,265,393 | 12/1941 | Place | 24—73 |
| 2,387,892 | 10/1945 | Ellis | 248—316 X |
| 2,511,801 | 6/1950 | Churchill | 24—81 |

FOREIGN PATENTS

| | | |
|---|---|---|
| 556,847 | 10/1943 | Great Britain. |
| 885,372 | | Great Britain. |


CHANCELLOR E. HARRIS, Primary Examiner

U.S. Cl. X.R.

24—73.7, 129, 257; 248—300