Sept. 9, 1958 R. E. PHELON ET AL 2,851,546

TERMINAL CONNECTION AND ASSEMBLY

Filed Oct. 13, 1955

FIG. 1

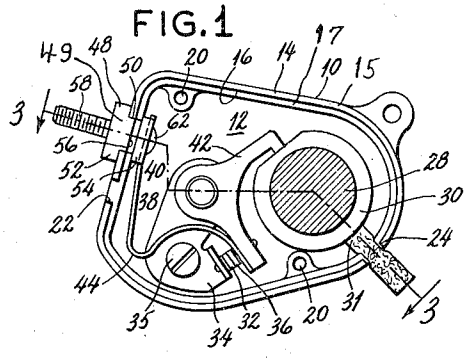


FIG. 2

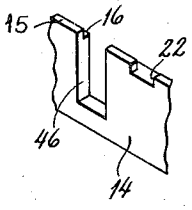


FIG. 3

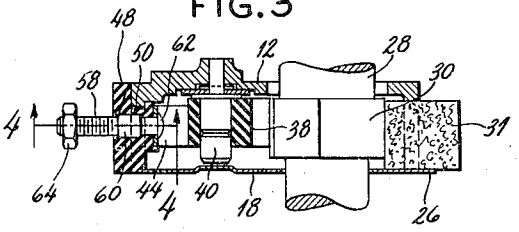


FIG. 6

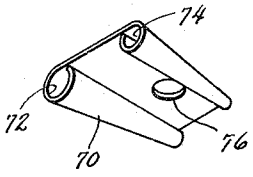


FIG. 4

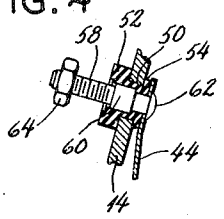


FIG. 5

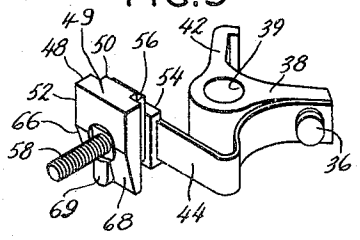


FIG. 7

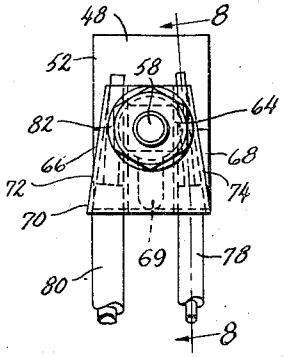
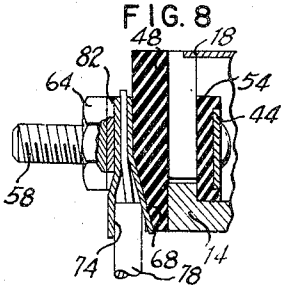


FIG. 8



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TERMINAL CONNECTION AND ASSEMBLY

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Application October 13, 1955, Serial No. 540,178

9 Claims. (Cl. 200—30)

The invention relates to a terminal device at, or adapted to be placed at, one wall of a box for providing an electrical connection through the box wall from an exterior wire or wires to the electrical mechanism within the box.

The general object of the invention is to provide a terminal device for the above-stated purpose which is simple and inexpensive and which can be readily assembled with or disassembled from the box without the use of tools.

A more specific object of the invention is to provide a terminal device such as referred to in combination with a magneto breaker mechanism, the leaf spring of the breaker mechanism being directly connected with the terminal device to constitute a terminal connection.

Further objects of the invention will be apparent from the drawing and from the following description and claims.

In the drawing we have shown in detail a preferred embodiment of the invention, but it will be understood that various changes may be made from the construction shown, and that the drawing is not to be construed as defining or limiting the scope of the invention, the claims forming a part of this specification being relied upon for that purpose.

Of the drawing:

Fig. 1 is a front view of a magneto breaker mechanism having a terminal connection and assembly embodying the invention, the front cover being omitted.

Fig. 2 is a fragmentary perspective view of the left portion of the box shown in Fig. 1.

Fig. 3 is a horizontal sectional view taken along the line 3—3 of Fig. 1, and also showing the front cover.

Fig. 4 is a fragmentary vertical sectional view taken along the line 4—4 of Fig. 3.

Fig. 5 is a perspective view of the terminal device and of an attached spring and breaker arm.

Fig. 6 is an enlarged perspective view of a sheet metal wire terminal adapted to be used in conjunction with a terminal connection embodying the invention.

Fig. 7 is an enlarged right side view of the insulating block of the terminal connection with wires attached thereto by means of the sheet metal wire terminal shown in Fig. 6.

Fig. 8 is a sectional view taken along the line 8—8 of Fig. 7.

Referring to the drawing, 10 represents a box for enclosing an electrical mechanism, and as illustrated this mechanism is a breaker mechanism for a magneto. The box is preferably formed of metal and it has a rear wall 12 and a peripheral wall 14 having outer and inner faces and also having a front face 15. The wall 14 has an interior rabbet 16 which provides a second front face 17. A detachable front cover 18 is provided which normally engages the wall 14 at one of the front faces thereof, preferably at the face 17 in the rabbet 16. The cover is held in place by screws, not shown, which enter holes 20, 20 in bosses on the box wall 14. As shown, said wall has notches 22 and 24 for receiving outwardly projecting tabs on the cover, one of said tabs being shown at 26 in Fig. 3.

When the mechanism within the box is a magneto breaker mechanism, the rear wall 12 and the cover 18 are preferably apertured to receive a shaft 28 having a breaker cam 30 carried thereby and located within the box. A conventional wiper felt 31 may be provided for the cam 30, thus being held in a notch in the wall 14 of the box. The details of the disclosed breaker mechanism do not constitute any part of the present invention, but the mechanism shown is similar to that shown in the copending application of Russell E. Phelon, Serial No. 492,158, filed March 25, 1955, and entitled "Magneto Mechanism."

The breaker mechanism, as shown, includes a stationary breaker point 32 carried by a bracket 34 secured by a screw 35 to the rear wall 12 of the box and thus grounded. Said mechanism also includes a movable breaker point 36 carried by a rocker arm 38 having a bearing aperture 39 for receiving a longitudinal pivot pin 40 carried by said box wall 12. The rocker arm 38 has an extension 42 which is engaged by said cam 30 on the shaft 28. A spring 44 serves to bias the rocker arm 38 to move the point 36 into engagement with the point 34, and the spring also serves as a conductor to provide an electrical connection to the movable breaker point 36.

A terminal device, to which the present invention more particularly relates, provides an electrical connection through one wall of the box between one or more exterior wires and the interior mechanism which may be the described magneto breaker mechanism.

The peripheral wall 14 of the box has a notch 46 therein as shown in Fig. 2 which notch is open at the front and is at least as wide at the front as elsewhere. Preferably the notch is substantially rectangular. A block 48 of insulating material is provided, this block having outer and inner faces and a flat front face 49 and having a central portion 50 which has the same size and shape as the notch 46 and which is adapted to be entered in the notch from the front and to have a tight fit therein. The said portion 50 of the block substantially fills the notch with the front face 49 of the block approximately flush with the front face 15 of the wall 14. The block 50 has wider outer and inner flanges or portions 52 and 54 which are spaced apart by a distance equal to the thickness of the box wall 14. Said portions 52 and 54 provide grooves at the sides of the central portion 50 and they engage the outer and inner faces of the peripheral box wall 14 and cooperate with said central portion to firmly hold the block 48 against transverse movement with respect to said wall 14. Said block 48 is insertable rearwardly in said notch 46 and is removable forwardly therefrom. The block is preferably provided at the front with a rabbet 56 which matches the rabbet 16 in the box wall 14, said rabbet providing the block with a second front wall which matches the second front wall 17 of the box wall. When the block 48 is in place, the front cover 18 preferably engages said second front wall of the block.

The block 48 has an aperture therein extending therethrough between the outer and inner faces thereof, and a conductor 58 extends through and fits said aperture, said conductor being exteriorly connectible to a wire or wires and being interiorly connectible to the electrical mechanism within the box. The main front face of the block is perpendicular to the axis of the aperture and of the conductor 58.

When the mechanism within the box is a magneto breaker mechanism such as described, the inner end of the conductor 58 is preferably directly connected with the outer end of the spring 44. As shown, the inner flange or portion 54 of the block 48 has a shallow transverse groove which receives and fits the outer end portion of

the spring, and the said outer end portion of the spring is apertured to receive the conductor **58**. The conductor **58** is preferably a combined screw and rivet, and it has a noncircular enlargement **60** which prevents rotation and limits inward movement. The inner end portion of the conductor **58** is riveted over at **62** to hold and provide electrical connection with the spring **44**. The transverse spring receiving groove in the block portion **54** has at least one transverse wall that engages a corresponding edge of the spring to prevent any rotative movement of the spring about the conductor **58**, and as shown said groove has two such walls. The outer end portion of the conductor **58** is threaded and is engageable by a nut **64** which constitute exterior means for the connection of wires.

Preferably, but not necessarily, the outer face of the block **48** has inclined or beveled portions **66** and **68** which are at one side of the block aperture and which extend to one edge of the block which edge is shown as being the rear edge. Said portions **66** and **68** are at opposite sides of a plane perpendicular to the main front face of the block and extending through the axis of the block aperture. As shown, the face portion **66** has a larger angle of inclination than the face portion **68**. The beveled face portions **66** and **68** adapt the terminal connection for use with a sheet metal wire terminal **70** such as shown in Fig. 6. A rib **69** is provided between the inclined portions **66** and **68**.

The metal comprising the terminal **70** is bent to provide two loops or curls **72** and **74** which are generally parallel and which are tapered in the same direction. Said loops are curled rearwardly from the front portion of the terminal. One of the loops, as for instance **72**, may be substantially larger than the other. Between the loops **72** and **74** the metal is substantially flat and is apertured at **76** to receive a screw such as the threaded portion of the conductor **58**.

When two insulated wires such as **78** and **80** are to be connected with the terminal connection, the insulation is removed at the ends of the wires and said wires are thrust into the respective loops to the extents permitted by the insulation as shown in Fig. 7. Then the terminal **70** is placed on the block **48** with the conductor member **58** extending through the aperture **76**, the inclined inner sides of the loops **72** and **74** engaging and fitting the inclined face portions **66** and **68**. The taper of the loops **72** and **74** and the inclination of the faces **66** and **68** are such that the front flat portion of the wire terminal is parallel with the main front portion of the block. A washer **82** is placed on the conductor **58** between the nut **64** and the terminal **70**. When the nut is tightened, the washer **82** crushes the loops **72** and **74** and provides good electrical connection between said wires **78** and **80** and the conductor **58**. The crushed loop **74** at the right is more clearly shown in Fig. 8. The rib **69** engages the wire terminal to prevent rotation of said terminal about the axes of the conductor **58**.

When the electrical mechanism in the box is a magneto breaker mechanism, the parts shown in Fig. 5 constitute a sub-assembly which can be initially assembled as a separate unit and which can be thereafter assembled as an entirety with the box and with the other parts of the breaker mechanism. With the box cover **18** not in place, the subassembly as shown in Fig. 5 can be moved rearwardly relatively to the box, care being taken to see that the central portion **50** of the block enters the notch **46** in the box wall and to see that the pivot pin **40** enters the aperture **39** in the rocker arm. The block **48** tightly fits the notch **46** in the wall and the block is frictionally held. Furthermore, the cover **18** when in place and held serves to prevent any forward movement of the block. Inasmuch as the spring **44** is firmly connected with the block **48**, said spring serves to prevent any forward movement of the rocker arm **38**. It will be obvious that, with the cover **18** removed, the said subassembly can be readily removed forwardly.

The invention claimed is:

1. The combination of a box including a peripheral wall having outer and inner faces and a front face and provided with an open-front notch at least as wide at the front thereof as elsewhere, a single unitary block of insulating material having outer and inner faces and a flat front face and having a central portion which fits and substantially fills said notch and said block being insertable rearwardly in said notch and removable forwardly therefrom and said block having outer and inner portions which are wider than the central portion and which engage the outer and inner faces of said peripheral wall adjacent the notch to hold said block against transverse movement with respect to said wall and with its said central portion in said notch, the flat front face of the block being approximately flush with the front face of the peripheral wall and said block having an aperture therein extending therethrough between the outer and inner faces thereof and said inner face of said block having a transverse shallow groove intersecting said aperture, a magneto circuit breaker mechanism within the box including a rocker arm and including a leaf spring connected with said arm and adapted to serve as a conductor, the outer portion of said spring entering and fitting said groove in the inner face of the block and having an aperture in register with said block aperture, an electrical conductor extending through and fitting said block aperture and having exterior means for electrical connection with exterior wires, said conductor also extending through said spring aperture and engaging said spring to hold it in fixed relation to said block, and a detachable front cover normally engaging the front faces of said peripheral wall and of said block.

2. The combination of a box adapted for containing an electrical mechanism and including a peripheral wall having outer and inner faces and provided with an open-front notch at least as wide at the front thereof as elsewhere, a single unitary block of insulating material having outer and inner faces and having a central portion which fits and substantially fills said notch and which block is insertable rearwardly in said notch and removable forwardly therefrom and has outer and inner portions which are wider than said central portion and engage the outer and inner faces of said wall adjacent the notch, said block having an aperture therein extending between said outer and inner faces thereof and said outer face of the block including a portion parallel with said box wall and also including two other portions which are transversely spaced and located at opposite sides of a plane through the axis of said aperture and which terminate at one edge of the block and are inwardly inclined similarly to each other, and electrical conductor extending through and fitting the aperture in said block and having means at its inner end for electrical connection with a mechanism within said box, and a wire terminal connected with said electrical conductor at its outer end and adapted for holding two electrical conductor wires and for providing electrical connection therewith which said terminal includes parts that engage and fit said inclined portions of the front face of the block.

3. The combination as set forth in claim 2, wherein a rib is provided between said two inclined portions of the outer face of the block, and wherein said rib engages said terminal to prevent rotation of the terminal about the axis of the conductor in said aperture.

4. The combination as set forth in claim 2, wherein said wire terminal is formed of sheet metal and is apertured to receive said conductor and has two transversely spaced rearwardly curled tapered loops which are adapted respectively for receiving and fitting two electrical conductor wires, said loops of the terminal engaging and fitting said inclined portions of the front face of the block and being so tapered that the front portion of the terminal

is parallel with said parallel portion of the front face of the block of the terminal, and wherein a nut in threaded engagement with said conductor engages a washer which engages said parallel front portion of the wire terminal.

5. The combination as set forth in claim 4, wherein wires are entered in and engaged with said loops of said terminal, and wherein said loops are partly flattened where engaged by said washer so that each loop at the inner and outer side thereof is in firm engagement with the corresponding wire.

6. The combination of a block of insulating material having an outer face and having an aperture therein which extends to said outer face, said outer face of the block including a portion perpendicular to the axis of said aperture and also including two other portions which terminate at one edge of the block and are inclined similarly to each other and inwardly from the plane of said perpendicular portion of the block face, the last said portions being transversely spaced and located at opposite sides of a plane perpendicular to said block face and extending through the axis of said aperture, an electrical conductor extending through and fitting the aperture in said block, and a wire terminal engaging said electrical conductor at its outer end and adapted for holding two electrical conductor wires and for providing electrical connection therewith which said terminal includes parts that engage and fit said inclined portions of the front face of the block.

7. The combination as set forth in claim 6, wherein said wire terminal is formed of sheet metal and is apertured to receive said conductor and has two transversely spaced rearwardly curled tapered loops which are adapted respectively for receiving and fitting two electrical conductor wires, said loops of the terminal engaging and fitting said inclined portions of the front face of the block and being so tapered that the front portion of the terminal is parallel with said parallel portion of the front face of the block of the terminal, and wherein a nut in threaded engagement with said conductor engages a washer which engages said parallel front portion of the wire terminal.

8. The combination as set forth in claim 7, wherein wires are entered in and engaged with said loops of said terminal, and wherein said loops are partly flattened where

engaged by said washer so that each loop at the inner and outer side thereof is in firm engagement with the corresponding wire.

9. The combination of a single unitary block of insulating material having outer and inner faces and a flat front face and formed with grooves at its sides which provide a central portion adapted to fit and substantially fill an open-front notch in a box wall which block has an aperture therein extending therethrough between the outer and inner faces thereof, said outer face of the block including a portion perpendicular to the axis of said aperture and also including two other portions which terminate at one edge of the block and are inclined similarly to each other and inwardly from the plane of said perpendicular portion of the block face which said inclined portions are transversely spaced and located at opposite sides of a plane perpendicular to said front face and extending through the axis of said aperture and said inner face of the block having a transverse shallow groove intersecting said aperture, a rocker arm for a magneto circuit breaker mechanism, a movable breaker point carried by said arm, a leaf spring fixedly connected mechanically with said rocker arm and electrically connected with said breaker point and adapted to serve as a conductor, the outer portion of said spring entering and fitting said groove in the inner face of the block and having an aperture in register with said block aperture, and an electrical conductor extending through and fitting said block aperture and also extending through said spring aperture and engaging said spring to hold it in fixed relation to said block, said conductor being threaded at its outer portion for engaging a nut adapted to hold a wire terminal having two transversely spaced portions adapted respectively for engaging the transversely spaced inclined portions of the outer face of the block.

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