Dec. 2, 1930. G. L. CHAMBERLAIN 1,783,220

MULTIPLE CONNECTING DEVICE

Filed Aug. 14, 1929

FIG. 1

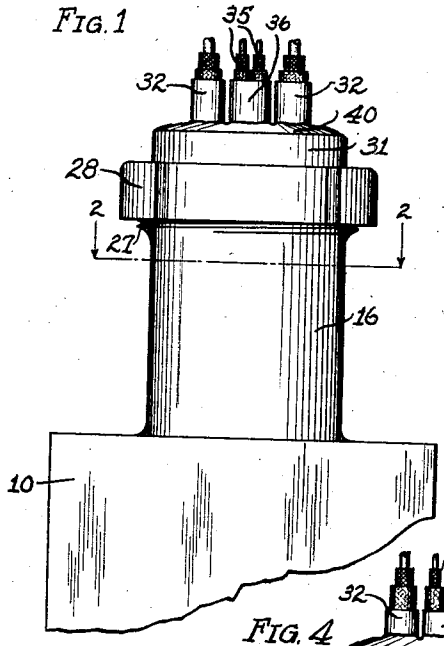


FIG. 2

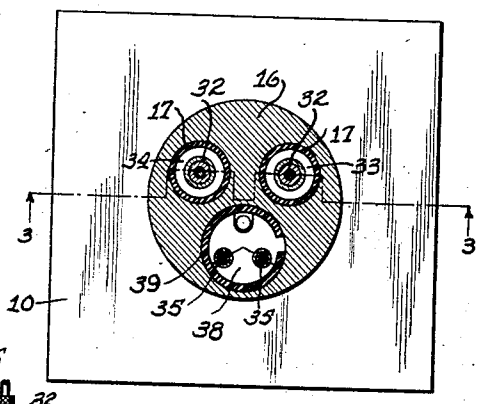


FIG. 4

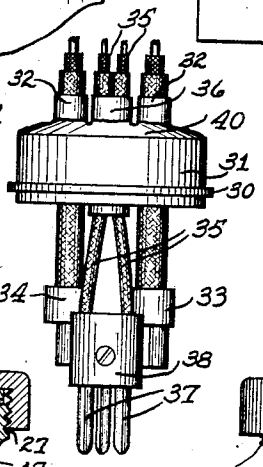


FIG. 3

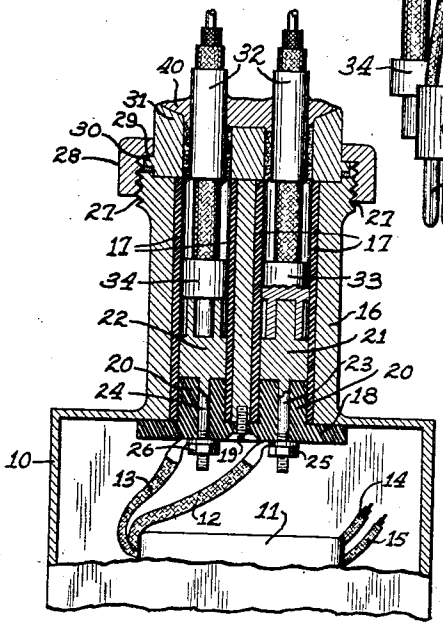
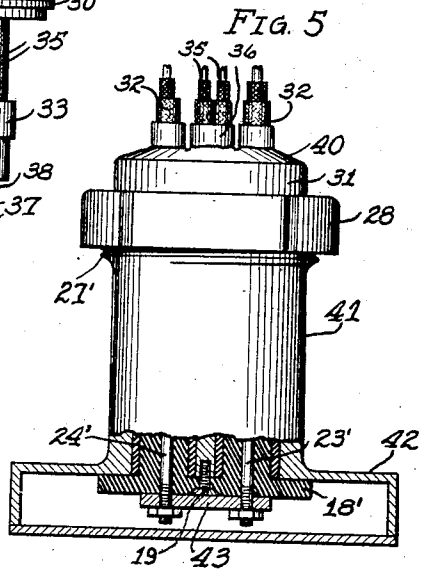


FIG. 5



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UNITED STATES PATENT OFFICE

GEORGE L. CHAMBERLAIN, OF CHICAGO, ILLINOIS

MULTIPLE CONNECTING DEVICE

Application filed August 14, 1929. Serial No. 385,956.

This invention relates to electrical connections, and it has for its objects to provide a unitary multiple connecting device, and more particularly for simultaneously connecting the primary and secondary elements of a transformer or the like.

The invention consists primarily in a novel arrangement of separate terminal contact elements on a single coupling body, and in providing the appliance with a single unitary connecting portion for the reception of said terminal contact elements, and in the further provision of a separate primary reconnecting device having an attaching portion in which said terminal contact members are interchangeably received. The invention further consists in the parts and combinations and arrangements of parts as hereinafter described and claimed.

In the accompanying drawings, forming part of this specification, and illustrating a practical adaptation of the invention,—

Fig. 1 is a fragmentary view, in side elevation, of the upper portion of a transformer housing, with the unitary connecting device attached thereto;

Fig. 2 is a section taken on or about the line 2—2 of Fig. 1;

Fig. 3 is a section taken on or about the line 3—3 of Fig. 2;

Fig. 4 is a side elevation of the unitary connecting device detached; and

Fig. 5 is a view, partly in side elevation and partly in vertical section, showing the unitary connecting device attached to the primary reconnecting device.

Referring now to the drawings, the numeral 10 designates the housing in which is mounted the transformer 11, said transformer being provided with the usual primary leads 12 and 13, respectively, and secondary leads 14 and 15. All of said leads are taken out of the housing 10 through a single outlet extension 16, being preferably formed integral with the housing and said extension 16 having separate bores which are lined with tubular insulating members 17, through which the respective connections are made with the said primary and secondary leads.

On the inside of the housing 10 is a block 18 of insulating material, said block being secured to the housing 10 by a screw 19 and being provided with cylindrical bosses 20 which are inserted in the inner end portions of the tubular insulating members 17 and have plug and socket members 21 and 22 mounted thereon, said plug and socket members being respectively provided with stem portions 23 and 24 extending through said insulation block 18 and being connected, as at 25 and 26, to said primary leads 12 and 13.

The primary leads, as shown, have separate outlets through the extension 16, but the secondary leads 14 and 15 are connected through a single outlet in which, however, is provided separate terminal contacts for the respective wires.

At the outer end portion of the extension 16 is an externally screw-threaded head 27 which is engaged by a coupling nut 28 having an internal annular flange 29 which cooperates with an external flange 30 on a connecting element 31. The meeting portions of said connecting element 31 and extension 16 are arranged for a moisture-proof jointure, which will be accomplished either by grinding the seating portions of said members, or providing a gasket between them.

The end portions 32 of the primary feed cables are secured in openings provided therefor in the connecting element 31, and they are respectively provided with a terminal contact socket 33 and a plug member 34 for engagement with the plug and socket members 21 and 22 in the extension 16 of the transformer housing 10. The secondary circuit wires 35, which conduct the output of the transformer, are carried in a single lead covered cable 36, which latter is secured in an opening provided therefor in the connecting element 31. The inner end portions of the secondary wires 35 are respectively connected to a pair of terminal contact members 37, which are mounted on a plug 38 of insulating material, said plug being insertable in an opening in the extension 16 of the transformer housing 10, said opening having a tubular insulating lining 39, and the insulating block 18 being provided with complementary contact members (not shown) which

latter are provided for engagement by said members 37 and are obviously connected to the leads 14 and 15 of the secondary winding of the transformer 11.

The respective cables 32 and 36 being securely attached to the connecting element 31, as by a body of solder 40, a unitary terminal contact structure is produced which is readily attached and detached from the extension 16 of the transformer housing 10 so as to simultaneously close and break the primary and secondary circuits at will.

In cases where it is desirable or necessary to disconnect and remove the transformer from the primary feed circuit and yet keep the primary circuit closed, a reconnecting device is provided. This device, as illustrated in Fig. 5 of the drawings, comprises a separate supplemental or substitute connecting member 41, which is similar to the extension 16 of the transformer housing 10, said member 41 being an extension of a special relatively small box or housing 42 which is provided to inclose the insulating block 18′, which latter is similar to the block 18 and carries terminal contact members similar to the members 21 and 22 whose stem portions 23′ and 24′ are electrically cross-connected by the member 43. In other respects the provision for the reception of the terminal socket and plug members 33 and 34 of the primary cables 32, in this emergency connecting device 41, is identical with the arrangements of the extension 16 of the transformer housing, with the exception that no provision is made for electrically connecting the terminal contact members 37 of the secondary wires 35. Obviously, the casing 42 may be filled with an insulating compound if desired and the externally screw-threaded end portion 27′ of the member 41 corresponds to the portion 27 of the extension 16 of the transformer housing 10 so as to receive the coupling nut 28 interchangeably thereon.

From the foregoing it is apparent that the device may be quickly connected and disconnected, which is of considerable advantage in cases of emergency where it is not convenient to immediately replace a disabled transformer, yet a transformer may be cut out of the circuit and the circuit reconnected to maintain other instruments in use, and while the structure illustrated in the drawings serves to carry the invention practically into effect, the invention is not limited to the details thereof, as many changes may be made in the construction and arrangement without departing from the spirit and scope of the invention as defined by the appended claims.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. The combination of a transformer and a unitary primary and secondary circuit connecting device, said transformer having a single connection extension provided with separate primary contact receiving portions in circuit with the primary winding of the transformer, and a single secondary contact receiving portion in circuit with the secondary winding of the transformer, said unitary circuit connecting device having separate primary contact members and a single plug carrying the several secondary terminal contact members, and an emergency reconnecting device having provision similar to that of said transformer single connection extension for the attachment thereto of said unitary connecting element and having provision for electrically connecting the primary terminal contacts of said unitary device but not the secondary terminal contacts thereof.

2. The combination of a transformer having a single connecting member, said connecting member being provided with separate complementary electrical contact elements respectively connected to the primary and secondary windings of the transformer, a unitary connecting element having separate primary and secondary current leads respectively engageable with said contact elements of said transformer, and a separate substitute reconnecting device having provision similar to that of the transformer connecting member for the attachment thereto of said unitary connecting element, and having means for electrically connecting the primary leads only of said unitary connecting element.

3. In combination, a closed housing having a transformer therein, said housing having a single attaching extension, terminal contact members in said extension having electrical connection with the primary winding of the transformer and separate terminal contact members having electrical connections with the secondary windings of said transformer, a unitary connecting element carrying primary current leads and secondary current leads, means for detachably securing said unitary connecting element to said attaching extension of the housing, and a supplemental emergency reconnecting device comprising a housing having a connecting extension similar to the connecting extension of said transformer housing, said reconnecting device having electrically connected primary terminal contact members, and means for detachably securing said unitary coupling element to said reconnecting device.

4. The combination with a transformer housing having a connecting extension provided with a parallel pair of bores, said bores being provided with tubular insulating members, said bores having terminal contact members therein, said contact members being electrically connected to the primary winding of the transformer, said connecting

portion having a third bore provided with a tubular insulating lining, terminal contact members in said third bore, electrical connection between the secondary winding of said transformer and said last named contact members, a unitary connecting member having primary leads provided with terminal contact members insertable respectively in said parallel pair of bores, whereby to engage the terminal contact members therein, a plurality of secondary current leads attached to said unitary connecting element and being provided with a plug having terminal contacts insertable in said third bore of the connecting extension of said transformer housing, and an interchangeably attachable supplemental reconnecting device arranged similarly to said connecting extension of said transformer housing, said reconnecting device having only its primary terminal contact members electrically connected, and common means for detachably securing said unitary connecting element to said connecting extension of said transformer housing and said reconnecting device.

5. In a transformer of the character described, a housing containing the transformer proper, said housing having a single connection extension provided with a pair of parallel bores having socket members therein respectively connected with the primary circuit terminals of the transformer, and a third bore provided with sockets connected with the respective secondary circuit terminals of the transformer, and a unitary connecting element having separate terminal plugs receivable in said parallel pair of bores and engageable with the respective primary terminal sockets, and an additional plug insertable in said socket member of the respective primary circuits.

6. In a transformer of the character described, having terminal leads to a primary feed circuit and terminal leads to a secondary output circuit, a housing having a common connecting portion provided with separate electrical contact elements for the respective terminal leads, and a detachable connecting device having counterpart primary and secondary electrical connecting elements, respectively, whereby the connection between the transformer and its primary feed circuit and with its secondary output circuit may be simultaneously made and broken, at will.

7. In a transformer of the character described, having terminal leads to a primary feed circuit and terminal leads to a secondary output circuit, a housing having a common connecting portion provided with separate electrical contact elements for the respective terminal leads, a detachable connecting device having counterpart primary and secondary electrical connecting elements, respectively, whereby the connection between the transformer and its primary feed circuit and with its secondary output circuit may be simultaneously made and broken, at will, and an emergency substitute connecting device comprising a housing having provision similar to that of said first mentioned housing for the attachment of said detachable connecting device, said emergency substitute connecting device having its primary feed circuit terminal contacts electrically cross-connected, but the secondary output circuit contacts thereof being without electrical connection.

In testimony whereof I have signed my name to this specification.

GEORGE L. CHAMBERLAIN.