Aug. 18, 1931. J. RAH 1,819,302

OIL AND AIR BREAK POTHEAD DISCONNECT

Filed Sept. 9, 1927 2 Sheets-Sheet 1

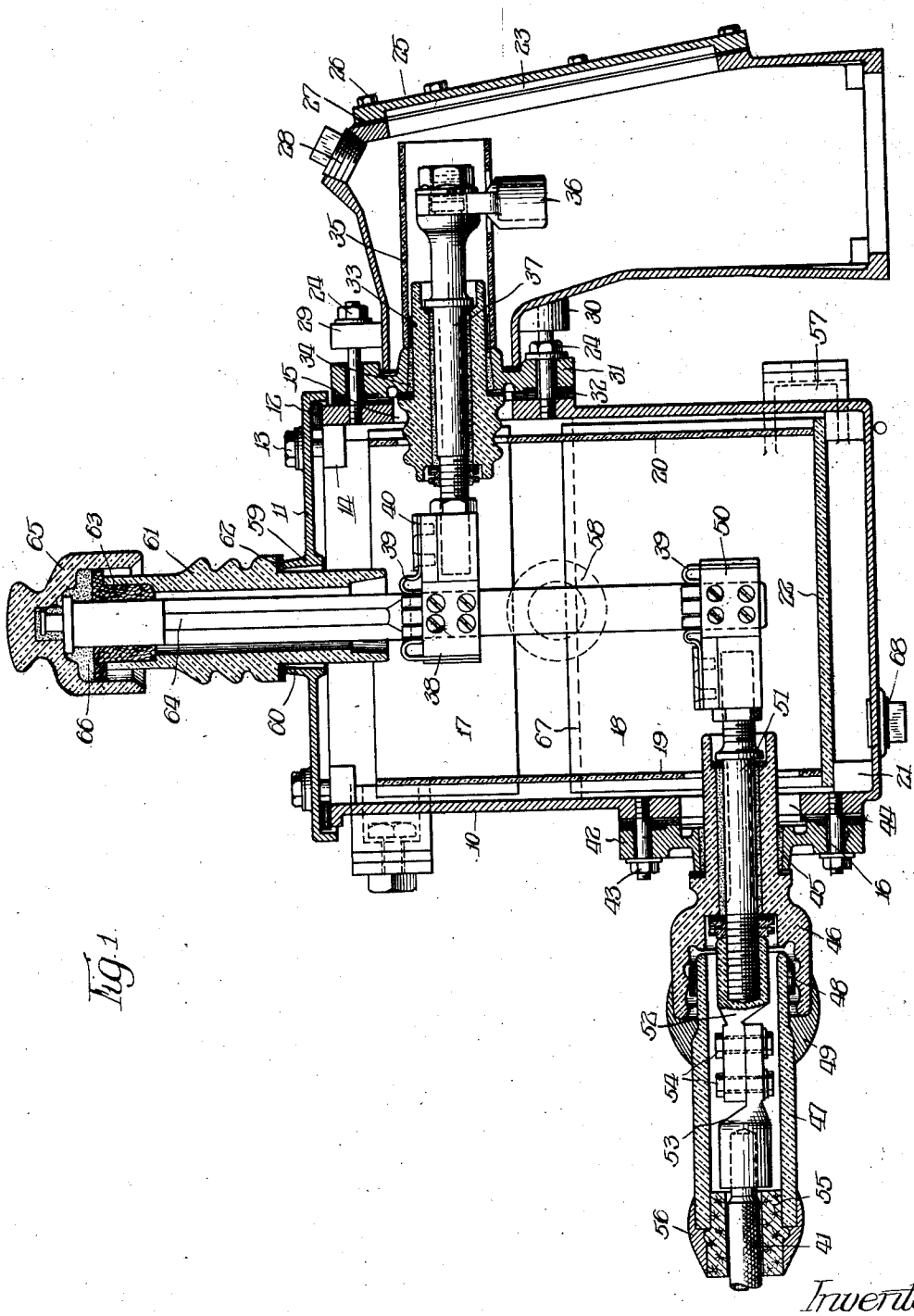


Fig. 1

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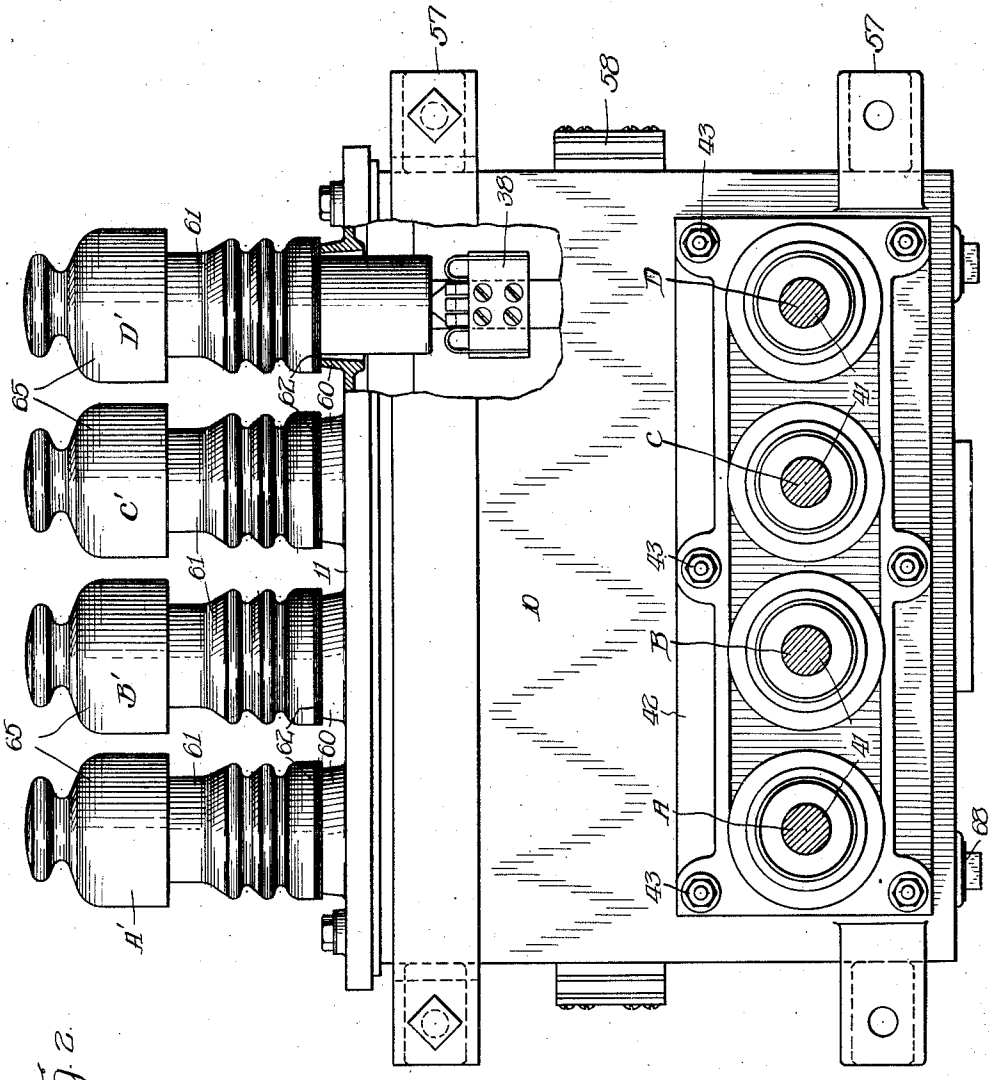


Fig. 2.

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Patented Aug. 18, 1931 1,819,302

UNITED STATES PATENT OFFICE

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OIL AND AIR BREAK POTHEAD DISCONNECT

Application filed September 9, 1927. Serial No. 218,439.

This invention pertains to disconnects and more particularly to oil and air break pothead disconnects.

It is often found necessary to effect electrical connections between different cables, such as those between a main line and various feeders, or between overhead and ground lines, or combinations thereof.

In providing connection between such lines, danger is often encountered in establishing or disconnecting said connections, as well as trouble being often encountered in maintaining such connections.

It is therefore an object of this invention to provide an electrically and commercially satisfactory simple disconnect embodying an oil break and an air separation.

Another object of the invention is to provide a disconnect of the above described character by which a section of the line may be completely removed without leaving a connecting body or film of oil, although the initial removal of said section will break the current in oil.

Still another object is to provide a disconnect whereby it is possible to make and break a series of contacts by means external of the disconnect and in such a manner as to prevent injury to the device or to the operator.

A still further object is to provide a device for effecting electrical connection between conductors, said device being of such character as will permit selective location of the conductor contact blocks, and as will provide insulation between said blocks to prevent arcing of the blocks or connecting links.

Still further object is to provide an inexpensive safety device of the type of an oil and air break pothead disconnect which fulfills all requirements of manufacture and service.

With these and various other objects in view, the invention may consist of certain novel features of construction and operation as will be more fully described and particularly pointed out in the specification, drawings and claims appended hereto.

In the drawings, which illustrate an embodiment of the device and wherein like reference characters are used to designate like parts,

Figure 1 is a sectional side elevation through the disconnect embodying the invention,

Figure 2 is a side elevation, a part being in section, of the disconnect shown in Figure 1.

The device consists essentially of a container or body portion 10, preferably of metal, provided with a removable top 11 supported on gaskets 12 disposed between the container and top, said top being fastened as by removable bolts 13 cooperating with the threaded lugs 14. The container is provided with apertures 15 and 16 in the walls thereof, of substantially the same dimensions but provided at different levels and preferably on different sides of the container. At this point it may be well to note that the box illustrated is for establishing a plurality of connections, such as between cables A, B, C and D, each being connected through a switch member A′, B′, C′ and D′ to respective separate cables. It has been found advisable to provide insulating partitions 17 and 18 between each set of cable connections, but as each of said connections and its associated parts are the same, so as to be readily interchangeable, it is thought sufficient to describe only one set of said connections. The box is further provided with insulating walls 19 and 20 running the full length of the box spaced from the walls and supported such as by insulating blocks 21 which also serve to support an insulating base 22.

A pothead 23 is secured to the container in way of the aperture 15, such as by bolts 24, this pothead 23 as illustrated being for the underground cable lead. The pothead is made accessible through a cover 25 secured to the pothead sleeve, as by bolts 26, the same having a gasket 27 provided between the cover and the sleeve. As it is usual to provide insulating oil around the cable lead disposed in the pothead, a filling plug 28 is provided near the top thereof for introduction of said oil. Lugs 29 and 30 are provided on

the sleeve cooperating with bolts 24 to effect securing relation with the container through threaded engagement of the bolts with the container.

A side plate 31 is provided on the pothead for assisting in connection to the container, and gaskets 32 are provided for effecting an oil tight joint. An insulating porcelain tube 33 extends through the pothead into the container, the same being held by the cooperating side plate 31, such as by the cement 34 disposed therebetween. Said tube is partially encircled by another insulating tube 35 disposed in the pothead and provided around a portion of the underground cable lug 36 secured to one end of a connector 37, the other end of said connector being provided with a switch block 38 extending into the container, said switch block being provided with an opening extending through the block substantially square in section, and having a plurality of switch springs or fingers 39 secured to said block in any convenient manner, such as by removable screws 40 on each side of said opening and extending therethrough.

The lower opening 16 in the container is shown closed by a connection for an overhead cable lead 41. This connection consists essentially of a side plate 42 similar in size to the side plate 31 and provided with fastening means 43 passing through the side plate and a gasket 44 to removably secure the connection to the container. The side plate is cemented or otherwise secured, as at 45, to a porcelain insulating tube 46 which in turn is secured to and carries a porcelain tube 47, the same being supported as at 48 and being provided with a wiping 49 therebetween. A contact block 50 similar to the contact block 38 and having switch fingers 39 provided thereon adjacent the opening therein, is positioned below said last named contact block and is secured to a connector 51 passing through the tube 46 and is secured to the cable 41 through lugs 52 and 53 releasably secured together as by bolts 54. A cork bushing 55 closes the end of the porcelain tube 47 and reinforces and surrounds the cable 41, wiping 56 being provided between the tube 47 and the bushing effecting securing relation therebetween. The container is provided with securing means, such as brackets 57, for holding said device in any convenient position, and is also provided with an oil window or gauge 58 disposed in such a place as to indicate the proper oil level 67.

Although a particular overhead and underground connection is described, it will be appreciated that said connections may be reversed, or connections utilizing the pothead may be used, or connections using the tube connections or any other combinations may be used. The top or lid 11 is provided with apertures 59 under which the contact blocks 38 and 50 are located, each of said apertures 59 being provided with an upstanding ridge or annular flange 60 for supporting the tube 61 through the gasket 62. The tube at and near the top is provided with felt gasket 63 extending within the tube and provided for supporting relation between the tube and the switch link 64. A suitable insulating cap 65 is secured to the link by any means, such as by cement 66, and is for the purpose of properly handling said link. The link 64 is preferably of square shape, adapted to fit in the apertures in the switch blocks and of such length as to readily establish electrical connection between said blocks. The container is adapted to be filled with insulating oil or any other insulating means such as to the level indicated at 67, that is to a point approximately mid-way between the contact blocks 38 and 50. It will be understood, of course, that the oil can be inserted through the lid or any other desired place, and may be withdrawn or the level be affected through the plug 68 provided in the container.

When a device of this sort is in use if there is the same kind of insulation provided between the contact blocks there is danger of this insulation becoming filled with carbon particles tending to form an electrical connection between the contact blocks so that even though the switch link 64 may be withdrawn from the assembly, contact is still established between the cables and in the blocks, making it exceedingly dangerous to work with the assembly. Not only that, there is a serious danger of arcing taking place, especially when the link 64 is being withdrawn, endangering the electrical system, the particular assembly, and the operator. With this invention both of these difficulties are overcome. The circuit is broken at the lower terminal which is submerged in oil and therefore arcing is prevented, for even though the oil is contaminated the arc will be quenched and the current flowing through the oil will not be sufficiently heavy to damage the apparatus. As the link is drawn out of the oil the terminals are separated by air so that absolutely no voltage is able to get across between the terminals. The oil break prevents injury to the apparatus and the air gap provides absolute safety for the line men working therebeyond. Because the link is physically removed it enables a line man to see at a glance that it will be safe to work on the line, and gives complete confidence.

It is to be understood, of course, that I do not wish to be limited by the exact embodiment of the device shown, as other and various embodiments will of course occur to those skilled in the art.

I claim:

1. A combined oil and air break disconnect comprising a container having an insulating medium therein, a pair of terminals each of which is directly connected to a lead extending outside of said container and away

from said disconnect, one of said terminals being located above the level of said medium and the other of said terminals being located in said medium, and a removable link normally connecting said terminals, said disconnect being so constructed that when said link is removed there will be neither body nor film of the said insulating medium extending between said terminals.

2. A combined oil and air break disconnect comprising a container having an insulating medium therein, a pair of terminals each of which is directly connected to a lead extending outside of said container and away from said disconnect, one of said terminals being located above the level of said medium and the other of said terminals being located in said medium, said terminals being located sufficiently far apart so that even though the level of the insulating material is varied substantially said terminals will remain respectively substantially above and substantially below the level of said medium, and a removable link normally connecting said terminals, said disconnect being so constructed that when said link is removed there will be neither body nor film of the said insulating medium extending between said terminals.

3. A combined oil and air break pothead disconnect comprising a container, an insulating bushing extending through the upper portion of said container, a lead extending through said bushing; an upper terminal connected directly to said lead; a bushing extending through the lower portion of said container, a second lead extending through said bushing and a second terminal directly connected to said second lead, said leads being the incoming and outgoing leads for said disconnect, insulating medium in said container extending from below said lower terminal to substantially above said lower terminal, said upper terminal being located substantially above the level of said insulating medium, said terminals being located sufficiently far apart so that a substantial variance in the level of said insulating material would leave said terminals still substantially spaced above and below the level of said medium; a removable link normally connecting said terminals, said disconnect being so constructed that when said link is removed there will be neither body nor film of the said insulating medium extending between said terminals.

Signed at Chicago, Ill., this 3d day of September, 1927.

JOSEPH RAH.