

April 2, 1957

F. M. KRATOVILLE

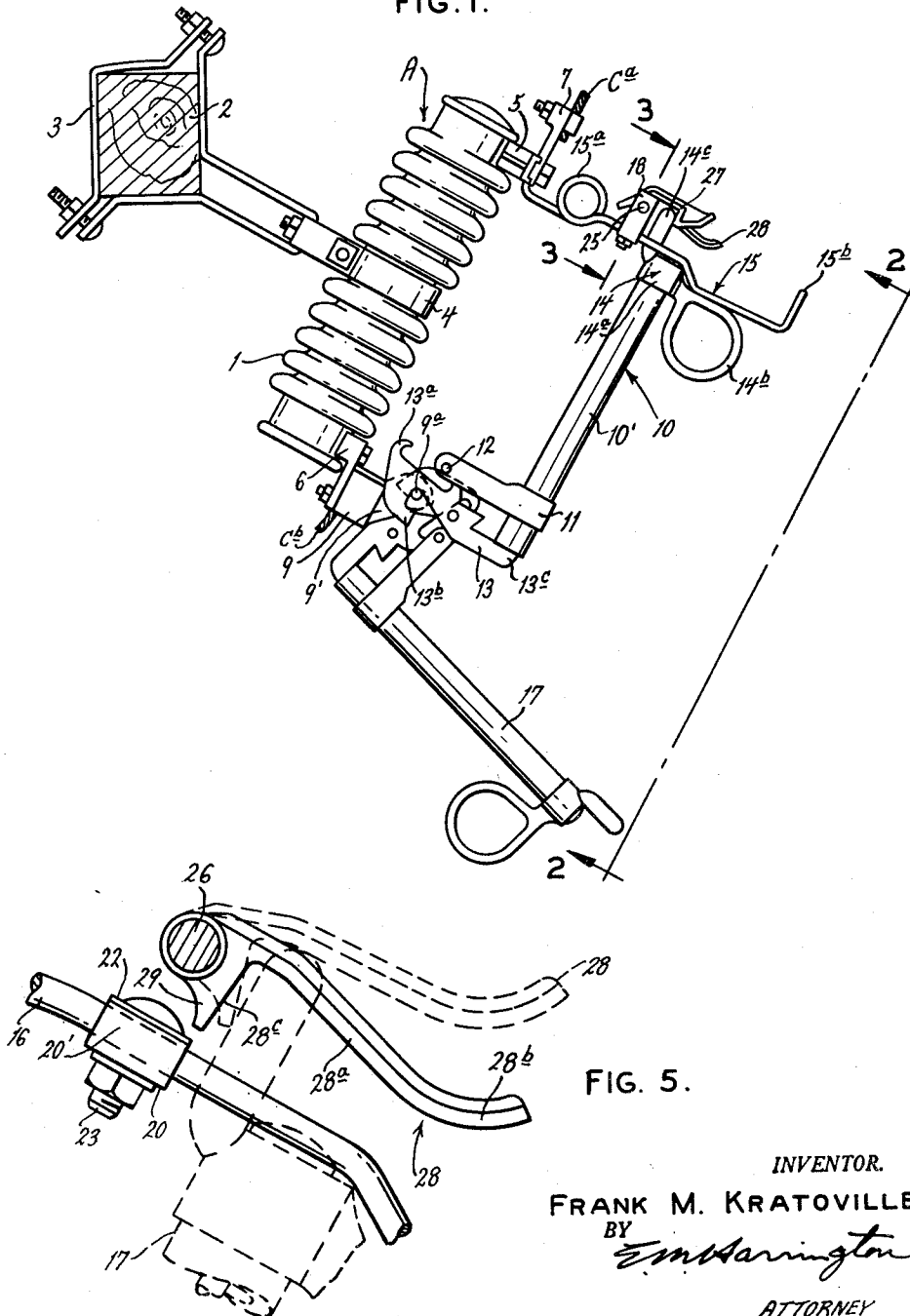
2,787,683

LOAD BREAK ATTACHMENTS FOR ELECTRICAL CUTOUTS

Filed Jan. 27, 1955

2 Sheets-Sheet 1

FIG. 1.



INVENTOR.
FRANK M. KRATOVILLE
BY *Emm Harrington*
ATTORNEY

April 2, 1957

F. M. KRATOVILLE

2,787,683

LOAD BREAK ATTACHMENTS FOR ELECTRICAL CUTOUTS

Filed Jan. 27, 1955

2 Sheets-Sheet 2

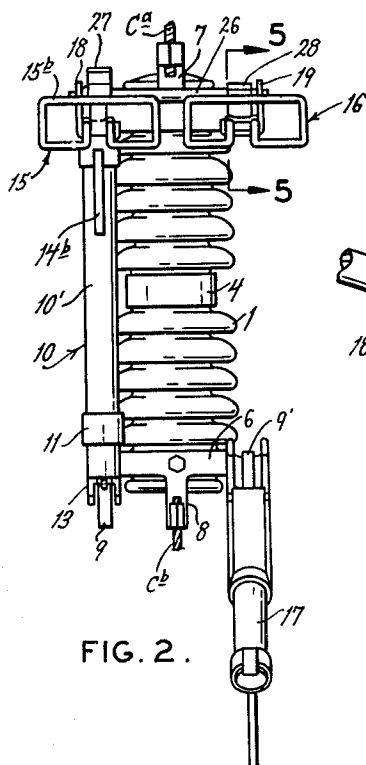


FIG. 2.

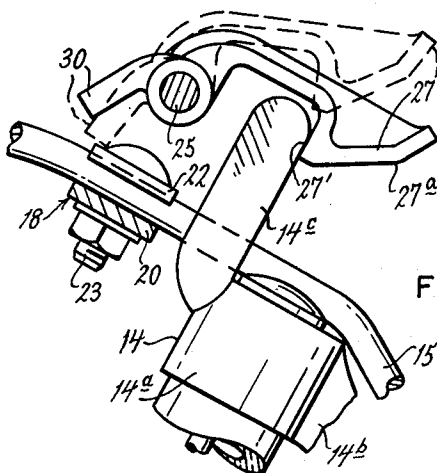


FIG. 4.

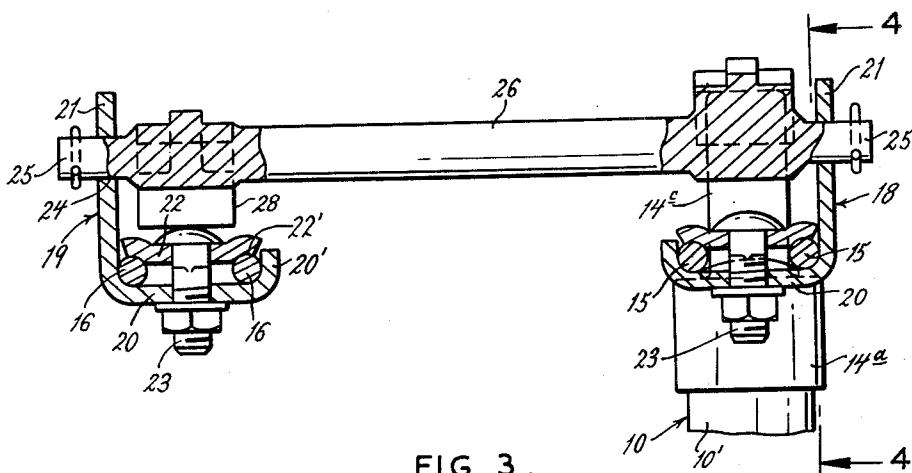


FIG. 3.

INVENTOR.
FRANK M. KRATOVILLE
BY *Wm. Harrington,*
ATTORNEY

1

2,787,683

LOAD BREAK ATTACHMENTS FOR ELECTRICAL CUTOUTS

Frank M. Kratoville, St. Louis, Mo., assignor to James R. Kearney Corporation, St. Louis, Mo., a corporation of Missouri

Application January 27, 1955, Serial No. 484,341

1 Claim. (Cl. 200—116)

This invention relates generally to attachments for electrical cutouts and more specifically to improvements in a sequence latch mechanism for a dual cartridge electrical cutout the cartridges of which are mounted on a common support and which insures manual operation of said cartridges in proper sequence, the predominant object of the invention being to provide a cutout of the type mentioned with sequence latch mechanism which is simple in construction and operation and is capable of performing its intended function in a highly efficient manner.

The present invention is adapted for use particularly with dual cartridge, load break cutouts and its purpose is to latch in the effective position one cartridge, which is provided with a relatively heavy fuse link to provide line protection, so that such cartridge will not be mistakenly moved manually to the open switch position and thus draw a destructive electrical arc within said cartridge, instead of first manually moving to the effective closed-switch position a second load break cartridge which is fused with a low-ampere-rated fuse link that is ruptured when said load-break cartridge interrupts the current and trips out of open position.

Fig. 1 is a side elevation of a dual cartridge cutout having my improved sequence latch incorporated as a part thereof.

Fig. 2 is a front elevation on a reduced scale of a dual cartridge cutout such as that shown in side elevation in Fig. 1.

Fig. 3 is an enlarged section taken on line 3—3 of Fig. 1.

Fig. 4 is an enlarged, fragmentary view along line 4—4 of Fig. 3 partly inside elevation and partly in vertical section showing the latching arrangement of this invention.

Fig. 5 is a view similar to Fig. 4 but with parts shown in changed positions.

In the drawings wherein is shown for the purpose of illustration, merely, one embodiment of the invention, A designates generally an electrical cutout which comprises a suitable insulator 1, preferably of the petticoat type, which is secured to a suitable support, for instance, a cross arm 2 of a pole, by clamp means 3 and a band 4 which embraces said insulator and is engaged by said clamp means, as shown in Fig. 1. Fixed to said insulator 1 adjacent to the upper end thereof is a transversely extended bar 5 and fixed to said insulator adjacent to the lower end thereof is a second transversely extended bar 6, there being a terminal 7 which receives in contact therewith an incoming electrical conductor C^a associated with said bar 5, while a terminal 8 that receives in contact therewith an outgoing electrical conductor C^b is associated with said bar 6.

The lower transversely extended bar 6 has fixed thereto adjacent to one end thereof a hinge bracket structure 9 which comprises a forwardly projected extension 9' that has extended laterally therefrom in opposite directions a pair of pins 9^a, one of said pins being shown in Fig. 1. Supported by the hinge bracket structure 9 is a cartridge 10 which comprises a tube 10' which has fixed thereto

2

an arm 11 that extends rearwardly and has pivotally attached thereto by means of a pivot pin 12 a bracket member 13, said bracket being bifurcated at its rear portion and having hook-shaped rear end portions 13^a and intermediate hook-shaped portions 13^b, the forward extension 13^c of said bracket member underlying the tube 10' of the cartridge 10, as shown in Fig. 1. The spaced portions at the rear of the bracket structure 9 straddle the forwardly projected extension 9' of the bracket structure 9 and the pins 9^a are disposed in the intermediate hook-shaped portions, the recesses within said intermediate hook-shaped portions being elongated in order to permit of the cartridge being removed by being lifted upwardly and moved outwardly relative to said pins 9^a. Fixed to the tube 10' of the cartridge 10 at the top thereof is a contact member 14 which comprises a socket portion 14^a that receives the upper portion of the tube 10', and an eye portion 14^b which is adapted to receive a portion of a suitable switch stick when the cartridge 10 is to be moved manually to the open-switch or closed-switch position. Also, the contact member 14 is provided with an upstanding finger 14^c which serves a purpose to be hereinafter set forth.

Secured to the upper bar 5 is a pair of upper contacts 15 and 16, one of which, the contact 15, is related to the cartridge 10, and is preferably formed from a single length of relatively heavy wire and is secured to the upper bar 5. The contact 15 is provided with spaced apart legs which are approximately parallel, each of these legs being provided with a coiled portion 15^a, and spaced apart portions of the contact 15 at the forward end of the contact extend outwardly in opposite directions and then extend upwardly and are joined at their tops by a portion 15^b. The contact 16 is constructed in accordance with the contact 15 and is secured in place with relation to the upper bar 5 and with respect to the terminal 7 in the same manner as is said upper contact 15. The contact 16 is related to a second cartridge 17 and this second cartridge is constructed in accordance with the cartridge 10 and is mounted in the same manner with respect to the lower bar 6 as is the cartridge 10. The cartridge 10 is provided within its tube 10' with a relatively heavy fuse link for line protection while the cartridge 17 is fused with a low-ampere-rated fuse link which is ruptured when said load-break cartridge interrupts the current to cause the load-break cartridge to trip out, all of which will be hereinafter explained in detail.

Clamped to the substantially parallel portions of the contacts 15 and 16 is a pair of bearing members 18 and 19, each of which is of L-shaped configuration, having a horizontal leg 20 which underlies parallel portions of the contact 15 or 16 with which it is associated, and a vertical leg 21 which extends upwardly from an end of said horizontal leg. The horizontal leg 20 of each bearing structure has an upwardly curved end portion 20' (Fig. 3), and a clamping member 22 overlies the parallel portions of the contacts 15 and 16 to which the bearing structure is secured, there being a bolt and nut assembly 23 forming part of each bearing structure which draws the clamping member 22 toward the horizontal leg 20 of the related bearing member 18 or 19, the shank of the bolt of each bolt and nut assembly extending through apertures formed through the horizontal leg and the clamping member of the bearing structure with which said bolt and nut assembly is associated, and each clamping member being provided with curved seats 22' which engage parts of the related contact. It is obvious that because the bolt and nut assemblies 23 draw the clamping members 22 toward the horizontal legs 20 of the bearing members 21, the bearing structures will be tightly clamped to the contacts 15 and 16.

The bearing members 18 and 19 are aligned transversely

3

of the cutout structure A and the vertical legs of said bearing members are provided with alined bearing openings 24 in which are supported for rotary movement opposed end trunnions 25 of a shaft 26. The shaft 26 is provided with a pair of arms 27 and 28, the arm 27 being in the form of a latch provided with a shoulder 27' and having an upwardly inclined forward camming portion 27^a. The arm 28 is shaped as shown to good advantage in Fig. 5, that is to say, said arm 28 includes a downwardly inclined portion 28^a and an upwardly curved forward portion 28^b, there being a shoulder 28^c at the rear end of said portion 28^a on the portion 29. As shown particularly in Fig. 2, the arm 27 of the shaft 26 is alined with the cartridge 10, while the arm 28 is alined with the cartridge 17. The arm 27 is provided with a tail portion 30 which strikes the head of a bolt 23 of the means for spacing the substantially parallel portions of the contact 15 and limits the upward movement of the forward portion of said arm 27.

In the normal operation of the cutout A, when the fuse link of the cartridge 10 is ruptured, as by reason of abnormal current passing therethrough, the bracket member 13 which is normally restrained by the intact fuse link, is freed at its outer end and acting under the forces imparted thereto, turns rapidly about the two axes of the pivot elements 9^a and 12. Movement of the bracket member 13 about the elements 9^a is accompanied by an endwise lowering of the cartridge 10 which, when clear of the shoulder 27' of the arm 27, swings under gravity action to full open position. It will appear that the bracket member, considered as a lever, has a high velocity ratio and that its outer end moves very rapidly. Accordingly the ruptured ends of the fuse link become quickly separated, resulting in practically instantaneous extinguishment of the arc created therebetween.

The predominant feature of the present invention is to provide a load break cutout which comprises employing two fuse cartridges in one unit, one cartridge (the cartridge 10) being fused for line protection and the other cartridge (the cartridge 17) being fused with a low-ampere-rated fuse link serving merely as a load-break cartridge, together with means for insuring operation of said cartridges in proper sequence for proper operation of the cutout. In the operation of the improved cutout A, the cartridge 17 is in the open-switch position, as shown in Fig. 2, and the cartridge 10 is in the closed-switch position where it affords protection to the line.

4

In the positions of the cartridges 10, and 17 mentioned, which are arranged in parallel, the cartridge 10 is latched in place by the shoulder 27' of the arm 27 engaging the finger 14^c of said cartridge 10. As result of the latching of the cartridge 10 in the closed-switch position this cartridge may not be mistakenly operated manually to the open-switch position with the consequent drawing of a destructive electrical arc between the member 14 of the tube of the cartridge and the contact 15. According to this invention, if it is desired to operate the cartridge 10 manually to the open-switch position, the cartridge 17 is first moved to the closed-switch position. The cartridge 10 is then moved, manually, with the aid of a switch stick, without drawing an electrical arc as the current flows through the fuse link of the cartridge 17 which fuse link immediately melts and said cartridge trips out to the open-switch position. It is to be noted that on movement of the cartridge 17 into the closed-switch position it engages the arm 28 of the cartridge latching mechanism to lift said arm and also the arm 27 of said cartridge latching mechanism to unlatch the cartridge 10 for movement to the open-switch position.

I claim:

In an electric cutout of the type having a first fuse assembly of the dropout type which is movable between circuit-open and circuit-closed positions; the improvement that comprises a second fuse assembly mounted for movement between circuit-open and circuit-closed positions, a latch member cooperable with said first fuse assembly to lock the first fuse assembly in its circuit-closed condition, said latch member being mounted for movement to an unlocked position wherein the first fuse assembly may then be manipulated to an open-circuit position, means on said second fuse assembly engaging said latch member to move it to the unlocked position when the second fuse assembly is moved to its circuit-closed position, thereby to prevent open-circuit manipulation of said first fuse assembly except when the second fuse assembly is in its circuit-closed position, and means connecting the two fuses in parallel when in their circuit-closed positions.

References Cited in the file of this patent

UNITED STATES PATENTS

2,081,623	Fox	May 25, 1937
2,091,135	Birkenmaier	Aug. 24, 1937
2,548,129	Steinmayer	Apr. 10, 1951