I/We (a) WESTINGHOUSE ELECTRIC CORPORATION

of (b) 3 Gateway Center

Pittsburgh, Pennsylvania, U.S.A.

I/We hereby apply for the grant of a (c) PATENT OF ADDITION for an invention entitled (d) IMPROVEMENTS...IN...OR...RELATING...FOR...HIG...VOL-...TWO-OR-THREE-BREAK...LIVE-MODULE-CIRCUIT-BREAKER CONSTRUCTIONS

which is described in the accompanying (c) provisional/complete specification.

I/We request that the patent may be granted as a patent of addition to the patent applied for on application No. in the name of

patent No.

I/We request that the term of the patent of addition be the same as that of the patent for the main invention or so much of the term of the patent for the main invention as is unexpired.

This application is a Convention application and is based on the following application or applications for a patent or patents or similar protection made in the following country or countries on the following date or dates:

No. (g) 965, 011...in (h) U.S.A...on (i) Nov...30...1978...

No. (g) ...in (h) ...on (i) ...19...

No. (g) ...in (h) ...on (i) ...19...

My/Our address for service is care of CLEMENT HACK & CO., Patent Attorneys, 140 William Street, Melbourne, Victoria, 3000, Australia.

(j) Dated this 2ND day of NOVEMBER 1979

(k) WESTINGHOUSE ELECTRIC CORPORATION

CLEMENT HACK & CO.
COMMONWEALTH OF AUSTRALIA

PATENTS ACT 1952-1954

DECLARATION IN SUPPORT OF A CONVENTION APPLICATION UNDER PART XVI FOR A PATENT.

In support of the Convention Application made under Part XVI of the Patents Act 1952-1954 by WESTINGHOUSE ELECTRIC CORPORATION for a patent for an invention entitled "IMPROVEMENTS IN OR RELATING TO "IMPROVED UPSTANDING MOUNTING STRUCTURES FOR HIGH-VOLTAGE TWO-OR-THREE-BREAK LIVE-MODULE CIRCUIT-BREAKER CONSTRUCTIONS"

I, Frank J. Delzio
of 157 South Drive, Pittsburgh, Pennsylvania 15238, United States of America, do solemnly and sincerely declare as follows:

1. I am authorized by WESTINGHOUSE ELECTRIC CORPORATION, the applicant for the patent, to make this declaration on its behalf.

2. The basic application as defined by section 141 of the Act was made in the United States of America on November 30, 1978 by Ben Jose Calvino.

3. Ben Jose Calvino of 116 Collingwood Place, Monroeville, Pennsylvania, United States of America are the actual inventor(s) of the invention and the facts upon which WESTINGHOUSE ELECTRIC CORPORATION is entitled to make the application are as follows:

   The said WESTINGHOUSE ELECTRIC CORPORATION is the assignee of the said Ben Jose Calvino.

4. The basic application referred to in paragraph 2 of this declaration was the first application made in a convention country in respect of the invention the subject of the application.

Declared at Pittsburgh, Pennsylvania this 10 day of October, 1978.

Vice-President
Frank J. Delzio

To,
THE COMMISSIONER OF PATENTS,
COMMONWEALTH OF AUSTRALIA.
Claim

1. A multi-break, puffer-type circuit-interrupting assemblage of the live-tank-type comprising the selective assemblage together of a plurality of modular-type components, one of said modular components being a puffer-type modular component comprising an upper-line-terminal metallic casing, an associated insulating hollow-casing and a metallic operating casing disposed at the other end of said hollow insulating casing, another modular component consisting of an intervening metallic flanged-end metallic casing member adaptable for interposition between casing sections, at least one of which is a puffer-module and finally supporting hollow casing sections of the same configuration as the hollow insulating casing section of the first-mentioned modular puffer-unit.
Complete Specification for the invention entitled:

"IMPROVEMENTS IN OR RELATING TO IMPROVED UPSTANDING MOUNTING STRUCTURES FOR HIGH-VOLTAGE TWO-OR-THREE-BREAK LIVE-MODULE CIRCUIT-BREAKER CONSTRUCTIONS"

The following statement is a full description of this invention, including the best method of performing it known to me/us.
IMPROVED UPSTANDING MOUNTING STRUCTURES
FOR HIGH-VOLTAGE TWO- OR THREE-BREAK
LIVE-MODULE CIRCUIT-BREAKER CONSTRUCTIONS

This invention relates to a multi-break, puffer type circuit-interrupting assemblage.

According to the present invention, a multi-break, puffer type circuit interrupting assemblage of the live tank type comprises the selective assemblage together of a plurality of modular-type components, one of said modular components being a puffer-type modular component comprising an upper-line-terminal metallic casing, an associated insulating hollow-casing and a metallic operating casing disposed at the other end of said hollow insulating casing, another modular component consisting of an intervening metallic flanged-end metallic casing member adaptable for interposition between casing sections, at least one of which is a puffer-module and finally supporting hollow casing sections of the same configuration as the hollow insulating casing section of the first-mentioned modular puffer-unit.

Conveniently, there is provided a novel, upstanding, structural supporting mounting arrangements for modular-type high-voltage circuit-interrupters of two-break, or three-break interrupting assemblages, particularly adapted for the use of the usual puffer-type interrupting unit, for example, all such modular-type units being disposed in electrical series arrangement for interrupting the higher voltage ratings, such as, for example, 123 kV, 245 kV and 420 kV. A particular feature of the
invention is the utilization or modulation of only one type of porcelain interrupting modular element, one type of modular interrupting element, three lengths of modular insulating rods, one intermediate modular mechanism casing and one modular supporting structure and operating mechanism. These various modular units or components may be economically manufactured in volume, and assembled and re-arranged in a wide variety of ways to result thereby in a two-break, or a three-break modular-type puffer-type interrupting assembly, as desired.

The invention will now be described, by way of example, with reference to the accompanying drawings in which:

Fig. 1 illustrates in side elevation a modular-type of puffer interrupting element;

Fig. 2 illustrates a single-break interrupting structure using the modular interrupting element of Fig 1;

Fig. 3 illustrates a side-elevational view of a modular-type two-break, gas-blast, high-voltage circuit-interrupting assemblage, the view showing only a single pole-unit of a multiphase transmission circuit;

Fig. 4 is an enlarged vertical-sectional view taken through the interrupting element of Fig. 1, with the contact structure being illustrated in the open-circuit position;

Figs. 5 and 6 illustrate the interrupting structure of Fig. 4 in the closed and in the partially-open-circuit position;

Fig. 7 is a vertical sectional view taken through the lower mechanism end of the interrupting unit of Fig. 1, illustrating, in more detail, the operating shaft and the linearly-movable drive-linkage;

Fig. 8 is a vertical-sectional view taken through an intermediate modular-type mechanism casing member which may be used to join two superimposed modular-type insulating casing sections;

Fig. 9 is a vertical sectional view taken through the intermediate mechanism linkage casing struc-
ture of Fig. 8, illustrating its application for operating a pair of serially-related puffer-units;

Fig. 10 is a view taken laterally to that of Fig. 9, but illustrating the mechanical cooperation between the intermediate casing member of Fig. 8 and the end mechanism casing member of Fig. 7, for the conjoint operation of two series puffer-units; and,

Fig. 11 illustrates a modular-type, three-break, high-voltage, interrupting device utilizing the modular units of Figs. 1, 7 and 8, and resulting in a modular-type high-voltage circuit-interrupting assemblage.

Figs. 1 and 3 illustrates a two-break, high-voltage, circuit-interrupting assemblage 1 utilizing two puffer-type modular-type interrupting units 3 connected in electrical series. Each puffer-type interrupting unit 3 is of the type illustrated in Fig. 1, the internal details of which are more clearly evident from an inspection of Figs. 4-6 of the drawings.

Fig. 4 provides an upper line-terminal housing 5, an upstanding insulating casing 7, a stationary contact 9, a movable contact structure 11 carried by a movable operating cylinder 13, the latter being slidable over a stationary piston structure 14, and compressing gas 16 therebetween, as more clearly apparent from an inspection of Fig. 6 of the drawings. As well known by those skilled in the art, puffer-type interrupters establish an arc 18 between the stationary contact 9 and the movable arcing contact rod 20, with the gas injection generated by compression between the movable operating cylinder 13 and the stationary piston structure 14.

The actuation of the movable contact structure 11 is afforded by an insulating operating rod 22, which is actuated linearly, in a generally straight-line fashion, by a floating link 23, a driving crank-arm 24 and a power-operating shaft 26, as illustrated in Fig. 4.

It will be noted that Fig. 1 generally shows, on a smaller scale, the modular interrupting unit 3 construction of Figs. 4-6.
With further reference to Fig. 3, it will be observed that two such units 3 are arranged in a generally "L"-shaped configuration. To mechanically interconnect the operation of the two puffer-units 3a and 3b, there is afforded an intermediate mechanism casing member 27, as illustrated in Fig. 8. Generally, such an intermediate, or intervening mechanism linkage casing member 27 comprises a rotatable operating shaft 30, driven by a crank-arm 31 and having the end thereof pivotally connected as at 32. by a floating link 33, to an operating rod structure 35, which passes centrally interiorly through such intervening intermediate mechanism casing member 27.

As illustrated in Fig. 3, an insulating operating rod structure 35 extends upwardly through the two superimposed insulating casing members 40 and 41, such insulating operating rod structure 35 being actuated by a lower-disposed common mechanism 44.

The aforesaid insulating operating rod 35 passes interiorly through the intermediate mechanism casing 27, as illustrated in Fig. 8, and effects the operation of the upper puffer-unit 3a, and also effects rotatable opening and closing driving movements of the operating shaft 30, the latter, as previously mentioned, passing internally through the intermediate casing member 27.

Such latter-mentioned power-operating shaft 30 extends externally, as viewed in Fig. 10, to effect, through a linkage 47 the rotatable operation of another shaft 50, which extends through the lower end of the mechanism driving casing 52, as shown more clearly in Fig. 9 of the drawings.

Accordingly, it will be observed that by the aforesaid interconnecting linkage structure 47, the lower-disposed insulating operating rod 35 effects simultaneously the opening and closing movements of two serially-related puffer-units 3a and 3b to result thereby in a two-break, high-voltage, circuit-interrupting assemblage. Such a unit would be adaptable for a voltage rating of, for example, 245 KV having a basic impulse level of 1,050...
It will be noted, with reference again directed to Fig. 3, that there is provided a pole-unit, composed of two interrupting elements (Fig. 1) plus two porcelain stacks 40 and 41, an insulator rod 35 of sufficient adequate length to extend to ground potential and an intermediate casing member 27 (Fig. 8), all of such modular component parts being capable of economical manufacture in volume and inventoried as such.

With reference to Fig. 11 of the drawings, it will be observed that the modified interrupting structure 60 of Fig. 11 contains three breaks 3a, 3b and 3c, each break being associated with a puffer-type unit 3, such as was illustrated in Figs. 1, 4-6 of the drawings. As before, an insulating operating rod, Fig. 8, extends to ground potential and effects rotation of a laterally-extending power-driving shaft 30, which effects operation of the puffer element 3c by the rotatable crank-arm structure 25 in the lower casing member 52 of Fig. 11. Additionally, such a power shaft 30 is connected by the intervening casing member 27 (Fig. 8) with the upper series unit 3a, and, as was the case with Fig. 3, a laterally-extending puffer-unit 3b may be actuated in the same manner as described hereinbefore in connection with Fig. 3.

Accordingly, Fig. 11 illustrates a three-break device, using the same general components 3, 25 and 27 as has been described hereinbefore.

From the foregoing description, it will be apparent that either a single-break, two-break, or a three-break, high-voltage interrupting assemblage, preferably of the puffer-type, may be assembled, as desired, by an incorporation of modular components to result in various voltage ratings.
THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. A multi-break, puffer-type circuit-interrupting assemblage of the live-tank-type comprising the selective assemblage together of a plurality of modular-type components, one of said modular components being a puffer-type modular component comprising an upper-line-terminal metallic casing, an associated insulating hollow-casing and a metallic operating casing disposed at the other end of said hollow insulating casing, another modular component consisting of an intervening metallic flanged-end metallic casing member adaptable for inter-position between casing sections, at least one of which is a puffer-module and finally supporting hollow casing sections of the same configuration as the hollow insulating casing section of the first-mentioned modular puffer-unit.

2. An assemblage as claimed in claim 1, wherein a two-break, high-voltage, live-tank-type of circuit-interrupting assemblage is provided comprising a pair of modular puffer-units disposed at right-angle configuration, and an intervening double-ended flanged mechanism casing member having an externally-projecting power-operating shaft for actuating the laterally-jutting puffer-unit.

3. An assemblage as claimed in claim 1 wherein a three-break, high-voltage, modular-type, live-tank-type of puffer-interrupting assemblage is provided comprising two puffer-units and an additional puffer-unit of modular construction surmounting a laterally-extending, hollow,
insulating casing element, and conducting means for electrically-connecting the three puffer-units in electrical series relationship.

4. A multi-break, puffer type circuit-interrupting assemblage, constructed and adapted for use, substantially as hereinbefore described and illustrated with reference to the accompanying drawings.

DATED THIS 2ND DAY OF NOVEMBER, 1979

WESTINGHOUSE ELECTRIC CORPORATION
By Its Patent Attorneys

CLEMENT HACK & CO.
Fellows Institute of Patent
Attorneys of Australia
FIG. 1

FIG. 2

FIG. 3

FIG. 11