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Cuorato et al.

[11] **3,723,824**

[45] **Mar. 27, 1973**

[54] **TELESCOPING OUTDOOR SWITCHBOARD AND AISLE SECTIONS**

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[73] Assignee: **I-T-E Imperial Corporation**, Philadelphia, Pa.

[22] Filed: **Dec. 13, 1971**

[21] Appl. No.: **207,428**

[52] **U.S. Cl.** **317/120**, 52/67, 317/103

[51] **Int. Cl.**.....**H02b 1/06**

[58] **Field of Search** ..312/205; 317/101 CB, 99, 103, 317/112, 120; 52/64, 66, 67

[56] **References Cited**

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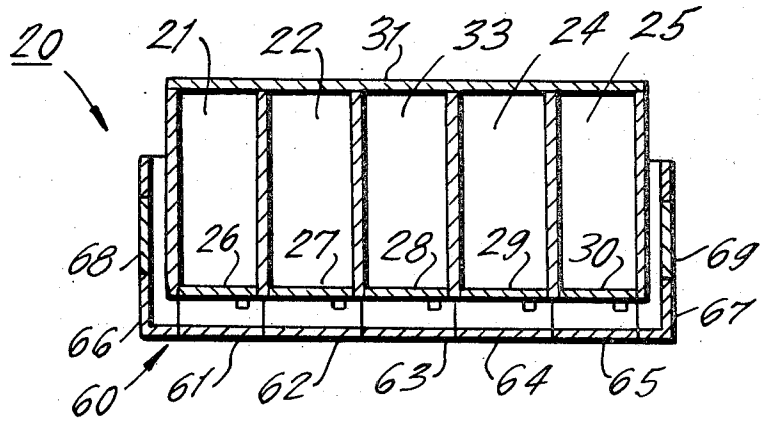
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Primary Examiner—Robert K. Schaefer
Assistant Examiner—Gerald P. Tolin
Attorney—Sidney G. Faber et al.

[57] **ABSTRACT**

The aisle section of outdoor walk-in type switchgear is telescoped over the front of the switchboard during shipment and is telescoped outwardly and is assembled with an aisle floor when delivered to its site of installation. Lifting and shipping members are provided as integral parts of the telescoping assembly.

8 Claims, 10 Drawing Figures



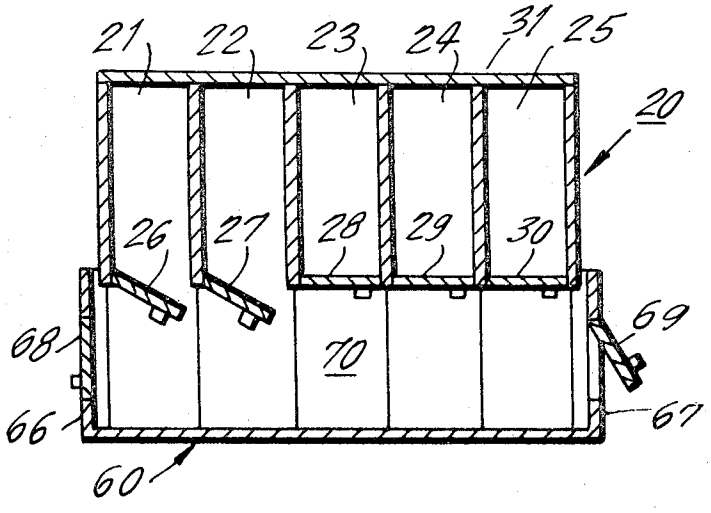


FIG. 1.

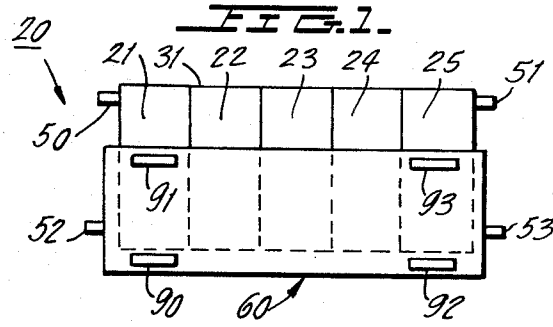


FIG. 2.

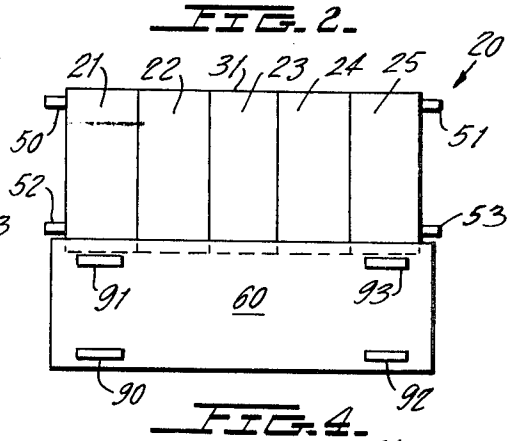


FIG. 3.

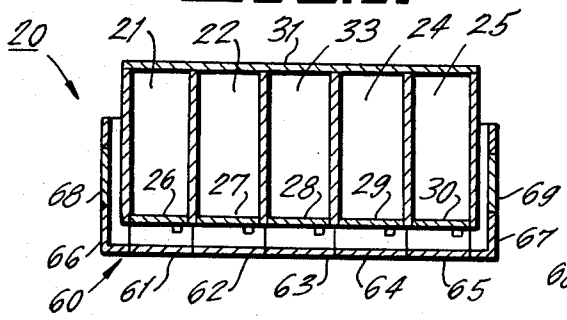


FIG. 4.

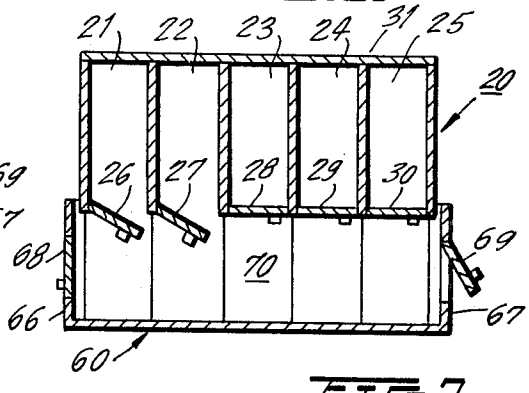


FIG. 5.

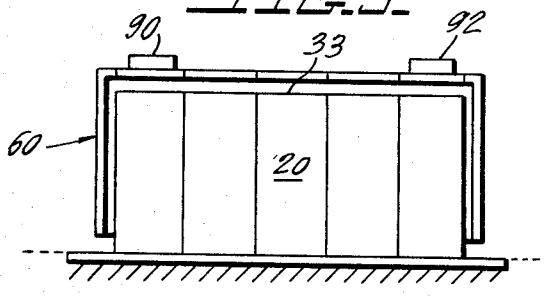


FIG. 7.

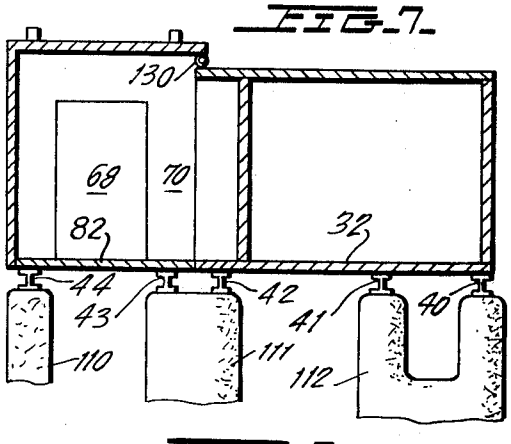


FIG. 6.

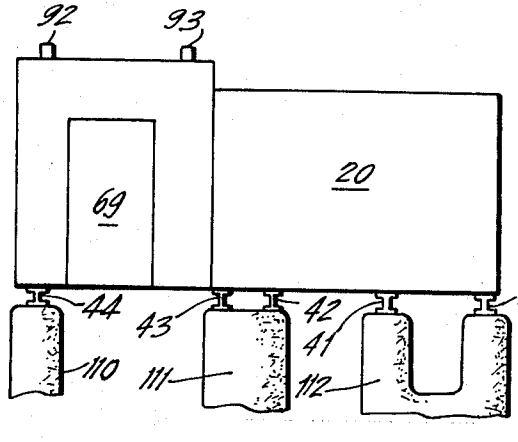


FIG. 8.

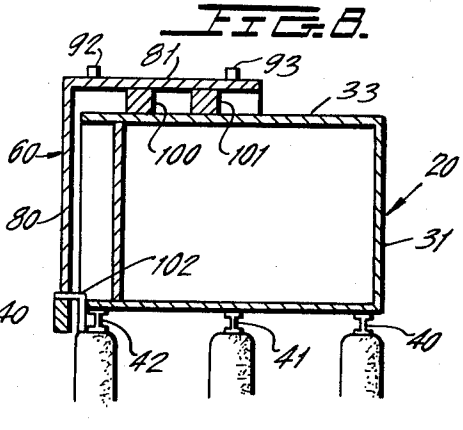


FIG. 9

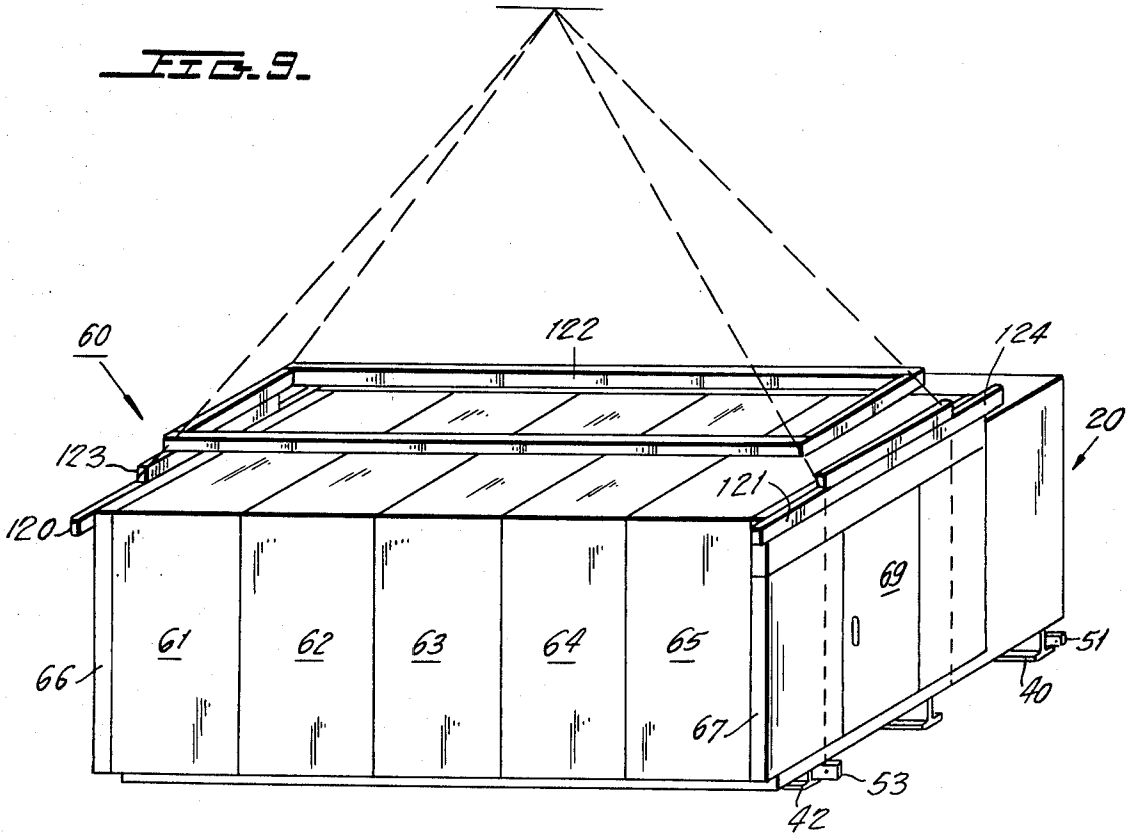
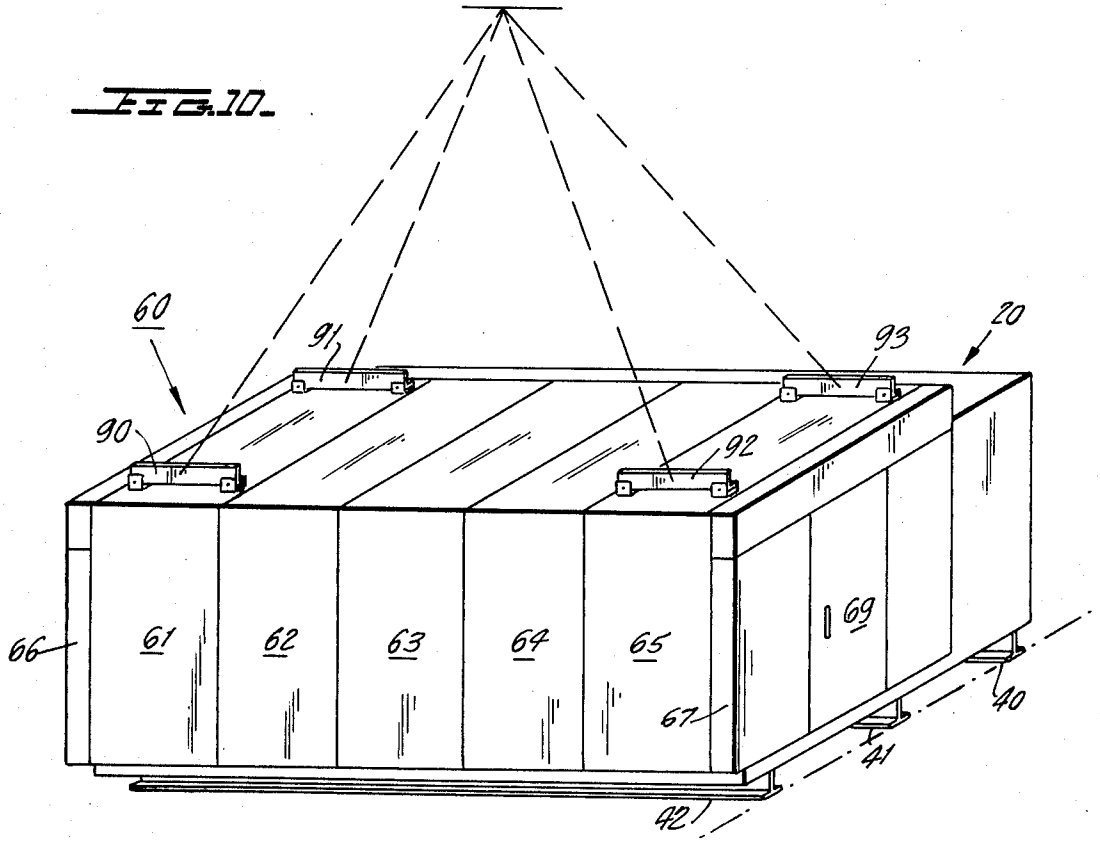

60
122
124
20
123
121
120
69
61
62
63
64
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66
40
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42

FIG. 10


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91
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42

TELESCOPING OUTDOOR SWITCHBOARD AND AISLE SECTIONS

BACKGROUND OF THE INVENTION

This invention relates to outdoor walk-in type switchgear, and more specifically relates to a novel construction for such switchgear in which the aisle section is movable to a telescoping position over the front of the switchboard in order to reduce volume and increase strength of the assembly during shipping.

Outdoor walk-in switchgear is well known, and is typically shown for example in the U.S. Pat. to Wortman et al. No. 2,952,799. Such switchgear generally consists of a switchboard section and an aisle section. The aisle section forms a waterproof enclosure located in front of a single-row switchboard or between the fronts of a double-row switchboard. Conventionally, the aisle may be constructed of unitary switchboard-frame width sections which are fastened together with end panels at both ends of the aisle containing doors providing access to the aisles.

Conventionally, the aisle section of outdoor switchgear is disassembled from the switchboard frame when the unit is shipped. The complete device is then reassembled in the field, at the installation site. The field erection costs are relatively high due to the necessary labor involved in the reassembly and because of loss and damage of the many loose parts which are involved.

BRIEF SUMMARY OF THE INVENTION

In accordance with the present invention, the switchgear is so constructed that the aisle section and switchboard section may be telescoped over one another during shipment, thereby to reduce volume and shipping costs while simplifying erection in the field. Thus, in accordance with the invention, there is provided a factory-assembled aisle section designed to nest over or telescope over the switchboard assembly during shipment. The roof and sides of the aisle section and switchboard section are designed to permit lifting and shipping as a unit by the provision of suitable hardware for receiving lifting hooks and the like. When a floor is required for the aisle section, the floor is shipped separately and assembled while the switchgear is being installed.

Among the numerous advantages provided by the invention are:

The bulk of the assembly has been factory assembled rather than field assembled, and shipping damages and losses are minimized.

Field assembly time is reduced to a minimum, and the user is assured that the aisle and switchboard components will arrive at the site together.

There is good control of the weatherproofing between the aisle and the switchboard, since weatherproofing occurs in factory-assembled seal housings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a top elevation view of a switchboard having a telescoping aisle frame member telescoping thereover for shipping purposes.

FIG. 2 is a view similar to that of FIG. 1 which shows the telescoped aisle pulled out and placed in position to form an aisle in front of the switchboard. FIG. 3 is a cross-sectional view through the elevation of FIG. 1.

FIG. 4 is a cross-sectional view similar to that of FIG. 3 to illustrate the aisle which is formed in FIG. 2.

FIG. 5 is a view of the rear of the switchboard of FIGS. 1 and 2.

FIG. 6 is a side elevation view of the switchgear of the invention in a position shown in FIGS. 2 and 4.

FIG. 7 is a cross-sectional view of the elevation of FIG. 6 to show the telescoping components in their with-drawn position.

FIG. 8 is a cross-sectional view similar to the view of FIG. 7 and shows the telescoping aisle section in its collapsed position as in FIGS. 1 and 3, and in position for shipping.

FIG. 9 is a perspective view of the telescoped arrangement of the FIGS. 1, 3 and 8 shown in lifted position while being moved to a foundation.

FIG. 10 is a perspective view of the assembly of FIG. 9 after being seated on its foundation with the lifting cables connected to the aisle enclosure preparatory to moving the aisle enclosure to its withdrawn position.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to the drawings, there is illustrated a switchboard **20** which is of a conventional type and is shown herein as containing five identical frame units **21** to **25**. Each of the frame units **21** to **25** are of the conventional type for receiving circuit protection equipment, such as a circuit breaker which can be racked in and out of the enclosure. Bus and cable compartments, along with metering equipment compartments, may also be provided. Each of the individual enclosures **21** to **25** may further contain openable doors, such as doors **26** to **30** (FIGS. 3 and 4).

All of the cubicles share a common rear wall **31** which is defined by the continuation of each of the individual rear walls of the individual frame assemblies. A floor **32** (FIGS. 7 and 8) is formed by a continuation of the individual floors of each of the individual framed units **21** to **25**. In a similar manner, the switchboard **20** has a roof **33** (FIGS. 5, 7 and 9), again formed by the individual roof elements of the individual frame units. Note in FIGS. 7 and 8 the roof **33** may slope downwardly to permit drainage of rain and snow.

The individual frames **21** to **25** are then suitably connected to one another in any desired manner, and are conventionally supported as by support I-beams shown in FIGS. 7 and 8 as the I-beams **40**, **41** and **42**. The I-beams **40** and **41** have lifting brackets **50–51** and **52–53** respectively extending therefrom, as best shown in FIGS. **1**, **2** and **9**.

In order to form a weatherproof aisle for the switchboard **20**, an aisle enclosure **60** is provided where the aisle enclosure **60** may be formed of individual frame sections identical in width to the width of frame sections **21** to **25** of the switchboard **20**. By way of example, individual frame sections **61** to **65** may be bolted together in any desired manner to form the body of the aisle enclosure **60**. Two end sections **66** and **67** are then bolted to the ends of the aisle enclosure with these end sections carrying doors **68** and **69** respectively, which allow entrance to the center aisle **70** formed by the aisle enclosure **60**. As in the case of the switchboard construction, the individual frame member elements **61** to **69**, as shown in FIGS. 7 and 8, define a side wall **80**, a top wall **81**, and the side walls **68** and **69**, previously mentioned.

It should be noted that the frame units forming the telescoping aisle enclosure **60** do not contain floor elements. Thus, if a floor is required in the aisle, the floor **82** is formed separately and consists of separate floor panels shown in FIG. **7**.

The combination of the switchboard enclosure and aisle section shown, for example, in FIG. **7**, is of a type well known to the art, with the assembly previously having been made in the field from individually shipped components. In accordance with the present invention, however, the aisle enclosure is adapted to telescope to a collapsed position as shown in FIGS **1**, **3**, **8**, **9** and **10** during shipping, so that a relatively low-volume package is handled. Moreover, the package shipped has increased strength, and is less likely to undergo distortion from a rectangular shape to a trapezoidal shape during shipping, since the switchboard section and aisle section tend to reinforce one another.

To allow telescoping, the aisle section **60** is made without a permanent floor, with the floor being installed at the installation site. In addition, the width of the aisle enclosure **60** is made sufficiently larger than the width of the switchboard **20** that the side sections **66** and **67** can telescope over the sides of the switchboard **20**. The top of aisle enclosure **60** is then further provided with lifting brackets **90** to **93** (FIGS. **1** to **8** and **10**) to enable movement of the aisle **60** as will be described in connection with FIG. **10**.

In the telescoped position, the enclosure **60** is supported on the switchboard **20** with the assistance of shipping support blocks, such as blocks **100** and **101** between the top of enclosure **60** and the roof **33** in FIG. **8**, along with a further shipping member **102** disposed below the bottom of the wall **80** of shipping enclosure **60**. Any suitable clamp arrangement (not shown) could also be provided to hold the aisle enclosure **60** in position during the shipping of the switchgear.

When the assembly reaches the installation site, a suitable foundation will have been prepared, which could include, for example, poured foundation piers such as the piers **110**, **111** and **112** of FIGS. **6**, **7** and **8**, which are arranged to receive I-beams **40**, **41** and **42**. Further I-beams **43** and **44** support the bottom floor **82** and the main aisle enclosure **60**.

In order to lift the telescoped or collapsed assembly of FIG. **9** from the carrying vehicle, a pair of pressure timbers **120** and **121** are placed on either side of aisle enclosure **60**, and lifting cables are guided over the pressure timbers **120** and **121** by the spreader timber frame **122** and the spreader timbers **123** and **124**. Lifting cables are then connected to the lifting brackets **50** to **53**, and the entire assemblage may be lifted on to the piers **111** and **112** of FIG. **7**. Thereafter, and as shown in FIG. **10**, the lifting cables are connected to brackets **90** to **93**, and the entire aisle enclosure **60** is moved from the position of FIG. **8** to the position of FIG. **7**, with the aisle **60** deposited on the floor **82** and piers **110** and **111**. At the same time, a weatherproof sealing gasket **130** (FIG. **7**) is connected between the peripheries of aisle enclosure **60** and switchboard **20** to form a good weather seal.

Although this invention has been described with respect to preferred embodiments, it should be understood that many variations and modifications will now be obvious to those skilled in the art and, therefore, the scope of this invention is to be limited not by the specific disclosure herein, but only by the appended claims. The embodiments of the invention in which an exclusive privilege or property is claimed are defined as follows:

1. An outdoor switchgear assemblage adapted for economical shipment comprising, in combination:

a switchboard comprising a generally rectangular metal housing having a front, rear, top and first and second side sections; said front section having a door therein for defining at least one cubicle adapted for the reception of circuit protective apparatus; and

an aisle enclosure comprising a generally rectangular metal housing having a rear, top and first and second side sections; said first side section having a door therein; and

means connecting said aisle enclosure to said switchboard, whereby said top of said aisle enclosure is connected to said top of said switchboard to form therewith a generally continuous roof, and whereby said first and second side sections of said aisle enclosure are connected to said first and second side sections respectively of said switchboard, to form therewith generally continuous side sections, and whereby said rear section of said aisle enclosure is spaced from said front section of said switchboard to form therewith a weatherproof aisle in front of said front section of said switchboard, with said door in said side section of said aisle enclosure communicating with said weatherproof aisle; and

said aisle enclosure being collapsible in telescoping relation over said switchboard for shipping said switchgear assemblage, wherein said top section of said aisle enclosure is disposed above said top section of said switchboard; said side sections of said aisle enclosure are spaced apart by a distance greater than the spacing between said side sections of said switchboard, and said first and second side sections of said aisle enclosure are over and alongside of said first and second side sections of said switchboard, whereby said aisle is substantially collapsed.

2. The switchgear assemblage of claim **1** wherein said switchboard includes a plurality of identical frame sections fastened together to define a plurality of individual cubicles, and wherein said aisle enclosure includes a similar plurality of identical frame sections connected together.

3. The switchgear assemblage of claim **1** which includes metal floor members for said switchboard and for said aisle enclosure; said aisle enclosure floor member is separable from and of a size not to fit in said aisle enclosure when it is collapsed but of a size to fit in said aisle enclosure when said assemblage is assembled open.

4. The switchgear assemblage of claim **1** which includes lifting apparatus connectors connected to the rear of said switchboard to enable lifting of said switchboard with said aisle enclosure telescoped thereover, and which further includes lifting apparatus connectors connected to said top section of said aisle enclosure to enable the lifting thereof off of said switchboard and to an extended position to receive said connection means.

5. The switchgear assemblage of claim 4 which includes metal floor members for said switchboard and for said aisle enclosure; said aisle enclosure floor member is separable from and is of a size not to fit in said aisle enclosure when it is collapsed but of a size to fit in said aisle enclosure when said assemblage is assembled open.

6. The switchgear assemblage of claim 1 which further includes a second switchboard spaced from said first switchboard; the front surface of said second switchboard defining said rear surface of said aisle enclosure.

7. The switchgear assemblage of claim 1 which further includes a plurality of elongated steel beam supports disposed beneath said switchboard and said switchgear for supporting said switchgear at its assembly site.

8. The switchgear assemblage of claim 1 which further includes weather seal means disposed between the adjacent portions of said aisle enclosure and said switchboard when connected by said connection means.

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