T. E. MURRAY.

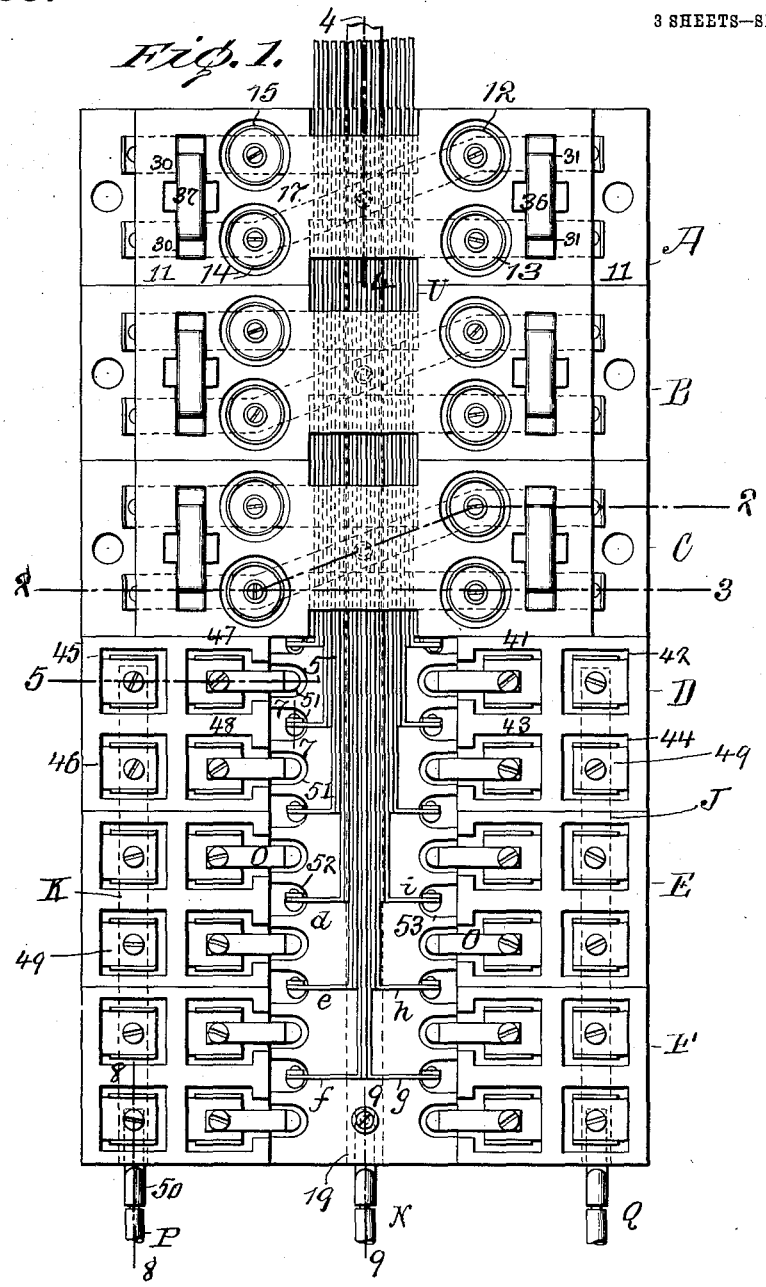
SERVICE CUT-OUT AND METERING APPARATUS.

APPLICATION FILED DEC. 21, 1909.

962,455. Patented June 28, 1910.

3 SHEETS—SHEET 1.

Fig. 1.



Witnesses
Mary T. McGarry
Gertrude T. Porter.

Inventor
Thomas E. Murray
by Paul Benjamin
his Attorney.

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Fig. 2.

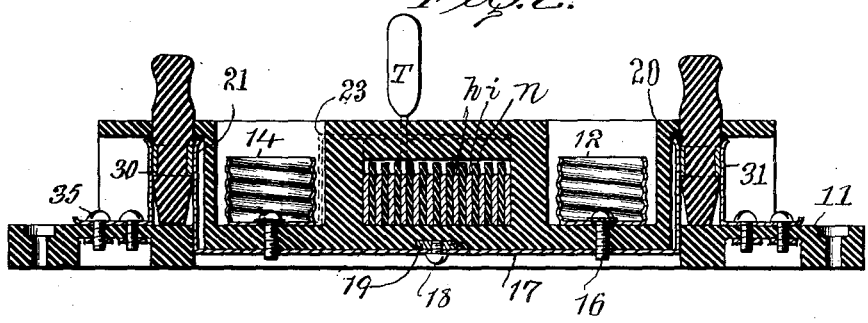


Fig. 3.

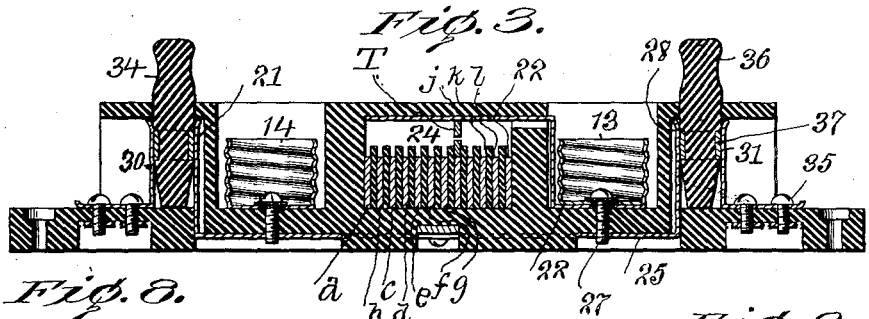


Fig. 8.

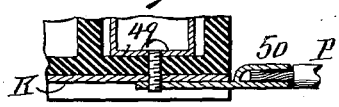


Fig. 4.

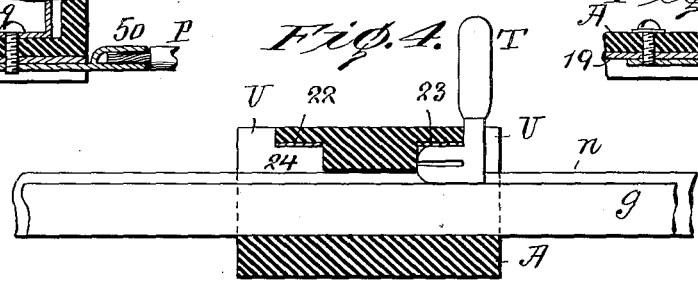


Fig. 9.

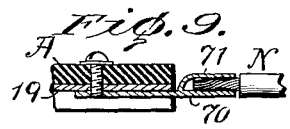


Fig. 5.

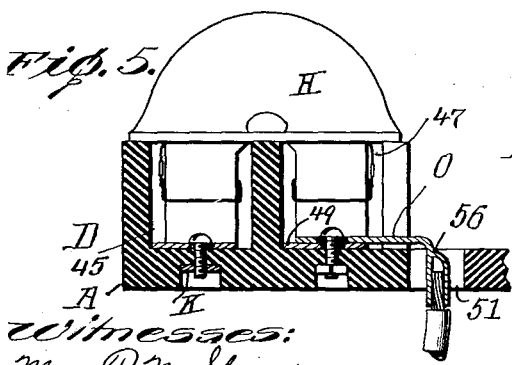


Fig. 7.

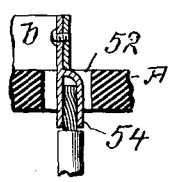
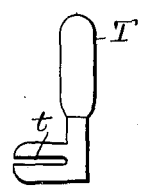


Fig. 6.



Witnesses:
May P. McGarry
Gertrude T. Porter

Inventor
Thomas E. Murray
by Paul Bryan
his Attorney.

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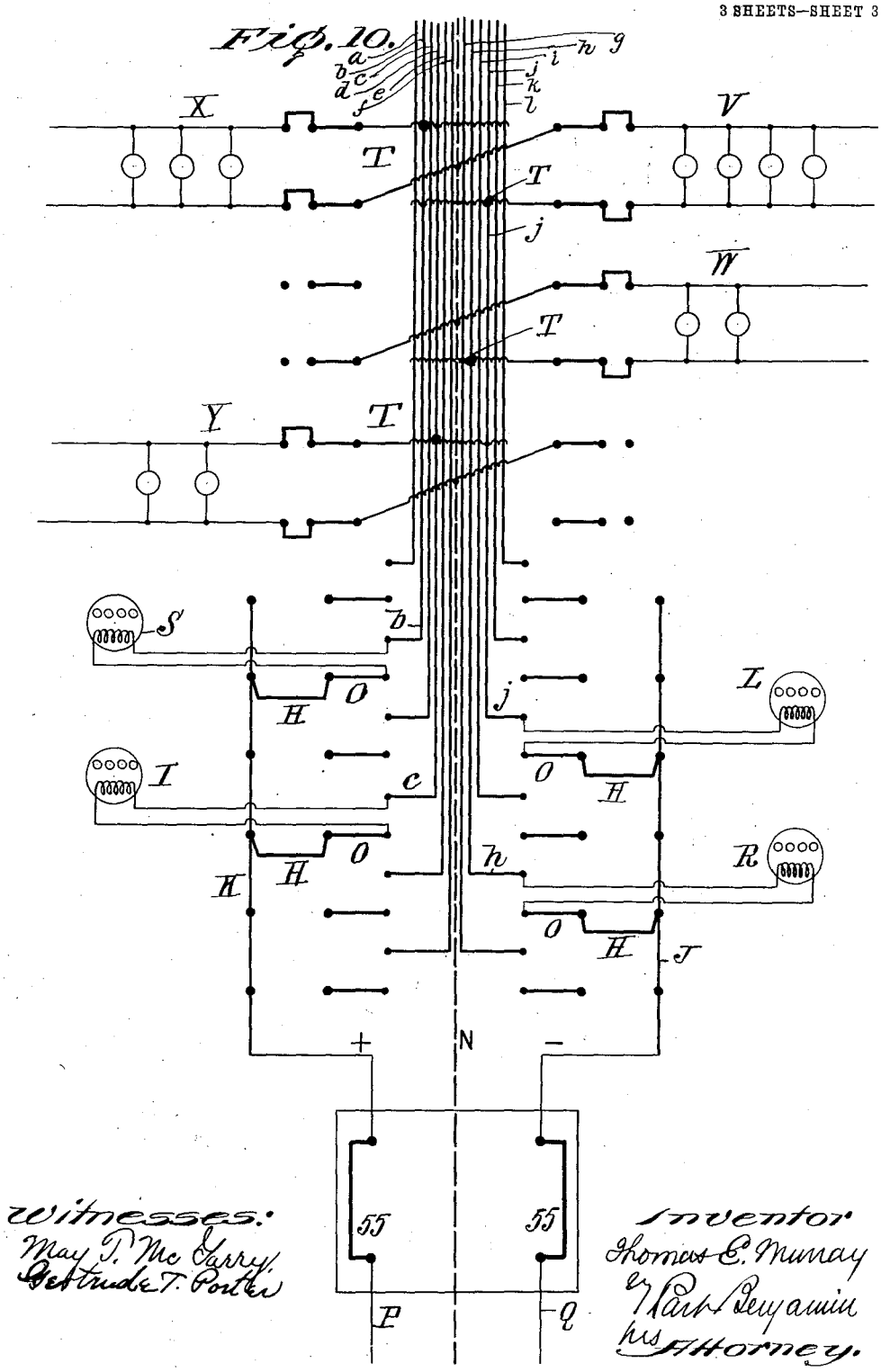
3 SHEETS—SHEET 3.



Witnesses:
May T. McCarry
Gertrude T. Porter

Inventor
Thomas E. Murray
by Paul Benjamin
his Attorney.

UNITED STATES PATENT OFFICE.

THOMAS E. MURRAY, OF NEW YORK, N. Y.

SERVICE CUT-OUT AND METERING APPARATUS.

962,455. Specification of Letters Patent. Patented June 28, 1910.

Application filed December 21, 1909. Serial No. 534,288.

To all whom it may concern:

Be it known that I, THOMAS E. MURRAY, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented a certain new and useful Improvement in Service Cut-Outs and Metering Apparatus, of which the following is a specification.

The invention is a service cut-out and metering apparatus, of the type whereby any local circuit may be connected with a meter, whereby any number of such local circuits may be connected to their several meters independently of one another, and whereby in every meter circuit a protective fuse is included.

The invention consists in the panel formed of a plurality of contiguous blocks of refractory insulating material, in which the various connections are embedded and inclosed, and in the construction of said panel and connections as more particularly set forth in the claims.

In the accompanying drawings—Figure 1 is a plan view of my service cut-out meter switch panel. Fig. 2 is a section on the line 2, 2, of Fig. 1. Fig. 3 is a section on the line 3, 3, of Fig. 1. Fig. 4 is a section on the line 4, 4, of Fig. 1. Fig. 5 is a section on the line 5, 5, of Fig. 1. Fig. 6 shows the switch piece T separately. Fig. 7 is a section of the end connection of one of the meter wires on the line 7, 7, of Fig. 1. Fig. 8 is a section of the connection of the positive conductor P to plate 49 on line 8, 8, of Fig. 1. Fig. 9 is a section of the connection of the neutral conductor N to the strip 19 on line 9, 9, of Fig. 1. Fig. 10 is a wiring diagram showing the electrical connections in the whole panel.

Similar numbers and letters of reference indicate like parts.

The apparatus, as a whole, is composed of (1) a plurality of cut-out blocks for the service conductors, the said blocks being alike and placed in juxtaposition. In the drawings, Figs. 1 and 10, three of these blocks are shown at A, B, C: (2) a plurality of cut-out blocks for the meters, these also being placed in juxtaposition and in proximity to the service cut-out blocks, the whole forming a panel. Three meter cut-out blocks are shown at D, E, F.

The service cut-out blocks A, B, C are made double, so as to provide for the connection of the terminals of a local circuit, as V, W, X, Y, at each end of the block. The meter cut-out blocks D, E, F are also double, and so constructed that at each end of each block are two connections, to either of which a terminal of a meter circuit conductor may be connected.

The service cut-out blocks.—Each service cut-out block, as A, is preferably formed of a block 11 of porcelain, or other insulating refractory material, in which are formed recesses to receive threaded metal sockets 12, 13, 14, 15. The sockets 12, 14 are connected by means of screw bolts 16, Fig. 2, to a metal strip 17 which extends diagonally (dotted lines Fig. 1) through a recess on the under side of the block, and is connected by a screw bolt 18 to a metal strip 19 which, at one end, is connected, as shown in Fig. 9, to the neutral conductor N by means of a plate 70 having a clip 71 which receives the end of the conductor. The strip 17 is continued outwardly beyond the sockets 12, 14, and has its extremities turned vertically upward to form spring contact plates 20, 21, Fig. 2.

Between the bottoms of the sockets 13, 15 and their containing recesses are interposed metal strips 22, 23 which are turned vertically upward and then horizontally, so as to lie on the under side of the upper wall of a passage 24 formed transversely to the block. On the under side of the block are metal strips 25 which are connected to the sockets 13, 15 by screw bolts 27, and which, at their outer ends, are turned vertically upward to form contact plates 28. The contact plates 28 alternate with the contact plates 20, and on the other end of the block the similar contact plates alternate with the contact plates 21.

At one end of the block are separate metal strips which respectively are turned upward vertically to form contact plates 31 which face the contact plates 20, 28, and at the other end of the block are separate metal strips 30 which are turned upward vertically respectively to face the corresponding contact plates. The lower horizontal portions of said strips are secured to the block by bolts 35, by which means the local circuit conductors may be secured to said strips.

In order electrically to connect the contact plates 20, 31 and 28, 31, I provide a plug 36 of porcelain, on opposite edges of which are secured metal plates 37, which plates are bent to extend over a portion of the sides of the block. When the plug 36 is

placed in position between the plates 20, 31 and 28, 31, said metal plates simultaneously close circuit between said plates. At the other end of the block is a similar plug 34 which, when in place, closes contact between contact plates 21, 30, etc., at that end. By removing the plug 36 or the plug 34, the local circuits connected to plates 30 or 31 may be interrupted.

Extending through the passage 24 are a plurality of parallel metal bars *a*, *b*, *c*, *d*, *e*, *f*, *g*, *h*, *i*, *j*, *k*, *l*. The bars *a*, *b*, *c*, *d*, *e*, *f* are disposed on one side of a line passing axially through the neutral conductor, and the bars *g*, *h*, *i*, *j*, *k*, *l* on the other side. The bars *a*, *b*, *c*, *d*, *e*, *f* may be connected separately to the positive main supply conductor P, and the bars *g*, *h*, *i*, *j*, *k*, *l* may be connected separately to the negative main supply conductor Q by the means now to be explained. Between said bars are strips *n* of insulating material which extend above said bars, as shown in Figs. 3 and 4, so that a channel is formed above the upper edge of each bar.

T, Fig. 6, is a removable switch piece having its lower portion turned at right angles, and of such thickness as to slide easily into any of the channels formed, as described, above the bars *a*, *b*, *c*, etc. Said lower portion is preferably split, as shown at *t*, and is of such vertical height, as that when it is inserted in any channel, the arms formed by the split shall be closed together, as shown in Fig. 4, so that said arms make resilient contact with the metal strip 22 or 23 (as the case may be) on the under side of the upper wall of passage 24, and with the metal bar *a*, *b*, *c*, etc., (as the case may be) below said strip. In this way any metal bar *a*, *b*, *c*, etc., forming part of the plus main conductor P may be connected in local circuit through the fuses in sockets 14, 15, and any metal bar *g*, *h*, *i*, etc., forming part of the negative main conductor Q may be connected in local circuit through the fuses in sockets 12, 13.

On referring to Fig. 4, it will be seen that the upper wall of the block above passage 24 is cut away, so that when two blocks, as A, B, are placed in juxtaposition, an opening U is formed to permit of introduction of the switch piece T: also that said wall at its edges is reduced in thickness, so as to afford space for the introduction of the arms of said switch piece above the bars *a*, *b*, *c*, etc., and below the strips 22, 23.

The meter cut-out blocks.—Each block, as D, Fig. 5, is formed of porcelain, or other insulating refractory material, and is provided with four recesses 41, 42, 43, 44 at one end, and four similar recesses 45, 46, 47, 48 at the other end. Secured at the bottom of each socket is a metal plate 49 having vertical clip arms. The plates 49 in sockets 42, 44 are connected to a metal strip J (dotted lines Fig. 1) which is connected to the negative main conductor Q. The plates 49 in sockets 45, 46 are connected to a metal strip K which is connected to the positive main conductor P. The mode of connection of plates 49 to the conductor P or Q is shown in Fig. 8. Below each plate 49 is secured a plate having a clip 50 in which the end of the conductor P is secured. From the plates 49 in sockets 41, 43, 47, 48 metal strips O extend into openings 51 formed in the block, Fig. 7. At the ends of each strip O is a clip 56, Fig. 5, to which the end of a circuit wire leading to a meter is connected.

The bars *a*, *b*, *c*, *d*, *e*, *f*, which pass through the passages 24 in the service cut-out blocks, extend over the blocks D, E, F, and have their ends turned outwardly over openings 52 in said block. Similarly the bars *g*, *h*, *i*, *j*, *k*, *l* extend over the blocks D, E, F, and have their ends turned outwardly, but in the opposite direction to the ends of bars *a*, *b*, *c*, etc., over openings 53 in said block. The openings 52 on one side and the openings 53 on the other side alternate with the openings 51. To the turned ends of the bars *a*, *b*, *c*, etc., clips 54, Fig. 7, are attached, by means of which a circuit wire leading to a meter may be connected.

In the pairs of sockets, as 41, 42 or 45, 47, the ends of a fuse case H, Fig. 5, are inserted, so that the clip arms in said sockets are electrically connected through the fuse in said case in the usual way.

The operation of the apparatus as a whole will best be understood from the wiring diagram, Fig. 10. The local circuit V has one terminal connected to the neutral conductor N (dotted lines) and the other to negative bar *j* by means of the switch piece T. The meter L for this circuit has its circuit wires connected to the turned end of bar *j* and to a plate O, in the manner already described. Circuit is then established from neutral conductor N to local circuit V, to bar *j*, to meter L, to plate O, through fuse H to strip J, to negative main conductor Q.

The local circuit W has one terminal connected to the neutral conductor N and the other to negative bar *h* by means of another switch piece T. The meter R for this circuit has its circuit wires connected to the turned end of bar *h* and to another plate O, in the manner already described. Circuit is then established from neutral conductor N to local circuit W, to bar *h*, to meter R, to plate O, through fuse H to strip J, to negative main conductor Q.

The local circuit X has one terminal connected to the neutral conductor N and the other to positive bar *b* by means of still another switch piece T. The meter S for this circuit has its circuit wires connected to the turned end of bar *b* and to a plate O, in the manner already described. Circuit is then

established from positive conductor P to bar *b*, to meter S, to plate O, through a fuse H to strip K, to positive main conductor P.

The local circuit Y has one terminal connected to the neutral conductor N and the other to positive bar *c* by means of still another switch piece T. The meter I for this circuit has its circuit wires connected to the turned end of bar *c* and to a plate O, in the manner already described. Circuit is then established from positive conductor P to bar *c*, to meter I, to plate O, through a fuse H to strip K, to positive main conductor P.

The usual fuses inserted in the main positive and negative conductors are indicated at 55, Fig. 10.

It will be evident from the foregoing, that I may have, on each side of the panel, as many pairs of local circuits V, W, X, Y as there are service cut-out blocks A, B, C, and that each local circuit in either the positive or the negative side may be connected with a meter on either side, and that any number of such local circuits may be connected independently of one another to their several meters.

I claim:

1. A metering panel comprising blocks of refractory insulating material placed together, circuit members extending across and within the bodies of said blocks, one of said members being composed of a plurality of parallel conductors, a pair of branch conductors in each block, one conductor of each pair being connected within said block to one of said circuit members, and means within said block for detachably connecting the other branch conductor of each of said pairs with any one of said parallel conductors.

2. A metering panel comprising blocks of refractory insulating material placed together, circuit members extending across and within the bodies of said blocks, one of said members being composed of a plurality of parallel conductors, a pair of branch conductors in each block, one conductor of each pair being connected within said block to one of said circuit members, means within said block for detachably connecting the other branch conductor of each of said pairs with any one of said parallel conductors, and fuses seated in said blocks and respectively interposed in each of said branch conductors.

3. A metering panel comprising blocks of refractory insulating material placed together, circuit members extending across and within the bodies of said blocks, one of said members being composed of a plurality of parallel conductors, a pair of branch conductors in each block, one conductor of each pair being connected within said block to one of said circuit members, means within said block for detachably connecting the other branch conductor of each of said pairs with any one of said parallel conductors, fuses in said blocks respectively interposed in each of said branch conductors, and circuit breakers interposed between said fuses and the terminals of said branch conductors and seated in said blocks.

4. A metering panel comprising blocks of refractory insulating material placed together, two circuit members within and extending across said blocks, one of said members being composed of a plurality of parallel conductors, circuit terminals on said conductors, circuit terminals on said blocks, and removable cut outs entering recesses in said blocks and detachably connecting each of said block terminals with the other of said circuit members.

5. A metering panel comprising blocks of refractory insulating material placed together, a circuit member within and extending across said blocks, circuit terminals in each of said blocks connected to said member, a second circuit member composed of a plurality of parallel conductors of different lengths, each of said conductors having an end terminal in proximity to one of said block terminals, and meter connections to said terminals.

6. A metering panel comprising two groups of contiguous blocks of refractory insulating material, a circuit member composed of parallel conductors within and extending across both of said groups, a pair of branch conductors in each block of one of said groups, one branch conductor of each pair being detachably connected within said block to one of said parallel conductors, a circuit member within and extending across the blocks of the other group, circuit terminals in each of said last-named blocks connected to said circuit member, terminals on said parallel conductors, and meter connections to said terminals.

In testimony whereof I have affixed my signature in presence of two witnesses.

THOMAS E. MURRAY.

Witnesses:

GERTRUDE T. PORTER,

MAY T. MCGARRY.