

(No Model.)

2 Sheets—Sheet 1.

W. MOSELEY.
MULTIPLE SWITCH BOARD.

No. 468,818.

Patented Feb. 16, 1892.

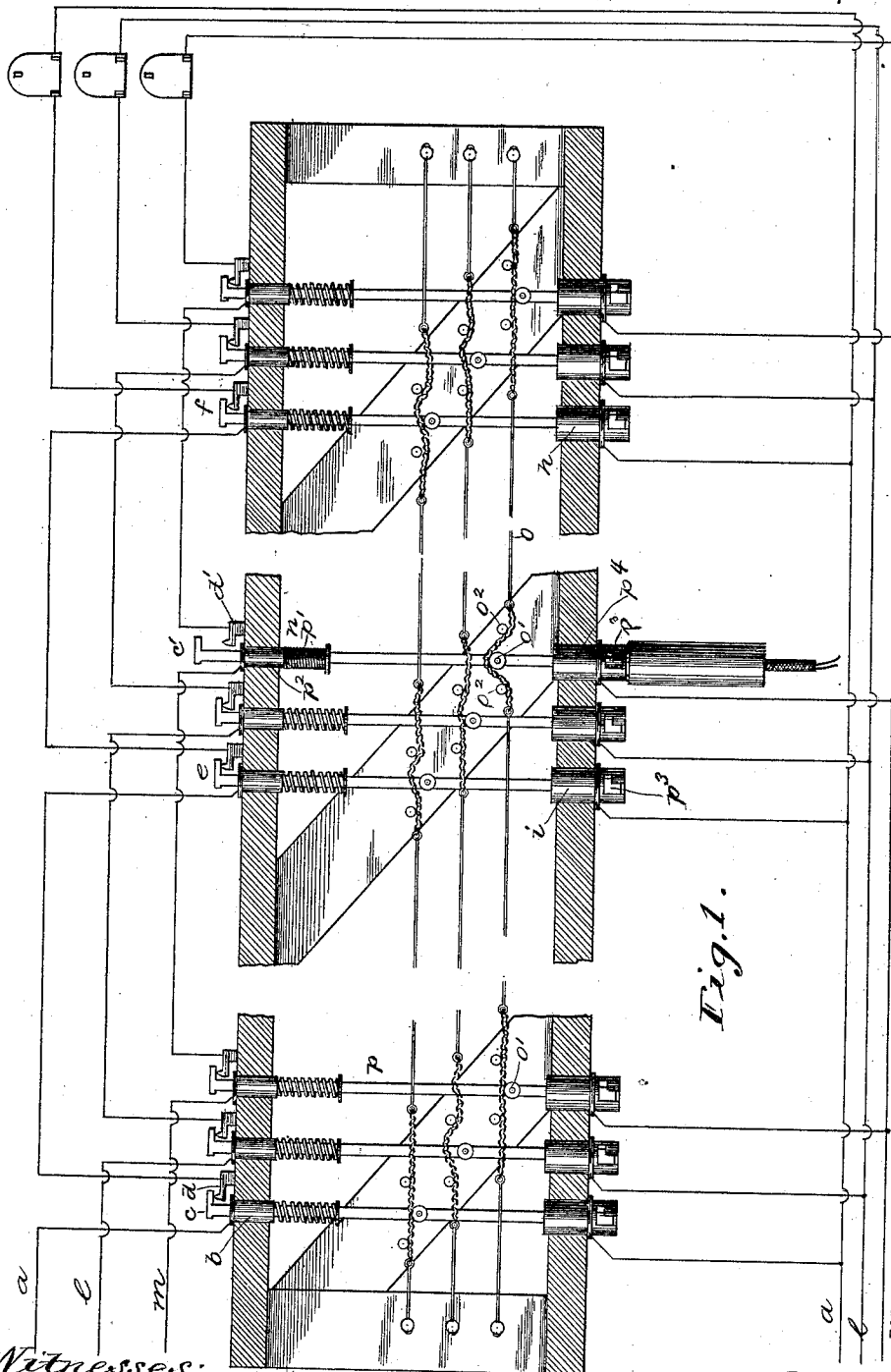


Fig. 1.

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Ella Edler

Inventor:
Walter Moseley.
By George P. Barton
Attorney.

(No Model.)

2 Sheets—Sheet 2.

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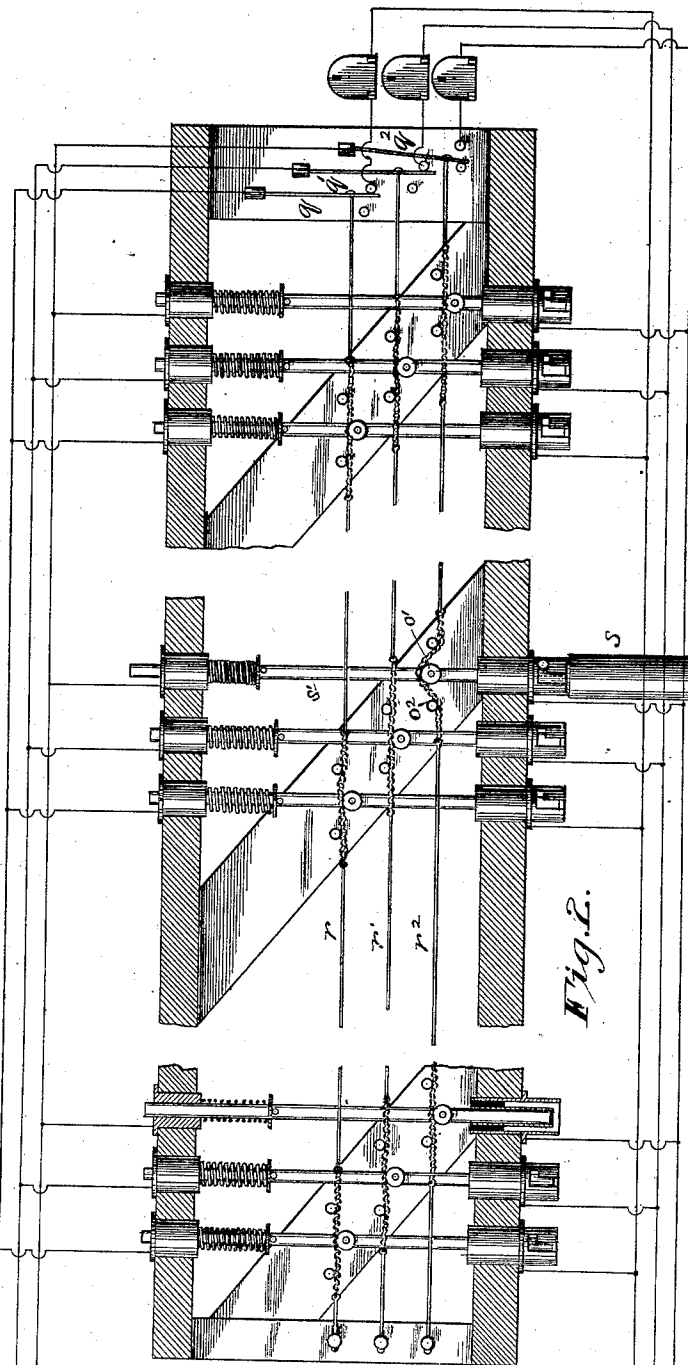


Fig. 2.

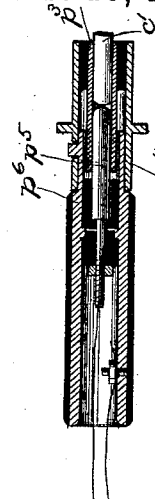


Fig. 5.

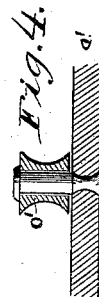


Fig. 4.

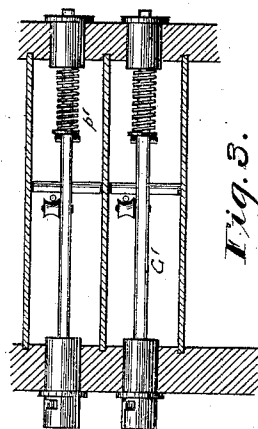


Fig. 3.

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UNITED STATES PATENT OFFICE.

WALKER MOSELEY, OF LONDON, ENGLAND, ASSIGNOR TO THE WESTERN
ELECTRIC COMPANY, OF CHICAGO, ILLINOIS.

MULTIPLE SWITCH-BOARD.

SPECIFICATION forming part of Letters Patent No. 468,818, dated February 16, 1892.

Application filed December 26, 1888. Serial No. 294,576. (No model.)

To all whom it may concern:

Be it known that I, WALKER MOSELEY, a
subject of the Queen of Great Britain, re-
siding at London, England, have invented a
certain new and useful Improvement in Mul-
5 multiple Switch-Boards, of which the following
is a full, clear, concise, and exact description,
reference being had to the accompanying
drawings, forming a part of this specification.

10 My invention relates to that class of tele-
phone-exchange systems in which the differ-
ent lines are provided each with several ter-
minals, these terminals being grouped upon
different boards and so arranged that any
15 two lines of the exchange may be connected
upon either of the switch-boards.

My invention relates more particularly to
apparatus whereby when a line is once con-
nected at one board the fact of such connec-
20 tion is made known to the operators at the
other boards, in order that when two sub-
scribers are connected upon one board they
may not be interrupted at any other of the
boards.

25 As to the state of the art prior to my inven-
tion reference is made to Letters Patent No.
266,320, granted Charles E. Scribner October
24, 1882, for telephone switch-boards and pneu-
matic signals therefor, and Letters Patent
30 No. 357,821, granted William S. Ford February
15, 1887, for multiple switch-board.

My invention consists in sliding bars, chain-
toggles, and apparatus so arranged and con-
nected between the different switch-boards
35 that when a line is busy at one board the op-
erators at other boards cannot insert their
connecting-plugs to form connection with the
same line. By this arrangement of apparatus
I provide a mechanical test system which is
40 not dependent upon audible or visual indica-
tions, which have heretofore been considered
indispensable.

My invention is illustrated in the accom-
panying drawings, in which—

45 Figure 1 shows three metallic-circuit tele-
phone-lines, each connected with three differ-
ent multiple switch-boards, with a different
individual annunciator included in the cir-
cuit of each line. Fig. 2 shows three similar

metallic telephone-lines connected with three 50
different multiple switch-boards and each in-
cluding its individual annunciator, the switch-
board apparatus being a modification of the
apparatus shown in Fig. 1. Fig. 3 is a trans-
verse vertical sectional view of the switch- 55
board. Fig. 4 is a detailed sectional view of
one of the rollers or guides carrying the
chain-toggles. Fig. 5 is a detailed sectional
view of a connecting-plug inserted in a switch.

Like parts are indicated by similar letters 60
and numerals of reference throughout the
different figures.

Referring to Fig. 1, *a* represents a metallic
circuit, which may be traced to the metallic
sleeve *b* of the switch on the first board, and 55
thence to the longitudinally-movable rod *c*
and contact *d*, and thence through corre-
sponding parts of the switch *e* of the line on
the next board, and thence in the same man-
ner through corresponding parts of the 70
switch *f* on the last board, and thence through
annunciator *g*, and thence to the insulated
thimbles *h i k* of the switches of the line on
the different boards. The other metallic cir-
cuits *l m* are connected in the same manner 75
with their respective switches on the differ-
ent switch-boards. The rod *c* of the switch
of line *a* on the first board is shown in con-
tact with the connection *d* of the switch.
This is the normal position of the switches 80
when the lines are not connected or in use.
When, however, a connection is made with a
line, as shown at switch *n*, board 2, the lon-
gitudinally-movable rod *c'* is separated from its
normal contact *d'*. 85

The chain-toggle connection *o* extends 85
across the switch-boards and is supported by
guides *o'* on the different boards. The chain-
toggle *o* belongs to the line *m*, and the guides
or rollers *o'* are placed, respectively, on the 90
different longitudinally-movable rods of the
switches of said line. The stops *o² o³* are
fixed. Therefore, when a rod, as *c'*, is moved
to the position shown, as is necessary when
connection is made with the line, the guide *o'* 95
of the sliding rod thus moved is forced
against the chain-toggle between the stops *o²*
o³, thus taking up all the slack in the chain-

toggle o , the chain-toggle o thus being drawn taut. It is now impossible to make connection with the same line at any other of the boards. If such connection were attempted, it would be found that the longitudinally-movable rod of the switch of the line could not be moved far enough to admit of the attempted connection. Thus suppose an attempt were made to connect with line m at switch p of board 1 the construction of the connecting-plug is such that in order to make a connection with any switch the sliding bar thereof must be moved, as shown at switch n . On attempting to move the sliding bar of switch p the guide o , carried upon the sliding bar of switch p , would be obstructed by the taut chain-toggle o . The switchman on making attempt and finding the movement of the sliding rod obstructed would know that the line was busy. This is essentially the mode of operation of my testing apparatus herein described and claimed.

I will now describe somewhat more in detail the different forms of the switch and the form of the connecting-plug illustrated herein, it being, however, understood that the form of the switch, as well as that of the plug, might be modified in various ways without departing from my invention.

As shown in Fig. 1, each switch—as, for example, switch n —consists of a movable part c' , which I have termed the “sliding rod,” a contact-point d' , a spring p' , tending to hold said movable rod against the contact-point d' . The rod c' is supported by the metallic sleeves or sockets $p^2 p^3$ on the different sides, respectively, of the switch-board. (For detailed section of front socket p^3 see Fig. 5.) The sleeves $p^2 p^3$ are thus electrically connected whatever may be the position of the rod c' . The contact d' is placed at the rear of the board and is readily accessible. The thimble p^4 is insulated from the socket p^3 , as shown in Fig. 5. The different connecting-plugs are each provided with two terminals, the tip or central terminal p^5 being adapted to be inserted in the socket p^3 to move the sliding bar c' to the position shown. The outer terminal p^6 of the plug is adapted to be locked to the thimble p^4 , as shown, so that the plug when inserted may be held in place against the pressure of spring p' . I preferably use a bayonet-lock between the thimble p^4 and the terminal p^6 of the plug. Any other form of locking device capable of doing the work might, however, be employed.

In Fig. 2 I have shown a single-circuit breaking and closing device in each line instead of a separate device for doing this work in connection with each switch of each line. These circuit-closing devices $q q' q^2$ (illustrated in Fig. 2) are connected, respectively, with the chain-toggle devices $r r' r^2$. When a plug is inserted in a switch of any line upon either board, the chain-toggle device, cord, or wire, as r , r' , or r^2 , is operated to open the key

q, q' , or q^2 , as the case may be. Thus, as shown in Fig. 2, plug s being connected with the switch s' , the key q^2 is drawn away from its normal contact to the position shown and held while the connection remains. Thus by the apparatus shown in Fig. 2 one circuit-breaking device only in each line is required.

I do not consider it necessary to illustrate or describe the manner of connecting the telephone-lines with the subscriber's stations; neither have I deemed it necessary to illustrate or describe the operator's outfits in detail. It will be understood, however, that each line includes one or more subscribers' stations. It will be also understood that an operator is placed at each board and provided with pairs of plugs and cords adapted to be connected with her telephone outfit and to loop the different lines together. The individual annunciators will be distributed upon the different switch-boards and suitable signaling apparatus provided, all in the usual manner.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. The combination, with two or more switch-boards with which telephone-lines are connected, of chain-toggle devices, one for each of the telephone-lines, each of said chain-toggle devices being drawn taut by the insertion of a plug in any switch of the line corresponding thereto to lock the other switches of said line on the other boards out of employment, substantially as and for the purpose specified.

2. A chain-toggle device extending across each of the two or more multiple switch-boards and being attached or supported upon the movable part of a switch of each of said boards, in combination with the two or more multiple switch-boards and a connecting device or plug which on being inserted in either of said switches forces the movable part of the switch in which it is inserted against the chain-toggle joint, thereby changing the tension of said chain-toggle device and obstructing the movement of the movable parts of said other switches, substantially as and for the purpose specified.

3. A telephone-line connected with several switches, each on a different switch-board, said line including an individual annunciator placed between different sockets or guides, as $p^2 p^3$, of the switch on the last board, the movable parts of the switches of the line being mechanically connected, in combination with a loop-plug inserted in one of said switches to open the connection of the line with the annunciator, while at the same time the other switches of the line are obstructed to prevent any other connection with the line, substantially as and for the purpose specified.

4. The switch consisting of the sliding bar, with metallic sockets or guides therefor, one on each side of the board, in combination with

the insulated thimble on the face of the board
around the front socket or guide, one branch
of a line connected with the rear socket and
the other branch connected with the thimble,
5 and a loop-plug inserted in said switch to form
connection with the said sliding bar and thim-
ble, as described.

In witness whereof I hereunto subscribe my
name this 3d day of December, A. D. 1888.

WALKER MOSELEY.

Witnesses:

I. E. KINGSBURY,
J. W. SPENCER.