

(No Model.)

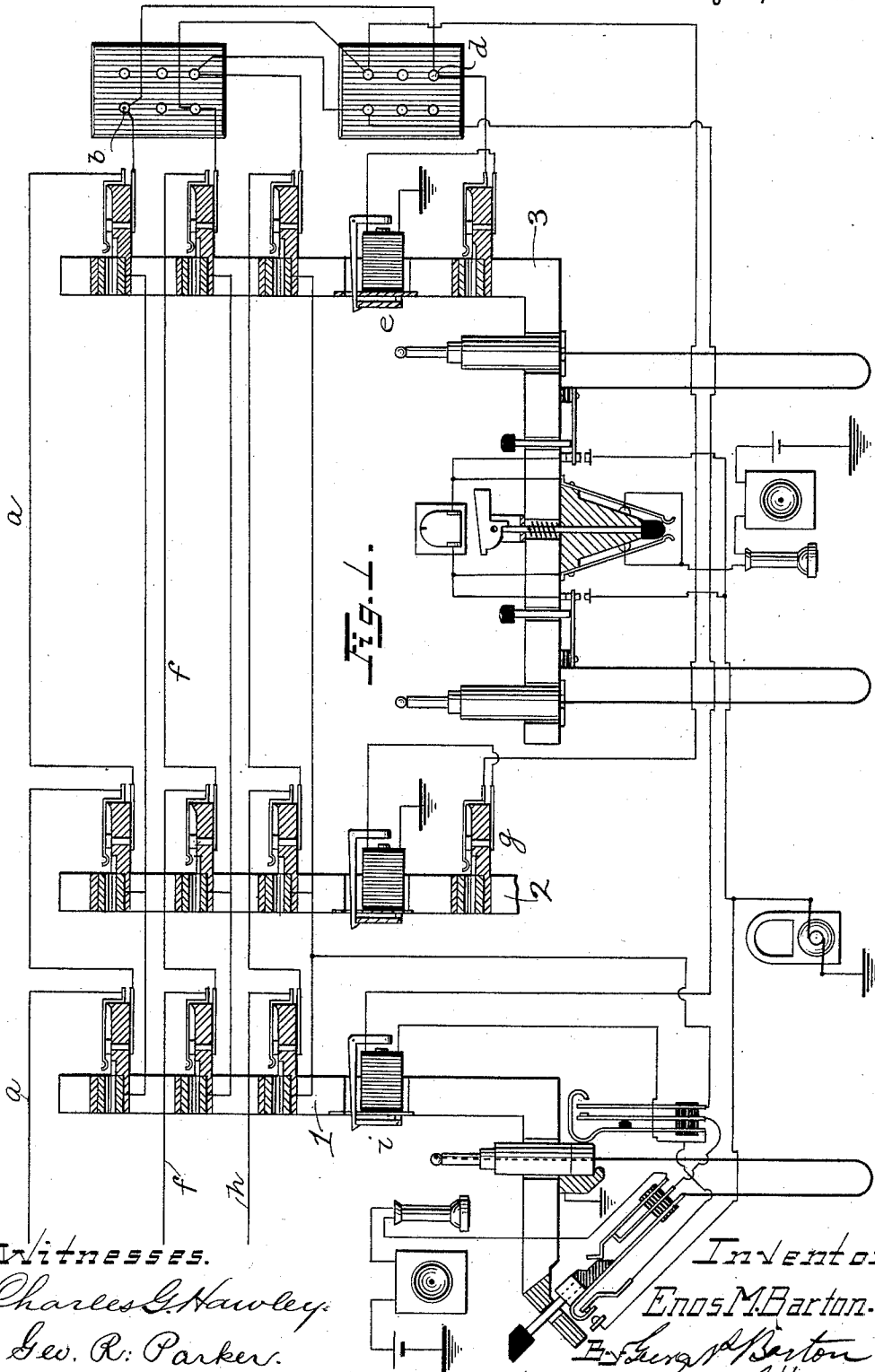
2 Sheets—Sheet 1.

E. M. BARTON.

TRANSFER CONNECTING APPARATUS FOR MULTIPLE SWITCH BOARDS.

No. 431,962.

Patented July 8, 1890.



Witnesses.

Charles L. Hawley.
Geo. R. Parker.

Inventor.

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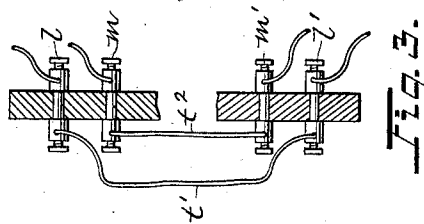
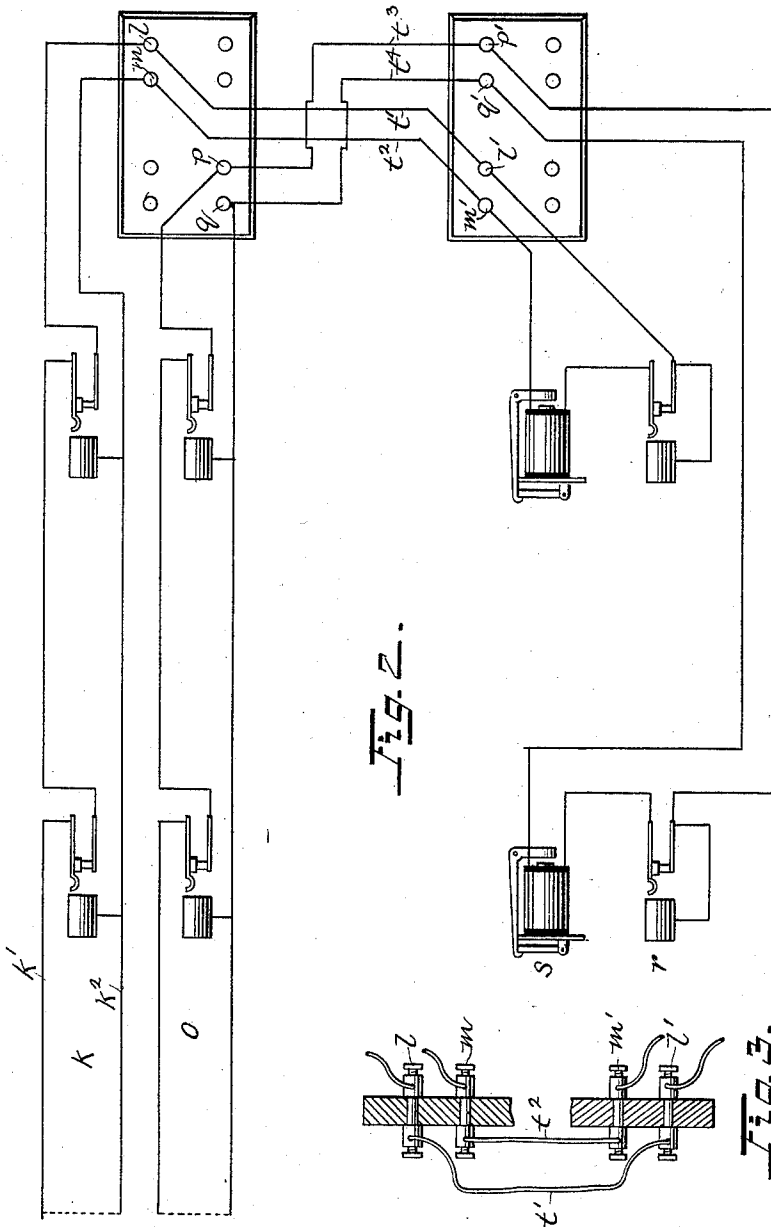
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By George P. Barton
Attorney

UNITED STATES PATENT OFFICE.

ENOS M. BARTON, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE WESTERN
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TRANSFER-CONNECTING APPARATUS FOR MULTIPLE SWITCH-BOARDS.

SPECIFICATION forming part of Letters Patent No. 431,962, dated July 8, 1890.

Application filed March 8, 1890. Serial No. 343,111. (No model.)

To all whom it may concern:

Be it known that I, ENOS M. BARTON, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Transfer-Connecting Apparatus for Multiple Switch-Boards, (Case 1,) 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.

In multiple-switch-board systems it is desirable that the work should be apportioned among the different operators as evenly as possible, and in order that such distribution of work may be accomplished the subscribers making the largest number of calls have been classified and their individual annunciators distributed among the different switch-boards, so that each operator may have only his proper proportion of such busy lines to answer. From time to time, however, it is found that the subscribers thus classified as busy will become less frequent in their demands for service, while those not included among the busy lines will require frequent connections. Thus from month to month it becomes necessary or convenient to make a new classification and distribution of the busy lines among the different sections of the switch-boards—that is, among the different operators—so that the work required of each may be practically the same amount. It is also desirable, in wiring a switch-board, to provide for the addition of sections of switch-board from time to time as the growth of the business demands. My invention as applied to multiple switch-boards greatly facilitates the addition of sections of switch-boards and the wiring of the same without interference with the connections at the sections previously wired.

My invention consists in a transfer switching apparatus, with which the different telephone-lines are connected immediately after passing through the switch on the last board and so arranged that any line may be readily transferred from the connection with one board to a corresponding connection with another board, thus facilitating the classifica-

tion or distribution of the busy lines among the operators.

My invention is applicable to metallic-circuit systems, single or grounded circuit systems, and to mixed systems of multiple switch-boards, and the switching apparatus at the different switch-boards may be of the single-cord type or of the more usual double-cord type.

In the drawings which are illustrative of my invention, Figure 1 is a diagram illustrative of three telephone-lines, each connected with three different switch-boards and each with an individual annunciator, in connection with my transfer switching apparatus interposed in said lines between the switches thereof on the last board and the individual annunciators of the lines. Fig. 2 is a diagram showing my invention applied to metallic-circuit telephone-lines. Fig. 3 is a sectional view of a switching apparatus having binding-posts adapted to be interchangeably connected with one another for the purpose of changing the lines connected therewith from an individual annunciator on one board to an individual annunciator upon another board.

I will first describe my invention as illustrated in Fig. 1. Sometimes single cords are used at one switch-board of an exchange and double cords at another board. As illustrated in Fig. 1, the line *a* is connected with the switch on each of the boards 1 2 3. From the contact of the switch on the last board it extends to a binding-post *b* and then by wire *c* to another binding-post *d*. From binding post *d* the circuit is continued through the answering spring-jack of the line and thence through the individual annunciator *e* thereof to ground. The telephone-line *f* is connected in like manner with the switch on each of the switch-boards and through binding-posts interposed between the contact of the switch of the line on the last board and the answering spring-jack *g* of the line, in this instance on board 2, and thence through the individual annunciator of the line to ground. The telephone-line *h* extends in like manner through a switch on each of the switch-boards and from the switch on the last board through two binding-posts or con-

necting devices, and thence through the individual annunciator *i* of the line, and thence through the grounding-key and metallic heel of the plug to the plug-socket, which is connected to ground. The terminal of this line is the ordinary single socket and terminal plug, and the usual listening in and calling apparatus is shown connected therewith. At board 3, on the other hand, I have shown a usual pair of plugs and cords, together with the operator's telephone and switching devices. Preferably all the lines of the exchange are connected through the transfer-connecting devices. These transfer-connections being provided immediately back of the last board, the changes necessary to keep the work uniformly distributed may be conveniently made.

Referring now to Fig. 2, it will be seen that I have provided two binding-posts in each of two sides of the metallic circuits immediately after the switches of said lines on the last board. In this instance two changes will be required in changing the connection of a line from an annunciator on one board to an annunciator on another board. Thus metallic circuit *k* has its limb *k'* connected through the springs and contacts of a switch on each of two switch-boards, and thence through binding-posts *l l'*, and thence to the contact of the answering spring-jack of the line, and thence through the individual annunciator of the line, in this instance placed on the second board. The other limb *k''* of this circuit is connected with the test-pieces of the switches on each of the boards and through binding-posts *m m'*, and thence to the other side of the individual annunciator, thus completing the metallic circuit of the line. The binding-posts *l m* and *l' m'* of Fig. 3 may be considered the same as those of like letter in Fig. 2. The circuit of line *o* is similar to that of line *k*. The two branches of said line *o* extend through different portions of the switches of the line on the different switch-boards and from binding-posts *p q* to binding-posts *p' q'*, and thence completing the circuit through the answering spring-jack *r* and individual annunciator *s* on the first board. It will be seen that the transfer-wires *t' t''* of circuit *k* are connected from binding-posts *l m* to binding-posts *l' m'*, respectively; also that the transfer-wires *t' t''* of line *o* are connected with binding-posts *p' q'*, respectively. Thus line *o* is connected with an individual annunciator on the first board, while line *k* is connected with an individual annunciator on the last board. Now by simply connecting transfer-wires *t' t''* with binding-posts *p' q'* and binding-posts *t' t''* with binding-posts *l' m'* line *k* will be transferred to the first board and line *o* to the last board. When single or grounded circuit-lines are employed, as in Fig. 1, only one change in the connection is required in order to transfer a line from its annunciator on one board to an annunciator upon another board.

It should be noted that answering spring-jacks are usually provided in connection with the individual annunciator. Thus a particular individual annunciator has connection with a particular answering spring-jack. Now, although the spring-jack switches upon the face of the board are given definite numbers corresponding to the individual numbers employed to designate the subscribers' stations connected therewith, it is in no way important that an operator shall know which particular subscriber is connected with a given annunciator which she is required to watch, since when the annunciator falls she must make connection with the answering spring-jack connected therewith in the first instance, and thus put herself in communication with the subscriber who has called, no matter what may be his individual number.

It is evident that the wires cabled from the last section of switch-board to the first set of binding-posts upon the transfer-connection board may be readily disconnected therefrom and continued to the switches upon an additional section of switch-board, and cables from this new section connected to the binding-posts from which the first-mentioned cables were disconnected, thus avoiding disconnection at the switch-board proper, as has been necessary in apparatus of this kind heretofore used.

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

1. The combination, with telephone-lines, each connected with two or more switches distributed on different switch-boards and extending each from its switch on the last board to a different individual signal-receiving device on one of the boards, the signal-receiving devices of the different lines being distributed among the boards, of transfer-connecting devices immediately back of the switches on the last board with which transfer-switching devices the different lines are connected in passing to their respective individual signal devices on the different boards, whereby the connections of the different lines may be readily changed between the individual signal-receiving devices to maintain an even distribution of the work between the different boards, substantially as and for the purpose specified.

2. Telephone-lines connected with multiple switch-boards, each line extending through its particular spring-jack switch on each of the boards in series, and each line being connected from its switch on the last board through an individual annunciator, the individual annunciators of the lines being apportioned among the different switch-boards, in combination with transfer-switching apparatus with which the lines are connected, said transfer-switching apparatus being placed immediately back of the switches of the lines on the last board, substantially as and for the purpose specified.

3. The combination of several telephone-
lines, each connected with different switches
on different switch-boards, and each from the
switch on the last board through different
5 transfer-connections, said transfer-connec-
tions being interchangeable between the said
several telephone-lines, in combination with
circuit-connections for said telephone-lines,
extending from said transfer-switching ap-
10 paratus through different individual annun-
ciators on the different switch-boards, where-
by the said telephone-lines may be inter-

changeably connected with the said different
individual annunciators to maintain an even
distribution of the work between the sub- 15
scribers at the different switch-boards, sub-
stantially as and for the purpose specified.

In witness whereof I hereunto subscribe my
name this 29th day of November, A. D. 1889.

ENOS M. BARTON.

Witnesses:

GEO. R. PARKER,
CHAS. G. HAWLEY.