

(Model.)

F. BLAKE.
Electric Switch Board.

No. 243,100.

Patented June 21, 1881.

Fig. 2.

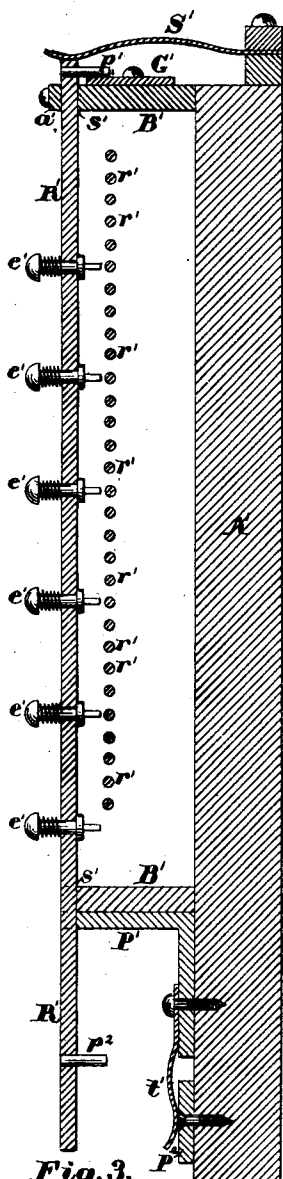
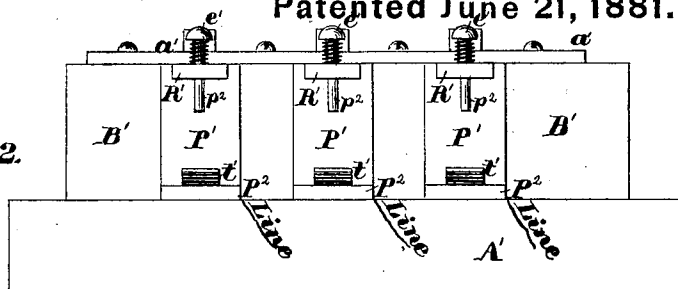
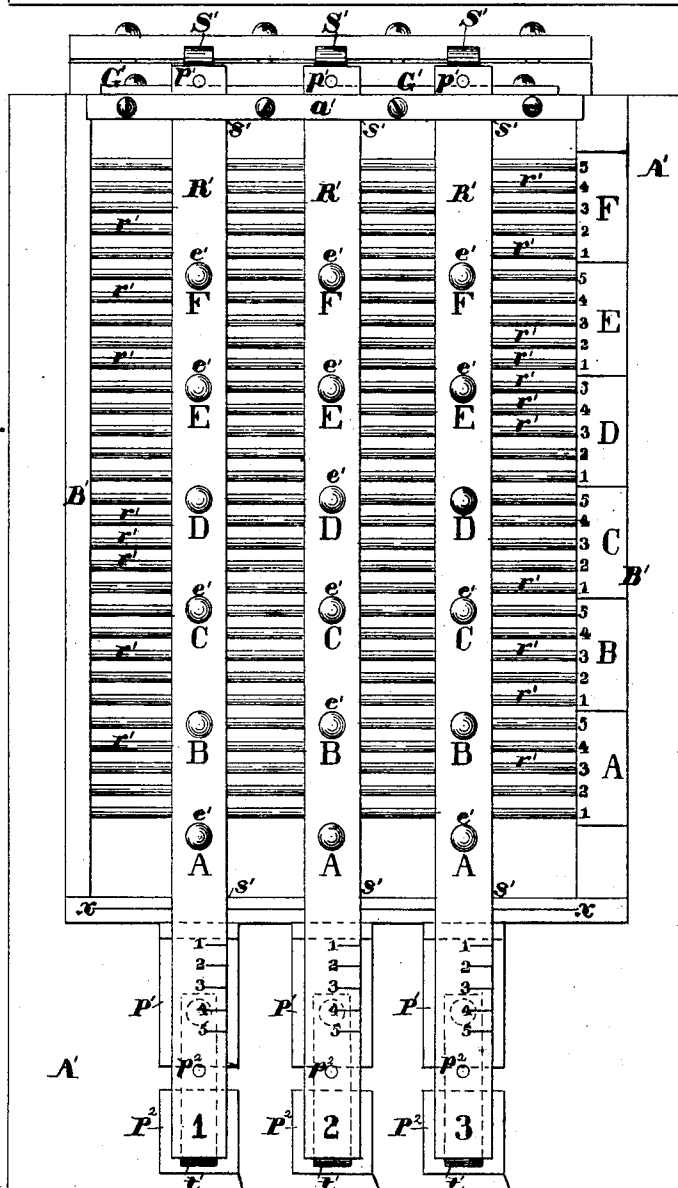


Fig. 3.

Witnesses:

H. G. Olmsted
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Fig. 1.



Inventor:

Francis Blake
by
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his atty

UNITED STATES PATENT OFFICE.

FRANCIS BLAKE, OF WESTON, MASSACHUSETTS.

ELECTRIC SWITCH-BOARD.

SPECIFICATION forming part of Letters Patent No. 243,100, dated June 21, 1881.

Application filed May 9, 1881. (Model.)

To all whom it may concern:

Be it known that I, FRANCIS BLAKE, of Weston, in the State of Massachusetts, have invented a new and useful Improvement in Electric Switch-Boards, of which the following is a specification.

The invention consists in the use of several line-rods or several series of line-rods crossing several series of insulated rods, in combination with a number of contact-pins for connecting the line and insulated rods—as many contact-pins for each line-rod as there are series of insulated rods, one appropriated to each series.

In the drawings, I have shown a switch-board embodying my invention, in which each line-rod has an independent movement over all the fixed rods, and is provided with a number of contact-pins, one for each series of fixed rods, for making metallic connection with any rod thereof.

Figure 1 is a plan of said switch-board; Fig. 2, an end elevation of the same, and Fig. 3 a longitudinal section on one of the line-rods.

A' is a table, and B' a frame rigidly secured thereto, both of insulating material.

R' R' R' are square metallic rods or bars sliding longitudinally in slots *s' s' s'* in the ends of the frame, while *r' r' r'* are small wire rods fixed in the sides of the frame, a cap-bar, *a'*, of insulating material holding the said movable rods in their respective slots.

G' is a ground-plate common to all the movable rods by means of pins *p'*, with one of which normally in contact with said ground-plate each movable rod is provided.

S' S' S' are springs attached to the frame and working one against each movable rod to maintain the said normal position of the pins *p'*, the rods R' having also each a second pin, *p*², serving as a stop-pin to limit its motion in opposition to its spring S'. Each movable rod is connected with an independent electric circuit through a spring-jack consisting of a yoke-shaped bracket, P', a spring, *t'*, and a metallic plate, P², the yoke of the bracket P' embracing the movable rod, as shown, while the line-wire is attached to the plate P².

The fixed rods *r' r' r'* are divided into several series, which, in practice, are designated by letters A B C D E F. The movable rods R' of each series are numbered 1 2 3, &c. I

have shown but three rods, but in the description of the mode of operation it will appear that the three may be taken as belonging to one series, or each to a separate series, or either two to one series, while the third belongs to any other series. Each movable rod R' is provided with a number of contact-pins, *e'*, equal to the number of series of fixed rods *r'*, one for each series, and near each of these contact-pins is stamped upon the movable rod, as shown, a letter corresponding to the letter of the series of fixed rods lying next beyond and with which it is to work. Each contact-pin has a head above its rod and a collar below, and is provided with a coiled spring, by which, in its normal position, it is held wholly above the plane of the rods *r'*; but each contact-pin is of such length that when pushed in by the hand of the operator against the force of the coiled spring it may pass between two of the fixed rods *r'*. When a contact-pin is thus pushed in between two fixed rods the spring S' will force and lock the pin against that fixed rod of the two which is more remote from the spring. The pin may be released from contact with such fixed rod by a slight movement of the movable rod against the spring S'. This locking and releasing device forms no part of the invention claimed herein, but is a part of the subject-matter of an application for a patent filed by me April 11, 1881.

Upon the frame is shown a common index-line, *xx*, and each movable rod has etched upon it a scale graduated to the distances between the centers of the fixed rods *r'*, the latter being of uniform diameter and at uniform distances apart.

In practice it is found that each operator can control about fifty line or movable rods, but it is also found that the number of fixed or switch rods required at an office is a small percentage of the number of line-rods. I therefore make all the fixed rods common to all the operators—that is, all the line-rods cross all the fixed rods—but I divide the fixed rods into as many series as there are operators or series of line-rods, and I appropriate a series of fixed rods to each series of line-rods, as shown in the drawings, where series A of the fixed rods may be considered as belonging to a series of line-rods under the control of a single operator and known as board A, fixed rods

in series B belonging to a series of line-rods under the control of another operator and known as board B, &c. All the fixed rods extend before all the operators, and it is obvious that any operator can connect any line-rod under his control with any fixed rod before him. It follows that but a single contact-pin in each rod is absolutely necessary, and in my said former application I have described and claimed a series of movable rods crossing a series of fixed rods, each movable rod furnished with a single contact-pin. I make no such claim herein, the present invention having reference to and requiring the use of several contact-pins in each movable rod, one for each series of fixed rods, except so far as it relates to the use of an index and scale.

In practice each operator will make connection between any two line-rods under his own control by means of the series of fixed rods especially appropriated to him, and when a connection is to be made between one of his own line-rods and a line-rod under the control of another operator he will connect his said line-rod with one of his own fixed rods, and then cause the other operator to connect the other line-rod with the same fixed rod, each operator using his own contact-pin which is appropriated to the series to which the fixed rod belongs. The index and scales will greatly

assist the operator in making the required connections, especially when the fixed rods are small and very near each other, and the one used is at the distance of an arm's length. If a graduation of the scale is brought to the index-line $x x$, each contact-pin on the rod is by the same movement carried just beyond the fixed rod of the series with which it works, having the number corresponding to the graduation.

I claim—

1. A switch-board containing several series of insulated or connecting-rods and two or more line-rods, each of which crosses all the insulated or connecting-rods, and is provided with a number of pins or other suitable contact devices, one for each series of insulated or connecting rods, substantially as described.

2. Several series of movable rods crossing several series of insulated fixed rods, each movable rod having an independent movement over all the fixed rods and provided with a number of contact-pins, one for each series of fixed rods for making metallic connection with any rod thereof, substantially as described.

FRANCIS BLAKE.

Witnesses:

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W. W. SWAN.