No. 763,404. PATENTED JUNE 28, 1904.

# W. KAISLING.

## SWITCHBOARD APPARATUS.

APPLICATION FILED JAN. 13, 1903.

NO MODEL. 2 SHEETS—SHEET 1.

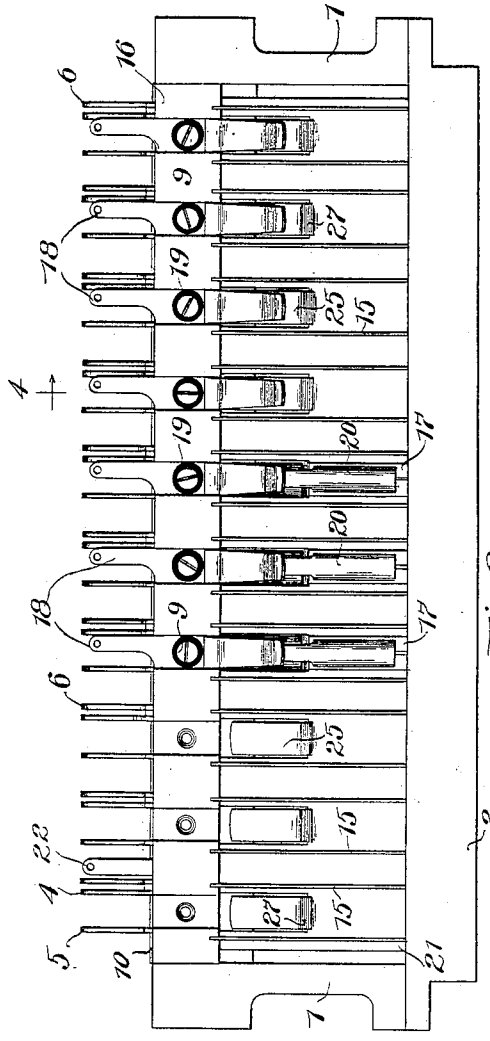


Fig. 2.

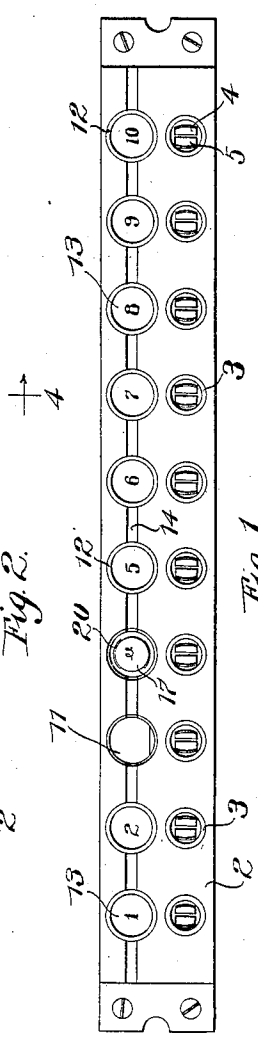


Fig. 1.

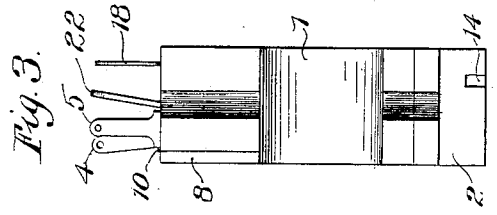


Fig. 3.

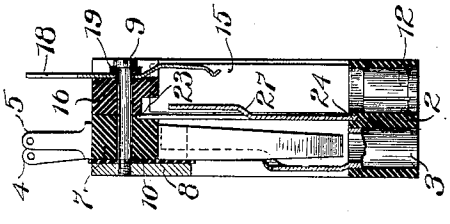


Fig. 4.

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# W. KAISLING.

## SWITCHBOARD APPARATUS

APPLICATION FILED JAN. 13, 1903.

NO MODEL. 2 SHEETS—SHEET 2.

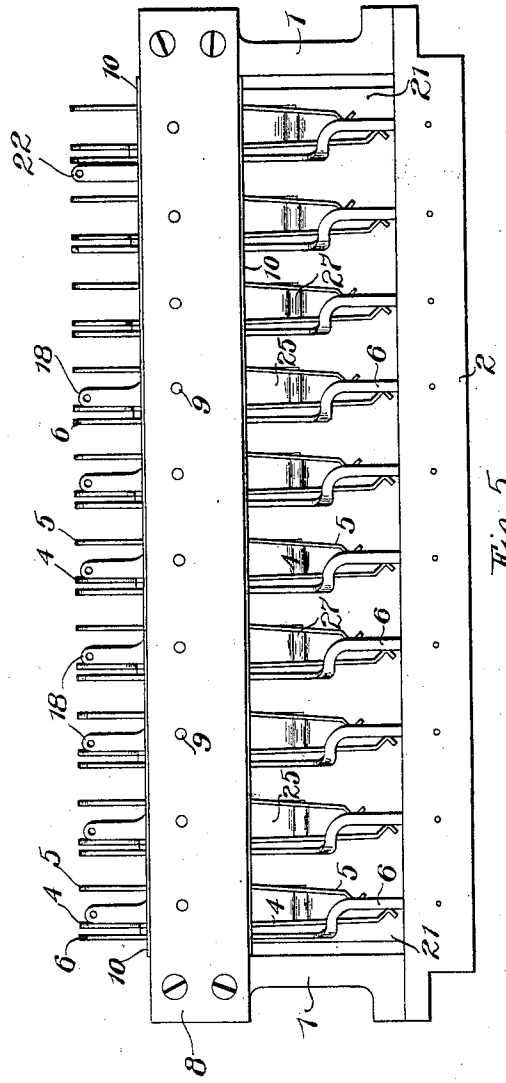


Fig. 5

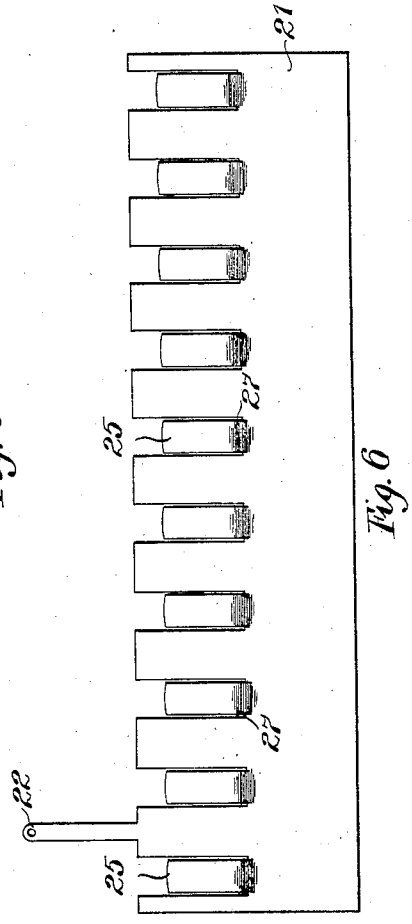


Fig. 6

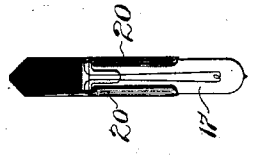


Fig. 7.

Witnesses:
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No. 763,404. Patented June 28, 1904.

# UNITED STATES PATENT OFFICE.

WILLIAM KAISLING, OF CHICAGO, ILLINOIS, ASSIGNOR TO STROMBERG-CARLSON TELEPHONE MANUFACTURING COMPANY, OF ROCHESTER, NEW YORK, A CORPORATION OF NEW YORK.

## SWITCHBOARD APPARATUS.

SPECIFICATION forming part of Letters Patent No. 763,404, dated June 28, 1904.

Application filed January 13, 1903. Serial No. 138,835. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM KAISLING, 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 Switchboard Apparatus, (Case No. 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.

My invention relates to switchboard apparatus for use in telephone-exchanges. In such telephone-exchanges it is frequently desirable to connect a considerable number of electrically-operated devices to a common source of current-supply. In other words, such devices are frequently connected in multiple arc. In such cases it is usually the practice to provide each of the said electrically-operated devices with a pair of terminals. In order to supply current to these devices, it is necessary to make electrical connection between suitable conductors and each of these terminals. Since it is frequently necessary to remove such devices from their position in the switchboard in order to repair or replace them, it is desirable to provide means whereby the connection between the electrically-operated devices and the supply-conductors may be readily broken. Such a means of connection may be afforded by a pair of contact-springs, with which the terminals of the said device may be brought into contact. It has heretofore been the practice to provide for each of said devices a pair of contact-springs. It has been customary to provide a suitable conductor for connecting together one of each of the contacts for each of said devices. The other spring associated with each device is frequently connected with switching means for controlling the current-flow through the said device, the circuit through a plurality of said devices including a common source of current.

My invention provides means whereby the cost of the connecting means for a series of such devices may be decreased and whereby the simplicity, the durability, and the ease of manipulation of such switchboard appliances may be increased.

My invention consists, essentially, in the provision of a series of connecting-springs formed of a single integral piece of metal.

My invention is particularly applicable to those installations in which small incandescent lamps are used for switchboard signaling purposes and in which the local circuits through such signaling-lamps are controlled by electromagnetically-actuated relays which may be controlled either wholly or in part by the condition of the subscriber's substation apparatus. Such signaling-lamps as are at present employed for this purpose are usually provided with a pair of connecting-terminals disposed on substantially diametrically opposite sides of the lamp. Receptacles are provided in a suitable switchboard lamp-bank, into each of which a lamp may be inserted, there to make contact, by means of the above-mentioned contact-terminals, with a pair of suitably-disposed connecting-springs. Since it is found desirable to electrically connect one of each of the springs associated with each of said lamps, I have found it of great advantage, as hereinbefore pointed out, to form one integral sheet of spring metal into a series of contact-springs, one spring being associated with each lamp-receptacle. The source of current may be connected with this strip or sheet of connecting-springs, thereby saving the expense and unnecessary complication of connecting said source of current with separate springs, one for each lamp-receptacle.

My invention will be more clearly understood by reference to the accompanying drawings, in which—

Figure 1 represents in front elevation a switchboard strip or section containing a series of ten lamp-receptacles and ten line-jacks associated therewith. Fig. 2 represents a top plan view of such a strip into which certain of the associated signal-lamps have been inserted and from which certain of the connecting-springs have been removed to more clearly illustrate the construction of the connecting-

plate. Fig. 3 is an end elevation of the same. Fig. 4 is a cross-sectional view taken on line 4 4 of Fig. 2. Fig. 5 is a bottom view of such a strip. Fig. 6 is a plan view of the connecting-plate wherein resides the principal feature of my invention, and Fig. 7 is a view of a lamp adapted for use with the present form of my invention.

I have shown suitable frame-pieces 1 1, to which are attached the hard-rubber strip 2, a series of which form the front panel of the telephone-switchboard. Suitable openings in this strip 2 retain in position the testing-thimbles 3 3 of the spring-jacks, comprising the springs 4 and 5 and the connecting-clips 6 6. The spring-jacks are desirably held in position by a back strip 7, which acts in conjunction with a binding-plate 8 and retaining-bolts 9 9, between which back strip and binding-plate there is provided a layer of insulating material 10. Other openings 11 11 are provided in the front strip, in which are inserted suitable opals or split cylindrical tubes 12, each provided with a translucent window 13, bearing the number of the line associated with the corresponding signal.

A groove 14 in the front plate provides for the insertion of suitable tweezers adapted to cause the removal of said tubes from their position within the front plate.

A series of wall-plates 15 15, supported in notches in the front strip 2 and in the back strip 16, serve to provide receptacles for the signal-lamps 17 17. To the upper side of the back strip 16 the lamp-connecting springs 18 18 are secured by the bolts 9 9, which bolts are insulated from said springs by suitable washers 19 19.

As best illustrated in Fig. 2, the insertion of a lamp 17 within one of the aforementioned receptacles causes an electrical contact and connection between one of the lamp-terminals 20 and an upper contact-spring 18. A plate 21, preferably having a single connecting-terminal 22, is retained by suitable grooves 23 and 24 in position between the front and back strips. This plate is formed into the connecting-springs 25 25, which, it will be seen, are adapted for connection with the terminals 20 of lamps inserted within the corresponding receptacles. As will be best seen in Fig. 4, each of these springs is upraised by means of an angularly-placed connecting-piece 27, a bevel ledge being thus formed to more readily guide the lamp into position within the receptacle. Since all the lamps in the strip are illuminated or adapted to be illuminated by current derived from a single source, the complete circuit for each lamp being controlled by the operative condition of an associated line-relay, one terminal of the source of current is preferably connected directly with the connecting-clip 22. The switching mechanism controlling the circuit including a lamp is connected in an electrical path between the other terminal of the source of current and the connecting-spring 25 associated with the given lamp.

In order to prevent the light from the signal-lamps shining through the openings or thimbles of the spring-jacks, and thereby causing confusion to the operator, it has been the practice to provide a sheet of opaque material forming lower walls for the lamp-receptacles, thereby preventing the light from the lamps from passing to the spring-jack openings. It will be seen that the plate 21 in addition to its function as an electrical conductor also forms a partition for each of the lamp-receptacles, thereby preventing the misdirection of the light from the lamp, as above pointed out.

By the arrangement used in accordance with my invention the illumination of each lamp is absolutely controlled by the operative condition of the switching mechanism controlled by the associated line-relay, and at the same time the multiplicity of the additional connecting-springs and conductors connecting the lamps with the source of current is dispensed with. It will be apparant to those skilled in the art that the substitution of an integral conductor formed of a single metal stamping in place of a series of connecting-springs and which at the same time replaces the otherwise necessary lower walls for the lamp-receptacles materially decreases the cost of manufacture and duplication of parts and the ease and rapidity with which the switchboard parts may be assembled.

While I have herein shown and described a preferred embodiment of my invention, it will be apparent to those skilled in the art that modifications and changes therein may be made without departing from the spirit of my invention, and I do not, therefore, wish to be limited to the precise disclosure herein set forth; but,

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

1. In a telephone-switchboard lamp-bank, the combination with front and rear supporting-strips, of a plurality of terminal springs extending forwardly from the rear strip and insulated from each other, a conducting-plate disposed below said springs and extending between the supporting-strips, and contact-springs extending from said conducting-plate and registering with said other springs, each pair of springs serving for the reception of a signal-lamp.

2. In a telephone-switchboard lamp-bank, the combination with front and rear strips, of terminal springs extending forwardly from said rear strip and insulated from each other, a plate of conductive material disposed opposite said springs and extending between said supporting-strips, notches in said supporting-strips in which said plate is secured, and springs extending from said plate and regis-

tering with said other terminal springs, the terminal springs serving for the reception of a signal-lamp.

3. In a telephone-switchboard lamp-bank, the combination with front and rear supporting-strips, of contact-springs extending forwardly from the rear strip and insulated from each other, a metallic plate bridging between said strips below said contact-springs, and other contact-springs formed from the material of said wall and disposed to register with the aforesaid contact-springs to form receptacles for signal-lamps, said plate forming a common conductor for said lamps.

4. In a telephone-switchboard lamp-bank, the combination with front and rear supporting-strips, of a plurality of contact-springs extending forwardly from the rear strip and insulated from each other, a metallic plate bridging between said supporting-strips, notches in said strips in which said plate is supported, and other contact-springs formed from the material of said plate and disposed to register with the aforesaid contact-springs to form receptacles for signal-lamps, said plate forming a common conductor for said signal-lamps.

5. In a telephone-switchboard lamp-bank, the combination with front and rear supporting-strips, of a plurality of contact-springs extending forwardly from said rear strip and insulated from each other, a metallic plate bridging between said strips, other contact-springs extending from said plate and registering with the aforesaid contact-springs to form receptacles for signal-lamps, and side walls for each lamp extending between said supporting-strips, said side walls and plate forming opaque inclosing chambers for said lamps.

6. In a telephone-switchboard bank, the combination with front and rear supporting-strips, of insulated material, of contact-springs extending forwardly from said rear strip and insulated from each other, a metallic plate bridging between said strips, contact-springs punched from the material of said plate and disposed to register with the aforesaid springs to form receptacles for signal-lamps, said plate forming a common conductor for said lamps, and vertical side walls for each lamp extending between the supporting-strips, said side walls and plate forming opaque inclosing chambers for said lamps.

7. In a telephone-switchboard lamp-bank, the combination with front and rear supporting-strips of insulating material, of contact-springs extending forwardly from the rear strip and insulated from each other, a metallic plate bridging between the strips and secured in notches in said strips, contact-springs punched from the material of said plate and disposed to register with the aforesaid contact-springs to form receptacles for signal-lamps, said plate forming a common conductor for said lamps, vertical side walls for each lamp extending between the supporting-strips and secured in notches therein, said side walls and horizontal plate forming opaque inclosing chambers for said lamps, and an opening through said front supporting-strip disposed before each lamp wherethrough the rays from the lamp may pass.

In witness whereof I hereunto subscribe my name this 10th day of January, A. D. 1903.

WILLIAM KAISLING.

Witnesses:
LYNN A. WILLIAMS,
HARVEY L. HANSON.