

(No Model.)

F. W. JONES.
ELECTRICAL SWITCHING APPARATUS.

No. 573,601.

Patented Dec. 22, 1896.

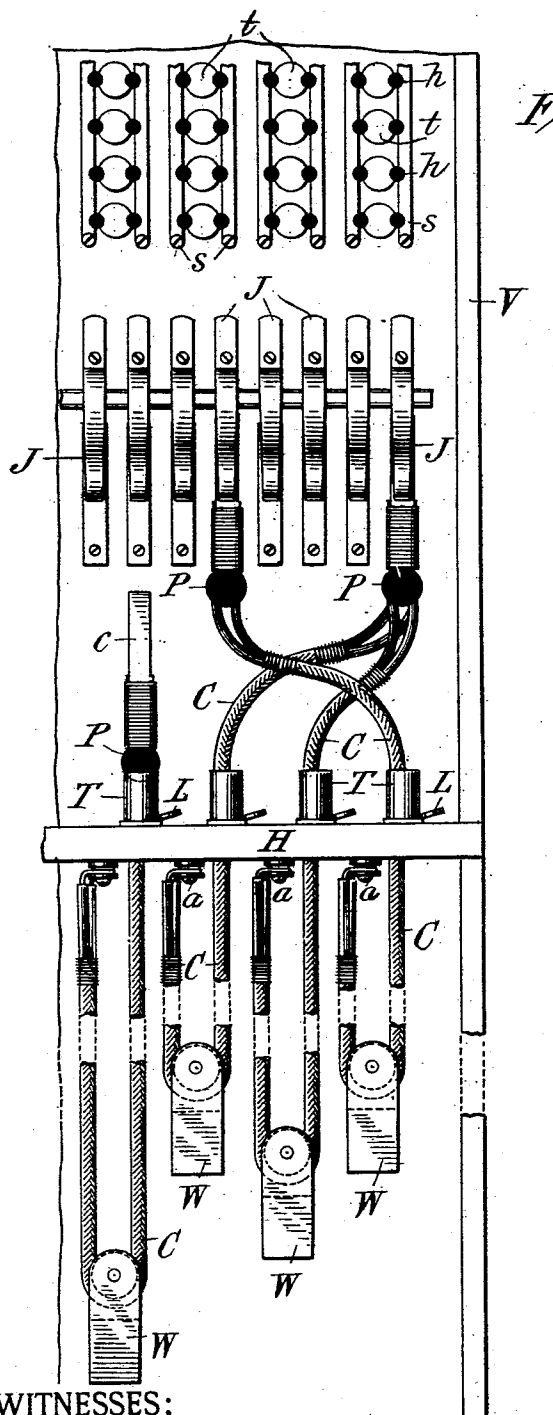


Fig. 1,

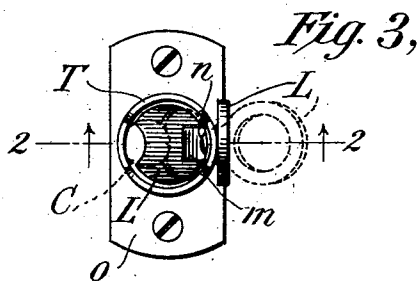


Fig. 3,

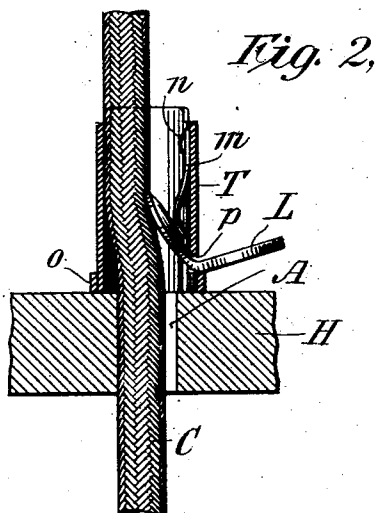


Fig. 2,

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FRANCIS W. JONES, OF NEW YORK, N. Y.

ELECTRICAL SWITCHING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 573,601, dated December 22, 1896.

Application filed October 15, 1896. Serial No. 608,933. (No model.)

To all whom it may concern:

Be it known that I, FRANCIS W. JONES, a citizen of the United States, and a resident of New York, in the county and State of New York, have made certain new and useful Improvements in Electrical Switching Apparatus, of which the following is a specification.

My invention is an improvement in switchboards or switching apparatus for use in telegraph offices.

It is the common practice to arrange a vertical switchboard upon a horizontal table. Upon the vertical board there are strips of metal arranged vertically and other strips at right angles thereto, a plug or connecting-pin being inserted at intersecting points to connect the battery terminating in the horizontal strips with the line-wire terminating in the vertical strips. Along the lower edge of the vertical board there is a row of spring-jacks normally forming part of the main line-wires, respectively. A series of flexible conducting-cords, either single or double conductor, have their ends fixed upon the under side of the horizontal board and are there connected with telegraphic instruments located in the same apartment, while other cords are connected to branch wires or loops extending to substations, such as hotels and mercantile establishments. Each of these flexible cords has its opposite end equipped with a plug having electrical contact-points which register or coöperate with the contact-points of the spring-jacks, and any number of these plugs, within certain limits, may be inserted into any single jack. These cords pass through apertures in the horizontal board or table of such a diameter that the cord will move freely while the plug on the end of the cord will be caught and held. Thus the plugs are always accessible upon the top of the table. For the purpose of maintaining the plugs in contact with the table and controlling the disposition of the flexible cord below the table a take-up device has been provided for each cord, and this usually consists of a leaden weight attached to a pulley running upon the cord. The pull or tension which these weights exert upon the cord is constant, whether the end of the plug be resting upon the table or in those cases where the plug is in position in the jack.

The object of my invention is to relieve a cord from the pull or tension due to a take-up device and due to the effect of the crossing of the cords which operates to superimpose the weight of several cords and take-up devices upon any single cord or cords in use for connection with the jacks to which they are assigned.

A further object is to provide for cases in which two or more plugs are in position in a spring-jack and it is desired to withdraw one of such plugs.

Hitherto the withdrawal of one of a pair of plugs having take-up devices has resulted in the displacement of the second plug, because in releasing the first plug the restraining effect of the jack upon the second plug is removed and the take-up of the second cord withdraws it unless special care be exercised and both hands of the operator be available.

My improvement consists in combining with the cord an automatic locking device, in position to engage the cord between the plug and the take-up device, so that when the plug is placed in a jack the length of cord between the horizontal table and the plug is relieved from the pull of the take-up device and from the pull of the other cords of the series which may cross or engage with such cord, so as to superimpose their weight thereupon and also the weight of two or more take-up devices. To this end I provide a metal thimble surrounding the cord at the aperture in the horizontal table through which the cord passes. In or upon this thimble or ring is placed a latch or lock and a spring which constantly presses the latch into engagement with the cord.

The accompanying drawings illustrate my invention.

Figure 1 is a vertical elevation of a switchboard having spring-jacks, conducting-cords, and my improved locking device applied to the cords. Fig. 2 is a vertical cross-section on the line in Fig. 3; and Fig. 3 is a top plan view of a thimble with the cord removed, allowing the interior of the lock or latch to drop down, while its normal position is shown in dotted outline.

V is the well-known arrangement of vertical board, preferably of hard wood, upon the surface of which are the metal line-strips s, ex-

tending vertically, and the horizontal rows of electrically-connected slotted metal disks *t*, with plugs *h*, to connect any row of disks to any vertical strip.

5 J J is a series of the well-known spring-jack, usually included in the main line in series with the strips *s*.

H is a horizontal board or table fixed to the vertical board V. Board H has a series of 10 perforations A, arranged in one or more rows. Through each perforation there passes a flexible conducting-cord C, which may contain one or two insulated electrical conductors. One end of each cord is fixed to a screw-cup 15 or screw-cups *a*, to which are also connected the terminals of electrical instruments or loops or lines extending to substations. The free end of each cord C terminates in a plug P, having contact-points *c*, which register and 20 cooperate with the contact-points of the jacks J. Upon each cord C is arranged a gravity take-up W, of well-known construction, usually consisting of a grooved pulley running upon a cord and a leaden weight attached 25 thereto.

T is a metal thimble, ring, or cylinder surrounding the perforation in the board H, through which the cord passes. Each thimble T has a lock or latch L, spring-actuated 30 to engage the surface of the cord C, but which is conveniently shaped to be operated by the thumb or finger and so withdrawn from engagement with the cord whenever it is desirable to change the position of the cord C. One 35 form of construction of this thimble is shown in Figs. 2 and 3.

T is a brass cylinder having a strengthening-collar *o* at the bottom. At one side near the bottom is a perforation *p* through the 40 wall, and a latch-piece L, consisting of a piece of brass bent to an angle of ninety-five or one hundred degrees, is passed through the perforation *p*, so that the angle rests upon the lower side of the perforation *p* and rocks thereon.

45 *m* is a blade-spring fixed upon the inside of T, as by the screw *n*. The free end of spring *m* rocks the latch L into contact with the surface of the cord C and blocks its free movement. In order to free the cord, pressure 50 is applied to the exterior portion of the latch L.

The operation of the apparatus is as follows: Normally all the cords rest with the butt of the plug P in contact with the thimble T. To insert the plug P into a jack, the 55 latch L is depressed to free or release the cord and the plug or plugs placed in position in the jack, as shown at the right hand of the drawing Fig. 1. The latch is then released 60 and the influence of the weight W is removed from the portion of the cord C above the ta-

ble. If it is desired to remove one of the two plugs, it can be withdrawn by the use of one hand, while the second plug in the same jack remains undisturbed, there being no pull 65 upon such second cord from the effect of the take-up W thereon. While the beneficial effect of such a locking device is apparent with a small number of cords, its greatest utility is found where there are a number of cords 70 employed, which in the course of use are caused to cross each other, as shown in Fig. 1. In such cases the weight of several cords with their take-up devices are superimposed upon one cord, such added weight being often suf- 75 ficient to interfere with the successful use of the plugs.

What I claim, and desire to secure by Letters Patent, is—

1. The combination in a switchboard of a 80 spring-jack, two or more flexible cords, a plug for each cord, a take-up device for each cord and means for locking or holding a cord against the action of said take-up device, substantially as described. 85

2. The combination in a switching apparatus of a spring-jack, a flexible conducting-cord, a take-up device therefor, a plug forming the terminal of said cord having contact-points cooperating with the contact-points 90 in said jack and means for locking or holding said cord at a point between said plug and said take-up device whereby said cord, when in use, may be relieved from the influence of said take-up, substantially as described. 95

3. The combination in a switching apparatus of a spring-jack, a flexible conducting-cord, a plug carrying contacts registering with said spring-jack contacts, a take-up device 100 operating to withdraw said cord, and a locking device fixed in position between said plug and take-up to catch and hold said cord, substantially as described.

4. The combination of a series of flexible cords each fixed at one end, a plug for each 105 cord forming the free terminal thereof, a spring-jack to receive such plugs, and a locking device to hold a cord against the tendency to displacement due to manipulation of other cords of the series, substantially as described. 110

5. The combination in a switchboard of a flexible conducting-cord, passing through an aperture in a table or support, a metal ring or thimble upon the table through which said cord passes having a spring-actuated lock or 115 catch engaging the surface of said cord, substantially as described.

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