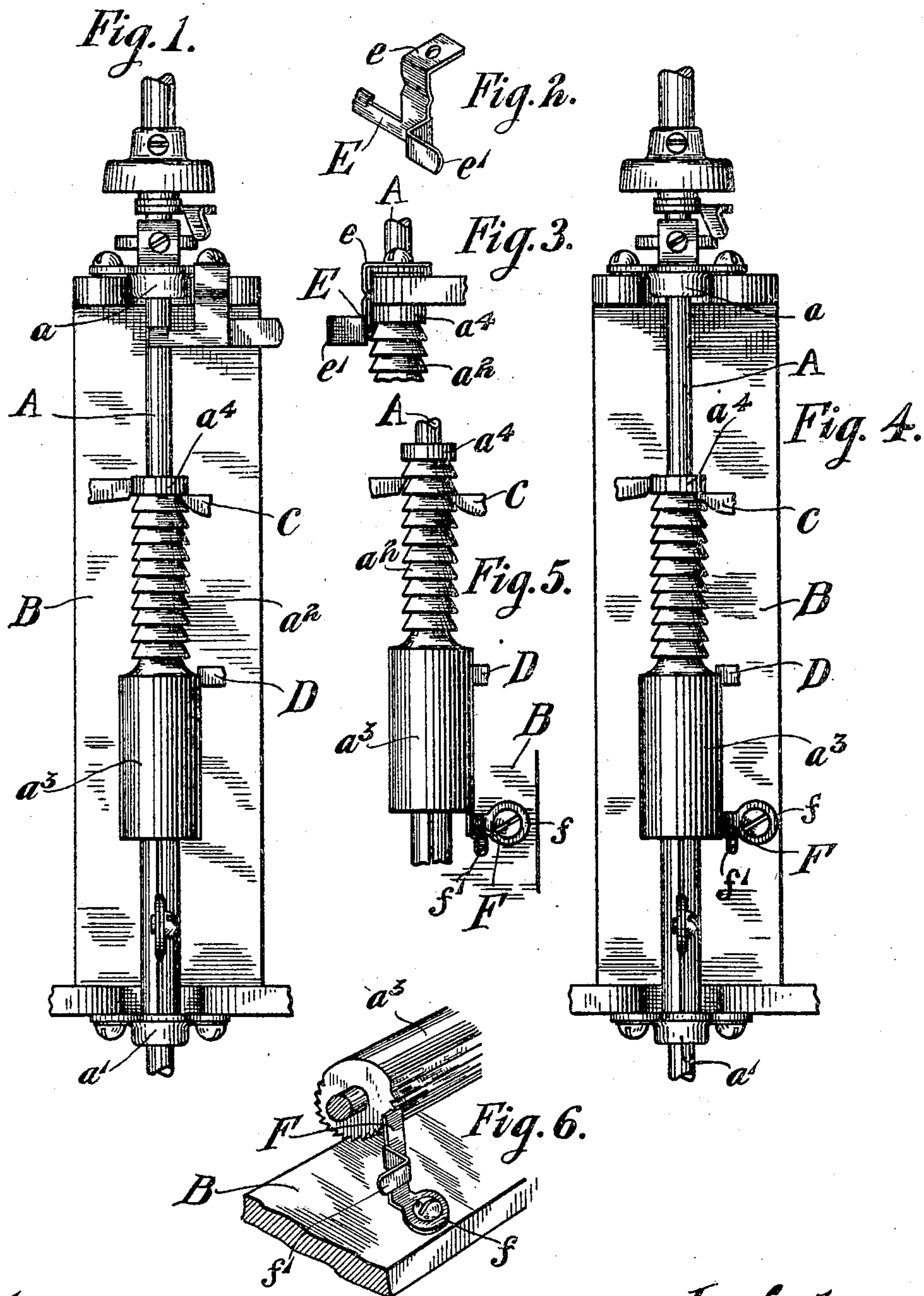


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LOCK FOR AUTOMATIC TELEPHONE SWITCH SHAFTS.

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UNITED STATES PATENT OFFICE.

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LOCK FOR AUTOMATIC TELEPHONE-SWITCH SHAFTS.

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To all whom it may concern:

Be it known that I, JOHN ERICKSON, a citizen of the United States of America, and a resident of Chicago, Cook county, Illinois, have invented a certain new and useful Improvement in Locks for Automatic Telephone-Switch Shafts, of which the following is a specification.

My invention relates to automatic telephone systems which embody or have suitable connection with means for transmitting fire-alarm signals. It is a matter of common knowledge that in certain automatic telephone-exchange systems it is the practice to so construct or arrange the apparatus that any subscriber can, by calling a predetermined number, cause the so-called "first selector-switch" to make connection with a so-called "special connector-switch." After this the subscriber may, by pushing a button, operate the said special connector-switch, and thereby ring or signal all of the different fire-alarm stations. When this has been done and after all of the said fire-alarm stations have answered their respective telephones, the subscriber can simultaneously give the different stations the location of the fire.

Generally stated, the object of my invention is to prevent the subscriber or party thus sending in the alarm to the different fire-alarm stations from making another call and from returning the apparatus to its normal condition until after the number of such subscriber or calling party has been recorded by the switchboard attendant at the exchange or central station, it being obvious that a provision of this character is desirable in order to prevent malicious tampering with the fire-alarm signaling apparatus and the sending in of false alarms, and a special object is to provide a "selector-switch" having a rotary and endwise-movable shaft and having also a catch or lock device for locking the said shaft in the position to which it is adjusted when the subscriber to whom such selector-switch is allotted desires to communicate with the different fire-alarm stations, and whereby the said switch cannot be returned to its normal position until the said catch or lock device is manually released by the switchboard attendant at the exchange or central station, and it is also an object to provide certain details and features tending to increase the general

efficiency of a device of this particular character.

In the accompanying drawings, Figure 1 is a front elevation of the rotary and endwise-movable shaft of a so-called "selector-switch," showing adjacent portions of the body-frame and illustrating one form of catch or lock device for locking the said shaft in the position necessary for connecting the subscriber with the fire-alarm stations. Fig. 2 is a perspective of the catch or lock device shown in Fig. 1. Fig. 3 is a side elevation of the lock device shown in Fig. 1, illustrating the manner in which the said catch or lock device locks the switch-shaft in an elevated position. Fig. 4 is a view similar to Fig. 1, but illustrates another form of catch or lock device. Fig. 5 illustrates the manner in which the switch-shaft disengages itself from the catch or lock device shown in Fig. 4 when the said shaft is to be used in establishing telephonic connection between subscribers. Fig. 6 is a perspective of the catch or lock device shown in Figs. 4 and 5, showing also adjacent portions of the switch.

As thus illustrated, it will be seen that the switch, with the exception of the catch or lock device, is of that well-known type in which a rotary and endwise-movable shaft is employed as an element whereby the telephone subscriber may establish connection with a trunk-line or with the line of some other subscriber. The said shaft A is, it will be seen, arranged vertically in the usual manner and mounted in upper and lower bearings a and a' . As shown, the said bearings are secured to the top and bottom of a frame or body B, which latter, it will be understood, is also employed for supporting various other necessary and well-known elements of an automatic telephone-switch of this particular character. The locking-dog C, connected with and operated by any suitable known or approved means, is adapted to engage the series of circular ratchet-teeth a^2 on the said shaft and is employed in locking the said shaft against downward movement after it has been given the extent of upward step-by-step movement necessary in establishing connection between two subscribers' lines. The said upward step-by-step movement can be produced in any ordinary or desired manner, and it will also be seen that the desired rotation of the said shaft in a step-by-step manner can be accomplished by

means of any of the known or approved devices. Another locking-dog D engages the teeth on the cylindrical enlargement a^3 , carried by the said shaft. With this arrangement the said shaft is also locked against back rotation after it has been rotated in a step-by-step manner to the extent necessary in establishing the desired telephonic connection. With the arrangement shown it will be seen that the teeth a^2 are ten in number, it being understood that the switch is provided with banks of contacts divided into ten levels with ten positions or contacts in each level. Consequently the cylindrical enlargement a^3 may have ten teeth, whereby the shaft may be rotated by means of ten consecutive impulses or by a less number, as may be required. As will be readily understood, the switch as a whole includes an electrical arrangement whereby when the subscribers are through talking the calling subscriber may then operate or release the dogs C and D, and thereby restore the switch-shaft to its normal position. Preferably the switch shown and the one whereby I accomplish the main object of my invention is the so-called "first selector"—that is to say, that particular automatic switch which is appropriated to the use of a single subscriber. In other words, each so-called "first selector" is not common to two or more subscribers' lines, but is individual to a single subscriber.

Ordinarily in the operation of simply connecting up one subscriber's line with another the said first selector may operate in the usual and well-known manner. As previously explained, however, it is desirable in certain cases to so arrange the apparatus that the subscriber may, by calling a special or predetermined number, cause the first selector to establish connection with a so-called "special connector-switch"—that is to say, a "connector" which is only used in case one of the subscribers of the exchange desires to transmit a fire-alarm signal to the different fire-alarm stations. This may be accomplished in various ways—as, for example, by appropriating the tenth or uppermost level of the switch-contacts for use only in transmitting fire-alarm signals. Again, the first or lowermost level of the bank-contacts in the switch may be employed solely for the purpose of connecting the subscriber's line with the said special "special connector." In either case, however, it will be seen that whatever level is appropriated solely for fire-alarm purposes the said level will never be employed in giving service between the different telephone subscribers.

In Figs. 1 to 3, inclusive, the construction is such that the tenth or uppermost level of the bank-contacts is employed only for transmitting fire-alarm signals. In Figs. 4 to 6, inclusive, the first or lowermost level of the bank-contacts in the switch is appropriated for use only in giving fire-alarm signals.

In a system where some provision of the foregoing character is made it is evident that more or less trouble and annoyance are likely to be experienced if no means are provided tending to prevent malicious tampering with the fire-alarm apparatus and the transmission of false fire-alarm signals. For this reason I preferably provide the said first selector with a suitable catch or lock device and adapt the same to so lock the shaft of the switch in the position to which it may have been moved or adjusted for the purpose of establishing a fire-alarm connection that the subscriber cannot then restore the switch to its normal position until after the attendant at the exchange or central station has manually released the said catch or lock device. It will be understood, of course, that the said catch or lock device is only brought into action when the switch-shaft is moved or adjusted to the position necessary for giving the fire-alarm, and consequently does not at all other times have anything to do or in any way conflict with the operation of establishing connection between two subscribers' lines. The said catch or lock device may be of any suitable form or construction and operate in any suitable or desired manner. For example, it may be of the form shown in Fig. 2 and applied as shown in Figs. 1 and 3. In such case the said catch or lock device is in the nature of a spring-dog E and is provided with a body portion e , secured in place by one of the upper screws of the frame structure, and with a handle portion e' . When the shaft A has been raised to the tenth level, the said dog E will then engage the under side of the collar a^4 , as shown in Fig. 3, the said collar being applied to the shaft at a point just above the series of ratchet-teeth a^2 . This will prevent the shaft from being restored to its normal position until the switchboard attendant at the exchange or central station manually disengages the dog E from beneath the said collar on the shaft. In other words, the subscriber after throwing the said shaft into the position necessary for communicating with the fire-alarm stations is then powerless to restore the switch to its normal position. Only the switchboard attendant at the exchange or central station can, by grasping the handle portion e' , release this shaft and restore the switch to its normal condition. In this way the switchboard attendant can always be certain of making a record of the number of every subscriber's station from which a fire-alarm is turned in or transmitted to the fire-alarm stations. This obviously will reduce to a minimum the tendency toward malicious tampering with the fire-alarm apparatus and the transmission of false fire-alarm signals. Again, the said catch or lock device may be of the form shown in Figs. 4, 5, and 6. In this case the catch or lock device is in the nature of a spring-dog F and is provided with a body portion f , adapted to be secured to the frame

or body, and also with a handle portion f' . The said spring-dog F can be located in position to normally engage additional teeth on the cylindrical enlargement a^3 of the shaft.

5 In this way and with the first level of the switch-contacts appropriated solely to the purpose of connecting up the subscribers with the fire-alarm stations, which is the case in Figs. 4, 5, and 6, it is evident that when the
10 shaft is rotated without being given any vertical movement the spring-dog F will hold or lock it against back rotation. In this way the subscriber can use the first level for establishing connection with the fire-alarm stations and
15 after so doing cannot then restore the switch to its normal condition until after the switchboard attendant at the exchange or central station has disengaged the spring-dog F from the teeth carried by the shaft. In either case
20 therefore it is evident that a spring-dog is employed and adapted to engage some operative portion of the switch in such manner that the switch as a whole cannot be restored to its normal condition after having been employed
25 for establishing connection with the fire-alarm stations until after the switchboard attendant has inspected the first selector of the subscriber's station from which the fire-alarm has been sent in and until after the switchboard attendant has manually disengaged or released
30 the spring-dog, and thereby placed the switch as a whole in condition to be restored in the ordinary manner and through the medium of the devices or means usually employed for
35 such purpose and under the control of the subscriber. Obviously, therefore, I provide a first selector or individual switch for automatic telephone systems of such character that when used for connecting the subscriber's
40 line with one or more fire-alarm stations it cannot then be restored to its normal condition or again used by the subscriber until after it has been located and inspected by the switchboard attendant and until after the said
45 attendant has made a record of the number of the subscriber's station with which the said first selector or individual switch is connected. It being thus impossible to transmit fire-alarm signals to fire-alarm stations without leaving
50 a record of the number of the station or telephone from whence the signal was sent, it is evident that the number of false signals and all malicious tampering with the fire-alarm apparatus and signals will at least be reduced
55 to a minimum.

What I claim as my invention is—

1. An individual switch for automatic telephone systems, said switch being provided with an operative part under the control of
60 the subscriber, and adapted to be given a plu-

ality of positions, one of said positions being appropriated solely for the purpose of transmitting alarms or special signals, and a spring-dog adapted to hold said operative part in said appropriated position until manually
65 released.

2. An individual switch for automatic telephone systems, comprising an operative part under the control of the subscriber, and adapted to be given various positions, accord-
70 ing to the character of the connection desired, one or more of said positions being appropriated solely for the purpose of giving alarms or special signals, and a locking device not under the control of the subscriber and adapt-
75 ed to hold said operative part in the position to which it may be moved for the said purpose of giving an alarm or special signal.

3. An individual switch for automatic telephone systems, comprising means under the
80 control of the subscriber for establishing any one of a number of possible connections, and a locking device adapted, when a connection of a certain character is made, to prevent the subscriber from restoring the switch to its
85 normal condition.

4. A "first selector-switch" for automatic telephone systems, comprising a rotary and endwise-movable shaft, said shaft being adapt-
90 ed to be given various positions, according to the character of the connection desired, and a spring-dog adapted, when a connection of a certain character is established, to engage a rigid part of the shaft structure, and thereby
95 lock the latter against restoration to its normal position until manually released.

5. A switch for automatic telephone systems, comprising means under the control of the subscriber for establishing any one of a number of possible connections, and means
100 adapted, when a connection of a certain character is established, to prevent the subscriber from restoring the switch to its normal condition, but the switch being releasable by the subscriber when used for making other con-
105 nections.

6. A switching device for establishing electrical connection, and a locking device adapted, when a connection of a certain character is made, to prevent the person who brought
110 about the connection from restoring the switch to its normal condition, but the switch being releasable by the subscriber when used for making other connections.

Signed by me at Chicago, Cook county, Illi-
115 nois, this 1st day of December, 1904.

JOHN ERICKSON.

Witnesses:

W. LEE CAMPBELL,
R. C. GIFFORD.