C. C. JOHNSON AND R. M. HOPKINS.

REGISTRY SYSTEM AND REGISTER THEREFOR.

APPLICATION FILED JUNE 12, 1919.

1,394,838. Patented Oct. 25, 1921.

4 SHEETS—SHEET 1.

Fig. 1.

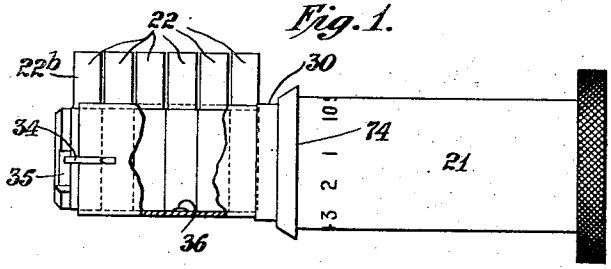


Fig. 2.

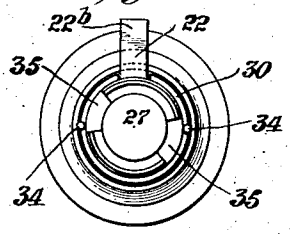


Fig. 3.

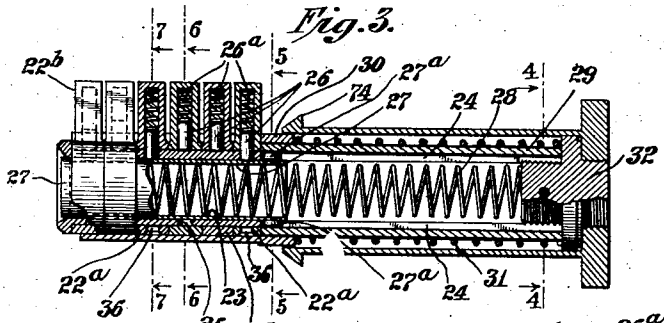


Fig. 4.

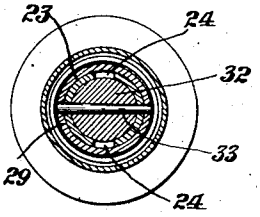


Fig. 5.

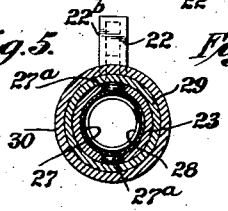


Fig. 6.

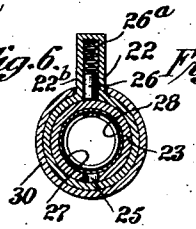


Fig. 7.

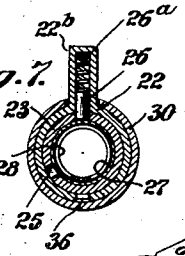


Fig. 8.

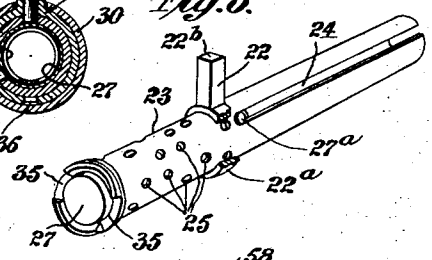


Fig. 9.

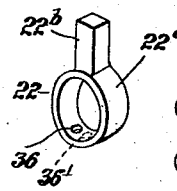
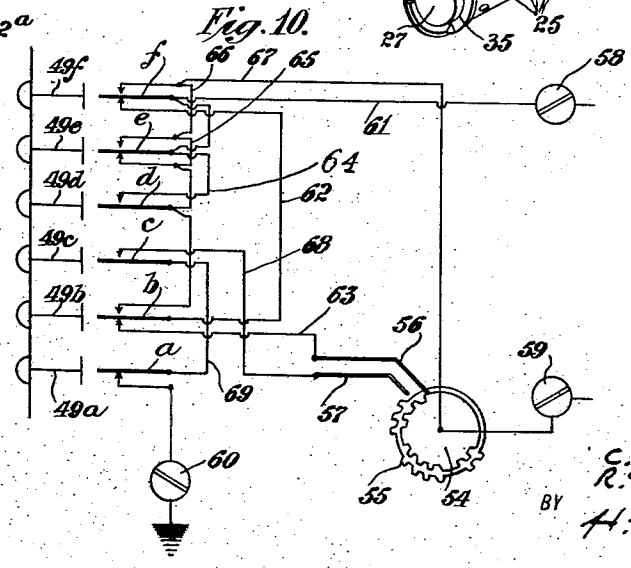


Fig. 10.



WITNESSES

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Fig. 11.

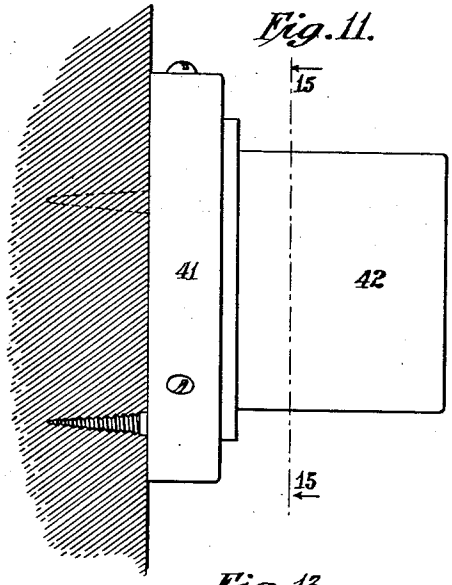


Fig. 12.

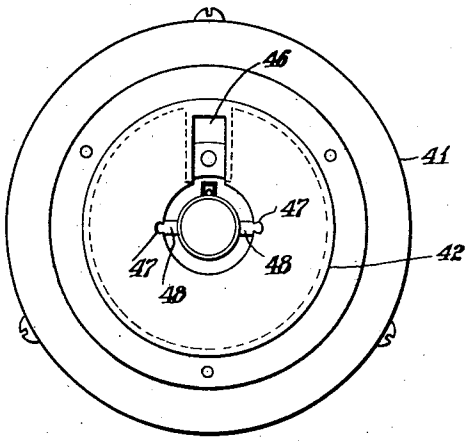


Fig. 13.

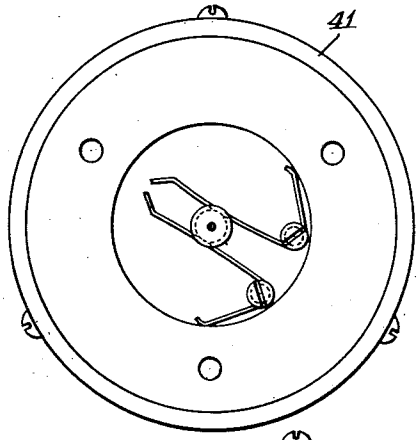


Fig. 14.

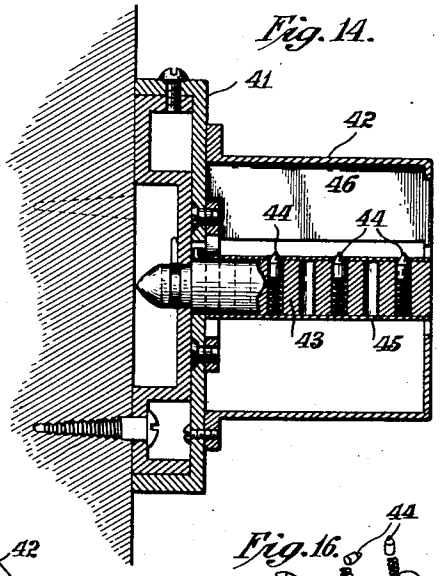


Fig. 15.

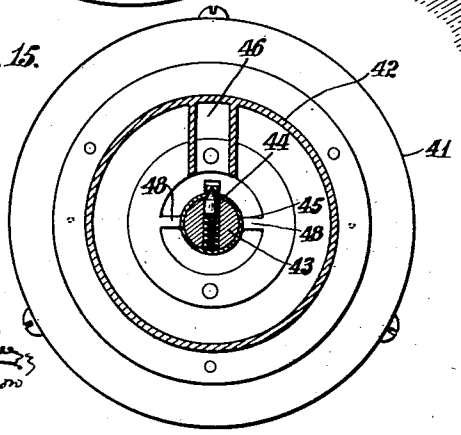
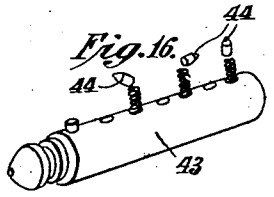


Fig. 16.



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4 SHEETS—SHEET 3.

Fig. 17

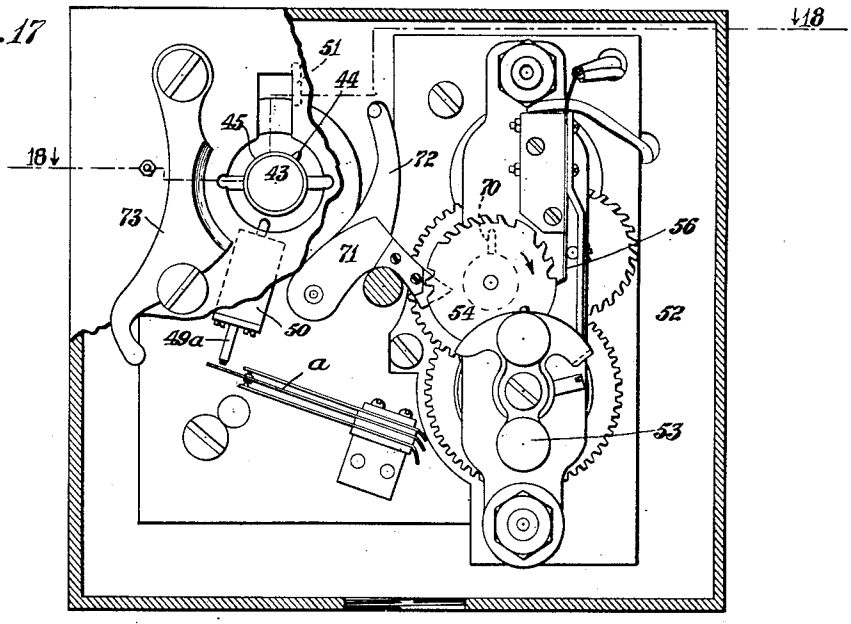
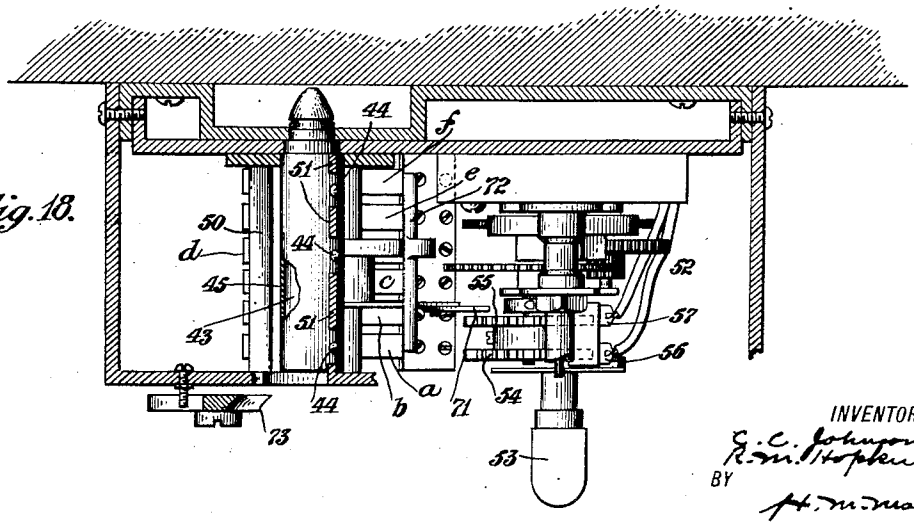


Fig. 18.



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4 SHEETS—SHEET 4.

Fig. 19.

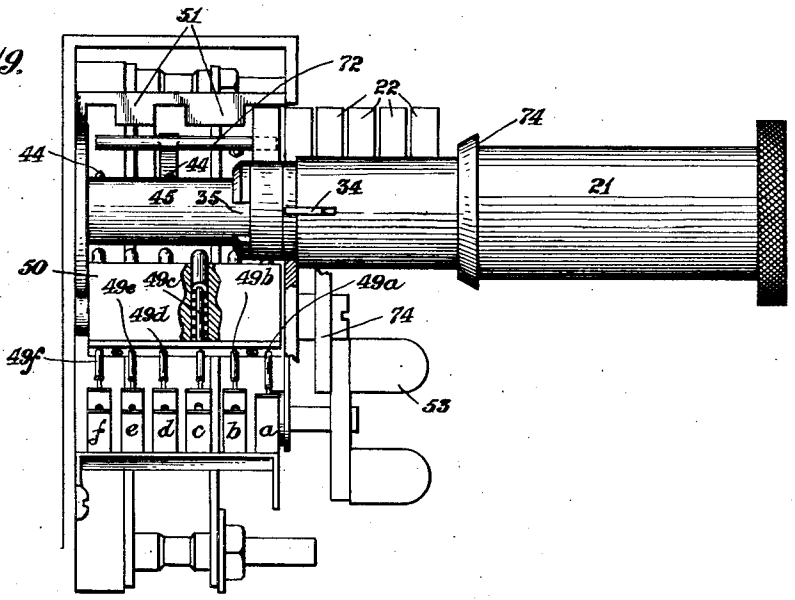


Fig. 20.

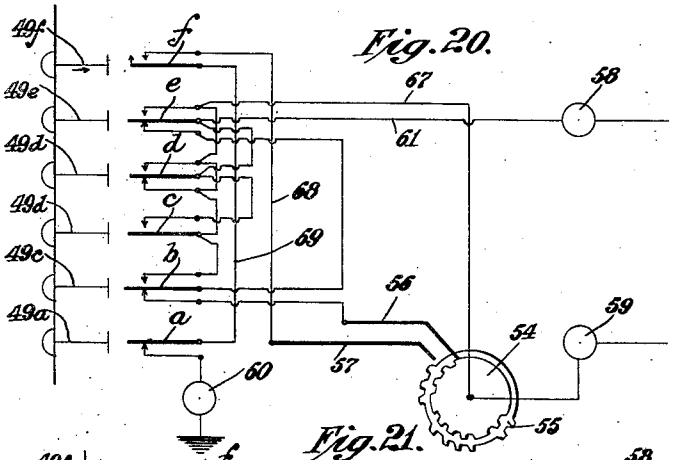
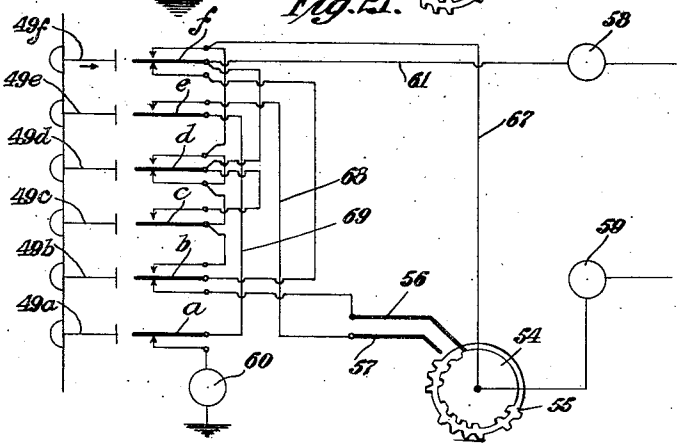


Fig. 21.



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CLARENCE C. JOHNSON, OF MOUNT VERNON, NEW YORK, AND RICHARD M. HOPKINS, OF RUTHERFORD, NEW JERSEY, ASSIGNORS TO AMERICAN DISTRICT TELEGRAPH COMPANY, OF JERSEY CITY, NEW JERSEY, A CORPORATION OF NEW JERSEY.

REGISTRY SYSTEM AND REGISTER THEREFOR.

1,394,838. Specification of Letters Patent. Patented Oct. 25, 1921.

Application filed June 12, 1919. Serial No. 303,593.

To all whom it may concern:

Be it known that we, CLARENCE C. JOHNSON, a resident of Mount Vernon, Westchester county, State of New York, and RICHARD M. HOPKINS, a resident of Rutherford, Bergen county, State of New Jersey, both citizens of the United States of America, have invented a Registry System and Register Therefor, of which the following is a specification:

Our invention relates to improvements in watchmen's registry systems, by which term is meant systems in which the visits of watchmen to certain stations which they are supposed to visit regularly, are registered, and embodies improvements in the system for the same purpose set forth in the application of C. C. Johnson, Sr. No. 209,279, filed Dec. 28, 1917. According to the said Johnson system, the watchmen is provided with a portable register having registry mechanism adapted to be actuated by a push-button or other suitable device which the watchman may actuate each time he reaches a station which he is supposed to visit; but this registry mechanism is normally locked, and cannot be actuated, except and until the watchman applies his register to a key device, or "conditioning device," of which there is one at each station to be visited. When the register has been so applied to a key device (preferably, means are provided whereby on each occasion only one particular key device may be so used) then, and only then, the watchman may actuate the registry mechanism and so register his visit to that particular station. The several key devices are preferably provided with means whereby they are differentiated one from another, and the mechanism of the register is such that actuation of the registering mechanism at one station conditions that mechanism for release upon application to the next key device of the series, and upon applicaion to said next key device only. In this way the watchmen is compelled to visit the several stations in regular order, and cannot continue to actuate his registering mechanism if he omit any staton in making his tour, or if he visit stations out of order. When the watchman reaches the end of a tour he may connect suitable transmitting mechanism within his register to a suitable circuit, or, alternatively, may connect his register to suitable stationary transmitting mechanism, and may then send through such circuit a signal indicating that he has completed the tour. In this way it is rendered unnecessary for the watchman to signal to the central station separately for each visit to each of his stations; one signal sent at the conclusion of each tour showing that he has visited all of the stations in that tour.

The object of our present invention is to improve and simplify the mechanism of such systems, particularly the registers and signal-transmitting means thereof; and our invention comprises an improved and simplified register, also an improved combined key-device and transmitter by means of which, when the register (properly conditioned by regular application to previous key-devices) has been applied thereto, the required signal may be sent. Other features of our invention will be pointed out hereafter.

We will now proceed to describe our invention with reference to the accompanying drawings, illustrating one embodiment of the improved register and of the improved combined key-device and transmitter, and will then point out the novel features in claims. In the said drawings:

Figure 1 is a side elevation of the register, a portion of one of its parts being broken away; Fig. 2 shows an end elevation of the register, viz., the end at the left of Fig. 1; Fig. 3 shows a longitudinal central section of the register; Fig. 4 a transverse section of the register on the line 4—4 of Fig. 3; Figs. 5, 6 and 7 are transverse sections of the register on the lines 5—5, 6—6, and 7—7 respectively, of Fig. 3; Fig. 8 is a detail perspective view of the central hollow spindle of the register, with one of the tumbler-carriers mounted thereon; Fig. 9 is a detail perspective elevation of one of the tumbler-carriers; and Fig. 10 is a diagram illustrative of the system.

Fig. 11 shows a side elevation of one of the key-devices or "conditioning devices," Fig. 12 a front elevation thereof, Fig. 13 a rear elevation thereof, Fig. 14 a central longitudinal section thereof, and Fig. 15 a transverse section on the line 15—15 of Fig. 11; Fig. 16 is a fragmentary perspective elevation of certain portions of the key-device, illustrating the "fall-apart" feature thereof.

Fig. 17 shows a front elevation of the

combined key-device and transmitter, located customarily at the end of the tour, the greater portion of the inclosing case of the instrument having been broken away to show the interior mechanism; Fig. 18 shows a top view of said mechanism, and Fig. 19 an end elevation, looking from the left of Figs. 17 and 18 the register being also shown partly inserted, in Fig. 19; Figs. 20 and 21 are diagrams, similar to Fig. 10, illustrating how the connections in the contact combination associated with the transmitter may be varied to make difficult tampering with the transmitting arrangements.

Referring first to Figs. 1 to 9 inclusive, showing the register: This instrument has somewhat of the appearance of a key of massive proportions, but is not in fact a key, having registering mechanism within it, together with means for actuating that mechanism. Externally, the principal visible parts of the register are, a handle portion 21, and a series of tumbler-carriers 22. Internally, the register comprises a tubular member 23, (Fig. 8), the rear portion of which is provided with longitudinal slots 24, for a purpose hereafter made apparent, while in the front portion are tumbler-holes 25. The tumbler-carriers, 22, are mounted on this member 23, and each comprises a ring-portion 22^a, and a lug 22^b, the latter bored radially for the reception of a pin-tumbler 26 and its actuating spring, 26^a. The pin-tumblers, of course, are adapted to engage the tumbler-holes 25 of the tubular member 23, but normally are restrained from passing completely through said holes by a slidable sleeve 27, mounted to slide longitudinally within the tubular member 23, but normally pressed out by a spring 28; projections 27^a of this sleeve work in the slots 24 of tubular member 23.

Surrounding the handle-end of the tubular member 23 is another sleeve 29; and slidably mounted upon member 29 is still a further sleeve 30, adapted to retreat into the handle 21, but normally pressed out by a spring 31. Sleeve 30 is slotted to embrace, and to permit the radial projection of, the lugs of the tumbler-carriers 22. Normally, sleeve 30 holds all of these lugs in line; but if pressed back into the handle, then so far as sleeve 30 is concerned the tumbler-carriers may be rotated with respect to the body portion of the register, though such rotation is prevented normally by engagement of the pin-tumblers with the holes of tubular member 23.

A screw-coupling 32 connects handle 21 to the tubular member 23; and a locking pin 33 connects 29 and 32. The tubular member or sleeve 23 constitutes a tumbler-engaging member, as will be seen, and is so termed in certain of the following claims. Said member 23, in connection with the handle 21 by which it may be rotated, and the connection between said members, constitutes the registering means of the register. Of course, the tumbler carrying means, such as members 22, is or are not necessarily located outside of sleeve 23, nor is member 23 necessarily a sleeve. The fundamentals, in a register such as this, are, registering means and tumbler-carrying means, the latter having yieldable tumblers and the former having sockets adapted to receive such tumblers, the registering means and the tumbler-carrying means being movable relatively, and their arrangement being such that suitable key devices may cause the disengagement of the tumblers from the registering means. Obviously, numerous constructions embodying such fundamentals are possible, of which constructions that illustrated in Figs. 1 to 9 inclusive is one only; all, however, being within our invention.

Referring now to Figs. 11 to 15 inclusive, showing one form of key-device or conditioning-device such as may be used with the particular construction of register above described: 41 designates the base of this key-device, adapted to be secured to a wall or other support, and 42 the shell or casing, and 43 a central tumbler-carrier, having sockets at suitably-spaced intervals for spring-pressed pin tumblers 44, normally retained by a suitably-perforated sleeve 45. The shell 42 has a slide-way 46 to receive the tumbler-carrying lugs 22^b of the register, and the diameter of the tumbler-carrier 43 and sleeve 45 are such that if the register be inserted into the shell 42, with its lugs 22^b in the way 46, as the register is pressed in the sleeve 27 of the register is pressed back against the action of its spring 28, so enabling the tumblers 44 of the key-device to press back to the parting line between tumbler-engaging member 23 and the tumbler-carriers 22 all of the tumblers 26 of the register then in engagement with member 23; so freeing member 23 for rotation with respect to the tumbler-carriers. Of course, such freeing of the tumbler-engaging member 23 for rotation will occur only in case the arrangement of tumblers 44 of the key-device corresponds to the arrangement of tumblers 26 of the register then in engagement with member 23; in other words, the registering means of the register will be freed only if the register be engaged with a proper key-device; *i. e.*, with the particular key-device of the series corresponding to the particular existing condition of the register. For each different registering position of the registering device of the register, there will be a different combination or arrangement of tumblers 26 in engagement with the member 23; this being determined by the arrangement of perforations in each row of such perforations of member 23, the

arrangement of perforations of such rows being in each case different from the arrangement in the other rows. Consequently, each key-device of the series must or should have an arrangement of tumblers different from that of all of the other key-devices.

At the same time that the sleeve 27 of the register is pressed back, as described above, the outer sleeve 30 of the register is also pressed back as a result of the engagement of the end of said sleeve 30 with the side walls of the way 46 of the shell 42; but the sides of this way hold all of the tumbler carriers 22 in line, so long as said tumbler carriers are within the way.

The manner of operating the register at the various key-stations will now be apparent. Supposing the register to be set for application to the first key-device of the series, the register is inserted into the casing of that first key-device, and pressed in; the sleeve 27 of the register yielding to permit engagement of the tumblers 44 of the key-device with the tumblers 26 of the register. Since the tumblers 44 are yieldingly mounted on springs, and since they are pointed at the top, they yield to permit sleeve 23 to pass over them, and then spring up again to engage and press back the tumblers 26 of the register. The register is provided, at its front end, with fins 34 which engage with notches in the front of the shell of the key-device, thus insuring accurate presentation of the register to the key-device.

The register having been pressed home to the full distance possible, its handle is now turned (to the right, in the construction shown) as far as it will go; engagement of notches 35 in the front end of member 23 with webs 48 of the key-device determining the maximum extent of this rotation. This rotation of the sleeve 23 brings a new row of its perforations opposite the tumblers 26 (for the tumbler-carriers 22, during this rotation of the registering device, have been held stationary by the right side of the slide-way 46 of the key-device), and therefore tumblers 26 corresponding to this new row of perforations will enter such perforations immediately, or as the register is withdrawn from the key-device. Thereby the register is set for engagement with the second key-device of the series, and with that second key-device only; because, as previously explained, no other key-device of the series will have a combination of tumblers such as will release the sleeve 23 for further registration. In a word, the watchman, in making his round, must visit the various stations in proper order, operating his register at each; and if he fail to visit a particular station, or fail to operate the register properly at each station, he cannot operate his register at any further station of the series.

As previously explained, it is intended that the watchman, during his round, shall at some one station at least transmit a characteristic signal to some central office or point from which supervision is exercised or at which a record is made of his signals; thereby, in effect, registration of the watchman's visits to the several stations is transferred from the register to the central station. It has not been thought desirable to complicate the register with signal transmitting mechanism, for the register itself should be as simple and compact as possible. Therefore, at one or more key-stations of the series, transmitting mechanism is provided; also, and for a reason stated hereafter, a contact combination operated by the operation of the register is also provided at such transmitting station. Commonly, such a transmitting arrangement is provided at the last station of the series; but other transmitting stations may also be provided; for example, at the start of the series (so causing the watchman to give a starting signal, when he starts his round) and at some intermediate station, so giving an intermediate check upon the movements of the watchman. Such a transmitting station, comprising a key-device, transmitting means, and a controlling contact-combination, is shown in Figs. 17, 18 and 19; and certain of the many possible circuit arrangements are shown in Figs. 10, 20 and 21.

The key-device proper, 43—44—45, at these transmitting stations, is the same as at the other stations of the series, and operates in the same manner. Beneath it, in the particular arrangement shown, is a controlling contact combination, comprising a plurality of spring-pressed plungers 49^a—49^f (one for each tumbler of the register, usually) mounted in a bridge 50, and contact devices *a*—*f* each arranged to be actuated by depression of the corresponding plunger of series 49. Some of these contact devices *a*—*f* may be single, and some double, as indicated in Figs. 10, 20 and 21; and, as will be seen by comparison of these Figs. 10, 20 and 21, the arrangement of the single and double contact devices may be different at different stations; a wide range of contact permutations being thus provided. The tops of the plungers 49^a—49^f are rounded, so that as the register is inserted in the usual manner, these plungers will yield successively. The case of the key-device, instead of having a slide-way 46 which prevents lateral movement of all of the tumbler-carriers of the register, has a series of wards 51 (which may be arranged selectively) whereby when the register is turned on the key-device, some of the tumbler-carriers 22 are permitted to turn with it, while others are held against turning.

For operating the contact combination *a*—*f*, certain or, it may be, all, of the tumbler

carriers 22 are provided with recesses or perforations 36 (Figs. 1, 3, 7 and 9) some of which may be in line with the tops of plungers 49^a—49^f as the register is inserted, while others may be brought into line with the corresponding plungers by the rotation of the register; the arrangement is selective, and may be varied as desired, and as required to set up the desired combination of contacts.

Adjacent to the key-device proper 43—44—45, there is a signal transmitter 52, which may be of any of the familiar and suitable types. As shown, it is of the ordinary spring-driven type, having a winding handle 53 and a double break-wheel 54—55, one member of this double break-wheel being, ordinarily, a line-circuit wheel, while the other is, ordinarily, a ground-circuit wheel; the transmitter being arranged, therefore, for McCulloh operation. Suitable contact pens 56 and 57 are arranged to coact with break-wheels 54 and 55 respectively. In the diagrams, Figs. 10, 20 and 21, for clearness of illustration these break-wheels are shown as of different diameters; but it will be understood that in practice this is not usually the case.

Referring now to Fig. 10, as showing one possible contact arrangement, 58 and 59 designate binding posts for incoming and outgoing line circuit conductors, and 60 designates a binding post for a ground connection. From binding post 58 a conductor 61 leads to the middle member of contact device *f;* and from the lower spring of this contact device *f* a conductor 62 leads to the middle member of contact device *b;* and from the lower spring of contact device *b* a conductor 63 leads to pen 56, and thence to break wheel 54, and thence to line binding post 59. The circuit thus traced would be broken and completed, alternately, by rotation of break wheel 54, except that it is bridged and rendered inoperative normally, by a shunt connection from the middle contact member of *f*, through 64 to the middle contact member of *e*, and through the lower member of *e* and 65 to the upper member of *e*, thence through 66 and 67 to the break wheel 54 and so to binding post 59. It will be seen that this shunt may be broken and the transmitting circuit rendered operative by moving the middle member of contact device *e* to a position intermediate both of its contact springs, provided contact be not closed between the middle and upper members of contact device *f*, or at contact device *d*. The middle member of contact device *e* may be brought to such middle position by means of a recess 36 coming opposite the plunger 46^e of contact device *e*, the adjustment of the contact members of this contact device being such, for the particular arrangement of circuits of Fig. 10, that the middle contact member never touches the upper contact member. While this upper contact member may never be of actual service in the arrangement shown in Fig. 10, it is desirable nevertheless to provide such upper contact member, partly to confuse a person seeking to tamper with the contact arrangement, and partly because it may be desirable at some time to change to some other circuit arrangement.

Similarly, there is a ground circuit from binding post 58 through the circuit previously traced to break wheel 54, also from binding post 59 direct to break wheel 54, thence to break wheel 55, and (when pen 57 is in contact with a tooth of break wheel 55) through pen 57 and conductor 68 to contact device *c* (where normally the circuit is open) thence through conductor 69 to contact device *a*, and thence to binding post 60 and to ground. In order that this ground connection may be operative, both contacts *a* and *c* must be closed.

While to a certain extent the arrangement of contacts in contact devices *a*—*f* is controlled by the fact that in the operation of inserting the register the line circuit and the shunt 67 must not be broken, nor must the ground connection be closed, yet obviously the arrangement shown offers a high degree of protection, both because the arrangement is so complicated that any attempt to tamper with the contact device by a person not thoroughly familiar with the connections is almost certain to render the transmitting circuit inoperative, and also because interchanging of the contact devices is possible to a high degree, permitting different transmitting stations to have widely different contact arrangements. Thus, comparing Fig. 20 and Fig. 10, contact device *f* of Fig. 20 performs the function of contact device *c* of Fig. 10, contact device *e* of Fig. 20 performs the function of contact device *f* of Fig. 10, contact device *d* of Fig. 20 performs the function of contact device *e* of Fig. 10, contact device *c* of Fig. 20 performs the function of contact device *d* of Fig. 10; etc. Similarly, in the arrangement of Fig. 21 the functions of various of the contact devices have been interchanged, as compared with the functions of those contact devices in the arrangement of Fig. 10. It is believed to be unnecessary to trace all of the circuits in full in these figures, as the purposes of the complete contact arrangements are the same in all cases, and the variations shown are only three of various possible, all of which it is within the ability of a person skilled in the art to make, once acquainted with the requirements, as stated above.

As will be obvious, the arrangement of tumblers 44 at the key station preceding a transmitting station should be such as to leave free, with respect to member 23, those

tumbler carriers 22 which are to be held against movement when the register is operated at the transmitting station. After the register has been operated at that transmitting station, and before the register is withdrawn, the watchman turns the handle of the transmitter, so causing that transmitter to operate. The break wheels of the transmitter are provided with a pin 70 (shown in dotted lines in Fig. 17) which, near the conclusion of the rotation of the break wheels, engages the tail 71 (Figs. 17 and 18) of a wiper 72, by the action of which wiper those tumbler carriers 22 of the register which have turned with the operation of the register, are moved back into line with those tumbler carriers which were held back by the wards 51; (the arrangement of tumblers 44 of the transmitter key device being such as to free those tumbler-carriers which turned with the register, once that register has been turned). The register may then be withdrawn from the key device.

It is important that apparatus such as described herein shall be substantially "tamper proof"; and it is believed that in this respect the apparatus herein described offers a high degree of protection. Normally, access to the tumblers 26 of the register is blocked by the sleeve 27. If this sleeve be pushed back with a view to tampering with the tumblers, the tamperer has still to learn what particular combination of tumblers is engaging sleeve 23; and if he learns this, still it is practically impossible for him, without special tools, to hold back simultaneously all of the tumblers engaging that sleeve. If, in working over the register, he should press back sleeve 30, as he is very apt to do, and then should press back a tumbler holding one of the tumbler-carriers 22, that tumbler carrier will be apt to fall to one side or the other, with its tumbler totally inaccessible, and the register cannot then be inserted into any of the key devices. This sleeve 30, by the way, is pushed back automatically as the register is inserted into any of the key devices, and moves out again as the register is withdrawn. It holds in line all of the tumbler carriers the tumblers of which may not be in engagement with perforations of member 23.

The construction of the key-device, illustrated in Figs. 11–15 inclusive, is such as to make it extremely difficult to learn the tumbler-arrangement of any particular key-device. While a key-device having a stem on which are tumbler-sockets, and spring-pressed tumblers within those sockets, together with a shell or case for that stem having a way 46 for the reception of the tumblers lugs, is within our joint invention, yet the particular construction of key-device shown, involving certain "fall-apart" features, such as the sleeve 45 by the removal of which the tumblers are permitted to spring out, as illustrated in Fig. 16, the two-part construction of the base 41, the means for holding the stem 43 in place, and certain other features, are the sole invention of R. M. Hopkins, and so are not claimed herein, but in a companion application, Serial Number 303,633 filed June 12, 1919.

An important feature of the transmitter-contact-combination arrangement is that while only one certain arrangement of contacts permits the transmission of signals, yet the transmitter itself is operative whether a correct combination of contacts has been set up or not. Therefore, the watchman, hearing the transmitter operate, is not advised whether or not a signal has been sent. Hence he is not apt to attempt to tamper with the transmitting devices, for any tampering is apt to prevent the transmission of signals, bringing his dereliction to notice immediately.

In order that the register may be held firmly in place during the transmission of a signal, the case of the transmitter device is provided with a swinging latch 73 which will engage a collar 74 of the register, so holding the latter in place.

In a separate application, Serial Number 329,729 filed October 10, 1919, by R. M. Hopkins, is claimed a register comprising registering means arranged to register by movements by successive stages with respect to locking means controlled by stationary keys external to the register.

What we claim is:—

1. In a registry system, the combination of a register comprising registering means and tumbler-carrying means and tumblers carried thereby and arranged to coact with said registering means, a plurality of said tumblers normally rendering the registering means inoperative, and one or more key-devices each adapted to coact with said register and each comprising a plurality of tumblers each adapted to coact with a corresponding tumbler of the register when a proper key-device is in engagement with the register and when the latter is set for engagement with that key-device, the engagement of proper tumblers of the register and key-device rendering the registering means operative.

2. In a registry system, the combination of a register comprising perforate registering means and tumbler-carrying means mounted thereon and tumblers carried by said tumbler-carrying means and adapted to coact with the perforations of said registering means, engagement of a plurality of said tumblers with corresponding perforations rendering the registering means inoperative, and one or more key-devices each adapted to coact with said registering means

and each comprising a plurality of tumblers each adapted to coact with a corresponding tumbler of the register when a proper key-device is in engagement with the register and when the latter is set for engagement with that key-device, tumblers of the register in engagement with the perforations of said registering means being arranged to be forced out of such engagement by tumblers of the key-device as the register and key-device are engaged.

3. In a registry system, the combination of a register having registering means comprising a sleeve having perforations in its wall corresponding to various different registering positions, tumbler-carrying means in coöperative relation to said sleeve and tumblers carried by said tumbler-carrying means and adapted to enter the said perforations of said sleeve, relative motion between said sleeve and tumbler-carrying means being prevented when one or more of said tumblers engage one or more of such perforations, and one or more key-devices each adapted to engage said sleeve and each comprising one or more tumblers adapted to coact with a corresponding tumbler of the register when a proper key-device is in engagement with the register and when the latter is set for engagement with that key-device, the engagement of proper tumblers of the register and key-device rendering the registering means operative.

4. In a registry system, the combination of a register having registering means comprising a sleeve having perforations in its wall corresponding to various different registering positions, tumbler-carrying means mounted on said sleeve and tumblers carried by said tumbler-carrying means and adapted to enter perforations of said sleeve, and thereby to prevent relative motion of said sleeve and tumbler-carrying means, and one or more key-devices each adapted to enter said sleeve and each comprising one or more tumblers adapted to press back to the parting line between sleeve and tumbler-carrying means any register tumbler which such a key-device tumbler may engage.

5. In a registry system, the combination of a register having registering means comprising a perforate tumbler-engaging member and tumbler-carrying means movably mounted with respect to said member and tumblers carried by said tumbler-carrying means and adapted to enter perforations of said tumbler-engaging member and thereby to prevent relative motion of said member and tumbler-carrying means, and one or more key-devices adapted to coact with said tumbler-engaging member, each such key-device comprising one or more tumblers adapted to engage and press back to the parting line between the tumbler-engaging member and tumbler-carrying means any tumblers of the register which may be engaged by tumblers of such key-device.

6. In a registry system, the combination of a register having registering means comprising a sleeve having perforations in its wall corresponding to various different registering positions, and tumbler-carrying means mounted on said sleeve and tumblers yieldingly carried by said tumbler-carrying means and adapted to enter perforations of said sleeve and thereby to prevent relative motion of said sleeve and tumbler-carrying means, and one or more key-devices each adapted to enter said sleeve and each comprising one or more yielding tumblers adapted to yield to enter said sleeve and thereafter to press back to the parting line between sleeve and tumbler-carrying means any register tumbler which such a key-device tumbler may engage, and likewise to yield to permit rotation of said sleeve with respect to said key-device.

7. In a registry system, the combination of a register having registering means comprising a sleeve having perforations in its wall corresponding to various different registering positions, and tumbler-carrying means mounted in said sleeve and tumblers carried by said tumbler-carrying means and adapted to enter perforations of said sleeve, and thereby to prevent relative motion of said sleeve and tumbler-carrying means, and one or more key-devices each adapted to enter said sleeve, each such key-device comprising one or more tumblers adapted to engage and press back to the parting line between the tumbler-carrying means and sleeve any tumblers of the register which may be engaged by tumblers of the key-device, said key-devices further comprising means for holding the tumbler-carrying means of the register against rotation during rotation of the register sleeve.

8. In a registry system, the combination of a plurality of stations having key-devices, a signal transmitter at one of said stations, a circuit for said transmitter, a combination of contact devices in connection with said transmitter, through which contact combination, if operated properly, the circuit may be rendered operative with respect to said transmitter, but by which said circuit is otherwise rendered inoperative with respect to said transmitter, and a portable register adapted to be engaged with each such key-device and thereby rendered operative for registration of the visit to the corresponding station and to be conditioned by such operation for operation at the next key-device of the series, said register arranged to operate said contact combination and thereby to render the same operative with respect to the corresponding transmitter when the visit to the station at which such transmitter is located is registered in said register.

9. In a registry system, the combination of a plurality of stations having key-devices, a signal transmitter at one of said stations, a circuit for said transmitter, a combination of contact devices in connection with said transmitter, through which contact combination, if operated properly, the circuit may be rendered operative with respect to said transmitter, but by which said circuit is otherwise rendered inoperative with respect to said transmitter, and a portable register adapted to be engaged with the several key-devices successively and comprising a plurality of combination-members normally locked with respect to each other but arranged, one or more, to be released for relative movement by engagement of the register with the key-device corresponding to said transmitter, said combination-members arranged to operate said contact combination to render the circuit operative with respect to the transmitter when said combination-members are properly set after release by the said key-device.

10. In a registry system, the combination of a plurality of stations having key-devices, a signal transmitter at one or more of said stations, a circuit for said transmitter, a combination of contact devices in connection with said transmitter, through which contact combination, if operated properly, the circuit may be rendered operative with respect to said transmitter, but by which said circuit is otherwise rendered inoperative with respect to said transmitter, and a portable register adapted to to be engaged with each such key-device and thereby rendered operative for registration of the visit to the corresponding station, said register comprising means for setting said contact combination to render the transmitter circuit operative with respect to the transmitter corresponding to that contact combination.

11. A register, comprising a tumbler-engaging member and tumbler-carrying means mounted for relative motion one with respect to the other, said tumbler-engaging member having tumbler-receiving perforations, and tumblers carried by said tumbler-carrying means and adapted to engage said perforations, the said perforations of said tumbler-engaging member being arranged in different combinations of two or more in accordance with different registering positions of the tumbler-engaging member with respect to the tumbler-carrying means.

12. A register, comprising a tubular perforate tumbler-engaging member and tumbler-carrying means mounted for rotation with respect thereto, and tumblers carried by said tumbler-carrying means and adapted to engage the perforations of said tumbler-engaging member, the said perforations being arranged in different combinations of two or more in accordance with different angular positions of the tumbler-engaging member with respect to said tumbler-carrying means.

13. A register, comprising a tubular perforate tumbler-engaging member and tumbler-carrying means rotatively mounted thereon, and tumblers carried by said tumbler-carrying means and adapted to engage the perforations of said tumbler-engaging member, the said perforations being arranged in different combinations of two or more in accordance with different angular positions of the tumbler-engaging member with respect to said tumbler-carrying means.

14. In a register, the combination of a tubular perforate tumbler-engaging member and a plurality of separate tumbler-carrying means rotatively mounted thereon, and tumblers carried by said tumbler-carrying means and adapted to engage the perforations of said tumbler-engaging member, the said perforations being arranged differently in accordance with different angular positions of the tumbler-engaging member with respect to said tumbler-carrying means, said tumbler-carrying means being provided with means whereby they may be held against motion with said tumbler-engaging member.

15. In a register, the combination of a tubular perforate tumbler-engaging member, tumbler-carrying means rotatively mounted thereon, tumblers carried by said tumbler-carrying means and adapted to engage the perforations of said tumbler-engaging member, and a guard sleeve within said tumbler-engaging member and normally covering the said perforations thereof.

16. In a register, the combination of a tubular perforate tumbler-engaging member, tumbler-carrying means rotatively mounted thereon, tumblers carried by said tumbler-carrying member and adapted to engage the perforations of said tumbler-engaging member, a guard sleeve within said tumbler engaging member and normally covering the said perforations thereof, but adapted to retreat to uncover said perforations, and means normally holding said sleeve in advanced position.

17. In a register, the combination of a tubular perforate tumbler-engaging member, a plurality of tumbler-carrying means rotatively mounted thereon, and provided with means whereby said means may be held against rotation with said member, tumblers carried by said tumbler-carrying means and adapted to engage the perforations of said tumbler-engaging member, and retractable means normally holding said tumbler-carrying means in fixed relation with respect to each other.

18. In a register, the combination of a tubular perforate tumbler-engaging member, a plurality of tumbler-carrying means rotatively mounted thereon, and each pro-

vided with a projecting lug, and retractable means normally engaging said lugs and holding said tumbler-carrying means in fixed relation to one another.

19. In a register, the combination of a tubular perforate tumbler-engaging member, a plurality of tumbler-carrying means rotatively mounted thereon, and each provided with a projecting lug, and a slotted retractable sleeve normally engaging said lugs and holding said tumbler-carrying means in fixed relation to one another.

20. In a register, the combination of a tubular perforate tumbler-engaging member, a plurality of tumbler-carrying means rotatively mounted thereon, and each provided with a projecting lug, a slotted retractable sleeve normally engaging said lugs and holding said tumbler-engaging means in fixed relation to one another, and a spring normally holding said sleeve advanced.

21. In a register, the combination of a hollow handle, a tumbler-engaging member secured thereto and in part located therewithin, a plurality of tumbler-carrying means rotatively mounted on said tumbler-engaging member and each provided with a projecting lug, a slotted retractable sleeve normally engaging said lugs but adapted to retreat therefrom into the annular space between said handle and tumbler-engaging member, and a spring normally holding said sleeve advanced.

22. A register comprising in combination a perforate tumbler-engaging member, tumbler-carrying means mounted on one side of the wall thereof, and tumblers carried by said tumbler-carrying means and adapted to engage the perforations of said tumbler-engaging member but to be forced out of said perforations by the action of a key-device, acting from the other side of the wall of said tumbler-engaging member, the register being adapted to effect registration by step-by-step motion of the tumbler-engaging member with respect to the tumbler-carrying means, the perforations of said tumbler-engaging member being arranged with respect to the various stages of such motion to permit engagement of the tumblers with said member in different arrangements for the several different registering positions, one arrangement for each such position.

23. A combined key-device and signal transmitter for registers such as described, comprising a stem adapted to be engaged by the register and having tumblers adapted to coact with corresponding register-tumblers when the register and stem are engaged, signal transmitting means, and a group of contact devices in electrical connection with said transmitting means and arranged to be operated selectively by the register when so engaged with said stem.

24. A combined register-conditioning device and signal transmitter comprising means adapted to receive a register having tumbler-carrying means and means to hold certain of said tumbler-carrying means while permitting motion of another or others, signal transmitting means, and a combination of contact devices adapted to be operated selectively by register tumbler-carrying means and controlling the circuit of said transmitter.

25. A combined register-conditioning device and signal transmitter comprising means adapted to receive a register such as described and to condition the same for further operation, signal transmitting means, and a combination of contact devices adapted to be operated by said register and controlling the circuit of said transmitting means.

26. A combined register-conditioning device and signal transmitter comprising means adapted to receive a register such as described and to condition the same for further operation, signal transmitting means, and a combination of contact devices adapted to be operated by said register and controlling the circuit of said transmitting means and comprising spring-pressed plungers adapted to contact with and be operated by said register, and contact devices operated by said plungers.

27. The combination, with a register comprising registering means and tumbler-carrying means operatively associated, a register-conditioning device adapted to condition the registering means for motion with respect to said tumbler-carrying means, means for holding certain of said tumbler-carrying means stationary while permitting motion of other of said tumbler-carrying means, a combination of contact devices arranged to be operated selectively by operation of said tumbler-carrying means, transmitting means, and means operated by the transmitting means for restoring the tumbler-carrying means so operated.

28. The combination with a key device comprising a stem provided with tumbler-pockets, and tumblers yieldingly mounted in said pockets, of a register comprising a sleeve within which said stem is adapted to be received, said sleeve having tumbler-perforations and tumbler-carrying means mounted upon said sleeve and provided with tumblers adapted to engage the perforations of the sleeve, the tumblers of the stem adapted to press back to the parting line between said sleeve and tumbler-carrying means the tumblers of said register.

29. The combination with a key device comprising tumbler-carrying means, of a register adapted for engagement with said tumbler-carrying means and itself comprising tumblers and registering means normally locked thereby, the tumblers of said key de-

vice arranged to engage and actuate the tumblers of the register upon engagement of that register with the tumbler-carrying means of the key device, and thereby to release the registering means of said register for actuation.

30. A signaling system comprising a transmitter and a plurality of stations at one of which is contact means, controlling the sending of signals by such transmitter, and portable means comprising means for operating said control contact means, to permit said transmitter to send a signal, said portable means and certain of said stations together comprising means for registering visits to said stations.

31. A signaling system comprising a transmitter and a plurality of stations at one of which is contact means controlling the sending of signals by such transmitter, and portable means comprising means for operating said control contact means to permit said transmitter to send a signal, said portable means and certain of said stations together comprising means for registering visits to said stations, together with means for preventing operation of said control contact means unless and until another of said stations has been visited.

32. A signaling system comprising a plurality of stations, at one of which is a transmitter together with contact means controlling the sending of signals by such transmitter, and portable means comprising means for operating said control contact means to permit said transmitter to send a signal, said portable means and certain of said stations together comprising means for registering visits to said stations, together with means for preventing operation of said control contact means unless and until another of said stations has been visited.

In testimony whereof we have signed this specification in the presence of two subscribing witnesses.

CLARENCE C. JOHNSON.
RICHARD M. HOPKINS.

Witnesses:
ARTHUR ECKERT STEARNS,
ETHEL N. RABAN.