

No. 663,082.

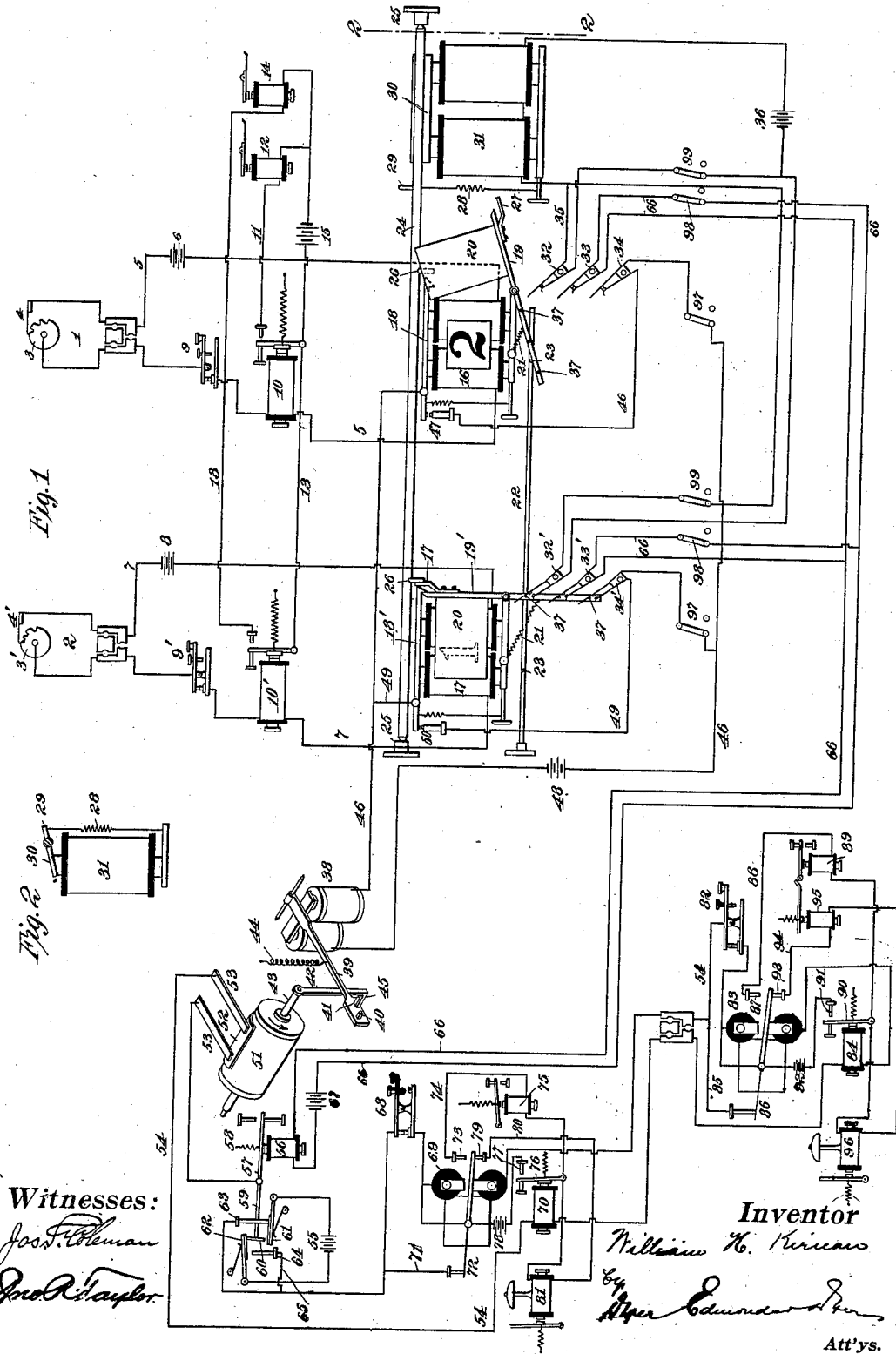
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W. H. KIRNAN.

FIRE ALARM TELEGRAPH APPARATUS.

(Application filed Oct. 4, 1899.)

(No Model.)



UNITED STATES PATENT OFFICE.

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FIRE-ALARM TELEGRAPH APPARATUS.

SPECIFICATION forming part of Letters Patent No. 663,082, dated December 4, 1900.

Application filed October 4, 1899. Serial No. 732,451. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. KIRNAN, a citizen of the United States, residing at Bayonne, in the county of Hudson, State of New Jersey, have invented a certain new and useful Improvement in Fire-Alarm Telegraph Apparatus, of which the following is a description.

My invention relates to various new and useful improvements in fire-alarm telegraph apparatus, and particularly to an improved system including the central-station and engine-house apparatus.

At the present time it is the practice to employ at the central station a so-called "joker-transmitter," by means of which alarms received at the central station will be repeated upon one or more joker-circuits, each including one or more engine-houses, the joker-signal thus sent being transmitted at a high speed corresponding to that of the street-box and being recorded upon a tape. It is the usual practice also at the present time to succeed the joker-signal with a slower repetition of the alarm, which is sounded upon a heavy and powerful gong in each engine-house. It thus becomes possible in the case of alarms received at night for the operator at each engine-house to observe by an inspection of the record produced by the joker-signal whether the alarm is to be responded to by his station, and, if not, it becomes possible by short-circuiting the gong mechanism to prevent the gong from being sounded and the firemen from being awakened.

The objection to the system which I have about outlined is that the joker-transmitter at the central station does not commence to operate until the first round from the street-box has been received, which in the case of some numbers, such as "685," may be of an objectionable extent.

The primary object of my invention therefore is to provide an apparatus of the same general type now in use, but by which the signal received at the central office will be sent out by the joker-transmitter immediately upon its receipt and without requiring a complete round of the signal to be first received at the central office. In this way I avoid the time now lost in this work. At the present

time with the apparatus in question difficulty is experienced by interference, the reception at the central office of two signals substantially simultaneously, or at least so closely following each other that the first has not been transmitted before the second is received, serving to produce aberrations in the joker-transmitter, and consequent confusion in the transmission of the joker-signals.

A second object of my invention is to produce a non-interference repeater for a joker system, by means of which the reception at the central office of two or more signals tending to overlap one another will not affect the joker-transmitter and which in consequence will not result in confusion of the joker-signals. With the fire-alarm telegraph systems of the type now in use it is the practice to provide a telegraph apparatus at each engine-house and in the central station, whereby communication between the several engine-houses or between the engine-houses and the central station may be carried on over the joker-line. It is therefore possible as these systems are now installed for any engine-house to practically disable the joker-line by breaking it at any telegraph-key, which if done will prevent the joker-signals from being transmitted or received.

The final object of my invention is to provide a system of the character described by means of which telegraphic communication between one or more engine-houses or between any engine-house and the central office may be carried on in the absence of any joker-signals on the line, but which telegraph apparatus will be immediately disabled and the joker-line placed in condition for the transmission and reception of fire-alarm signals upon the receipt of such signals at the central office, thus making it impossible for any one, either accidentally or intentionally, to disable the joker-line by breaking the circuit at the key.

In order that my invention may be better understood, attention is directed to the accompanying drawings, forming a part of this specification, and in which—

Figure 1 is a diagram of a convenient embodiment of my improved system, and Fig. 2 a section on the line 2 2 of Fig. 1.

In each of the above views corresponding parts are represented by the same numerals of reference.

The system illustrated is a closed-circuit system, and it will be so described; but it will be understood that my invention may be applied to open-circuit systems or to systems employing both open and closed circuits, the necessary changes for converting it into one or the other being obvious to any one skilled in the art. I prefer to use a closed-circuit system on account of the greater security which is offered thereby.

1 and 2 represent, diagrammatically, the transmitting mechanism of two ordinary street-boxes, any number of which can be used. Each box is provided with a power-driven make-and-break wheel 3 or 3', adapted to be released when the box is pulled to make its prescribed number of rotations. Coöperating with the break-wheels 3 and 3' are contact-springs 4 4'. Leading from the box 1 is a closed circuit 5, including a battery 6, and leading from the box 2 is a closed circuit 7, including a battery 8. These circuits 5 and 7 are the usual street-circuits and lead to the central station, where suitable mechanism is placed. Generally a plurality of street-boxes are placed in each street-circuit, as will be understood. A key 9 or 9' is placed in each street-circuit 5 and 7, respectively, and is located at the central station for the purpose of testing. A relay 10 or 10' is also included in the street-circuits 5 and 7, respectively, and placed in the central station. The relay 10 controls a local circuit 11, including a register 12 for effecting a visual permanent record on a traveling tape, as is common, while a local circuit 13 is controlled by the relay 10' and includes a register 14, similar to the register 12 and recording on a second tape or, if desired, upon the same tape as the register 12. A local battery 15 is common to both the circuits 11 and 13. Where more than two street-lines are employed, a corresponding number of street-relays will be used, one for each line, each relay controlling a separate register. The street-circuit 5 includes a repeater-magnet 16, located at the central station, and the street-circuit 7 includes a repeater-magnet 17, located adjacent to the magnet 16. As many of these repeater-magnets will be used as there are street-circuits leading to the central station. The armatures 18 and 18' of the repeater-magnets 16 and 17, respectively, will be normally attracted, as shown, assuming a closed circuit to be used, and when so attracted the armatures serve to lock in place levers 19 and 19', respectively, each carrying a shutter 20, normally concealing a number corresponding to and designating each respective street-circuit. I illustrate the shutter 20 for the repeater-magnet 16 as having been released, the supposition being that the street-box 1 is in operation, the break-wheel 3 having completed at least a full turn or

having completed its entire movement. The shutter-levers 19 and 19' when released may fall by their weight; but they are preferably tripped by a spring 21 and are reset by a restoring-rod 22, having pins 23 23, which engage the shutter-levers below their pivots, said restoring-rod 22 being mounted in bearings, (not shown,) so as to slide sidewise.

Mounted above the repeater-magnets 16 and 17 is a non-interference shaft 24, which is carried in bearings 25 25, so as to permit of a rocking movement, and said shaft carries the arms 26 26, adapted to engage with fingers 27, carried upon the levers 19 and 19' when the latter are locked in their uppermost positions by means of the armature-levers 18 and 18'. A spring 28, engaging an arm 29 on the non-interference lever 24, normally withholds the arms 26 from the fingers 27. The non-interference shaft 24 carries the armature 30 of a non-interference magnet 31, whereby when said magnet 31 is energized the armature 30 will be attracted, rocking the non-interference shaft and engaging the arms 26 in front of the fingers 27. Each shutter-lever 19 and 19' controls a series of circuit-closers 32 33 34 and 32' 33' 34'. The circuit-closers 32 and 32' and any other corresponding circuit-closers, when more than two repeater-magnets are used, are included in a normally open circuit 35 with the non-interference magnet 31. A battery 36 is included in said circuit. When all the shutter-levers are locked in their normal positions, the circuit-closers 32 and 32' will break the circuit 35 and the non-interference magnet 31 will be deenergized; but upon the release of any of the shutter-levers by the breaking of a line-circuit at one of the street-boxes the circuit-closer 32 or 32' will close the circuit 35, energizing the non-interference magnet 31, attracting the armature 30, rocking the shaft 24, and throwing the arm 26 in front of the finger 27 of the other repeater magnet or magnets than the one which was operated. In this way it will be observed the repeater-magnets, except the one first operated, will be locked by the non-interference mechanism, and they cannot therefore affect the joker-transmitter, as I will hereinafter explain. Assuming the parts to be in the position shown in Fig. 1, it will be seen, however, that although the repeater-magnet 17 is locked against interference and cannot affect the joker-transmitter, yet a signal coming over the street-circuit 7 will energize the relay 10' and operate the register 14, so that the operator at the central office will know that the street-circuit 7 has been energized and can send out the proper signals to the engine-houses after the restoration of the shutter-lever of the repeater-magnet 16. When the message has been received, the restoring-arm 22 is operated to restore the shutter-lever, which will be again locked in its normal position by the armature of the repeater-magnet, and in this movement the pins 37 on the

ized relays into contact with the back stops 79 and 93, respectively, thereof. Thus the telegraph-keys at the central station and at the several engine-houses will be prevented
 5 from breaking the joker-circuit by the closure of the shunts 71 and 85 through the contact devices 72 and 86, respectively. As soon, therefore, as one of the repeater-magnets is operated to actuate the pole-changer the po-
 10 larized relays will be operated on the joker-circuit to prevent the disablement of that circuit by any one of the signaling-keys, and it thus becomes impossible for a person, either accidentally or intentionally, to disable the
 15 joker-circuit by the manipulation of one of such keys. The reversal of the current by the pole-changer throwing the armature of the polarized relay 69 into contact with the back stop 79 thereof places the bell 81 in con-
 20 dition for signaling upon the energization and deenergization of the direct relay 70, while the corresponding movement of the armature of the polarized relay 83 places the reg-
 25 ister 95 and bell 96 in condition for operation when the direct relay 84 is affected. The move-
 30 ments which have been described take place immediately after the breaking of the line-circuit to one of the repeater-magnets—for ex-
 35 ample, magnet 16—so that at the first release of said magnet the closing of the repeater-circuit 46 at the contacts 47 and circuit-closer 34 will energize the repeater-magnet 38 to
 40 move the detent 41 out of engagement with the turned-in end 45 of the arm 42, thus al-
 45 lowing the shaft 43 to turn almost a complete rotation and breaking the joker-circuit be-
 50 tween the contact-springs 53 53. The breaking of this circuit allows the direct relays 70 and 84 to close the local circuits 80 and 94,
 55 respectively, on the bell 81 at the central station and upon the register 95 and bell 96 at each engine-house. Upon the completion of the line-circuit 5 to again energize the re-
 60 peater-magnet 16 the repeater-circuit 46 will be broken at the contacts 47 to deenergize the joker-transmitter magnet 38, allowing the
 65 detent 40 to be withdrawn from engagement with the turned-in end 45 and permitting said end to again engage the detent 41, whereby
 the shaft 43 will have completed its full turn, the contact 52 will be brought again into en-
 gagement with the springs 53, and the joker-circuit will be again completed, energizing the direct relays 70 and 84 and breaking the
 local circuits through the bell and register. Thus each make and break in the line-circuit
 will be transmitted over the joker-circuit and received at the engine-house, and this result
 will take place during the first and each suc-
 ceeding round of the street-box signal instead of only at the commencement of the second
 round of said signal, as at the present time. During the normal condition of the joker-cir-
 cuit when the pole-changer circuit 66 is broken at the several repeater-magnets the
 armatures of the polarized relays 69 and 83,

respectively, will be in engagement with their front stops. The shunts 71 and 85 are there-
 fore broken at the contacts 72 and 86, respec-
 70 tively, so that the joker-circuit can be con-
 trolled from the telegraph-keys. The break-
 ing of the circuit at one of the telegraph-keys
 will therefore result in the deenergization of
 the direct relays 70 and 84, respectively, clos-
 75 ing the battery 78 at the central station on
 the sounder 75 through the front stop 73 and
 circuit 74 and closing the battery 92 at the
 engine-house on the battery 92 through the
 front stop 87 and circuit 88. Ordinary tele-
 80 graphic communication can in this way be
 established; but the moment a signal is re-
 ceived at the central station to operate the
 pole-changer the movement of the armatures
 of both polarized relays will complete the
 shunt around each key, throw out the sounder, 85
 and connect in the bell at the central station
 and the register and bell at the engine-house.
 It thus becomes possible during the normal
 condition of the joker-circuit to establish
 90 communication between any two engine-
 houses or between an engine-house and the
 central station; but such communication will
 be automatically interrupted immediately a
 signal is received at the central station.

Having now described my invention, what 95
 I claim as new, and desire to secure by Let-
 ters Patent, is as follows:

1. In a fire-alarm telegraph system, the combination of a street-circuit, a repeater-
 magnet controlled thereby, a joker-transmit- 100
 ter magnet operated from the repeater-mag-
 net, a joker transmitting apparatus under the
 control of the joker-magnet, and a joker-cir-
 cuit controlled by said transmitting appara-
 105 tus, substantially as set forth.

2. In a fire-alarm telegraph system, the combination of a street-circuit, a repeater-
 magnet controlled by said circuit, a repeater-
 circuit controlled by the armature of said re-
 110 peater-magnet, a joker-magnet in said re-
 peater-circuit, a joker-transmitter controlled
 by the joker-magnet, and a joker-circuit ex-
 tending to an engine-house and controlled by
 said joker-transmitter, substantially as set
 115 forth.

3. In a fire-alarm telegraph system, the combination of a plurality of street-circuits, a repeater-magnet for each circuit, a joker-
 transmitter magnet, repeater-circuits con-
 120 trolled by the repeater-magnets and including
 said joker-transmitter magnet, a joker-trans-
 mitter controlled by the joker-magnet, and a
 joker-circuit controlled by the joker-trans-
 mitter, substantially as set forth.

4. In a fire-alarm telegraph system, the 125
 combination of a plurality of street-circuits,
 a repeater-magnet for each circuit, a joker-
 transmitter magnet, repeater-circuits con-
 trolled by the repeater-magnets and including
 said joker-transmitter magnet, a joker-trans- 130
 mitter controlled by the joker-magnet, a
 joker-circuit controlled by the joker-trans-

mitter, and a non-interference mechanism for locking the armature of the inactive repeater-magnet, substantially as set forth.

5. In a fire-alarm telegraph system, the combination of a plurality of street-circuits, a repeater-magnet for each of said circuits, a joker-circuit controlled by said repeater-magnets, a non-interference device for locking the armatures of the repeater-magnets in an inactive position, a non-interference magnet controlling said device, and a circuit-controlling device actuated upon the operation of one of said repeater-magnets to allow the non-interference magnet to effect the locking of the armatures of the non-actuated repeater-magnets, substantially as set forth.

6. In a fire-alarm telegraph system, the combination of a plurality of street-circuits, a repeater-magnet for each of said circuits, a joker-circuit controlled by said repeater-magnets, a non-interference device for disabling the repeater-magnets to prevent them from actuating the joker-circuit, and means controlled by the operation of one of said repeater-magnets to cause the non-interference device to lock the other repeater-magnets, substantially as set forth.

7. In a fire-alarm telegraph system, the combination of a plurality of street-circuits, a repeater-magnet for each of said circuits, a joker-circuit controlled from the armatures of said repeater-magnets, a non-interference device, a shutter-lever locked against movement by the armature of each repeater-magnet, a non-interference device, and a circuit-controlling mechanism operated by the shutter-levers of the repeater-magnets to actuate said non-interference device, substantially as set forth.

8. In a fire-alarm telegraph system, the combination of a plurality of street-circuits, a repeater-magnet in each circuit, a shutter-lever controlled by each repeater-magnet, a non-interference shaft mounted above said repeater-magnets, arms on said shaft to engage the shutter-levers, a magnet for operating said shaft, and circuit-controlling devices operated by the shutter-levers for effecting the operation of the non-interference magnet, substantially as set forth.

9. In a fire-alarm telegraph system, the combination of a plurality of street-circuits, a repeater-magnet in each circuit, a repeater-circuit controlled by the armatures of said repeater-magnets, a joker-magnet in said repeater-circuit, a joker-circuit controlled by the joker-magnet, and a circuit-controlling device for making the repeater-circuit operative controlled from the operation of any one of said repeater-magnets, substantially as set forth.

10. In a fire-alarm telegraph system, the combination of a plurality of street-circuits, a repeater-magnet in each circuit, a repeater-circuit controlled by said repeater-magnets, a joker-magnet in said repeater-circuit, a joker-circuit controlled by the joker-magnet,

and circuit-controlling devices for completing the repeater-circuit, said devices being under the control of the respective repeater-magnets, substantially as set forth.

11. In a fire-alarm telegraph system, the combination of a plurality of street-circuits, a repeater-magnet in each circuit, a shutter-lever controlled by each magnet, a repeater-circuit controlled by said magnets, a joker-magnet in said circuit, a joker-circuit controlled by the joker-magnet, and a circuit-closing device operated by each shutter-lever for closing the repeater-circuit at each repeater-magnet, substantially as set forth.

12. In a fire-alarm telegraph system, the combination of a street-circuit, a repeater-magnet in said circuit, a repeater-circuit controlled by the armature of said repeater-magnet, a joker-magnet in said repeater-circuit, an escapement device actuated by said joker-magnet, a joker-transmitter controlled by said escapement device, and a joker-circuit controlled by said transmitter, substantially as set forth.

13. In a fire-alarm telegraph system, the combination of a street-circuit, a repeater-magnet controlled by said circuit, a repeater-circuit controlled by said repeater-magnet, a joker-magnet in said repeater-circuit, a joker-circuit controlled by said joker-magnet, telegraphic apparatus in the joker-circuit, a polarized relay for disabling said telegraphic apparatus, a pole-changer for reversing the current in the joker-circuit, and a circuit-controlling device under the control of the repeater-magnet for actuating said pole-changer, substantially as set forth.

14. In a fire-alarm telegraph system, the combination with a street-circuit and a repeater-magnet controlled thereby, of a joker-circuit, a joker-transmitter controlled by the repeater-magnet, a polarized relay in the joker-circuit, a telegraph-key connected to said relay, a shunt around said key adapted to be broken by reversal of current in the relay, and a pole-changer in the joker-circuit controlled by the repeater-magnet, substantially as set forth.

15. In a fire-alarm telegraph system, the combination with a street-circuit and a repeater-magnet controlled thereby, of a joker-circuit, a joker-transmitter controlled by the repeater-magnet, a polarized relay in the joker-circuit, a telegraph-key connected to said relay, a shunt around said key adapted to be broken by reversal of current in the relay, a pole-changer in the joker-circuit controlled by the repeater-magnet, a sounder connected to the front stop of said polarized relay, and a bell connected to the back stop of said polarized relay, substantially as set forth.

16. In a fire-alarm telegraph system, the combination with a street-circuit and a repeater-magnet controlled thereby, of a joker-circuit, a joker-transmitter controlled by the repeater-magnet, a polarized relay in the joker-circuit, a telegraph-key connected to

said relay, a shunt around said key adapted to be broken by reversal of current in the relay, a pole-changer in the joker-circuit controlled by the repeater-magnet, a sounder connected to the front stop of said polarized relay, and a bell and register connected to the back stop of said polarized relay, substantially as set forth.

17. In a fire-alarm telegraph system, the combination with a street-circuit and a repeater-magnet controlled thereby, of a joker-circuit, a joker-transmitter controlled by the repeater-magnet, a polarized relay in the joker-circuit, a telegraph-key connected to said relay, a shunt around said key adapted to be broken by reversal of current in the relay, a pole-changer in the joker-circuit controlled by the repeater-magnet, a sounder connected to the front stop of said polarized relay, a bell connected to the back stop of said polarized relay, and a direct relay in the joker-circuit for actuating said sounder, substantially as set forth.

18. In a fire-alarm telegraph system, the combination with a street-circuit and a repeater-magnet controlled thereby, of a joker-circuit, a joker-transmitter controlled by the repeater-magnet, a polarized relay in the joker-circuit, a telegraph-key connected to said relay, a shunt around said key adapted to be broken by reversal of current in the relay, a pole-changer in the joker-circuit controlled by the repeater-magnet, a sounder connected to the front stop of said polarized relay, a bell connected to the back stop of said polarized relay, and a direct relay in said joker-circuit for actuating the sounder and bell, substantially as set forth.

This specification signed and witnessed this 14th day of September, 1899.

WILLIAM H. KIRNAN.

Witnesses:

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