(No Model.) 2 Sheets—Sheet 1.

D. H. WILSON.

SWITCH BOARD FOR ELECTRIC FENCE STATIONS.

No. 455,696. Patented July 7, 1891.

Fig. 2.

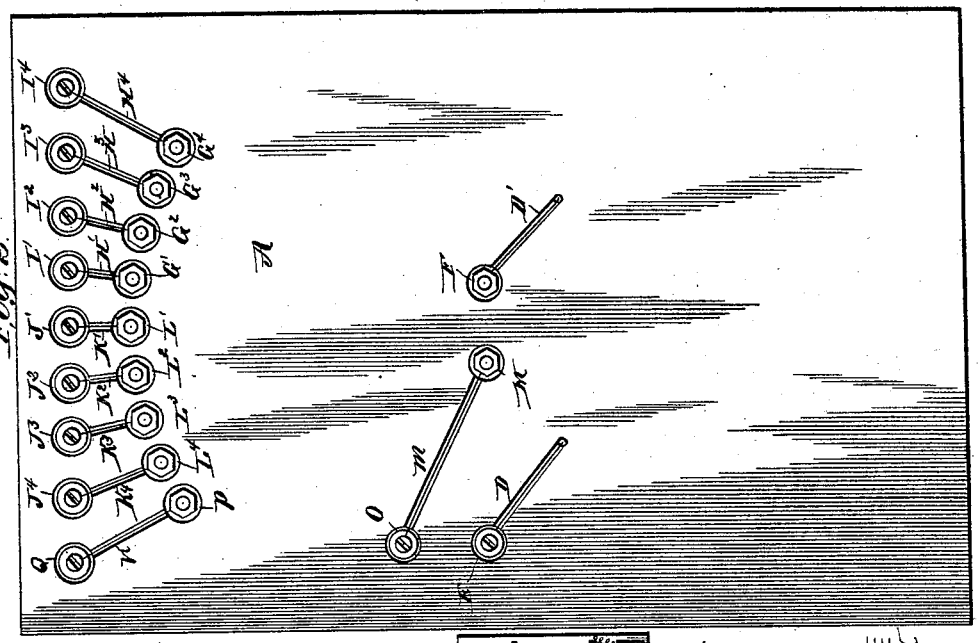
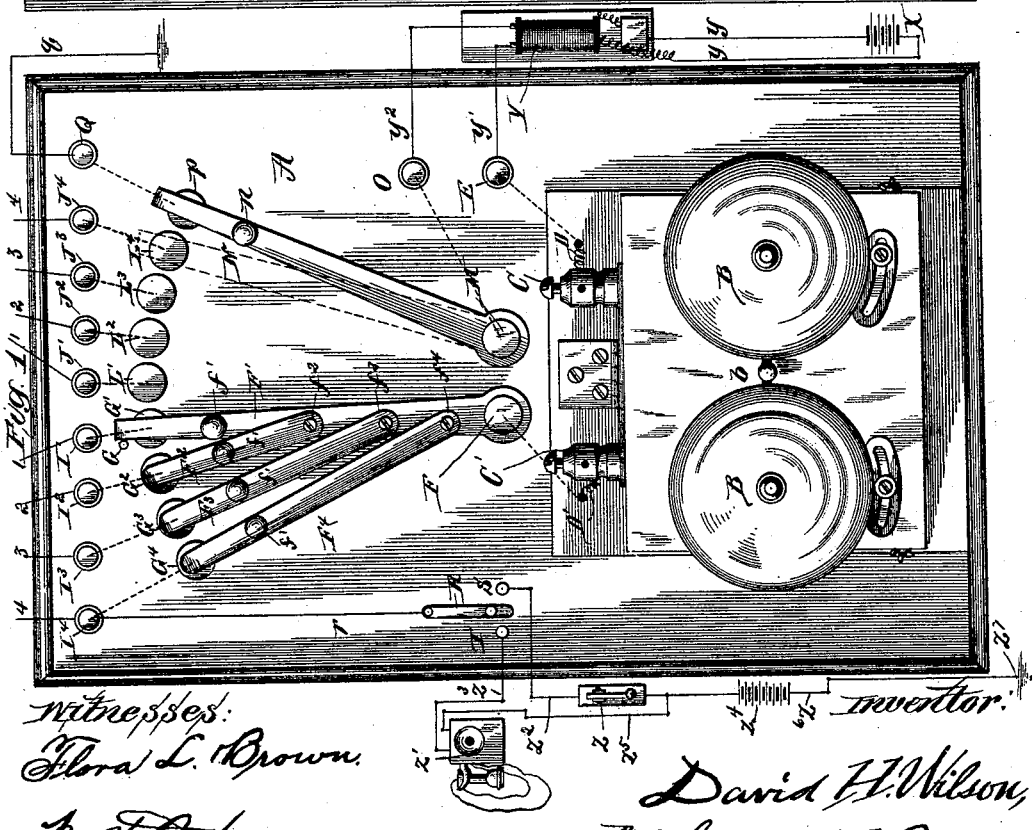


Fig. 1.



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Wm. H. Scott.

Inventor.
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By Charles J. Brown, Atty

(No Model.) 2 Sheets—Sheet 2.

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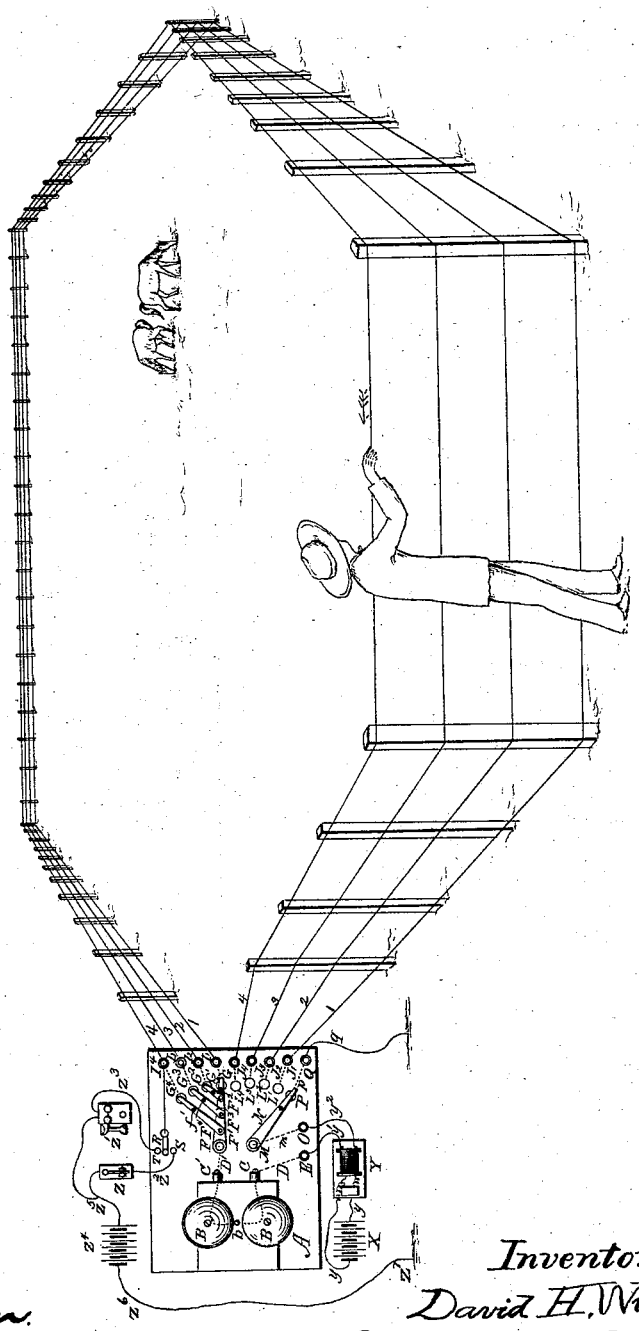

Fig. 3.

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UNITED STATES PATENT OFFICE.

DAVID H. WILSON, OF NORMAL, ASSIGNOR TO THE AMERICAN ELECTRIC FENCE COMPANY, OF CHICAGO, ILLINOIS.

SWITCH-BOARD FOR ELECTRIC-FENCE STATIONS.

SPECIFICATION forming part of Letters Patent No. 455,696, dated July 7, 1891.

Application filed August 25, 1890. Serial No. 362,996. (No model.)

To all whom it may concern:

Be it known that I, DAVID H. WILSON, a citizen of the United States, residing at Normal, in the county of McLean and State of Illinois, have invented certain new and useful Improvements in Switch-Boards for Electric-Fence Stations, of which the following is a specification.

My invention relates to switch-boards adapted to be used at a station wherein is located the electric generator and other apparatus necessary for the proper equipment of an "electric fence," as it is termed, an electric fence of the kind referred to being a fence composed of one or more strands of uncovered wire not in electrical connection with the ground, each of such strands, where more than one is used, forming an electrical conductor over which an electric current will be automatically conveyed when any animal or other electric conductor comes in contact therewith and with the ground, thereby grounding such wires. In a fence of this character one end of each of the strands of wire forming the fence is—when the fence is in condition to automatically impart a shock to an animal touching and thereby grounding any one or all of such strands—connected with one of the wires extending from an induction-coil or from a magneto-electric generator, and the other end of each of such strands of wire is disconnected from such induction-coil or from such magneto-electric generator and not grounded, but adapted to be connected to such induction-coil or magneto-electric generator by a return-wire or by grounding, as preferred, whenever desired; and in a fence of this character the other wire extending from the induction-coil or from the magneto-electric generator is grounded, such ground wire being arranged to be cut out from the circuit when a return-wire is employed for completing the circuit.

The object of my invention is to provide means for readily connecting and disconnecting one end of all or any of the strands of wire forming the electric fence with the wire extending to the induction coil or coils when an induction-coil is used for generating the desired current, or to the magneto-electric generator when one is used instead of an induction-coil for generating the desired current; to provide means for connecting with or disconnecting from the induction-coil or from a magneto-electric generator that end of the strands of wire which is ordinarily in an electrical connection with such induction-coil or magneto-electric generator; to provide means for readily forming a closed electric circuit consisting of any one of the strands of wire forming the fence, within which circuit shall be contained a magneto-electric alarm-bell, constituting the signal by which a test may at any time be made of the electrical conditions of the strand tested, and to provide means for readily disconnecting any one of the strands forming the fence from electrical connection with the induction-coil or magneto-electric generator and to connect or disconnect at will a primary battery with the strand so cut out of the circuit connected with the induction-coil or magneto-electric generator, such primary battery having or adapted to have placed in the circuit thereof a telegraph-instrument or telephone.

I have illustrated my invention by the drawings accompanying and forming a part of this specification, in which—

Figure 1 is a front elevation of my invention with wires attached thereto extending to an induction-coil actuated by a primary battery also in an electrical connection with the induction-coil to the fence, to a telegraph-instrument, and to a telephone; and Fig. 2 is a rear elevation of my invention, showing the manner in which the several binding-posts thereon which are in permanent electrical connection are wired together. Fig. 3 is a diagrammatic view showing the entire system consisting of the fence and my invention applied thereto.

Like letters and figures refer to like parts throughout the several views.

X is the primary battery. A magneto-electric generator may be employed instead and in place of the primary battery, and if a magneto-electric generator is employed wires would extend therefrom directly to binding-posts E and O, hereinafter described, on the switch-board.

Y is an induction-coil, and $y\,y$ are wires extending from primary battery X to induction-coil Y.

$y'\,y^2$ are wires extending from the induction-coil to binding-posts E O on the switch-board.

Z is a telegraph-instrument, and Z′ is a telephone.

Z^2 is a wire extending from the telegraph-instrument to binding-post S on the switch-board, and Z^3 is a wire extending from the telephone to binding-post T upon the switch-board.

Z^4 is a primary battery connected by a wire Z^5 to the telegraph-instrument and to the telephone and by wire Z^6 to the ground-plate Z^7.

A is the base-board of my improved switch.

B B are magneto-electric alarm-bells, and *b* is the hammer thereof.

C C′ are binding-posts electrically connected in the ordinary manner with the electro-magnet-actuating hammer *b* of the alarm-bells B B.

D is a wire electrically connected at one end with binding-post C, and, after passing through a hole in base-board A to the rear thereof, connected at the other end with binding-post E, hereinbefore referred to as electrically connected with wire y'. To the binding-post C′ there is electrically connected one end of wire D′, the other end of which wire, after passing in like manner as wire D through a hole in base-board A to the rear thereof, is electrically connected with post F.

F′ is a metal spring-arm pivotally secured on post F.

f' is a handle on pivotal arm F′, by which such arm may be turned.

F^2 F^3 F^4 are metal spring-arms, each pivotally secured by pivot f^2 f^3 f^4 to arm F′, and each having a handle thereon, lettered, respectively, f'.

G′ G^2 G^3 G^4 are posts, upon the upper face of which pivotal arms F′, F^2, F^3, and F^4 may be respectively placed in contact and in electrical communication with, and it will be observed that pivotal arm F′ may be brought in contact with each of the posts G′, G^2, G^3, and G^4.

G is a pin forming a stop tending to hold pivotal arm F′ on post G′, thereby preventing it from leaving its position on the post G′ when any one or all of the pivotal arms F^2, F^3, and F^4 are turned off from contact with posts G^2, G^3, and G^4.

H′, H^2, H^3, and H^4 are wires upon the back face of the base-board A, electrically connecting posts G′, G^2, G^3, and G^4, respectively, with binding-posts I′ I^2 I^3 I^4.

1, 2, 3, and 4 are wires electrically connected with binding-posts I′, I^2, I^3, and I^4, respectively, and forming the first, second, third, and fourth strands of an electric fence, wire 1 being the bottom strand and 4 the top one thereof.

J′, J^2, J^3, and J^4 are binding-posts upon the switch-board, to which the other and returning end of fence-wires 1 2 3 4 are respectively secured.

K′, K^2, K^3, and K^4 are wires secured at one end, respectively, to binding-posts J′, J^2, J^3, and J^4 and at the other end to posts L′, L^2, L^3, and L^4.

M is a post having pivoted thereon spring-arm N, such spring-arm being adapted to bring into electrical connection with post M any one of the several posts L′, L^2, L^3, and L^4, when the arm N is swung over such post. Post M is electrically connected with post O by wire *m*.

P is a post arranged at one end of the series of posts L′, L^2, L^3, and L^4, and, like them, being adapted to be electrically connected with post M by having the arm N placed thereover.

p is a wire secured at one end to post P and at the other end to post Q.

q is a wire extending from post Q to the ground.

R is a pivotal switch-arm connected by wire with post I^4. Arm R is adapted to be turned to the right or to the left and into electrical connection with posts S or T, as desired. To these posts S and T are secured, as hereinbefore described, wires Z^2 and Z^3, respectively.

In order that the operation of my invention may be fully understood, I will describe this operation in use with an induction-coil for generating the necessary electric current; but it will be observed that in place of such induction-coil a magneto-electric generator may be employed, if preferred.

The primary current generated by the battery X extends on wires $y\,y$ through the induction-coil Y. The secondary and alternating current will thereupon extend from such induction-coil on wire y' to post E, through such post, and from thence on wire D to post C, thence through the coil-actuating hammer *b* of alarm-bells B B to post C′, from thence on wire D′ to post F, from thence on pivotal arms F′ F^2 F^3 F^4 to posts G′ G^2 G^3 G^4, from thence over wires H′ H^2 H^3 H^4 to posts I′, I^2, I^3, and I^4, and from thence on wires 1, 2, 3, and 4, forming the fence, and, extending over such wires, or that one thereof, if any, which is grounded, to the point of grounding, will return by the ground to ground-wire *q*, thence over wire *q* to post Q, thence over wire *p* to post P, thence over pivotal arm N to post M, thence over wire *m* to post O, and from thence over wire y^2 to the induction-coil Y, thereby completing the circuit.

If no one of the strands of wire forming the fence is grounded, each of such wires, when the fence surrounds the field or other inclosure, being returned to the switch-board and secured to posts J′ J^2 J^3 J^4, respectively, if pivotal arm N be turned on pivot M, so that the free end thereof is over and in electrical contact with any one of the posts L′ L^2 L^3 L^4, such posts being respectively connected by wires K′ K^2 K^3 K^4, as hereinbefore described, with posts J′, J^2, J^3, and J^4, a closed electrical

circuit will be formed over some one of the strands of wire forming the fence. For instance, if arm N be in contact with post L^4, as indicated by the dotted lines in Fig. 1 of the drawings, a closed electric circuit will be formed thereby, and an electric current will extend entirely around the inclosure upon wire 4 or the top strand of the fence to post J^4, thence over wire K^4 to post L^4, thence over lever N, post M, wire *m*, post O, and wire y^2 to the induction-coil Y, as hereinbefore described. By turning lever N upon post L^3 the same circuit will be formed, with the exception that wire 3 of the fence will be substituted as an element therein for wire 4, which will thereby be dropped from the circuit. Wires 1 or 2 may in like manner be placed in a closed circuit by placing arm N over and in contact with post $L' L^2$. In the event of any of the above-described circuits being closed in the manner described, by turning arm N the alarm-bells B B, being included in such circuit, will thereby be rung. A test of the electrical condition of any of these wires is thus quickly made. Again, with the switch in the position illustrated in the drawings, Fig. 1, if any one of the wires 1 2 3 4, forming the fence, is grounded the alarm-bells B B will be rung, as above described, and in order to test, if any, which one, or, if more than one, which ones, of such wires are grounded pivotal levers F^2 F^3 F^4 are turned away from contact with posts G^2, G^3, and G^4, and, lever F′ being in contact with post-head G′, if the alarm-bells B B continue to ring, wire 1 of the fence being the only one in electrical communication with post C′ through arm F′, in contact with post G′, such wire 1 of the fence is grounded. By turning lever F′ upon post G^2 the bell will continue to ring if wire 2 of the fence is grounded, such bell ceasing to ring if wire 1 is not grounded. Wires 3 and 4 may be tested in the same manner by turning the lever F′ upon posts G^3 and G^4, respectively. By turning lever F^4 away from contact with post G^4 wire 4 of the fence is thrown entirely out of the circuit traversed by the current, if any, from induction-coil Y, and thereafter by turning switch R to post S and grounding wire 4 by a suitable conductor at any point selected as a receiving-point the telegraph-instrument Z may be operated and messages sent and received on wire 4 from the station to the receiving-point, provided, of course, that a receiving-instrument be placed in the circuit in the ordinary manner. If, instead of turning the arm R upon post S, such arm be turned to post T and wire 4 be grounded at a point desired for a receiving-station, with a telephonic receiver placed in the circuit, telephone Z′ may be worked over wire 4.

It will be observed that any person may ground, say, wire 4 at any point on the fence, and if such grounding be done by a regular series of movements there will thereby be received a signal upon bells B B, and upon receiving such signals the operator at the station may throw any agreed wire out of circuit with the induction-coil in the manner last described and throw into circuit on such wire either the telegraph-instrument or the telephone, as called for, and messages may thereby be sent and received in the ordinary manner.

Having thus described my invention, what I claim, and desire to secure by Letters Patent of the United States, is—

1. A switch-board having posts thereon adapted to have secured thereto wires extending from an induction-coil or other electrical generator, one of such posts electrically connected with the coil of a magneto-alarm bell, a wire extending from such coil to a pivotal arm, other pivotal arms pivoted on the first-named pivotal arm, each and every of such pivotal arms adapted to be brought into contact with posts, each of such posts being electrically connected with a wire forming a strand of an electric fence, and a second pivotal arm electrically connected with the other of the first-named posts, such last-named pivotal arm being adapted to be brought in contact with posts placed in the switch-board, one of such posts having a ground-wire electrically connected thereto and the other of such posts having the other end of the wires forming the strands of the fence electrically connected thereto, substantially as described.

2. A switch-board having posts thereon adapted to have secured thereto wires extending from an induction-coil or other electrical generator, one of such posts electrically connected with the coil of a magneto-alarm bell, a wire extending from such coil to a pivotal arm, other pivotal arms pivoted on the first-named pivotal arm, each and every of such pivotal arms adapted to be brought into contact with posts, each of such posts being electrically connected with a wire forming a strand of an electric fence, a second pivotal arm electrically connected with the other of the first-named posts, such last-named pivotal arm being adapted to be brought in contact with posts placed in the switch-board, one of such posts having a ground-wire electrically connected thereto and the other of such posts having the other end of the wires forming the strands of the fence electrically connected thereto, and a third pivotal arm electrically connected with one of the wires forming a strand of the fence and adapted to be turned into and out of contact with a post or posts electrically connected with a suitably-grounded telegraph-instrument and telephone alternately, substantially as described.

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