

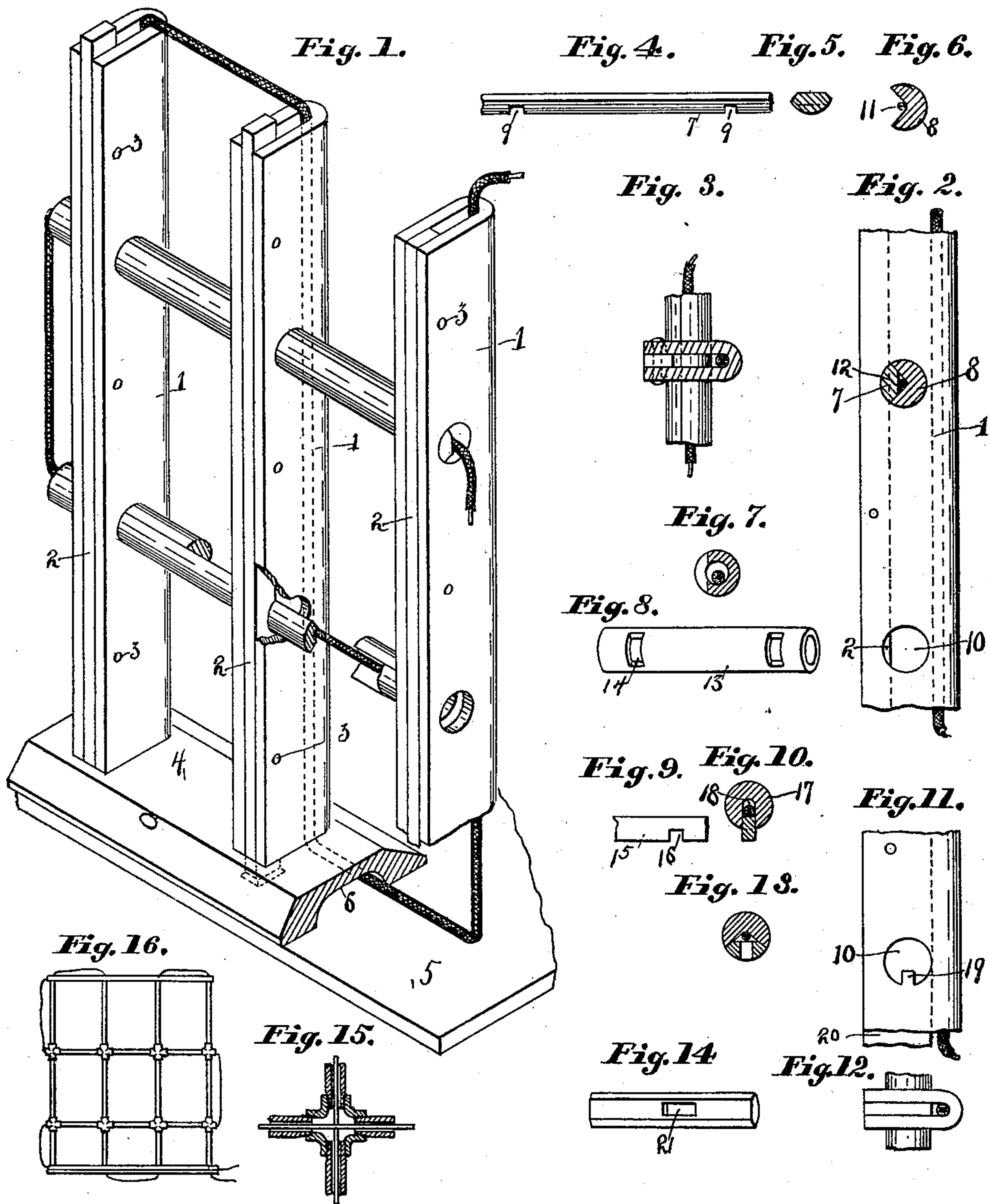
(No Model.)

3 Sheets—Sheet 1.

P. HALE & C. H. SPARKS.
ELECTRIC JAIL.

No. 477,301.

Patented June 21, 1892.



Witnesses
A. A. Eicher,
Eq. E. Langan

Perley Hale
Chas H. Sparks Inventors
By their Attorneys Higdon & Higdon

(No Model.)

3 Sheets—Sheet 2.

P. HALE & C. H. SPARKS.
ELECTRIC JAIL.

No. 477,301.

Patented June 21, 1892.

Fig. 17.

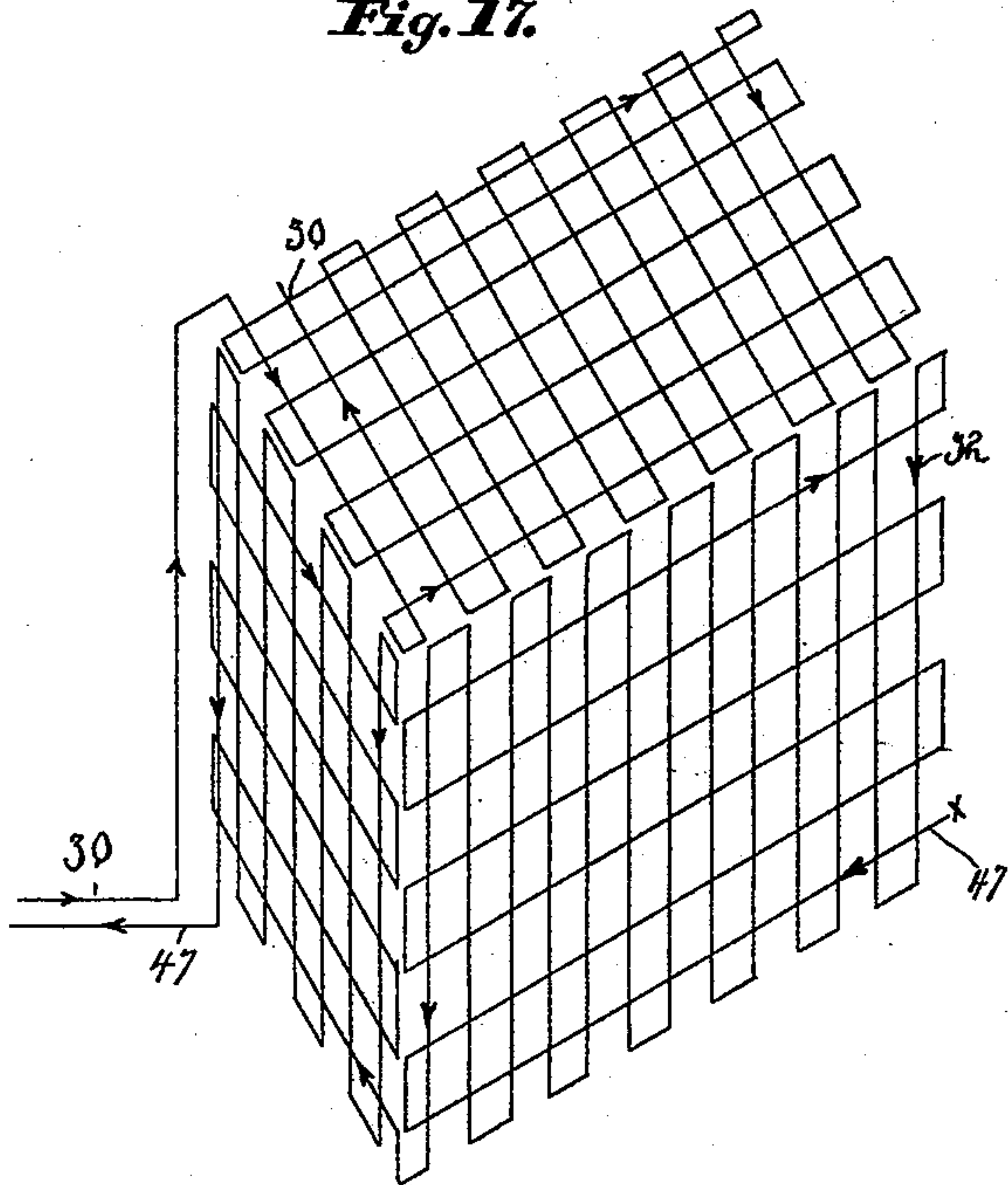


Fig. 18.

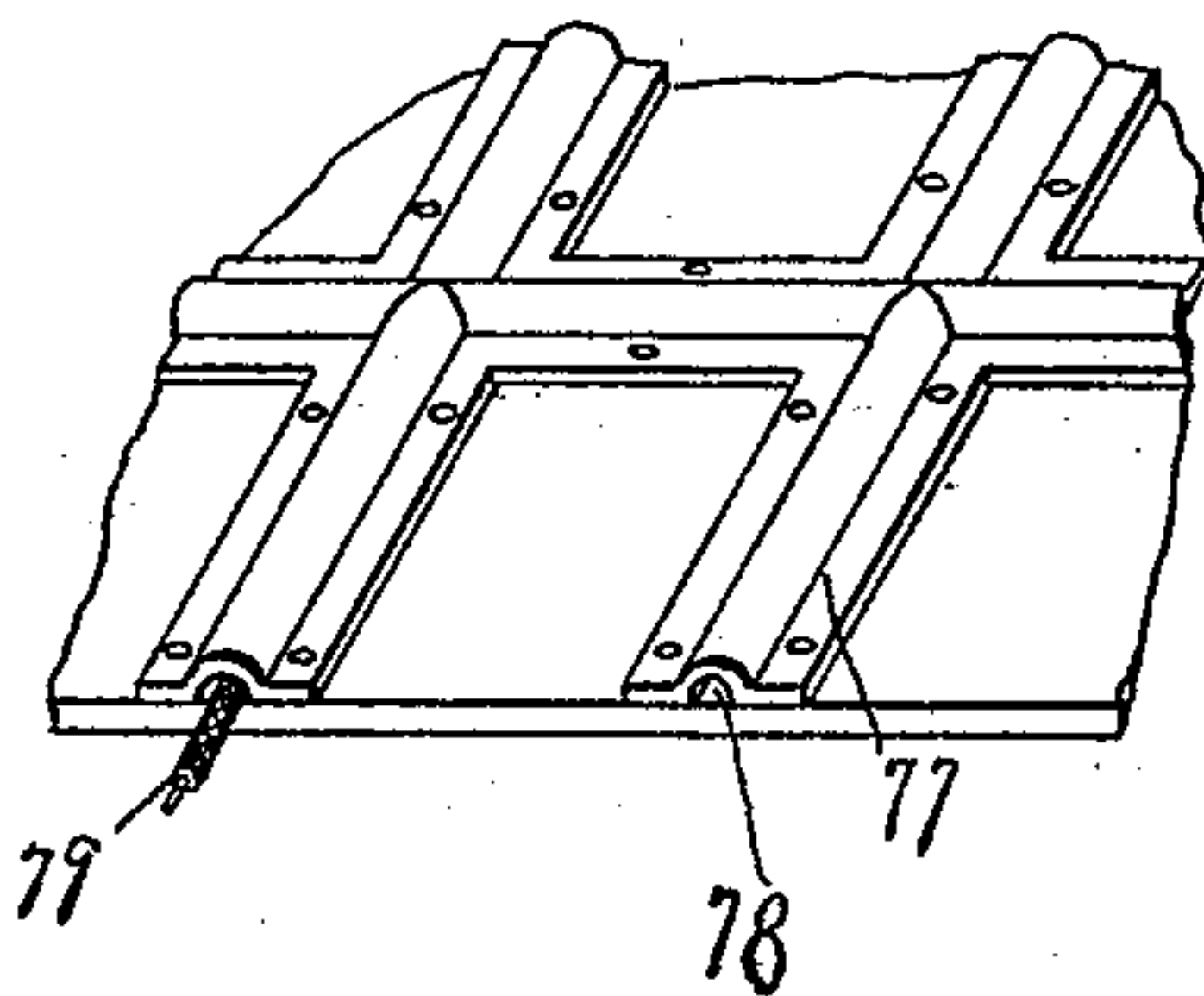
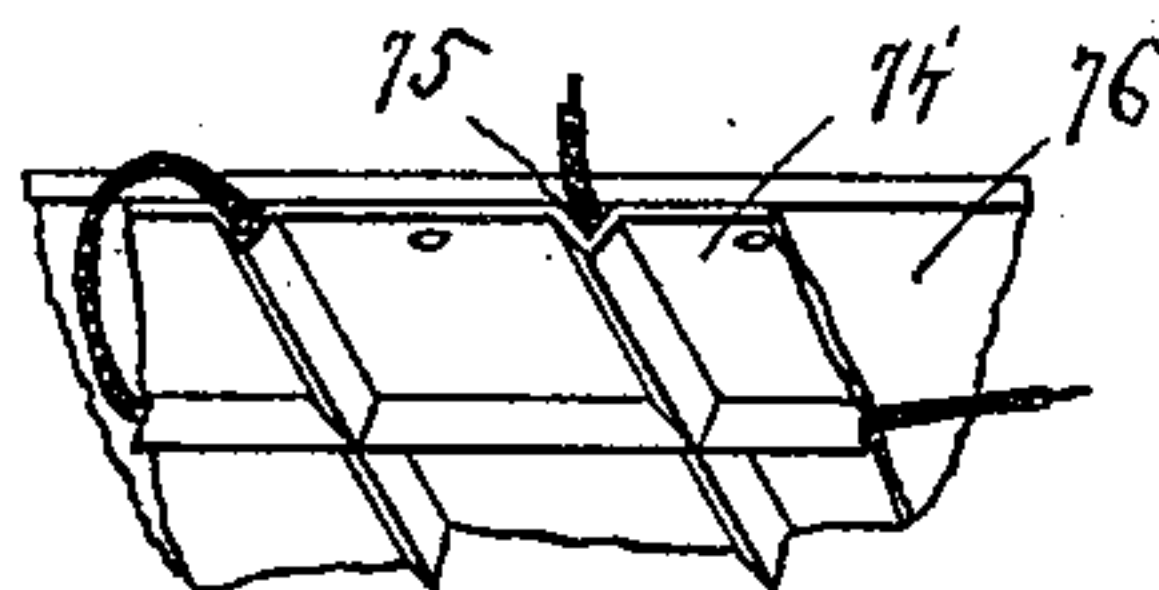


Fig. 19.



Witnesses
A. A. Eicks
Ed. E. Langan

Perley Hale.
Chas. H. Sparks, Inventors

By their Attorneys Higdon & Higdon

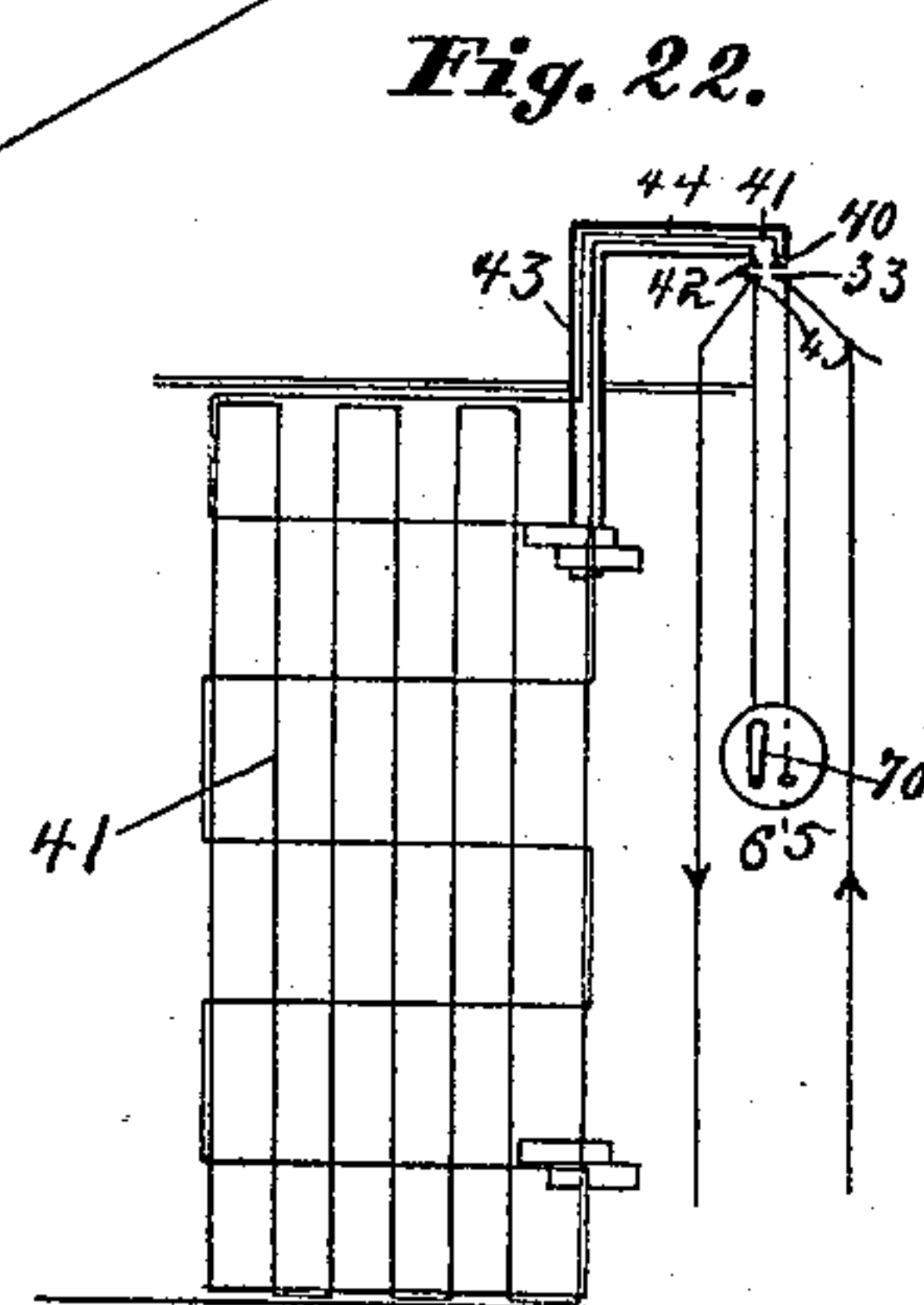
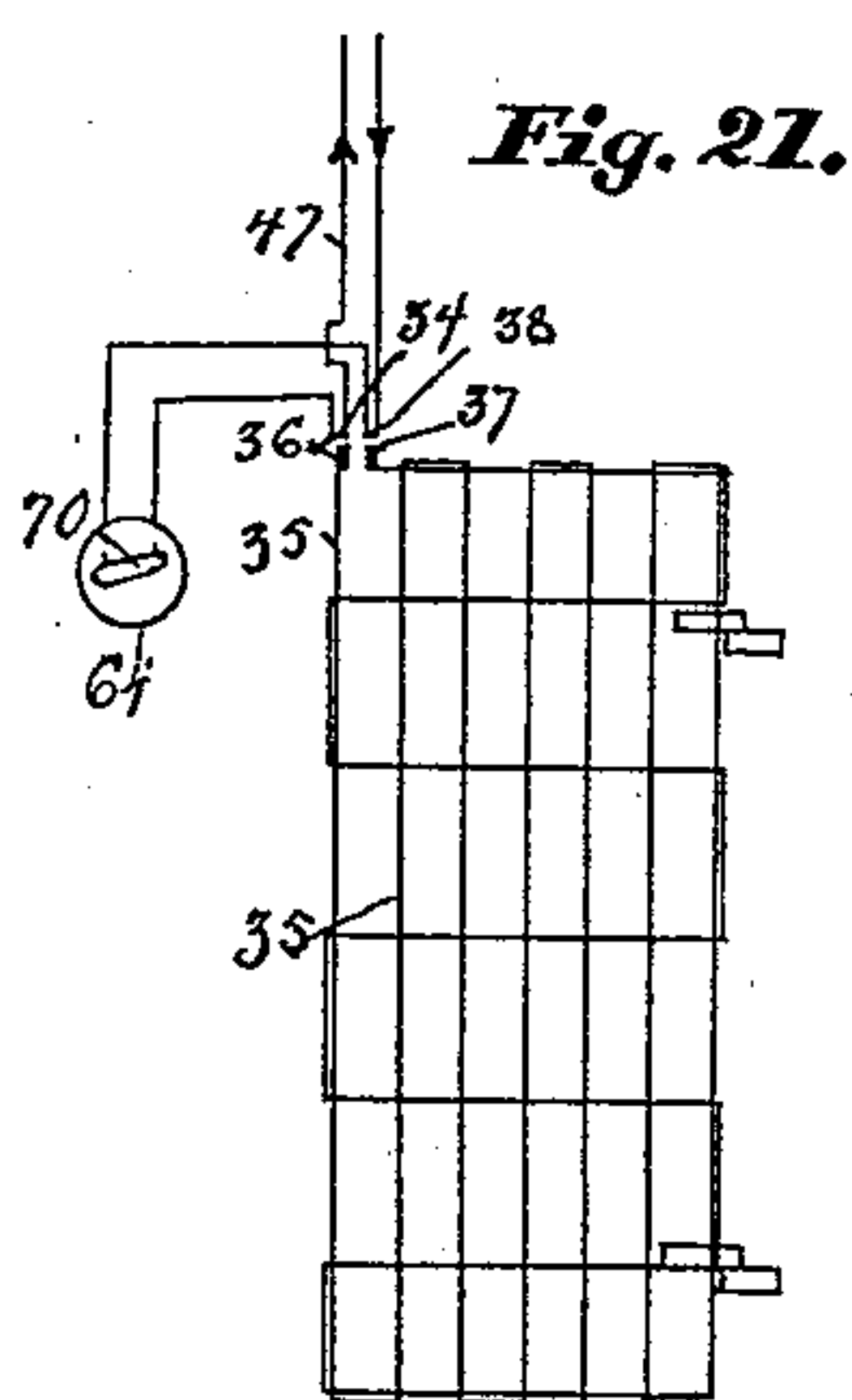
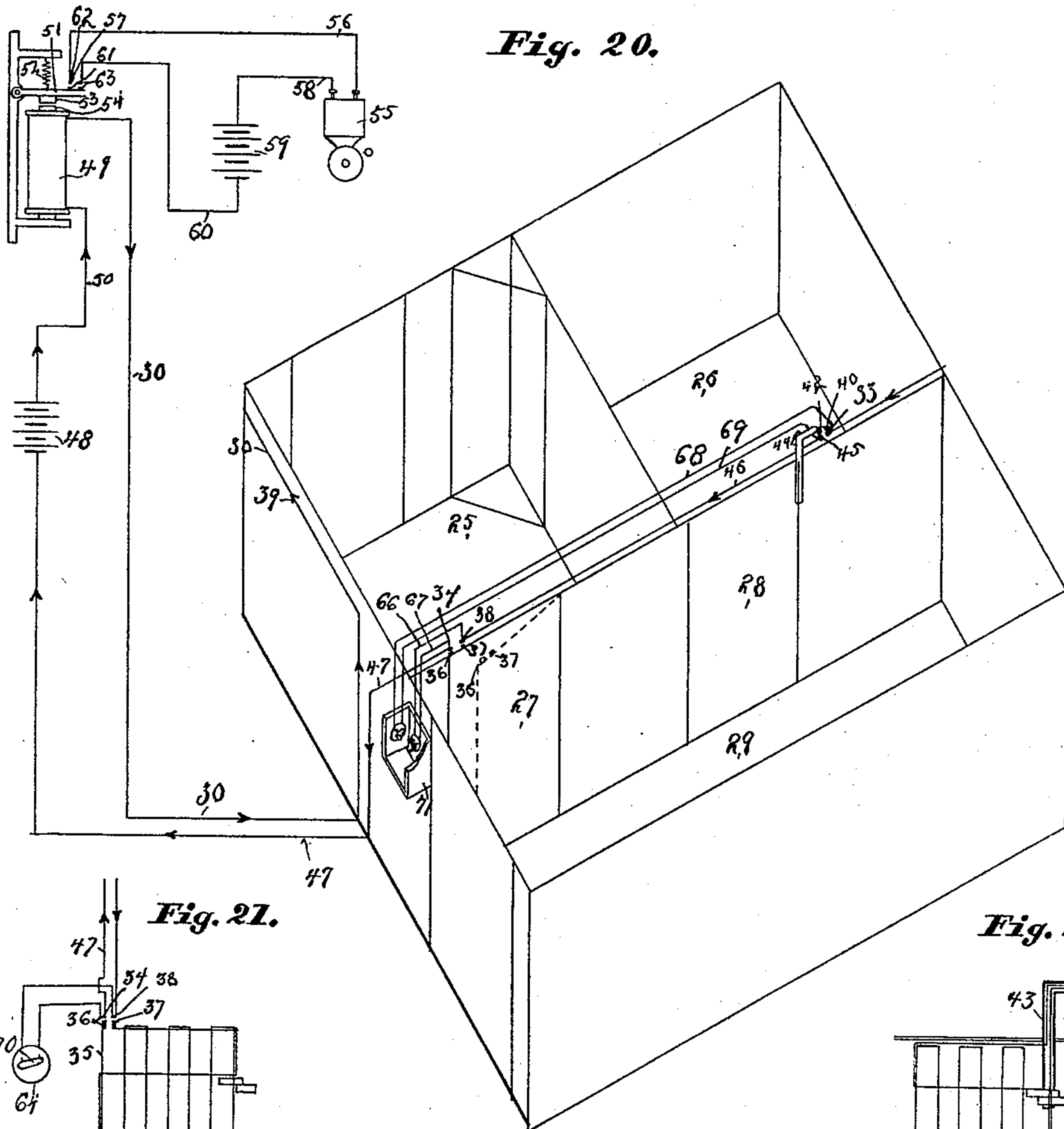
(No Model.)

3 Sheets—Sheet 3.

P. HALE & C. H. SPARKS.
ELECTRIC JAIL.

No. 477,301.

Patented June 21, 1892.



Witnesses
A. A. Eicks,
E. E. Langan.

Perley Hale,
Chas H. Sparks Inventors

By their Attorneys Higdon & Higdon

UNITED STATES PATENT OFFICE.

PERLEY HALE, OF CHICAGO, ILLINOIS, AND CHARLES H. SPARKS, OF ST. LOUIS, MISSOURI, ASSIGNORS, BY DIRECT AND MESNE ASSIGNMENTS, OF PART INTEREST TO WILLIAM S. HULL, OF SHEFFIELD, ALABAMA.

ELECTRIC JAIL.

SPECIFICATION forming part of Letters Patent No. 477,301, dated June 21, 1892.

Application filed September 7, 1891. Serial No. 405,016. (No model.)

To all whom it may concern:

Be it known that we, PERLEY HALE, of Chicago, in the county of Cook and State of Illinois, and CHARLES H. SPARKS, of St. Louis, Missouri, have invented certain new and useful Improvements in Electric Jails, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

Our invention relates to improvements in electric jails and electric-alarm mechanism for the same; and it consists in the novel arrangement and combination of parts, as will be more fully hereinafter described, and designated in the claims.

In the drawings, Figure 1 is a perspective view of the jail-grating, showing the electric wires traversing the same. Fig. 2 is a side elevation of one of the vertical grate-bars with parts broken away and a sectional view of one of the horizontal bars. Fig. 3 is a cross-section of one of the vertical grate-bars and electric wire passing through the same. Fig. 4 is a detail view of the key lock-bar with parts broken away. Fig. 5 is a cross-section of the lock-bar. Fig. 6 is a cross-section of the key-bar, showing the electric wire located in the V-shaped groove formed in the same. Fig. 7 is a cross-section of a modification of a horizontal bar, the same being tubular in cross-section, and showing an electric wire passing therethrough. Fig. 8 is a detail view of said tubular horizontal bar, showing recesses formed in the same. Fig. 9 is a detail view of a flat lock-bar or a modification of the lock-bar illustrated in Fig. 4. Fig. 10 is a cross-section of a further modification of a key-bar and also the flat lock-bar located in the groove thereof. Fig. 11 is a side elevation, with parts broken away, of a modification of the vertical grate-bar. Fig. 12 is a top plan view of the same. Fig. 13 is a cross-section of the key-bar, as illustrated in Fig. 6, and a modification of the lock-bar, taken through one of the perforations formed in said lock-bar and showing the electric wire interposed between the same. Fig. 14 is a detail view of a further modification of a lock-bar, showing the same provided with a perforation. Fig. 15 is a vertical section taken through the inter-

section of the vertical and horizontal tubular grate-bars. Fig. 16 is a side elevation of a modified tubular grating, preferably constructed of gas-pipes. Fig. 17 is a diagrammatical view of a net-work of electric wires conceived to traverse the sides, ceiling, bottom of a jail, a cell, or a corridor. Fig. 18 is a detail view of a modified form for the ceiling or floor of a jail, cell, or corridor, showing the electric wires traversing the same. Fig. 19 is a detail view of the ceiling or floor of a cell, jail, or corridor which we preferably use, showing a series or net-work of electric wires traversing the same. Fig. 20 is a diagrammatic view of the electric alarm mechanism, showing the same applied or in connection with the jail, or especially the doors thereof, and showing the manner of producing an alarm by the opening of the cell-door. In said figure two cells, two doors, and a corridor are shown. Fig. 21 is a diagrammatic view of a net-work of electric wires conceived to traverse a cell-door of any desired construction, and also an electric switch; and Fig. 22 is a diagrammatic view of a similar net-work of wires conceived to traverse a cell-door, showing an electrical connection formed from the rear part of the door or the portion of the door which is hinged to the cell-wall.

The object of our invention is to construct a certain form of jails adapted for the passage of electric wires through the same, and through the cells or corridors thereof, so devised that an alarm is produced whenever the prisoner cuts any aperture in the exterior walls of said jail or floor or ceiling of the same, in the cell-walls or floor or ceiling of the same, or in the corridor or doors initiatory for escaping. We also show, as will be more fully hereinafter described, an electric construction for cell-doors, wherein an alarm is produced by the opening of the door by any unauthorized person. We accomplish this object by passing an electric current either through the metallic construction of the cells, doors, or corridors, or, preferably and more feasibly, through a system of wires located in the metallic construction and having said metallic construction or system of wires in suitable electrical connection with an alarm mechanism.

ism and a source of electricity, and so devised that whenever the circuit is closed or broken an alarm is produced, thereby notifying the jailer that the prisoner is attempting to escape.

In the present specification we show an electric alarm mechanism for jails, whereby an alarm is produced when the circuit is broken. However, we may extend a similar principle of construction so as to produce an alarm when the circuit is closed.

We will first give an explanation of the mechanical construction of the cells, and in connection therewith the location of the electric wires which traverse the same.

Referring to the drawings, 1 indicates a series of vertical grate-bars, which are formed of heavy sheet metal, bent in U-section, as illustrated in Fig. 3, having a filling-plate 2 between the extreme ends of the U and extending throughout the entire length of the vertical bar 1 and projecting beyond the terminal ends thereof, as illustrated in Fig. 1. Said filling-plate 2 is secured in the vertical bar 1 by means of rivets 3 or in any other suitable and mechanical manner. The filling-plate 2 does not extend the full depth, but leaves a space or channel in the grooved side of the U-section for the passage of electric wires.

4 indicates a base-plate, which is secured to the floor 5 of the cell in any suitable and mechanical manner, and to said plate 4 the filling-plate 2 is secured in any suitable and mechanical manner; or, if necessary, both the vertical bars 1 and the filling-plates 2 may be secured to the base-plate 4. It may be noted in this connection that the upper ends of the vertical bars 1 and the filling-plates 2 may be similarly secured to the ceiling of the cell. We may, however, dispense with the base-plate 4 and secure the vertical bars 1 and filling-plates 2 directly to the bottom 5 or the ceiling of the cell, bearing in mind to leave a channel for the passage of electric wires. The base-plate 4 is provided on its lower surface with a substantially-U-shaped groove or channel 6 for the passage of the electric wires.

The horizontal grate-bars consist of two parts—viz., a lock-bar 7 of the construction as illustrated in Figs. 4 and 5, and a key-bar 8, as illustrated in Fig. 6. The key-bar 7 is provided with a longitudinal V-shaped groove extending throughout its entire length, and the lock-bar 7 is in cross-section a substantially-truncated sector of a circle and is provided with a series of depressions or recesses 9, in which the filling-plates 2 are adapted to fit. The vertical bars 1 are provided with a series of circular perforations 10, and the filling-plates 2 project in the same when in use, as illustrated in Fig. 2. By referring to Fig. 2, and especially to the cross-section of the key-bar and lock-bar, it can be readily perceived that when the lock-bar 7 is located in the V-shaped groove 11 of the key-bar a channel 12 is formed between the truncated base

of said lock-bar and the inner apexial surface of the V-shaped groove 11, and in said channel 12 the electric wires may be located, through which the electric circuit may pass through the series of horizontal wires of the grating. It can be deduced from the foregoing description that when the lock-bar is located in perforations 10 and the filling-plates 2 inserted in the recesses 9 of said lock-bar the same is prevented from any horizontal movement.

In Fig. 7 we show a tubular horizontal grate-bar with the electric wire located therein, and in Fig. 8 we show said tubular horizontal bars 13, provided with recesses 14, in which the filling-plates 2 are adapted to snugly fit, and consequently prevent any horizontal movement of said tubular horizontal bars.

In Fig. 9 we show a modification of a lock-bar 15, the same being rectangular in cross-section and provided with a series of recesses 16, in which the filling-plates 2 may be inserted.

In connection with modified lock-bar 15 we employ a modified form of key-bar 17, the same being provided with a deepened U-shaped groove 18, of greater depth than the width of the lock-bar 15, so as to permit the insertion of an electric wire between the same.

In Fig. 11 we show a modified form of the vertical grate-bars 1, wherein the perforations 10, formed therein, have tongues 19 projecting from their surfaces. In connection with said vertical bar we use a filling-plate 20, the same being provided with coinciding perforations similar to the perforations 10, formed in the vertical bars, and also with coinciding tongues similar to the tongues 19, projecting from the surfaces of perforations 10.

In connection with the vertical bar and filling-plate 20, illustrated in Fig. 11, we employ the same key-bar as illustrated in Fig. 6 and a modified construction of the lock-bar illustrated in Fig. 14, wherein said lock-bar is provided with a series of perforations 21, in which the tongues 19 are adapted to fit.

Fig. 13 illustrates, or more specifically is, a cross-section of the key-bar as illustrated in Fig. 6 and the lock-bar as illustrated in Fig. 14, the said section being taken through perforation 21, and also shows an electric wire located between the apexial inner surface of the V-shaped groove 11 of the key-bar and the truncated surface of the lock-bar.

Fig. 12 is a top plan view of the construction as illustrated and described in Fig. 11.

In Fig. 16 we show a modified tubular grating, which is preferably constructed of gas-pipes, and Fig. 15 is a sectional view showing the manner of connecting the vertical and horizontal tubular grate-bars, and also shows electric wires passing through the same and crossing each other. In this construction of grating we pass the electric wires directly through the bores of the tubular grate-bars.

Having given a description of the mechani-

cal construction of the cell-gratings, we will now proceed to describe in consecutive order, first, the electrical appliances, which produce an alarm when the cell-door is opened by any one except an authorized party, referring to Figs. 20, 21, and 22, which are diametrical views, for illustration.

25 and 26 are outline views of cells. 27 and 28 are their appropriate doors, respectively, the door 27 being open, as shown in dotted lines. It can be readily perceived by referring to Fig. 20 that the views are only outlined, as the mechanical construction of the doors is immaterial to the understanding of the invention, said construction being of the bar form shown and described herein.

29 indicates an outline view of the jail-corridor, which is adjacent to cells 25 and 26.

In order to fully comprehend the diagrammatic view and the electric construction, as illustrated in Fig. 20, it is necessary to refer to Fig. 17, which is a diagrammatic view of electric wires which traverse, or, rather, are conceived to traverse, the walls, ceiling, and floor of a jail, cell, or corridor. Wire 30 traverses the remaining two sides, as illustrated in Fig. 17, and bottom of the cell, and connects with wire 47, thus forming a complete circuit around the walls, ceiling, and bottom of the cell. The direction of the current is illustrated by arrows 32.

We will now refer to Fig. 20. The wires 30 and 47 traverse the cells outlined in Fig. 20 similarly to the diagrammatic view illustrated in Fig. 17, and wire 30 is connected to a metallic contact-point 33, located above and to the right of door 28 in Fig. 20. Wire 47 is connected to a metallic contact 34, located above door 27.

Figs. 21 and 22 are diagrammatic views of the electric wires which traverse, respectively, doors 27 and 28. 35 indicates an electric wire, which passes vertically upwardly and downwardly and alternately in door 27, and also traverses the same door in a similar manner across the same, and one end of said wire is connected to metallic contact-piece 36 and the opposite end to metallic contact-piece 37. Metallic contact-piece 36 comes in contact with metallic contact-piece 34 when door 27 is closed, and metallic contact-piece 37 comes in contact with metallic contact-piece 38, also when door 27 is closed. You will first, in order to trace the current, conceive door 27 to be closed and the contact-points 38 and 37 in electrical contact and the contact-pieces 34 and 36 also in electrical contact. The current will then pass through wire 30 in direction of the arrow 39 into the metallic contact-piece 33, which is in electrical contact with the metallic contact-piece 40 when door 28 is closed. The current from metallic contact-piece 40 passes into wire 41. (One end of said wire 41 is connected to metallic contact-piece 40, and the opposite end of said wire 41 is connected to a metallic contact-piece 42.)

The terminal portions of wire 41 are located in a pipe 43, which is secured to door 28 in any suitable and mechanical manner and is movable therewith. Said pipe 43 is provided with a horizontal arm 44. Metallic pieces 33 and 40 are in electrical contact when the door 28 is closed, and metallic contact-piece 42 is also in electrical contact with a metallic contact-piece 45 when door 28 is closed. The wire 41 traverses the door 28 horizontally and vertically across the same, as illustrated in Fig. 22. The current then passes through wire 41 into metallic contact 42, and from metallic contact-piece 42 it goes into metallic contact-piece 45, and from metallic contact-piece 45 it goes or passes through wire 46, and from wire 46 it goes into metallic contact-piece 38, thence into metallic contact-piece 37, thence through wire 35, which traverses door 27, thence into contact-piece 36, then through wire 47, one end of which is connected to metallic contact-piece 34 and the opposite end thereof is connected to the negative pole of battery 48. The positive pole of battery 48 is connected to one end of the wire of the electro-magnet 49 by means of a wire 50 and the opposite end of said electro-magnet wire is connected to wire 30. Pivotaly mounted above said electro-magnet 49 is a pivoted armature 51, which is elevated by means of a spring 52. Said armature 51 is provided on its under surface with a lug 53, which is adapted to come in contact with the core 54 of the electro-magnet.

55 indicates an alarm-bell of ordinary construction, one pole of which is connected to one end of a wire 56 and the opposite end of said wire 56 is connected to a metallic contact-point 57. The other pole of said bell 55 is connected to one end of a wire 58 and the opposite end of said wire 58 is connected to the positive pole of the battery 59. The negative pole of said battery 59 is connected to one end of a wire 60 and the opposite end of said wire is connected to a metallic contact-piece 61. The upper surface of the armature 51 is provided with lugs 62 and 63, which are adapted to come in contact, respectively, with the contact-pieces 57 and 61. It can be readily perceived from this construction that while the current is passing through the electro-magnet 49 the alarm-bell circuit will be broken; but when no current passes through the electro-magnet 49 the armature 51 will be released and pulled upwardly by spring 52 and complete a circuit through the alarm-bell circuit, and consequently the alarm will be made. It may be noted in this connection that the electro-magnet 49 and the alarm-bell 55 and the electrical connections between the same may be located at any suitable distance from the cells. It may also be noted in this connection that whenever any of the bars which traverse the cell-walls or doors, ceiling, or bottom of the cell, which are in connection with wires 30 and 47, are severed by the prisoner

the current which passes through the electro-magnet 49 will be broken, the armature 51 released, and an alarm produced.

We will now proceed to describe the manner of breaking the circuit when door 28 is opened. The contact-pieces 40 and 33 are normally in electrical contact when door 28 is closed, and also the contact-pieces 42 and 45 are normally in electrical contact when said door is closed. The contact-pieces 40 and 42 are carried by the horizontal arm 44 of the pipe 43. When the door 28 is opened outwardly from the cell 26, the arm 44 will pass inwardly in the direction of cell 26, and consequently contact-pieces 40 and 42 will be removed from contact-pieces 33 and 35 and the circuit broken.

64 and 65 are switches, which are employed for shunting or cutting the circuit out of the doors 27 and 28 when an authorized person desires to open the same, thus preventing an alarm when the doors are opened by an authorized person. The poles of switch 64 are in electrical connection with the contact-pieces 38 and 34 through wires 66 and 67, and the poles of switch 65 are in electrical connection with the contact-pieces 40 and 42 through wires 68 and 69, and by the proper manipulation or turning of the switch-lever 70 of said switches the current which passes through doors 27 and 28 may be shunted or cut out of said doors when an authorized person desires to open the same. The switches 64 and 65 are securely contained in a metallic lock-box 71 and are rendered only accessible to the jailor or some authorized person.

We prefer to construct the ceiling and floor of the cells or corridors in the manner as illustrated in Fig. 19 and a modification as illustrated in Fig. 18, wherein we employ a covering-plate 74, provided with a series of depressions or corrugations 75, in which the electric wires are located, and cross each other at the points where the corrugations intersect. Said plate 74 is secured in any suitable and mechanical manner to a smooth plate 76, which answers as the floor of the cell or corridor or may answer as a ceiling.

In Fig. 18 we show a modification wherein we secure a series of covering-cleats 77, provided with corrugations or crevices 78, to the floor or ceiling of the cell or corridor, and in said crevices or corrugations the electric wires 79 may be located. By this construction it can be readily perceived that the floor and ceiling of the cells or corridor are completely protected by a net-work of wires traversing the same.

We desire it understood that whenever we employ the word "pipes" in the claims we have reference to all the forms of grate-bars herein described, whether applied to the construction shown in Figs. 1 to 16, inclusive, or to the doors shown in Figs. 21 and 22.

We do not herein claim a lattice for jails and the like comprising pipes, insulated conductors forming a circuit passing through

said pipes, and a battery and alarm included in the circuit, as that is claimed, broadly and specifically, in a division of this application filed by Perley Hale on the 14th day of March, 1892, Serial No. 424,736.

Having fully described our invention, what we claim is—

1. A cell having vertical and horizontal grate-bars forming a cell-grating and provided with channels for the passage of electric wires, a ceiling and a floor provided with crevices or corrugations for the reception of the electric wires, a door carrying electric contact-points, electric wires traversing said cell grating, ceiling, and floor and adapted to be brought in contact with the contact-points carried by the cell-door, an electric wire traversing the said cell-door and in electrical connection with said contact-point carried by the same, an electric switch for throwing the wire traversing the door out of circuit, a battery, an electro-magnet provided with an armature, an alarm mechanism and battery for actuating the same, and suitable electrical connection between the wires which traverse the cell walls, floor, and ceiling, and the electro-magnet, battery, and alarm mechanism, substantially as set forth.

2. An inclosure having its sides, floor, and ceiling and doors provided with crevices or corrugations for the insertion of electric wires, the said door carrying electric contact-points, electric wires traversing said walls, ceiling, floor, and door and adapted to be thrown in electrical continuity with the contact-points carried by said door, an electric wire traversing said door and in electrical connection with said contact-points carried by the same, an electric switch for throwing the wires traversing the door out of circuit, a source of electricity, an electro-magnet provided with an armature, an alarm mechanism and battery for actuating the same, and suitable electrical connections between the wires which traverse said inclosure, the electro-magnet, battery, and alarm mechanism, substantially as set forth.

3. A metallic grating consisting of vertical bars 1, U-shaped in cross-section and provided with a series of perforations, filling-plates 2, secured in said vertical bars and projecting within said perforations, tubular horizontal bars provided with recesses in which said filling-plates are adapted to fit, a ceiling and floor for said cell, composed of plates, such as 74, provided with crevices 75 and a plate 76, secured to said plate 74, electric wires passing through said vertical bars, horizontal bars, and traversing said ceiling and floor, an electro-magnet, a source of electricity, an alarm mechanism, and a source of electricity for actuating the same, and suitable electrical connections between said circuit-wires which traverse the cell, the electro-magnet, and alarm mechanism, substantially as set forth.

4. A cell having vertical and horizontal grate-bars forming a cell-grating and provided

with channels for the passage of insulated electrical conductors, a ceiling and floor composed of plates, insulated electric conductors interposed between said plates, an alarm mechanism, and suitable electric connections, substantially as set forth.

5. An inclosure having vertical and horizontal grate-bars forming a grating provided with channels for the passage of insulated conductors, a ceiling and floor composed of plates, insulated conductors interposed between said plates, a door carrying electric contact-points, insulated conductors traversing said grating, ceiling, and floor and adapted to be brought in electrical continuity with the contact-points carried by the said door, an insulated conductor traversing the said door and in electrical connection with said contact-points carried by the same, an electric switch for throwing the wire traversing the door out of circuit, a battery, an electro-magnet provided with an armature, an alarm mechanism and battery for actuating the same, and suitable electric connections between the wires which traverse the inclosure, walls, floor, and ceiling, and the electric magnet, and alarm mechanism, substantially as set forth.

6. A cell having vertical and horizontal grate-bars forming a cell-grating and provided with channels for the passage of electric wires, a ceiling and floor composed of plates, electric wires interposed between said plates, a door carrying electric contact-points, electric wires traversing said cell grating, ceiling, and floor and adapted to be brought in contact with the contact-points carried by the cell-door, an electric wire traversing the said cell-door and in electrical connection with the said contact-points carried by the same, an electric switch for throwing the wire traversing the door out of circuit, a battery, an electric magnet provided with an armature, an alarm mechanism and battery for actuating the same, and suitable electrical connections between the wires which traverse the cell walls, floor, and ceiling,

and the electro-magnet, battery, and alarm mechanism, substantially as set forth.

7. An inclosure having its sides, floor, ceiling, and doors embodying plates, electric wires interposed between said plates, the said door carrying electric contact-points, electric wires traversing said walls, ceiling, floor, and door and adapted to be thrown into electrical continuity with the contact-points carried by said door, an electric wire traversing said door and in electrical connection with the said contact-points carried by the same, an electric switch for throwing the wire traversing the door out of circuit, a source of electricity, an electro-magnet provided with an armature, an alarm mechanism and battery for actuating the same, and suitable electrical connections between the wires which traverse said inclosure, the electro-magnet, battery, and alarm mechanism, substantially as set forth.

8. A metallic grating consisting of vertical bars 1, U-shaped in cross-section and provided with a series of perforations, filling-plates 2, secured in said vertical bars and projecting within said perforations, tubular horizontal bars provided with recesses in which said filling-plates are adapted to fit, a ceiling and floor for said cell, composed of plates, electric wires passing through said vertical bars, horizontal bars, and traversing said ceiling and floor, interposed between the plate thereof, an electro-magnet, a source of electricity, an alarm mechanism and a source of electricity for actuating the same, and suitable electrical connections between said circuit-wires which traverse the cell, the electro-magnet, and alarm mechanism, substantially as set forth.

In testimony whereof we affix our signatures in presence of two witnesses.

PERLEY HALE.

CHARLES H. SPARKS.

Witnesses:

BENJ. J. KLENE,

ED. E. LONGAN.