

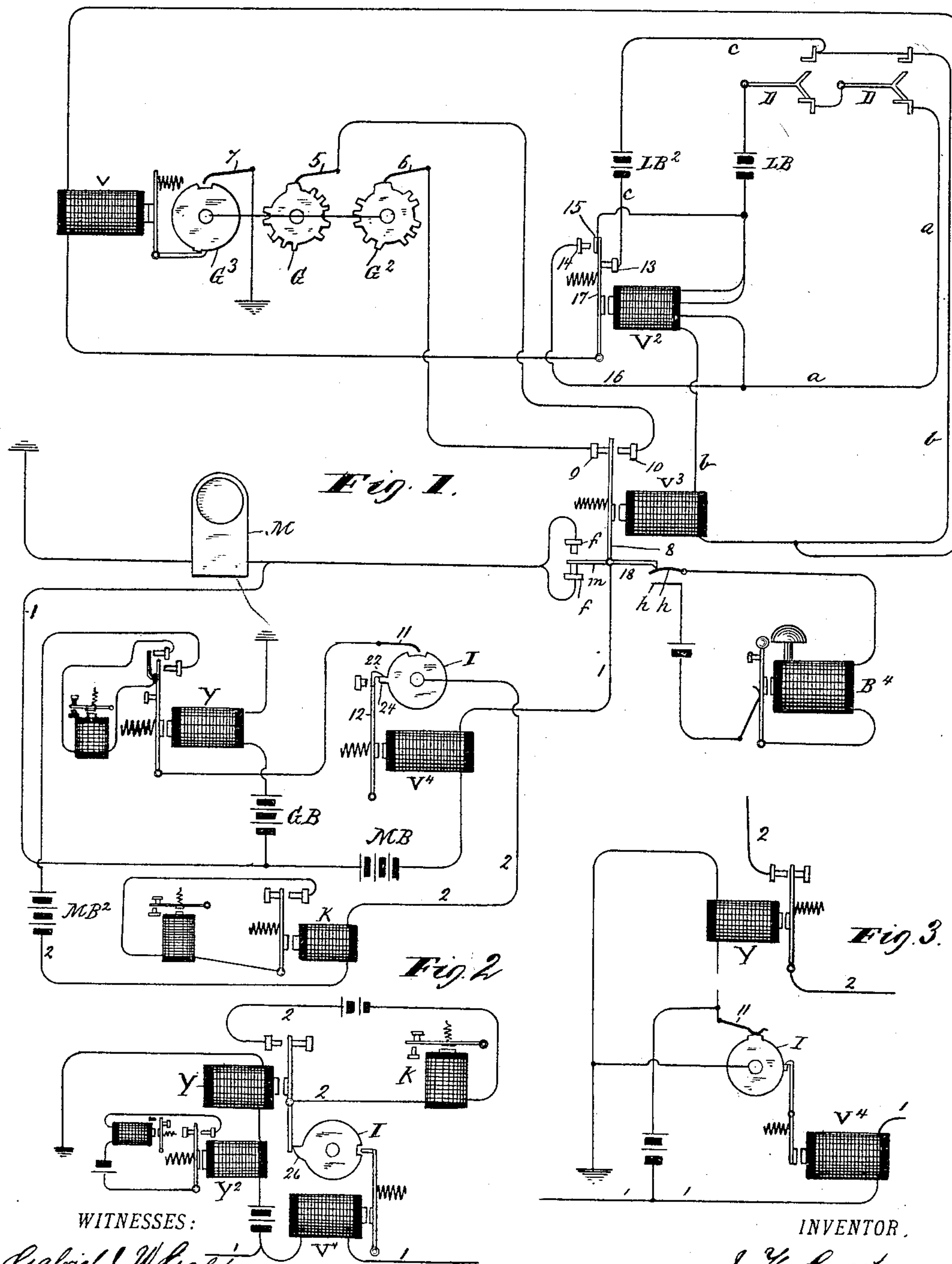
(No Model.)

2 Sheets—Sheet 1.

J. H. GUEST.
AUTOMATIC FIRE TELEGRAPH.

No. 388,358.

Patented Aug. 21, 1888.



WITNESSES:

Gabriel J. W. Galster
Wm. H. Cape

INVENTOR.

J. H. Guest.

BY

Townsend & MacArthur.

ATTORNEYS.

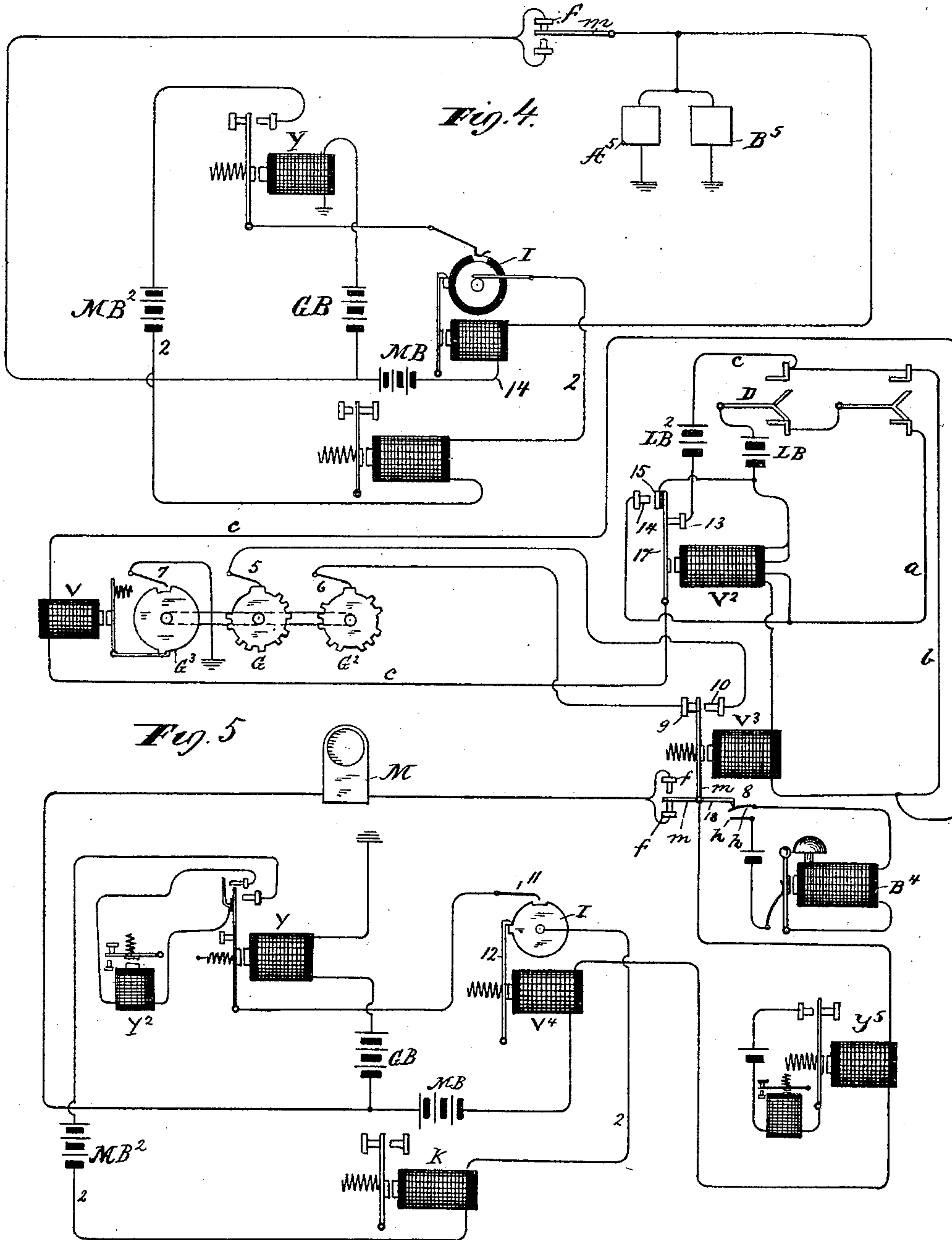
(No Model.)

2 Sheets—Sheet 2.

J. H. GUEST.
AUTOMATIC FIRE TELEGRAPH.

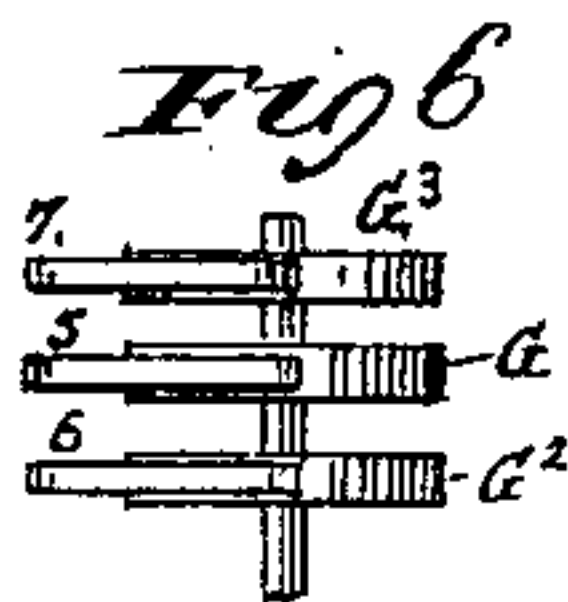
No. 388,358.

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WITNESSES:

Gabriel J. W. Galster.
John H. Cabel.



INVENTOR,

J. H. Guest.

BY

Turnsund & MacArthur.

ATTORNEYS.

UNITED STATES PATENT OFFICE.

JOHN H. GUEST, OF BROOKLYN, NEW YORK.

AUTOMATIC FIRE-TELEGRAPH.

SPECIFICATION forming part of Letters Patent No. 388,358, dated August 21, 1888.

Application filed October 27, 1887. Serial No. 253,505. (No model.)

To all whom it may concern:

Be it known that I, JOHN H. GUEST, a citizen of the United States, and a resident of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Automatic Fire-Telegraphs, of which the following is a specification.

My invention relates to telegraph circuits or systems in which signals of different character or having a different signification are transmitted over the same general circuit and received on the same or different apparatus located at one or more different points and connected also with said circuit.

The object of my invention is to provide a simple and effective arrangement or combination of circuits and apparatus wherein the receiving apparatus for responding to signals of a given character or significance may be rendered automatically irresponsive to signals of another character or significance.

My invention is designed more particularly for application to systems wherein one class of signals is received upon a relay employed for relaying said signals to a second circuit; and it is designed that such signals only may be relayed, the signals of other character or significance, although passing over a circuit including said relay, being ineffective to effect the second circuit through the action of devices which shall control the operative condition of the relay, as will be hereinafter more particularly described.

My invention is especially applicable to a system in which signals indicating the existence and location of fire are transmitted from automatically released or controlled signal mechanisms or otherwise over the same circuit with ordinary calls or messages—such, for instance, as those from an ordinary district-telegraph box—or with other signals—such as burglar-alarm signals—sent by automatically released or controlled mechanism in the ordinary way, or with special signals indicating the derangement of the local circuits containing the thermostats.

My invention provides a means whereby the automatically-produced fire-alarm signal may be automatically relayed to the circuit of a city fire-department or insurance fire-patrol, the remaining signals being, however, received in the ordinary way without being so relayed.

My invention consists, essentially, in the combination, with the main circuit having the transmitting and receiving apparatus for the two classes of signals included in branches from said circuit, of a magnet in the main circuit controlling the operative condition of the receiving apparatus, and a circuit-controller, also in the main circuit, for governing the action of said magnet.

The apparatus on which the signals are received may be normally out of condition for properly responding to the signals, in which case the circuit-controller on the main circuit will be operated automatically or otherwise at or just before the operation of the signal mechanism whose signal is to be read or relayed at the office; or the receiving apparatus may stand normally in condition to respond to the signal, in which case the circuit-controller will remain quiescent at the time that the signal is sent and will be operated at or just before the transmission of any signal which it is desired should not affect said receiving apparatus or should not be relayed.

In the present case I have shown a circuit-controller as coming automatically into action at the time of the transmission of the signal which is to be relayed, said controller serving by its momentary action on the main-line circuit to change the condition of the controlling-magnet in said circuit, and thereby to throw the relay apparatus into operative condition for relaying such signal.

The main-line magnet may control the operative condition of the relay either mechanically or electrically—that is to say, when operating mechanically it may hold or lock some portion of the relay apparatus, or when operating electrically it may break or close the circuit onto which the signals are to be relayed, or may shunt or interrupt the flow of current flowing to the relay-magnet.

Various devices for governing the operative condition of an apparatus on an electrical circuit have been hitherto employed by electrical engineers, and I do not deem it necessary to describe in detail all the various devices that might be employed, inasmuch as my invention does not consist in these details of construction, but in the general combinations of apparatus, as hereinafter claimed.

The circuit-controller on the main line

which governs the operation of the controlling-magnet may act momentarily to change the condition of said line in any desired manner known in the art.

5 In the accompanying drawings, Figure 1 is a diagram of circuits and apparatus embodying my invention. Figs. 2 and 3 illustrate modifications in the manner of controlling the operative condition of the receiving apparatus. Fig. 4 illustrates a modifica-
10 tion of the invention in which the receiving apparatus is normally in condition to respond, thus requiring the operation of the controller-magnet on the transmission of a signal which is not to be relayed, this being the converse
15 arrangement of that shown in Fig. 1. Fig. 5 illustrates a modification in the manner of connecting ordinary district-telegraph apparatus with the main telegraph-circuit when
20 the latter is employed also for sending signals from automatic mechanism indicating fire or burglary, and also the arrangement of thermostat or burglar-alarm circuit-controller circuits. Fig. 6 is a plan of a portion of the
25 mechanism shown in Fig. 1.

In Fig. 1 I have shown the application of my invention to an arrangement of local circuits and apparatus such as is described in a prior application for patent filed by me March
30 21, 1887, Serial No. 231,678, wherein a number of thermostats are employed in a building to be protected from fire, and are connected with devices for transmitting a signal to a distant point to indicate the existence of fire and
35 location of the building threatened.

In the prior application referred to I have also provided a special-signal device which shall come into action automatically on a derangement of the circuits in the building—
40 such, for instance, as the accidental breaking or closing of a circuit-wire, the failure of a battery, or a crossing of the thermostat-circuits—such special signal being transmitted automatically by a wheel properly cut to send a
45 signal indicating derangement and the location of the derangement to the central office.

G indicates the wheel which sends a signal indicating fire, and G^2 the special-signal wheel, which wheels are in a branch or ground con-
50 nection from the main or all-round metallic circuit 1, leading to the central office and there connected with a receiving-instrument of any kind.

The receiving-instrument is here typified by
55 an electro-magnet, Y, acting as a relay for the transmission of signals to a second circuit, 2. If desired, the relay Y may operate upon a local circuit of a recorder in a manner well known in the art; or other instruments might
60 be employed for receiving the signals locally at the station at which the relay Y is placed, whether such signals come from one or the other of the wheels, G or G^2 . It is with reference, however, to the action of the receiving apparatus in relaying the signal to the
65 circuit 2 that my invention is organized, and its operative condition in such action is deter-

mined by the action of the magnet in the main circuit 1, as will be described.

The main circuit 1 includes at any point a
70 battery or other generator of electricity, M B, and the ground or branch at the central office containing the receiving-instrument Y includes another battery, G B. The branch con-
75 taining the wheels G G^2 is normally open, as indicated, the circuit being carried at such point through a spring, 7, which normally rests over an insulating-space on the wheel G^3 ,
80 connected to or moving with the wheels G G^2 . All three wheels are, for the sake of convenience, placed upon the same shaft, driven by a spring or other motive power, and normally
85 locked from movement by a lever or detent governed by an electro-magnet, V. A plan of the wheels as mounted on the same shaft is shown in Fig. 6. Ordinary contact-springs for
the transmitting-wheels G G^2 are indicated at 5 6, respectively.

The electro-magnet V comes into action to re-
90 lease the wheels on the occurrence either of fire or of any derangement, and the character of the signal sent over the circuit 1 is determined by a second magnet, V^3 , whose armature-lever
8 moves between the two contact-stops 9 10, as indicated—one connected to the contact-spring
95 of wheel G^2 and the other to that of wheel G.

The ground-connection is through the armature-lever and stops, as indicated, so that when
100 the magnet V^3 is unexcited the wheel G^2 will be in the ground-circuit, while, when the magnet draws up its armature, wheel G^2 will be thrown out and wheel G will be thrown into
105 circuit. When, therefore, the magnet V^3 is excited at the same time that the wheels are released by the operation of the retractor acting on the armature for magnet V, the signal
will be sent in by the wheel G. If, however, the magnet V^3 should remain unexcited, the
special signal will be sent in by wheel G^2 .

Connected with the magnet V^3 so as to act
110 at the same time that the fire-alarm signal comes in from wheel G is a circuit closing and breaking arm, m, which moves between two
contacts or stops, f f, which with the arm are in the metallic circuit 1. When the armature-
115 lever of V^3 is against its back stop, the circuit 1 is closed through the lower stop f; but when the magnet is excited the metallic circuit 1 is first broken and then closed and remains closed
while the armature-lever of V^3 is drawn up. 120

By means of the arm m a momentary change
is produced in the circuit 1 suitable for affecting a magnet, V^4 , which is placed in the
125 main circuit 1 at any desired point, and the position of whose armature-lever 12 controls the operative condition of the apparatus for relaying a signal to the circuit 2. For
this purpose, the circuit 2 is governed by a circuit-controller placed in the relay-circuit
130 and consisting of a circuit closing and breaking wheel, I, of any suitable character and driven by any suitable power, which wheel is normally held from rotation by the armature-lever 12 of magnet V^4 . For this purpose, the

armature-lever is provided with a hook, 22, engaging with a projection, 24, from the wheel. The circuit 2 is carried through the hub of the wheel and through a spring, 11, adapted to make contact therewith in obvious fashion.

In the present instance the parts are arranged so that the spring 11 will normally rest over an insulating-space in the wheel, thereby holding the circuit 2 broken, so that the magnet Y, though its armature-lever may move, will be ineffective in relaying its signal.

The hook 22 is so arranged that the magnet V^1 requires to be excited in order to hold the wheel from rotation; but if the magnet loses its normal power through a momentary change of tension on the line 1, produced by the operation of the circuit-controller m , the armature-lever 12 will be drawn back by its retractor, thus releasing the wheel I, which is to be driven at a speed suitable for keeping the circuit closed during the reception of the signal on the instrument Y.

The circuit 2 is the circuit of a city fire department or of an insurance fire-patrol, and includes at one or more points instruments K, on which fire-alarm signals may be received.

M B² indicate the battery for said circuit 2. The magnet Y is obviously responsive to any makes and breaks of a branch circuit connected to the line 1—as, for instance, by the operation of either wheel G G²—when the ground branch is properly closed by the wheel G³. When the wheel is released and allowed to turn under the action of any suitable driving-power, the metallic circuit 2 is closed at wheel I, and during such closure any signals received on relay Y will be relayed onto circuit 2. The movement of wheel I should be so adjusted that it will close the circuit 2 during the time occupied in sending the two or more times repeated fire-alarm signal from wheel G.

At M is indicated, in a ground connection from metallic circuit 1, an ordinary district-telegraph box, which in this case should be properly constructed to normally keep its ground-connection open.

The signal-wheels G G² are constructed to send in their signal a large number of times, so that there shall be no practical interference from the operation of the district-telegraph box M.

One or more devices M G G² may be connected to the circuit.

The operation of the apparatus, so far as described, would be as follows: Normally the main circuit 1 is closed and the wheel I is held from movement by the electro-magnet V^1 . The ground-circuits at M G G² are open, as indicated, and the wheel G² is in the connection from the line through the back stop 9 of the armature-lever 8 of V^3 . The circuit 2 is broken at I. If now a signal be sent in from wheel G² or from box M, such signal will be received on the instrument Y, indicated in the ground-connection with battery G B, but will not be relayed, because the circuit-controller

at $f f m$ has not been operated, and therefore the magnet V^1 is not affected, and wheel I therefore remains in position to keep the circuit 2 open. If, however, the wheels G G² should be released and the magnet V^3 should at the same time operate its armature-lever so as by front stop, 10, to throw in the wheel G, whose signal is to be relayed to the circuit 2, the circuit-controller governing the metallic circuit will first break and then make such circuit, with the effect of allowing the armature-lever of V^1 to drop back for an instant and release the wheel I. The effect of these actions is to close the circuit 2 at wheel I, so that the signal coming in from wheel G over the now completed metallic circuit and ground, including relay Y, will be retransmitted by means of said relay onto the circuit 2. When the wheel I completes the movement, it will be stopped by the armature-lever of relay V^1 , and the circuit 2 will be broken, so that a following signal from box M or from wheel G², which signals are unattended by any action of the magnet V^1 , will be received in the proper manner on any instrument or instruments—such as magnet Y—indicated in the ground branch, but will not be relayed to circuit 2, because such circuit remains broken at the wheel I.

Any arrangement of circuits or apparatus may be employed for bringing into operation the wheels G G², and for effecting an action of the circuit-controller which governs magnet V^1 when the signal is transmitted from wheel G.

I do not limit myself to operating the circuit-controller m in the main circuit by electro-magnetism, inasmuch as it is obvious that the action of the same upon the circuits would be identical whatever the operating power. The said circuit-controller might even be operated manually.

The operation of magnet V^3 and of magnet V in the manner already described is brought about by the following arrangement of devices, which form the subject of a prior invention set out in my aforesaid application.

D D are thermostats of any suitable kind, adapted to normally close one branch or circuit, a , leading from a battery, L B, and when operated break said branch and close another branch or circuit, b , leading from the same or another battery and including the electro-magnet V^3 . The thermostats are preferably constructed to work in the manner described in my prior patent, No. 193,650. The two branches $a b$ include oppositely-wound coils of an electro-magnet, V^2 , which is normally excited by the current on the branch a , and holds up its armature so as to keep a circuit closed which is formed by a wire, c , connected to the branch b , as indicated, and including the front contact-stop, 13, of the armature-lever 17 for V^2 and the coils of the electro-magnet V. When, through the movement of a thermostat from one to another of its contacts, the magnet V^2 momentarily loses its power, the circuit c is broken by the falling away of the

armature-lever, and the electro-magnet V loses its power and thus releases the wheels $G^1 G^2$. The same effect would be produced, obviously, by a break in the wire b at any point between the points of connection of the circuit c . The magnet V^2 would also lose its power and cause an operation of the signal-wheels $G^1 G^2$ in case wires a b should become crossed, because in such instance the two coils on the magnet would neutralize one another's effects.

The relay-armature of V^2 , also through its back contact, 14, establishes a short circuit, 16, for battery $L B$ around both coils of the relay and around the magnet V^3 , as indicated. This short circuit is formed by an insulated contact-plate, 15, insulated from the armature-lever 17, and adapted to rest upon the back contact, 14, when the magnet loses its power. The circuit c is formed through the armature-lever proper, as clearly shown. When the wires become crossed, the magnet V^2 will lose its power, as before, and cause the release of the wheels $G^1 G^2$; but the armature-lever of V^3 will not be drawn up, and the signal will therefore come in from wheel G^2 . If, however, a thermostat should act in the normal way, the branch a will be broken and the short circuit just mentioned will therefore fail to be formed; but the establishment of the connection through branch b at a thermostat will bring into operation the magnet V^3 , which will operate to throw into the ground connection the wheel G , so that the latter, when released through the momentary loss of power in magnet V^2 and magnet V , will send in its signal of fire. The breakage of a branch a , or the failure of a battery, $L B$ or $L B^2$, will cause the signal to be sent from wheel G^2 , magnet V^3 under such cases being unaffected, and the special or emergency signal will be transmitted over the circuit 1 to the instrument included in the ground of battery $G B$; but such emergency or special signal will not be relayed, for the reason before cited.

In Fig. 1 the control of the receiving apparatus so as to prevent any but the proper signal from being relayed onto the circuit 2 is effected through the action of a circuit breaker and closer, whose operation in such controlling action is purely electrical.

The control might be a mechanical one, as indicated in Fig. 2, where the wheel I , instead of making and breaking the relay-circuit, is shown as operating mechanically on the armature-lever of the receiving instrument Y . For this purpose the wheel is provided with a projection, 26, which, in the position of rest of the wheel I , bears against the armature-lever of Y and holds the same against its back or open-circuit stop, so that, although the magnet Y be excited, no effect will be produced on the relay-circuit 2, including magnet K . When, however, the wheel is released by the action of the magnet V^4 on the main-line circuit, the locking projection moves away from the armature-lever of magnet Y , and the latter may then

operate to relay the signals received on the branch connection, including said magnet.

An electrical control of the relaying devices or circuits might be effected by the arrangement shown in Fig. 3, where the wheel I is employed to normally shunt the relaying magnet Y , to prevent the signal from being relayed. When the wheel is released, the shunt is broken and remains broken, and any signal received on the ground-connection is retransmitted in an obvious manner.

With the arrangement shown in Figs. 2 and 3, where the armature-lever of the relay Y is rendered inactive, it would of course be necessary to employ a separate magnet for receiving the signals which are sent to be received at the station where the instrument Y is located, but which it is desired should not affect the instrument in the circuit 2. Such an additional relay-magnet is indicated at Y^2 , and is arranged to operate upon the local circuit of a Morse register or other instrument in the ordinary way.

I do not limit myself to the employment of a device such as the lever m for effecting an action of the magnet V^4 , as any instrument which will operate on the circuit in such manner as to cause a change in the magnet V^4 on the same circuit will answer the purpose of my invention.

It will of course be understood that where the line 2 is employed as a district-telegraph line the district-telegraph instruments M of Fig. 1 can be placed directly in the main circuit 1, as indicated in Fig. 5. In this case the instruments M would be arranged to normally close the circuit when at rest, as is usual with district-telegraph boxes, and the signals sent by such instruments would be received on a relay, Y^5 , included in the main circuit, instead of upon an instrument in the ground connection or branch. Inasmuch as instrument Y in the ground connection or branch will not respond to makes and breaks of the circuit produced by the instrument M , no effect will be produced on the relay circuit 2, even though the wheel I should be released through the action of the instrument M upon the closed circuit.

In the arrangements before described the apparatus by which the signals are relayed is normally in inoperative condition, thus requiring the operation of magnet V^4 when a signal of given character is to be relayed. A converse arrangement might be employed, as indicated in Fig. 4. In this instance the circuit 2 is normally closed over the wheel I . When the wheel is released, the circuit is broken at the wheel and remains broken during revolution of the same to the starting-point.

If the instrument in the box A^5 sends the signal which is to be relayed, the circuit-controller m should remain quiescent, so that the wheel I shall not act; but in case the instrument in box B^5 operates, which may be assumed to be the one which sends the signal that is not

to be relayed or received on some other instrument, then the circuit-controller *m* should be operated, in order that the wheel *I* may be released. The movements of the armature-lever of the instrument *Y*, produced by the operation of the instrument in box *B*⁵, will in that case produce no effect upon the circuit 2.

The obvious advantage of employing the arrangement shown in Fig. 1, in which the magnet *V*⁴ controls the continuity of the circuit 2 by means of the circuit closing and breaking wheel *I*, is that the same magnet *Y* may be used both for relaying the signals and for receiving the signals locally at the station. This advantage arises from the fact that the armature-lever of the instrument *Y* can move in response to any signals sent by any instrument in any ground-connection from the circuit 1. When the magnet *Y* is so employed it is only necessary to attach to its lever circuit-closing contacts properly insulated from the same, as is well understood in the art, this being an expedient frequently adopted where it is desired that the same relay-magnet should act simultaneously to relay two or more different circuits.

In Fig. 1 *B*⁴ indicates an automatic alarm-bell, which is placed on the outside of the building to be protected, and is connected into a circuit with springs *h h* or other circuit-closing device that is normally open, but that is closed so long as the electro-magnet *V*³ is excited. This closure is effected by an arm, 18, extending from the armature-lever of *V*³, or by other suitable means governed by said magnet.

As *V*³ only comes into action on the occurrence of fire and the operation of a thermostat in the normal manner, it is obvious that an alarm may be given on the outside of the building, which alarm will not be sounded, however, when the special signals are sent from a wheel, *G*², indicating derangement of the apparatus or circuits.

The arrangements herein described whereby a signal-indicating derangement may be transmitted are not claimed herein, as they form the subject of claims in my application Serial No. 231,678, filed March 21, 1887.

What I claim as my invention is—

1. The combination, with an all-round metallic main-line circuit, of a branch containing a transmitting apparatus, a branch containing a receiver of the signals sent by said transmitting apparatus, a magnet in the main line governing the operative condition of said receiver, and a circuit-controller in said line, whereby the action of the magnet and the condition of the receiver may be governed, as and for the purpose described.

2. The combination, with an all-round metallic circuit, of a branch from the same containing a transmitter, a second branch containing a receiver of the signal sent by said transmitter, a second circuit governed by said receiver, a magnet in the main line governing the continuity of said second circuit, and a

circuit-controller, also in said main line, for effecting a momentary change in the condition of the main-line magnet, so as to change the condition of the second circuit, as and for the purpose described.

3. The combination, substantially as described, with an all-round metallic circuit, 1, and a circuit, 2, of fire-alarm signal-wheel *G*, of any suitable character, connected to a branch from circuit 1, a special signal-wheel, *G*², also connected to a branch of the same, a relay apparatus whose relay-magnet is also in a branch, a controller-magnet for governing the operative condition of the relay apparatus, and a circuit-controlling device connected to circuit 1 for changing the electrical condition of the line, and consequently the condition of said controller-magnet, as and for the purpose described.

4. The combination, with an all-round metallic circuit, 1, having signal-transmitting apparatus in a ground-connection from the same, of a relay apparatus having its magnet also in a ground-connection, a mechanism for governing the operative condition of said relay apparatus, an electro-magnet in the main circuit controlling said mechanism, and a circuit-controller in the main circuit governing the operation of said magnet, as and for the purpose described.

5. The combination, with an all-round metallic circuit, 1, and a circuit, 2, of a relay-magnet in a ground-connection from circuit 1, and having contacts connected with circuit 2, and a magnet, *V*⁴, in the metallic circuit for governing the operation of the relay devices, as and for the purpose described.

6. The combination, with the all-round metallic circuit 1, of a receiving-instrument, *Y*, in a branch from the same, a transmitting apparatus in another branch for sending signals of different character or significance, as described, and controlling-magnet *V*⁴ in the main-line circuit for governing the operative condition of the instrument *Y*, as and for the purpose described.

7. The combination, with an all-round metallic circuit, 1, having district-telegraph apparatus *M* connected therewith, of fire or burglar alarm transmitters in branches from said line, a special or derangement signal wheel also connected with the branch, a relay circuit, 2, a receiving apparatus, *Y*, for the fire or burglar alarm, and the derangement-signal apparatus, a controller-magnet, *V*⁴, in the main telegraph-circuit 1, for governing the operative condition of the apparatus *Y* in relaying-signals, and a circuit-controller in the main telegraphic circuit 1, controlling the action of the magnet *V*⁴.

8. The combination, with an alarm-bell, *B*⁴, on the outside of an electrically-protected building, of a fire alarm signal-transmitting wheel having local controlling-circuits, a special or derangement signal-transmitting wheel having local controlling circuits formed in part over the controlling-circuits for the former,

and a controlling-magnet for said alarm-bell, connected with a portion of the controlling-circuits for the fire-alarm independent of the controlling-circuits of the special-signal wheel, as
5 and for the purpose described.

9. The combination, substantially as described, of a fire-alarm-signal transmitter, local controlling-circuits therefor, a special or derangement signal transmitter, controlling cir-
10 cuits for the latter formed, in part, over the controlling-circuits for the former, a circuit-controller at the building to be protected and connected with the line, a local controlling-circuit for the latter controller, a main telegraph-line
15 connecting said transmitting-wheels with a central office, a fire-department circuit, a relay

apparatus for relaying the fire-signals from the main circuit to the fire-department circuit, and a controlling-magnet for determining the operative condition of the relay apparatus, said mag- 20
net being connected to the main telegraph-line and being governed by the circuit-controller connected with the line at the building to be protected, as and for the purpose described.

Signed at New York, in the county of New 25
York and State of New York, this 8th day of October, A. D. 1887.

JOHN H. GUEST.

Witnesses:

WM. H. CAPEL,
HUGO KOELKER.