

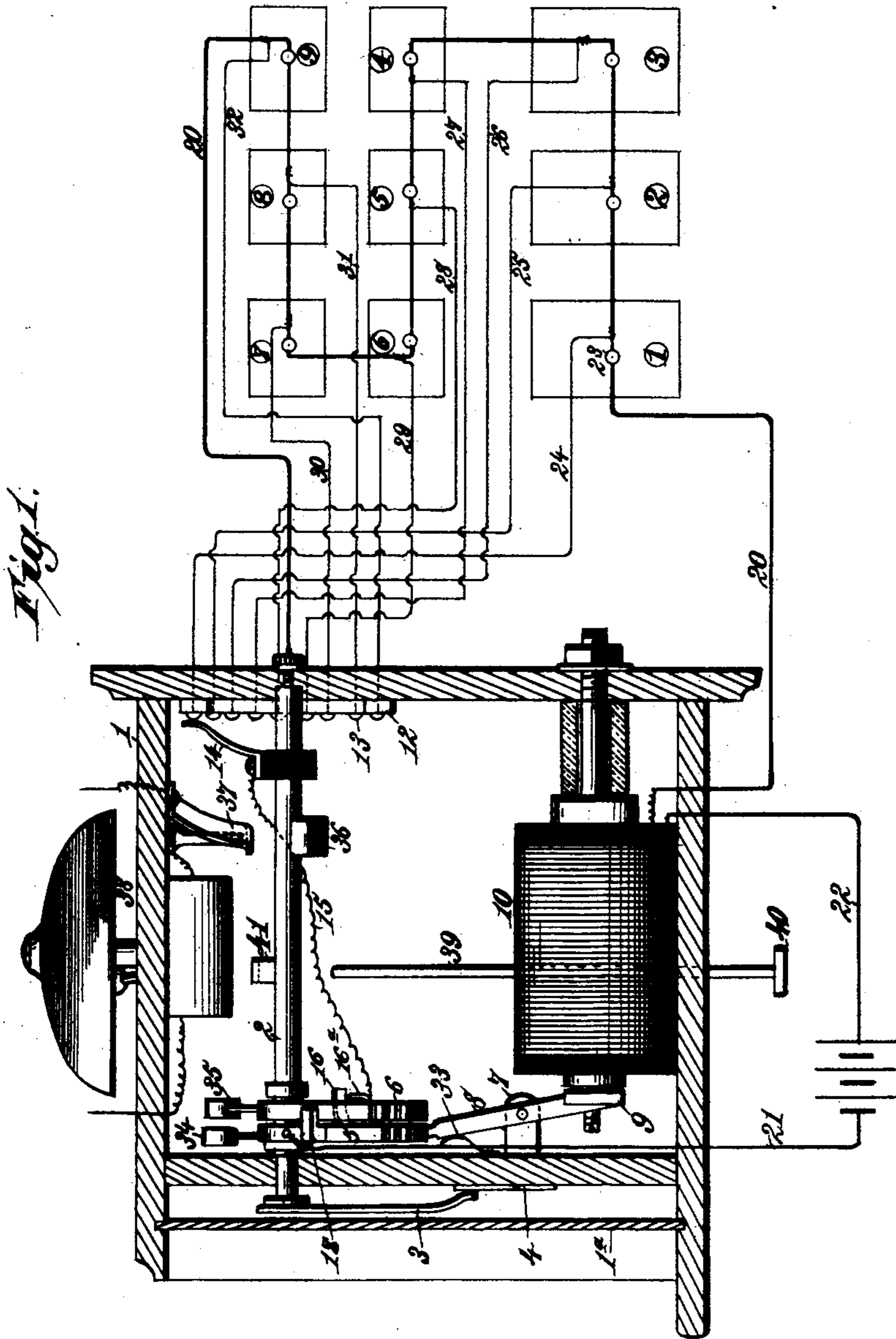
(No Model.)

2 Sheets—Sheet 1.

N. M. WATSON.
BURGLAR ALARM.

No. 424,387.

Patented Mar. 25, 1890.



Witnesses.
Phet Grutt.
Dennis Sumby.

Inventor.
Nelson M. Watson.
By James L. Norris,
Atty.

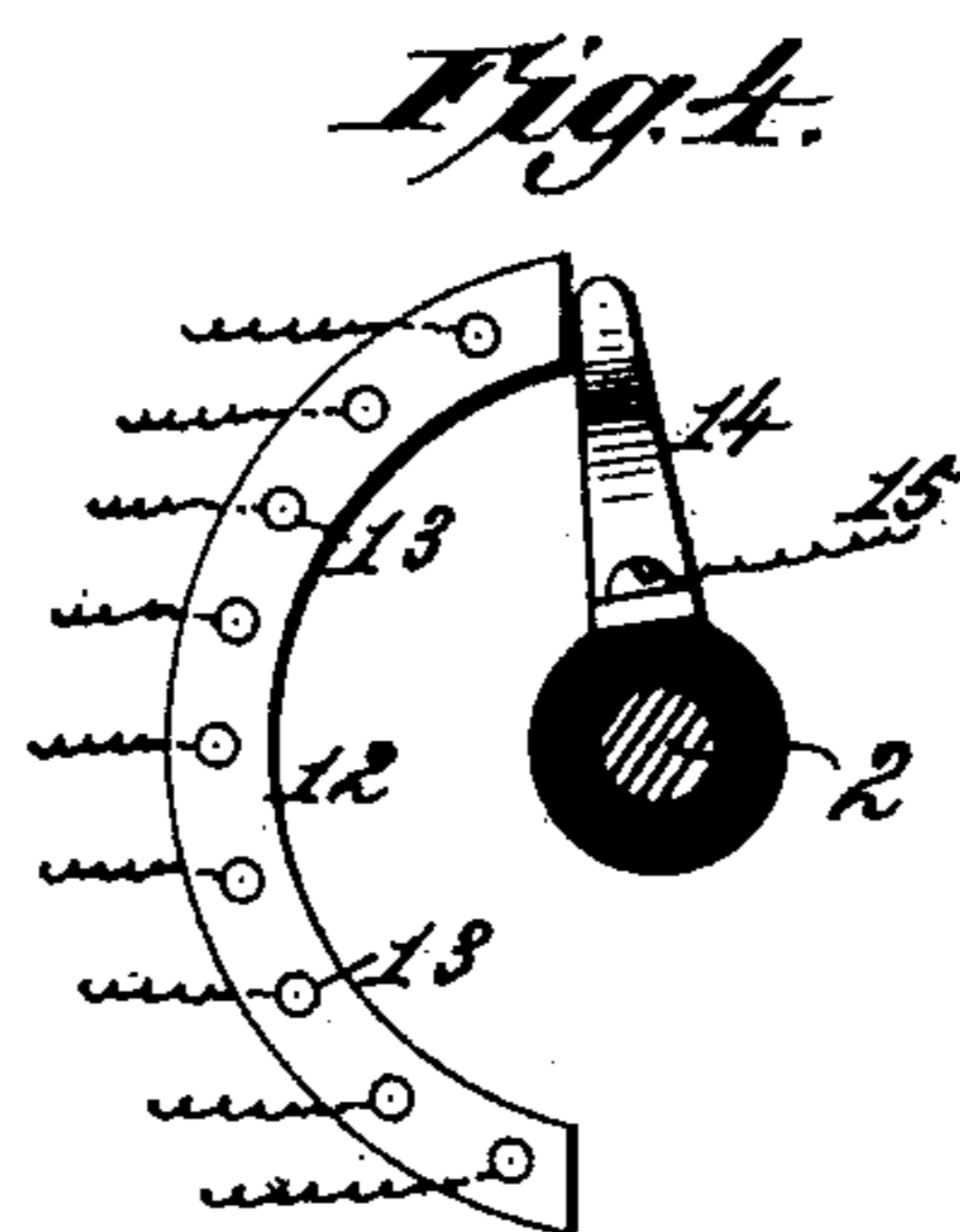
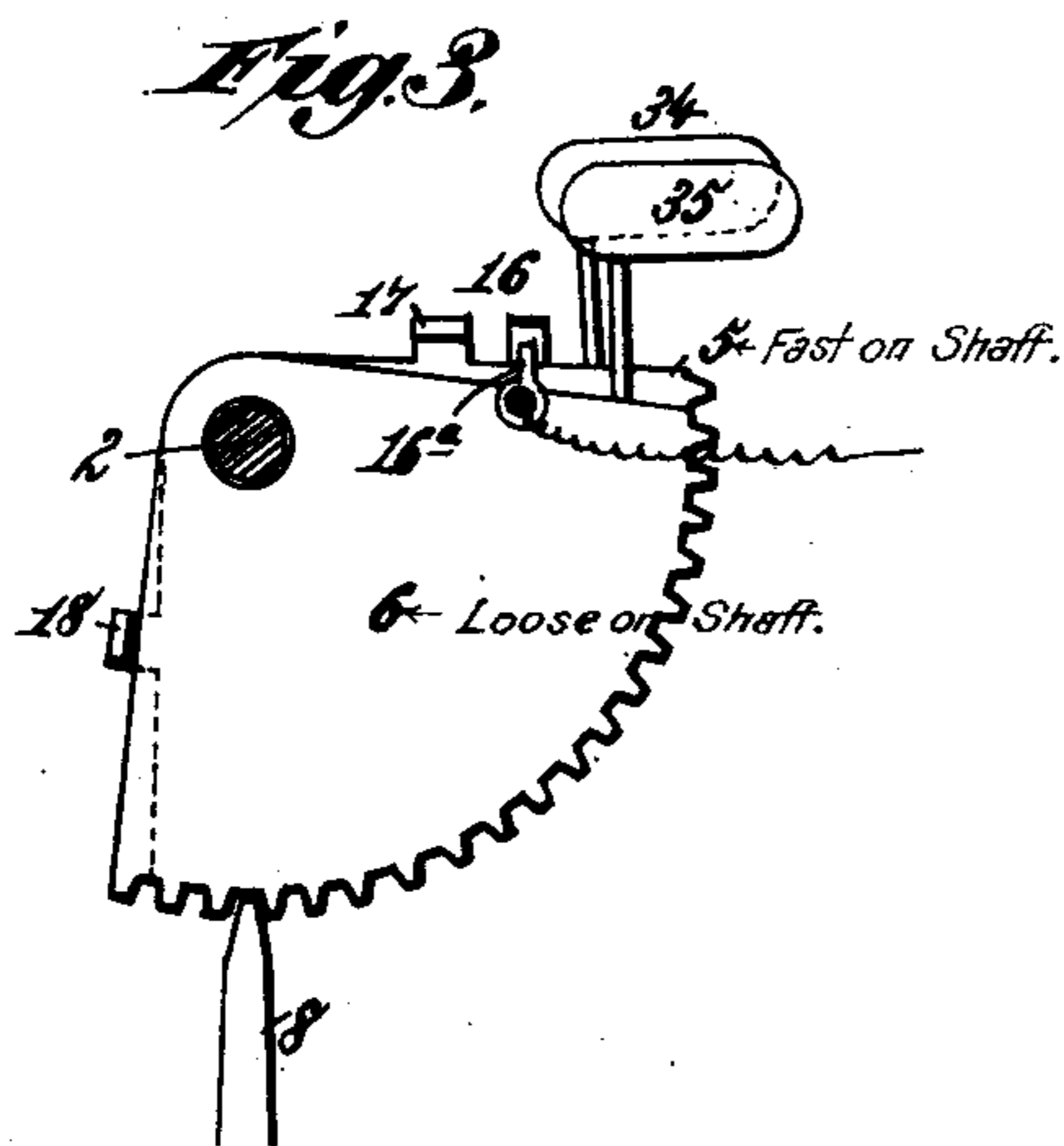
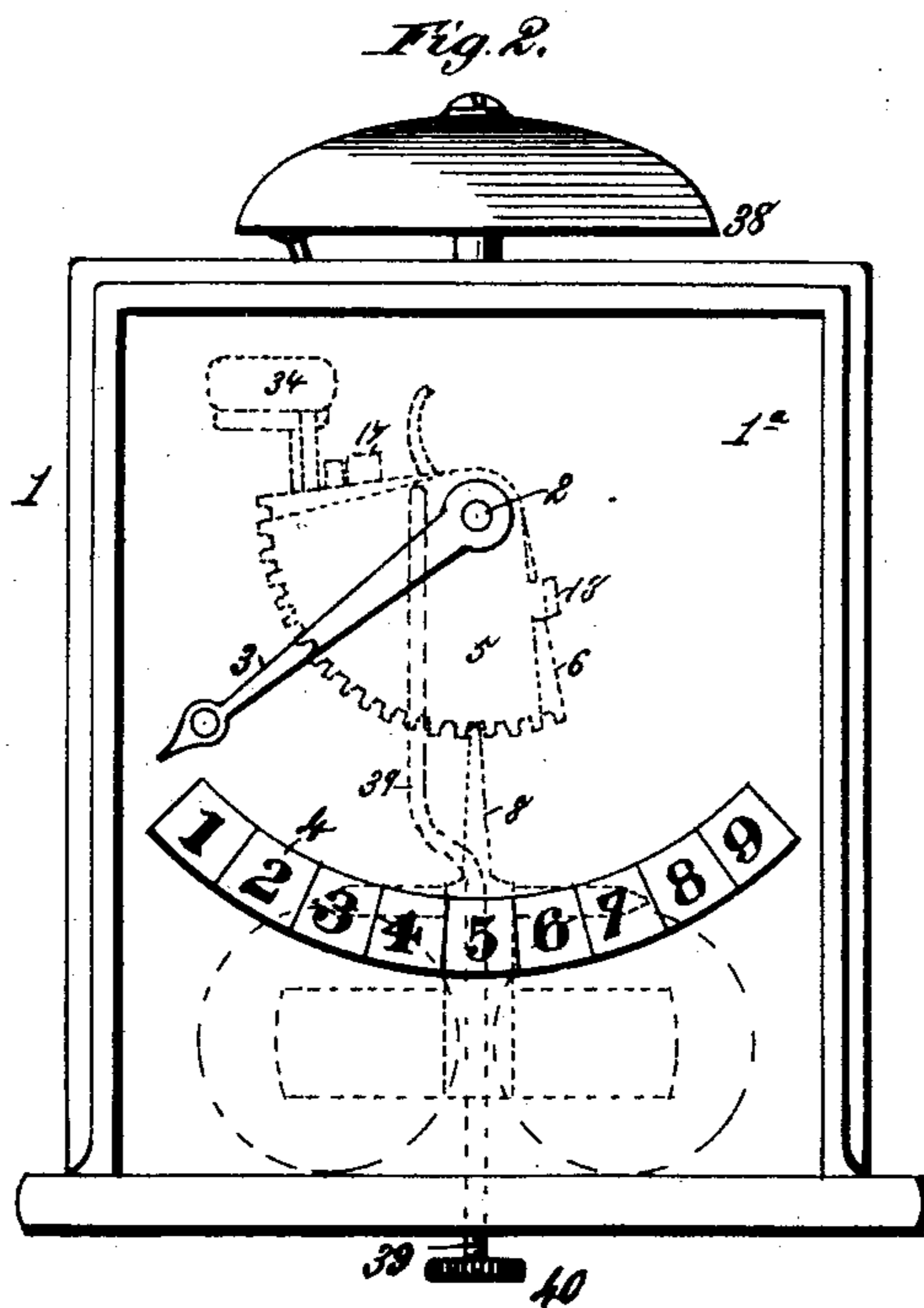
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2 Sheets—Sheet 2.

N. M. WATSON.
BURGLAR ALARM.

No. 424,387.

Patented Mar. 25, 1890.



Witnesses
Robert Everett

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Inventor:
Nelson M. Watson.
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UNITED STATES PATENT OFFICE.

NELSON M. WATSON, OF ECORSE, ASSIGNOR OF TWO-THIRDS TO JOHN B. GOUNDRY AND WILLIAM A. CHAMBERLAIN, BOTH OF DENTON, MICHIGAN.

BURGLAR-ALARM.

SPECIFICATION forming part of Letters Patent No. 424,387, dated March 25, 1890.

Application filed October 15, 1889. Serial No. 327,075. (No model.)

To all whom it may concern:

Be it known that I, NELSON M. WATSON, a citizen of the United States, residing at Ecorse, in the county of Wayne and State of Michigan, have invented new and useful Improvements in Electric Annunciators, of which the following is a specification.

My invention relates to that class of devices commonly known as "electric annunciators" for automatically sounding an alarm upon the occurrence of fire or upon the break of an electrical circuit caused by the entry of a burglar or from other causes.

It is the purpose of my invention to provide a simple construction and organization of parts whereby the interruption of the circuit upon any one of a series of wires connected with separate and distant points will be immediately shown at any given point or station and the particular point where such interruption takes place accurately indicated by the automatic action of the apparatus or bell or other call being switched in thereby to attract the attention of those present.

It is my purpose, in other words, to provide a simple and comparatively inexpensive annunciator whereby the occurrence of fire, a dangerous rise in temperature, a burglarious entry, or other event taking place at any one of a number of separate points may be instantly made known at a central or main station and the location of the point simultaneously determined and indicated.

The invention consists in the several novel features of construction and new combinations of parts hereinafter fully set forth, and then pointed out in the claims following this specification.

In order to enable those skilled in the art to make and use said invention, I will now proceed to describe the same in detail, reference being made to the following drawings, in which—

Figure 1 is a central vertical section from front to rear of an annunciator embodying my invention. Fig. 2 is a front elevation of the same. Fig. 3 is a detail view showing the construction of the gears or escapement devices. Fig. 4 is a detail view showing the switch-connection.

In the said drawings, the reference-numeral

1 denotes the casing of my apparatus, within which is arranged a horizontal shaft 2, upon the end of which is mounted an index or finger 3, moving over a scale 4, upon which are displayed at regular intervals a series of numbers, letters, or other characters, for a purpose presently to be shown.

Upon the shaft 2 is mounted a segment-gear 5, which is rigid upon said shaft, and a similar segment-gear 6, which is loose on the shaft. Upon a suitable support 7 is pivotally mounted a detent-lever 8, the point of which is adapted to mesh alternately with the teeth of the two gears 5 and 6. Upon the end of this lever is mounted an armature 9, which is attracted by an electro magnet or magnets 10.

Concentric with the shaft 2 is a plate or strip 12, formed of rubber, glass, or other insulating material, and having set therein at equal intervals contact-points 13, over which moves an elastic switch-arm 14, mounted on the shaft 2 and insulated therefrom in any suitable manner, said switch-arm being in electrical connection with the insulated gear 6 by a wire 15. Mounted upon the fixed gear 5, which is not in contact with the gear 6, is an insulated contact 16, which is adapted to make engagement upon the alternate movement of said gears with a contact pin or point 16^a on the loose gear 6. A guard 17, mounted on one edge of the fixed gear, limits the movement of the loose gear, and a similar guard 18, mounted on the opposite edge of said fixed gear, limits the movement of the loose gear 6 in like manner. The entire apparatus described is inclosed within the casing 1, the graduated plated or scale 4 being arranged in front and behind a glass pane 1^a, where it is exposed to view. The contact-points 13 are connected in the manner hereinafter shown with wires, which are carried to different points more or less widely separated, such as different rooms in the same building, or different buildings in the same city. At these several points I may use any form of device whereby the circuit is broken upon fulfilling a given condition—such, for example, as raising a window, or opening a door, or other similar act.

The electrical circuits are as follows: For

the purpose of illustration let it be supposed that there are nine blocks, houses, or rooms upon the main line, and let these points be indicated in Fig. 1 by the characters (1) (2) (3) (4) (5) (6) (7) (8) (9). From one terminal of the electro-magnet 10 a wire 20 is carried through each of these points and connected in such manner as to give a normally-closed circuit, which may be broken by raising a window, opening a door, or in other ways, according to the result to be accomplished. After traversing the points designated the wire is returned to and electrically connected with the frame of the machine by way of the shaft 2. This shaft being in electrical contact with the fast gear 5, a wire 21 is connected to the latter and carried to one pole of the battery B, a wire 22 from the other pole to the other terminal of the magnet 10 completing the circuit. The numeral 23 indicates any form of circuit-breaker located at each of the points denoted.

Connected with the main line 20 at the point (1) beyond the circuit-breaker 23 is a branch wire 24, which is carried to the first one of the contacts 13. In a similar manner a branch wire 25 is led from the main line at a point beyond the circuit-breaker 23 at the station (2) to the second contact 13. In the other rooms or at the several points (3) (4) &c., wires 26, 27, 28, 29, 30, 31, and 32 are connected in a similar manner and led to the remaining contacts 13 in succession. When working as a fire-alarm upon a closed circuit, the arrangement is such that the rise of temperature at any one of the points included will break the circuit at that point by the action of the thermometer or other thermal indicator, thereby demagnetizing the electro-magnets 10. The detent-lever 8 being no longer held by the attraction of its armature 9, it is pushed by a spring 33 out of the teeth of the tight gear 5 into mesh with the teeth of the loose gear 6, leaving the gear 5 free to move under the impulse of a weighted arm 34, projecting from the edge of said gear. The movement thus produced is limited by the guard 17, which impinges upon the edge of the loose gear 6, and at the same instant the contact-piece 16 makes engagement with the contact-point 16^a and restores the circuit, again energizing the electro-magnets and throwing the detent-lever back into engagement with the fast gear 5. The loose gear 6 thus released moves a single step in its turn under the impulse of a weighted arm 35 on its edge until its movement is arrested by the guard-piece 18. The separation of the contact-piece 16 and point 16^a in this manner again breaks the circuit and causes the release of the detent-lever, which is again thrown into mesh with the loose pulley 6. At each movement of the fast gear 5 the shaft 2 is turned through part of a revolution and the switch-arm 14 is moved from one of the contact-points 13 to another until it finally rests upon the one connected with the particular branch wire having connection

with the point where the interruption of the circuit has taken place. Having reached this point, the electro-magnets cannot be energized by the closing of the circuit through the contact-piece 16 and point 16^a, and the detent-lever therefore remains in mesh with the loose gear 6, while the index or needle 3 stands at a point on the scale 4, where a number or character of any suitable kind appears designating the particular point where the circuit has been closed.

To make the operation more intelligible, let it be supposed that, by a burglarious entry, fire, or other means, the main-line circuit 20 is interrupted at the point (3.) The index 3 stands normally at the zero-point, and the contact-plate 14 is likewise removed a single step from the first one of the contact-points 13. As the break occurs the magnet 10 is rendered inert, and the spring 33 throws the detent-lever out of the fast gear 5 into the loose gear 6, leaving the fast gear free to move under the impulse of the weight 34 until it is arrested by the stop-lug 17 coming against the edge of the loose gear. This movement shifts the contact-plate 14 and brings it upon the first one of the contact-points 13, and at the same time brings the contact-spring 16 upon the pin 16^a. This restores the circuit through the coils of the magnet, by way of the main line 20, wire 24, contact 13, contact-plate 14, wire 15, spring 16, point 16^a, gear 5, and wire 21, back to the other pole of the battery. The magnet is thus energized a second time, drawing the detent out of the loose gear 6 back into the fast gear, leaving the former free to drop by the impulse of its weighted arm until arrested by the stop 18. This movement of the loose gear breaks the circuit between the contact-spring 16 and the pin 16^a, and the spring 33 again throws the detent back into the loose gear, leaving the fast gear 5 free to rotate another step, bringing the contact-plate 14 upon the second point 13 and again restoring the circuit through 16 and 16^a. The circuit is now by way of the coils of the magnet 10, wire 20, branch wire 25, contact-point 13, plate 14, wire 15, pin 16^a, spring 16, gear 5, and wire 21, leaving the index 3 upon the figure "2" on the dial. The operation being repeated, the shaft is again advanced, leaving the contact-plate 14 upon the third contact-point 13; and here, inasmuch as the main line 20 is broken at the point (3) between the battery and the branch wire 26, leading to the third contact-point 13, there is no circuit for the magnet and the parts remain in position, the detent holding the loose gear, which in turn holds the fast gear. The index now stands motionless upon the figure "3" on the dial and indicates the point where the interruption has taken place. Upon the shaft 2 is an arm 36, which at a given point in the revolution of the shaft makes contact with an elastic strip 37 and switches in a call-bell or other alarm 38, which continues to ring until the operator restores

the parts to their normal position. This is effected by means of a rod 39, having a push-button 40 on its end. By driving this rod inward it is caused to act upon an arm 41 on the shaft 2 and replace the shaft and index 3. Any other form of replacing device may be substituted, however, for that described.

What I claim is—

1. In an electric annunciator, the combination, with a shaft having a contact-arm moving over the terminals of a series of wires having connection with separate points, of a gear fast upon said shaft and a gear loose thereon, each gear having a weighted arm to impel said gear in the same direction, a detent-lever acting alternately upon the fast and loose pulley, an electro magnet or magnets attracting an armature on said detent-lever, and a contact-piece on one gear making electrical connection with a contact-point on the other gear, substantially as described.

2. In an electric annunciator, the combination, with a shaft having a contact-arm moving over and in successive electrical contact with the insulated terminals of a series of branch wires connecting with a main line which traverses a number of separate points, of a pivotally-mounted detent actuated in one direction by a spring and meshing alternately with the teeth of a loose and a fast gear on said shaft, an electro-magnet attracting an armature on the end of the detent-lever, a contact-piece on one gear adapted to engage a point on the other gear, said gears being provided with weighted arms to impel them and with guards to limit their movement, and a needle or index mounted on said shaft and moving over a scale corresponding with the terminals of the wires, substantially as described.

3. In an electric annunciator, the combination, with a series of branch wires leading to

different points and having their terminals arranged concentrically and insulated, of a main-line circuit traversing said points and connecting with the branch wires, a shaft carrying a contact moving over said terminals, a fast gear and a loose gear mounted on said shaft and turned by weighted arms, a detent-lever actuated in one direction by a spring and engaging said gears alternately, an electro-magnet attracting an armature on said detent, means for breaking the circuit at any one of the points connected by wire, and a needle or index on the shaft moving over a scale corresponding with the number and arrangement of the terminals, substantially as described.

4. In an electric annunciator, the combination, with a series of branch wires having terminals arranged in an insulating-support, of a main line traversing said points and connecting with the branch wires, a corresponding series of circuit-breaking devices, a contact-arm moving over said terminals, a shaft carrying said arm, a gear fast on said shaft, a similar gear loose thereon, each gear having a weighted arm, a contact-spring on one gear connected to the battery and a contact-point on the other gear, a spring-actuated detent-lever engaging said gears alternately, an electro-magnet moving said detent-lever, an index at the end of the shaft moving over a scale corresponding with the number and arrangement of the terminals, an alarm or call, and a switch on the shaft by which said alarm is brought into operation, substantially as described.

In testimony whereof I have affixed my signature in presence of two witnesses.

NELSON M. WATSON.

Witnesses:

E. J. WATSON,
E. J. GOODELL.