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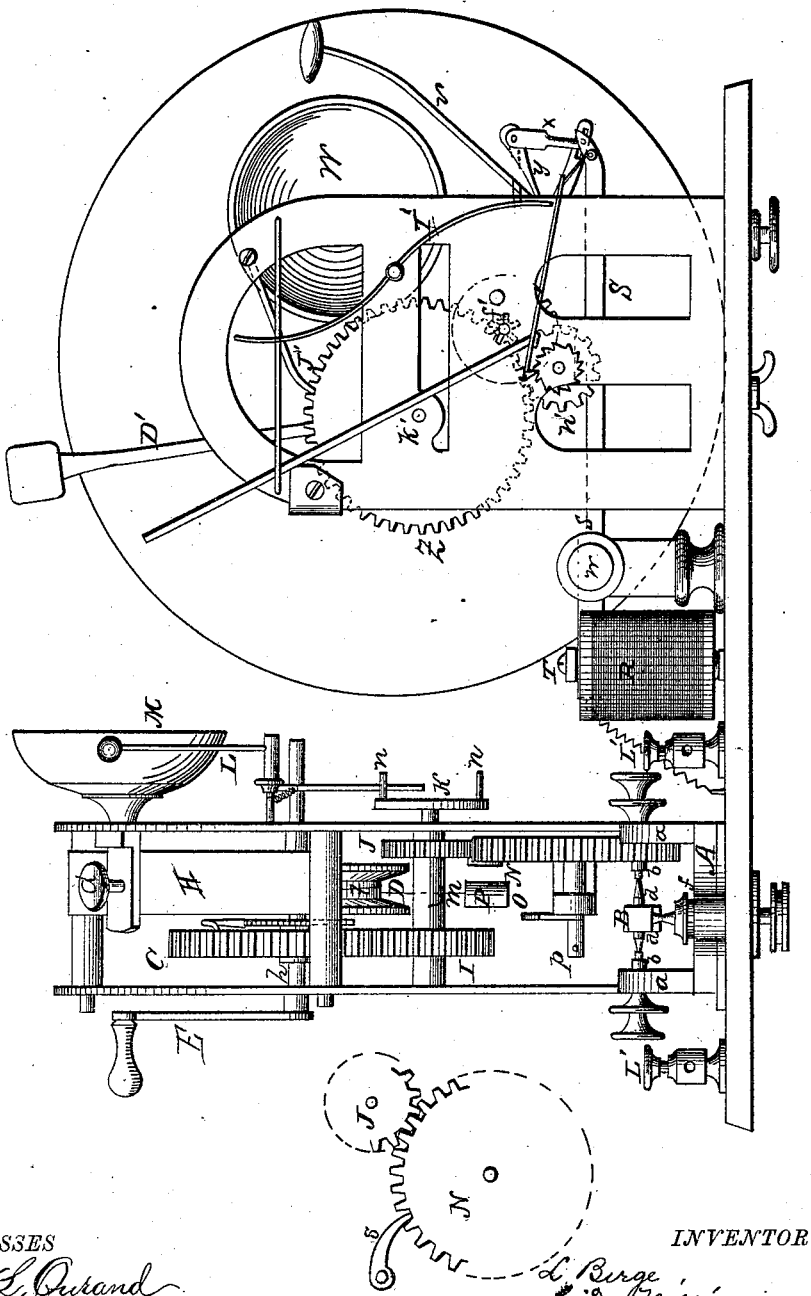
L. BIRGE & C. D. WILLIAMS.

TELEGRAPH FIRE-ALARM.

No. 183,364. Patented Oct. 17, 1876.

Fig. 1.



WITNESSES

Franck L. Durand

H. N. Miller

INVENTOR

L. Birge

C. D. Williams

By Alexander Simpson

Attorneys

3 Sheets—Sheet 2.

L. BIRGE & C. D. WILLIAMS.

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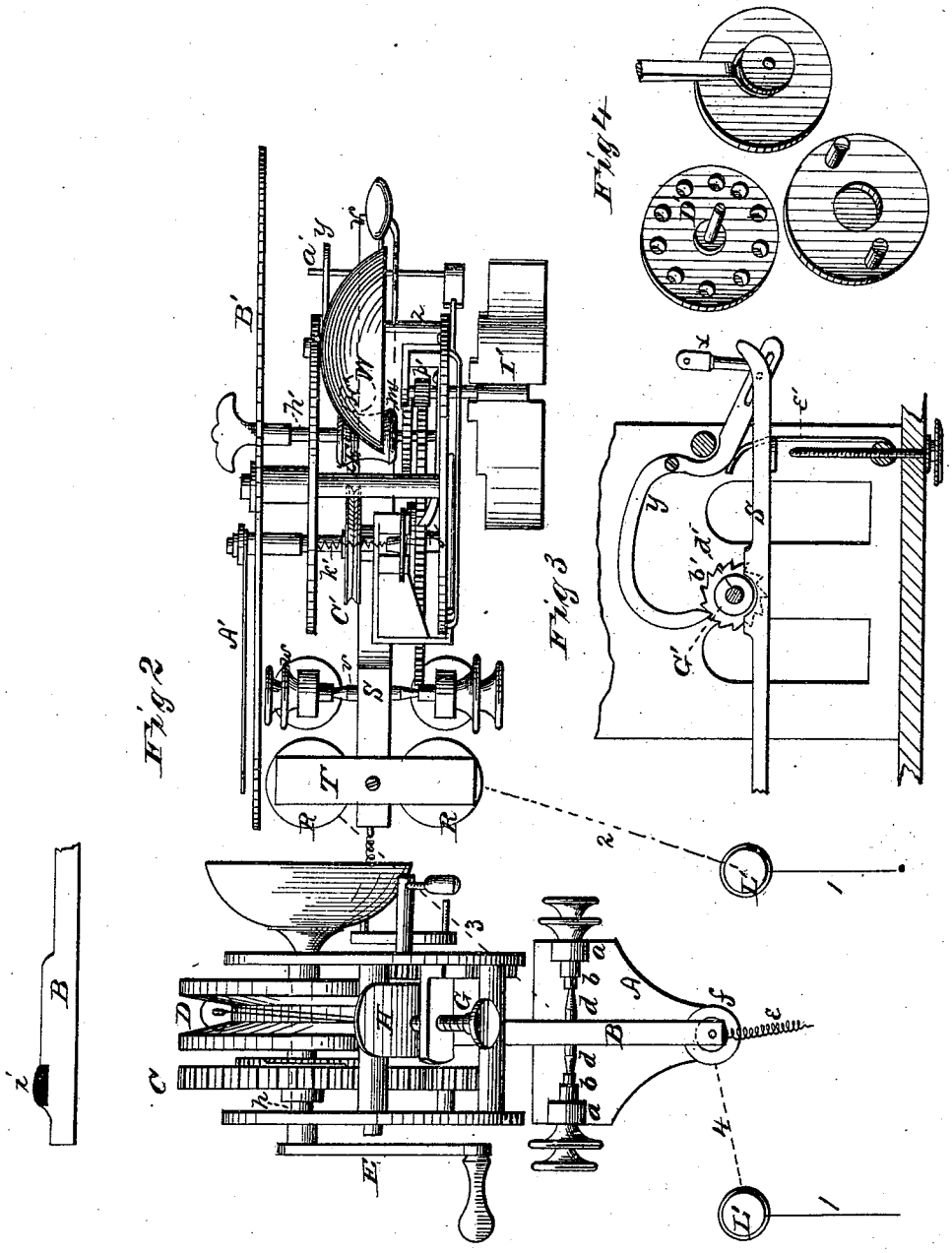

WITNESSES

Franck L. Durand

C. L. Everh

INVENTOR

L. Birge

C. D. Williams

By Alexander & Mason

Attorneys

3 Sheets—Sheet 3.

L. BIRGE & C. D. WILLIAMS.

TELEGRAPH FIRE-ALARM.

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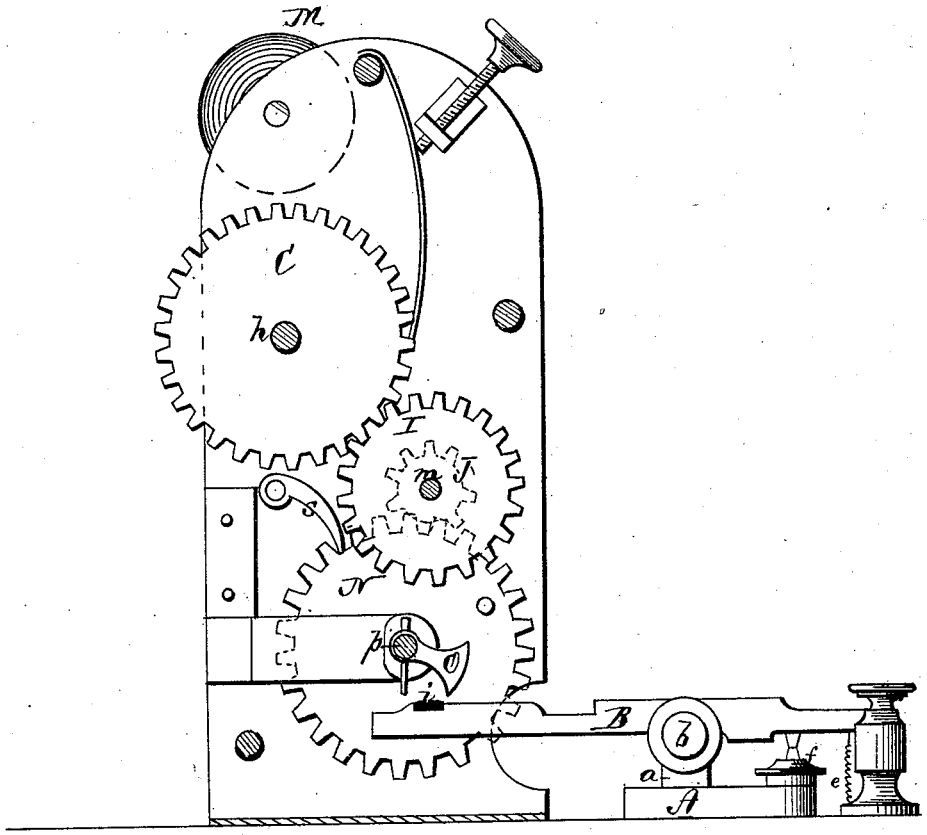
Fig. 5.



WITNESSES
Franck L. Ouiaud
C. L. Evert

INVENTOR
Louis Birge
C. D. Williams
By Alexander & Mason
Attorneys.

UNITED STATES PATENT OFFICE.

LEWIS BIRGE AND CHARLES D. WILLIAMS, OF ST. PAUL, MINNESOTA.

IMPROVEMENT IN TELEGRAPHIC FIRE-ALARMS.

Specification forming part of Letters Patent No. **183,364**, dated October 17, 1876; application filed June 20, 1876.

To all whom it may concern:

Be it known that we, LEWIS BIRGE and CHARLES D. WILLIAMS, of the city of St. Paul, in the county of Ramsey, and in the State of Minnesota, have invented certain new and useful Improvements in Fire-Alarms and Box-Indicators; and do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, making a part of this specification.

The object of our invention is to communicate a fire-alarm from the fire-alarm box or boxes directly to each and every station or engine-house in any city, village, or township where it may be in use, instead of first communicating the alarm to a central station, and from thence to engine-houses or stations where the engines are kept.

Our invention consists of two parts: first, an alarm-box and gearing, or any number of them desired, from which a fire-alarm may be given from any point, and attached to or connected with telegraph-wires or other conductors of electricity; second, an alarm apparatus and box-indicator, situated in an engine house or houses, which are also connected with said telegraphic wires or other conductors of electricity.

In order to enable others skilled in the art to which our invention appertains to make and use the same, we will now proceed to describe its construction and operation, referring to the annexed drawings, in which—

Figure 1 is a side elevation of our invention. Fig. 2 is a plan view of the same. Figs. 3 and 4 are detached views of parts thereof. Fig. 5 is a side view of a part of the machine.

The mechanism of the alarm-box is constructed as follows: A is a plate or casting, provided with two ears, *a a*, through which are passed the screws *b b*. These screws center the pivot-pins *d* of a lever, B, working thereon, one end of said lever being held down on a post, *f*, by a spring, *e*, as shown. At this point the electrical current is broken. On the other end of the lever B, where the cam to break the current comes in contact with it, is placed a pad, *i*, of some suitable non-conducting material, to isolate the other parts of the machine.

C is the cogged driving-wheel, placed on a shaft, *h*, which is provided with a crank, E, for turning the same. On the shaft *h* is placed a friction and weight pulley, D. The cog-wheel C is connected to the shaft *h* by ordinary pawl and ratchet, while the pulley D is fast on the shaft. H is a spring of steel, held by the tension-screw G against the periphery of the pulley.

The cogged driving-wheel C meshes with a gear-wheel, I, on a shaft, *m*, upon which is placed the pinion J, and also the pin-wheel K. The pins *n n* on this wheel operate the hammer L to strike the bell M. The pinion J meshes with a large cog-wheel, N, on a shaft, *p*, and rotates the same. On this shaft is fastened the cam O, which operates on the inner end of the lever B, and breaks the electric circuit by depressing the same while the cam is passing over it, so that when the cam passes off from the lever the circuit is again closed.

The cam O must vary in length of working-face, to correspond with the numbers or figures on the dial-face of the indicator, as the time required for the cam O to pass over and upon the lever B determines the time required to keep the circuit open, and for the hand on the dial to pass to the number of the box where the alarm is started, so that each and every alarm-box must have a cam constructed in length of face to correspond to the numbers of each and every alarm-box, respectively.

On the gear-wheel N is placed a pawl, *s*, to hold all the gears except the pulley or wheel D until the weight P is wound up, said weight being connected with the pulley by a cord or chain, *t*.

This entire mechanism is to be held in a suitable frame and incased within the fire-alarm box.

The indicating-instrument is constructed as follows: R represents one pair of magnets, with armature T attached to lever S, which works upon adjustable pivots *v* on adjustable centering-screws *w*. On the end of the armature-lever S is a post, *x*, connected to an

arm, y, that projects from a rocking shaft, z, and to this rocking shaft the hammer V is attached for striking the bell W. Through the end of the armature-lever S passes a pin-lever, a', which works in a slot in the end of a pivoted pawl, Y, said pawl taking into a ratchet-wheel, b^1, on a shaft, d^1, when the circuit is closed. e' is a spring, arranged in conjunction with the pawl Y, to aid in throwing the pawl out of the ratchet-wheel when the circuit breaks or parts. f' is the driving-pinion on the shaft h^1, which pinion gears with and revolves the cog-wheel Z on the shaft k'. This shaft carries the hand A′ on the face of the dial-plate B′. On the shaft k' is secured a grooved wheel, C′, to raise the weight to draw the hand back to zero on the dial as its starting-point, by throwing out the clutch D′, after an alarm has been given. On the pinion or driving shaft h^1 is placed a wooden or metallic spool, E′, to which a cord, i', is attached, with weight H′, for the purpose of driving the gearing of the device when wound up. A ratchet-wheel, m', holds the weight that drives the gear in the instrument. On the shaft d^1, that carries the ratchet-wheel b^1, is a gear-wheel, n', driven by the gear Z, and on said shaft is also a friction-roller, G′, against which the lever S bears when the circuit is closed, for the purpose of aiding in stopping the gearing. The gear-wheel Z also, by means of the pinion p', drives the fan I′, for regulating and governing the speed of the gearing.

J′ is a pawl that falls into the gear Z, for the purpose of holding gears when winding up the weights.

The dial-plate B′ may be made of tin or any other suitable material, and in which are placed any number or numbers so desired, corresponding with numbers on the alarm-boxes employed in the circuit. The hand or indicator A′ moves around the dial-plate, pointing to the number thereon corresponding with the number on the box where the alarm originates.

On the end of the shaft d^1 is a ratchet-wheel, a^2, into which takes a pawl, b^2, pivoted to the frame, the other end of the pawl bearing against a trip, d^2, on the end of the lever S. To the pawl b^2 is attached a regulating-lever, h^2. When the circuit is closed the pawl and lever are in the position shown in Fig. 1. When the circuit opens the end of the lever S is depressed, and the pawl b^2 follows it down as far as it goes. When the circuit again closes, the lever S and trip d^2, in rising, strike the pawl b^2, and throw the pawl into the ratchet, at the same time throwing the regulating-lever h^2 forward, which holds the ratchet and hand on the dial-plate at the figure on it corresponding with the number of the box pulled, while the circuit continues to open and close while the box is running in. When the box has run in, and when the engineer returns from the fire to his engine-house, he places by hand the regulating-lever h^2 back, and which movement also lifts the pawl b^2 from the teeth of the ratchet-wheel a^2, and causes the pawl to fall back on the trip d^2.

This is an important part of our invention, because it holds the hand to the number of the box pulled. Were it not for this arrangement the hand could not be held at the number desired at all, because as soon as the circuit became open again the hand would again travel.

L′ L′ are binding-posts in the alarm-box, to which the electric wires 1 1 are fastened to connect with the two poles of the battery. From one of these posts a wire, 2, connects with one of the magnets R, the other magnet R being, by a wire, 3, connected with the plate B in the fire-alarm box. This plate is also, by another wire, 4, connected with the other binding-post.

By this invention we carry out and establish a perfect system of fire-alarm, avoiding all the difficulties connected with the systems now in use, such as confusion in counting the strokes of the bell, the parting of the circuit, and the irregularity of working in the boxes.

With this system the hand goes to the number of the box instantly and stays there, and makes the alarm known beyond all mishaps and peradventures.

This device is also suitable for use in hotels, boarding-houses, &c., to indicate the rooms in which it is placed by the hand on the dial in the office.

The cam O, that opens the circuit, may be made of some non-conducting substance, where no non-conducting pad is required on the lever B.

Having thus fully described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. The combination, in a system of fire-alarm telegraphy, of a rotating cam, a lever provided with a non-conducting pad, an indicator, and a dial-plate having numbers corresponding with the numbers on the alarm-boxes, to indicate the locality of the alarm-box and fire, substantially as and for the purposes herein set forth.

2. The ratchet-wheel b^1 and pawl Y, operated by the armature-lever S, for holding the hand still to the number of the box operating while the alarm is running in, as set forth.

3. The lever S and friction-roller G′, for stopping and holding the indicator, as set forth.

4. The grooved wheel C′, for drawing the hand back to the point on the dial-face from which it starts when the alarm is given.

5. In a system of fire-alarm telegraphy, rotating cams of varying sizes in the different alarm-boxes, and a lever in each of said boxes, upon which the cam strikes to open the circuit, in combination with magnets, armature,

bell, indicator, and dial-plate at the station, all constructed and arranged substantially as described, whereby a single opening and closing of the electric circuit will indicate the location and number of the alarm-box, as set forth.

In testimony that we claim the foregoing we have hereunto set our hands this 7th day of June, 1876.

LEWIS BIRGE.
CHARLES D. WILLIAMS.

Witnesses:
EDWARD WALTHES,
J. P. ALLEN.