Case B. Sheet No. 1.

William B. Watkins.

Automatic Fire-Alarm Telegraph.

111412

Figure 1. PATENTED JAN 31 1871

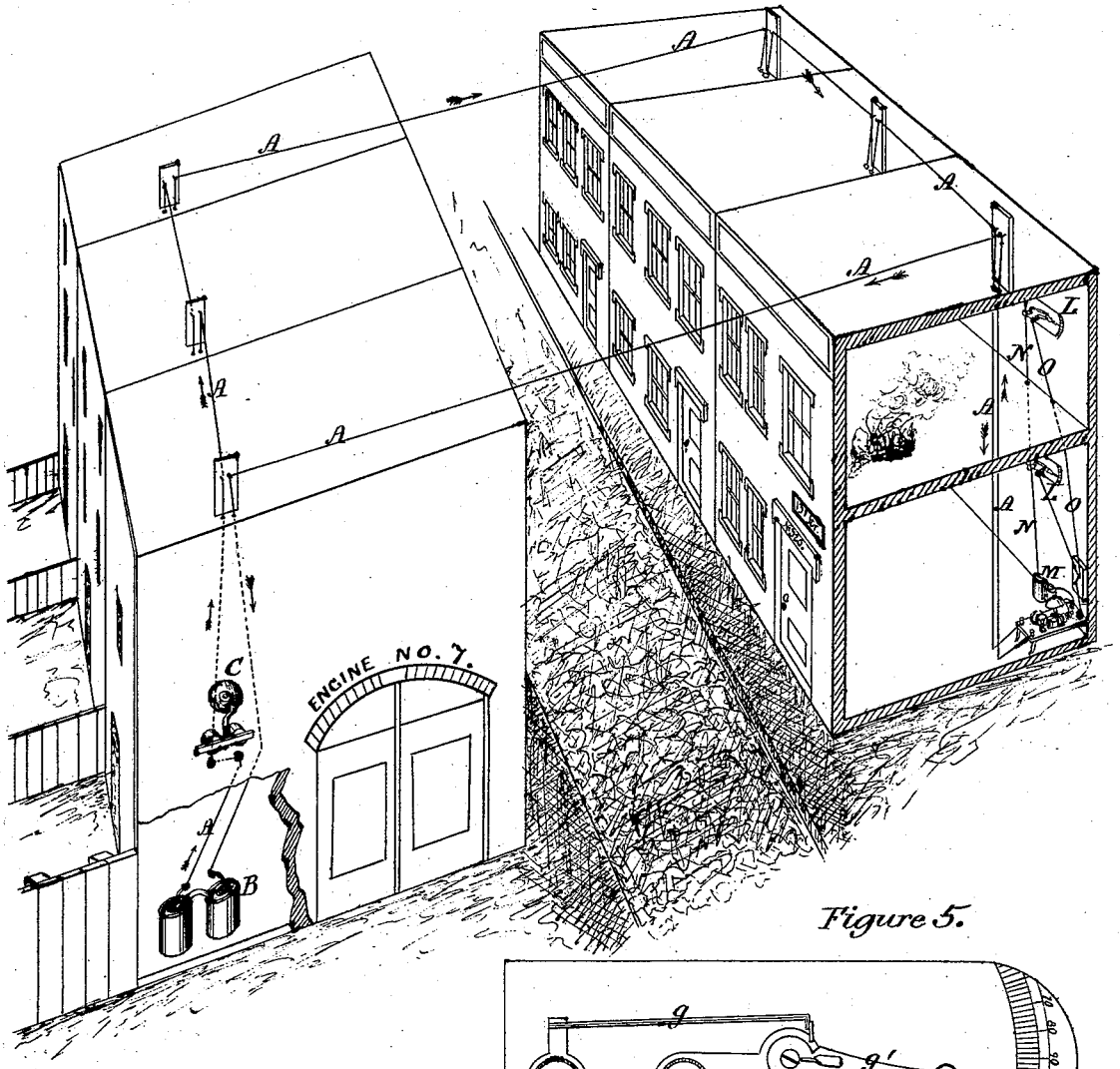
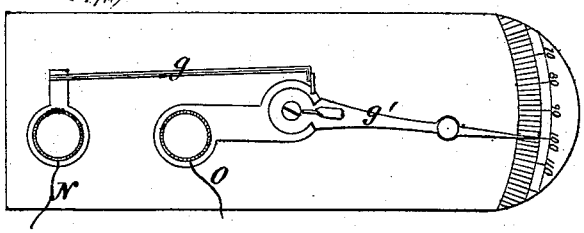


Figure 5.



Witnesses.
A. W. Hamilton Johnson
Henry A. Liggatt

William B. Watkins, Inventor,
By his Attorneys,
Upperman & Johnson.

Case B.

Sheet No 2.

William B. Watkins.

Automatic Fire-Alarm Telegraph.

Fig. 2.

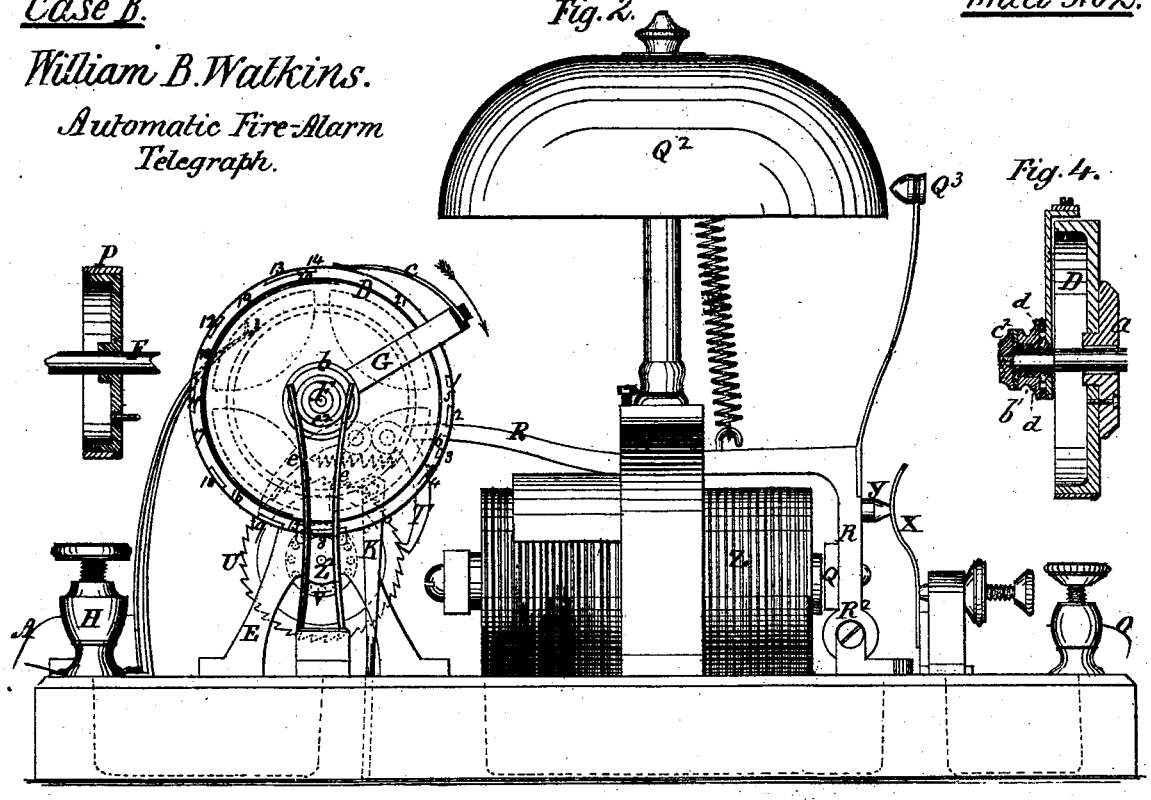
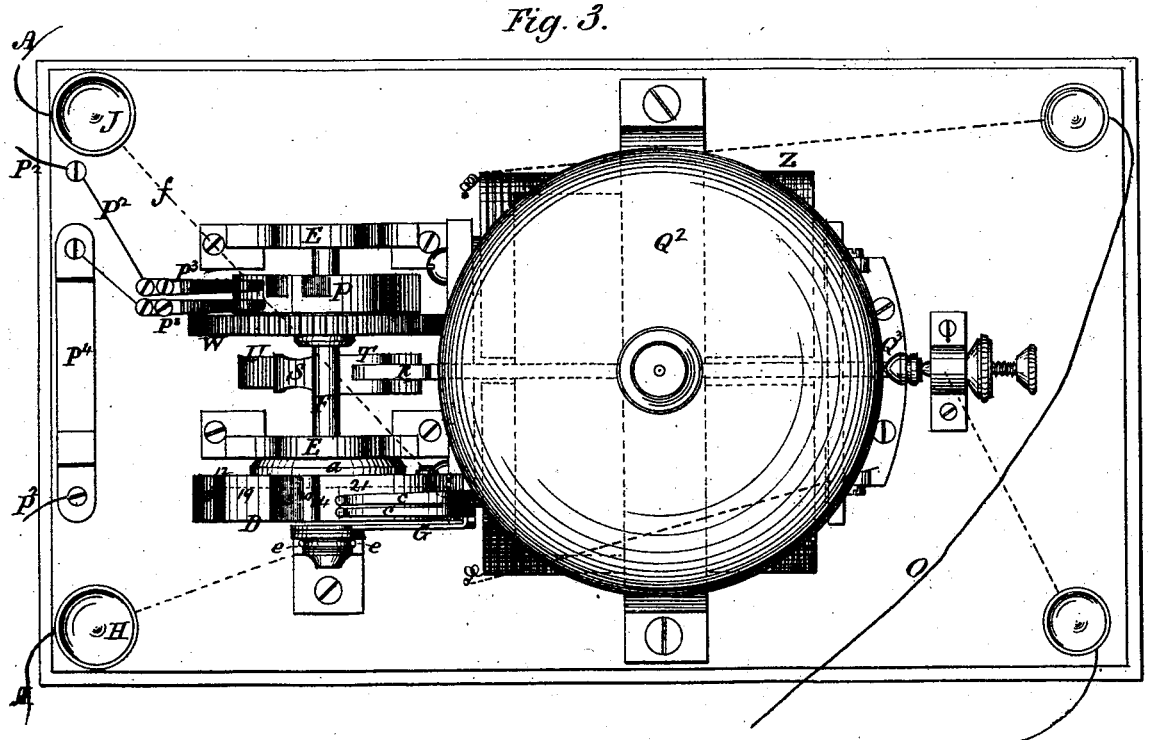


Fig. 4.

Fig. 3.



Witnesses.

W. Hamilton Johnson

Henry Stillgatt

William B. Watkins, Inventor.

By his Attorneys,

Hopperman & Johnson.

UNITED STATES PATENT OFFICE.

WILLIAM B. WATKINS, OF JERSEY CITY, NEW JERSEY.

IMPROVEMENT IN FIRE-ALARM TELEGRAPHS.

Specification forming part of Letters Patent No. **111,412**, dated January 31, 1871.

CASE B.

To all whom it may concern:

Be it known that I, WILLIAM B. WATKINS, of Jersey City, in the county of Hudson and State of New Jersey, have invented a new and useful Automatic Fire-Alarm Telegraph; and I do hereby declare the following to be a full, clear, and exact description of the construction and operation thereof, which will enable others skilled in the art to make and use my invention, reference being had to the accompanying drawings, which make part of this specification, and in which—

Figure 1, Sheet No. 1, represents a view illustrating my new system of wires leading from one building to another, and connecting with suitable apparatus for operating an automatic fire-alarm telegraph. Fig. 2, Sheet No. 2, represents a side elevation of an electro-magnetic fire-alarm signal apparatus, which forms part of my new system of constructing and operating an automatic fire-alarm telegraph. Fig. 3 represents a top view of the same.

The systems of telegraphing the alarms of fire, as heretofore employed, have required physical force to set the alarm in motion, and have only been useful and brought into operation generally when the fire has burst out of the building. The delays incident to such systems not only allow the fire to get headway and destroy the building, but to spread and become disastrous in its consequences.

The object of my invention is to produce a fire-alarm telegraph which shall be operated automatically without physical force, and by means of the fire itself, at its very commencement, indicate with unerring certainty the street and the number of the building where the fire has commenced to burn at every station in a town or city, or at as many points as may be desired, no matter how far distant, and thereby give the alarm long before the fire could be seen from without, and save the destruction of life and property consequent upon delays.

In carrying out this object my invention consists, first, in constructing a telegraph-line of any desired length, having an electric battery, suitable signal and telegraph apparatus, and alarm-bells at different points, in such a manner as to enter as many buildings as may be desired in a street, or any number of streets, in the place, and to connect the said line within the buildings with suitable apparatus for working the said line automatically by means of the fire itself, so that the number of the building, or the number of the street and that of the building, or any suitable signal, may be sounded or struck at as many points as may be desired within the line, for the purpose of giving the alarm, and at the same moment the exact location of the fire; second, in the construction and employment of an automatic apparatus for the purpose of opening and closing the line in such manner as to strike or sound the desired alarm or signal at the desired points; third, in working automatically, by means of the fire itself, any suitable apparatus for sounding the street and building numbers, or any desired signal for each or both, through such a line as I have described, at different points within the line.

In the accompanying drawings, Sheet No. 1 represents my improved system of telegraph-lines. This system consists in carrying a line-wire, A, through one or more streets, and into and out of as many buildings as may be desired, in such manner as to connect such buildings with said line A, as shown in Fig. 1 of the drawings. This line is connected with a battery located at any convenient point, as shown at B of the same figure, with which the line-wire forms a metallic connection between the positive and negative poles of said battery. The line must be supported and insulated in any suitable manner. The buildings being numbered, the purpose of entering the lines therein is to connect them with suitable automatic mechanism which shall open and close the line A in such manner as to sound or strike the number of the building on fire at any place or places where suitable alarm-bells may be located, as shown at C, Fig. 1.

The apparatus for opening and closing the line described may be located in each building with which the wire is connected, and consists of a break-circuit composed of a stationary plate and a revolving arm. This break-circuit may be operated by any suitable motor. A particular description, therefore, of a motor for this purpose is deemed unnecessary, further than to state that the armature Q thereof, as in the example shown in Fig. 2, must pos-

sess a continuously-automatic vibrating motion, derived from the electric current, for producing a rotary motion by means of a ratchet-wheel and suitable pawls; and it may be provided with an alarm-bell, Q^2, and any suitable clapper, Q^3, operated by the lever R.

The fixed plate D of the break-circuit is mounted upon one of the standards, E, in which are the bearings of the shaft F of the revolving arm G. This plate D is secured to its standard by means of an insulator, *a*, the central opening in which, being larger than the revolving shaft F, allows the latter to pass through it without touching, as shown in Fig. 4. The fixed plate D is provided on its circumference or side with non-conductors, which may consist of insulating material; or spaces may be cut in the metallic plate, so as to allow the spring *c* of the arm G to pass over them without contact with said plate. These breaks or non-conductors are arranged in a novel manner, in two divisions—the first for indicating the street, which for this purpose is numbered, and the other the number of the building from which the alarm emanates. In the drawings the first division represents the number of the street as 13, which is formed by four distinct breaks, 1, 2, 3, and 4, with proper metallic intervals 5 6 7; the interval 5 between the first and second breaks 1 and 2 being twice as great as the others—in this manner, 1 5 2 3 4—so that the revolving spring-arm G *c*, in passing over them, will open and close the circuit to indicate I - - - - III. The second division consists of seven breaks 8 9 10 11 12 13 14, with proper metallic intervals, 15 16 17 18 19 20; those designated 15 and 16 being equal, and, with the breaks 8 9 10, will indicate the number 3. The interval 17 is greater than the others, and separates the number 3 from the number 2, which follows. This number 2 is formed by the breaks 11 12 and interval 18. The interval 19 is the same as that of 17, so as to separate the number 2 from 0 or cipher, which follows. The cipher is made by the breaks 13 and 14 and the short interval 20, so as to open and close the circuit at short intervals, to produce two quick strokes. The two quick strokes always represent the cipher of any number, and is an important feature in my system of signals. The second division, as described, therefore, represents 320, the building numbered, and, in connection with the first division, will make street 13, building 320. The long metallic interval 21 separates the beginning and ending of each series of numbers. The breaks and intervals which indicate the number of the street are arranged so as to make the strokes in quick succession, and those for indicating the building number in slow succession, in order to distinguish between the two. The arm G is secured to its shaft F by means of an insulating-hub, *b*, and revolves with it in the direction of the arrow, Fig. 2. The insulator *b* prevents the current from passing into the gearing, and the metal collar c^2 is connected to the arm G by metal pins *d*, Fig. 4, and to the screw-cup H by the metallic arms *e*, so as to form the connection with the line. The arm G carries a spring, *c*, so as to bear upon the circumference or side of the plate, and cause the breaks or non-conductors, as said arm is revolved, to open and close the circuit. When at rest and ready for operation, the spring-arm *c* is on the metallic interval 21, as shown in Figs. 2 and 3, in order that when the mechanism is set in motion, the number of the street, under this arrangement, will be first indicated. The metallic connection between the stationary brake-plate D and the screw-cup J is made by means of a metallic rod, K, Fig. 2, attached to said plate, and the connecting-wire *f*, Fig. 1. Instead of the fixed break-plate which I have described, a revolving break-wheel may be used for the purpose; or the revolving shaft may be constructed with both, as shown in Fig. 3, for the purpose of working an extra line, P^2, without interfering with the regular line; or both may revolve or be fixed, and provided with spring-arms P^3, for the purpose of opening and closing the circuit of said extra line. In using the two break-circuits, one of them, P, is for the purpose of communicating the alarm—for example, to the residence of the owner of the building on fire—and in this respect is a very important and advantageous addition to my apparatus. In this case one of the break-circuits may be constructed so as to indicate the building number only through the extra line P^2. This extra line may also be used for the purpose of telegraphing between residence and place of business, and for this purpose be provided with suitable keys, P^1, and sounders at each end of the line. The utilization of the fire-alarm for this purpose is a feature of general importance, and greatly increases its capacity for business purposes.

The mechanism which I have described is operated automatically, and the means for accomplishing this consists in the employment of any of the local fire-alarms which are put into operation by the effect of heat—such, for instance, as that patented by Alexander Ross, March 10, 1863, and owned by the subscriber, or that patented by the subscriber May 10, 1870.

The former of these devices is represented at L, Figs. 1 and 5 in Sheet No. 1; and consists of a compound strip, *g*, of two different metals, and an adjustable arm, *g'*, to complete or close the circuit by the action of heat. This instrument is located near the ceiling in the different rooms of the building, and connects with the local battery M, Fig. 1, by the wire N, through the mechanism for working the break-circuit, as described, by the wire O, which mechanism is located in the most convenient part of the building, and connected with the wires from the several rooms.

When the instruments thus constructed and connected are put into the building, the heat-indicator, Fig. 5, is adjusted so as to be closed

whenever the heat reaches the desired degree. The mechanism which it automatically operates is adjusted so that the revolving spring *c* will be upon the interval 21, for the purpose of closing the street-line, and both instruments will be in readiness to communicate the alarm.

From the foregoing description it will be seen that upon the breaking out of the fire in any apartment where the heat-alarm is placed, the circuit will be closed, and instantly set in motion the various parts of the mechanism, so as to strike the alarm throughout the street-line; but as the method by which this is accomplished has been described in connection with the description of the construction of the several parts, it is deemed unnecessary to repeat it here, further than to state that the alarm will be continued so long as the local-alarm device is subjected to the influence of heat.

It will be understood that the line herein described may be provided with the necessary switches, keys, sounders, and lightning-arresters for testing and protecting said line or lines.

The wire A may enter and leave the buildings through pipes for its protection.

The apparatus for opening and closing the circuit may be kept in a box, to prevent interference, &c., therewith, and the line A may be either a metallic circuit, or, with proper ground connections, the circuit may be completed through the earth.

Any of the well-known indicators may be placed within the local circuit embracing the heat-detecter, for the purpose of locating the precise room in the building where the fire may have commenced to burn.

I have stated that the armature Q of the magnet Z has a continuously-automatic vibrating motion, derived from the automatic make and break circuit X Y of the local line O, actuated by the fire itself. This automatic motion is communicated to the lever R, which is pivoted at R^2, and carries a pawl, S, and a hook or catch, T, at its opposite end, so as to take into the teeth of a ratchet-wheel, U, on a shaft, Z^2, having its bearings in the standards E, and which also carries a pinion, V, into which matches a gear-wheel, W, on the shaft F, which carries the revolving arm G *c*, for operating the line A. As the lever R, therefore, is vibrated, it imparts to the said spring-arm G *c* a continuously-revolving motion by means of the ratchet, pawl, and gearing just described.

Having described my invention, I claim—

1. A street-telegraph line or lines, A, constructed so as to enter one or more buildings, and be operated automatically through suitable mechanism by the agency of the fire itself, to produce an alarm simultaneously at different points within the circuit of said street-line, as described.

2. A street telegraph line or lines, A, constructed so as to enter one or more buildings, and be operated automatically by the agency of the fire, in such manner as to indicate by an alarm the street and the number of the building, or the latter only, in which the fire originates, simultaneously at different points within the circuit of said street line or lines, as described.

3. In combination with a street-telegraph line, A, constructed and arranged to enter one or more buildings, a heat-detecter or local fire-alarm for closing a local circuit, and suitable mechanism operated automatically thereby, for opening and closing the circuit of said street-line, for the purpose herein described.

4. The combination of a revolving spring-arm, *c*, and stationary break-plate D, for opening and closing the electric circuit.

5. In a mechanism for opening and closing the electric circuit of a street-telegraph line, operated automatically by a heat-detecter or local fire-alarm, a revolving spring-arm, *c*, in combination with a stationary break-plate, D, by which said circuit is opened and closed, constructed, arranged, and operated as herein described.

6. In a mechanism for automatically opening and closing the electric circuit of a street-line, the break-circuit D thereof, constructed with non-conductors or breaks, arranged in two groups, the divisions in one group separated by long intervals, and the divisions in the other by short intervals, and each group separated by a long space, so as to indicate and communicate the street and the number of the building therein at or to as many points within the circuit as may be desired.

7. In connection with a break-circuit having non conductors or breaks, and metallic intervals for indicating numbers, the method of indicating or sounding the cipher of any number by the use of two or more short breaks and intervals, to produce short, quick signals.

8. The manner of producing a succession of interruptions of an electric circuit by means of mechanism so constructed as to produce a rotary motion on the automatic closing of an electric circuit by a heat-detecter or local fire-alarm.

9. In combination with mechanism set in motion by the action of heat upon a local fire-alarm, as described, a secondary line, P^2, in which the circuit is broken and closed by a revolving break-wheel, P, so as to indicate or sound the number of the street and the number of the building, or the latter only, within said line, without sounding the said alarm within the primary line A, as herein described.

10. In a mechanism for automatically opening and closing the electric circuit of a street-telegraph line, A, by means of the fire itself, the combination therewith of a fixed break-circuit, D, and a revolving break-circuit wheel, P, or two of either, for the purpose of indicating and communicating the street and the number of the building thereon, one or both, to any point or points within the street-line A, and at the same time through an independent line, P^2, as described.

11. In a mechanism for automatically opening and closing one or more street-lines, the combination of the continuously-vibrating armature Q or lever R with its pawl S and hook or catch T, one or both, armature Z, the ratchet-wheel U, and the gearing V and W, with a fixed or revolving break-circuit, D P, or both, the several parts being constructed, arranged, and operated substantially in the manner and for the purpose as herein described.

12. The combination, with a heat-detecter, *g g'*, its local line N O, and battery M, of an automatic electro-magnetic motor, for working one or more break-circuits and the line A by the action of the fire itself, as described.

In testimony whereof I have hereunto set my hand.

WILLIAM B. WATKINS.

Witnesses:
A. E. H. JOHNSON,
T. H. UPPERMAN.