

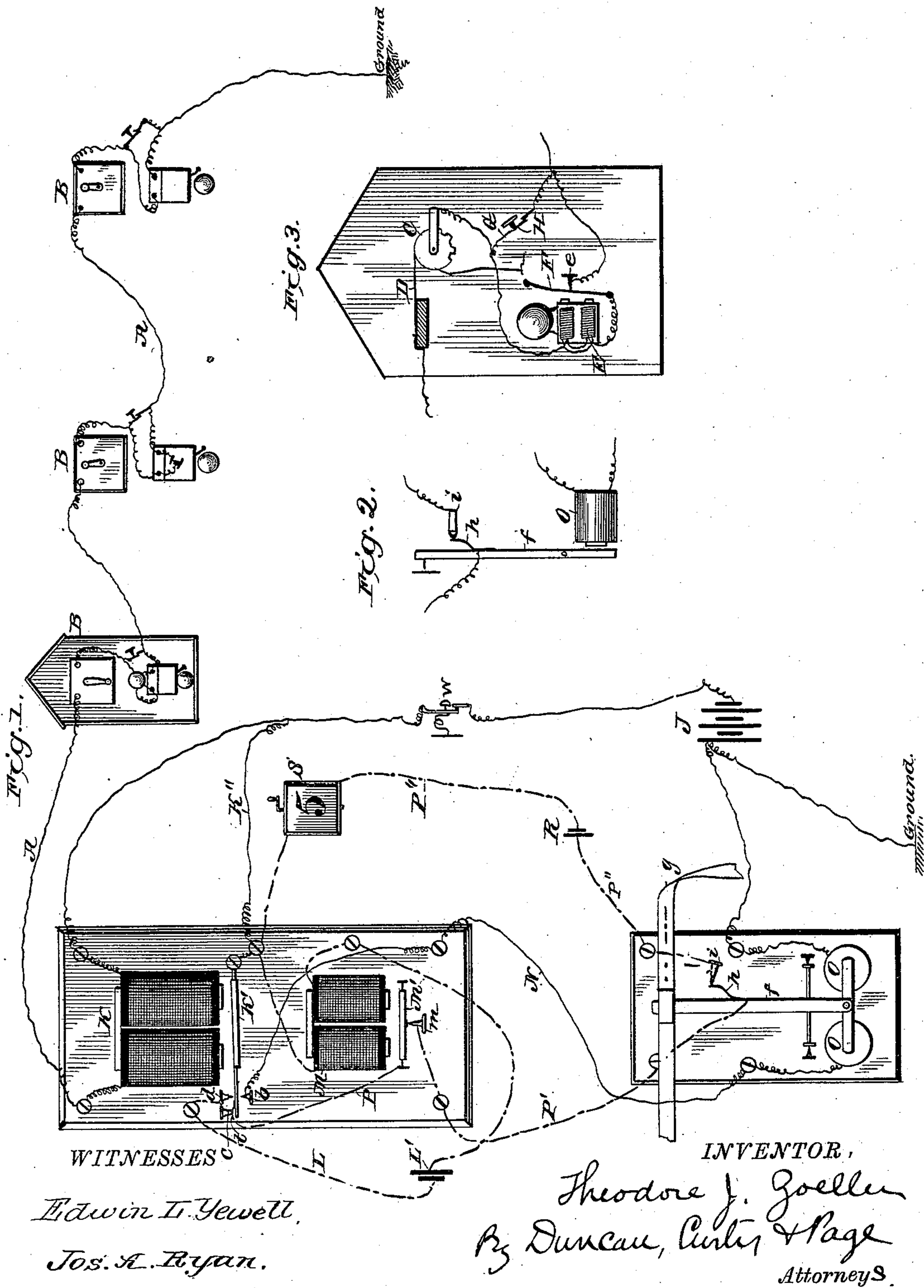
(No Model.)

T. J. ZOELLER.

MUNICIPAL TELEGRAPH SYSTEM.

No. 396,450.

Patented Jan. 22, 1889.



UNITED STATES PATENT OFFICE.

THEODORE J. ZOELLER, OF LOUISVILLE, KENTUCKY, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE UNITED STATES SIGNAL CLOCK COMPANY, OF SAME PLACE.

MUNICIPAL TELEGRAPH SYSTEM.

SPECIFICATION forming part of Letters Patent No. 396,450, dated January 22, 1889.

Application filed January 5, 1888. Serial No. 259,893. (No model.)

To all whom it may concern:

Be it known that I, THEODORE J. ZOELLER, a citizen of the United States, residing at Louisville, in the county of Jefferson and State of Kentucky, have invented certain new and useful Improvements in Municipal Telegraph Systems, of which the following is a specification, reference being had to the drawings accompanying and forming a part of the same.

The object of this invention is to provide an electrical telegraphic or signaling system for cities and towns by means of which signals of various kinds may be transmitted from different points in the town to a central station or stations.

The invention pertains to the general class of municipal telegraphs, including fire-alarms, police-patrol, and other similar electrical systems of signaling.

The particular objects of the invention are to simplify the system as a whole without impairing its efficiency and reliability, and to so reduce its cost as to render it possible for many of those smaller cities and towns to adopt it which have heretofore been unable to employ such systems on account of their great expense.

In carrying out my invention I run from a given point, which may be considered the central station, a given number of circuits, using the ground as a return. I find it desirable to subdivide a city or town into districts, running one circuit to each district, and using, say, four or five signaling-instruments or sets of instruments in each circuit. Of these instruments, those which are located at different points along the line are for transmitting current-impulses to produce certain signals or records at the central station. The instruments at each of such points are constructed or adjusted in such manner that one will effect very rapid makes and breaks in the circuit—i. e., very short current-impulses—while the other produces slower makes and breaks and longer current-impulses.

At the station there are receiving or recording instruments which, either by reason of peculiarities in construction or by a special arrangement of circuit-connections, or both, are adapted to respond one to the short or

rapid impulses and the other to the longer impulses, by which means one circuit or line may be utilized for two distinct kinds of signaling, which may be employed to transmit signals for different purposes or of different significance without interference with one another. The purposes to which I prefer to apply these properties of the system are for recording the movements of watchmen or the police by one kind of impulse and by sending and receiving fire-alarms by the other, or by both combined. I shall therefore describe the invention as applied and adapted to these purposes; but it will be understood that I do not restrict myself to these particular uses.

It is not new to employ with one and the same circuit instruments of different degrees of resistances, or, in other words, of such character that one will be operated by rapid interruptions only and the other by slow makes and breaks only; but my invention differs from these by the peculiarities of construction which I shall now describe.

Figure 1 of the accompanying drawings is a partly-diagrammatic representation of one of the branches or circuits of the system. Fig. 2 is a side view of the operative parts of a register or recorder shown in plan in Fig. 1. Fig. 3 is an enlarged view, in side elevation, of one of the signal-boxes along the line.

As before stated, let a given number of circuits be run from a central station to different portions or districts of a town or city. In connection with each circuit is a set of instruments for receiving, indicating, or recording the signals from different points along the line of these circuits, and at proper and convenient points throughout the district are located a given number of transmitting devices.

A A represent one of the circuits, and B B the signal-boxes or transmitting-instruments connected therewith. These instruments may be inclosed in boxes like the ordinary fire-alarm signal-boxes and secured to posts or otherwise, as may be desired. The main features in each box are illustrated in detail in Fig. 3.

C is a metal disk or wheel with teeth or with insulating-spaces in its periphery similar

lar to the disks heretofore used in messenger and fire-alarm boxes. A contact-spring, D, bears upon the periphery of the disk, and the circuit is carried through the disk and spring, so that if the disk be turned the interruptions in the circuit carried by the spring passing over the insulated parts of the same signals of corresponding character will be sent over the line. Suitable provision is made for turning the disk at an even rate of speed, and I may say that in so far as the mechanical construction and electrical connections are concerned I prefer to construct this device in accordance with the description in United States Patent No. 352,549. There is also in the box an electrical vibrator or instrument which makes and breaks the circuit with great rapidity, such as an ordinary trembler-bell. The magnet E of this instrument sets in motion an armature, F, which has a back-stop, *e*. The circuit is completed through the stop *e* and the armature, so that the moment the armature is drawn off from its stop the circuit is broken and the magnet loses its force. The instrument is included directly in the main circuit; but in order to prevent it from operating a shunt, G, is formed around it and a switch or key, H, included in the shunt. The system being operated on closed circuit, it is only necessary to open the switch H to direct the current through the vibrator.

All the signal-boxes are practically alike except in the number of teeth or insulating spaces on the peripheries of the rotating disks C.

Of course it will be understood that with a suitable register the teeth of the disks may be longer or shorter, as in those forms of instrument which transmit Morse signals. In such case the shortest teeth must be long enough to operate the register; but with the register which I employ the teeth should all be of the same length.

At the central station the instruments and electrical connections are as follows: The circuit A includes a relay-magnet, K, and a line-battery, J, and then goes to ground. The pivoted retractile armature K' of the main relay K vibrates between two independent front stops, *c* *d*, on the side of the magnet and one back-stop, *b*. The armature K', the stop *d*, a wire, L, and battery L' are parts of a local circuit which includes the magnet M of a secondary relay, the armature of which is designated by M', and for which there is a single back contact-stop, *m*. The armature K' is electrically connected to the line A by a wire, K''. Together with this wire and a portion of wire A the stop *b*, wire N, and the main battery J it forms a circuit, including the magnet O of a register or recorder, which consists of a pivoted marking-lever, *f*, operated by the magnet O, to mark or indent a traveling band of paper, *g*. The construction of this device may be greatly varied; but in practice I prefer to employ a

register constructed in accordance with United States Patent No. 303,298, dated August 12, 1884. A third local circuit made through the armature K', stop *c*, wire P, armature M', stop *m*, wire P', a spring, *h*, carried by the marking-lever *f*, a contact-stop, *i*, against which the spring impinges, wire P'', and a battery, R, includes an annunciator-drop, S, which falls when the said circuit is completed. There are thus three local circuits which are in part or wholly under the control of the main relay K. The armatures K' and M' and the annunciator-drop S are sufficiently sensitive to respond to any sudden or short makes or breaks of the circuit. The register, on the other hand, is now sluggish in its movement, an appreciable time being required to move its armature-lever *f* through the necessary space to record a dot.

In Fig. 2, which shows the register in elevation, the several parts are shown in their proper relative positions—that is to say, the contact *i* is on the opposite side of the lever *f* to the strip of paper, so that when the lever *f* is attracted by the magnet to a sufficient extent to perforate the paper the contact between spring *h* and stop *i* is broken. In Fig. 1, which is merely a diagram, these relations are distorted in order to exhibit more clearly the electrical connections.

The manner of using these devices and the manner of operating the system is as follows: When a watchman or a police-patrol has to send in a signal from a certain box, he opens the box and simply turns the handle or mechanism controlling the rotation of the disk C. This sends the proper signal to the station by a succession of slow makes and breaks. On the first break armature K' falls and closes the circuit through stop *b*, wire N, register-magnet O, the armature K', and wires K'' and A. This moves the register-arm and records the signal on the traveling paper band and separates the spring *h* and stop *i*. The moment the circuit is closed again the armature K' rises and breaks the circuit through the register. In rising the armature K' makes contact with stops *c* and *d*, touching a light spring, *t*, on stop *c* first. The annunciator-circuit, although closed at this instant between armature K' and stop *c* and armature M' and stop *m*, is open between spring *h* and stop *i*, which have not yet come together, owing to the slower movement of the lever *f*, and before contact can be established again between spring *h* and stop *i* the stop *d* is encountered by the lever K' and the secondary relay-circuit closed. This separates armature M' and stop *m*, so that the annunciator cannot work. Watchmen's signals, therefore, will not affect the annunciator, but operate the register.

Suppose a fire occurs in the vicinity of one of the boxes. The watchman or key-holder simply presses the key H, which throws the current through the bell or vibrator, and by this means a rapid succession of impulses is sent over the line. These impulses, received at

the station, set in rapid vibration the armature K' , which touches, or is supposed to touch, the stops c , d , and b alternately. The instantaneous contact of the armature K' with the stop b is not sufficient to operate the register, which consequently remains practically unaffected, leaving spring h in contact with stop i ; but, again, when the lever K' drops from its normal position of contact with stops d and c the armature of the secondary relay drops against stop m . In its subsequent upward movement the lever K' encounters the spring t , as above explained, just before it touches the stop d . Hence, for an instant the annunciator-circuit is completed, because lever M' and stop m and spring h and stop i , respectively, are in contact. This causes the drop to fall and indicate the circuit from which the alarm has been sent in. Although in many cases this might be sufficient, it will be desirable for the attendant at the station to depress a key, w , in the main circuit. This stops the vibrator in the signal-box from operation, which is a signal to the watchman that his signal has been received. The latter may then send in the signal by the disk C to indicate the box near which the fire is burning. The latter signal may be received audibly by the attendant at the station by having a bell in the circuit.

This system is capable of many uses for district telegraphing by means of a preconcerted code similar to those I have described, and apparatus may be constructed in a great variety of ways to effect the same result.

Without limiting myself to those as to details, what I claim is—

1. The combination, with an electric circuit and slowly and rapidly operating circuit-breakers or transmitters therein, of a primary and a secondary relay located at a given station, a register and an indicator, and local circuits, those containing the register and secondary relay being controlled by the main or primary relay alone and that containing the indicator being controlled conjointly by the main and secondary relays and the register, as and for the purpose set forth.

2. A central-station apparatus for combined fire and police telegraphs, consisting of a main or primary and a secondary relay and two receiving-instruments—such as a register or recorder and an indicator—combined by means of the following circuits: a local circuit containing the register and closed by the contact of the main relay-armature with its back-stop, a local circuit including the secondary relay and closed by the contact of the main relay-armature with a front stop, d , and a local circuit including the indicator and closed by the simultaneous contact of the main relay-armature with front stop, c , the secondary relay-armature with its back-stop, and a spring on the register-armature with a stop, i , as and for the purpose set forth.

Signed this 31st day of December, 1887.

THEO. J. ZOELLER.

Witnesses:

FRANK B. MURPHY,

FRANK E. HARTLEY.