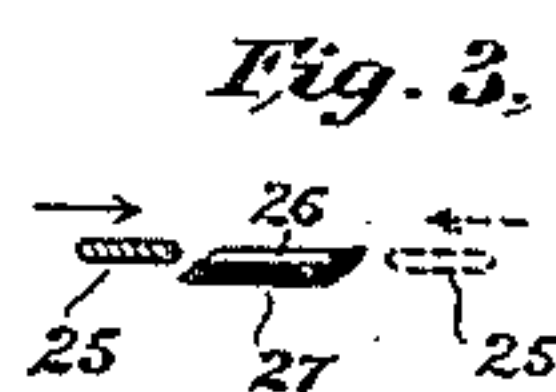
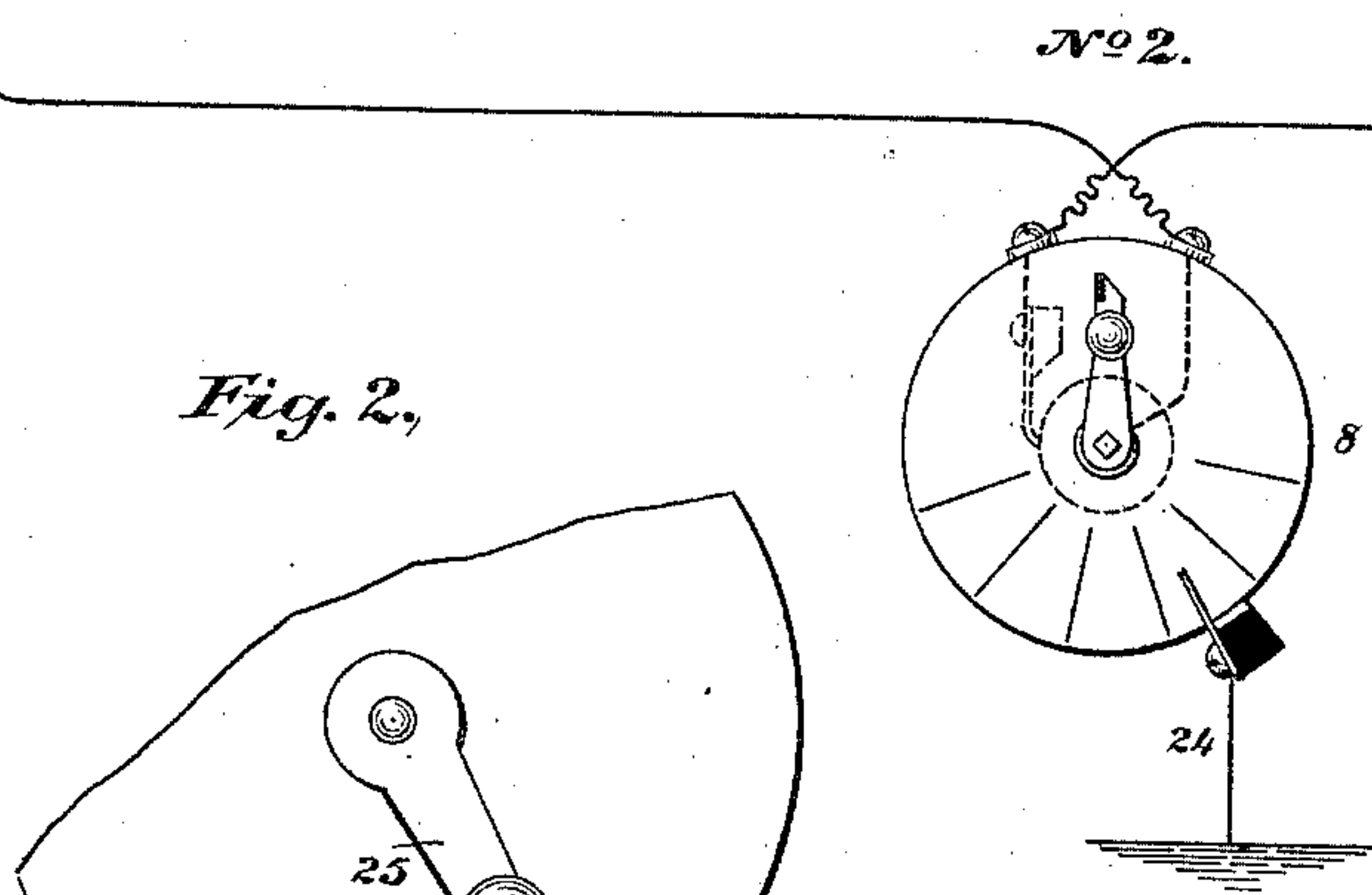
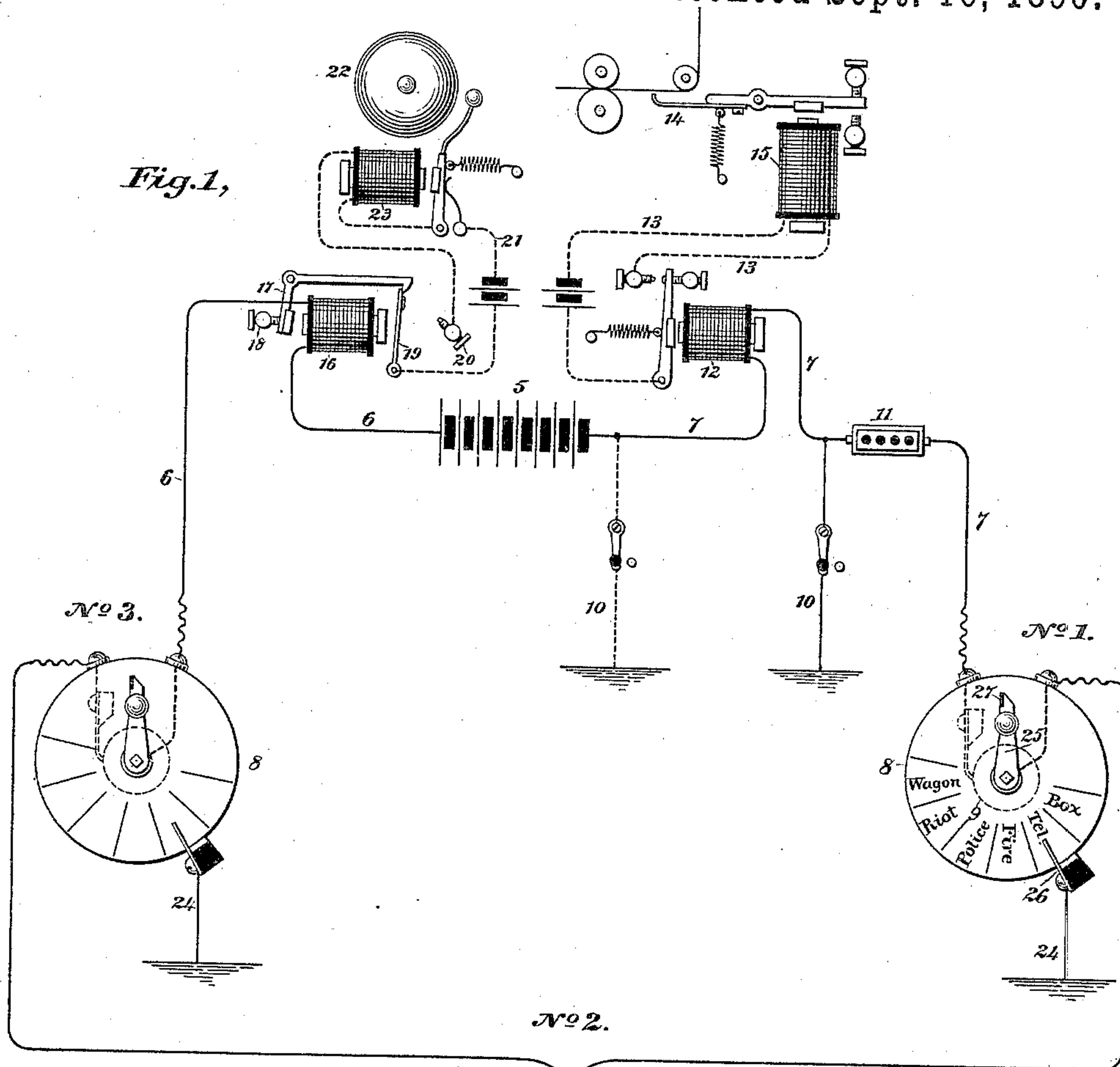


(No Model.)

J. W. STOVER.
MUNICIPAL SIGNALING APPARATUS.

No. 436,747.

Patented Sept. 16, 1890.



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UNITED STATES PATENT OFFICE.

JOSEPH W. STOVER, OF BROOKLYN, NEW YORK.

MUNICIPAL SIGNALING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 436,747, dated September 16, 1890.

Application filed March 21, 1889. Serial No. 304,089. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH W. STOVER, a citizen of the United States, residing at Brooklyn, county of Kings, and State of New York, have invented certain new and useful Improvements in Municipal Signaling Apparatus, of which the following is such a full, clear, and exact description as will enable any one skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, forming part of this specification.

My invention relates to the class of municipal signaling apparatus whereby there may be transmitted from a sub-station to a main station multiple or different signals, all of which are to be recorded at the main station, while only the important ones that demand the attention of the attendant at the main station are to be audibly announced.

The objects of the invention are to provide simple and efficient apparatus for fulfilling the requirements of municipal signaling systems.

The invention has particular reference to the novel and peculiar arrangements of the circuits, the disposition of the various mechanisms therein, and also to the multiple-signaling box, all as hereinafter fully described, and then pointed out in the claims.

In the accompanying drawings, showing my invention, and in which like numbers of reference designate like and corresponding parts throughout, Figure 1 is a diagrammatical view of the improved apparatus. Figs. 2 and 3 are enlarged detail views of parts of the signaling-box hereinafter referred to.

Referring to the drawings, at the main or central station is a battery 5, from which leads a main metallic line 6 7, connecting the sub-stations Nos. 1 2 3 with the main station and forming a closed circuit. At each sub-station there is cut in on the main line a multiple-signaling box 8, designed to transmit any one of several different signals varying in significance and importance. The general construction and operation of this box are well known, and therefore need not be described here. It acts to transmit a signal by breaking and making the main circuit, in an evident man-

ner, through means of the usual break-wheel 9. (Shown dotted in.)

It is desired to discriminate between the signals as to which shall be audibly announced at the central station and which shall not, so that the "patrol" or "report" signal, indicating the report of an officer at a sub-station, shall not be audibly announced, while other signals or calls, the urgency and importance of which demand immediate attention of the central-station attendant, shall be audibly announced in order that the attendant may promptly respond to them. To accomplish this I place a normally-closed ground-connection 10 and a suitable resistance 11, preferably in the side 7 of the main line at the main station, and also locate, preferably in the same side of the line and between the ground 10 and the battery 5, a recorder-relay 12, which controls a local circuit 13 in such way as to operate an ordinary recording device 14, through means of magnet 15, at each change in the main line. In this case the operative change in the circuit 6 7 will be a break, which will be registered by a dot or a dash, according to the prolongation thereof, in a manner that is evident from the drawings. Of course the recording can be done direct by magnet 12 without the intermediary of a local circuit, as 13.

To audibly announce certain calls (the important ones) I locate a relay 16 at the main station, preferably in the opposite side 6 of the main line from where the closed ground 10 is. The armature 17 of this relay is provided with stop 18, and is extended on one side of its pivot-joint into a hooked-shaped piece, which engages with the gravity circuit-closer 19, which is so arranged that when the relay 16 is sufficiently energized to draw down its armature it will drop into contact with the contact 20, thereby closing a local alarm-circuit 21, which effects the ringing of the bell-alarm 22 through means of magnet 23. The armature 17 of the alarm-circuit magnet 16 is designed to close on its magnet only when the full power of battery 5 is thrown on the magnet. The sounding of alarm 22 can therefore only be effected under such condition of the apparatus.

In order to throw the whole of battery 5 onto the magnet 16, I provide each signaling-box 8 with a normally-open ground-connection 24, which is closed on the main line 5 whenever an important or special signal is to be transmitted to the main station. There are numerous ways in which the sub-station ground 24 may be closed to give the audible alarm when certain calls are to be made. In 10 the construction shown this is done by placing the starting-lever 25 of the sub-station signaling-box in circuit with the main line and arranging a trip-contact 26, so as to be tripped thereby as the starting-lever 25 is 15 swung around to set the signal and then runs back to normal position. Though the trip-contact 26 is engaged by lever 25 in both directions of its movement, the two parts are so constructed as to make electrical connection 20 in the forward or signal-setting movement only of the lever. Thus the sub-station ground is closed and the audible alarm at the central station operated by the preliminary operation of the signaling-box and previous to the 25 registering of the transmitted signal. This forms one feature of my present invention.

I show two ways of effecting the grounding of the signaling-box prior to the sending of the signal. In Fig. 1 the starting-lever 25 30 is provided with a tip 27 of insulating material upon one side of the end of the same, so that in moving the lever around to set it at any one of the important signals (which in this case comprise all signals beyond the "call-box," such as "telephone," "police," "fire," 35 &c.) the metallic portion of the lever will make contact with the spring 26 and close the ground, while in the running back of the lever the insulating-tip 27 will strike 26 without closing the ground. In the form shown 40 in Figs. 2 and 3 the trip 26 is formed with inclined side edges to guide the lever, and is provided with the insulating-tip 27 upon the under face of its end. As the lever is swung 45 into position to set an important signal, its under and metallic side rubs over the upper face of the trip 26 and closes ground 24, while upon the return of the lever it passes under the trip, which presents the insulating-tip to the lever 25, thus preventing closing of 50 the ground and the consequent sounding of the alarm 22. As shown, the grounding momentarily of the signaling-box is done automatically by the operation thereof. It may, 55 however, be effected by an independent manipulation; but the automatic arrangement is obviously preferable.

In the signaling-box herewith illustrated only one call—the one labeled "box," which 60 gives the number of the sub-station—will be registered without being announced by the audible alarm 22. This is due to the location of the trip-contact 26, the same being situated between call-box and telephone, so as to 65 be encountered by the lever 25 after the call-box is passed over thereby in the preliminary movement of the lever in setting the signal.

The resistance 11 is to be greater than either the relays 12 and 16, and the permanent ground 10 is to be located between the 70 battery 5 and the resistance in the side of the main line.

The operation of the system will be readily understood. The signals are transmitted by breaks in the main line, caused by the signaling devices at the sub-stations. These breaks 75 are registered by the recorder, owing to the operation of relay 12. To such breaks, however, the relay 16 is non-responsive, for the reason that its armature 17 is so adjusted as 80 not to be drawn down by its magnet when the normal strength of current is on the same. When, however, a sub-station is closed, in transmitting an important signal a part of 85 side 7 of the main line, including the resistance therein, is cut out. This intensifies the current as thrown on the relay 16, which then draws down its armature, which can only be induced to close under this condition, and 90 thus the alarm 22 is sounded. In this way discrimination is made as to the warning or audible announcement of certain signals sent from a sub-station.

Instead of having the resistance 11 in the side 7 of the main line and the ground 10 95 adjacent thereto, I can dispense with resistance 11 and remove the ground 10 from the full-line position to the dotted-in one between relay 12 and battery 5, and then operate the 100 system. Under this condition, upon grounding a box a portion of the side 7 of the main line, including the recorder, will be cut out, as before described, and the recorder will be started and the audible alarm sounded as before. 105

Having thus described my improvements in municipal signaling apparatus, what I claim as my invention, and desire to secure by Letters Patent of the United States, is—

1. In signaling systems for transmitting 110 from sub-stations to a main station multiple signals of different significance and importance, the combination of a battery and a main line leading therefrom and connecting the sub and main stations and normally grounded 115 on one side of the main station, a signal-recording device and a suitable resistance located in the grounded side of the main line at the main station, said recording device responsive to makes and breaks in the main 120 line, a multiple-signaling box located at each sub-station and effecting changes in the main line to transmit signals, said box provided with a normally-open ground and means for connecting the open ground with the main 125 line when the box is operated to send an important signal, and an audible alarm located at the main station in the opposite side of the main line from the normally-grounded side 130 thereof and responsive only upon the grounding of the sub-station box in transmitting an important signal, whereby certain signals transmitted may be registered by the recorder, but only the more important ones announced

by the audible alarm, substantially as and for the purpose set forth.

2. In a signaling system for transmitting from sub-stations to a main station multiple signals of different significance and importance, the combination of a main line connecting the sub-stations with the main station and normally grounded at the main station, a single battery in the circuit of the main line, a signal-recording device located in the line at the main station and responsive to makes and breaks of the circuit, a multiple-signal box located at each sub-station and set for signals by movement in one direction only, and provided with a normally-open ground between the important and unimportant signals, transmitting means for automatically connecting the ground with the main line in setting the signal-box to transmit important signals, and an audible alarm at the main station controlled by the main line and responsive to the grounding of the sub-station signal-box, whereby in operating the box to transmit unimportant signals the open ground may be undisturbed, while in the preparatory operation of the box to transmit important signals the open ground may be closed, in order to operate the audible alarm at the main station, substantially as and for the purpose set forth.

3. In a signaling system for transmitting from sub-stations to a main station multiple signals of different significance and importance, the combination of a battery and a main line leading therefrom and connecting the main and sub stations, and having a normally-closed ground on one side of the line at the main station, a multiple-signaling box at each sub-station acting to transmit important and unimportant signals over the main line and provided with a normally-open ground, and means for closing the open ground on the main line whenever the box is operated to transmit important signals, a relay located at the main station in the main line controlling a local recorder-circuit and responsive to makes and breaks in the main line, and a second relay located at the main station in the opposite side of the main line from where the normal ground is and controlling a local alarm-circuit and responsive when the open ground is closed at a sub-station, whereby the recording apparatus may be operated upon the transmission of certain signals, while the alarm may be operated only when important signals are transmitted, substantially as and for the purpose set forth.

4. In a signaling system for transmitting from sub-stations to a main station multiple signals of different significance and importance, a main metallic line connecting the sub and main stations, a battery in the main line and a normally-closed ground on one side of the battery at the main station, a relay in the main line at the main station and controlling a recorder and responsive to

changes in the main line, a second relay at the main station in the opposite side of the main line from where the normal ground is and of less resistance than the apparatus in the said grounded side at the main station and having its armature out of inductive proximity when the ground-circuit is normal, so as to be responsive only to changes in the ground-circuit, a multiple-signaling box located in the main line at each sub-station and having a normally-open ground, and means for automatically closing the same to actuate the alarm-circuit relay upon the operation of a signaling-box to send an important signal, substantially as and for the purpose set forth.

5. In a signaling system of the class described, the combination, to form means for momentarily grounding a multiple-signaling box at a sub-station, of the vibrating starting-lever of the signaling-box moving in one direction to set the box to transmit a determinate signal and returning in its movement while the set signal is being transmitted, and a trip-contact located in the open ground at the sub-station and tripped by the starting-lever in its vibration, the said trip and lever relatively insulated, so as to be electrically connected only when tripping in the movement of the lever to set the signal, substantially as and for the purpose set forth.

6. In a system for transmitting from sub-stations to a main station multiple signals of different characters, the combination of a multiple-signal box at each sub-station, a main line passing from the sub-stations to the main station, a normally-open ground at each of the sub-stations, a normally-closed ground for the said main line, an electro-magnet in the main line responsive to makes and breaks of the circuit effected by the multiple transmitters at the sub-stations, a battery in the main line, and a second magnet, also in said line, responsive only to increase of current due to cutting out a part of the resistance in the main circuit upon closing a normally-open ground at a sub-station, for the purpose described.

7. In a system for transmitting from sub-stations to a main station multiple signals of different characters, the combination of a multiple-signal box at a sub-station for effecting changes in the main circuit to transmit signals, a permanent ground on the main circuit at the main station, and circuit-controller at the sub-station for closing a normally-open ground and thereby cutting out a portion of the resistance in the main circuit upon the transmission of signals of a certain character, a signal recorder or relay located at the main station in the main line responsive to makes and breaks thereof, and a second relay at the main station in the main circuit having its armature so adjusted as to be only responsive when the current on said relay is intensified by the reduction of the resistance in the main

circuit effected through means of the said circuit-controller closing the normally-open ground.

8. In a system for transmitting from sub-
5 stations to a main station multiple signals of
different importance, the combination of a
main line having a battery therein at the
main station and connecting said station with
the sub-stations, multiple signal boxes set by
10 movement in one direction only, located at
the sub-stations for effecting changes in the
main circuit, circuit-controllers at the sub-
stations for closing an auxiliary circuit be-
tween the important and unimportant sig-
15 nals and cutting out a portion of the main
circuit upon the transmission of an important
signal, a signal-recorder located at the main
station and responsive to changes in the main
circuit, and a relay in the main line at the main
20 station having its armature responsive only
when the said circuit-controller closes the
auxiliary circuit at the sub-station and there-
by intensifies the current thrown on said re-
lay by shunting part of the main-line circuit,
25 substantially as and for the purpose set forth.

9. In a system for transmitting from sub-
stations to a main station multiple signals of
different significance and importance, the

combination of a main line connecting the
sub-stations to the main station and normally 30
grounded at the main station, a battery in
the circuit of the main line at the main sta-
tion, multiple-signaling boxes set by move-
ment in one direction only, located at the sub-
stations for effecting changes in the main cir- 35
cuit, a normally-open ground at each of the
sub-stations between the important and un-
important signals, a circuit-controller at each
of said sub-stations for closing the normally-
open ground-circuit and cutting out a portion 40
of the main circuit upon the transmission of
important signals, and two relays in the main
line at the main station, the one responsive
to and recording all changes in the main cir-
cuit effected by the multiple-signaling boxes 45
at the sub-station, and the other responsive
only to the grounding of the boxes at the sub-
stations and sounding an alarm thereupon.

In testimony whereof I have hereunto set
my hand, in the presence of the two subscrib- 50
ing witnesses, this 12th day of March, 1889.

JOS. W. STOVER.

Witnesses:

PAUL T. C. TUCKER,
WILLIS FOWLER.