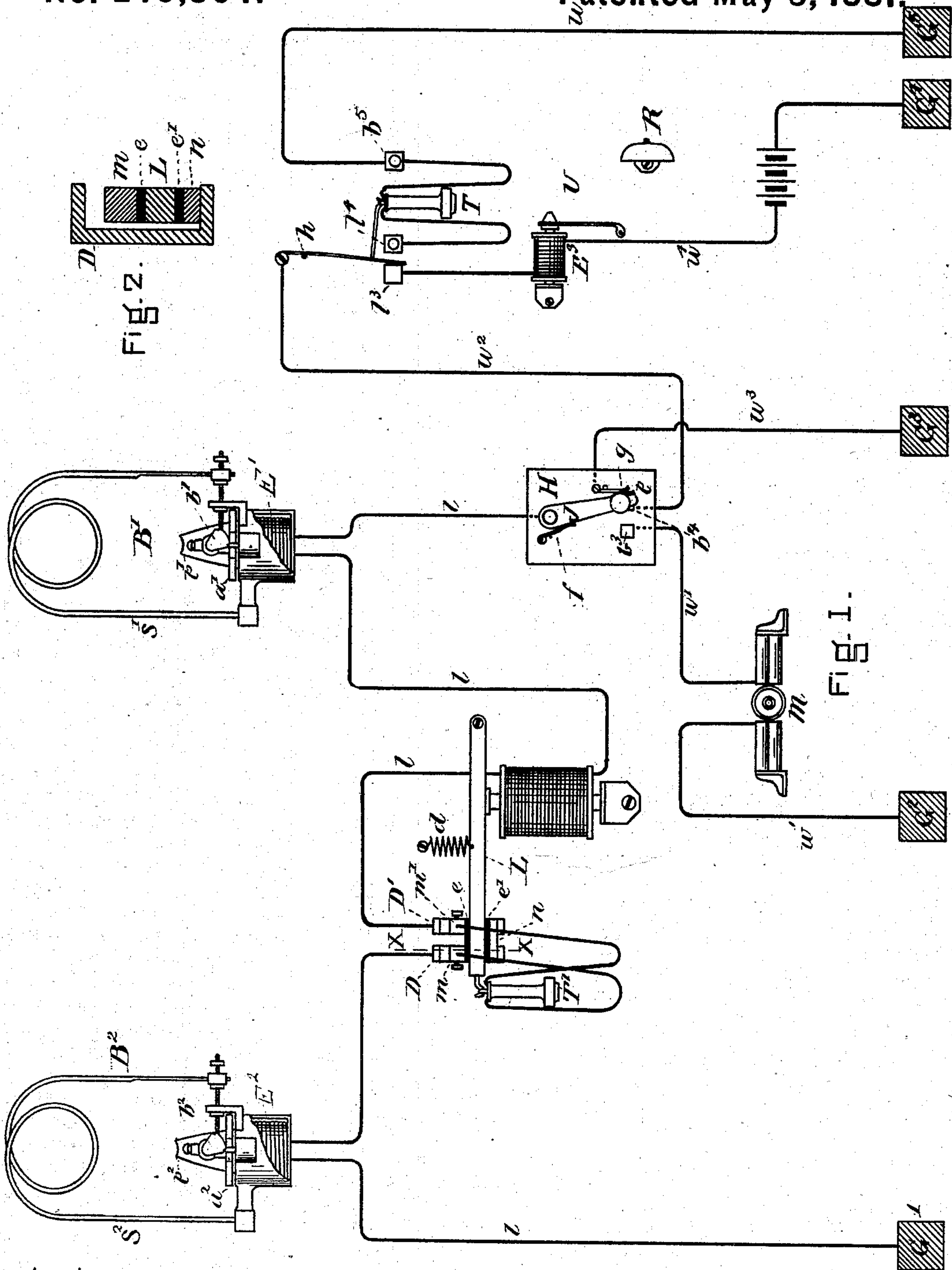


(No Model.)

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Combined Police Telephone Circuit and Gas Lighting
Apparatus.

No. 240,804.

Patented May 3, 1881.



WITNESSES

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COMBINED POLICE-TELEPHONE CIRCUIT AND GAS-LIGHTING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 240,804, dated May 3, 1881.

Application filed March 7, 1881. (No model.)

To all whom it may concern:

Be it known that I, GEORGE D. BANCROFT, of Boston, in the State of Massachusetts, have invented an Improvement in Combined Police-Telephone Circuits and Gas-Lighting Apparatus, of which the following is a specification.

The invention consists, first, in the combination, with a single main wire, of a telephone-circuit containing two or more telephones provided with an independent source or independent sources of electricity, and each telephone having an independent switch, by which it may be brought upon or disconnected from the main line; a gas-lighting circuit containing several burners, at each of which are an electro-magnet for controlling the cock and a wire for lighting the gas, both in the main line, and a suitable battery or magneto-machine provided with means for coming upon the main line to operate the cocks and light the gas at the burners; and, second, in the further combination therewith of an alarm-circuit with an independent battery.

One of the telephones is at a central office. The others are at out-stations, in this specification termed "watch-stations," and should be kept under lock and key.

In the drawings I have illustrated the manner in which two gas-burners and a single watch-station may be worked in connection with a central office, and from the description it will appear that in the same manner any number of telephones and burners may be so worked.

Figure 1 is a diagram illustrating the combined systems. Fig. 2 is a cross-section of a commutator at a watch-station, taken on line *x x*, Fig. 1.

The two burners are marked B^1 and B^2 . They are both lighted at the same instant by the incandescence of platinum wires $p^1 p^2$, these wires being in the main line, which is elsewhere marked *l*. Similar electrical apparatus is used at both burners, and it is necessary to describe that at one burner only; but for convenience in tracing the circuits the apparatus at both has been lettered, the numeral of the burner being added to the letters.

Confining this part of the description to the apparatus at burner B^1 , E^1 is an electro-magnet, and a^1 its armature carrying a small pin,

which, when the armature is up, takes into a notch at one side or the other of a sector, b^1 , rigidly secured to the gas-cock.

S^1 is a thermo-spring connected with the sector b^1 , as shown, and at the temperature of the atmosphere pressing inward to open the cock; but when heated by the gas-flame pressing outward to close the cock, substantially as in patents heretofore granted to me. A current sufficiently strong to cause the electro-magnet to attract its armature will heat the platinum wire p^1 sufficiently to light the gas. It follows that all the burners may be simultaneously lighted by sending a sufficiently strong current over the line, and also that when the gas has been burning long enough to requisitely heat the thermo-springs it may be turned off simultaneously at all the burners by a similar current. To generate the current I employ a magneto-machine. (Shown at *M*.)

The telephone at the central office is marked *T*, the one at the watch-station is marked T^1 . The telephone at the watch-station is normally hung upon a hook in the end of a pivoted lever, *L*, the weight of the telephone overpowering a spring, *d*. The lever *L*, near its free end, which carries the hook, is provided above and below with insulating-plates $e e^1$, the plate *e* carrying two metallic blocks, $m m^1$, to which are secured, by binding-screws, the wires of the telephone T^1 , while beneath the insulating-plate e^1 is secured a single metallic plate, *n*.

$D D^1$ are two bridge-pieces, with the lower or upper projections of which the plate *n* or the blocks $m m^1$ are in contact, accordingly as the telephone is on or off of its hook.

The parts just described form a commutator, and it is obvious that the telephone T^1 is in the main line only when removed from the hook, and also that the circuit is not broken in the commutator when the telephone hangs upon the hook.

G^1, G^2, G^3, G^4 , and G^5 are grounds, whose uses will appear in the description of the mode of operation hereinafter set forth.

H is a board provided with a switch, *J*, and two stops, $b^3 b^4$, the switch *J* being normally in contact with stop b^4 by the force of the spring *f* secured to the board *H*. Stop b^3 is in contact with wire w^1 , leading through the magneto-machine *M* to ground at G^2 . Stop b^4 is

in contact with wire w^2 , leading to the alarm and telephone apparatus at the central-office, as will be described. Switch J is always in contact with line-wire l . It carries a piece of hard rubber, p , which, when the switch is in contact with stop b^4 , strikes against a second spring, g , upon the board H. The arrangement is such that when the switch J is in its normal position, in contact with stop b^4 , contact is broken between stop b^4 and spring g ; but when the switch is shifted to stop b^3 contact is made between spring g and stop b^4 before it is broken between switch J and stop b^4 . Spring g is connected by wire w^3 with ground at G^3 .

At the central office are two other stops, b^3 and b^4 , the latter of which is also a binding-screw, to which, with b^5 , another binding-screw, are connected the wires of the telephone T. A wire, w^4 , leads from stop b^3 , through a bell-magnet, E^3 , and a battery, as shown, to ground at G^4 , while a wire, w^5 , leads from binding-screw b^5 to ground at G^5 . A spring, h , is so located as to be in contact with stop b^3 when the telephone T is hung upon an arm projecting from said spring, and to be in contact with stop or binding-screw b^4 when the telephone is removed from the arm.

R is the bell at the central office. Its hammer U is pivoted, as shown, and in its normal position is held up by the magnet E^3 .

The line-wire l finds ground at G' beyond the most remote burner or watch-station.

At Fig. 1 the apparatus is represented in its normal condition.

The modes of operation and the circuits are as follows:

1. *To call the central office from a watch-station.*—The normal circuit is from ground G' , by line-wire l , through the electric apparatus at burner B^2 to bridge-piece D, plate n , bridge-piece D', to line-wire l again; then through the electric apparatus of the burner B' to switch J; thence by stop b^4 , wire w^2 , to spring h , stop b^3 , wire w^4 , through bell-magnet E^3 and battery to ground at G^4 . The person having the key to the watch-box opens it and takes the telephone T' from its hook. The lever L flies up and momentarily breaks the circuit, thus releasing the bell-hammer U and ringing the bell R. The officer on duty at the central office then takes his telephone T from its hook and the spring h shifts from stop b^3 to stop b^4 . In the meantime the circuit has been restored at the watch-box through the telephone T', and it may now easily be traced in the diagram from G' to G^5 .

2. *To restore the normal police-circuit.*—The person at the watch-box and the operator at the central office hang up their respective telephones, and the latter lifts the bell-tongue U to its former position.

3. *To light or extinguish the gas.*—The operator moves switch J from stop b^4 to stop b^3 and generates a current in the magneto-machine M. The gas-lighting circuit is from ground G' to switch J, as before, but is now from switch J through stop b^3 , wire w' , and the magneto-machine M to ground at G^2 .

4. *To keep the alarm-bell from ringing when lighting or extinguishing the gas.*—As before stated, the spring g makes contact with stop b^4 before switch J breaks contact with that stop. When, therefore, a movement of the switch J would otherwise break the alarm-circuit by leaving stop b^4 the alarm-circuit gets a new ground at G^3 and the bell does not ring.

I claim—

1. In combination with a single line-wire, two electric circuits, neither normally established, the one a telephone-circuit containing two or more telephones provided with an independent source of electricity and brought upon the line, each telephone by its own switch, and the other a gas-lighting circuit containing several burners, each of which is furnished with an electro-magnet controlling its cock and a wire for lighting the gas, both in the main line, the gas-lighting circuit provided also with a battery or magneto-machine of requisite strength, and means for bringing the same upon the main line, substantially as described, for the purpose specified.

2. A central telephone office furnished with an alarm-bell having an independent battery of inferior strength, in combination with a single line-wire, a telephone-circuit, and a gas-lighting circuit, neither of the latter normally established, but each provided with an independent source of electricity, and an independent switching mechanism for bringing it upon the main line, while the alarm-bell is always in its independent battery-circuit, which is broken when a telephone is brought upon the line, and is short-circuited when the gas-lighting circuit is established, substantially as described.

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Witnesses:

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