No. 762,364. PATENTED JUNE 14, 1904.

E. W. E. TOMPSON, DEC'D.

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TELEPHONE CALL INSTRUMENT.

NO MODEL. APPLICATION FILED MAY 18, 1903.

2 SHEETS—SHEET 1.

Fig. 1.

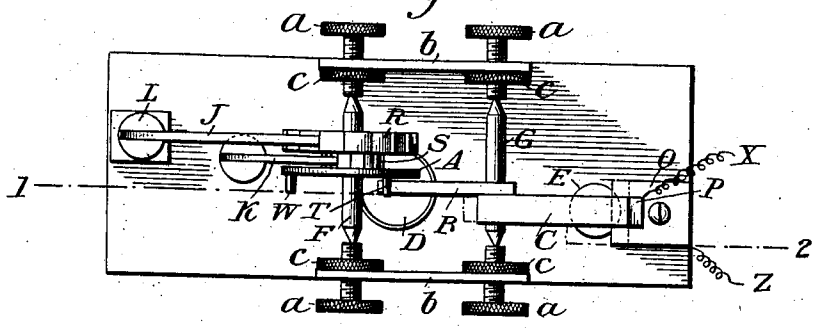


Fig. 2.

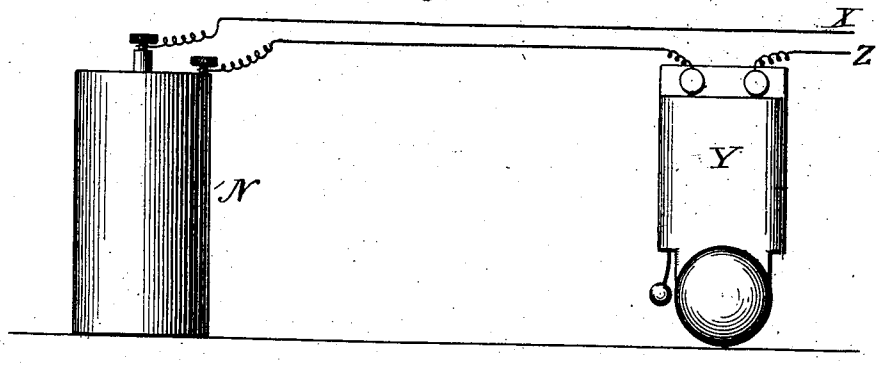
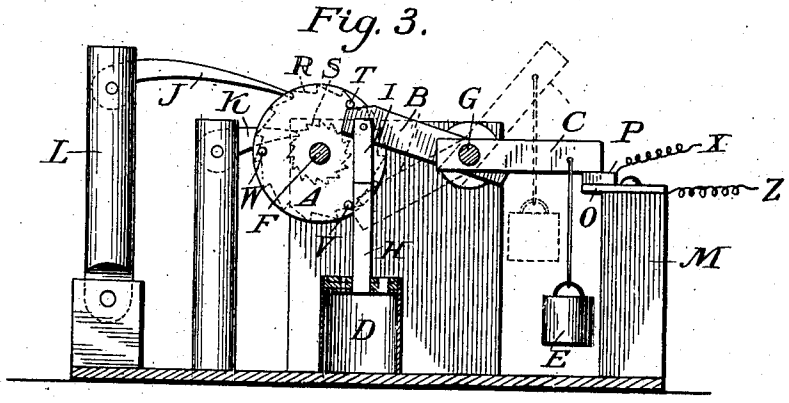


Fig. 3.



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2 SHEETS—SHEET 2.

Fig. 4.

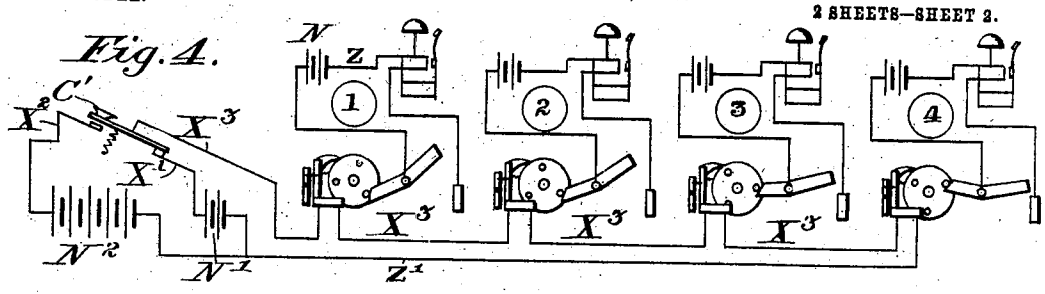


Fig. 5.

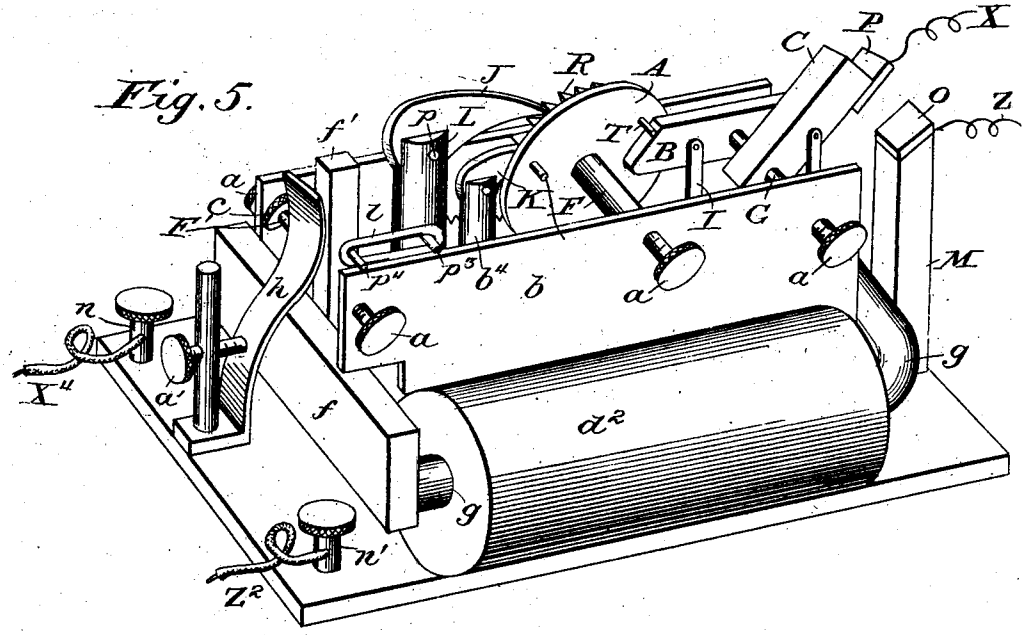
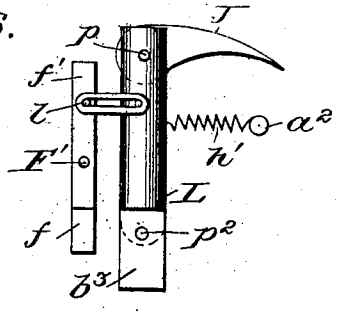


Fig. 6.



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No. 762,364. Patented June 14, 1904.

UNITED STATES PATENT OFFICE.

EDWARD W. E. TOMPSON, OF BROOKLINE, MASSACHUSETTS; RUTH H. TOMPSON ADMINISTRATRIX OF SAID EDWARD W. E. TOMPSON, DECEASED.

TELEPHONE-CALL INSTRUMENT.

SPECIFICATION forming part of Letters Patent No. 762,364, dated June 14, 1904.

Application filed May 18, 1903. Serial No. 157,743. (No model.)

To all whom it may concern:

Be it known that I, EDWARD W. E. TOMPSON, of Brookline, in the county of Norfolk and State of Massachusetts, have invented certain new and useful Improvements in Telephone-Call Instruments, of which the following is a specification.

The object of the invention is to give a signal by ringing a bell or otherwise at any desired telephone only where there are two or more on the same circuit or party-line. I attain this object by the mechanism shown in the accompanying drawings, in which—

Figure 1 is a plan of the entire mechanism. Fig. 2 is an elevation of the auxiliary battery and call-bell. Fig. 3 is a vertical section of part of the machine on line 1 2. Fig. 4 shows four instruments on one main circuit having connections with two electric batteries and the operator's key. Fig. 5 is a view of the entire mechanism and means of actuating lever L. Fig. 6 shows lever L and connections in detail.

Similar letters refer to similar parts throughout the several views.

The mechanism of this invention is described as follows: The frame *b*, supports b^3 b^4 M, and the cylinder of pneumatic valve D are attached to a suitable base. Wheels R S and disk A are attached to shaft F. Wheels R S have fifteen teeth each; but more or less than that number may be used, as occasion requires. Fig. 5 indicates more than fifteen teeth on said wheels. Pivoted ends of shafts F G are held in place by thumb-screws *a*, which pass through the sides of frame *b*, to which they are attached by set-nuts *c*. Ends of thumb-screws *a* are adapted to hold said shafts and allow them to move freely on their axes. Circuit-closer B C is attached to shaft G. Lever L is attached to support b^3 by pin p^2, the upper portion of said lever moving forward and backward. Propelling-pawl J is attached to the upper end of lever L by pin *p*, the free end of pawl J moving upward and downward. With each forward movement of lever L pawl J engages a different tooth of wheel R and rotates the shaft F, wheels R S, and disk A. Check-pawl K is attached to support b^4 by a pin allowing its free end to move upward and downward, engaging in succession each tooth of wheel S as it rotates and preventing backward movement of shaft F.

The wheel S and disk A may be omitted and the pins hereinafter referred to inserted in wheel R and check-pawl K adapted to engage the teeth of wheel R.

The piston of pneumatic valve D, connected with arm B by rod H and link I, has a valve opening outwardly which allows air to escape freely as the piston descends. A small opening in the piston admits air slowly as the piston rises. The pneumatic valve retards the upward movement of arm B and gives time to check it before terminal P is brought into contact with terminal O. Any suitable retarding device may be used. Weight E gives downward movement to arm C when arm B is free and if unchecked brings terminals P and O into contact, thereby closing the local circuit. Terminal P, attached to arm C, rises and descends with it. Terminal O is fixed to support M. Terminal P is connected with one pole of local battery N by wire X. Terminal O is connected with the other pole of local battery N by wire Z, which passes through the electromagnet of the signal-bell Y, so that signal-bell Y rings while the local circuit is closed. The circuit to the local battery is normally open. Pins T V W are inserted in one side of disk A, projecting so as to engage arm B of the circuit-closer B C. As disk A is rotated a projecting pin engages the free end of arm B, forcing it downward and raising the free end of arm C. When arm B is forced to its lowest position, the pin slides off and arm B is raised by weight E. If disk A ceases to rotate as soon as arm B is released, arm C closes the local circuit. If disk A continues to rotate after arm B is released, another projecting pin arrests the movement of arm B and prevents the closing of the local circuit. Any signal electrically operated may be substituted for bell Y. Valve D prevents B from rising quickly and gives ample time to rotate A, and thereby check B before the local circuit is closed.

Means of actuating the lever L and operat-

ing the instruments may be described as follows: The electromagnet d^2 g, the binding-screws n n', the spring h, and support for thumb-screw a' are attached to the base of the instrument. The wires X^4 Z^2 connect n and n', respectively, with the main circuit. Binding-screws n n' are also connected with terminals of the coils of the electromagnet d^2 g, and electric currents passing through the main circuit also pass through the electromagnet d^2 g. Lever f' is attached to shaft F'. Armature f, attached to lever f', oscillates in close proximity to the exposed ends of core g. A strong electric current passing through the coils of the electromagnet d^2 g magnetizes core g, which attracts armature f and swings the upper end of lever f' in the opposite direction, forcing spring h backward. When the strong current ceases to pass through the electromagnet d^2 g, spring h forces lever f' forward and swings armature f away from core g. Spring h is of sufficient strength to resist the action of weak currents used for operating telephones. When in normal position, spring h, pressing against lever f', holds armature f away from core g. Pressure of spring h may be regulated by thumb-screw a'. Spiral spring h' is attached to the upper part of lever L and pulls it forward. Tension of spiral spring h' may be regulated by thumb-screw a^2, to which it is attached. Levers f' and L are connected by link l, which slides freely on pins p^3 p^4 when one of the upper extremities of said levers approaches the other. When armature f, attracted by core g, swings lever f' backward, lever L and pawl J are drawn backward by link l, spring h' is extended, and pawl J engages a tooth of wheel R. When lever f' is pushed forward by spring h, lever L is released from tension of link l, spring h' draws forward lever L and pawl J, and shaft F, wheels R S, and disk A are rotated one tooth.

Fig. 4 shows the main circuit to strong battery N^2 through wires X^2, operator's key C', wire X^3, electromagnets of instruments at stations 1 2 3 4, and return-wire Z', this circuit being normally open; also, circuit to battery N', used when talking over the line, through wire X', operator's key C', wire X^3, electromagnets of the four instruments above mentioned, and return-wire Z', this circuit being normally closed. Telephones may be connected with the main circuit at the several stations. Said instruments being set for use, arms B of the several circuit-closers are in positions to be set free, as follows: at station 1 when disk A is rotated one tooth by ratchet-wheel R, at station 2 when disk A is rotated two teeth, at station 3 when disk A is rotated three teeth, and at station 4 when disk A is rotated four teeth. The several instruments on the same circuit move simultaneously. To set the mechanism of the instruments in motion, two movements of the key C' are necessary. Depressing key C' breaks the circuit to battery N' and closes the circuit to battery N^2, sending a strong electric current over the main circuit. Raising key C' when depressed breaks the circuit to battery N^2 and shuts off the strong current. Moving key C' once downward and once upward causes wheel R to rotate one tooth.

An operator having four instruments properly adjusted and connected with four different telephone-stations on the same circuit desiring to call No. 3 must work—that is, depress and raise—key C' three times in quick succession. Each time the key is worked the wheels and disk in every instrument rotate one tooth. The first time key C' is worked projecting pin on disk A in No. 1 releases arm B and circuit-closer B C is set in motion. Projecting pins in Nos. 2, 3, and 4 press arms B in those instruments downward. The second time key C' is worked arm B in No. 2 is released and circuit-closer B C is set in motion. A projecting pin in No. 1 obstructs arm B and prevents the closing of the circuit to local battery N, attached to that instrument, and projecting pins in Nos. 3 and 4 press arms B downward. The third time key C' is worked arm B in No. 3 is released and circuit-closer B C is set in motion. A projecting pin in No. 2 obstructs arm B, and projecting pins in Nos. 1 and 4 press arms B downward. Having worked his key the number of times necessary to call No. 3, the operator must wait for the instrument at that station to give the signal, which it does as follows: Disk A having ceased to rotate, arm B, released from pressure by projecting pin, is unobstructed, and circuit-closer B C automatically closes the circuit to auxiliary battery N, and signal-bell Y is rung by the electric current from battery N until the circuit is broken. Having allowed time for the signal to be given, the operator must work his key twice more to set the several instruments on the main circuit for future use. The fourth time key C' is worked arm B in No. 4 is released and projecting pins in Nos. 1, 2, and 3 press arms B in those instruments downward. The fifth time key C' is worked a projecting pin obstructs arm B in No. 4 and projecting pins in Nos. 1, 2, and 3 press arms B in those instruments downward and leave each instrument ready for the next call. To call a station, key C' must be worked in quick succession the number of times corresponding to the number of the station desired. Time must then be allowed for the instrument to give its signal, after which the operator's key must be worked the number of times then necessary to set the several instruments on the line for future use. For every call the operator's key C' must be worked once for each instrument on the circuit and once to maintain open circuits to the several local batteries of all the instruments.

I make no claim to the invention of electromagnets, ratchets, or ratchet-wheels, electric battery, or bell.

What I do claim as my invention, and desire to secure by Letters Patent of the United States, is—

1. In a telephone system a telephone-call instrument a normally open local circuit, including an auxiliary battery and a signal-bell; a circuit-closer adapted to bring the terminals of said circuit in contact, and cause said bell to ring, a pneumatic valve, a weight, a propelling-lever, a propelling-pawl, a check-pawl, a ratchet-wheel rotatable in one direction by said propelling-pawl, a ratchet-wheel controllable by said check-pawl so that it may rotate in one direction only, a disk with projecting pins adapted to engage and control said circuit-closer and so adjusted as to cause said circuit-closer to bring said terminals in contact only when said disk is rotated by the proper number of movements of said propelling-pawl; and a rotatable shaft to which said wheels and disk are attached; in combination with a strong battery connected with the main line, and having a normally open circuit, for operating telephone-call instruments, a weaker battery connected with the main line, and having a normally closed circuit, for operating telephones, a main-line electric circuit including a plurality of telephone-call instruments and telephones in different localities or stations, a circuit changer or key adapted to control the circuits to batteries connected with said main line; each telephone-call instrument having an electromagnet operated from the source of electric power, a movable armature with lever, a spring with thumb-screw, a link connecting said armature-lever with said propelling-lever, a spring to move said propelling-lever in one direction, and a thumb-screw to regulate tension of said spring; and a source of electric power to operate.

2. In a telephone system a selective apparatus for causing a signal to be given at the station desired, consisting of a propelling-lever, a propelling-pawl, a check-pawl, a ratchet-wheel rotatable in one direction by said propelling-pawl, a ratchet-wheel that may rotate in one direction only, controllable by said check-pawl, a normally open local circuit having terminals adapted to be brought in contact, and including a local battery and signal-bell; a circuit-closer adapted to bring the terminals of said local circuit in contact and cause said signal-bell to ring when the station at which said bell is located is called, a pneumatic valve connected with one arm of said circuit-closer and adapted to retard the upward movement of said arm, a weight attached to the other arm of said circuit-closer, a disk with projecting pins, adapted to engage and control said circuit-closer so that the same may bring the terminals of said local battery in contact only when said disk and pins without intermission make the number of movements appropriate to call the station at which said disk is located, a rotatable shaft to which said wheels and disk are attached, in combination with a main circuit, an electric battery, an operator's key controlling electric currents over said main circuit, and means for actuating said propelling-lever, said means being operated by the current from said battery.

3. In a telephone system a selective apparatus, consisting of a circuit-closer having two arms attached to a movable shaft, a weight attached to one of said arms, and adapted to cause said circuit-closer to bring in contact the terminals of a local circuit, a pneumatic valve connected with the other said arm, and adapted to retard the movement of said circuit-closer, a rotatable disk with projecting pins, so placed as to engage said circuit-closer, and control its movements; said circuit-closer, weight, valve and disk being adapted to cause a signal-bell to ring, only when the station at which they are located is called; in combination with a swinging armature with lever, a main line, an electromagnet connected with said main line to attract said armature, a spring to repel said armature, a propelling-lever with spring attached, a thumb-screw to regulate tension of said spring, a link connecting the armature-lever with the propelling-lever, a ratchet-wheel and propelling-pawl to rotate said disk in one direction, a second ratchet-wheel and check-pawl to prevent backward movement, a local circuit including an auxiliary battery and signal-bell, an electric battery connected with said main circuit, and a key controlling said main circuit.

In testimony whereof I have affixed my signature in presence of two witnesses.

EDWARD W. E. TOMPSON.

Witnesses:
EDWARD S. TOMPSON,
NATHUM WARD TOMPSON.