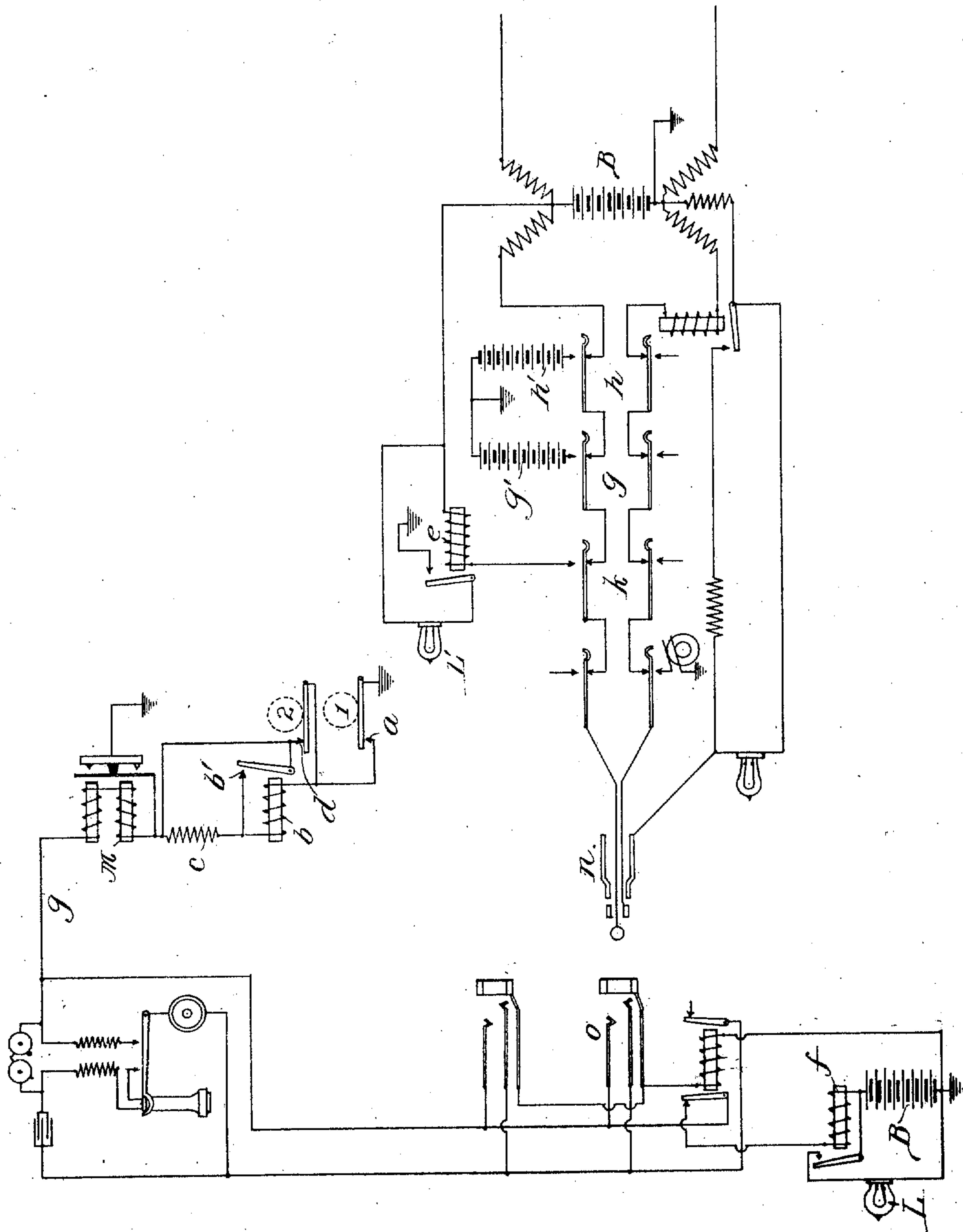


No. 850,349.

PATENTED APR. 16, 1907.

H. M. CRANE.  
CIRCUIT FOR COIN COLLECTORS.

APPLICATION FILED FEB. 13, 1906.



Witnesses:  
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Att'y

# UNITED STATES PATENT OFFICE.

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## CIRCUIT FOR COIN-COLLECTORS.

No. 850,349.

Specification of Letters Patent.

Patented April 16, 1907.

Application filed February 13, 1906. Serial No. 300,928.

*To all whom it may concern:*

Be it known that I, HENRY M. CRANE, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented a certain new and useful Improvement in Circuits for Coin-Collectors, of which the following is a full, clear, concise, and exact description.

My invention relates to a coin-collecting telephone system; and its object is to provide an improved arrangement of the coin-controlled circuit for coin-collectors where the deposit of one or more coins may be required.

My invention provides simple means for testing to determine whether the subscriber has deposited the coins required of him and also means for enabling the operator at the central office to refund the coin or coins or deposit them in the cash-box without aid from the subscriber.

In my invention the branch circuit, which includes the usual coin-operating magnet, also includes a high resistance in series with a relay which controls a short circuit about said resistance. A normally closed short circuit about both the resistance and the relay has contacts controlled by a coin deposited in the coin-receiving apparatus.

I will describe my invention more particularly by reference to the accompanying drawing, which is a diagrammatic view showing a telephone system embodying my invention and illustrating by conventional symbols the apparatus at a subscriber's station and at the central office.

The cord and line circuit in connection with which I have illustrated my invention are of well-known types, and hence a detailed description thereof is unnecessary.

Referring to the drawing, the branch circuit *g* to ground from the tip side of the line includes the usual polarized magnet *M* for controlling the disposal of a coin or coins 1 2, deposited by the subscriber in his coin-receiving apparatus. A non-inductive resistance *c* and a relay *b* are in series with the magnet *M*. The resistance *c* is of sufficient value to prevent the operation of relay *b* or the relay *e* in the cord-circuit when included in circuit with said relays and the common central office battery. The branch circuit *g* is normally open at contact *a*, which is adapted to be closed by the coin 1. A normally closed short circuit of both resistance

*c* and relay *b* is adapted to be opened at contact *d* therein by the deposit of a second coin 2. A normally open short circuit of resistance *c* alone is controlled by the relay *b*.

The operation of the system is as follows: A subscriber desiring a connection deposits a coin 1 in the coin-receiving apparatus, thereby closing contact *a*. A circuit is thus completed from ground at the subscriber's station through contact *a*, the short circuit of relay *b*, and resistance *c*, normally closed at contact *d*, magnet *M*, the tip side of the line, relay *f*, battery *B* to ground at the central station. The relay *f* operates its armature to close a local circuit, including lamp *L* or other signal at the central office. The operator observing the signal at the central office inserts her answering-plug *n* in the spring-jack *o* and ascertains the subscriber's wishes in the usual manner.

In case the deposit of a second coin is required of the calling subscriber my invention provides simple means for testing for said coin. The deposit of coin 2 opens contact *d*. Hence when the operator actuates her test-key *k* the circuit closed from ground at the central station through battery *B*, test-relay *e*, the tip side of the line, and the branch *g* to ground includes resistance *c*, the short circuit thereof being open at *d*. Owing to the high resistance *c* sufficient current does not flow through the line to operate relay *e*, and hence the test-lamp *L'* is not lighted. Moreover, current from battery *B*, owing to the resistance *c*, is insufficient to energize relay *b* to attract its armature *c'* to close the short circuit about resistance *c*. The fact that the lamp *L'* is not lighted when the test-key *k* is operated indicates to the operator that the second coin has been deposited. If the second coin has not been deposited when the test-key is operated, the resistance *c* is short-circuited through contact *d*, and sufficient current passes through relay *e* to close the circuit of the test-lamp, the lighting of said lamp indicating that a second coin has not been deposited.

When the operator wishes to deposit or refund the coins, she does so in the usual manner by operating key *g* or *h*, sending a high-voltage direct current from battery *g'* or *h'*, respectively, over the branch line *g*. The relay *b* is thereupon operated and closes at contact *b'* the short circuit about resistance



c, thereby allowing the coin-controlling magnet M to receive sufficient current to operate in the usual manner the mechanism for disposing of the coin.

5 Having thus described my invention, I claim—

1. The combination with a signaling-circuit including an indicating device, of normally open contacts in said circuit adapted to be closed by a coin to actuate the indicating device, an electromagnetically-operated test-signaling device adapted to be connected to said circuit, a resistance in the circuit rendering said signaling device inoperative, and  
15 a short circuit of said resistance having coin-controlled contacts.

2. The combination with a signaling-circuit including an indicating device, of normally open contacts in said circuit adapted to be closed by a coin to actuate the indicating device, an electromagnetically-operated test-signaling device adapted to be connected to said circuit, a resistance in the circuit rendering said signaling device inoperative, and  
25 a short circuit of said resistance having normally closed contacts adapted to be opened by a coin.

3. The combination with a telephone-line extending from a subscriber's station to a  
30 central office, of a coin-receiving apparatus at the subscriber's station, a branch circuit of said telephone-line including an electromagnet for controlling the disposal of coin deposited in the coin-receiving apparatus, an electromagnetically-operated test-signal device included in a circuit adapted to be connected to said telephone-line, a resistance in  
35 said branch circuit rendering said test-signal inoperative, a short circuit of said resistance

having coin-controlled contacts, an additional short circuit of said resistance having normally open contacts, a relay in the branch circuit controlling said short circuit, said relay being unresponsive to signaling-currents, and means at the central office for impressing upon the telephone-line current which  
40 will operate said relay to short-circuit said resistance, thereby removing said resistance from the circuit of said coin-controlling magnet.

4. In a telephone system, the combination with a signaling-circuit extending from a subscriber's station to a central office, of an indicating device included in said circuit, a coin-receiving apparatus at the subscriber's station, normally open contacts in said circuit adapted to be closed by a coin to actuate the indicating device, an electromagnetically-operated test-signaling device adapted to be connected to said circuit, a resistance in the circuit rendering said signaling device inoperative, a short circuit of said resistance having coin-controlled contacts, an electromagnet for controlling the disposal of coin deposited in said coin-receiving apparatus, a  
50 relay in the signaling-circuit, a short circuit of said resistance controlled by said relay, and means at the central office for impressing upon the circuit current which will operate said relay to cut out said resistance from the circuit of the coin-controlling magnet.

In witness whereof I hereunto subscribe my name this 29th day of January, A. D. 1906.

HENRY M. CRANE.

Witnesses:

ROBERT WHITE, Jr.,  
GEORGE E. MATHER.