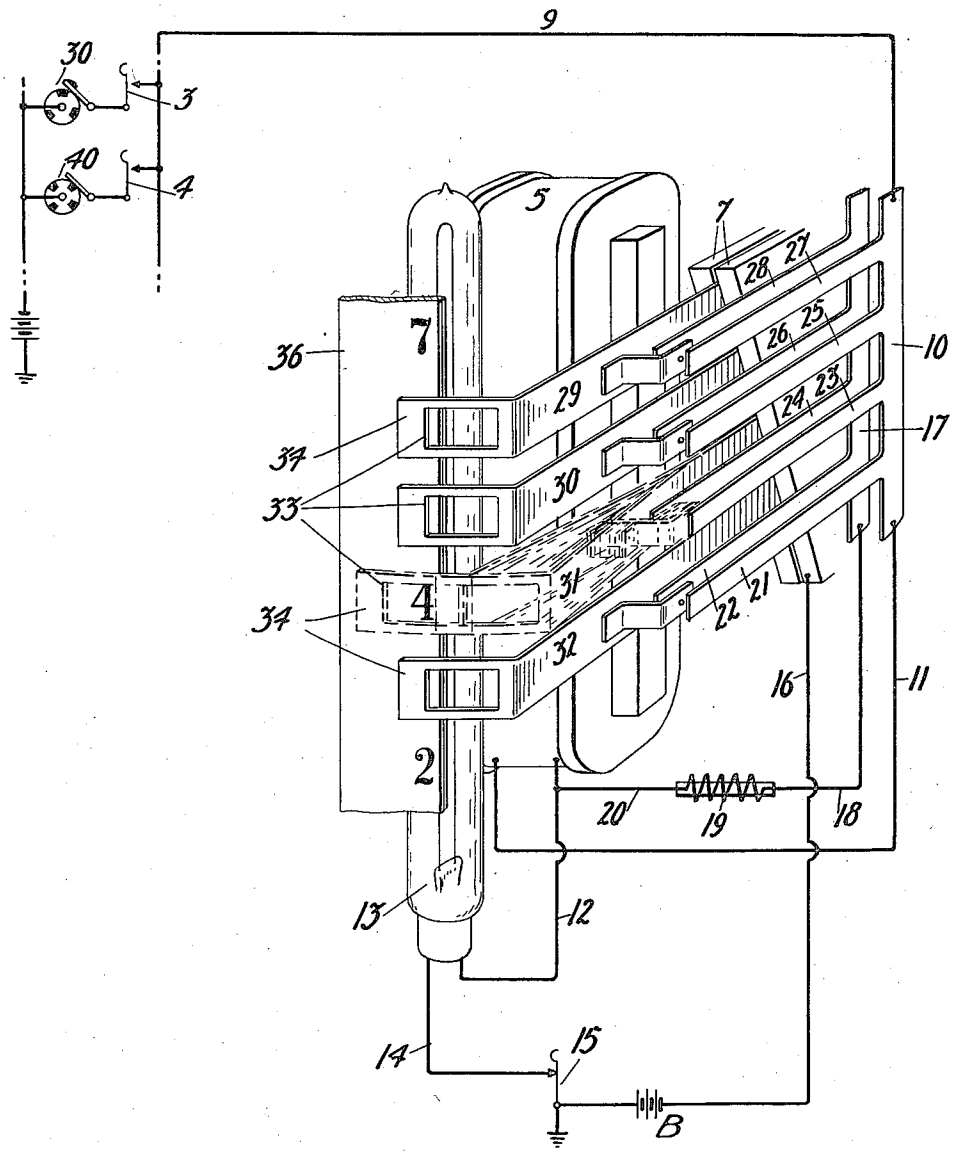
J. A. HALL.

INDICATING DEVICE.

APPLICATION FILED OCT. 20, 1916.

1,262,333. Patented Apr. 9, 1918.



Inventor:
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UNITED STATES PATENT OFFICE.

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INDICATING DEVICE.

1,262,333. Specification of Letters Patent. Patented Apr. 9, 1918.

Application filed October 20, 1916. Serial No. 126,722.

To all whom it may concern:

Be it known that I, JOHN A. HALL, a citizen of the United States, residing at East Orange, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Indicating Devices, of which the following is a full, clear, concise, and exact description.

This invention relates to indicating devices and more particularly to such devices for use in telephone systems.

The object of this invention is to provide new and simple means for displaying a character in such a device.

A feature of this invention is the provision of means for displaying a character by rapidly vibrating the shutter which normally conceals such character.

Another feature is means for illuminating the character during that period of vibration of the concealing shutter in which the character is displayed.

It is believed that the invention will best be understood by reference to the drawing, which shows an indicating device embodying this invention.

Referring to the drawing, the indicating device consists of a set of tuned reeds 29, 30, 31, 32, etc., (only four being shown), which are held in a frame 7. Each reed is tuned to a separate and distinct frequency. A magnet 5 is secured to the frame in any substantial manner (not shown). This magnet is so arranged with respect to the set of reeds that when it is energized by an interrupted current it starts the one reed of the set in vibration which is tuned to the same frequency as that of the energizing current.

The free end of each reed has a shutter 34 secured thereto, which normally conceals a particular character on a plate of translucent glass 36. Each shutter has an opening 33 provided therein so that, as the reed is vibrated, the character normally concealed thereby is covered only while the reed is passing through its normal position. As the motion of the shutter is harmonic, the rate of movement when passing through the normal position is maximum, and the rate of movement at either end, at which time the character is displayed, is a minimum. The character will therefore be displayed during the greater part of the period of vibration, thus allowing it to be easily distinguished.

A bank of keys, of which only two, 3 and 4, are shown, is arranged according to the system of characters used. Each key is connected to battery through a commutator arranged to interrupt the circuit at a frequency corresponding to that of the tuned reed associated with the same character in the indicating device.

An electrical lamp 13 is placed behind the plate of translucent glass and serves to illuminate the characters which are of opaque material to enable them to be more plainly seen. This is accomplished by having the reed close a circuit for the lamp at each end of its movement, thus giving the lamp its maximum brilliancy at these times. Two sets of contact springs are provided for this purpose.

The operation of the device is as follows. Let us assume that the number to be indicated is 4. The key corresponding to the numeral 4 is pressed, closing the circuit from ground, commutator 40 making forty interruptions a second, key 4, conductor 9, contact bar 10, conductor 11, magnet 5, conductor 12, lamp 13, conductor 14, key 15 to ground.

In accordance with our assumption that the circuit is interrupted forty times per second, the reed 31 at the indicating device will be tuned to the same frequency. This reed will, therefore, begin to vibrate with such an amplitude that numeral 4, normally concealed by the shutter 34, is displayed in the manner already described.

During the vibration of the reed, a circuit for an intermittent current is closed, when the reed is at the right-hand end of its movement, from ground, battery B, conductor 16, reed 31, contact spring 23, contact bar 10, conductor 11, magnet 5, conductor 12, lamp 13, conductor 14, key 15 to ground. Since this intermittent current flows through the magnet 5 at the same frequency to which the reed is tuned, the reed will continue to vibrate until this circuit, just described, is broken by pressing key 15. It will be noticed that the lamp 13 is included in this circuit, and, therefore, will be at its maximum brilliancy when the numeral 4 on the plate 36 is displayed, as at this time the reed 31 will be at its extreme right-hand end of its movement.

The reed 31, when at the left-hand end of its movement, closes another circuit for lamp 13, which may be traced as follows: from

ground, battery B, conductor 16, reed 31, contact spring 24, contact bar 17, conductor 18, impedance coil 19, conductors 20 and 12, lamp 13, conductor 14, key 15, to ground.

Coil 19 contains the same amount of impedance as the magnet 5, so that the total impedance of the circuit just traced is the same as the impedance of the circuit previously described through the reed and contact spring 23. The amplitude of the current in both circuits will, therefore, be the same so that the maximum brilliancy of the lamp 13 also will be the same in each case.

It should be noted that any other device for generating intermittent current of different frequencies may be used, and that other frequencies than those herein indicated may be used, as long as the reeds of the indicating device are tuned accordingly.

What is claimed is:

1. In an indicating device, a character, a member normally concealing said character, a magnet for vibrating said member to display said character, a circuit for initially energizing said magnet to start said member vibrating, and a circuit completed by the vibration of said member for energizing said magnet to maintain said member vibrating.

2. In an indicating device, a plurality of characters, a plurality of tuned reeds, each reed being tuned to a different frequency of vibration and also having a member attached thereto for normally concealing one of said characters, a magnet, a circuit for said magnet, means for supplying currents of different frequencies to said magnet for selectively vibrating said reeds to display any desired one of the characters normally concealed by said members, and a circuit for said magnet completed by the vibration of the selected reed for maintaining said selected reed vibrating.

3. In a vibrating device, a character, a member normally concealing said character, means for vibrating said member to display said character, an electric lamp for illuminating said character, and circuits for said lamp completed by said means during that period of vibration of said member in which the character is completely uncovered.

4. In an indicating device, a plurality of characters, a plurality of tuned reeds each reed having a member attached thereto for normally concealing one of said characters, means for selectively vibrating said reeds to display any desired one of the characters normally concealed by the member, and an electric lamp for illuminating said characters and circuits for said lamp completed by the selected vibrating reed during that period of its vibration in which the character is completely uncovered.

In witness whereof, I hereunto subscribe my name this 19th day of October A. D., 1916.

JOHN A. HALL.