

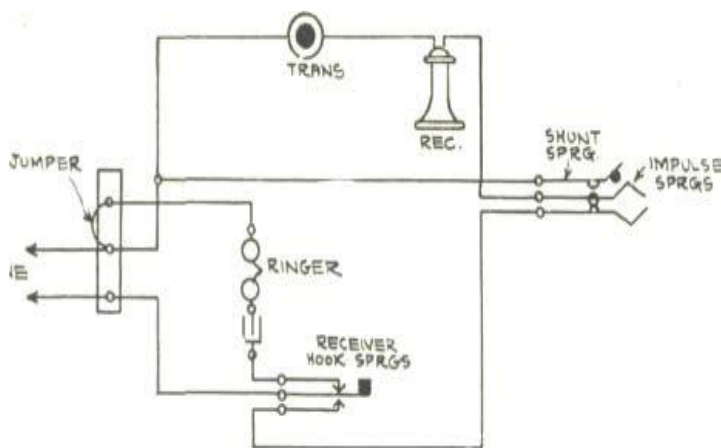
Automatic Electric



In Australia called the PMG type 35 and known locally as the "Geelong" set because many were used with Australia's first Strowger (AE) exchange installed at Geelong Victoria in 1912. The Australian version was typically wood, painted black and of cheap but durable construction - fully imported from the USA.

Because the (wooden version) phone was used in reasonable numbers in Australia and the USA and reasonable numbers have survived, more information has been requested regarding their relatively unusual circuit arrangement. When we examine the following picture, the obvious lack of an “induction coil” makes this phone quite different to almost all other dial telephone circuits of the 1930s. Another significant difference is the absence of permanent magnets in the bell receiver.

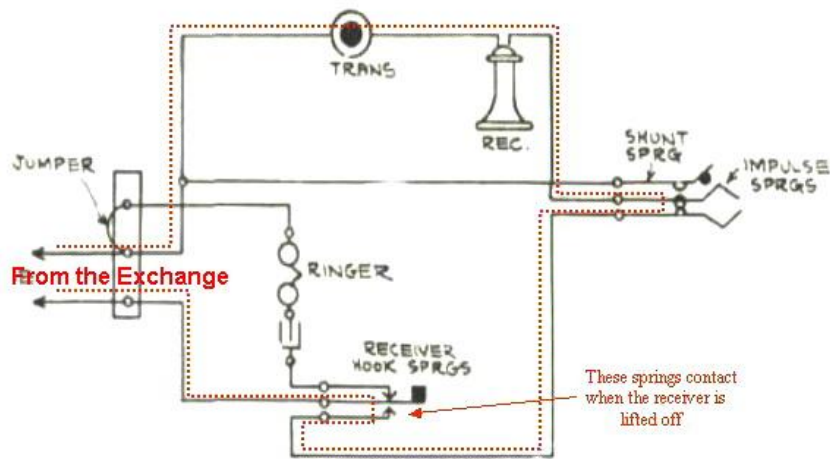
Automatic Electric Co (Metal Version).



Although the circuit is electrically the same, we will deal with the circuit principles by looking at the circuit diagram for the Metal version of the Automatic Electric Co telephone, purely because it is drawn in a manner that is easier to understand. Immediately obvious in this preceding circuit is the lack of an Induction Coil. This is often called an Anti Side-Tone Induction Coil, or ASTIC.

Over time and with different telephone manufacturers, there have been a number of variations to the Induction Coil Circuitry, but the basic requirement is to reduce the level of noise from the (local) microphone that is reproduced in the local receiver. This effect of excessive side-tone will be that background noise that is reproduced in the local earpiece can make the other callers more difficult to hear and understand.

Imagine our experiences in a very noisy environment, where we need to cover up the mouthpiece to hear the caller – without the anti side-tone circuitry the problem is magnified.



Following the red (dotted) lines added to the circuit diagram, we could see that the transmission currents from and to the telephone exchange would pass through the transmitter (TRANS) and receiver (REC) in series.

This will cause high levels of background noise and can even cause “howling” which is the phenomenon

that occurs when a transmitter is placed too close to a receiver and the resulting resonating high pitched tone. This is often heard when a stage performer has the microphone too close to their amplifier.

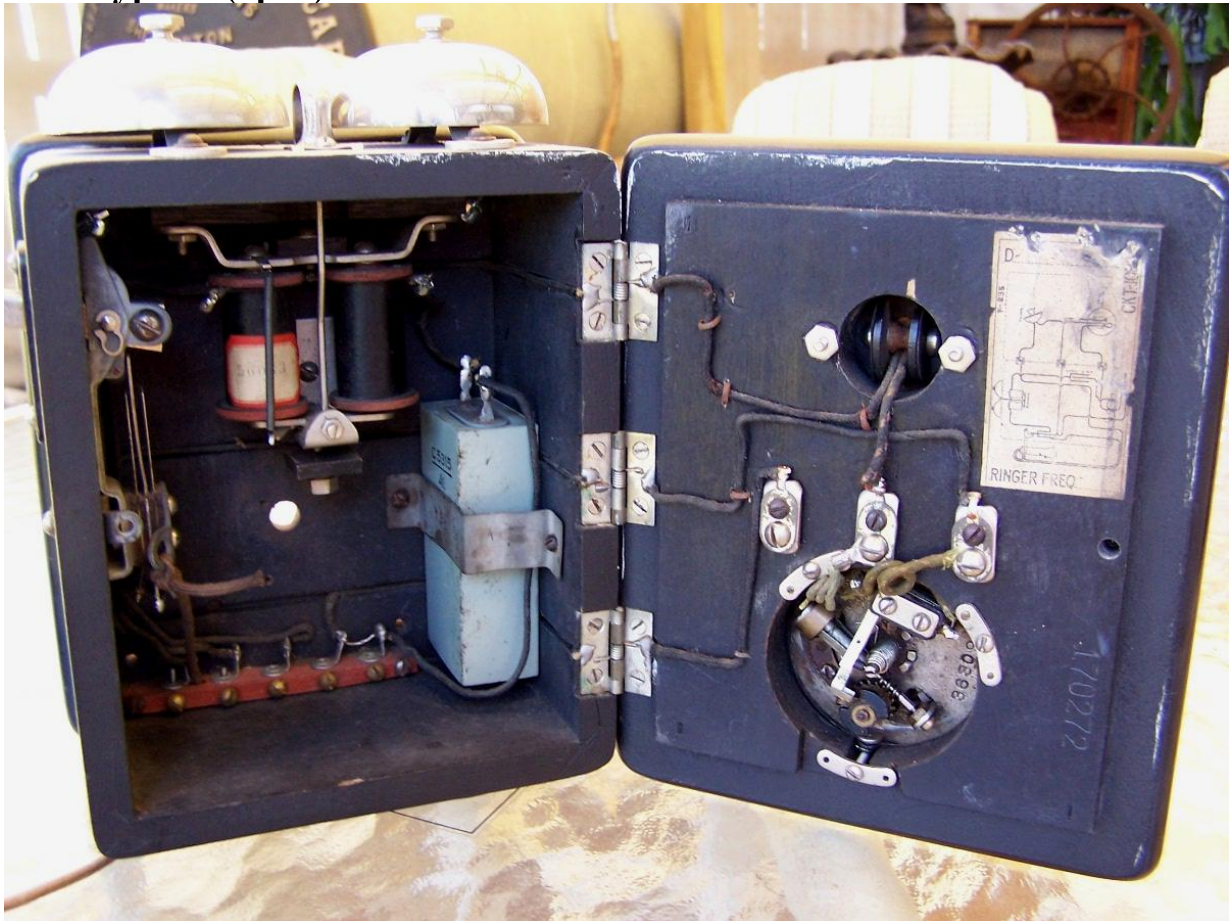
With this type of circuitry is that permanent magnets can be omitted from the receiver due to the high level of current flowing through the receivers coil windings.

A serious shortcoming would also have been the noisy clicks produced from the current interruptions as the dial impulse springs make and break to produce the impulse train for the required dialled number.

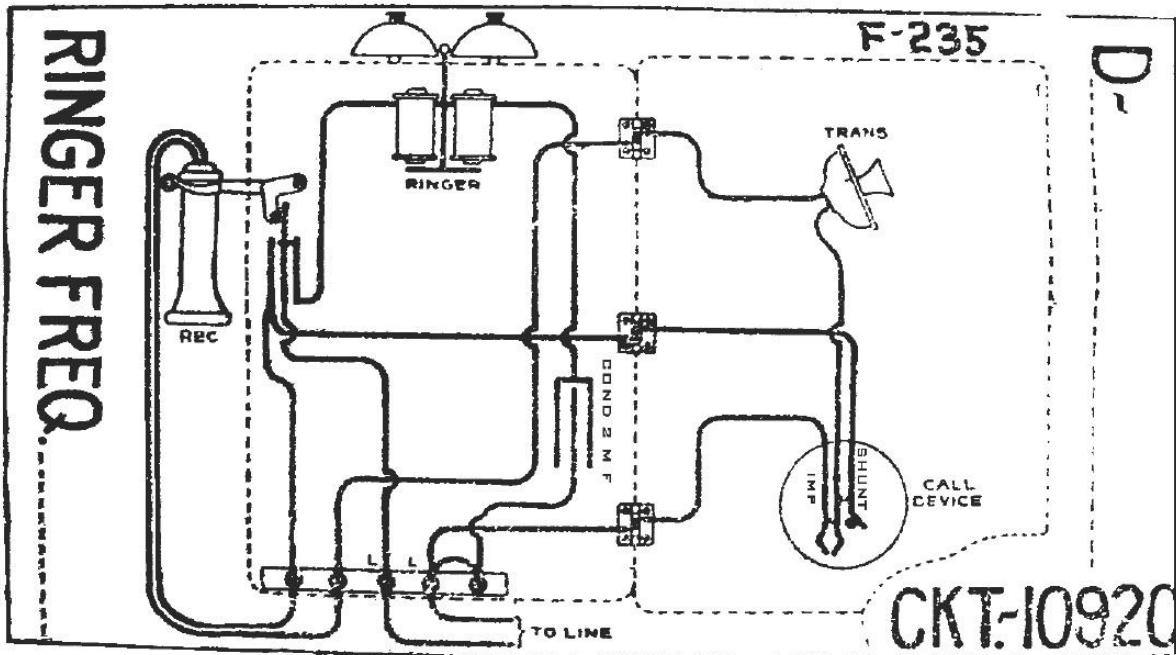
PMG type 35



PMG type 35 (open)



PMG type 35 (circuit diagram)



Bibliography

Metal telephone pictures from Principles of Automatic Telephony (1924)

PMG type 35 circuit diagram from **The TCI Technical Library**