



*TECHNICAL ARTICLE ON THE SOP
A technical article published in the UK
about 1928.*

Published about 1928 in the UK this technical article details the operation of the SOP switch. The SOP switch invented by Alton Emerson Stevens (1876-1924) and patented in 1918 was a far advanced interior telephone switching system than was currently being used. It eliminated the cumbersome push button sets and adjuncts. Additionally it provided a private talk path for as many pairs of phones in the system. The original patent and drawings can be found elsewhere on the Select-O-Phone website.

Created from scans furnished by Remco Enthoven

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“ SELECT-O-PHONE ” PRIVATE AUTOMATIC EXCHANGE

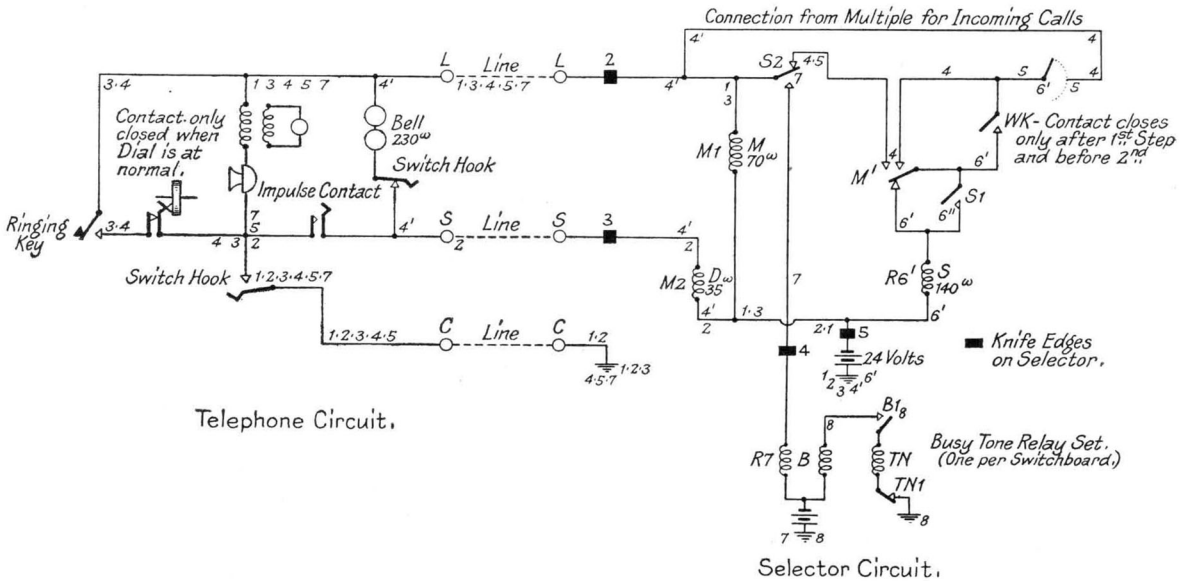


FIG. 98.—SELECT-O-PHONE PRIVATE EXCHANGE CIRCUITS

Screw Machine Products Corporation, U.S.A., for installations up to 33 lines.

In addition to direct secret service it provides for *conference* facilities for three or more people and with a *direct call* or *code circuit* for calling to the nearest telephone anyone wanted who may be at some unknown point in the establishment. The circuit is shown in Fig. 98. It is built up in sections as shown in Fig. 99, and therefore can be readily extended. The instrument may be of the type used generally, and Fig. 100 illustrates a convenient design with handset and dial or circular impulse sender attached to the base.

The receiver is lifted *after* the dial has been set to make a call, and a ringing-key depressed after the dial has returned to normal. The dial is locked during conversation to prevent interference.

The dial has two sets of contacts. The *impulse contact* is normally *open*, and is closed intermittently to send impulses. The *ringing-guard* contact is only closed when the dial is at normal. The first setting movement opens the contact to prevent disturbance should the ringing-key be irregularly depressed.

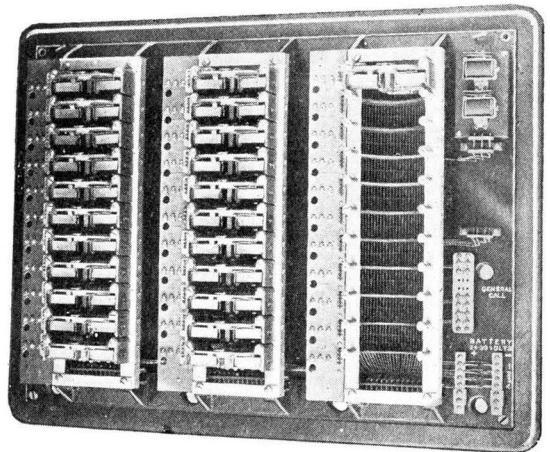


FIG. 99.—SELECT-O-PHONE SWITCH PANEL.

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A *stepping rotary switch* is associated with each line. It has three magnets. D receives the impulses and steps the wiper to the required number. M serves two purposes—holding the ratchet pawl in position during impulsing and switching the line to the talking position. S tests the required line and connects busy tone to the caller if the wanted line is busy.

Magnets M and S have contacts to control the circuits. M has two armatures, one operated immediately the receiver is lifted to insert the pawl into the selector ratchet and so retain it in the position set by magnet D. The second armature is operated after the ringing-key is depressed. Spring set M1 is controlled by this second armature and opens the circuit of testing magnet S when operated. It also connects the line to the wiper for talking.

Magnet S carries spring sets S1 and S2, the former closing a locking circuit for the S magnet, to prevent the busy tone being stopped by the caller depressing the ringing-key wrongly. S2 contact connects the busy tone to the caller.

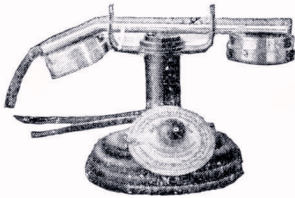


FIG. 100.—SELECT-O-PHONE TABLE INSTRUMENT.

The commutator contact WK is adjusted to close only after the switch has taken its first step and the second is not quite completed. This contact is required for the general call circuit. The contacts are shown in their normal position.

The circuits (Fig. 98) are numbered as follows :—

1. The dial being set and the receiver lifted, the C wire is connected to the switch. Magnet M inserts pawl in the ratchet. The circuit resistance is such that the second armature is not attracted.
 2. The impulse circuit is closed a number of times and magnet D is energised a corresponding number of times. The wiper is stepped to the required line.
 3. Ringing-key is depressed and short-circuits the transmitter, so that the M magnet pulls up its second armature, which is then held in that position.
 4. Ringing-circuit, over 4 of the calling and 4' of the called line. The called receiver is lifted and conversation is carried on.
- Line busy.*
5. When a receiver is lifted, positive battery is connected to the multiple contact.
 6. Another party calling this number, his S relay is energised over circuit 5 and locked over contact 6", so that it is independent of contacts M1 and S2.
 7. Busy tone control-circuit. Relay B energises.
 8. Tone relay TN energises and busy tone is induced in the second winding of B.

Ringling.—The bell is rung by lowering the resistance at the calling instrument. Ringing ceases because the bell is shunted by the M magnets of the calling and called lines in parallel.

General Call.—The general-call relay is controlled from the first contact of the multiple. The WK commutator is not closed, and consequently the S magnet is not connected to the wiper. The line is therefore not busy. This allows the call to be answered from any telephone.

