SOLUTION OF SFMT 43 BY REASON OF TECHNICAL DEFECTS OF THE MACHINE.

1) Encoding with SFMT 43 is effected by the superposition of a Key perforated strip on the clear perforated strip, which results in a pure addition of clear and key impulses in accordance with the following principle:

Equal current conditions in the clear - and key sign give a + impulse in the encoded sign and unequal conditions give a - impulse.

$$\begin{matrix}(+) + (+) = (+)\\(-) + (-) = (+)\\(+) + (-) = (-)\\(-) + (+) = (-)\end{matrix}$$

(The reverse may have been the case)

This corresponds to the scheme: (See Fig. 9 in appendix.)

2) Each key perforated strip is only used once, so that the solution of an encoded text is thus theoretically impossible. The key perforated strip is automatically destroyed after it has passed through the machine.

3) Defects of the machine, which schematically have exactly the same result as a phase- shift in the superposition of clear and key signs, are key relays, which work too slowly. E.g The phase shift from key sign to clear sign is 30%. (This is naturally less in practice.)

An oscillogram of encoded texts showed therefore shortened and lengthened impulses. In order to remove this defect it was demanded that every SFMT43 be coupled with a so-called teleprinter "Entzerrer" which synchronised the encoded impulses. It cannot be stated with certainty whether everywhere, where SFMT43 was used, the teleprinter "Entzerrer" was actually employed. Siemens made every effort to remove the sources of technical defects by changing the construction of SFMT43. New perfect machines however never came into action.

4) One and only one solution of an encoded text with non-synchronised impulses by making use of an oscillogram is possible. In example fig. 10 (see appendix) the first gap in the current (a) in the encoded sign must result from a + impulse in the key sign. Since the first encoded impulse and the first key impulse are both + then the first clear impulse must be +. In addition the second key impulse must be + for otherwise the first encoded sign would have been shortened. Since the second encoded impulse is - then the second clear impulse must be -. Since further the second encoded impulse is shortened the third key impulse must be -. In this way further conclusions can be arrived at and one and only one solution of clear and key signs be found.

Appendix (SFM T43)

Fig. 9

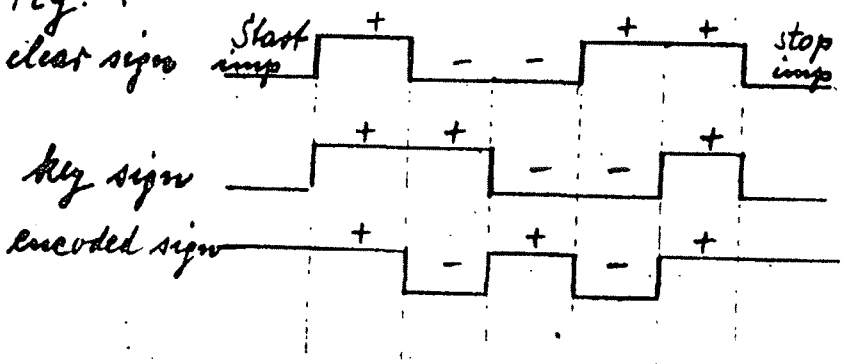

Fig. 10