

IN REPLY
REFER TOWAR DEPARTMENT
OFFICE OF THE CHIEF SIGNAL OFFICER
WASHINGTON

8

September 3, 1935

Invention of Mechanico-electrical Control of Cipher Wheels
for Small Cryptograph.

1. Have 3 substitution wheels with Enigma type return circuit, and 2 control wheels also with Enigma type return circuit.
2. The control wheels are moved meter-like by universal bar. Period: 676.
3. The 25 available final resultants of control wheel circuit are divided up into 3 groups of primes. Example: Group 1, of 5 resultants, to control movement of substitution wheel 1; Group 2, of 9 resultants, to control movement of substitution wheel 2; Group 3, of 11 resultants, to control movement of substitution wheel 3. Other groupings of primes may be desirable.
4. The control wheel circuits merely operate small magnets which interpose stop-links between a rocker frame and recesses in the substitution wheels, or the teeth of a ratchet on substitution wheels. The rocker frame is operated mechanically by universal bar, or by hand lever, or foot lever, or by magnet.

*Invented
1 Aug 35
F**(Rowlett
June 35)**William F. Friedman*
William F. Friedman.

● Type 1 org ² carbons ● Sept. 3, 1935

for Invention of Mechanico-electrical control of cipher wheels for small cryptograph. (Copied) ^{d'm}

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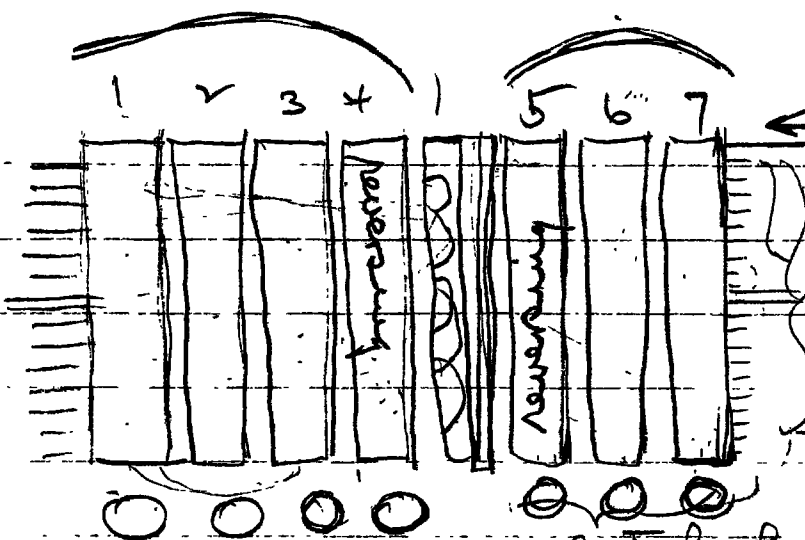
4. The control wheel circuits usually operate small magnets which interpose ~~the~~ stop-links between a rocker frame and ~~teeth~~ ^{or the teeth of a ratchet on substitution wheels.} The rocker frame is operated mechanically by universal bar, or by hand lever, or foot lever, or by magnet.

~~Timing is accomplished by~~
~~noted circuits~~

W.F.F



17576



← 4 currents in 144

25 current-out currents divided up into 4 groups

in 5 groups of 5
+ one group of 5
group 1-5
2-4
4-9
15

magnets for stepping, controlled by these

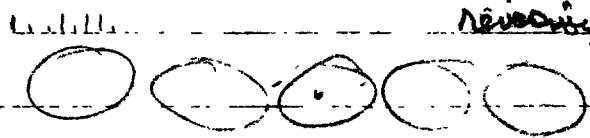
control wheels (same as cipher wheels)

These move in meter-like manner, universal bar steps wheel 7 once per depression, 6 once per 26, 5 once per 676 - total 17576

But five wheels are interchangeable, and two reversing wheels are also interchangeable, hence many series

of "17576 keys"

$2 \times 10 \times 8 = 160$ keys of 17576 letters



Invented Aug 1, 1935 W.F.F.