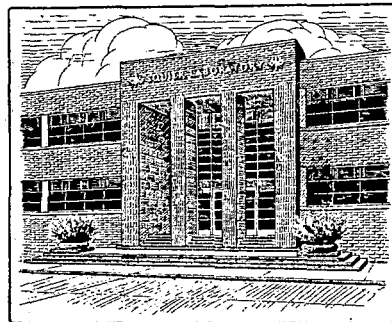


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SIGNAL CORPS LABORATORIES
ANNUAL REPORT FOR FISCAL YEAR 1937
ON
MECHANICAL AND ELECTRICAL CIPHER MACHINES,
APPARATUS ELECTRICAL AND MECHANICAL
FOR BREAKING CODES AND CIPHERS

M-134

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SIGNAL CORPS LABORATORIES
FORT MONMOUTH, NEW JERSEY

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SIGNAL CORPS LABORATORIES
ANNUAL REPORT FOR FISCAL YEAR 1937

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MECHANICAL AND ELECTRICAL CIPHER MACHINES,
APPARATUS ELECTRICAL AND MECHANICAL FOR
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Submitted by:



WM. R. BLAIR

Lt.Col., Signal Corps
Director

SIGNAL CORPS LABORATORIES
FORT. MONMOUTH, NEW JERSEY

July 10, 1937

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By Authority of the Chief Signal Officer

Date 10 July 37 Initials WPR

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ANNUAL REPORT FOR FISCAL YEAR 1937

ON

MECHANICAL AND ELECTRICAL CIPHER MACHINES,
APPARATUS ELECTRICAL AND MECHANICAL FOR
BREAKING CODES AND CIPHERS
(Project No. 86)

1. Converter M-134. Reference Figs. 1 to 6 inclusive. Two models of this apparatus were completed during the year. An instruction book covering the equipment was also prepared. One model was transported to Panama and the other to the Message Center, office of the Chief Signal Officer, and the two machines were operated in encipherment and decipherment of messages between those points for a period of several weeks. Representatives of the Signal Intelligence Section, War Plans and Training Division, office of the Chief Signal Officer, conducted these tests. As a result of the tests the Converter M-134 was recommended for adoption as standard with a number of modifications and additions. These modifications and additions were incorporated in one of the two models upon the return thereof to these Laboratories. Specifications for quantity production were prepared based upon construction as per model. A number of wiring diagrams and schematic diagrams were made for benefit of the contractor. The sum of \$19,500 was allotted by the Chief Signal Officer for procurement under a secret contract. Contract was awarded to the Wallace Tiernan Products, Inc., Belleville, N.J., for the production of eight Converters M-134, delivery required in eight months' time. Certain funds remaining of the initial allotment, combined with an additional allotment made by the Chief Signal Officer, were used for the purchase of auxiliary equipment for the War Department Message Center, as follows:

- 1 Keyboard perforator
- 1 Machine reperforator
- 1 Tape transmitter and distributor
- 100 Rolls paper tape
- 6 Rectifiers

2. Components. The Converter M-134 comprises the following units:

- Cryptograph MC-164
- Typewriter MC-174
- Case CS-54

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The cryptograph in conjunction with the properly modified electrical typewriter constitutes an electromechanical machine by means of which messages may be enciphered or deciphered automatically up to speeds of about 40 words per minute. Operation of the keyboard of the cryptograph to form an intelligible plain-text message, as one would operate a conventional typewriter results in the production, by the electrical typewriter, of a printed unintelligible enciphered cryptogram. Conversely this cryptogram may be deciphered by striking the keys on the keyboard of the cryptograph in accordance with the individual printed characters of the cryptogram, whereupon the electrical typewriter prints the original intelligible plain-text message. The functions of the cryptograph and electrical typewriter end with the production of the cryptogram or the decipherment thereof. In order to transmit the prepared cryptogram to any given destination, it is necessary to employ one of the conventional agencies of communication; i.e., wire, radio or messenger.

3. Tape Marking Device. Thought has been given to the development of a device for marking the key tapes to facilitate the proper setting of the tapes at all stations. Now that the repeated use of paper tapes has been proved practicable it is intended to produce a preliminary marking device during the next fiscal year.

4. Keyboard Actuating Mechanism. This device is intended for actuation from the cryptograph MC-164 to operate any standard typewriter or telegraph printer. No work has been performed in this connection during the year.

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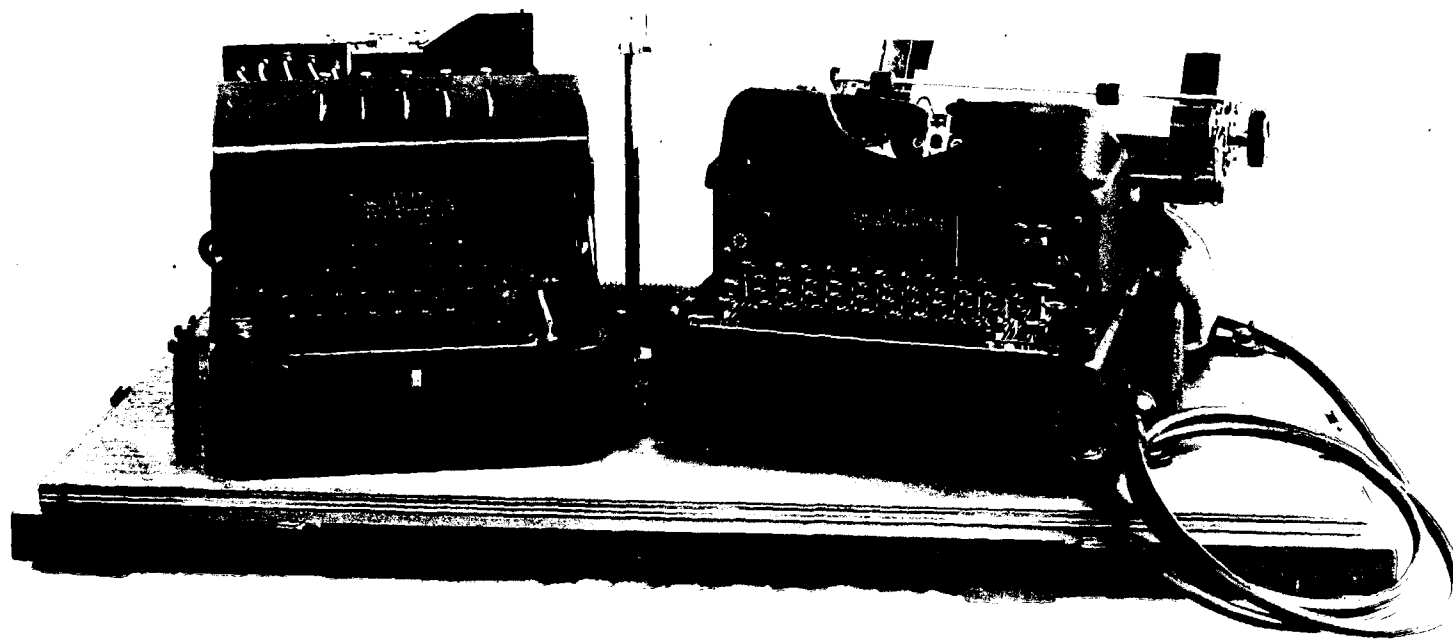


Fig. 1 - Converter M-134, Front View

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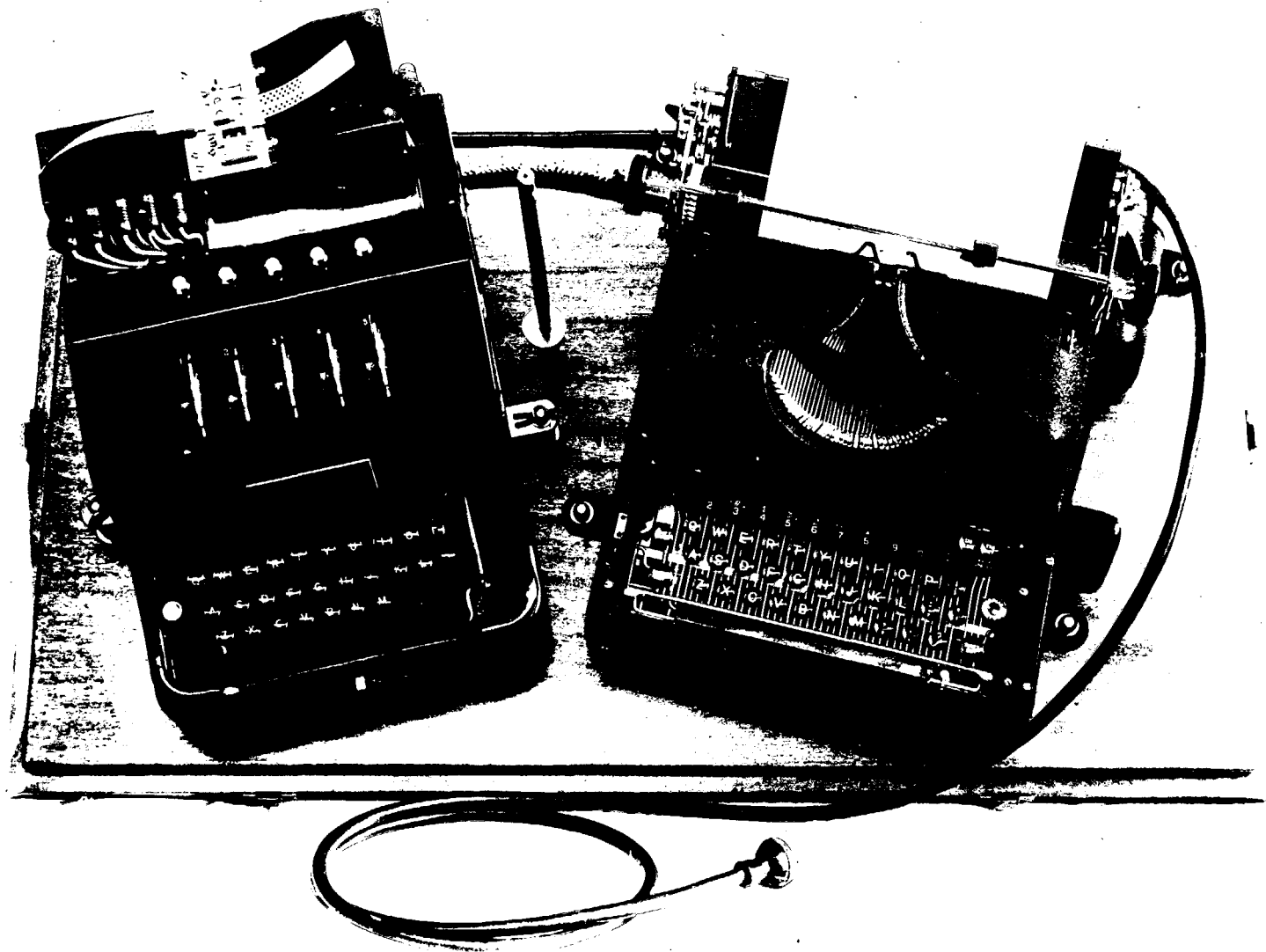


Fig. 2 - Converter M-134, Plan View

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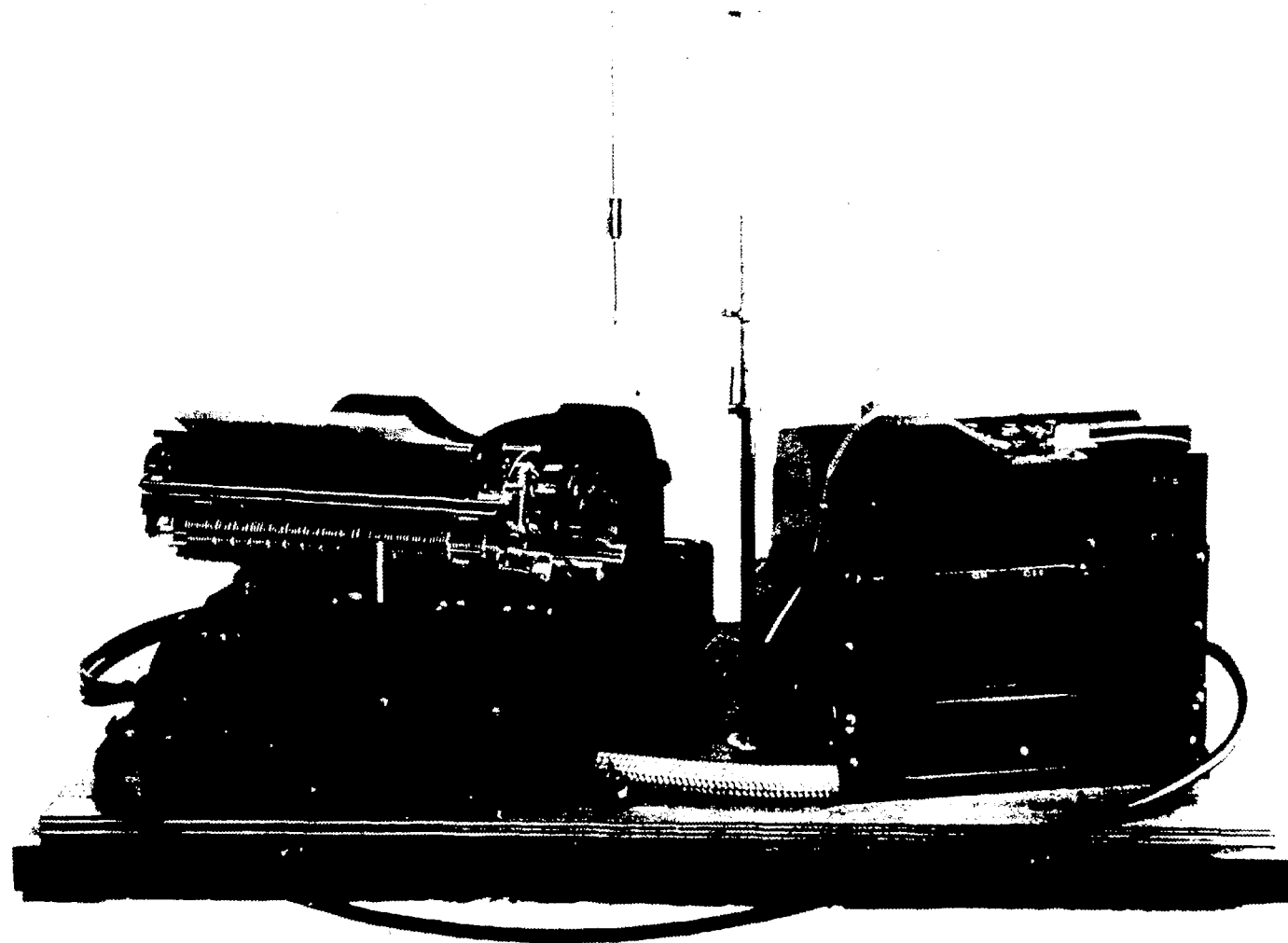


Fig. 3 - Converter M-134, Rear View

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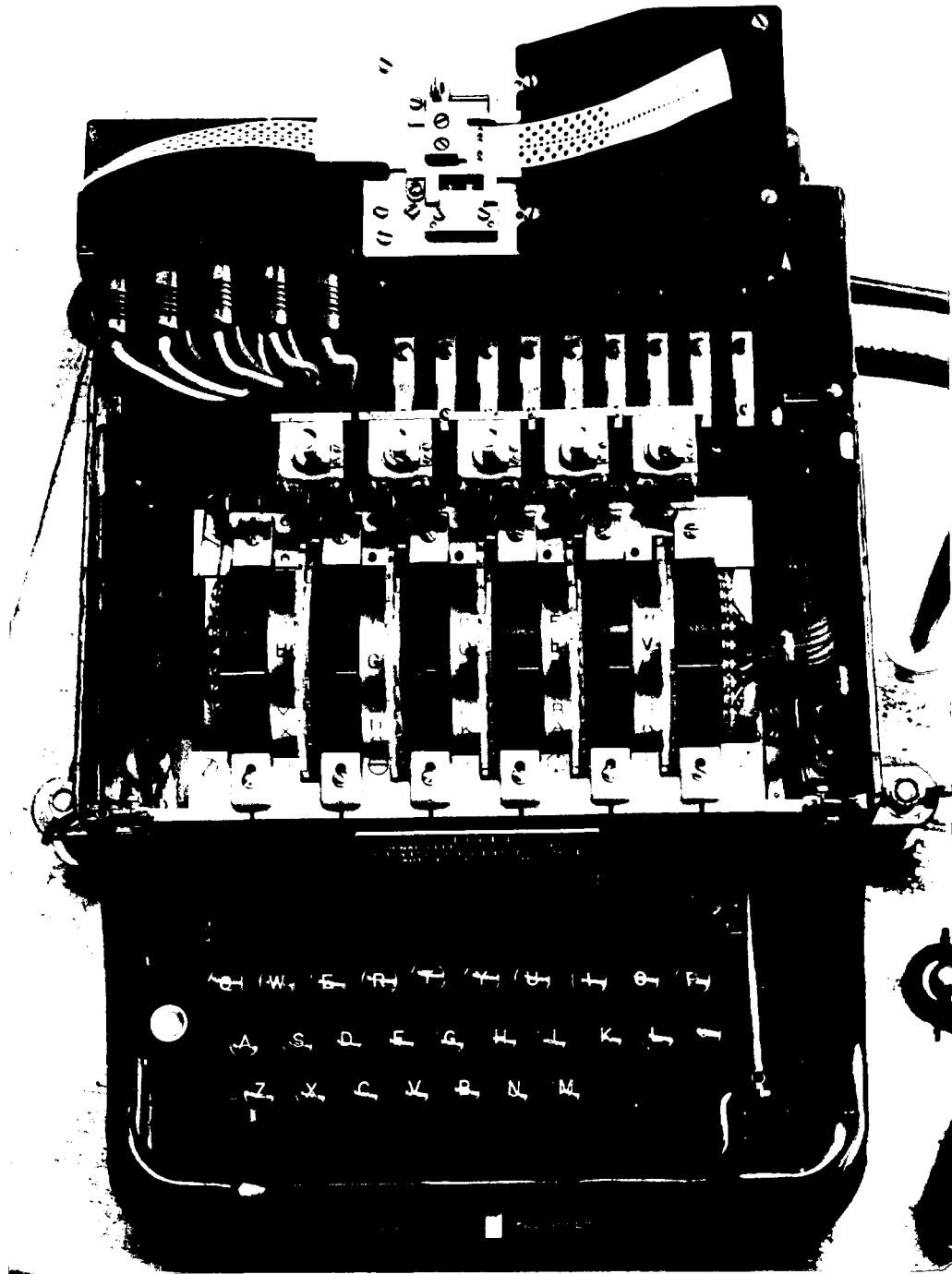


Fig. 4 - Converter M-134, Cryptograph MC-164, Plan View

with Cover Removed

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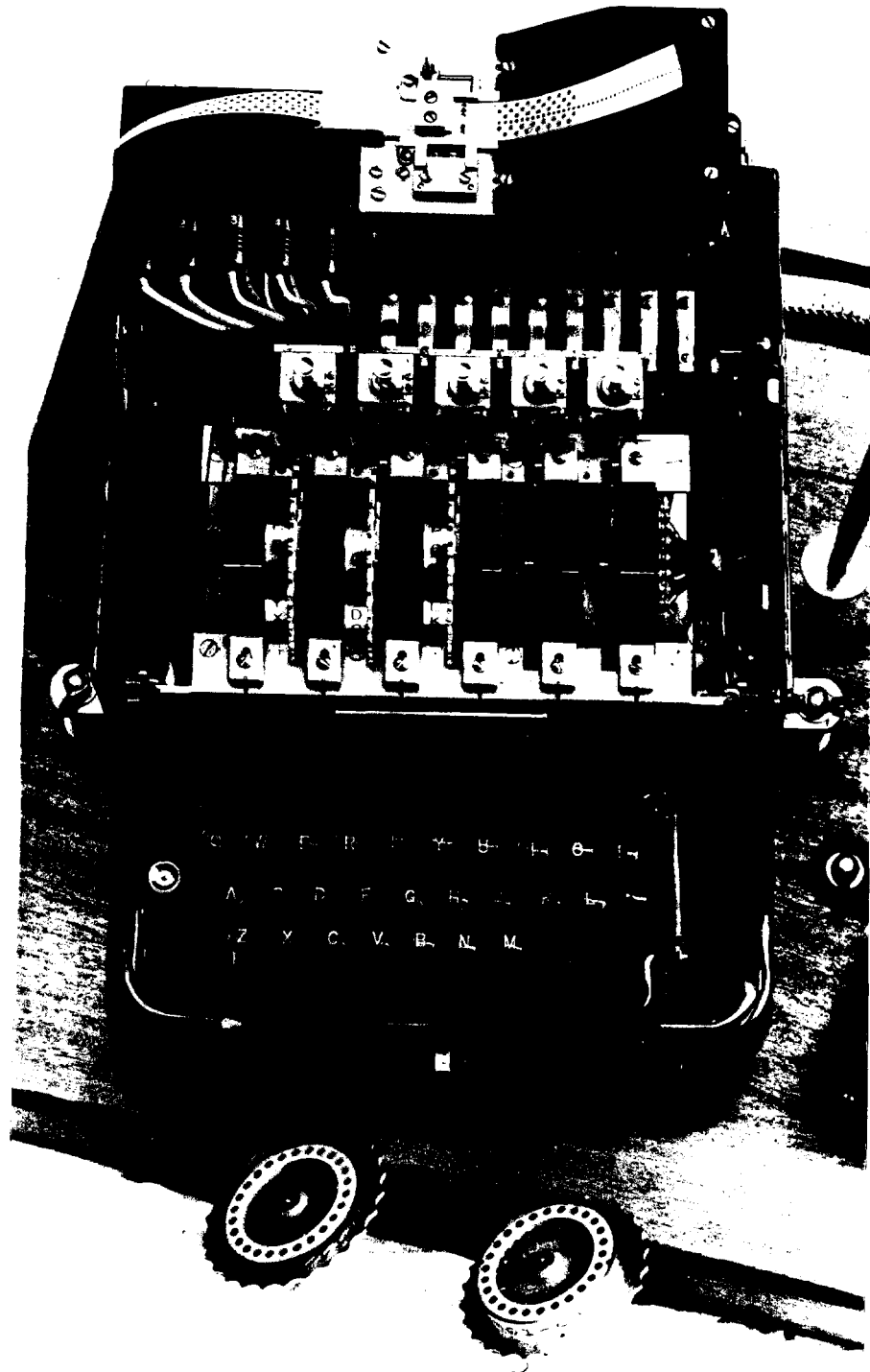
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Fig. 5 - Converter M-134, Cryptograph MC-164, Plan View

Showing Cipher Disks Removed

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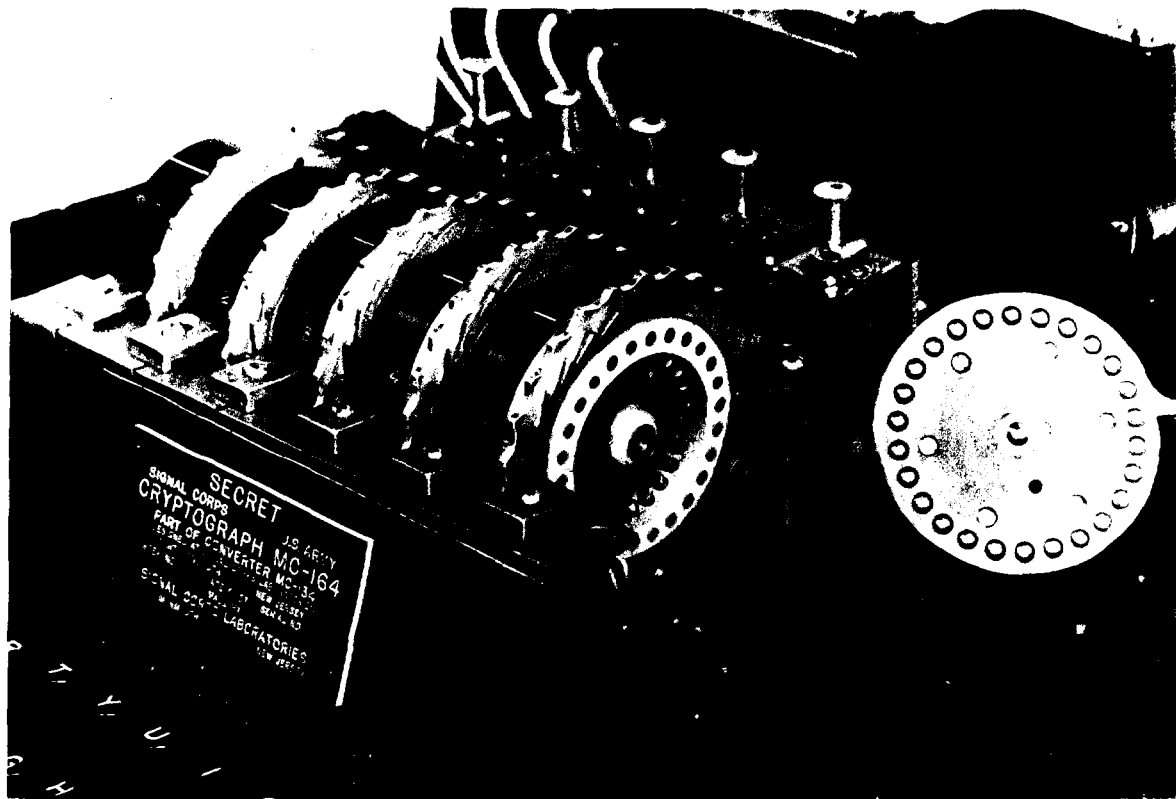


Fig. 6 - Converter M-134, Cryptograph MC-164, Showing

Cipher Disk Stepping Mechanism

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