

Printing Mechanisms for M-161

1. Revolving type-wheel. - a. A type wheel mounted upon the end of a shaft driven by a clock-spring or electric motor drive is stopped in one of 26 printing positions, by means of small selector magnets controlled by circuits coming from the cipher wheels. A lever operated by hand delivers the power necessary to drive the printing arm against the type wheel, move the typewriter ribbon, and advance the paper.

b. In enciphering: When a key on the keyboard is depressed, a latch is released, allowing the type wheel to revolve on shaft; a circuit is established through the cryptograph to one of the above-mentioned selector magnets; the type wheel stops at the selected cipher letter; the hand lever is operated, printing takes place, the paper is advanced and a cipher wheel is stepped forward.

c. In deciphering: operation is identical except that keyboard is struck according to cipher letters and type wheel prints plain-text letters.

d. The record is made on a paper tape, ready to be gummed to a telegram blank form, as in standard practice.

e. The clock-spring motor drive, if used, will have to be wound every so often, depending on size of spring, length of message, and power delivered.

f. Another type of controlled type wheel is exemplified in the attached drawing, Fig. 7. In this figure K_1 to K_{26} are connected to 26 relays having a common return through release relay RK . The type wheel TW is mounted on a shaft driven by clock-spring or electric motor, through some form of slipping clutch. The shaft also carries a brush arm BA and as the brush arm sweeps over a circular ring R of 26 contacts a circuit is established through the print magnet PM whenever one of the relays K_1 to K_{26} is energized. The shaft is normally prevented from rotating by a prolongation of the brush arm abutting against a latch controlled by release magnet RM , which is controlled by release relay RK , and the latter is energized by any one of the keys of the keyboard. When the print magnet is operated, it strikes the tape against that letter on the type wheel which is presented at that moment, due to the rotation of the type wheel. Means must be provided for stepping the tape forward.

2. Horizontally-juxtaposed type bars. - a. A gang of 26 juxtaposed, independent type bars sliding between an upper and a lower grooved member, is controlled by a bank of 26 small selector magnets. The current through the magnet is sufficient to throw the type bar against the paper through a typewriter ribbon, making the impression on the paper. The magnets work against a retractile spring tending to withdraw the type bar into non-print position after each operation.

b. The type of record made by this proposed form is illustrated in the attached sample, Fig. 8. The letters are to be read downward consecutively, and spell out the sentence **THE SEVENTH BRIGADE HAS RETIRED.**

g. The disadvantages inherent in this form of record should be balanced against the advantage that no spinning type wheel, no mechanism for driving the type wheel, and no special relays are required. The apparatus is therefore simpler, with fewer moving parts; and the speed of operation is greater since no time delay is required for orienting a printing wheel.

d. The only moving parts required in this type of recording mechanism (other than the sliding bars) are those connected with advancing the paper and the typewriter ribbon.

3. Electro-chemical method. - a. Using chemically treated paper, electric currents from 26 conductors leave marks on the paper whenever current is passed through the paper. If the conductors terminate with steel-embossed letters in the form of type faces, the marks left on the chemically sensitized paper will correspond in outline with letters of the alphabet. Thus the record will consist of letters arranged as in the case of method 2 above, but no magnets are required. The only moving parts are those connected with advancing the paper.

b. The paper must be moistened, however, in order that electrolysis can take place and this is a small disadvantage. It is not necessary, as I understand it, that the paper be actually wet or emersed in water. It need only be moistened, as by a wet roller.

4. Photographic method. - a. This is a modification of method 2 above. Horizontally juxtaposed sliding members actuated by 26 small magnets move stencils in the path of a beam of light. The light passing through the stencil is focussed by a lens on a moving strip of sensitized paper tape. A liquid developer is required, although I understand that a recently invented method does not require complete immersion of the paper for development and fixing, but only moistening with water. It is possible that a blue-print paper tape method might be worked out for such a purpose as this.

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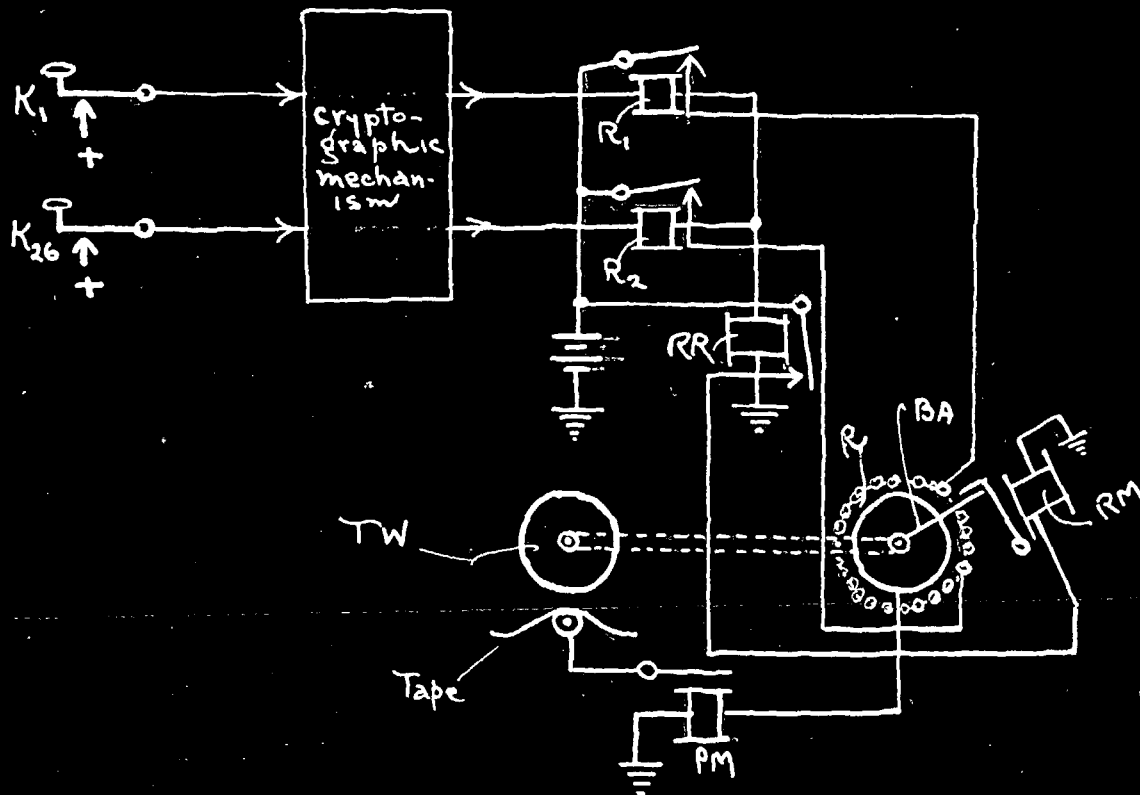


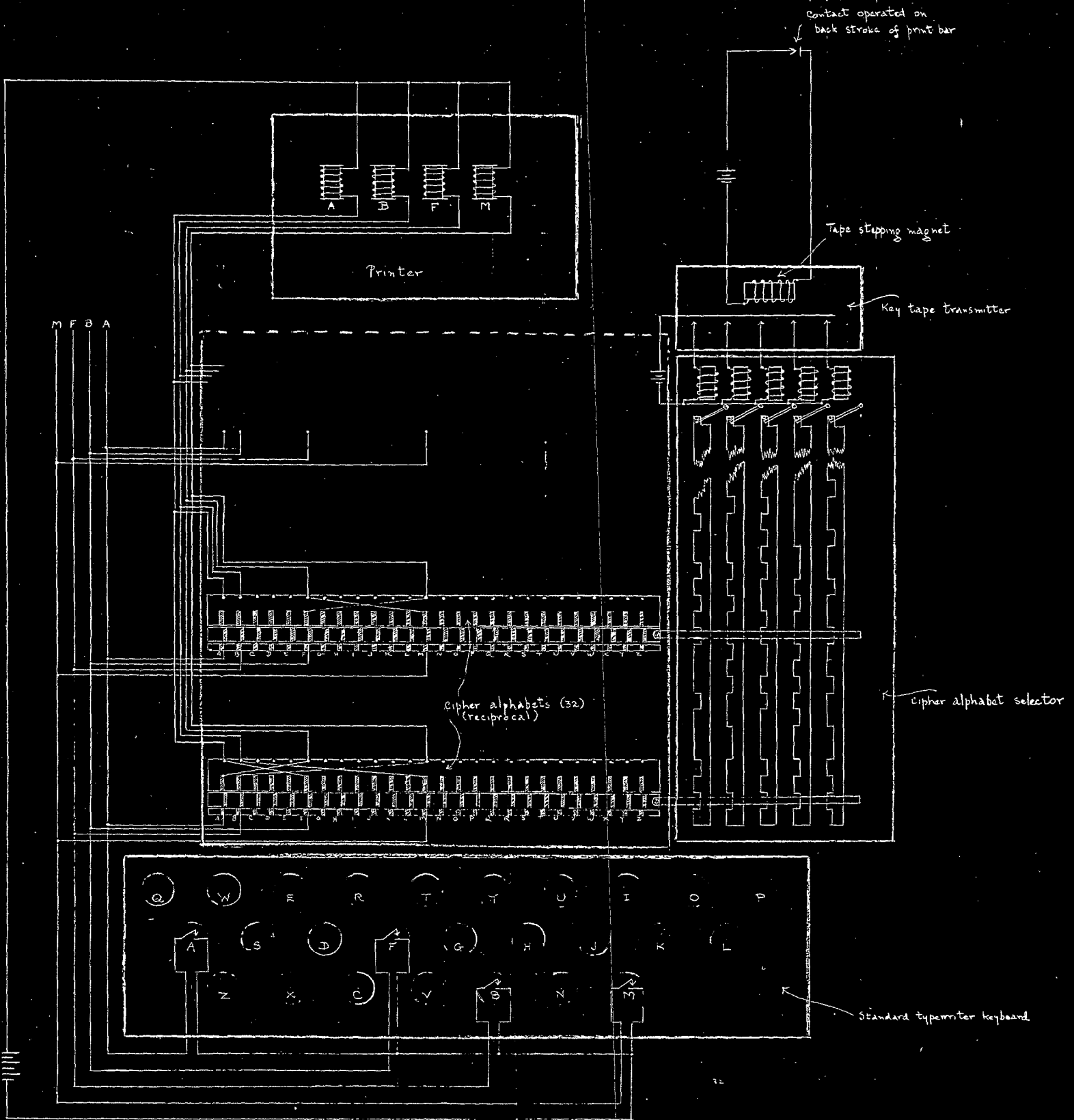
Fig 7

(Taken from Harrison's
Printing Telegraph Systems and Mechanisms)

T
 H
 E
 S
 E
 E
 N
 T
 H
 B
 I
 R
 I
 D
 E
 H
 A
 S
 R
 E
 T
 I
 R
 E
 D

V
 G

Fig. 8



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referred to

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