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20 Nov 23
received 17 Nov 31

From: Bureau of Engineering.
To: The Judge Advocate General.

Subject: Electric Ciphering Machines; request for opinion concerning patent features.

Enclosure: (A) Photostatic copy of correspondence in connection with U.S. Patent application No.

- Hebern → 675898 of 10 April 1923, together with U.S. Patents Nos. 1,414,496 and 1,472,775. *675898 became 1,683,072*
- Bayer → (B) Copies of U.S. Patents Nos. 1,510,441, 1,683,072 and 1,861,857. *Hebern 45 Sept 28*
- Aspt on subject → (C) Copies of U.S. Patents Nos. 1,705,641, 1,733,886 and 1,777,425. *Hebern*
- Korn → (D) Copies of U.S. Patents Nos. 1,556,964, 1,584,660 and 1,657,411. *Hebern*
- (E) Copy of U.S. Patent No. 1,846,105. *Hebern*
- (F) Description of Electric Cipher Machine of Bueng. design with 4 blueprints.

1. For several years the Navy Department has been interested in the procurement of a satisfactory electric cipher machine. It has purchased several models of such a machine from Mr. E. H. Hebern, or the various companies with which he has been associated. The machine, in its various models, is of the type described in the patents listed in enclosure (B). The Bureau is now in possession of a later model of this machine, upon which it is understood application for patents has been, or shortly will be, filed. None of the models purchased and tested have proven satisfactory for Naval use for various reasons.

2. Enclosure (C) is description of a machine manufactured in Germany, one model of which is in the possession of the Department. U.S. Patent 1,777,425 appears to cover a slightly different type of machine but it is assigned to the Company which manufactures the other and is therefore grouped with this machine. Enclosure (D) covers a machine for which the patents have been issued to a different individual. Enclosure (E) is similarly issued to a different individual.

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3. From an examination of the various patents listed in enclosures (B) to (K) inclusive, it is apparent that all of the devices patented utilize the same basic principle. This principle is that a selective electric circuit is used to substitute for any given letter of plain language another letter which is determined by the formation of a constantly changing series of circuits. This changing series is obtained practically by means of a series of drums and the necessary interconnections. The drums are so constructed that on either face is a circular member carrying 26 equally spaced contacts which are connected in a random manner by flexible leads to a similar series of contacts on the opposite face of the drum. The drums are caused to rotate 1/26 revolution at a time by an external mechanical means in such a manner that a meter-like step by step action takes place. Each step of any drum forms a different series of circuits through the chain of drums. Appropriate keyboards and typewriters or other indicating means suitably connected permit the practical use of the machine.

4. The fact that patents have been issued to at least four different individuals or assignors, all for a similar type of machine, indicates that none of the patents concerned cover the basic principle of the machine. Each type of machine varies considerably in detail, particularly in the details of construction of the circuit changing drums and the means by which they are actuated. The actuating means in particular may cause a variety of movements of the drums with widely different cryptographic results. However, the differences appear to be in the utilization of the principle rather than in the principle itself.

5. Enclosure (A) is a photostatic copy of the application and correspondence for the patent, 1,510,441, which Mr. Hebern considers basic. On sheet 15 may be found the action of the examiner with respect to certain claims which appeared to cover the drum-type circuit changer. As a result of this action the claims were modified. Two of the patents referred to are included with the enclosure. The Bureau does not possess a copy of the Koch Application No. 526,588.

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6. Enclosure (F) describes and illustrates the design of a machine of this type developed by the Bureau. While it uses the basic principle of a revolving drum, it is believed that the drum actuating mechanism is entirely original and permits a much wider combination of drum movements than any of the others. The Bureau is contemplating the construction of a model of this machine and should it be constructed and prove satisfactory, desires to arrange for its manufacture and eventual issue to the Service.

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7. In order that its position may be clear and a basis for licence or royalties be reached, the Bureau requests the opinion of the Judge Advocate General on the following questions:

(a) Do any of the patents enclosed cover the basic principle of the utilization of a rotating drum or do they merely cover the mechanical and electrical means by which the principle is utilized?

(b) Does the design described in enclosure (F) infringe on any of the patents listed with particular reference to enclosure (B)? If so, to what degree?

(c) Is the design described in enclosure (F) patentable? If not in its entirety, is the cipher drum actuating mechanism in particular, patentable?

(d) The basic principle of the design described in enclosure (F) is adopted from the various machines covered by the patents listed in enclosure (B). With this in view, depending upon the answers to the questions listed in subparagraphs (a) to (c) inclusive, to what degree would the Bureau be liable in proceeding with the development of its own design? An opinion is desired as to the basis upon which the Bureau should proceed to obtain the necessary licenses.

8. The return of enclosures (A) to (F) inclusive is requested.

A. C. Wrenn,
Acting Chief of Bureau

Copy to:
Chief of Naval Operations.

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