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C. HAAS & H. STUDDT.
 APPARATUS FOR CORRESPONDENCE IN CIPHER.
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Fig. 1.

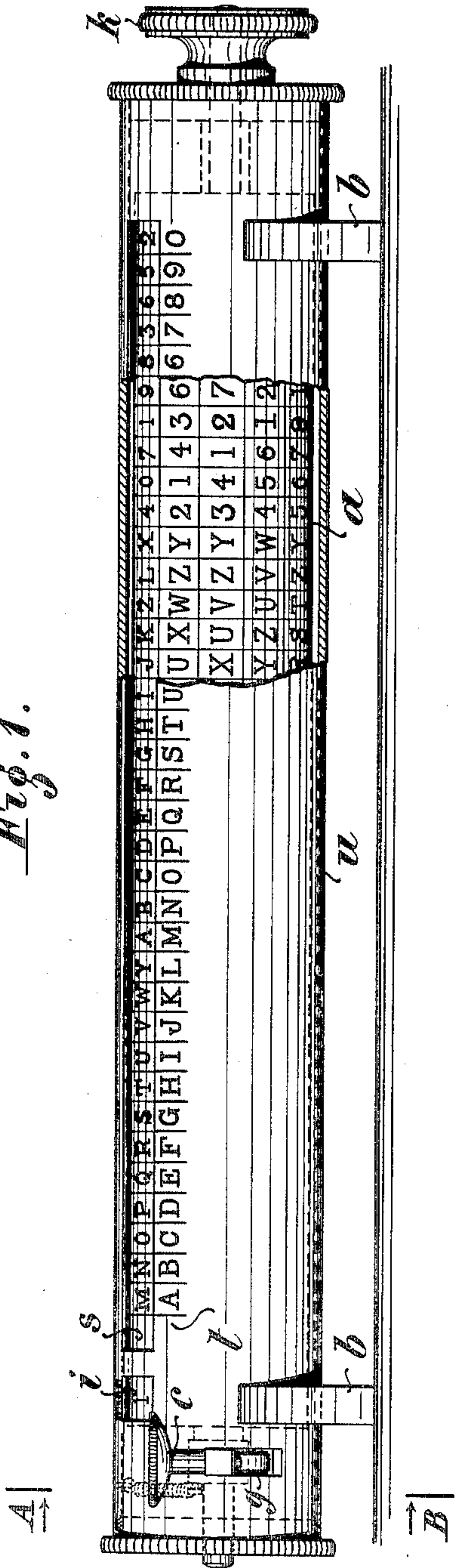
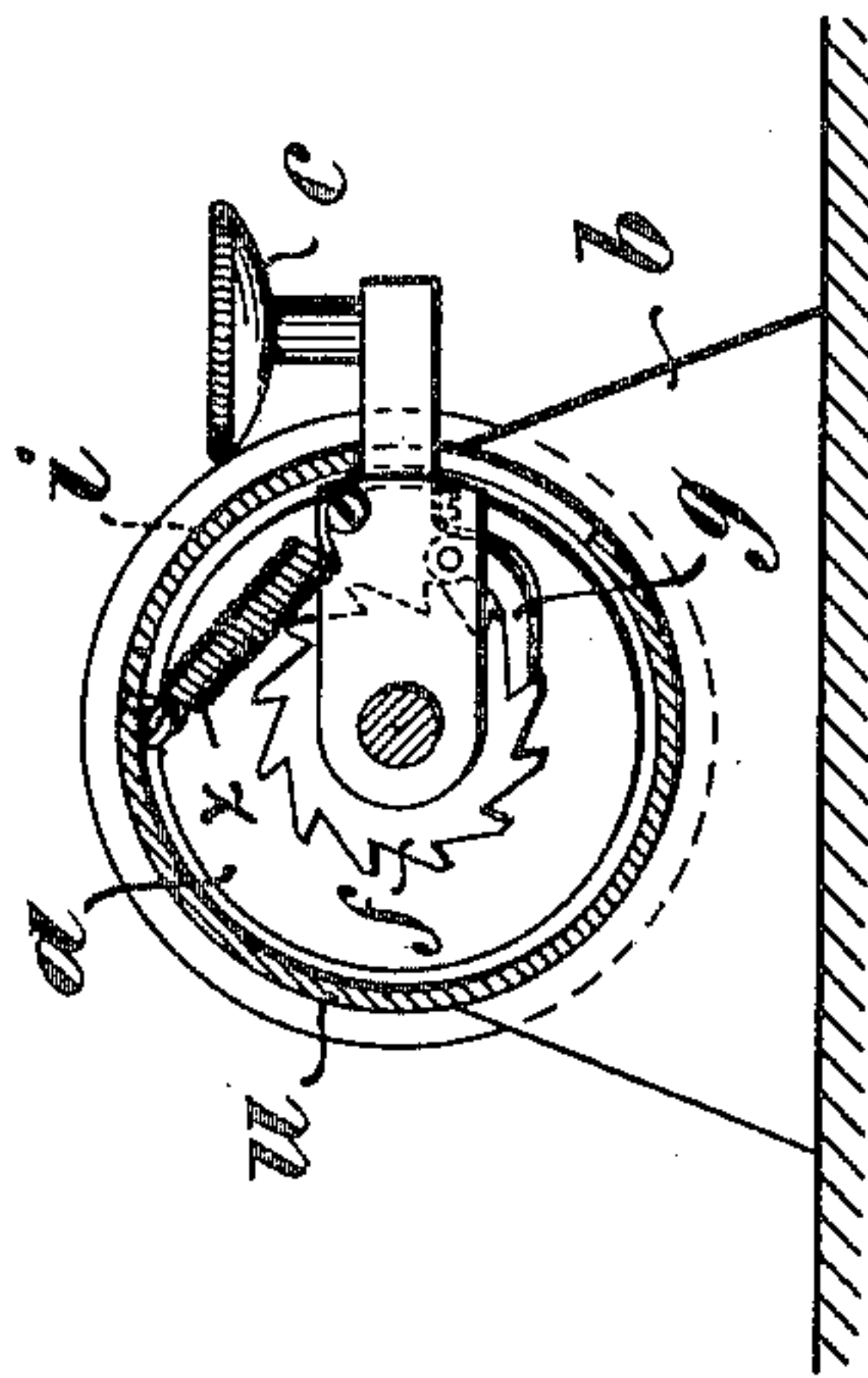


Fig. 2.



WITNESSES

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CARL HAAS, OF MANNHEIM, AND HEINRICH STUDDT, OF HEIDELBERG, GERMANY.

APPARATUS FOR CORRESPONDENCE IN CIPHER.

No. 875,070.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that we, CARL HAAS, of Mannheim, a subject of the Grand Duke of Baden, whose post-office address is O. 7. 8., Heidelbergerstrasse, Mannheim, Grand Duchy of Baden, German Empire, and HEINRICH STUDDT, of Heidelberg, a subject of the King of Prussia, whose post-office address is 87 Bergstrasse, Heidelberg, Grand Duchy of Baden, German Empire, have invented new and useful Improvements in Apparatus for Correspondence in Cipher, of which the following is a specification.

The present invention relates to improvements in apparatus for correspondence in cipher.

The apparatus is based on the idea of changing the symbols or letters of a sentence which is to be transmitted by the sender so that a new sentence is formed which the receiver who possesses a corresponding apparatus can convert by changing it back into the original sentence.

For this purpose the apparatus consists of a roller which rotates in a casing and carries a definite number of rows with symbols (letters, numerals) on its periphery. This roller can be turned a row at a time by depressing a key by means of a suitable ratchet feeding-device and further can be rotated by a knob on its end independently of the depression of said key.

The case is provided with a slot behind which one row of symbols of the roller is always visible, and carries a scale with the original characters (the alphabet and numerals 0—9) below said slot. There is another opening (index) by the side of this slot in the periphery of the casing, behind which the indices of the rows of cipher appear in continuous succession.

Apparatus are known which are based on a similar principle, which however have not one key only, but an entire keyboard. Such apparatus are consequently of considerably more complicated construction and mistakes can easily arise with them by the inadvertent depression of an adjacent key, in which case the wrong symbols instead of the correct ones become visible and difficulties occur on deciphering.

With great simplicity of construction and action the present apparatus permits the same combinations and permutations as these complicated apparatus, the above mentioned source of error being avoided.

In order that the invention may be clearly understood reference is made to the accompanying drawing in which one form of the apparatus is represented, and in which:

Figure 1 is an elevation, part of the casing being broken away in order to show the arrangement of the rows on the roller, and Fig. 2 is a section in the plane A—B of Fig. 1 with an end elevation of the feeding-device.

A roller *a* is mounted revoluble in a cylindrical casing *u* with feet *b* and it can be rotated by hand by a lateral knob *k*. This roller is provided, as represented, with a number of rows of symbols (letters and numerals), the respective arrangement of which changes in each row. All the rows are divided into equal spaces by continuous cross lines. A scale *t* having equal divisions and an equal number of symbols is on the casing *u*, but the symbols are arranged in the order of the alphabet and of the numerals 1—9 and 0 (thus 35 signs in all) and immediately below a slot *s* behind which one of the rows of symbols of the roller *a* appears each time.

The roller *a* is provided with a toothed ratchet-wheel *f* which moves the roller by one tooth of *f* each time the key is depressed, the roller being rotated by a lever having a key *c* by means of a spring-pressed pawl *g*, said lever being rotatable round the axle of the roller and adapted to be pulled upwards by a spring *x*. The pawl *g* prevents the roller being turned backwards by means of the knob *k*, whereas it allows the roller to be rotated forwards by this knob independently of the movement effected by the key *c*. Close by the slot *s* the casing *u* has an opening *i* and the roller has behind the latter, in line with the rows of symbols, the consecutive numbers 1, 2, 3, and so on, as many as the roller has rows of symbols, so that the number of the row or the index is visible in this index-opening *i* for each row of symbols which appears behind the slot *s*.

The apparatus is used in the following manner: The person who sends a message and the one who receives it have each such an apparatus with the same number of rows of symbols and with the symbols in these rows arranged alike. The person who sends the message sets the roller by means of the knob *k* to a definite character on the index *i* which has been agreed upon and writes in the letter or telegraph form the symbols of the row which then appears above the scale *t* in

the slot *s*, which correspond to the letters and numbers of the text which are to be read off on the scale *t*. The key *c* is depressed for each letter or each group of letters (word), and the rows of symbols of the roller which then appear above the scale *s* are used for the next letter or group of letters (word), and so on. When the receiver knows the index character he can by setting it on the index *i* change back the text by means of the scale *t* on reading the cipher which appears behind the slots. Of course the most manifold combinations and permutations can be made with the apparatus; another index character can be selected at any time, and the latter may be agreed upon to be changed after a certain number of letters or words; it may be agreed that after each individual letter or a definite number of letters or words the key *c* is depressed not once, but twice, thrice or a progressively increasing number of times, as for instance, twice after the first or the third letter or word, thrice or four times after the second or fourth letter or word, and so on. In this manner the index characters and order of the depression of the key can be varied by previous agreement, so that the secrecy of the text and its conversion is guaranteed in the highest degree.

What we claim, and desire to secure by Letters Patent of the United States, is:

1. In a cipher apparatus the combination of a casing, a roller rotatable within said casing and provided with rows of characters, a feeding device adapted for rotating said roller step by step, a single key operating upon said feeding device, said casing having a longitudinal slot and a scale with alphabet characters and numerals, 1—9, 0—arranged below said slot, substantially as set forth.

2. In a cipher apparatus the combination of a casing, a roller rotatable within said cas-

ing and provided with rows of characters, a feeding device adapted for rotating said roller step by step, a single key operating upon said feeding device, said casing having a longitudinal slot, a scale with the characters arranged below said slot and means for rotating said roller independently of its rotation step by step by the key feeding mechanism, substantially as set forth.

3. In a cipher apparatus the combination of casing, a roller rotatable within said casing and provided with rows of characters, a feeding device adapted for rotating said roller step by step, a single key operating upon said feeding device, said casing having a longitudinal slot, a scale with the characters arranged below said slot, said casing having also an index opening and index characters of the character-rows on the roller, substantially as set forth.

4. In a cipher apparatus the combination of a casing, a roller rotatable within said casing and provided with rows of characters, a feeding device adapted for rotating said roller step by step, a single key operating upon said feeding device, said casing having a longitudinal slot, a scale with the characters arranged below said slot, said casing having also an index opening, index-characters of the character-rows on the roller and means for rotating said roller independently of its rotation step by step by the key feeding-mechanism, substantially as set forth.

In testimony whereof we have hereunto set our hands in presence of two subscribing witnesses for both the inventors.

CARL HAAS.
HEINRICH STUDDT.

Witnesses:

D. WILHELM HAAS,
JOS. H. LEUTE.