No. 845,515. PATENTED FEB. 26, 1907.

H. BURG.

CRYPTOGRAPH.

APPLICATION FILED JAN. 31, 1906.

2 SHEETS—SHEET 1.

Fig. 1.

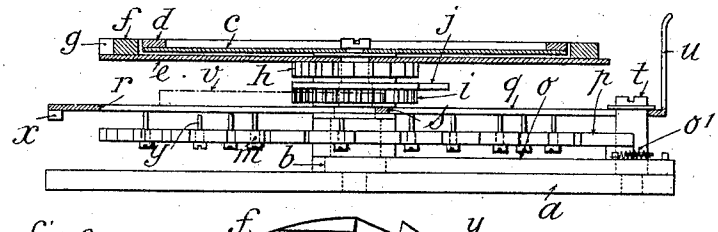
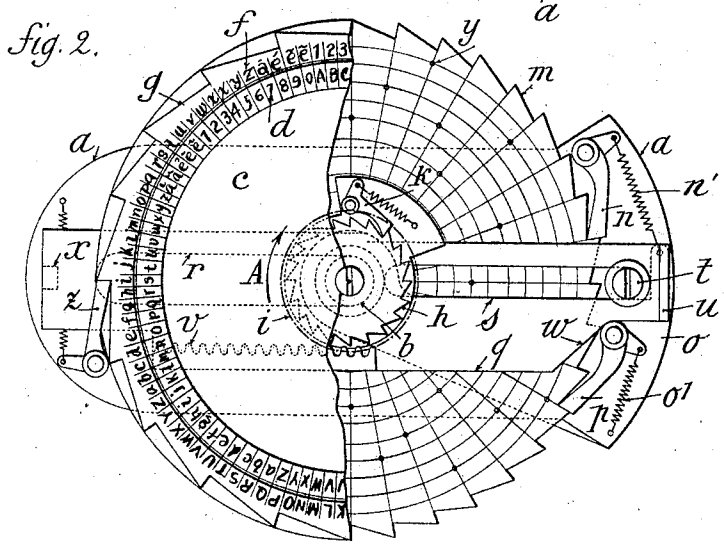


Fig. 2.



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2 SHEETS—SHEET 2.

Fig. 3.

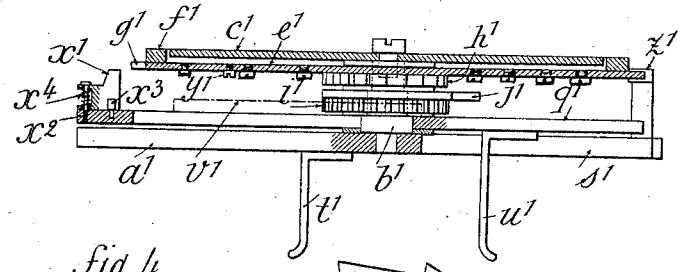
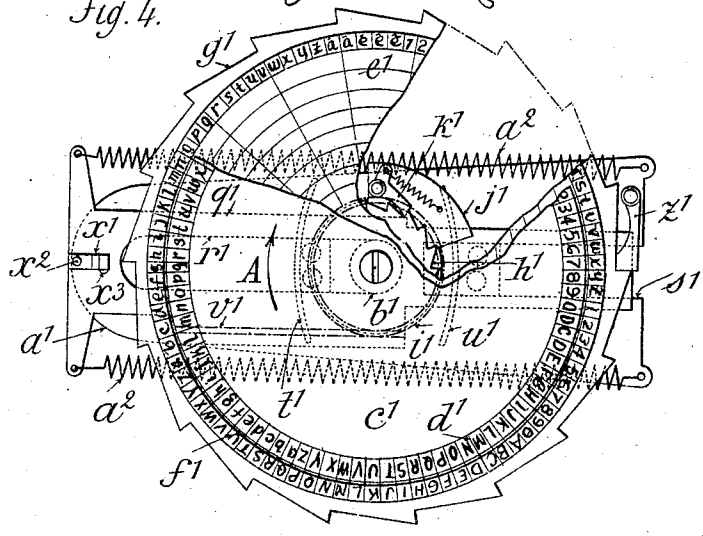


Fig. 4.



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UNITED STATES PATENT OFFICE.

HUBERT BURG, OF MOLLKIRCH, GERMANY.

CRYPTOGRAPH.

No. 845,515. Specification of Letters Patent. Patented Feb. 26, 1907.

Application filed January 31, 1906. Serial No. 298,774.

To all whom it may concern:

Be it known that I, HUBERT BURG, a German subject, residing at Mollkirch, Canton de Rosheim, Alsace-Lorraine, Germany, curé, have invented certain new and useful Improvements in Cryptographs, of which the following is a specification.

This invention relates to improvements in cryptographs; and it has for its object to provide a device of this character which will be simple as to the construction and easy to use, while giving a considerable number of combinations of letters and signs.

In the device or apparatus each change of combination is produced by the displacement of a carriage which is reciprocated directly by hand, the extent of such reciprocation varying automatically each time, according to a predetermined law, and this variable reciprocation of the carriage is transmitted to a crown of letters movable concentrically with respect to a fixed crown of letters, the said crowns serving to make the cryptographic translations.

In the accompanying drawing, which shows, by way of examples, two embodiments of this invention, Figure 1 is a side elevation, partly in section, of an apparatus constructed according to the present invention. Fig. 2 is a plan of the same, certain parts of the disks carrying the crowns of letters being broken away. Figs. 3 and 4 are similar views of an embodiment of greater simplicity in construction.

In Figs. 1 and 2, the frame of the apparatus consists of a bed-plate *a*, which can be held in the hand and on which is secured a stud or swivel pin *b*. On the upper end of the latter is fixedly secured a disk *c*, provided with a crown of letters *d*, which presents a series of letters, figures, or signs equally spaced apart.

Rotatably mounted on the stud or swivel pin *b* are, first, a disk *e*, carrying another crown of letters *f* and provided with ratchet-teeth *g;* secondly, a ratchet-wheel *h*, secured to the disk *e;* thirdly, a toothed pinion *i*, provided with a plate or segment *j*, carrying a pawl *k*, so arranged as to act on the wheel *h;* fourthly, a ratchet-wheel *m*, on which acts a stop-pawl *n*, mounted on the plate *a* and held in engagement with the wheel by spring *n'*, and, fifthly, a segment *o*, carrying an actuating pawl or dog *p*, which acts on the wheel *m*, said pawl being held in engagement with the wheel by spring *o'*. On the stud or swivel pin *b* also is slidably mounted a carriage *q*, which is guided in a straight line by means of a slideway *r*, slidable on the stud *b*, and of a slideway *s*, slidable on a fixed stud *t*. The said carriage is provided with a handle *u*, by means of which it can be moved by hand, and with a toothed rack *v*, meshing with the toothed pinion *i*. One of the edges of the said carriage comprises an inclined plane *w*, so arranged as to act on the rotary stem of the pawl or dog *p* and cause the latter to move forward to the extent of one of the teeth of the ratchet-wheel *m*. The carriage *q* is also provided with a pin *x*, designed to impinge against the fixed pins *y*, secured to the ratchet-wheel *m*. The apparatus also comprises another stop-pawl *z*, mounted on the bed-plate *a* and acting on the teeth *g* to prevent the disk *e* from turning backward and from being carried onward by the momentum when turned forward. The pins *y* are equal in number to that of the teeth of the ratchet-wheel *m* and arranged on radii corresponding to the said teeth at different distances from the center.

On a reading being made on the crowns *d f* in the position of rest shown in the drawings the handle *u* is pulled toward the right, so as to move the carriage *q* until the pin *x* impinges against the pins *y*. During this movement the toothed rack *v* causes the toothed pinion *i* to revolve with the plate or segment *j* in an inverse direction to that of the arrow A, so that the pawl *k* rides on the wheel *h* and that the latter, as well as the disk *e*, remain motionless through the action of the pawl *z*. At the same time the inclined plane *w* has pushed back the segment *o* against the action of the retracting-spring *n'*, so that the pawl or dog *p* has caused the ratchet-wheel *m* to turn forward to the extent of one tooth and that one of the pins *y* has come into the path of the pin *x* before the latter has advanced above the ratchet-wheel *m*. When the carriage has thus been brought to a stop by the pin *y*, it is pushed back to its initial position. This movement has the effect of causing the toothed pinion *i* to revolve in the direction of the arrow A to the extent of an angle corresponding to the stroke of the carriage. The pawl *k* then causes the wheel *h* to revolve to the extent of the same angle, as

well as the disk *e*, so that the crown *f* takes up a fresh position with respect to the crown *d*. A fresh reading can now be made on the said crowns to give the cryptographic translation of any letter, figure, or sign.

The carriage can be operated in the manner just described either after each reading or of a determined number of readings. It can also be operated several times in succession between two readings, according to a predetermined conventional code. At each operation of the carriage another pin *y* comes into the path of the pin *x*, so that the stroke of the carriage and the angle of rotation of the crown *f* vary each time.

By varying the positions of the pins *y* on the ratchet-wheel *m* there can be obtained a considerable number of combinations, each representing a law of succession of the different angles of rotation of the crown *f*.

In the simplified embodiment of the invention (shown in Figs. 3 and 4) the bed-plate *a'* carries a stud or swivel pin *b'*, on which is fixedly secured a disk *c'*, carrying one of the crowns of letters *d'*. The other crown of letters *f'* is located on a disk *e'*, free to revolve on the stud *b'*, and the periphery of which is provided with ratchet-teeth *g'*, against which acts a stop-pawl *z'*. To the disk *e'* is secured a ratchet-wheel *h'*, which can be revolved forward by a pawl or dog *k'*, mounted on a plate *j'*, secured on the toothed wheel *i'*. The said toothed wheel, loosely mounted on the stud or swivel pin *b'*, meshes with a toothed rack *v'*, coöperating with a carriage *q'*, which is guided by a guideway *r'*, slidable on the stud *b'*, and by a handle *u'*, slidable in the guideway *s'* of the bed-plate *a'*. Spiral springs a^2 pull the carriage toward the right, so that the handle *u'* tends to move away from another handle *t'*, secured to the bed-plate *a'*. The handles *u'* and *t'* are so arranged that they can be grasped by the fingers of one hand and brought together by the same, so as to bring the carriage back to the left, as shown in the drawings. The stroke of the carriage to the right is limited by a pin *x'* impinging against the pins *y'*, secured direct to the disk *e'*, and its stroke toward the left is limited by the length of the slideway *r'*.

When after a reading has been made on the crowns *d' f'*, the handles *u'* and *t'* being moved away from each other, the hand is closed in bringing the said handles together to the limit of their inward strokes, as shown in the drawing, the displacement of the carriage toward the left revolves the toothed wheel *i'* in the direction of the arrow A. The pawl or dog *k'*, which moves with the wheel *i'*, carries forward the wheel *h'* and the disk *e'* in the same direction to the extent of an angle which corresponds to the stroke of the carriage. By relieving the pressure on the handles *u'* and *t'* the carriage is allowed to return toward the right under the action of the springs a^2 until the pin *x'* impinges against the pin *y'*, which has just been brought into its path by the rotation of the disk *e'*. During this return movement of the carriage the pawl or dog *k'* jumps onto the wheel *h'* and the disk *e'* is rendered motionless by the pawl *z'*. Consequently at each pressure of the hand on the handles *u'* and *t'* the disk *e'* is revolved to the extent of an angle which depends on the variable stroke allowed to the carriage by the different pins *y'*.

In order that the rotation of the disk *e'* shall not be stopped unseasonably by the impingement of a pin *y'* against a lateral face of the pin *x'*, the latter may be mounted on a pivot x^2 and be held normally against a stop-pin x^3 by means of a spring x^4, so as to be enabled to yield to the pressure of the pins *y'* in the direction of the arrow A.

The hereinbefore apparatuses are intended to be held in the hand, but they may be provided with legs and thus become fixed apparatuses.

I claim—

1. A cryptograph comprising a bed-plate, a stud or swivel pin fixedly secured on the bed-plate, a disk provided with letters secured on the said stud, a disk provided with letters revolving around the said stud, a ratchet-wheel on the last-named disk, a toothed wheel revolving around the stud, a pawl carried by the last-named toothed wheel and which engages the ratchet-wheel, a carriage transversely slidable on the said stud and having a handle, a toothed rack on the said carriage meshing with the said toothed wheel a ratchet-disk revolving around the said stud, pins on the said disk so arranged as to be successively met with by the carriage, and means for revolving the said ratchet-disk step by step at each reciprocation of the carriage to bring successively the pins into the path of the carriage.

2. A cryptograph comprising a bed-plate, a fixed spindle on the said plate, a fixed letter-disk on the said spindle, a letter-disk revolving on the said spindle, a ratchet-wheel on the latter disk, a tooth-wheel revolving on the spindle, a pawl carried by the said toothed wheel and engaging with the ratchet-wheel, a carriage slidable transversely on the said spindle and having a handle, a toothed rack on the said carriage meshing with the said toothed wheel, an abutment on the said carriage, a series of pins at different distances from the spindle and on radial lines and adapted to be met successively by the abutment of the carriage, and means whereby the said series of pins are turned at each reciprocation of the carriage to bring a fresh pin in front of the abutment.

3. A cryptograph, comprising a fixed character-disk, a revoluble character-disk, a reciprocating member, means for operating

the revoluble disk from said member, and means controlled by the reciprocating member for varying the stroke of said member.

4. A cryptograph, comprising a fixed character-disk, a revoluble character-disk, a reciprocating member, means for operating the revoluble disk from the reciprocating member, a plurality of stops, and means for bringing a stop in position to arrest the movement of the reciprocating member.

5. A cryptograph, comprising a fixed character-disk, a revoluble character-disk, a reciprocating member, means for operating the revoluble disk from the said member, a plurality of stops, and means controlled by the reciprocating member to bring a stop in position to arrest the movement of said reciprocating member.

6. A cryptograph, comprising a fixed character-disk, a revoluble character-disk, a reciprocating member, means for operating the revoluble disk from the reciprocating member, a revoluble member carrying a plurality of stops, and means for operating the movable member to bring a stop thereof in position to arrest the movement of the reciprocating member.

7. A cryptograph, comprising a fixed character-disk, a revoluble character-disk, a reciprocating member, means for operating the revoluble disk from the reciprocating member, a revoluble member provided with a plurality of stops arranged at different distances from the center of said member, and means controlled by the reciprocating member for operating the revoluble member to bring a stop in position to arrest the movement of the said reciprocating member.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

HUBERT BURG.

Witnesses:
HANSON C. COXE.
MAURICE ROUX.