

WAR DEPARTMENT
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Invention of Mechanical Wheel Control for a Small Cryptograph.

1. Have (say) 3 cipher wheels and one control wheel. Mounted on the control wheel are 3 collars with pins which may be pushed into operative and inoperative positions (as on Swedish machine).
2. The control wheel is regularly stepped forward, one space for each depression of keyboard. Each collar controls the motion of one cipher wheel.
3. The control may be of two types:
 - a. A pin in operative position causes a small bar to be interposed between the wheel-step-forward drive-arm and the cipher wheel to be moved. The drive-arm is moved by universal bar or other means once after each encipherment.
 - b. A pin in operative position causes the withdrawal of the small bar interposed as under a. Thus, each wheel moves after each encipherment except when a pin in operative position presents itself on the control collar.
4. Except for the cipher circuits through the three cipher wheels, all action to be mechanical, from universal bar on keyboard, or from a hand or a foot lever.
5. The pins are to be set to operative and inoperative positions according to a key. The key should be such as to use up the complete period of 26^3 before repeating. Prime numbers such as 15, 16, 17 on the collars will do this. If 15 pins are to be operative, they should be distributed at random over the 26 spaces.

6. Collars with fixed pins may be used instead of above. The arrangement may be such that the collars are permanently attached to the control wheel; or they may be demountable and interchangeable. They may also be rotatable on the control wheel, affording additional keying for individual messages.

7. A rough sketch of collars and control arrangement is attached. The action of collars on cipher wheels may be varied so that a collar may control CW-1, 2, or 3.

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