June 26, 1935

MEMORANDUM FOR: Research and Development Division
(THRU: War Plans & Training Division)

1. In connection with the tabulating machinery now employed by the Signal Intelligence Section, the undersigned have invented a new and useful device which may be attached to the electrical counting sorter and which will be of importance in future employment of this machine in code compilation and in other work not related thereto, of a purely commercial character.

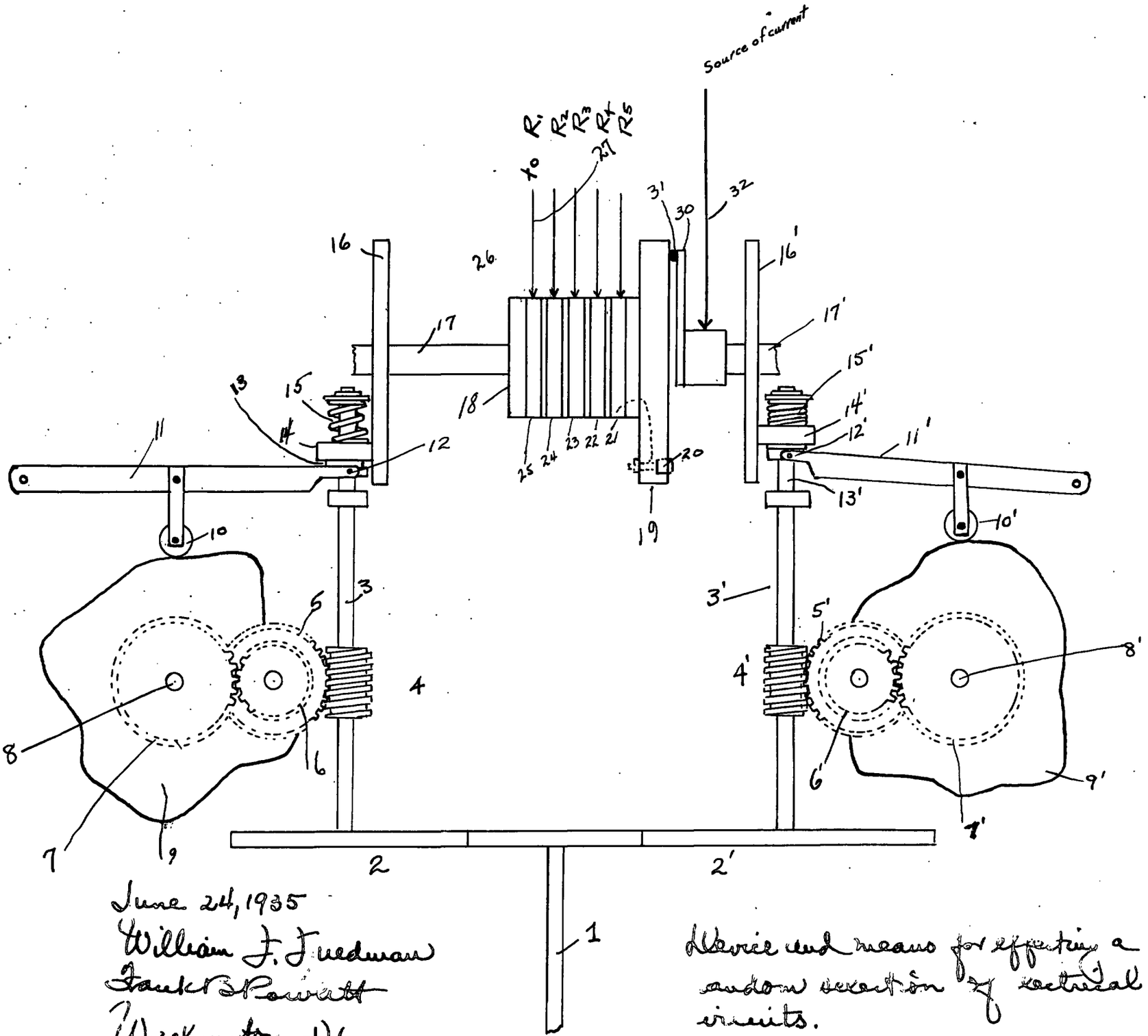
2. The principal object of the invention is to transform the electrical sorter into a device of exactly opposite function, viz., to "unsort", "scramble", or disarrange in a wholly random sequence a set of punched cards originally arranged in a definite or regular sequence. Another object is to provide a means and device for obtaining a wholly random, small sample from a large set of punched cards.

3. In view of the fact that such a device will be very useful in code production, it is desirable that patent application be made in order to protect the government's interests.

4. At the same time, in view of the usefulness of the device for certain commercial tabulating installations in which random selections of punched cards must occasionally be made, permission is requested to enter into negotiations with the International Business Machines Corporation or other companies, with a view to possible sale of commercial rights to this invention.

5. Attached hereto is a sketch and description of the invention, in the form of a preliminary draft of specifications.

Attached:
Sketch
Description.



June 24, 1935
William F. Friedman
Frank B. Rowlett
Washington, D.C.
Office of the Chief Signal Officer

Device and means for effecting a random selection of electrical circuits.

This invention relates in general to electrical devices in which are incorporated a plurality of circuits, and in particular to any sorting device for punched cards using an electric circuit for the zoning of a particular card. It has for its object the provision of apparatus and means for automatically arranging a large set of punched cards in a purely arbitrary or random order.

A further object of this invention is to provide a device, to be used in connection with a sorting device, for selecting from an assortment of punched cards, a set of cards which are chosen at random from the basic assortment.

A further object of this invention is to provide a means of selecting from a plurality of available electrical circuits a single circuit at random, which electrical circuit will be operative for a period of time, the length of which depends upon one or several variable factors.

A further object of this invention is to provide apparatus for varying the speed of a rotating shaft by means of a friction drive working in conjunction with a cam wheel of irregular outline for the purpose of opening and closing electrical circuits for varying periods of time.

In order that the invention and its mode of application may be readily understood, there is set forth in the accompanying drawing and in the detailed following description thereof, a specific embodiment of one form of the invention.

Referring to Figure 1, which is a schematic diagram, 1 is a gear, driven by a motor or clock spring mechanism, not shown in the drawing; gear 1 meshes

with the two gears 2 and 2', having different numbers of teeth. Gear 2 is fixed to shaft 3 and drives the worm gear 4, which in turn, through the train of gears 5, 6, 7 drives shaft 8, on which is mounted cam 9 of irregular outline. Roller 10 rides on the periphery of cam 9 and serves to move lever 11, through a succession of angles which are determined by the depressions and elevations of cam 9. The free end of lever 11 is connected by a pin 12 to a collar 13 which is free to slide up and down on shaft 3 but is independent of the latter in its rotation. The upper end of collar 13 presses against disk 14, which is also mounted on shaft 3 but, by a slot and bar arrangement, is driven by shaft 3. Spring 15 serves to keep the assembly 12, 13, and 14 in place on the shaft 3 and also to cause the roller 10 to follow the outline of cam 9. Disk 14, by frictional effect, drives wheel 16, keyed to shaft 17 so that as shaft 3 turns disk 14 turns and slides up and down against the face of wheel 16, causing shaft 17 to rotate at constantly varying speeds as the roller 10 rides on the periphery of cam 9. On the shaft 17 is mounted commutator 18 and a contact bearing wheel 19, carrying a circle of contacts, 20 connected in a random manner to the commutator rings 21, 22, 23, 24, 25. Resting against the commutator rings are collectors 26, which are connected to conductors 27 leading to individual circuits.

The action of the members 2 to 17 inclusive is the same as that of the members 2' to 17'. Shaft 17' rotates brush arm 30, carrying brush 31 which sweeps over the contacts 20 as it rotates. Brush 30 is connected to the common return conductor 32 for the circuits R_1, R_2, R_3, R_4, R_5 to which conductors 27 lead.

Since wheel 19 and brush arm 30 rotate in different directions and at constantly varying speeds the circuits R_1, R_2, R_3, R_4, R_5 are selected in the order of the contacts 20 on wheel 19, but each circuit is operative for a different interval of time.

In the drawing of Figure 1 specific mechanical principles are shown for effecting the movements of the various parts of the drawing. However, these are shown only for the purpose of demonstration of the principles incorporated in this invention, and it is pointed out that any other mechanical means for varying the angular velocity of the disk 19 and the contact arm 30, either separately or conjointly, will effect the result desired. It is also pointed out that, while five commutator rings are depicted in the drawing of figure 1 any number may be used, and that the number of contacts on the face of the disk 19 may be equal to the number of contact rings or greater by any practicable number.

July 28

~~CONFIDENTIAL~~

8

June 26, 1935

MEMORANDUM FOR: Research and Development Division
(THRU: War Plans & Training Division)

1. In connection with the tabulating machinery now employed by the Signal Intelligence Section, the undersigned have invented a new and useful device which may be attached to the electrical counting sorter and which will be of importance in future employment of this machine in code compilation and in other work not related thereto, of a purely commercial character.

2. The principal object of the invention is to transform the electrical sorter into a device of exactly opposite function, viz., to "unsort", "scramble", or disarrange in a wholly random sequence a set of punched cards originally arranged in a definite or regular sequence. Another object is to provide a means and device for obtaining a wholly random, small sample from a large set of punched cards.

3. In view of the fact that such a device will be very useful in code production, it is desirable that patent application be made in order to protect the government's interests.

4. At the same time, in view of the usefulness of the device for certain commercial tabulating installations in which random selections of punched cards must occasionally be made, permission is requested to enter into negotiations with the International Business Machines Corporation or other companies, with a view to possible sale of commercial rights to this invention.

5. Attached hereto is a sketch and description of the invention, in the form of a preliminary draft of specifications.

William F. Friedman
Frank B Rowlett

Attached:
Sketch
Description.

~~CONFIDENTIAL~~