

B. S. POTTER.
EDUCATIONAL DEVICE.
APPLICATION FILED FEB. 26, 1909.

947,064.

Patented Jan. 18, 1910.

2 SHEETS—SHEET 1.

Fig. 1.

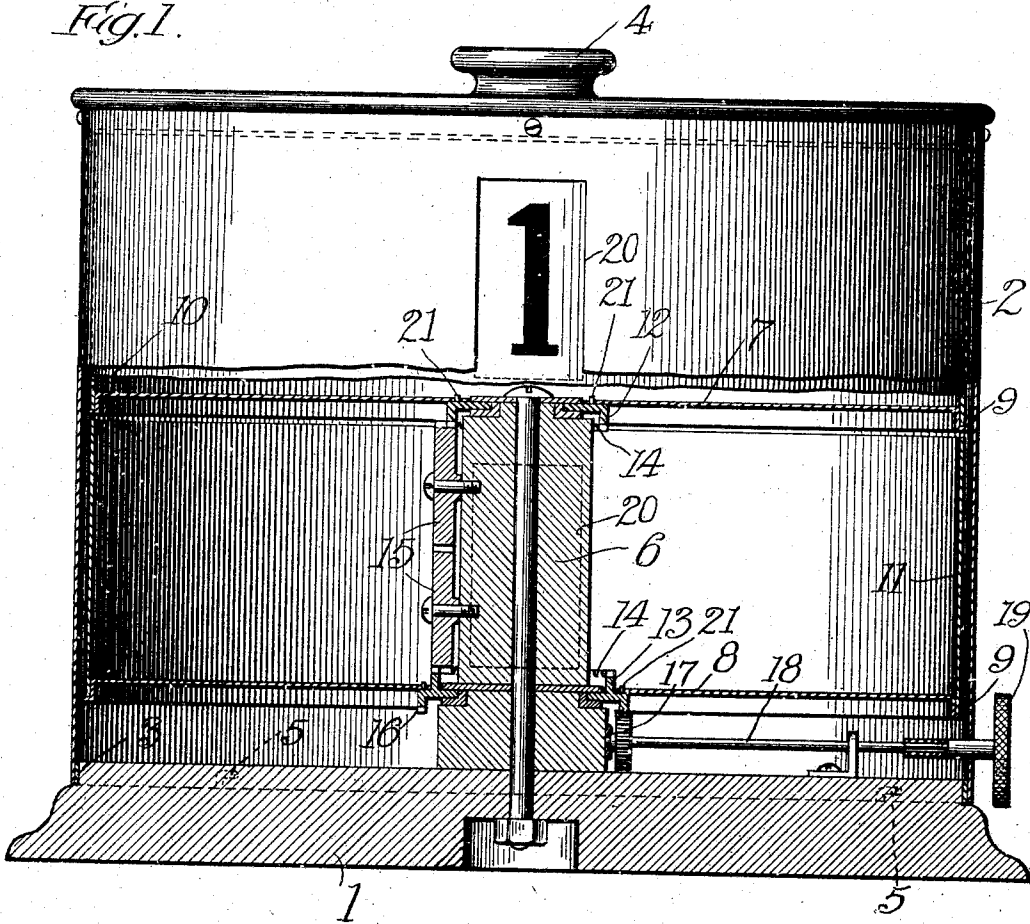
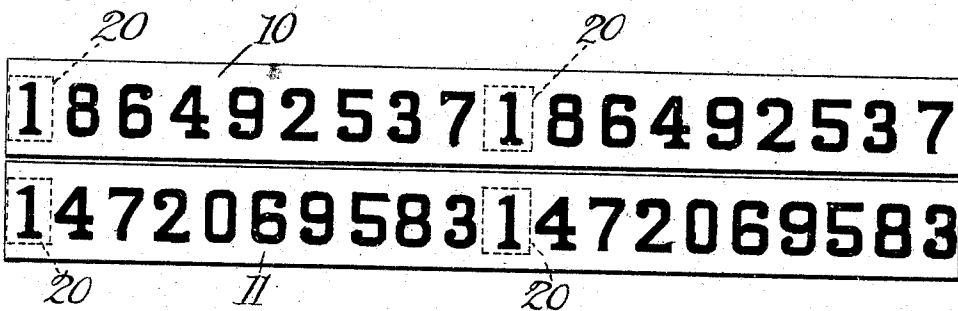


Fig. 2.



Witnesses
R. A. White,
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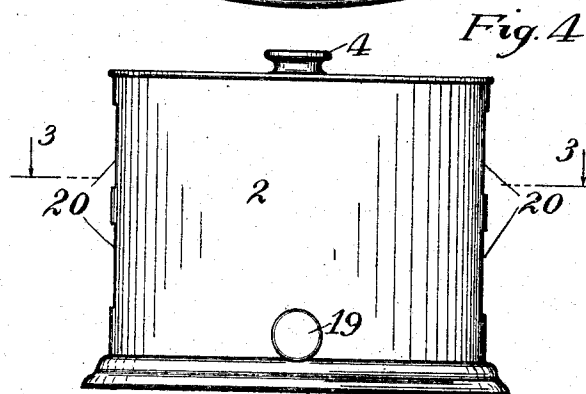
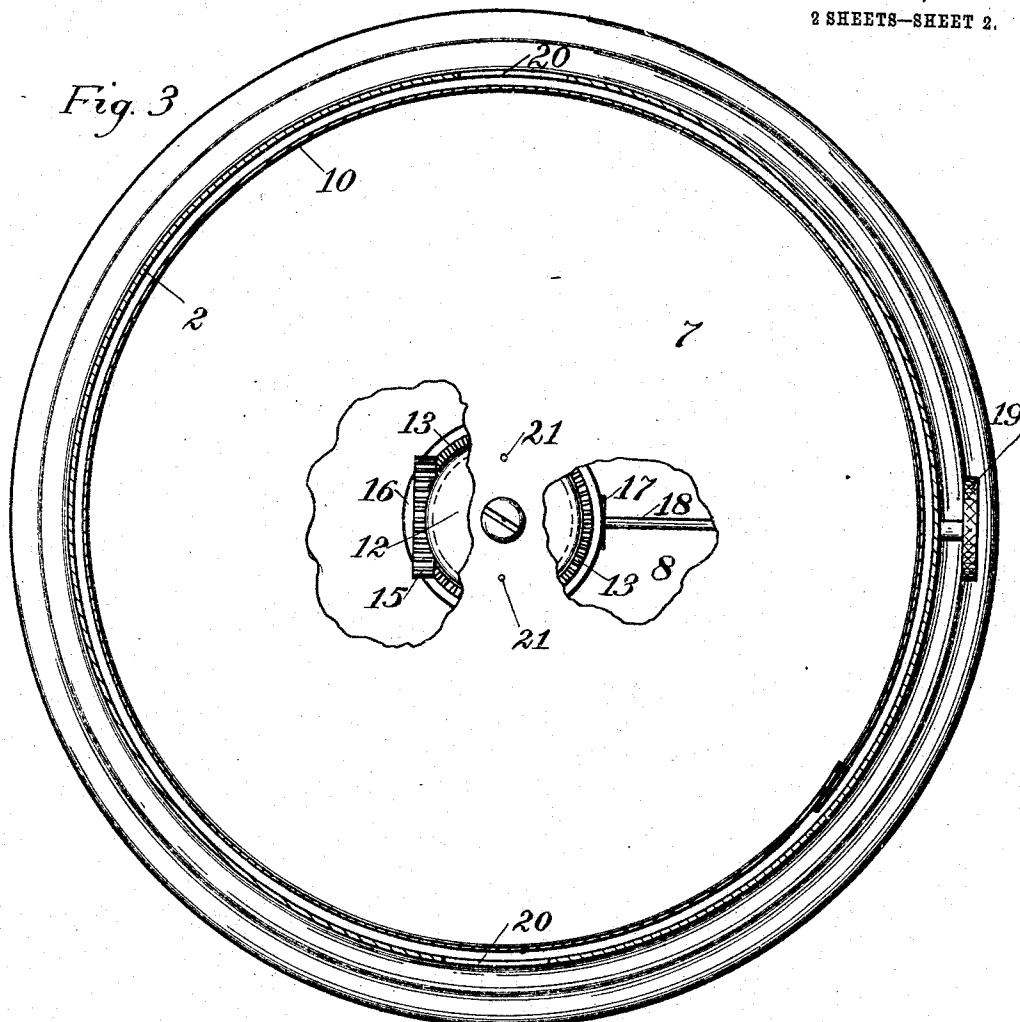
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2 SHEETS—SHEET 2.



Witnesses:

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UNITED STATES PATENT OFFICE.

BRADFORD S. POTTER, OF EVANSTON, ILLINOIS.

EDUCATIONAL DEVICE.

947,064.

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To all whom it may concern:

Be it known that I, BRADFORD S. POTTER, a citizen of the United States of America, and a resident of Evanston, Cook county, State of Illinois, have invented certain new and useful Improvements in Educational Devices, of which the following is a specification.

The main objects of this invention are to provide an improved form of permutation device adapted to display successively different combinations of characters; to provide a device of this kind which is particularly useful for educational purposes in that many permutations of the characters could be made while any particular combination of characters would be repeated only at infrequent intervals, so that it would be difficult for a person to memorize the order in which the combinations occur and thereby anticipate successive combinations; and to provide a device of this kind in which the same combinations of characters would be simultaneously displayed at opposite sides of the device.

A specific embodiment of this invention is illustrated in the accompanying drawings, in which:

Figure 1 is a front elevation, partly sectional, of a permutation device constructed according to this invention and adapted for the purpose of displaying successively different combinations of numbers. Fig. 2 is a view on a smaller scale, showing a development of the surfaces of a set of cards suitable for use in the apparatus shown in Fig. 1. Fig. 3 is a section taken on the line 3—3 of Fig. 4, the upper disk being partly broken away to show the construction below. Fig. 4 is a side elevation, showing the arrangement of the sight openings.

In the construction shown in the drawings, the base 1 is circular and supports a cylindrical casing 2. The lower edge of the casing loosely engages an annular shoulder 3 on the base, so that the casing may be readily lifted to allow access to the interior thereof. For this purpose the casing is provided with a knob 4 at the top and is secured to the base by means of pins and bayonet slots indicated by dotted lines at 5.

Journalled within the casing on a central post 6 are two rotary members 7 and 8 which are preferably in the form of disks and journalled one above the other in axial alinement with each other. The edges of

the disks are flanged downwardly and outwardly to form the annular seats 9 for supporting cylindrical cards 10 and 11. The members 7 and 8 are respectively carried by gears 12 and 13 which are journaled upon the post 6 and provided with gear teeth 14 on their adjacent faces. Intermediate gears 15 on the post 6 connect the gears 14. The pitch of the teeth 14 is the same on each of the gears 12 and 13, but said gears are of different diameters, so that the corresponding angular intervals of the rotation of the cards 10 and 11 will be different. As will be seen from Fig. 2, each of the cards has on its periphery a series of characters, and there is a different number of characters on the card 10 than on the card 11. The sequence of the characters is different on different cards, and in each case the order is different from the usual numerical order. The ratio of diameters of the gears 12 and 13 is such that when one of the cards is rotated through an angular interval corresponding to the spacing of the characters thereon, then the other card will be rotated through an angular interval corresponding to the spacing of its characters. The width of the gears 15 is such that they will mesh with both of the gears 12 and 13, as shown in Fig. 1. The gear 13 has an additional set of downwardly facing teeth 16 which mesh with the pinion 17 on the operating shaft 18, said shaft being rotated by means of a removable key 19.

The casing is provided with sight openings 20 adjacent to each of the cards 10 and 11 and so located as to display one character at a time on each card. There is preferably a set of openings 20 both at the front and at the back of the casing, and the numerals or characters are arranged on the cards so that the same characters will simultaneously appear at both the front and back sight openings, thus enabling the teacher sitting behind the device to see what characters are being displayed to the pupils at the front openings. The gearing is such that the cards travel in the same direction, which is less trying on the eyes than if the cards turned in opposite directions.

In the form shown, the disks 7 and 8 are of sheet metal and are loosely seated on the gears 12 and 13, being prevented from relative rotation by means of the studs 21. The cards are preferably of thin material, such as paper, and it is intended that each de-

vice shall be provided with a plurality of sets of cards, so that the cards having differently arranged characters may be substituted from time to time. To this end, the cards are seated on the annular seats 9 so that they may be readily withdrawn, and the upper disk 7 is removable so as to permit the ready removal of the card 11 from the lower disk. The cards fit the seats 9 snugly and are prevented from shifting on said seats by friction.

The operation of the device shown is as follows:—The gearing is so arranged that whenever a character appears at one of the openings 20, one of the characters on the other member will also appear at the other opening 20. The main purpose of the device is to enable the teacher to quickly display to the pupils different sets of numbers for use in various mathematical exercises, as, for instance, multiplication, addition, and subtraction. By rotating the knurled head of the key 19, the teacher may advance the cards one or more intervals, and the gearing will cause the numbers on both cards to simultaneously register with the openings. On account of the arrangement of the gearing, there will be a continuous permutation of the numbers on the two members, so that a repetition of combinations will appear only at long intervals. With this arrangement, it will be impossible for the pupils to anticipate the numbers which are about to be displayed.

Although but one specific embodiment of this invention is herein shown and described, it will be understood that numerous details of the construction shown may be altered or omitted without departing from the spirit of this invention.

I claim:—

1. A device of the class described, comprising a plurality of members mounted to rotate and each having thereon a series of characters, a wall in front of said members having therein sight openings through which a part of each of said members is visible while another part thereof is hidden by said wall, and mechanism adapted to rotate said members to a predetermined relatively different extent at each operation for the purpose of displaying successively different combinations of characters at said openings.

2. A device of the class described, comprising a plurality of members mounted to rotate and each having thereon a series of characters arranged in a circle having its center in the axis of rotation, a wall in front of said members having therein sight openings through which the adjacent characters on said members are visible while those at each side are hidden by said wall, mechanism adapted to angularly advance said members simultaneously for displaying successively different combinations of characters

at said openings, the angular movements of said members being in the same direction and of predetermined relatively different extent.

3. A device of the class described, comprising a casing, a pair of members rotatably mounted in said casing and each having thereon a series of characters, there being a different number of characters on each of said members, said casing having therein sight openings for displaying a limited number of the characters on each member, and gearing connecting said members and adapted to rotate the same through respectively different angular intervals, whereby the characters on each will be successively brought to register with said openings for the purpose of displaying successively different combinations of characters.

4. A device of the class described, comprising a casing, a pair of members rotatably mounted in said casing and each having thereon a series of characters, there being a different number of characters on each of said members and the characters being arranged in different order on each of said members, said casing having therein sight openings for displaying a limited number of the characters on each member, and gearing connecting said members and adapted to rotate the same through respectively different angular intervals, whereby the characters on each will be successively brought to register with said openings for the purpose of displaying successively different combinations of characters.

5. A device of the class described, comprising a casing, a pair of members journaled on vertical axes one above the other, cylindrical bands respectively supported on said members and each having on its periphery a series of characters, said casing having therein sight openings arranged to display the adjacent characters on said bands, and mechanism adapted to simultaneously rotate said members through respectively different angular intervals for the purpose of displaying successively different combinations of characters at said openings.

6. A device of the class described, comprising a casing having sight openings at different sides thereof, a pair of members journaled in said casing, means for simultaneously rotating said members at respectively different angular velocities, and characters on said members arranged to be successively displayed at said openings, each character being repeated at such intervals that similar characters will be simultaneously displayed at each of said different sides of the casing, and the relative spacing of the characters on said members being proportional to the relative angular velocities thereof, whereby the recurrence of the same combination of characters in each revolution

tion of one of said members will be prevented.

7. A device of the class described, comprising a wall having sight openings therein,
5 a pair of endless bands mounted behind said wall and arranged to travel across said sight openings, mechanism for simultaneously driving said bands at predetermined relative velocities, characters on said bands
10 spaced to correspond with the relative velocities whereby characters on both bands will appear simultaneously at said openings, said velocities being so proportioned

to the peripheral lengths of the bands as to cause said bands to complete their cycles of travel at respectively different times, and thereby insure that repetition of the character combination in similar order will occur only at intervals longer than those corresponding to the cycles of travel of the bands. 15 20

Signed at Chicago this 23rd day of February, 1909.

BRADFORD S. POTTER.

Witnesses:

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