

UNITED STATES PATENT OFFICE.

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PERPETUAL-ADDING SLATE AND KEY.

993,680.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, WILLIAM B. HERBERT, a subject of the King of Great Britain, and a resident of West Nutley, county of Essex, and State of New Jersey, have invented certain new and useful Improvements in Perpetual-Adding Slates and Keys, of which the following is a full, clear, and exact description.

10 This invention relates to an education appliance adapted to assist in the instruction of addition.

The primary object of the invention is to provide a simple device which will display 15 various columns of figures in a designated space together with means for determining the sum total of said columns.

A further object of the invention is to produce a device that will arrange various 20 columns of figures in proper alinement to be added by a student.

With these and other objects in view, the invention will be hereinafter more particularly described with reference to the accompanying drawings, which form a part of this specification, and will then be pointed out in the claims at the end of the description.

Figure 1 is a front elevation of the device. 30 Fig. 2 is an elevation of a key chart constituting a feature of my invention. Fig. 3 is a section on the line III—III. Fig. 4 is a section on a line IV—IV; and Fig. 5 is a section on the line V—V.

35 In the drawing, 10 designates a casing consisting of three members 11, 12 and 13 secured to each other at their edge portions. These members are so positioned as to provide a space between each outer member and 40 the central member. A plurality of rectangular members 1, 2, 3, and 4 are inserted between the inner member and the member 11, said members being arranged one above the other. Each of these members is adapted 45 to slide back and forth between the two members 11 and 12. Each sliding member is provided with five rows of numerals the first four rows of which may be arranged in any manner, but in the bottom row the 50 numbers are arranged consecutively from left to right. The member 11 is provided with a vertical slot 14 and four longitudinal slots 15, 16, 17 and 18. The longitudinal slots are to permit the operator to move the 55 sliding members, said sliding members being provided with an opening which may be

engaged by pencil or other instrument. The vertical slot 14 is of sufficient width to display five columns of numerals on each of the slides at one time. At the base of this 60 vertical slot is a member 19 formed of ground glass on which the scholar may add the figures in the said five columns. This structure will assure the proper alinement of the figures as the columns are being 65 added. When it is desired to add a certain set of five columns of figures the sliding members are moved until said set appears in the vertical slot. Each set of five numbers is designated by a different numeral 70 in the lower right hand corner and by referring to this numeral the instructor may designate the particular column to be added. Thus after if it is desired to add a certain set of columns on each slide it will only be 75 necessary for the instructor to state what lower right hand figure should be in each set. This arrangement it will be seen will do away with the necessity of calling off 80 each numeral in the entire set. The slides are termed 1, 2, 3 and 4 and referred to by their numbers as the designating numeral in the lower right hand corner is given. This means will allow an unlimited number of combinations of numerals to be arranged 85 for addition.

The numerals upon the strips 1, 2, 3 and 4 are so placed that the sum of any group of five numbers will always be the same when the lower right hand figure of the 90 group is the same, and the totals on the key chart are previously ascertained by adding. The totals in column No. 1a in Fig. 2 represent the sums of the group of five numbers on slide 1 for each ten numerals, that is 95 for each of the ten numerals from 0 to 9, as the right hand lower numeral of the group of five. The totals in the column No. 2b represent the sums of the group of five numbers on slide 2, &c., the totals varying 100 with the variation of the lower right hand figure of each group of five numbers.

In Fig. 1 in the drawing it will be seen that the slides are set so that series 2 will appear on the first slide, series 3 on the second 105 slide, series 5 on the third slide, and series 4 on the fourth slide, therefore in instructing a student to add the five columns of figures displayed it would be necessary for the instructor to merely designate series 2 slide 110 1 series 3 slide 2, etc. On the opposite face of the device are arranged four members 20

to correspond with the number of slides on the reverse side. These members are numbered 1^a, 2^b, 3^c, and 4^d, and said members consist of strips of card-board or other material provided with recesses to support the member 21 which is adapted to slide over the face of said strips. On each of the stationary members are arranged rows of numerals, each row of numerals being numbered to correspond with the lower right hand figure on one of the sliding members 1, 2, 3 and 4. Each set of numerals of the rows on the stationary key represents the sum total of one of the groups of numerals on the slides 1 to 4. For example the totals on the key under the heading "No. 3c" represent the sums of the group of figures on slide 3. In the illustration given the lower right hand number of the group of figures on slide 3 is 5, and the figures on the key under "No. 3c" numbered 5 represent the total of the figures shown on slide 3 in Fig. 1 or 196557. If the lower right hand numeral on slide 3 were 9, the sum of the group of figures on said strip 3 would be 299,067, as that number appears under the designation 9 on the key under the heading "No. 3c" and so on. As before stated the stationary members 1^a, 2^b, 3^c and 4^d are numbered to correspond with the sliding members 1, 2, 3 and 4 and the total of the various sets of figures on slide 1 are arranged upon the stationary member No. 1a. Each total bears the same figure as that which appears in the lower right hand corner of the set of numerals of which the same is the sum total. These numbers are arranged above the sum total. It will therefore be seen that if the numeral 2 appears in the lower right hand corner of slide 1 the set of numerals designated by 2 under the heading No. 1a on the stationary member will be the sum total of the five columns of figures displayed on slide 1 when it is in the position shown. The slide 21 is for the purpose of locating the various lines of figures on the stationary member. A ground glass member 22 is located at the bottom of the stationary members on which the sum total may be written. To ascertain the sum total of all of the four sets displayed by slides 1, 2, 3, 4, it is only necessary to add the four sets of figures which represent the sum total of each set, therefore it will be seen that the sum of twenty rows of figures may be ascertained by adding four rows of figures.

In Figs. 1, 3, 4, and 5 the adding mechanism which we will term the key is shown as

an integral part of the means for displaying the figures to be added but this form of device is intended only for the use of the instructor as it is desired that the student find the sum total by adding the columns displayed. A separate device as shown in Fig. 2 may be supplied to the student to verify his work after he has performed the various sums in addition. This device consists of a member 23 provided with slots 24 through which the slides 25 are inserted.

The many advantages of a device of this nature will be clearly apparent, first it is a quick method of giving out work to a student, second the student's time is saved by not having to copy the sum to be added, and third it provides a means whereby the student or instructor can instantaneously ascertain the correct solution to the problems given.

Having thus described my invention I claim as new and desire to secure by Letters Patent:—

1. A device of the character described comprising a casing consisting of a front formed with a slot, a plurality of slots transverse to said first mentioned slot, a back, and a series of slides between said front and back each bearing a plurality of rows of aligned characters and exposed through said first mentioned slot, said transverse slots serving to expose portions of said slides to facilitate their being moved.

2. An adding device comprising a casing consisting of a front formed with a vertical slot, and a plurality of horizontal slots, a back, and a series of slides between said front and back each bearing a plurality of rows of vertically-aligned numerals constituting a problem in addition and exposed through said vertical slot, said horizontal slots serving to expose portions of said slides to facilitate their being moved.

3. An adding device comprising a casing formed with vertical and horizontal slots, horizontally movable slides within said casing bearing vertically aligned groups of numerals, and being adapted to be exposed through said slots, and a key bearing numerals representing the sum totals of the groups of numerals on the slides.

This specification signed and witnessed this 18th day of December A. D. 1909.

WILLIAM B. HERBERT.

Witnesses:

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