March 31, 1942. J. J. PRESTON 2,277,993

AVERAGING DEVICE

Filed Dec. 2, 1941

Fig. 1.

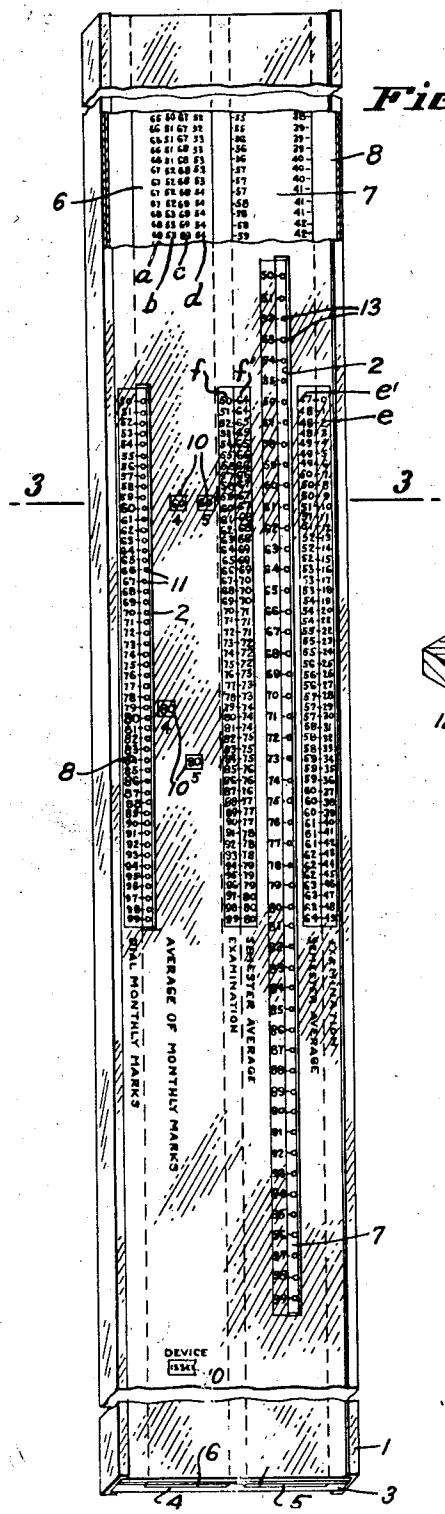


Fig. 2.

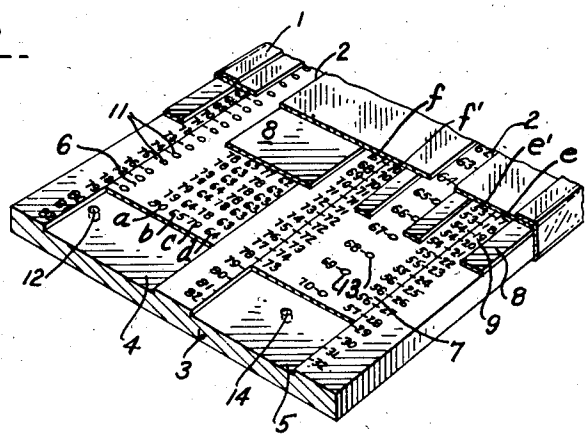
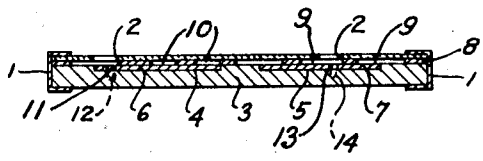


Fig. 3.



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AVERAGING DEVICE

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1 Claim. (Cl. 235—69)

This invention relates to improvements in averaging devices for use by teachers in calculating the average marks of students.

An object of my invention is to provide a device for averaging numbers.

Another object of my invention is to provide an improved device of the kind characterized, embodying novel means for readily determining the average monthly mark of a student when a certain base number is used in making the calculation, and also his final mark when the average monthly mark and the mark received in the final examination are combined in a certain proportion, as in the proportion of two-thirds and one-third.

Other and further objects of my invention will be pointed out hereinafter, or will be indicated in the appended claims, or will be obvious to one skilled in the art upon an understanding of the present disclosure. For the purpose of this application, I have elected to show herein certain forms and details of an averaging device representative of my invention; it is to be understood, however, that the embodiment of my invention herein shown and described is for the purpose of illustration only, and that therefore it is not to be regarded as exhaustive of the variations of the invention, nor is it to be given an interpretation such as might have the effect of limiting the claim, short of the true and most comprehensive scope of the invention in the art.

In the accompanying drawing:

Fig. 1 is a perspective view of an averaging device embodying the preferred principles of my invention;

Fig. 2 is a detailed view of a fragmentary part of the device, showing parts broken away and in section;

Fig. 3 is a sectional view taken on the line 3—3 of Fig. 1.

Referring to the drawing, the illustrated embodiment of the invention shown therein comprises a transparent covering 1 open at its ends and provided with two suitably placed elongated openings 2. The outer transparent covering 1 is secured to the rear side of an elongated board 3 having two longitudinally disposed grooves 4 and 5 within which slidable strips 6 and 7 are respectively mounted. Secured to and extending over the front side of the board 3 is an inner front panel 8 having a series of suitably placed elongated slots 9 and a series of suitably placed apertures or windows 10.

Arranged vertically on the board 3 adjacent and to the left of the longitudinal groove 4 are a series of numbers from 50 to 99 which are visible through one of the slots 9 in the panel 8. Two of these numbers, say 60 and 80, or any other number which is taken as a base number, is preferably distinguished from the others by suitable means such as by bold face printing. Vertically arranged on the slidable strip 6 adjacent the vertical row of stationary numbers from 50 to 99 are a series of openings 11 which are positioned opposite the said numbers, and are separated one from another by intervening spaces equivalent to the spaces between the said numbers. The board 3 is provided with holes 12 at points opposite the base numbers 60 and 80, the said holes being located beneath the openings 11. The pointed end of a pencil inserted in the openings 11 may be used to move the strip 6 up and down to bring successive openings 11 into registry with a hole 12 when it is desired to obtain the average of a series of numbers. Arranged on the slidable strip 6 are four vertical rows of numbers, *a*, *b*, *c* and *d*, the lefthand row, *a*, being numbers from 65 to 95 arranged in groups of four each, the next row to the right, *b*, being numbers from 50 to 80 arranged in groups of four each, the next row to the right, *c*, being numbers from 65 to 95 arranged in groups of five each, and the next row to the right, *d*, being numbers from 50 to 80 also arranged in groups of five each. The first row of numbers, *a*, to the left are used with the base number 80 on the board 8 to average four numbers from 65 to 95, while the third row of numbers, *c*, from the left are also used with the said base number 80 to average five of the said numbers from 65 to 95. The second and fourth rows of numbers, *b* and *d*, are used with the base number 60 to average four and five numbers between 50 and 80. The various numbers from 65 to 95, and those from 50 to 80, are used in illustrating my invention because under the methods now used by teachers in averaging the marks of students, the monthly marks ordinarily come within these ranges. If a device embodying my invention is used for other purposes, other groups of numbers may be placed on the board 3 and on the slidable strip 6. One of the windows 10 in the panel 8 is positioned opposite the base number 80 and in registry with the lefthand row of numbers on the strip 6; and beneath this window is the numeral 4 which indicates that the particular number appearing therethrough is the number resulting from averaging four of the numbers from 65 to 95. Another of the windows 10 is positioned over the third from the left row of numbers and about opposite

the stationary number 85; and beneath this window is the numeral 5 which indicates that the particular number appearing therethrough is the number resulting from averaging five numbers from 65 to 95. The two windows 10 located opposite the base number 60 (which windows are located over the second and fourth row of numbers *b* and *d* on the strip 4) are used with the said base number 60 to indicate the average of four and five numbers in the range from 50 to 80.

At the lower end of the device is an aperture or window 10, and through the same appears the words "is set" when the slidable strip 6 is suitably positioned to commence the operation of the device. It so happens when the words "is set" appear through the lower window 10, that the numerals 60 of the second and fourth rows of numbers, *b* and *d*, and the numerals 80 of the first and third rows, *a* and *c*, appear through their associated windows 10. It is, of course, to be understood that by arranging certain numerals within a certain range into groups of 6, 7, 8, etc., each, a correspondingly greater number of numerals within said range may be averaged.

In operation, say a teacher desires to average a student's five monthly marks to find his semester average, and that the said monthly marks are 83, 90, 76, 84 and 91: The device is first adjusted so the words "is set" appearing on the strip 6 are visible through the lower window 10. A pencil point is placed through the particular opening 11 located opposite the stationary number 83, and the strip 6 is moved upwardly until the pencil point lodges in the hole 12 located opposite the stationary base number 80. The pencil point is withdrawn and placed in the particular hole 11 which is then located opposite the stationary number 90, and the strip 4 is then moved upwardly until the pencil point becomes lodged in the hole 12 opposite the stationary number 80. After each of the other numbers, 76, 84 and 91, are similarly dialed, the particular number appearing through the window 10 which registers with the third column of numbers and is about opposite the stationary number 85, will be 85. This number is the average of the said five numbers, 83, 90, 76, 84 and 91.

Arranged on the board 3 at the immediate right and to the immediate left of the longitudinal groove 5, are two vertical columns or rows *e* and *f* of stationary numbers from 0 to 49 and from 50 to 99, respectively. The succeeding numbers of each column are uniformly separated one from another, and each is visible through certain slots 9 in the panel 8. Arranged on the slidable strip 7 opposite the said stationary columns of numbers *e* and *f* are two vertical rows or columns of numbers *e'* and *f'*, the row *e'* comprising numbers from 33 to 82 arranged in groups of three each, and the column *f'* comprising numbers from 50 to 99 also arranged in groups of three each. The succeeding numbers of each column *e'* and *f'* are separated by a uniform distance equivalent to the space separating the stationary numbers of the columns *e* and *f*.

Arranged in vertical order on the slidable strip 7 between the columns *e'* and *f'* are openings 13, which are positioned opposite a vertical column of numerals from 50 to 99. The successive numerals 50 to 99, as well as the openings 13 opposite the same, are separated one from the other by spaces twice as great as the spaces separating the successive numbers in the columns *e'* and *f'*. The top number in the center column on the slidable strip 7 is 50, and it is positioned opposite the middle 60 of column *f'* and also opposite the lower 43 of column *e'*. The next lower number is 51, and it is positioned opposite the upper 61 of column *f'* and also opposite the middle 44 of column *e'*, and similarly the various successive numerals in the center column of the slidable strip 7 are positioned opposite the numbers of the two adjacent columns *e'* and *f'*.

The pointed end of a pencil inserted in the openings 13 may be used to move the strip 7 up and down to bring any one of the successive openings 13 into registry with a hole 14 provided in the board at a point opposite the base number 30 of the stationary column *f*. In averaging certain numbers from 50 to 99, where one of them is to be counted twice and another number within the same range is to be counted but once, the pointed end of a pencil is inserted into the particular opening 13 opposite the number which is to be counted twice, and then the strip 7 is slid to a position whereby the pencil point lodges in the hole 14 of the board 3 opposite the base number 30 of column *f*. After the proper dialing as aforesaid, the particular number of either of the columns *e'* or *f'* which is then in line with and opposite the other selected number to be taken but once in the averaging operation, will constitute the average of the numbers. For example, the number 85 is to be combined with the number 94 in the proportion of two-thirds and one-third, the pencil point is inserted in the particular opening 13 of the strip 7 opposite 85, and then slid upwardly to a point opposite the base number 80 of the column *f* where it lodges in the hole 14. By looking at the stationary number 94 of column *f*, it will be observed that the numeral 88 on the slidable strip 7 appears opposite the said number 94. This number 88 is the average of 85 taken twice and 94 taken once. Since the common practice frequently followed by teachers in calculating the semester mark of a student is to give the monthly average two-thirds of the semester's final mark, and the semester's examination one-third, the present invention provides a device for readily determining a student's final mark for a semester.

It is apparent that the present invention may be embodied in various forms where other combinations, numbers, characters or letters, and other mechanical means for moving them to different positions with respect to each other, is used. It is also apparent that the principles of my invention may be provided in devices used for various purposes where averages are to be calculated.

Having described my invention, what I claim is:

An averaging device comprising a board having a series of stationary consecutive numbers separated one from another by a uniform distance, and arranged in vertical order thereon, one of the numbers being a base number, a strip slidably mounted on the board, having a plurality of vertically arranged openings for receiving a manipulating implement, the said openings being separated one from another by spaces equivalent to the distances by which the stationary numbers are separated, a plurality of vertical columns of consecutive numbers on the slidable strips and having the same range as the stationary numbers, each column having each of the consecutive numbers repeated a certain number of times, the said numbers of each column being separated one from its adjacent number by an intervening

distance equivalent to the distances separating the stationary numbers one from another, a panel mounted on the board having a series of slots and apertures, one of the slots being arranged to uncover the vertical column of stationary numbers and the vertical row of openings and certain of the apertures being arranged at predetermined points with respect to the base number so as to uncover a number in each of the vertical columns of numbers, and means on the board adjacent the stationary base number for engaging the manipulating implement when it reaches a point opposite the said base number.

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