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ROBERT MARSHALL WILLIAMSON, OF BURLEY, RINGWOOD, ENGLAND

DEVICE FOR TEACHING ARITHMETIC

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The present invention has for its object to provide a simple and improved device or appliance for use in teaching arithmetic according to the decimal system of notation by the method in which groups of numbered and preferably coloured tablets are arranged in columns according to their numerical denominations or significances and simple arithmetical processes carried out by varying the number of tablets contained in one or more of the columns

An appliance in accordance with this invention broadly comprises a plurality of rectangular frames or receivers corresponding to different orders of digits or different powers of ten, each frame or receiver either of itself, or when resting on a suitable supporting surface, forming a trough-like structure adapted to accommodate number-signifying tablets to the number of nine or a multiple of nine, and the plurality of such tablets being adapted when placed in said receptacles in any desired number to be grouped therein in columnar fashion while exhibiting the indications which distinguish their numerical values

Any number of such trough-like receivers may be provided, but preferably not less than three, with each subdivisible into two or more, or with three sets of two or more not subdivisible, although in the simplest form of the appliance two or two sets of two may suffice Lower powers of ten as well as higher powers thereof may also be dealt with

According to one arrangement or method of carrying out the invention, a number of separate rectangular frame structures or frames of uniform size is provided, comprising preferably two or more sets of frames of identical pattern, there being two or more similar frames in each of the said sets, such frames being adapted to be juxtaposed on any suitable supporting surface to form a complete appliance in which columns of tablets of different denominations can be set up If desired, a carrier board or equivalent means may be provided to support a plurality of the trough-like tablet holding frames and to keep them together in the desired relationship In any case the surface on which the frames rest may constitute the trough bottom on which the tablets rest or alternatively each frame may have its own bottom member or members for the said tablets to rest on Tablets of a different denomination for each set of frames are also provided

In a modified arrangement a rectangular board or base may be provided with one or more ribs or ridges parallel to a pair of opposite sides, so that parallel recesses or trough-like receptacles, hereinafter called troughs, are formed on each side of the rib, or between each pair of consecutive ridges, each trough being adapted to receive nine, or a multiple of nine numbered tablets and in the latter case being sub divisible by a single transverse partition or by a series of transverse partitions into a plurality of sections of equal length, each corresponding approximately to the total length occupied by nine tablets placed together in columnar fashion

In either arrangement the distinct sets of tablets allocated to the several sets of frames or troughs may, instead of or in addition to bearing numbers of different orders or powers of ten, be distinctively marked or coloured according to the particular set of frames or troughs which they are intended normally to occupy Thus, for instance, the colouring, whether of the surface as a whole or of the numbering figures may be alike in the case of all tablets intended to be placed in any one particular set of frames or troughs but may differ in respect of different sets of frames or troughs

Each tablet for insertion in one set of frames or troughs may be numbered 1, in another 10, and for others higher powers of 10 or lower powers, such as 1, 01

At one side or both sides of each frame or of each of the two or more sections of each trough a scale may be arranged bearing the figures 9, 8, 7 1, in descending order so as to indicate the number of tablets present in the frame or trough section when tablets are placed in columns touching each other starting from the end of the frame or trough-section where the number 1 appears

In the accompanying drawings which illustrate practical embodiments of the invention,

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Fig 1 is a perspective view of a single frame element with tablets therein

Fig 2 is a plan view of an appliance comprising three sets of two frames, each set of frames being used with tablets of different denominations An optional supporting tray for the several frames is included in this figure Fig 3 is a sectional view taken on the line III—III of Fig 2 and including a section through a cover or lid for the tray aforesaid, such cover being also adapted to serve as a receptacle or "bank" for spare tablets when the appliance is being used

Referring first to Fig 1, the reference character *a* designates a rectangular frame, constructed from any suitable material such, for instance, as metal, wood or cardboard and *b* a number of like digit-indicating tablets which are adapted to fit into the aperture a^1 of the trough In the case illustrated, each tablet bears a number indicating its numerical significance and it is to be assumed that all the tablets used in one frame (or set of frames, as hereinafter referred to) at any time will have the same numerical significance If such a frame be laid on a flat surface (for instance, on a table) a shallow trough is formed, the tablets resting on the table and being held in columnar fashion by the said frame *a* If desired, a bottom member a^2 may be attached to the frame *a* in such manner as to support the tablets even when the structure is lifted from the table or other supporting surface, but this is not necessary, especially if the frame has a backing as generally preferred Moreover the parts *a* and a^2 may be made integrally from one solid block of material, in which case d^1 must be regarded as designating a recess rather than an open aperture Although only a shallow trough is illustrated it may obviously be of any desired depth in proportion to its width but preferably its depth is the same as the thickness of the tablets *b* As shown in Fig 1 the frame is provided along one edge a^3 with the figures 9, 8, 7 1, arranged in descending order so as to indicate the number of tablets grouped together at any time, in the said frame, the left hand end of which is of course, assumed to be the bottom end of the columns of tablets

Fig 2 shows a complete teaching appliance built up by arranging on any suitable surface (it may be on a board or tray *c*) a plurality of trough-like receivers or frames *a* in sets of two or more, each set placed in columnar fashion Each set represents a different order of digits or different power of ten, tablets distinctively numbered, or distinctively coloured, or both, being provided for each set of frames for use therein in any desired number Troughs representing hundreds, tens and units are here shown removably arranged side by side and end to end in the recess spaces of the rectangular base member *c* It will be obvious however that higher or lower powers of ten may be indicated, using either the same set of troughs or a different set, the latter being preferable if a different distinctive colouring is allocated to every different power of ten

The tablets fitting into said receivers in column arrangement to a maximum of nine are coloured correspondingly to the receivers to which they are related or intended to be placed They may be distinctively coloured on their reverse, as well as on their obverse surfaces and the colouring, or numbering, if any, may be the same on both surfaces or may differ as between the two Thus, for instance, a tablet which indicates a higher power of ten on one face may be used for indication of a lower power of ten on the opposite face, if desired, and the two faces may accordingly be of different colours

The provision of a carrier frame or display board, such as *c* to hold a plurality of frames in preferably parallel relationship is optional When provided it may hold the frames or sets of frames at the same level or on different levels, according to the denominations of the tablets to be contained in the several troughs

The device of the present invention, as described, provides means for teaching the significance of the figures and digits in common use by arranging tablets in columnar fashion against the scale in any section of trough It also permits of additions, subtractions and simple processes of multiplication and division being carried out with concrete objects (that is to say, with the tablets) in such a way as to convey impressions to the pupil's mind through the visual sense, thus teaching the principles of arithmetic by concrete means and introducing the pupil by concrete illustration to the normal technic of recording arithmetical calculations in figures according to the decimal system of notation In all such appliances it is desirable to provide a storage (or, as it may conveniently be termed, a 'bank") for tablets temporarily out of use, such a store being exceedingly useful for instance in demonstrating the arithmetical processes in which ten tablets in one trough have to be exchanged for one tablet in the next trough to the left or vice versa, those being assumed to be of equal value under the decimal system of notation In the device of the present invention any convenient form of tablet receptacle (preferably furnished with troughs) may be associated with the device hereinabove described but I prefer to use for this purpose a flat or hollow lid or cover *d* arranged to perform the dual functions of protecting the appliance when not in use and of providing a tablet "bank" when the arithmetical processes are being demonstrated Ribs or partitions are inserted in this cover to form the desired

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tablet holding troughs from which tablets of any desired denomination may be drawn as required and to which such tablets may be returned when not in use in the display troughs *a*

What I claim is —

1 An arithmetical teaching device, comprising a rectangular base member, a plurality of trough-like receivers removably arranged side by side and end to end thereon in recess spaces, said receivers being identifiable each from the others by different coloring and indicia of different powers or multiples of 10 and each having the figures 9 to 1 applied in descending order from top to bottom along one margin, a plurality of sets of separate digit bearing tablets, each of said sets bearing numerical denominations differing from the others and fitting in column arrangement within said receivers to a maximum of nine and each of said sets being colored correspondingly to the receiver to which it is related by the value of the digits borne thereby

2 An arithmetical teaching device, comprising a flat base member in the form of a picture frame subdivided by partitioning into rectangular spaces, a plurality of flat frame like receivers fitted removably within the subdivided spaces of said member in a side by side relation, said receivers being distinguished each from the others by different colors and by applied indicia of different powers or multiples of 10 and each also having the figures 1 to 9 applied thereto in ascending order from bottom to top along one edge or margin, a plurality of sets of separate tablets bearing indicia of digit valuation with all in each set denominated alike and each set thereof being of a different numerical valuation corresponding to the indicia on the several receivers, said sets of tablets fitting in column arrangement within their designated receivers to a maximum of nine in each and each set being colored correspondingly to its intended receiver

Signed at Burley, Ringwood, Hants, England, this eleventh day of March, 1929

ROBERT MARSHALL WILLIAMSON

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Fig 1

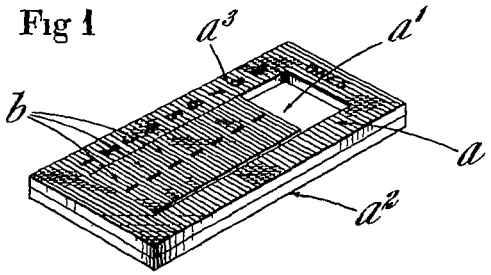


Fig 2

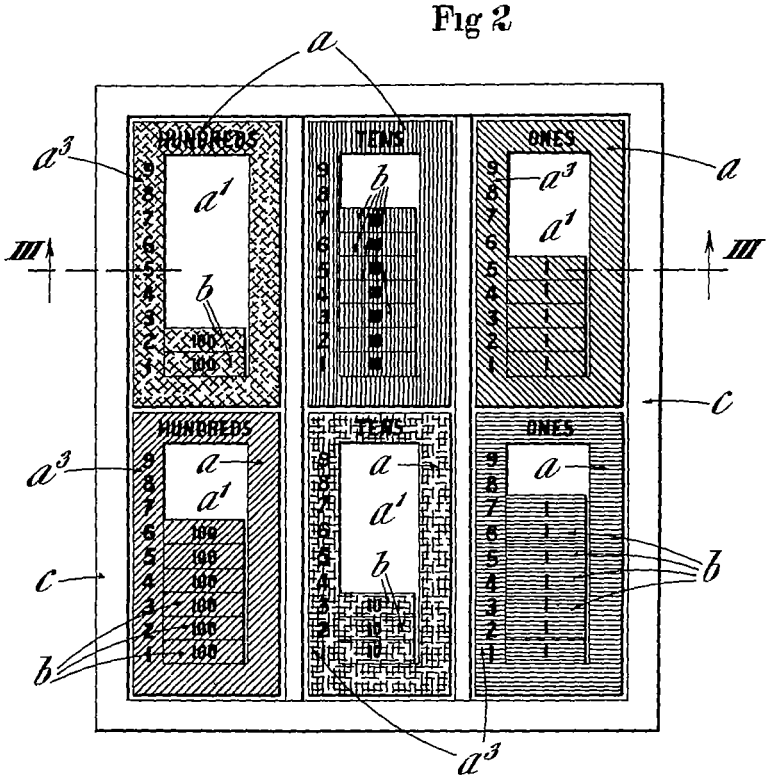
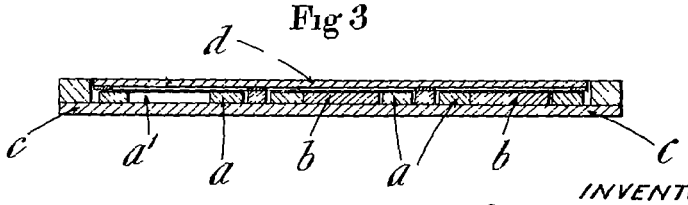


Fig 3



INVENTOR
Robert Marshall Williamson
BY Dowell & Dowell
ATTORNEYS