

(No Model.)

L. D. MYERS.  
ABACUS.

No. 532,282.

Patented Jan. 8, 1895.

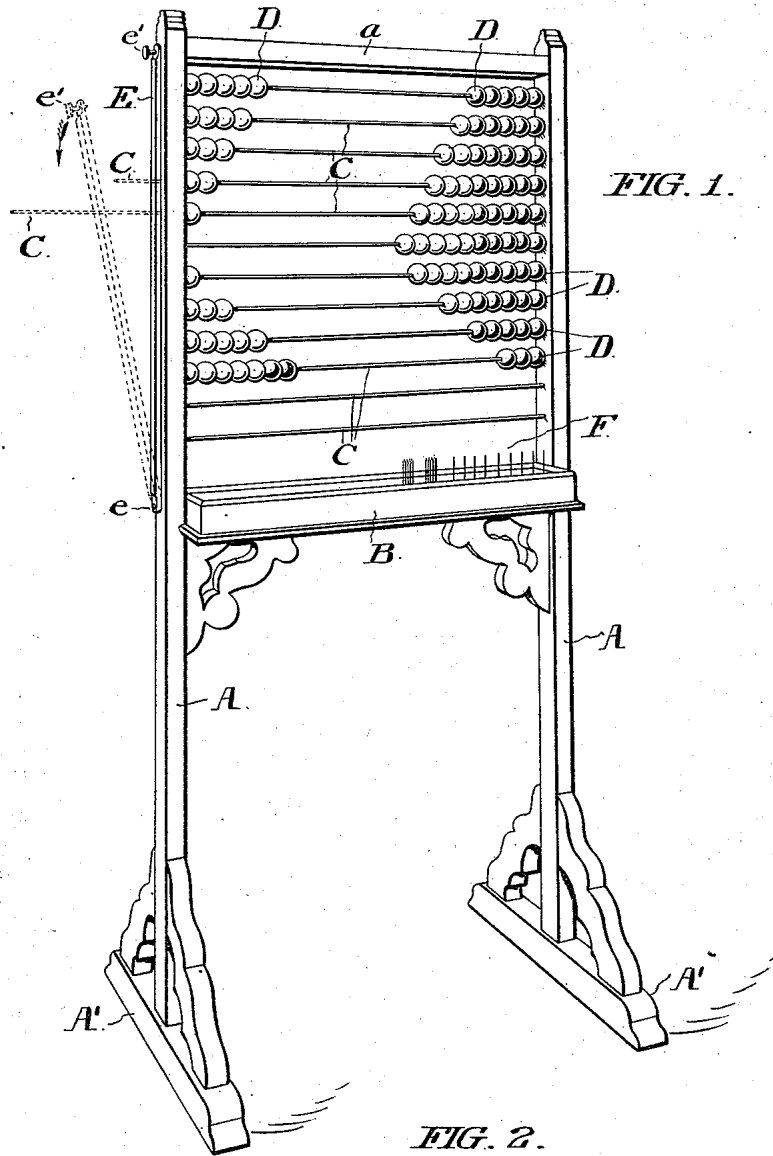


FIG. 1.

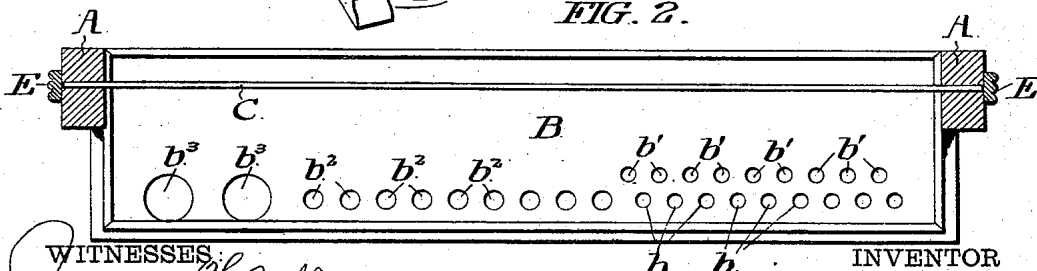


FIG. 2.

WITNESSES  
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# UNITED STATES PATENT OFFICE

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## ABACUS.

SPECIFICATION forming part of Letters Patent No. 532,282, dated January 8, 1895.

Application filed May 13, 1893. Serial No. 474,163. (No model.)

*To all whom it may concern:*

Be it known that I, LYDIA D. MYERS, of Philadelphia, in the State of Pennsylvania, have invented a certain new and useful Abacus, whereof the following is a specification, reference being had to the accompanying drawings.

My invention is intended to remedy certain defects found in the abacus now commonly in use for instructive purposes, and also to present some of the points of instruction in a novel manner to the eye of the pupil.

Referring to the drawings, Figure 1 represents a front view, in perspective, of an abacus embodying my invention, and Fig. 2 is a top or plan view, on an enlarged scale, of the shelf which is arranged beneath the ball-carrying frame, showing also the uprights of the frame in cross section.

The abacus is preferably constructed with two upright side pieces, A, A, downwardly prolonged to form legs, which terminate in the enlarged feet, A', A'. These two pieces, A, A, are connected at the top by the cross-bar,  $\alpha$ , and at a point about midway of their height by the shelf, B. The balls, D, or other movable objects used to indicate numbers, are strung upon transverse wires, C, which wires, instead of being permanently fastened in the frame, as in the case of the devices heretofore used, are applied so as to be removable individually. The preferred form of construction for attaining this result, is to seat the wires, C, in holes formed in the opposite side pieces, A, said holes extending entirely through at least one of the side pieces. A guard-strip, E, is pivotally secured at  $e$  to the outer face of the side piece through which the holes penetrate, said strip being provided with a thumb-screw,  $e'$ , or other means for securing it rigidly in position to cover the holes and prevent the wires, C, from slipping out.

By releasing the screw,  $e'$ , and turning the strip, E, downward, into the position indicated by the dotted lines of Fig. 1, the wires, C, may be withdrawn longitudinally and thus the balls, D, may be removed from any one or more of the wires without disturbing the others. This feature is particularly desirable for instructive purposes, as occasion often arises when it is proper to place upon a given wire more than the normal number of balls,

as for instance, where subtraction is being taught and the units upon one wire require to be supplemented by the addition of a ten thereto. With the abacus at present in use, where the balls upon the individual wires cannot be increased or diminished in number, it is frequently very confusing to the pupil to be compelled to watch two or more wires at the same time.

Beneath the ball-carrying frame is the shelf, B, which is preferably made double or of considerable thickness and is provided with a number of holes, having the following relation to one another in position and size: Eighteen small holes are arranged in two parallel rows of nine each, as indicated respectively at  $b$ ,  $b'$ . These holes are adjacent to the right hand end of the shelf, as faced by the observer, and are preferably placed so that those of the respective rows alternate as shown. Immediately adjacent to the left hand end of one of said rows is a row of nine larger holes,  $b^2$ , and again immediately adjacent to the left hand end of the row of holes,  $b^2$ , are one or more still larger holes,  $b^3$ . If deemed desirable, two or more such larger holes may be arranged in a row extending toward the left. These rows of holes are intended to receive upright splints, F, the smallest holes being of convenient size to receive one splint, the next largest holes,  $b^2$ , being adapted to hold ten splints, and the largest holes of all,  $b^3$ , being adapted to hold a hundred splints. The holes,  $b$ , and  $b'$ , are preferably arranged to alternate with one another as stated in order that a person standing in front of the frame may be able to see the splints in both rows simultaneously. This shelf with its series of holes arranged as set forth is particularly desirable in conjunction with the abacus, for teaching subtraction, where for instance it is necessary to borrow a ten in order to increase the units of the minuend sufficiently to permit a larger number of units in the subtrahend to be deducted by actual removal. Thus, if the number 29 is to be taken from the number 35 the pupil will readily comprehend the proceeding, when ten splints are taken from a hole,  $b^2$ , and inserted one by one, in the holes  $b$  and  $b'$ , thus increasing the units to fifteen. The subtracting process can then be shown without the necessity

of an explanation as to the method by which the units of the subtrahend have been increased. The same proceeding can be adopted with reference to the other series of holes, if it is desirable to carry the instruction so far.

Having thus described my invention, I claim—

1. An abacus comprising a frame having openings through one side thereof and seats in the other side, ball-carrying rods C passing through the openings and entering the seats, a plate pivoted to the side of the frame having openings, said plate normally covering said openings, and means for securing said plate in position; substantially as described.

2. An educational appliance comprising a frame, a series of nine receptacles arranged upon said frame and representing units, a secondary series of nine unitary receptacles, and a series of receptacles upon said frame representing tens, said receptacles for repre-

senting tens being distinguished from those for representing units; substantially as described.

3. The combination with the abacus frame, of the shelf having a series of nine holes arranged adjacent to its right hand end and representing units, a secondary series of nine unitary holes arranged parallel to the first row and in similar notative position, a series of nine larger holes arranged in juxtaposition to the left hand end of one of the unitary series representing tens, and a still larger hole or holes representing hundreds and arranged in juxtaposition to the left hand end of the series which represents tens, substantially as set forth.

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Witnesses:

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