

(No Model.)

2 Sheets—Sheet 1.

S. M. SAPP.
EDUCATIONAL APPLIANCE.

No. 468,475.

Patented Feb. 9, 1892.

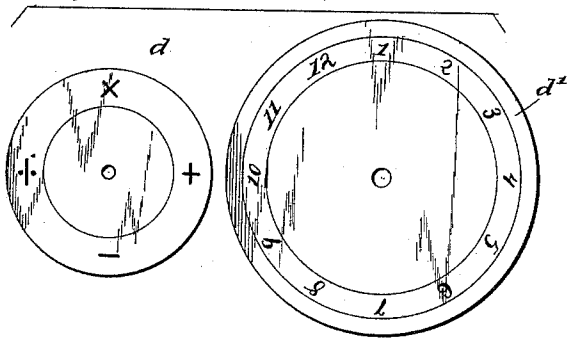
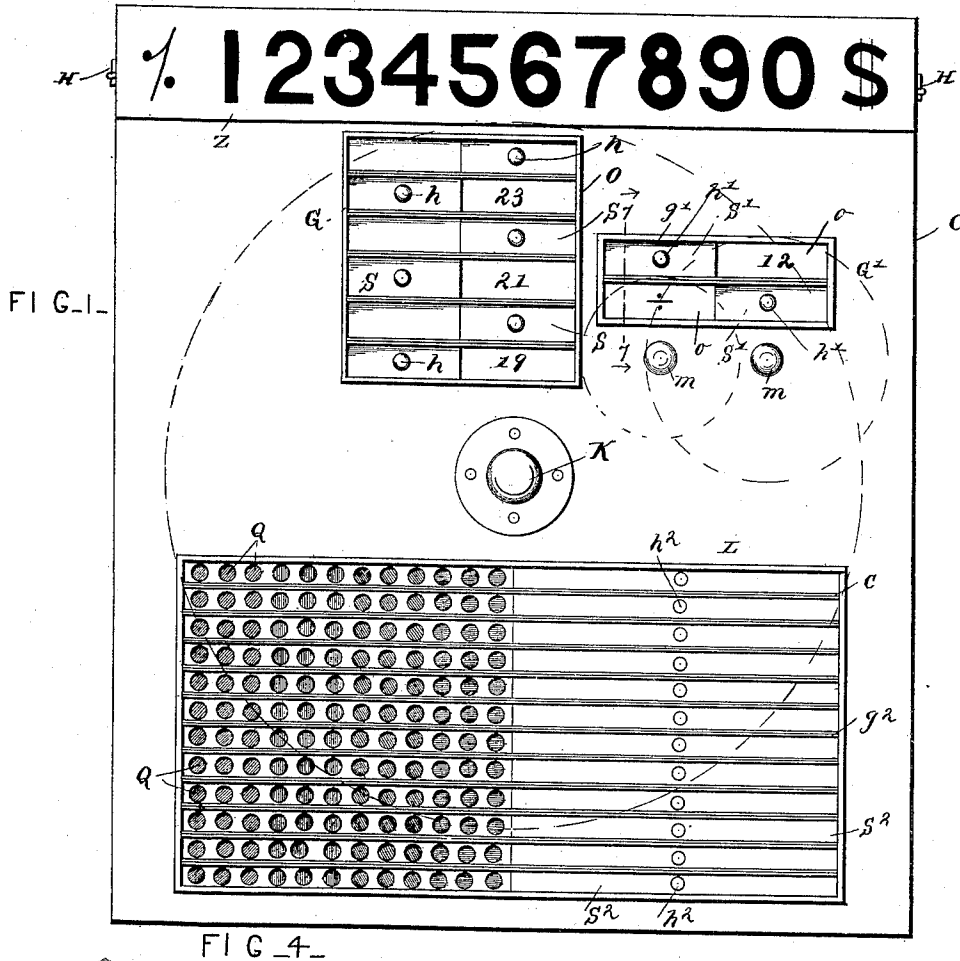
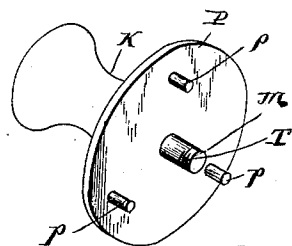


FIG. 5.



Witnesses

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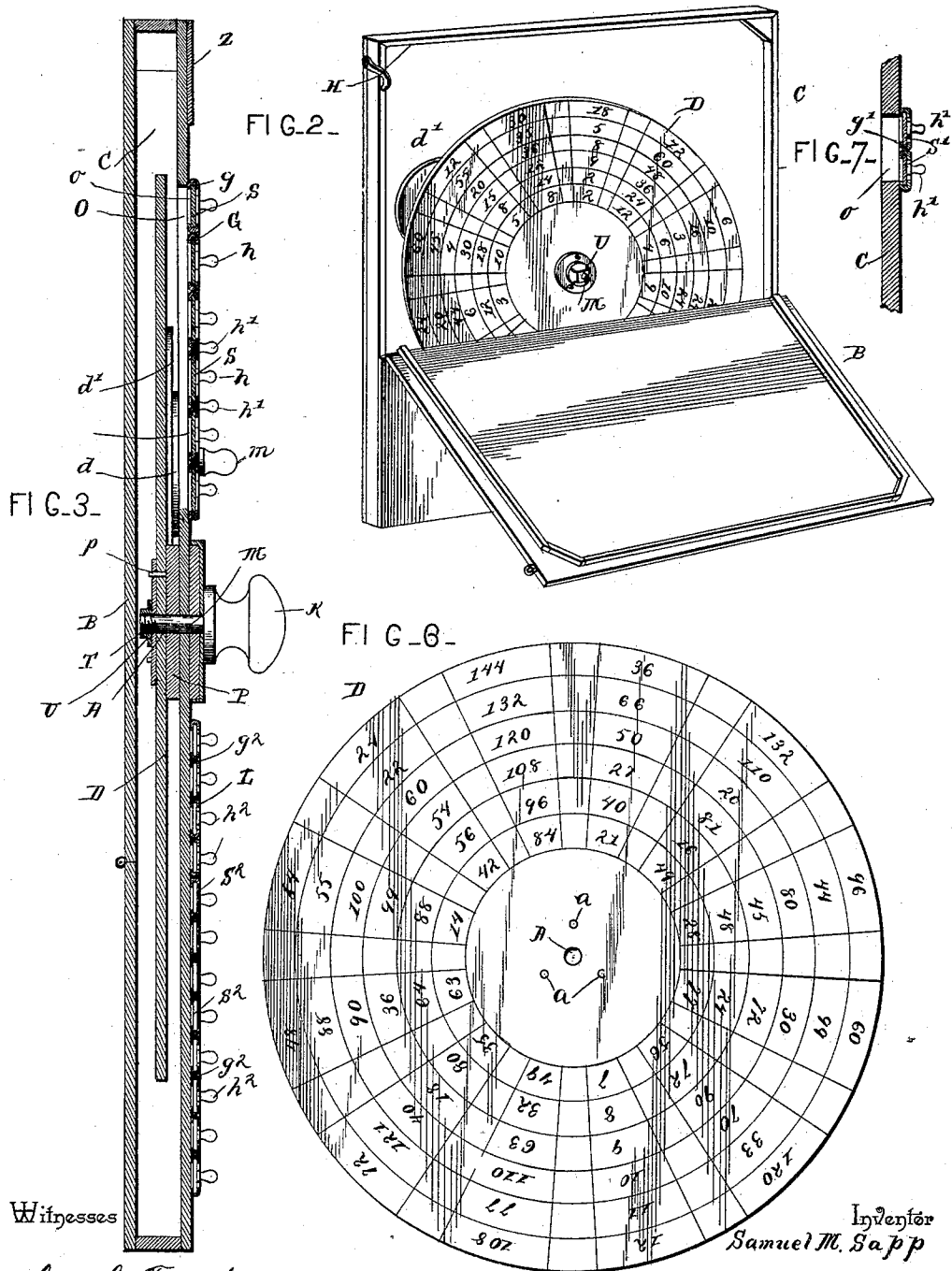
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2 Sheets—Sheet 2.

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Witnesses

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UNITED STATES PATENT OFFICE.

SAMUEL M. SAPP, OF GENESEO, KANSAS, ASSIGNOR OF ONE-HALF TO JOHN W. MILLARD, OF SAME PLACE.

EDUCATIONAL APPLIANCE.

SPECIFICATION forming part of Letters Patent No. 468,475, dated February 9, 1892.

Application filed March 14, 1891. Serial No. 385,075. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL M. SAPP, a citizen of the United States, residing at Geneseo, in the county of Rice and State of Kansas, have invented a new and useful Educational Appliance, of which the following is a specification.

This invention relates to educational appliances, and the object of the same is to effect certain improvements therein.

To this end the invention consists of the details of construction hereinafter more fully described and claimed, and as illustrated on the two sheets of drawings, wherein—

Figure 1 is a perspective view of the face of this device. Fig. 2 is a similar view from the rear side, showing the back let down and exposing one of the large dials. Fig. 3 is a central vertical section. Fig. 4 is a front elevation of the two smaller disks removed. Fig. 5 is a perspective detail of the dial-spindle, viewed from the rear. Fig. 6 is a plan view of one of the dials. Fig. 7 is a section on line 7 7 of Fig. 1.

Referring to the said drawings, the letter C designates a suitable casing having a back B, which is hinged so as to be let down, as seen in Fig. 2, and which may be held closed by hooks or buttons H. Through the center of the front of this casing is journaled the main spindle M, whose front end where it projects from the casing is formed into a knob, and whose rear end is threaded, as shown at T. Around this threaded extension T a plate P is rigidly mounted on the spindle M, and projecting rearwardly from this plate are pins *p*, all as best seen in Fig. 5.

The letter D designates a large dial having a central aperture A and surrounding apertures *a*, adapted to respectively engage over the threaded portion T and the pins *p*, a thumb-nut U being passed over the outer end of the threaded portion and against the rear side of the dial to hold the latter in place, all as best seen in Fig. 2.

The front of the casing is provided with a large opening O above the main knob M, and with other smaller openings *o*, for a purpose to be presently explained. Over the opening O is secured a guide-plate G, having horizon-

tal strips provided with grooves *g*, and in these grooves move about six slides S, each having a handle *h*. By this means any one or more of the six small openings into which the large opening O is divided by said strips may be opened or closed to expose points upon the dial D at different distances radially from its center, and by the knob M said dial may be turned behind the front of the casing C to bring any one of its radial lines of figures opposite the opening O. The said smaller openings *o* are covered by other guide-plates G', having horizontal strips provided with grooves *g'*, in which move two slides S', each having a handle *h'*. Beneath these openings are journaled through the front of the casing spindles *m*, having knobs at their front ends, and to their rear ends are secured disks *d* and *d'*, the former being inscribed on its face with the four signs, "plus," "minus," "divided by," and "multiplied by," and the latter bearing upon its face the numbers from one to twelve, inclusive. By this means one or both of these openings can be uncovered to show any of these signs or any of these abstract numbers, all for a purpose to appear later on.

Upon the face of the casing near its lower end is arranged a large plate L, having horizontal grooves *g*² similar to those in the guide-plates, thus providing for twelve slides S², each having a handle *h*². Between each pair of grooves the plate is provided at one end with twelve openings Q, and differently-colored papers are inserted beneath the plate and behind each three vertical rows of openings. Thus it will be seen that there are one hundred and forty-four openings in all, the first thirty-six of which (that is, the first three vertical lines) are red, the next thirty-six white, the next thirty-six blue, and the last thirty-six green, or some other distinguishable colors. Each slide S² may be moved so as to uncover any number of the twelve holes in line therewith or to cover them all, as will be readily understood, and by this means the teacher may instruct his pupils by object-lessons in concrete numbers, calling the red holes "apples," the white ones "eggs," the blue ones "plums," and the green ones "pears."

Across the top of the front of the casing is a strip Z of white, upon which are inscribed in black the ten digits, together with some of the arithmetical signs—such as % and \$—and after the pupil has been taught the concrete numbers, say “9 apples,” the teacher indicates with his pointer the numeral “9” on the strip Z, thus teaching the child at a glance that the nine spots of the concrete numbers are expressed by the one sign of the abstract. Addition and subtraction may be illustrated by moving the slides S² in a manner which will be obvious. Referring now to Fig. 6, it will be seen that the dial D is provided with twelve radial lines of numbers with six in each line, each ring of figures giving the answers of the number of its position from the center, plus six, multiplied by the numerals on the disk d'. Thus it will be seen that this side of the dial D will give all the answers from seven multiplied by one to twelve multiplied by twelve, while it will be understood that the back of this dial is marked with suitable answers, so that when it is reversed it will give the products from one multiplied by one to six multiplied by twelve, as seen in Fig. 2, which products are obtained by multiplying the numbers on the disk d' by the number from the center of the dial D of the ring carrying the answer. Hence one side gives one half and the other side the other half, and the whole multiplication-table is given on the two sides of a single dial. In illustration, take the radial line in Fig. 2 bearing the numbers 5, 8, 15, 20, 55, 12. The result 5 is produced by multiplying the number of its position from the center 1 by the figure 5 on disk d'. 8 is position 2 multiplied by figure 4 on the disk. 15 is position 3 multiplied by figure 5. 20 is position 4 multiplied by figure 5. 55 is position 5 multiplied by figure 11 on the disk, and 12 is position 6 multiplied by figure 2 on the disk. In the same manner the line in Fig. 6, bearing numbers 42, 56, 54, 60, 22, 24 is found as follows: 42 is position 1, plus 6 on this side of dial D, which we will call “position 7,” multiplied by 6 on disk d'. 56 is position 8 multiplied by 7. 54 is position 9 multiplied by 6. 60 is position 10 multiplied by 6. 22 is position 11 multiplied by 2, and 24 is position 12 multiplied by 2. In all cases the “position” represents one element—say the multiplicand—and whatever figure on the disk is used represents the other element (the multiplier of the example) while the product is on the dial. The products are shown promiscuously arranged; but obviously they might be regular, if preferred—that is, one line could be 5, 10, 15, 20, 25, 30, and a line on the other face 35, 40, 45, 50, 55, 60, thus giving the fives in regular order. In this case the figure 5 on the disk d' would alone be exposed, while the slides S would be manipulated to expose successively six products, and then the dial D reversed and the other six products exposed. The numbers in the in-

side circles on both sides of this dial can be used for addition and multiplication in connection with the sign of “multiplied by” on the disk d and with the numbers on the disk d'. There may be another dial containing miscellaneous abstract numbers, which are preferably prime numbers, and do not occur in the multiplication-table, and when this dial is substituted for the one shown these numbers may be used with each other by moving two or more of the slides S or with the numbers on the disk d' for the purpose of addition. In fact, the device hardly needs explanation as to its uses, and its operation is so simple that it cannot be misunderstood. The dials D may be removed and transposed or reversed by loosening the thumb-nut U in a manner which will be well understood; but the disks d and d' are preferably permanently fixed to their spindles. Other details of construction may be considerably changed without departing from the spirit of my invention.

What is claimed as new is—

1. In an educational appliance, the combination, with a casing having larger and smaller openings through its face, a guide-plate over the larger opening, several slides moving on said plate and adapted to close the holes there-through, another guide-plate over the smaller openings, and similar slides thereon, of a dial having numbers marked thereon and registering with the openings through the larger guide-plate, a disk marked with arithmetical signs, another disk bearing the numbers from 1 to 12, these signs and numbers registering with the openings through the smaller guide-plate, and means for moving said dial and disks, as and for the purpose set forth.

2. In an educational appliance, the combination, with a casing, a main spindle journaled therethrough and having a rearwardly-projecting threaded extension, a plate secured around said extension, and rearwardly-projecting pins on said plate, the casing being provided with an opening, of a dial having apertures adapted to register with said extension and pins, and a thumb-nut engaging the tip of said extension, the face of the dial having numbers registering with said opening in the casing, as and for the purpose set forth.

3. In an educational appliance, the combination, with a casing having openings, slides moving thereover, a centrally-pivoted dial moving behind one set of said openings and bearing abstract numbers adapted to be exposed therethrough, and means for moving said dial, of a disk journaled in the casing and bearing the arithmetical signs adapted to be exposed singly through another opening, means, substantially as described, for exposing through still another opening abstract numbers independently of said dial, as and for the purpose set forth.

4. In an educational appliance, the combination, with means, substantially as described, for indicating abstract numbers, of

a plate provided with a number of holes arranged in vertical and horizontal rows, strips of differently-colored papers behind certain of said rows, and slides adapted to be adjusted independently over the rows, as and for
5 the purpose hereinbefore set forth.
In testimony that I claim the foregoing as

my own I have hereto affixed my signature in presence of two witnesses.

SAMUEL M. SAPP.

Witnesses:

JOSIAH GOCHNOUR,
A. E. PIEHLER.