J. M. HITCHCOCK.

Devices for Teaching Arithmetic.

No. 214,822. Patented April 29, 1879.

FIG. 1.

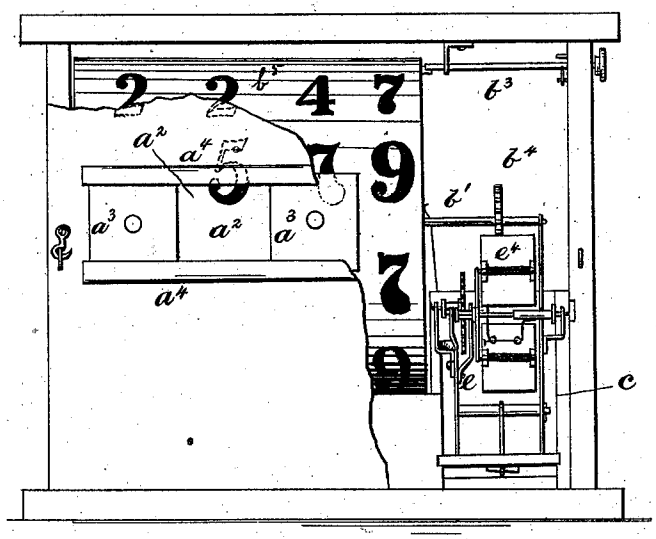


FIG. 2.

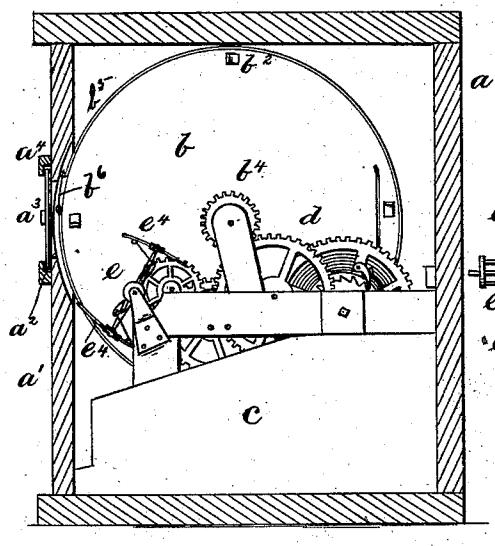
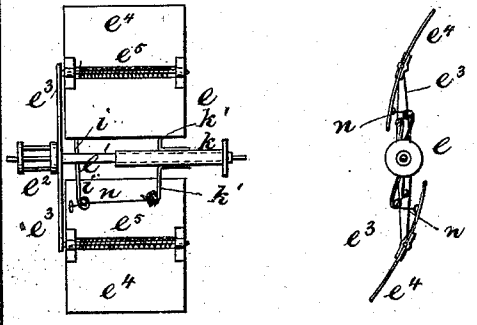


FIG. 3.



WITNESSES

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UNITED STATES PATENT OFFICE

JAMES M. HITCHCOCK, OF MICHIGAN CITY, INDIANA, ASSIGNOR OF ONE-HALF HIS RIGHT TO SAMUEL E. MILLER, OF SAME PLACE.

IMPROVEMENT IN DEVICES FOR TEACHING ARITHMETIC.

Specification forming part of Letters Patent No. **214,822**, dated April 29, 1879; application filed March 25, 1879.

To all whom it may concern:

Be it known that I, JAMES M. HITCHCOCK, of Michigan City, in the county of La Porte and State of Indiana, have invented certain new and useful Improvements in Devices for Teaching Arithmetic; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

This invention has for its object to furnish an improved device for use in teaching the primary rules of arithmetic.

It consists in a drum having on its periphery combinations of figures, a clock-train, and a fan for regulating the speed of the drum, all of which are arranged in a casing of suitable construction, as hereinafter fully explained.

In the drawings, Figure 1 is a side elevation of my device having a portion of the casing broken away. Fig. 2 is an end view with the end board removed; and Fig. 3 shows the regulating-fan.

a is the casing, having in its front wall or side, a^1, the horizontal opening a^2, of same length of the drum hereinafter described. The opening a^2 is closed or opened, as desired, by means of a series of small sliding doors, a^3, held in place by the grooved cleats a^4. The entire front a^1 may be removed or placed in position in the casing at pleasure.

b is the drum, which, with the clock-train, hereinafter described, is supported on a frame, *c*, which slides into the casing *a*. The drum is supported on an axis, b^1, on the extension of which is placed a small pinion, b^4, which is engaged by the gearing of the clock-train.

On the outer side or face of the drum I arrange the ten figures, or any number of them, in parallel rows across the face, and around the circumference, as shown in Fig. 1.

The figures are printed, by preference, on a sheet or scroll, b^5, which fits snugly around the drum and is held by a fastening, b^6. Different scrolls, having different combinations of figures, may be provided, and one may be replaced by another when desired.

In the revolutions of the drum one or more of the rows of figures may be brought to view by opening one or more of the doors a^3.

The drum has on its end next the clock-train one or more projections, b^2, which are engaged by a stop, b^3, under the control of the teacher. The movement of the drum may be stopped at any time by the bar b^2.

d is a clock-train, of ordinary construction, which gears with the pinion b^4 on the axis b^1 of the drum *b*.

e is the regulating-wheel, which has its axis e^1 suitably journaled and provided with a pinion, e^2, which gears with the clock-train. It has affixed to the outer ends of its radial arms e^3 the adjustable wings e^4, which are hinged or journaled by a central axis in the outer ends of said arms e^3.

The wings e^4 have a curvature the same as the circumference or circle described by the ends of the arms e^4, and they are provided with the tension or retracting springs e^5, placed on their axes, which springs hold them extended, as shown in Fig. 2.

The axis e^1 is provided with two small arms, *i i*, which project in opposite directions, and have in their outer ends small eyes or loops, as shown. On the said axis is also placed a sleeve, *k*, which may be slipped back and forth, and is provided with small arms, k' k', similar in construction to the arms *i i*.

n is a cord, one end of which is tied to a loop on the inner side of the wing e^4, while its opposite end is passed through the loop in the end of arm *i*, and is secured to the end of arm k'. By drawing the sleeve *k* outward on the axis e^1, the wing e^4 will be drawn into the position shown in Fig. 3. If the sleeve be pushed inward, the spring e^5 will turn the wing outward to the position shown in Fig. 2. The sleeve *k* will remain at any point to which it may be moved, so that by it the wings e^4 may be set at any desired angle.

The set or angle at which the wings e^4 are fixed determines or regulates the speed at which the drum *b* will revolve. If the wings e^4 be set at right angles to the radial arms e^3, as shown in Fig. 2, the train *d* will act or run rapidly, and will cause the drum to revolve with its greatest speed. If the wings be set parallel, or nearly parallel, with the radial arms e^3, as shown in Fig. 3, the slowest move-

ment of the drum will be secured. Different degrees of movement may be obtained by setting the wings at different angles between the two extremes above described.

The use of this device is to facilitate the teaching of the elementary rules of arithmetic to children.

In teaching, one or more of the doors a^3 are opened to expose the drum. The latter being made to revolve, the figures of any given circumferential row pass consecutively before the open door, through which the pupils can see them. The pupils may be required to name the figures as the latter come to view, thus teaching them to read numbers. By opening two or more of the doors there will be presented to the eye numbers composed of two or more figures.

In addition, the figures can be added as the drum revolves, or subtracted, according to the wish of the teacher. The figures can also be used in the rules of multiplication and division with great success.

The object of this device is to place under the control of the teacher the presentation of the numbers to the view of the pupils according to the expertness of the latter.

It will be readily understood that the device hereinbefore described can be employed in teaching other elementary branches besides arithmetic—as, for example, object-lessons, spelling, reading, &c. In such cases, scrolls constructed as described, and having thereon objects, letters, words, &c., can be provided and applied to the drum in the same manner as when figures were employed.

What I claim is—

1. The combination, with the drum b and the clock-train d, of the regulating-wheel e, having wings e^4, springs e^5, arms i and k', sleeve k, and cords n, substantially as and for the purpose set forth.

2. The combination, with the drum b, having the projections b^2 on its end and the pinion b^4 on its axis of casing a, and stop d^3, all arranged to operate substantially as and for the purposes set forth.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

JAMES M. HITCHCOCK.

Witnesses:

P. DORAN,

JARED H. ORR.