No. 618,198. Patented Jan. 24, 1899.

# H. BRODT & J. MUELLER.

## EDUCATIONAL APPLIANCE.

(Application filed Apr. 1, 1897.)

(No Model.)

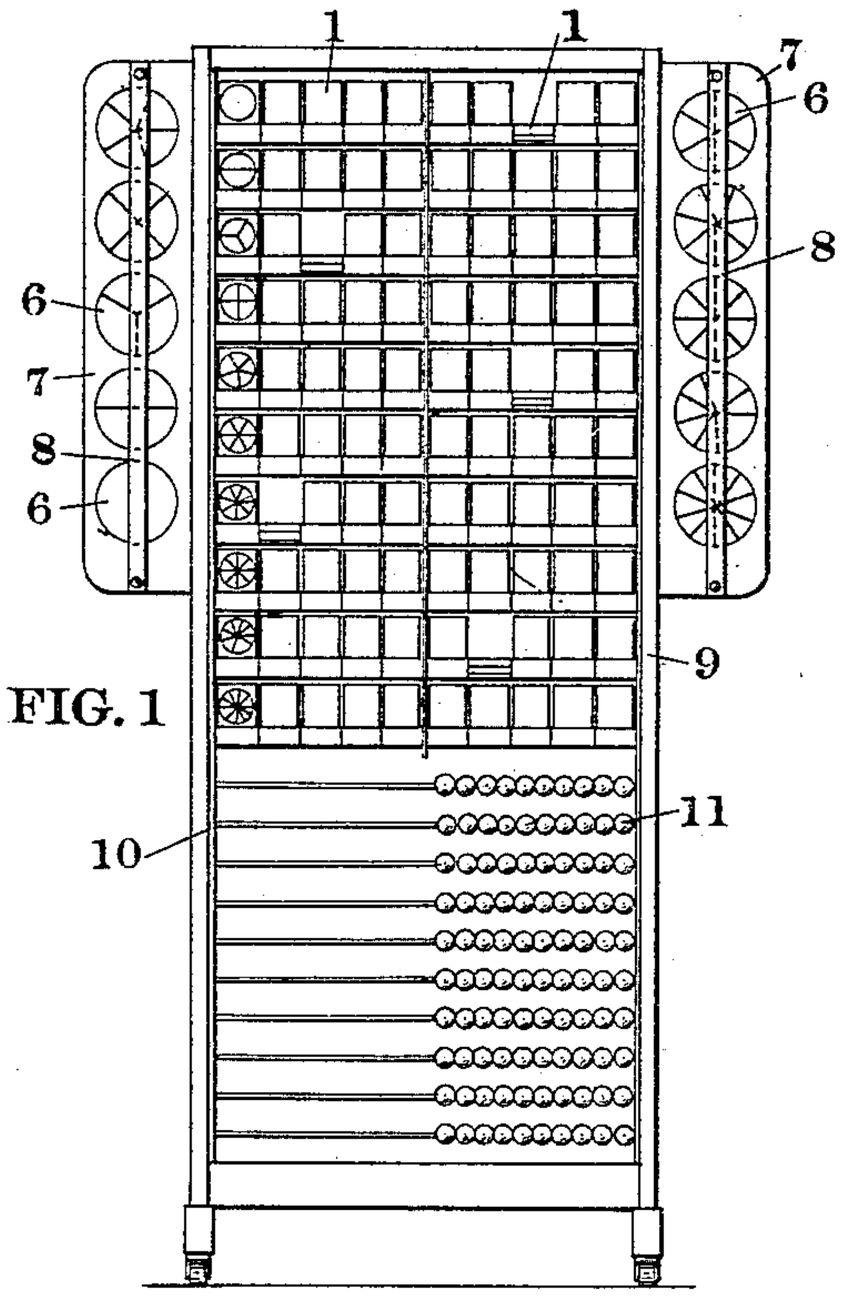



FIG. 1

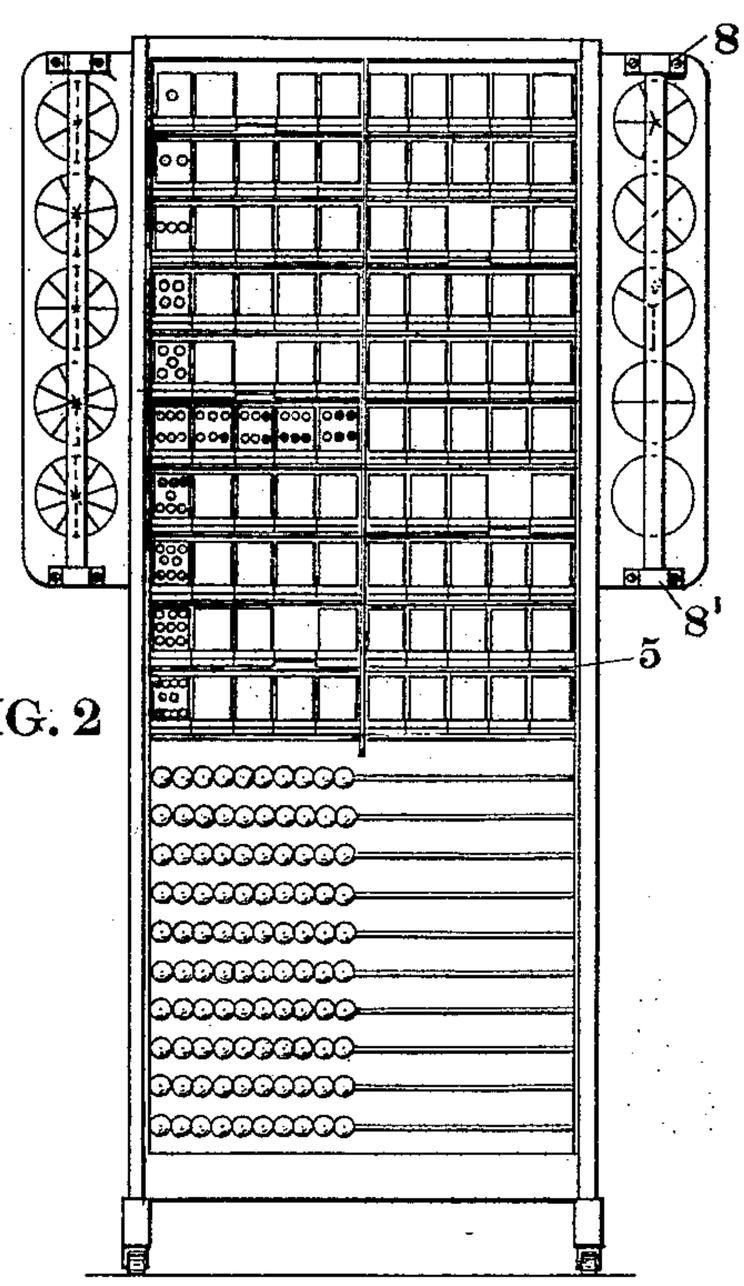



FIG. 2

FIG. 3

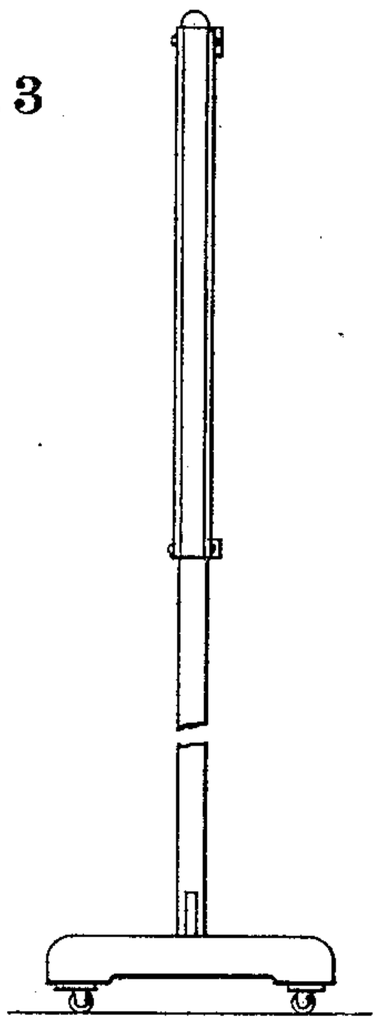


FIG. 4

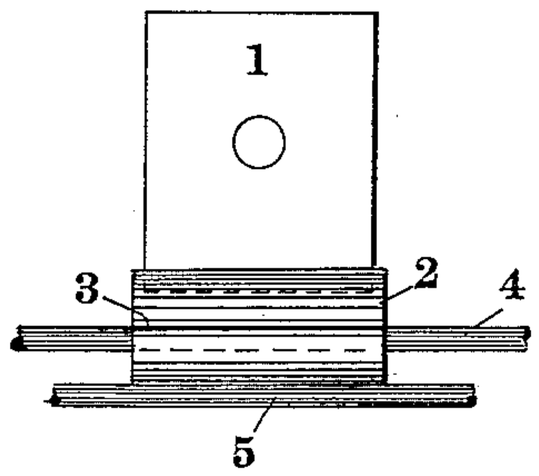
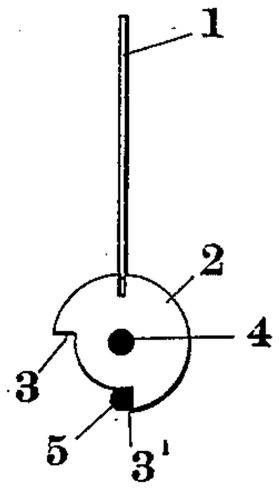



FIG. 5

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# UNITED STATES PATENT OFFICE.

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## EDUCATIONAL APPLIANCE.

SPECIFICATION forming part of Letters Patent No. 618,198, dated January 24, 1899.

Application filed April 1, 1897. Serial No. 630,254. (No model.)

*To all whom it may concern:*

Be it known that we, HERMANN BRODT and JOHN MUELLER, citizens of the United States, residing at Elmhurst, in the county of Du Page and State of Illinois, have invented a new and useful Improvement in Educational Appliances, of which the following is a specification.

Our invention relates to devices for illustrating mathematical problems. Its main object is to facilitate such illustration by providing a frame with movable sections or shields having figures thereon representing mathematical parts, the movable sections being so arranged that any or all of them may be changed in position upon the frame, so as to practically exclude the figures thereon from view. To further aid in such illustration, we provide the frame with a series of disks composed of movable fractional sections and with a series of movable balls.

The manner in which we put our invention into practice will be understood from the following description, with reference to the accompanying drawings, in which—

Figure 1 is a front view of a device constructed according to our invention with the figures on the shields omitted from all except the left row of shields. Fig. 2 is a back view of same with the figures omitted from most of the shields. Fig. 3 is a side view with part of the frame broken away. Fig. 4 is a back view of one of the shields or sections 1, showing in detail the block 2 and part of the supporting-rods 4 and 5. Fig. 5 is an end view of the same.

The device consists of a main frame 9, supporting a series of rods 4, 5, and 10, and the auxiliary frames 7.

Each shield 1 is secured to a hub or block 2, through which one of the rods 4 passes so as to pivotally support the blocks mounted thereon. The blocks 2 are partly cut away so as to form the shoulders 3 and 3′. The rods 5 are located in such position with reference to the rods 4 that same will engage the shoulders 3′ when the shields are in a vertical position and the shoulders 3 when the shields are in a horizontal position.

The auxiliary frames 7 each consists of a board having a series of circular holes through same. In these holes are disks 6, which are divided into removable fractional parts. The strips 8 on each side of the boards hold the disks in the holes. On one side of the boards (see Fig. 2) the strips 8 are removable, so that fractional parts of the disks may be removed. On this side a socket 8′, which is closed at the bottom, supports each strip 8, and a socket 8″ supports same at the top. The sockets 8″ are open at the top, so that the strips may be pushed up through same. These sockets may be made large, so that the strips may be removed by merely lifting the bottom out of the socket 8′ and then pulling the strip down and out of the socket 8″.

The balls 11 are separately slidingly mounted on the rods 10.

The shields 1 and manner of supporting same are the main features of our invention, the disks 6 and balls 11, with their support, being auxiliary to the shields.

The shields 1 on their front (see left row, Fig. 1) are marked or figured for illustrating problems in fractions. On the front of each shield, in the upper row of our device, is a circular figure representing an integer. On the second to the tenth horizontal rows, inclusively, the circular figures are divided into two to ten fractional parts, respectively. The adjoining fractional parts of each of said circular figures are preferably of different color, so as to more clearly show the division. On the back of the shields are figures representing integers. (See left row, Fig. 2.) Each shield in the top horizontal row has a single circle thereon, shown in the drawings on the left shield only. The shields in the second to the tenth horizontal rows, inclusive, have thereon two to ten circular figures, respectively. In the second vertical row from the left one of these figures on each shield is filled in solid black so as to be of different appearance than the other figures on such shield. In each succeeding vertical row, beginning from the left, one more figure is thus filled in solid black, as illustrated in the sixth horizontal row from the top, it being understood that in the second horizontal row the second shield only has one of the figures thus filled in, while the other shields toward the right have all of the figures of the same appearance as on the first or left-hand shield in said row; that in the third horizontal row one of its figures

is thus filled in black in the second shield from the left and two of its figures in the third shield from the left, while the other shields toward the right have all of the figures of the same appearance as on the first or left-hand shield in said row, and that the filling continues in this order until in the tenth shield of the last row nine of the figures are thus filled in black.

It is plain that different colors may be used instead of black and white for the above-mentioned purpose, that the colors may be differently arranged, or that certain of the figures may be made of different shape to distinguish same from the others.

The operation of the device consists merely in turning down different shields to the horizontal position, thereby excluding the figures on such shields from the view of a person looking horizontally toward the device, or in first turning down all of the shields and then turning up those showing certain numbers or figures, as required, and also, if necessary for further illustration either removing some of the disks 6 or parts thereof or moving some of the balls 11 on their supporting-rods.

It will be seen that numerous combinations of integers and fractions may be made by the operator for illustrating all simple problems for beginners in the study of mathematics.

We do not confine ourselves to the particular form or arrangement of the figures on the shields nor to the particular means for supporting same in the two positions. It is an important feature of our invention, however, that the shields be so supported that they can be stopped in a position at which both faces are practically excluded from view.

It will be seen that in the form shown in the drawings the shields 1 are so supported that when in a vertical plane same stand above their respective axes. We prefer this form both from the standpoint of the manufacturer and the operator, since same permits the use of the very simple means shown for supporting the shields in a horizontal position.

We prefer to make the shoulders 2 and 3′ by a cut in each block 2, since the opposite side of the block is thus heavier and serves to support the shield in the vertical position. This weight may be augmented by making that side of the block partly of heavier material than the other side.

What we claim as our invention, and desire to secure by Letters Patent, is—

1. A device for illustrating mathematical problems, comprising a supporting-frame; the horizontal rods 4, and 5; the blocks 2, pivotally supported upon the rods 4, and having the shoulders 3 and 3′ for engaging the rods 5; and shields secured to said blocks, having a different number of marks or figures on different shields; said shields being supported in different positions by the engagement of said shoulders with said rods 5, substantially as described.

2. An educational appliance, comprising a supporting-frame; the horizontal rods 4, and 5; blocks pivotally supported upon the rods 4, and having shoulders thereon for engaging the rods 5; and shields having figures thereon for illustrating mathematical problems; said shields being secured to said blocks in such manner as to be supported in different positions by the engagement of said shoulders with said rods 5, substantially as described.

3. An educational appliance, comprising a supporting-frame; a series of shields, pivotally secured to said frame upon horizontal axes, and having figures on the front and back thereof for illustrating mathematical problems; and stops for engaging said shields in either a horizontal or vertical position; substantially as described.

4. An educational appliance comprising a supporting-frame; a series of shields pivotally secured to said frame, and having figures on the front and back thereof for illustrating mathematical problems; stops for engaging said shields so as to face in different planes which are substantially at right angles to each other; and an auxiliary frame 7 on said supporting-frame, supporting the divided disks 6 in such manner as to exhibit same on the front and back of the frame; substantially as described.

5. An educational appliance comprising a supporting-frame; a series of shields pivotally secured to said frame upon horizontal axes, and having figures on the front and back thereof for illustrating mathematical problems; stops for engaging said shields in a vertical position above their axes; and stops for engaging said shields in a horizontal position; substantially as described.

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