(No Model.)

F. SHEPPARD.

EDUCATIONAL APPLIANCE.

No. 564,396. Patented July 21, 1896.

Fig. 1.

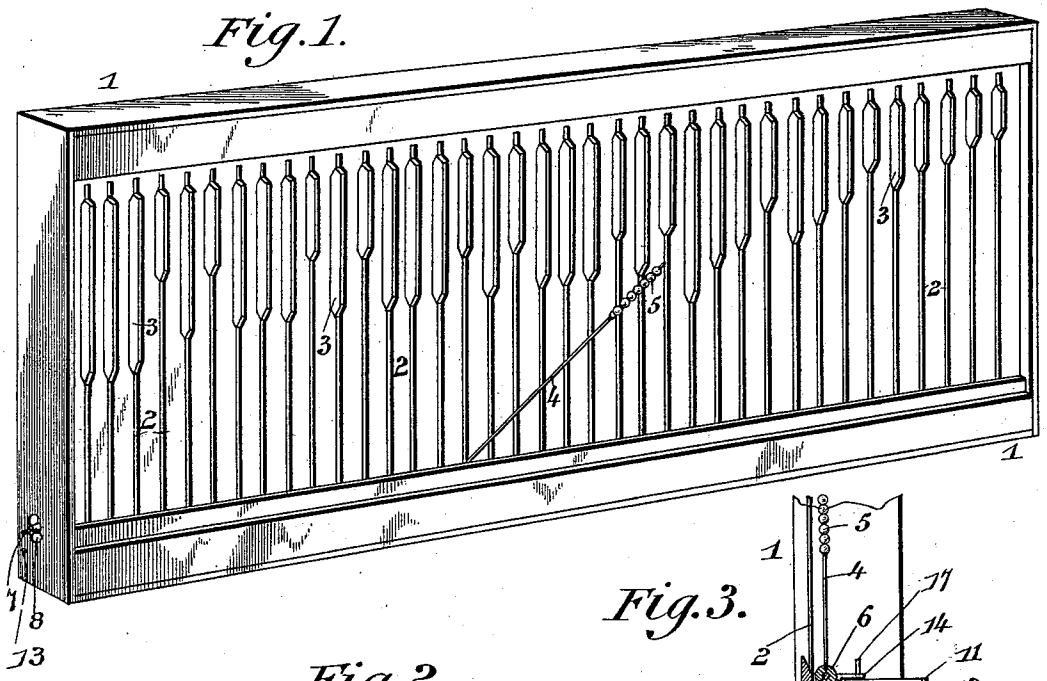


Fig. 3.

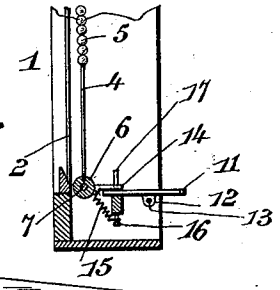
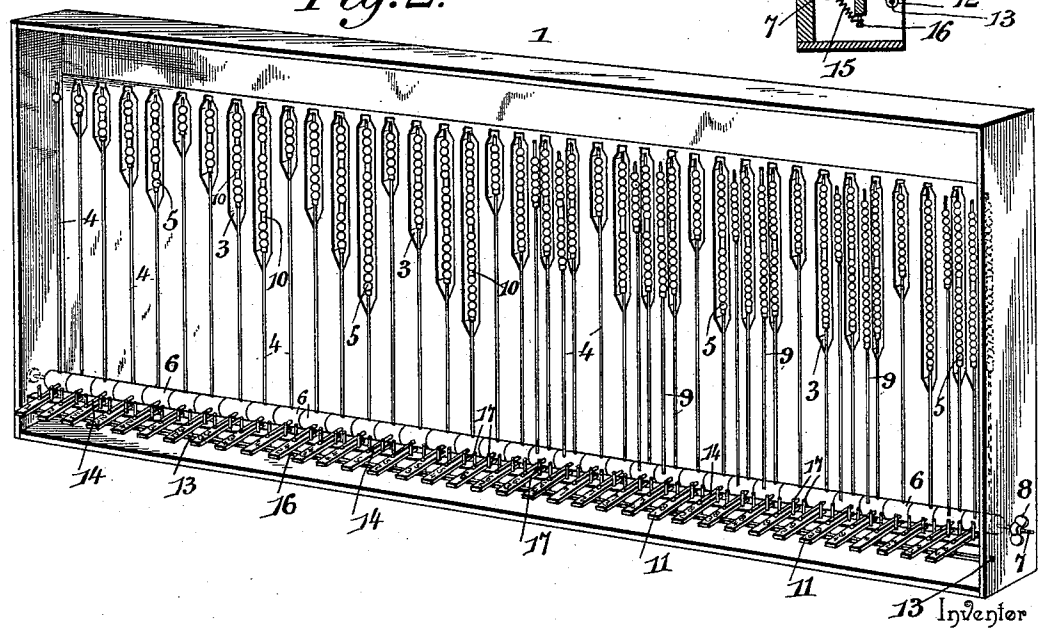


Fig. 2.



Witnesses

Jas. F. McCathran

C. E. Hoyt

Inventor

Frank Sheppard

By his Attorneys,

C. A. Snow & Co.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

FRANK SHEPPARD, OF EAST ST. LOUIS, ILLINOIS, ASSIGNOR OF TWO-FIFTHS TO K. G. WHITTAKER, OF SAME PLACE.

EDUCATIONAL APPLIANCE.

SPECIFICATION forming part of Letters Patent No. 564,396, dated July 21, 1896.

Application filed October 30, 1895. Serial No. 567,420. (No model.)

To all whom it may concern:

Be it known that I, FRANK SHEPPARD, a citizen of the United States, residing at East St. Louis, in the county of St. Clair and State of Illinois, have invented a new and useful Educational Appliance, of which the following is a specification.

My invention relates to educational appliances of the class designed for practically illustrating the principles and operations in arithmetic, and the object in view is to provide an apparatus in which only those beads to which the attention of the pupil is invited are exposed to view; to provide a simple and efficient arrangement of parts whereby any desired combination of numbers may be produced, and, furthermore, to provide simple and improved means for actuating the parts of the apparatus, whereby less of the attention of the teacher is absorbed by the manipulation of the objects comprising the device.

Further objects and advantages of this invention will appear in the following description, and the novel features thereof will be particularly pointed out in the appended claims.

In the drawings, Figure 1 is a front perspective of an appliance constructed in accordance with my invention. Fig. 2 is a rear perspective view of the same. Fig. 3 is a partial vertical section.

Similar numerals of reference indicate corresponding parts in all the figures of the drawings.

The casing or frame 1 of the apparatus is provided in its front with a plurality of slots 2, of which the upper portions 3 are widened or enlarged, and arranged, respectively, behind these slots in the face-plate of the frame or casing are bead-carrying arms 4, provided with beads 5, the enlarged or widened portions of the slots being designed to allow said beads to pass therethrough. These bead-carrying arms are threaded at their lower extremities into hubs 6, mounted upon a spindle 7, which extends longitudinally through the frame, one end of said spindle being headed and the other end being fitted with a thumb-nut 8, whereby the tension thereof may be adjusted. Any desired number of these bead-carrying arms may be employed, but in the construction illustrated in the drawings are shown thirty-seven, of which one carries a single bead, while the remaining thirty-six arms carry combinations of beads from two to ten, inclusive. For instance, the arm next to the one carrying the single bead is provided with two beads, the next with two groups of two beads, the next with three groups of two beads, and the fifth with four groups of two beads. Following this is an arm carrying a single group of three beads. The next is provided with two groups of three beads, and so on to the end of the series. Those arms which carry three and four groups of beads, each group containing six or more beads, are double, or constructed of two rods, as shown at 9, there being insufficient space upon a single rod to accommodate more than two groups containing six or more beads. The groups of beads upon an arm are separated by spacing-collars 10, of any suitable construction.

In connection with the above-described mechanism I employ a series of key-levers 11, fulcrumed at intermediate points, as shown at 12, by means of suitable hubs mounted upon a spindle 13, and arranged in operative relation with fingers 14, extending rearwardly from the hubs of the bead-carrying arms, the bead-carrying arms being held in their retracted or folded positions by means of springs 15, connected at their lower ends to pins 16, arranged upon the frame below the plane of the key-levers. The fingers which extend rearwardly from the hubs of the bead-carrying arms bear upon the upper surfaces of the inner extremities of the fingers, whereby the springs which actuate said bead-carrying arms also return the key-levers to their normal positions.

Preferably the key-levers respectively bear numerals indicating the number of beads upon the arms in operative relation with which said keys are arranged, as clearly shown in the drawings, and in order to guide the inner ends of the key-levers I employ parallel guide-pins 17, between which said levers operate.

The operation of the apparatus will be readily understood from the foregoing description, it being obvious that except when

a key-lever is depressed to throw a bead-carrying arm forward beyond the plane of the face-plate all of the beads are concealed within the casing, and hence do not serve to confuse the pupil in observing the beads to which the teacher has called attention.

It will be understood, furthermore, that the teacher is enabled, by reason of the construction of the apparatus, to expose any desired combination of beads with facility and without loss of time, and, under ordinary circumstances, by means of one hand, thereby materially simplifying the operation of devices of this class.

Furthermore, it will be seen that all of the various arithmetical operations may be illustrated, including addition, subtraction, multiplication, and division, and that when an illustration has been completed it is only necessary to release the key or keys to cause the return of the parts to their normal positions.

Particularly can problems in multiplication be illustrated by the manipulation of the minimum number of bead-carrying arms, and hence the pressure of the minimum number of keys. For instance, if it is desired to set the problem for solution of four, the multiplicand, multiplied by three, the multiplier, the result may be shown by the exposure of the third bead-carrying arm in the series containing groups of four beads, or that arm which carries three groups of four beads each. On the other hand, if it is desired to illustrate the product of three as a multiplicand by four as a multiplier, the arm containing four groups of three beads each may be exposed. This separation of the groups enables the teacher to show the combination or accumulation of a number of groups, each containing a lesser number of objects to form a single group containing a greater number of objects.

Various changes in the form, proportion, and the minor details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages of this invention.

Having described my invention, what I claim is—

1. In an educational appliance, the combination with a casing, of a plurality of independently-pivoted spring-retracted arms which are normally concealed and are adapted to be independently exposed, each arm carrying beads arranged in one or more groups separated by interposed spacing-collars, each group containing a number of beads from one to ten and contiguous arms carrying different numbers of groups each containing the same number of beads, and means for extending the arms to expose the beads, substantially as specified.

2. In an educational appliance, the combination with a casing, of a plurality of pivotal hubs, bead-carrying arms secured, respectively, to the hubs, pivotal key-levers, and fingers carried by the hubs and arranged in the paths of the rear ends of the key-levers, said arms being spring-retracted, substantially as specified.

3. In an educational appliance, the combination with a casing, of a plurality of pivotal bead-carrying arms adapted to be exposed independently and arranged for extension through slots in the face or front side of the casing, a spindle forming the common pivot of said arms and provided with means for adjusting its tension, and key-levers operatively connected with the arms and adapted to be actuated to expose the bead-carrying arms, substantially as specified.

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

FRANK SHEPPARD.

Witnesses:
E. C. PRICE,
D. ZUNSTIN.