

T. DOUGHERTY.

KINDERGARTEN APPARATUS FOR TEACHING SPELLING.

No. 342,737.

Patented May 25, 1886.

Fig. 3.

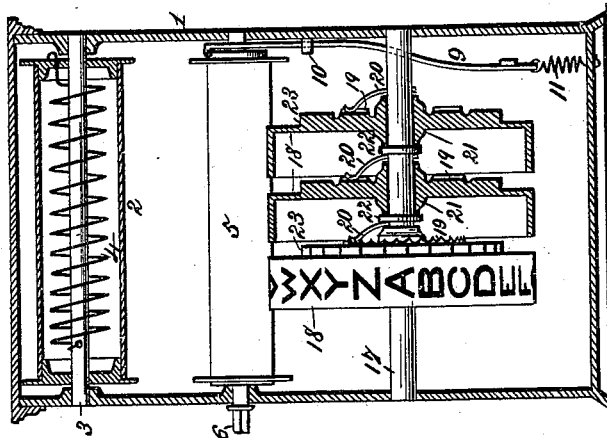


Fig. 2.

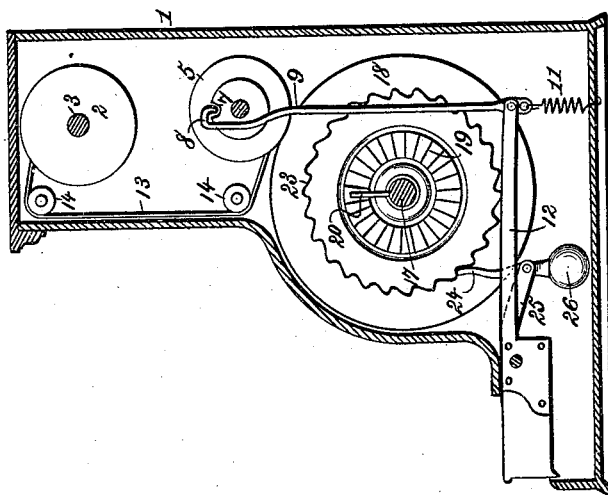
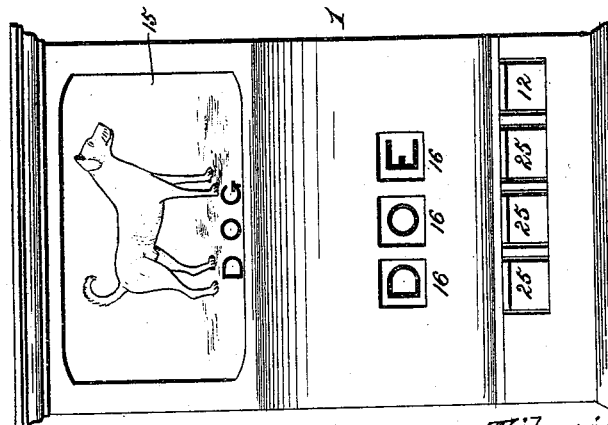


Fig. 1.



Witnesses.

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(No Model.)

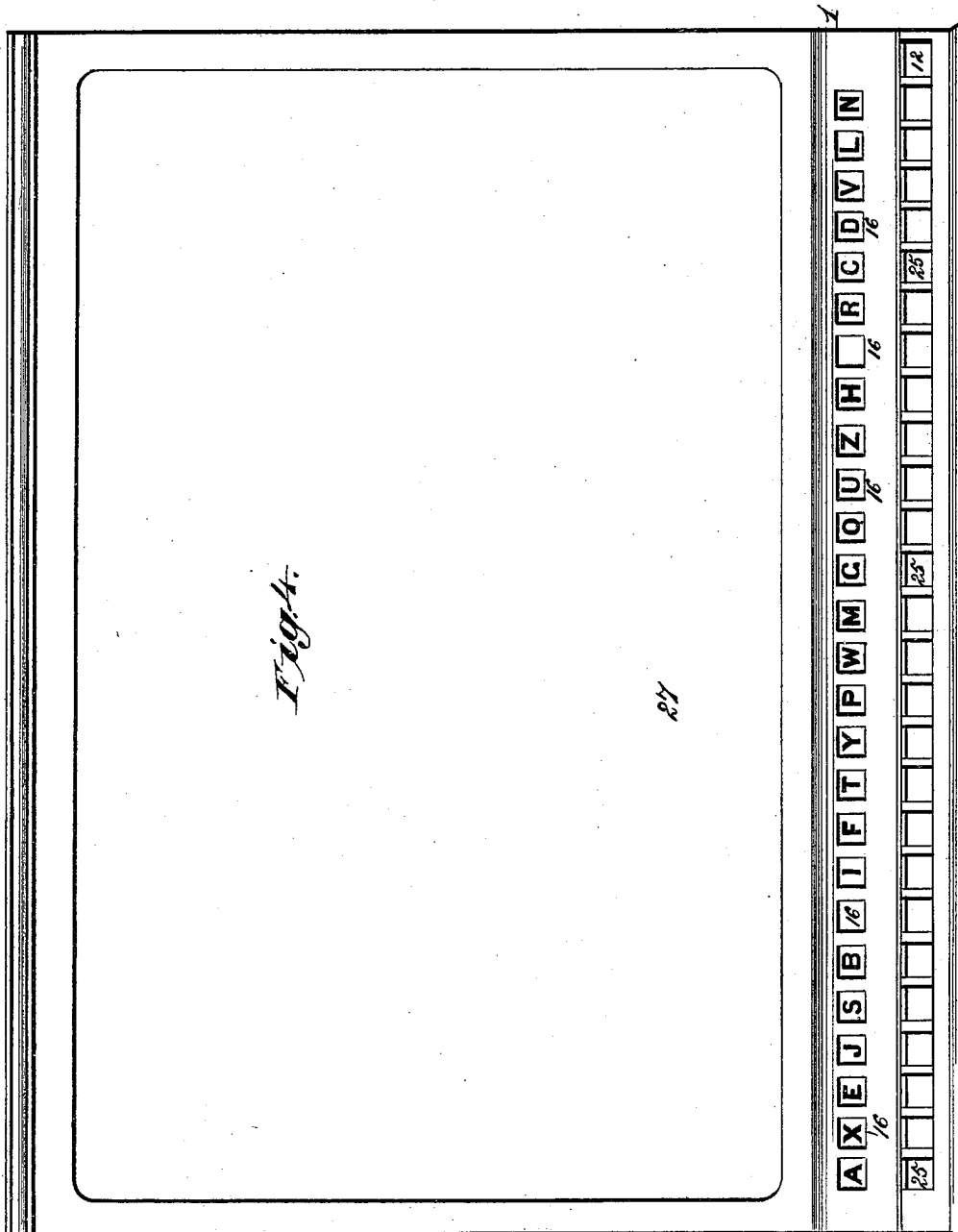
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Robert Emmett.

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UNITED STATES PATENT OFFICE.

TIBERIAS DOUGHERTY, OF PHILADELPHIA, ASSIGNOR OF TWO-THIRDS TO
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KINDERGARTEN APPARATUS FOR TEACHING SPELLING.

SPECIFICATION forming part of Letters Patent No. 342,737, dated May 25, 1886.

Application filed September 14, 1885. Serial No. 177,066. (No model.)

To all whom it may concern:

Be it known that I, TIBERIAS DOUGHERTY, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented new and useful Improvements in Kindergarten Teaching Apparatus, of which the following is a specification.

My invention relates to an improved apparatus for kindergarten or primary school-work in teaching the alphabet and its uses in spelling. This is readily accomplished in a simple and attractive manner by the employment of a box or cabinet inclosing a pair of rollers carrying a band or strip of paper or other material, having a series of pictures delineated thereon and arranged to be successively displayed at an opening in the face of the cabinet. Each picture may represent some well-known object, and should have its name attached in conspicuous letters. In another part of the cabinet-face, preferably below the opening at which the picture is displayed, are arranged other openings, one for the exhibition of each letter required to spell the word or name attached to the picture. At the back of these latter openings are mounted a series of alphabetical disks, so arranged as to be capable of rotation to bring the required letter opposite the proper opening in the cabinet.

According to my invention, one of the picture-carrying rollers is provided with a winding-stem for the attachment of a key or wrench, by which said roller can be rotated, so as to wind the picture-strip thereon. The other end of the picture-strip is attached to a roller having a spring, which is wound up by the rotation of its connected roller when the picture-strip is unwound therefrom and wound upon the other roller. The key-winding roller is provided at one end with a notch, and is normally held at rest or prevented from rotating by the engagement with said notch of a hooked rod having a spring or weight attached thereto, said rod being connected to a releasing-lever or finger-key, which projects from the cabinet. By pressing this key or lever the hooked rod will be disengaged from the roller with which it connects, thereby releasing the same, and both rollers will revolve automatically under the tension of the wound

spring attached to one of said rollers. The picture-rollers will continue to revolve as long as pressure is maintained on their releasing-lever or until the spring is unwound, which occurs when all or nearly all the pictures have been transferred to the spring-roller. When the desired picture comes opposite the exhibit-opening, the rotation of the rollers will be arrested by relaxing pressure on their releasing-lever or key, thus allowing the hooked rod to engage one of said rollers under the action of a spring or weight and so hold the rollers at rest. The alphabetical disks are loosely mounted on a common fixed shaft, and are normally held at rest by means of springs attached to said shaft and engaging the sides of the respective disks. These alphabetical disks are actuated by finger-keys that project at the front of the cabinet, and carry at their rear ends pawls adapted to engage ratchet-teeth on the disks, said pawls being normally held at rest by a weight or spring. On pressing the appropriate finger-key its attached pawl will be brought forcibly in contact with a ratchet-tooth on the adjacent disk, and thus rotate it a distance corresponding to the space occupied by one of the letters on its periphery, continued rotation of the disk being effected by imparting repeated impulses to the key until the desired letter appears opposite its proper opening in the face of the cabinet. By attentively observing the form of each letter attached to the picture, and then manipulating the correspondingly-located keys from left to right until the required letters are displayed by the respective alphabetical disks, the name of the picture or object can be readily spelled, even by a young child, a useful exercise being meanwhile afforded in the comparison of letters having a somewhat similar form. This principle of operation can also be applied in the formation, letter by letter, of several words constituting a sentence by simply providing a sufficient number of alphabetical disks and actuating-keys.

Heretofore in an apparatus for teaching spelling the alphabetical disks or wheels have been mounted on a rotary shaft in such a manner as to be capable of rotating therewith, and yet allow any or all of said disks to be held stationary without resisting the rotation of their

shaft, to which motion is communicated by means of cogged gearing from a crank-shaft that actuates the picture-carrying rollers. In the apparatus here referred to pivoted keys or levers are employed to control the rotation of the several alphabetical disks, and hold them stationary when the proper letters are exhibited, each key or lever being provided with a catch for engaging one of a series of pins projecting from the side of each disk. By depressing any or all of said keys the respective disks will be released and allowed to rotate with the movement of the crank and intermediate gearing. With such mechanism it is necessary to provide a means of throwing the picture-rollers out of gear with the crank-shaft, while said shaft is occupied in rotating the alphabetical disks. This necessity is obviated by my invention, which contemplates an essentially different and uncomplicated arrangement of parts in which the picture-rollers are automatically actuated by mechanism entirely distinct from the keys or levers that move the alphabetical disks. I thus dispense with a crank-shaft and gearing, mount the alphabetical disks on a fixed shaft, instead of a rotary one, and employ keys to actuate each alphabetical disk independently through pawl-and-ratchet connections, instead of providing such keys with catches to arrest the movement of said disks.

My invention is clearly illustrated in the annexed drawings, in which Figure 1 is a front elevation of a kindergarten alphabetical apparatus embodying my improvements. Fig. 2 is a sectional elevation of the same from front to rear. Fig. 3 is a sectional elevation from side to side; and Fig. 4 is a front elevation of an apparatus enlarged, to adapt it to the formation of sentences, and having a black-board face above the letter-openings.

Referring to these drawings, the numeral 1 designates a case or cabinet of convenient size and form. In the upper part of this cabinet is arranged a hollow roller, 2, loosely mounted upon a fixed horizontal shaft, 3, that is supported in the sides of the case. This hollow roller 2 incloses a spirally-coiled spring, 4, one end of which is secured to the roller and the other end to its fixed shaft. At a suitable distance below the spring-roller, and journaled in the sides of the case or cabinet, is a roller, 5, having at one end a key-winding stem, 6, that projects at one side of the cabinet. In the opposite end of the roller 5, or at other convenient point therein, is formed a notch, 7, for engaging the upper hooked end, 8, of a vertical rod, 9, that is supported in a guide-loop, 10, within the cabinet or box. This hooked rod has attached to its lower end a spring, 11, or a weight, if preferred, to hold its upper hooked end into engagement with the notched roller. To the lower end of the hooked rod 9 is connected the inner or rear end of a key or lever, 12, that is pivoted in an opening in the lower front part of the cabinet.

A strip or band, 13, of paper or other suit-

able material, is secured at either end to one of the rollers 2 and 5, so as to be wound from one to the other, small guide-rollers 14 being suitably arranged in such a manner as to stretch said band or strip smoothly in front of an opening, 15, in the cabinet-face. On this band or strip 13 are delineated a series of pictures, each of which has its name or some appropriate word or sentence prominently attached, as shown in Fig. 1.

By depressing the finger key or lever 12 the hooked rod 9 will be carried forward sufficiently to disengage it from the notch 7 in the lower roller, 5, and said roller can now be turned by means of a key or wrench applied to its stem 6, so as to wind the greater part of the picture-band 13 on said lower roller, leaving one picture displayed at the opening 15 in the cabinet-face. The act of winding the picture-band upon the roller 5 and the consequent rotation of the hollow roller 2 results in winding the spring 4 inclosed therein. After the picture-band has been wound upon the roller 5 the key 12 will be released, thus causing the hooked rod 9 to again engage the notch 7 in said roller and thereby hold it stationary. The pictures are now ready for exhibition in their proper order, and can be displayed successively by simply depressing the key 12, thereby releasing the roller 5 and permitting both rollers to rotate under the tension of the spring 4, thus automatically bringing the pictures to view. As each picture comes opposite the opening 15 the key 12 will be relieved of pressure, the hooked rod 9 will engage the notch 7, and the movements of the rollers and picture-band will be arrested.

In the front of the cabinet-case, and preferably below the picture-opening 15, is a series of openings, 16, for displaying the letters of the alphabet in such a way as to form, letter by letter, the name, word, or sentence appropriate to the picture exhibited. At the rear of the openings 16 is a fixed shaft, 17, on which are loosely mounted a series of alphabetical disks, 18, corresponding to the number of letter-openings in the face of the cabinet. The periphery of each disk 18 is provided with the letters of the alphabet arranged in regular order, and when the apparatus is designed to display several words in a sentence, each disk will also be provided on the periphery with a blank space that, when registered with one of the letter-openings, will serve to separate the words in such sentence.

In the drawings, Figs. 1 and 3, the apparatus is shown with only three disks and corresponding letter-openings for displaying short words, one at a time, and therefore the disks do not need a blank space. The disks will, however, have such blank spaces when the apparatus is enlarged, as shown in Fig. 4, to adapt it to the formation of longer words, phrases, and sentences.

Each disk 18 is provided on one side with radial indentations or corrugations 19, for en-

gagement with the free end of a leaf-spring, 20, the opposite end of which is secured to the shaft 17, on which said disks are mounted, the several disks being thus held from accidental rotation. The disks 18 are preferably open on one side, as shown in Fig. 3, to afford a space for the spring 20 of the adjacent disk, and thus enable the several disks to be arranged in proper proximity. The closed side or web of each disk is formed with a hub, 21, and the shaft 17 has fixed collars 22, against which said hub rests, the disks being thus held from lateral movement by the springs 20 on one side and the collars 22 on the other.

On the outer side of each disk 18, beyond the outer ends of the radial indentations 19, is formed an annular series of ratchet-teeth, 23, for the engagement of a pushing-pawl, 24, that is attached to the inner end of a key or lever, 25, pivoted in the front lower part of the cabinet. To the lower end of each pawl, 24, is attached a weight, 26, or a spring, by which the pawl is normally held in a perpendicular position without acting on the ratchet-teeth 23, though in contact therewith; but by depressing the outer ends of the keys or levers 25, the power of the respective weights or springs will be overcome and the pawls 24 will be forced up against the ratchet-teeth 23, thus rotating each disk a distance equivalent to the space occupied by one of the letters on its periphery. By thus giving repeated impulses to either one of the finger-keys or levers 25 its corresponding disk, 18, will be rotated letter by letter, until the required alphabetical character is brought opposite one of the openings 16 in the cabinet-front.

It will be understood that each key 25 is provided with a pawl, 24, for acting on the ratchet-teeth 23 of the corresponding disk. This pawl 24 is preferably attached to the key by a pivot, as shown in Fig. 2, and has its lower end extended below the key and connected to the weight 26 or to a spring, said weight or spring serving to hold the pawl in a normally perpendicular position. The pawl is thus adapted to impinge directly against the ratchet-teeth and thereby impart a positive movement to the disk under the action of the key, the weight or spring causing the pawl to resume its proper position after each stroke. The power exerted by the key 25 and pawl 24 is sufficient to overcome the pressure of the spring 20, that is engaged in one of the radial indentations 19; but after the disk has rotated the space of one letter the spring immediately engages the next radial indentation and prevents further rotation of the disk by arresting its momentum.

In employing this apparatus for teaching the alphabet, spelling, word-building, and formation of sentences, the picture exhibited at the opening 15 is designed to excite the interest and hold the attention of the pupil. The word, name, or sentence attached to the picture serves as a copy to be imitated in dis-

playing similar letters or characters at the lower openings in the cabinet.

The apparatus having been wound up or set for operation by means of a key applied to the winding-stem 6, it is only necessary to touch the finger key or lever 12 in order to produce any desired picture or replace it by another. The name attached to this picture will now be observed and the key-lever 25 at the extreme left of the apparatus touched repeatedly until the first letter of the word is exhibited opposite its appropriate opening, the other required letters being obtained in like manner by repeated touches, if necessary, on the second and third keys consecutively, and so on according to the number of letters in the word. After one word in a sentence has been spelled in this manner the next key 25 will be vibrated until a blank space appears opposite the corresponding opening 16, thus furnishing the required space between words. While operating the machine in this manner a pause can be made as each letter appears, and the pupil's attention directed to its points of similarity or difference as compared with the copy or word attached to the picture. Thus, as shown in Fig. 1, the picture represents a dog, and has the word "DOG" displayed in prominent characters. These several disks have been rotated sufficiently to display the several letters "D O E," and a pause is made while the letter "E" at the lower opening is compared with the letter "G" in the copy, after which the third key will be vibrated until the letter "G" appears at the third lower opening, and thus completes the word in accordance with the copy. Many other useful applications of the apparatus will readily suggest themselves to a teacher.

If desired, the picture-exhibiting devices may be omitted or replaced by a blackboard, 27, as shown in Fig. 4, or the cabinet may be provided with means for suspending a blackboard or a map or a screen in front of its upper portion when it is not desired to use the pictures.

What I claim as my invention is—

1. In a kindergarten teaching apparatus, the combination of a casing having openings in its face for the display of pictures, letters, or other characters, a spring-roller and a key-winding roller mounted in said casing, a band or strip wound on said rollers and bearing a series of pictures or characters, a series of rotary disks mounted in the casing, said disks being provided with ratchet-teeth and bearing on the periphery a series of alphabetical characters, pivoted keys or levers having pawls for engaging said ratcheted disks, and a key or lever having a hooked rod for engaging the key-winding roller, whereby the picture of an object can be displayed and its name spelled by manipulating said keys, substantially as described.

2. In a kindergarten teaching apparatus, the combination of a cabinet or casing having

an opening in its face, a spring-roller, and a notched key-winding roller mounted in said casing, a picture-exhibiting band attached to said rollers and adapted to be wound from one to the other, a pivoted lever or key, a rod attached to said key, and having a hooked end adapted to engage a notch in the key-winding roller, and means for holding said rod and roller in engagement until released by depressing the key, whereby the picture-band is allowed to move under the action of the spring-roller, substantially as described.

3. In a kindergarten teaching apparatus, the combination of a cabinet or casing having openings in its face, a series of rotary disks mounted in said casing on a fixed shaft, and provided with ratchet-teeth and radial indentations, springs attached to said shaft and engaging said radial indentations, and a series of keys or levers pivoted in the casing and provided with pawls for actuating said ratcheted disks, substantially as described.

4. In a kindergarten teaching apparatus,

the combination of the spring-roller 2, the key-winding roller 5, the band 13, wound on said rollers, the pivoted lever or key 12, and the rod 9, attached to said key and adapted to normally engage the winding-roller and be disengaged therefrom by the pivoted lever or key, substantially as described.

5. In a kindergarten teaching apparatus, the combination of a cabinet or casing having a series of openings, 16, the fixed shaft 17, having springs 20 and collars 22, the rotary alphabetical disks 18, mounted on said shaft at the rear of the openings in the case and having radial indentations 19, hubs 21, and ratchet-teeth 23, and the pivoted keys or levers 25, having pawls 24, substantially as described.

In testimony whereof I have affixed my signature in presence of two witnesses.

TIBERIAS DOUGHERTY.

Witnesses:

JAMES L. NORRIS,
J. A. RUTHERFORD.