

M. A. McCLELLAND.
EDUCATIONAL DEVICE.

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Inventor
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UNITED STATES PATENT OFFICE.

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EDUCATIONAL DEVICE.

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To all whom it may concern:

Be it known that I, MARY A. McCLELLAND, a citizen of the United States, residing at Albany, in the county of Albany and State of New York, have invented certain new and useful Improvements in Educational Devices; and I do declare the following to be a full, clear, and exact description of the invention, such as 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 the letters of reference marked thereon, which form a part of this specification.

It is well known that the mind is much more likely to retain a fact or statement if a demonstration of the fact or statement can be made to the eye, and it matters but little whether such ocular demonstration be literal and exact, or merely suggestive, so long as the attention of the eye is drawn to a performance which is suggestive of the fact or statement which it is sought to impress upon the mind. In accordance with this principle, the object of my invention is to produce a novel system or method of instruction, whereby the eye is brought to assist the mind in acquiring, understanding, and retaining facts, statements, propositions, and the like, which go to make up the subject or branch of learning being taught; and my invention has for a further object to produce a machine or apparatus whereby my system of instruction can be carried out.

The invention consists of a machine or apparatus of novel design and construction whereby instruction in various subjects taught in institutions of learning is rendered more easy, and whereby my method of instruction can be carried out.

I will first proceed to describe in detail the apparatus and will then describe the way in which the same is operated, thus illustrating the system or method of instruction.

I have illustrated in the accompanying drawings an apparatus embodying my invention, and referring to these drawings,—Figure 1 is a perspective view, parts of the apparatus being broken away, illustrating a ma-

chine embodying my invention. Fig. 2 is an elevation, partly broken away, showing the shaft and the rollers mounted thereon which serve to support the demonstrating bands or belts at one end of the apparatus.

In the drawings A designates the box or case in which the parts of the apparatus are supported. It may be of any preferred size and shape and is preferably provided with means for supporting it either in a flat position or upon a vertical wall. One side of the case is left open and there is a cover B adapted to be secured to the box by the hooks E and to cover this open side of the case. The cover is preferably divided longitudinally by the strip B', whereby there are formed two elongated openings in the side of the case which is closed by the cover, B, through which the interior of the case is exposed, the said openings being provided with the two pieces of glass G, G, or other transparent material.

R, R, are endless demonstrating belts or bands, extending lengthwise under the openings in the cover just referred to, and supported upon the spools or drums D, D, mounted upon spindles or shafts S, arranged at the opposite ends of the box or casing. The shafts S extend through the sides of the casing and are provided with the handles H by which the shafts can be turned. As shown in Fig. 2 of the drawings the spools or drums D are loose upon the shafts, but they can be secured thereto so as to turn with the shafts by means of the pins or screws *d*. The inner end of each of the spools is provided with a bevel wheel W, and a bevel wheel W' is mounted upon a stud shaft *w* projecting from the end of the case and engages with the two bevel wheels W, W, upon the ends of the spools or drums D. It will be understood that when the two drums or spools are thus connected they will turn in opposite directions and cause the belts to move in opposite directions as indicated by the arrows in Fig. 1.

It will of course be understood that when the two spools at one end of the machine are connected by means of the bevel gearing above described, one of the said spools or drums is secured to the shaft by the screw *d*

so as turn therewith while the other remains loose thereon and is free to turn in a direction opposite to the shaft.

The bevel wheel W' is removable from its supporting shaft so that the wheels can be disconnected and both be loose upon their supporting shaft, or both secured thereto so as to turn therewith and both in the same direction.

The sets of spools at the opposite ends of the machine are both provided with the bevel gears W , and there is a stud shaft w adjacent thereto projecting from each end of the box so that the bevel wheels W' can be arranged at either end or at both ends of the machine as desired. When either bevel wheel is removed I prefer to place a sleeve or thimble s upon the shaft S between the bevel wheels D , D , in order to keep the drums the proper distance apart.

The sides of the casing A are slotted as at J to permit the shafts S , S , to be readily removed or replaced. N , N , are plates secured to the sides of the casing and forming the bearings in which are supported the shafts S .

T , T , are slides or blocks fitted into the slots in the plates N and adapted to rest upon the shafts and hold them in place. These confining blocks are preferably of T -shape and can be secured in place each by a screw passing through one of the cross arms thereof, or by the cover resting upon them as indicated in Fig. 1.

O indicates an index, or finger, or pointer pivoted to the dividing strip B' of the cover about midway between its ends. It is adapted to be swung so as to extend across either one or the other of the two pieces of glass G which are set in the cover B , B .

L , L indicate arms secured to the cover and adapted to carry cards upon which can be placed printed matter. I prefer that the arms should be pivoted so that when not in use they can be swung into grooves in the side of the cover as indicated by the dotted lines in Fig. 1.

K , K , indicate cards upon which can be placed printed matter, which are shown as covering a portion of one of the glasses G in the cover of the case or box. These cards K may be slipped into grooves in the cover, as shown in Fig. 1, or they may be held in card-holding arms L , as indicated by dotted lines in the same figure.

As has been hereinbefore suggested, when it is desired that one of the belts R should move in one direction and the other in the opposite direction, one of the spools D at one end of the machine is secured to its shaft and the other spool which is mounted upon the same shaft is left loose, and the two spools are connected by the bevel gearing W , W' . The two spools at the opposite end of the apparatus are preferably disconnected from their shaft. If it be desired to have both belts move in the same direction then the two spools which are mounted upon the shaft

which is serving as the motor shaft are both connected thereto so that they will turn therewith, the spools upon the opposite shaft being preferably, though not necessarily, disconnected from their supporting shaft.

While I have described, and ordinarily preferred to make, the demonstrating bands endless, they might not be so, but could be wound from one of the spools to the other at the opposite end of the machine; and for some demonstrations this arrangement might be preferable to that shown, as in such case a longer belt or band could be used than when the bands are arranged in endless form, and varying characters could be placed thereon.

One or both of the belts or bands R , R , may be used, and when but one is employed then the one which is not in use can be covered by placing a card over the glass G which is opposite thereto.

Having thus explained the construction of an apparatus which is adapted to be used in carrying out my method of instruction I will now explain how it is used.

I will not of course herein attempt to enumerate all the uses to which my invention can be put, as the instructor will readily perceive how the apparatus can be best employed to demonstrate the particular branch or science which he may be teaching. I have found that the invention is particularly adapted to teaching tense, voice, and the distinction between the transitive and intransitive verbs in grammar; and that it is useful in teaching arithmetic, and history, and in any subject in which it is desirable to illustrate the sequence or the concurrence of events, or the combinations of parts.

In order to illustrate my method of teaching, and the use of the apparatus, I will first suppose that it is desired to teach voice in grammar. For this purpose the apparatus is so arranged that when one of the handles is turned the demonstrating belts will move in opposite directions as indicated by the arrows marked thereon. Two cards bearing sentences are then placed in the holders L , one being adjacent to one of the bands or belts, and the other adjacent to the other band or belt. It will be supposed that one of the cards has written upon it the sentence "He will send a message," and the other card the sentence "A message will be sent by him." In the first of the said sentences the subject represents the actor, and in the other sentence the subject represents the thing acted upon, and when the apparatus is arranged as has just been described, the directions in which the belts move, represent the direction of the forces or actions expressed by the verbs, and thus give an ocular demonstration thereof, which will materially assist the mind in perceiving the relations which the different words in the sentence have to each other—that is to say, the arrows upon the band adjacent to the card bearing the first sentence appear to

be moving away from the subject and thus carry the idea that the action is passing from it and hence indicate the active voice; whereas the arrows which are upon the band adjacent to the card bearing the second sentence appear to be moving toward the subject and indicate that the action is toward it or as being received by the subject of the sentence, and hence the verb which expresses that action is in the passive voice.

I will now suppose that the apparatus is to be used to illustrate tense. In this case one of the bands, say the upper one, is concealed by a card on which appear the words, "Past, Present, Future." The lower band is left exposed, and is moved in the direction indicated by the arrows. The indicator or pointer O is turned so as to lie over or across the exposed band, and the word "Present" on the card comes opposite thereto. That part of the exposed band to the right of the pointer represents future time, that portion thereof to the left of the pointer represents past time, and that portion which is directly under the pointer indicates present time. The pointer O is very narrow and thus indicates that the present time, which separates the future and the past, is but a moment; and this is further represented by the rapidity with which the band passes from the future to the past, and in so doing moves past the present. The passage of time is thus indicated by the movements of the belt in connection with the above noted words and the pointer O.

In connection with the apparatus arranged as described may be combined sentences indicating the changes in the form of the verb to denote past tense, present tense, and future tense, the cards bearing the different forms of the verb being placed opposite to the words "Past, Present, Future" according as they indicate past, present or future tense.

The concurrence and sequence of various historical events can be well illustrated by means of the apparatus which has been described but I do not consider it necessary to describe in detail how the machine will be operated to illustrate such facts as these.

The device can also be made an aid to teachers in teaching scholars to make quick computations. Thus a number can be placed upon a card over one of the bands and the other band can have a series of numbers applied to it which may be brought opposite to the number upon the card. If desired, all of the second band except that portion which is opposite to the number upon the said card can be covered or concealed from view, so that only the number which it is desired to add to or subtract from the number upon the card will be exposed.

I do not consider that it is necessary to further describe the many uses to which my invention can be put, as they will readily suggest themselves to those skilled in the art of instruction, and sufficient has been explained

to illustrate my method of instruction and the way in which the apparatus which forms a part of my invention is to be used.

It will be evident that an apparatus embodying my improvements and provided with but a single traveling band or belt might be employed, and I have described, in setting forth my method, how an apparatus of this kind would be operated. So also an apparatus having more than two belts might be made use of, the same gearing which has been described and is shown in the drawings being made use of to connect together the spools upon which the different bands are supported. It will also be evident that my invention is not limited to the particular style of gearing which I have shown as a means for connecting the supporting spools for the band as other and equivalent means might be made use of.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In an educational device, a case provided with a cover B, which is divided in the direction of its length by a strip B' whereby there are formed two elongated openings in the cover, through which openings the interior of the case may be seen, the two movable horizontal demonstrating bands mounted within the case and extending lengthwise under the said openings, and means for moving said demonstrating bands simultaneously in opposite directions, substantially as set forth.

2. An educational device consisting of a case, the two movable demonstrating bands mounted upon shafts arranged within the case, means for connecting and simultaneously moving the said bands in opposite directions, and the holders for cards, arranged adjacent to the said demonstrating bands substantially as set forth.

3. In an educational device, the combination of the case, the shafts supported in the opposite ends thereof, the two spools or drums mounted loosely upon each shaft, means for connecting one of the said spools or drums with its shaft, bevel gearing arranged between and adapted to form connections between the adjacent spools or drums at one end of the case, and the belts or bands mounted upon the said spools or drums, substantially as set forth.

4. In an educational device, the combination of the case, A, the shafts mounted in the opposite ends thereof, the spools D, D mounted loosely upon the shafts and provided at their inner or adjacent ends with the bevel wheels W, W, the connecting bevel wheels W' between the gears W, W, the handle for turning the shaft, and the means for connecting one of the spools with its shaft, and the belts or bands mounted upon the said spools, substantially as set forth.

5. In an educational device, the case having the two openings formed in its cover and extending in the direction of the length of the

case, the said openings being separated from
each other by a strip B', the movable bands
mounted in the case and arranged beneath
the said openings, means for moving the said
5 belts or bands simultaneously in opposite
directions, and a narrow pointer pivoted to
the strip B' between the openings in the cover,
and adapted to be moved so as to overlie

either one or the other of the said belts, sub-
stantially as and for the purposes set forth. ro

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

MARY A. McCLELLAND.

Witnesses:

H. V. LONG,

F. H. BUENAR.