Dec. 13, 1966 R. J. GURDA 3,290,796

CONTROL APPARATUS

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Fig. 1.

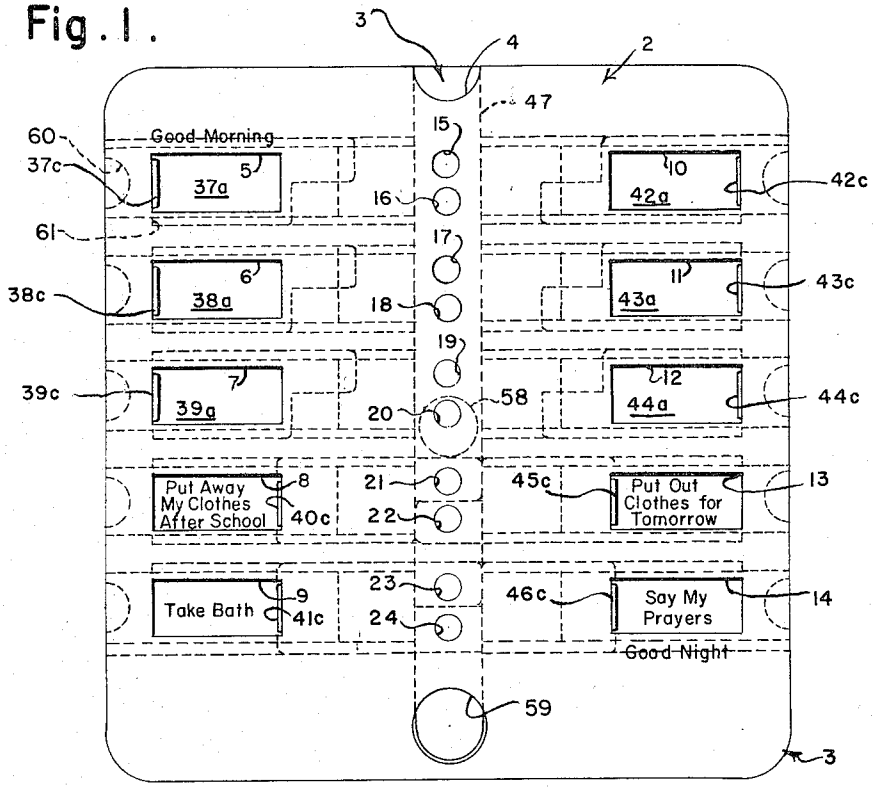
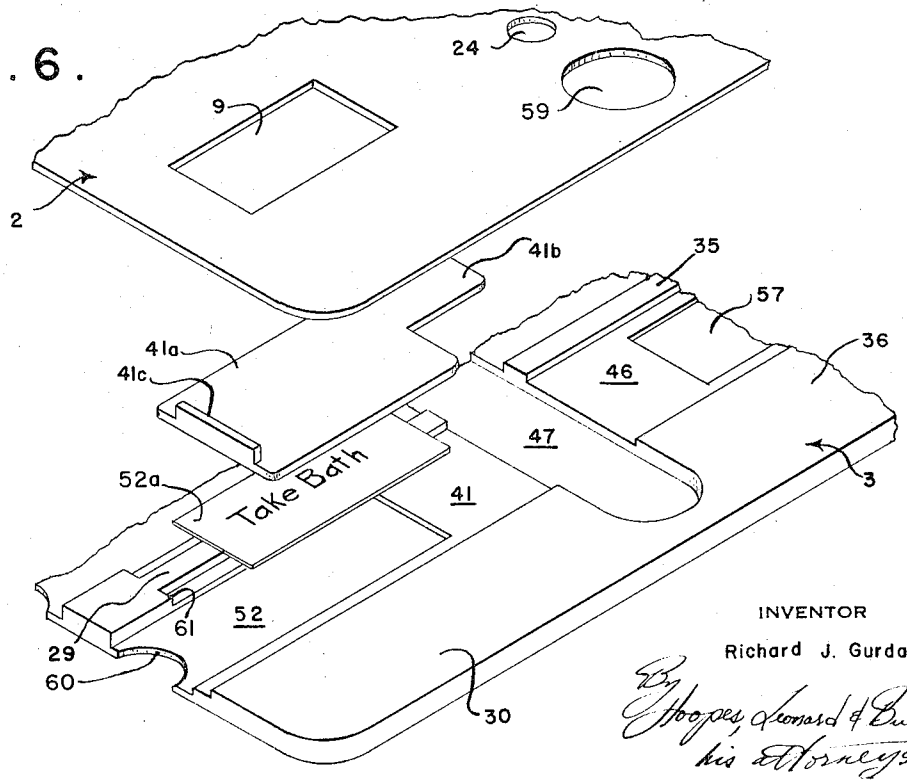


Fig. 6.



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CONTROL APPARATUS

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Fig. 2.

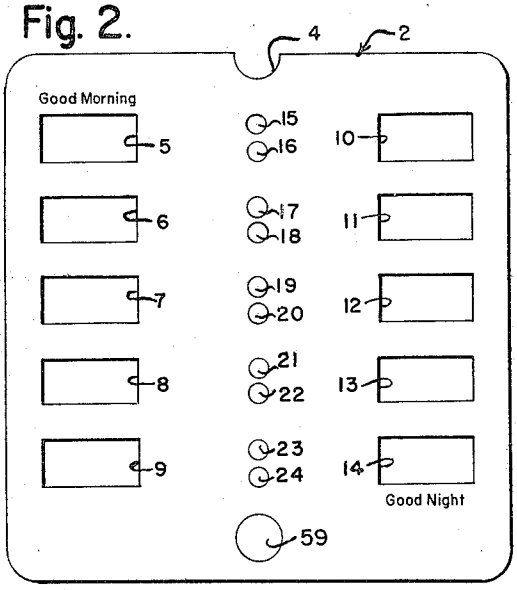


Fig. 3.

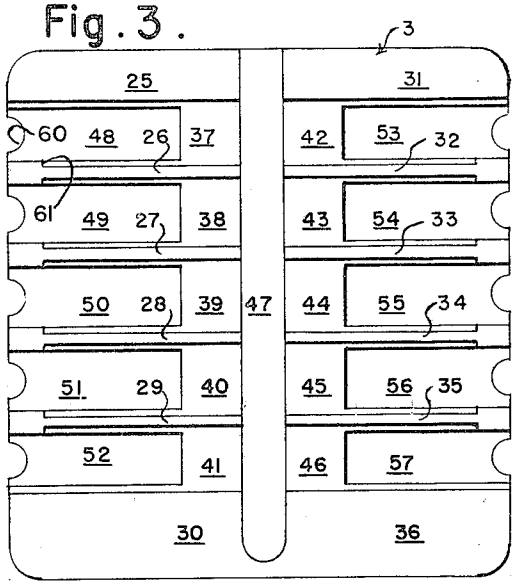


Fig. 4.

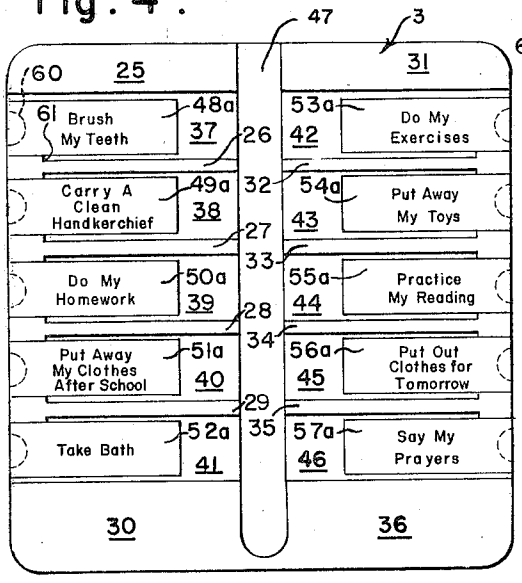
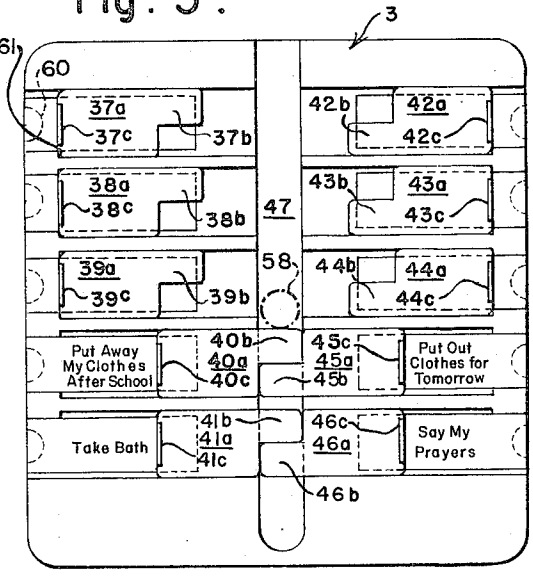


Fig. 5.



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3,290,796

CONTROL APPARATUS

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16 Claims. (Cl. 35—23)

This invention relates to apparatus which for want of a more descriptive term I call control apparatus. It is adapted for a wide variety of applications in certain of which it might be termed an educational device or a reminding device. Broadly it involves the movement of an element along a guideway, which movement has relation to an objective to be attained and is dependent upon removal of blocking or detent means from the path of the element, which removal is related to the existence of certain conditions precedent, such, for example, as the performance of predetermined acts.

The general nature of the invention may perhaps be best understood if it is explained in connection with one of the many possible embodiments. The invention is well suited for embodiment in a device for reminding a child of chores to be performed each day. A coin may be inserted into the upper end of the guideway which may be disposed at an angle to the horizontal so that the force of gravity impels the coin to move downwardly when it is not held or blocked against downward movement. When the coin reaches the lower end of the guideway it may be removed and taken by the child. Intermediate the upper and lower ends of the guideway the coin cannot be removed. Ranged along the guideway are a series of detents each movable between an operative position blocking advance of the coin or other element downwardly along the guideway and an inoperative position permitting such advance. Each detent is initially disposed in operative position. When the child has performed or completed a chore he moves a detent to inoperative position. The detents are related to the chores in chronological order from top to bottom of the apparatus. A legend may be associated with each detent describing or related to one of the chores to be performed. Upon the successive performance of the chores and successive movement of the detents to inoperative position sequentially from top to bottom of the apparatus the coin will move downwardly in the guideway step by step. Each time one of the detents is moved to inoperative position the coin moves downwardly past that detent and is stopped by the next detent. When that detent is moved to inoperative position the coin moves downwardly again and is stopped by the next detent. When all the detents have been moved to inoperative position the coin has reached the bottom of the guideway and can be removed.

Many other applications for the invention suggest themselves. The invention has value in any situation in which a control is desired or required to insure the performance of certain acts. For example, the invention could be employed to great advantage in checking out procedures to make sure that all of the required preliminary steps are taken before starting an engine or performing a similar operation. While I believe that normally it will be desired to dispose the control apparatus so that the longitudinal guideway is disposed at an angle to the horizontal, utilizing the force of gravity to move the element along the guideway, the control apparatus may be disposed with the guideway horizontal and the element may be advanced along the guideway by a force other than the force of gravity, as, for example, by use of a spring or by magnetic force.

I provide control apparatus comprising a guideway for an element adapted to advance therealong and a series of detents ranged along the guideway each movable between

an operative position blocking advance of the element along the guideway and an inoperative position permitting advance of the element along the guideway. The detents are preferably movable transversely of the guideway between an operative position intersecting the guideway blocking advance of the element along the guideway and an inoperative position relatively remote from the guideway permitting advance of the element along the guideway. As above indicated the guideway may extend at an angle to the horizontal so that the element is acted on by the force of gravity tending to advance it downwardly in the guideway.

The guideway along which the element is adapted to advance may be termed a longitudinal guideway. A series of transverse guideways may be provided which are ranged along the longitudinal guideway and intersect the longitudinal guideway, and a slide may be disposed in each of the transverse guideways movable therein between an operative position blocking advance of the element along the longitudinal guideway and an inoperative position permitting advance of the element along the longitudinal guideway. Certain of the transverse guideways may be on one side of the longitudinal guideway and other of the transverse guideways may be on the opposite side of the longitudinal guideway. The transverse guideways may be arranged in pairs with the respective guideways of each pair in opposed relationship on opposite sides of the longitudinal guideway, and a slide may be provided in each of the transverse guideways which is movable therein between an operative position in which a portion thereof blocks advance of the element along the longitudinal guideway and an inoperative position permitting advance of the element along the longitudinal guideway, said portions of the slides in opposed transverse guideways blocking advance of the element at different locations along the longitudinal guideway. Said portion of one of a pair of opposed slides may be disposed relatively near one end of the longitudinal guideway and said portion of the other of said pair of opposed slides may be disposed relatively near the opposite end of the longitudinal guideway.

Means are preferably provided indicating the position of the element along the longitudinal guideway. Such guideway may have opening means therein through which a portion of the element may be seen whereby the position of the element along the guideway may be known. Legends may be provided which are exposed to view when the detents are in operative position and covered when the detents are in inoperative position.

Other details, objects and advantages of the invention will become apparent as the following description of a present preferred embodiment thereof proceeds.

In the accompanying drawings I have shown a present preferred embodiment of the invention in which

FIGURE 1 is a plan view of control apparatus embodying my invention;

FIGURE 2 is a plan view of the front member of the control apparatus shown in FIGURE 1 but to reduced scale;

FIGURE 3 is a plan view of the back member of the control apparatus shown in FIGURE 1;

FIGURE 4 is a plan view of the back member but showing cards with legends applied thereto;

FIGURE 5 is a view similar to FIGURE 4 but with slides applied thereto; and

FIGURE 6 is a fragmentary exploded view to greatly enlarged scale showing the relationship of the elements of my control apparatus.

Referring now more particularly to the drawings, the control apparatus as shown therein comprises generally sheet-like front and back members 2 and 3 respectively. These members may be made of any suitable material such

as wood, plastic, cardboard, metal, etc. In the form shown the front member 2 may be simply stamped out of sheet material, being of generally rectangular form and of uniform thickness throughout and having at the top a notch 4 of semi-circular shape and having two vertical columns of rectangular openings, one such column being near the left hand margin of the member 2 and the other such column being near the right hand margin of the member 2. The openings of the left hand column are designated respectively by reference numerals 5, 6, 7, 8 and 9 from top to bottom while the openings of the right hand column are designated respectively by reference numerals 10, 11, 12, 13 and 14 from top to bottom. A central column of smaller circular openings is also provided for a purpose to be presently described. The central openings are designated respectively by reference numerals 15, 16, 17, 18, 19, 20, 21, 22, 23 and 24 from the top to bottom. It will be noted that the central openings are grouped in pairs with each pair disposed between two of the side openings which are in transverse alignment. For example, the central openings 15 and 16 are disposed between the side openings 5 and 10.

The back member 3 is of the same size and shape as the front member 2 but has portions of its front face (i.e., its face adapted to be disposed against the front member 2) disposed in three different planes for a purpose to be presently described. The rear face of the back member 3 may be planar.

The back member 3 is thickest at portions designated 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35 and 36. All of these portions are of generally transversely elongated shape and are arranged to form transverse guideways designated respectively 37, 38, 39, 40, 41, 42, 43, 44, 45 and 46. In other words, the thickness of the material of the back member 3 is greater at the portions 25–36 than it is at the portions 37–46 whereby the later mentioned portions constitute transverse guideways.

The material of the back member 3 is thinnest at portions designated 47, 48, 49, 50, 51, 52, 53, 54, 55, 56 and 57. The portion 47 constitutes the longitudinal guideway to which reference has been made above. It is open at the top so that a coin or similar element may be introduced into it and it is closed at the bottom. The portions 48–57 are depressed portions within the transverse guideways 37–46 for receiving cards or sheets bearing legends or indicia. The portions 26–29 and 32–25 have enlarged outer ends as clearly shown in the drawings providing shoulders 61 to serve as stops for slides to be disposed in the transverse guideways 37–46 as will presently be described. Each of the portions 48–57 has a semicircular shaped notch 60 at its outer edge to facilitate insertion and removal of a card bearing a legend.

FIGURE 4 shows cards 48*a*–57*a* disposed in the portions 48–57 of the back member 3, the cards in this instance bearing legends defining chores to be preformed by a child each day. These cards are simply by way of example and cards bearing any series of legends related to acts to be performed, items to be checked, etc., may be substituted. My control device may be sold as a kit, the kit including any desired number of sets of cards bearing legends from which appropriate selection may be made.

FIGURE 5 shows slides which for convenience have been numbered the same as the transverse guideways in which they operate but with the letter "*a*" appended. For example, the slide which operates in the transverse guideway 37 is designated 37*a*, etc. Each slide has at its inner end, i.e., the end thereof nearer the longitudinal guideway 47, a projection designated by the reference numeral applied to the slide but with the letter "*b*" instead of the letter "*a*" appended. For example, the projection of the slide 37*a* is designated 37*b*, etc. It will be noted that the height of each projection, i.e., the dimension thereof parallel to the length of the longitudinal guideway 47, is about half or slightly less than half the height of the body of the slide and that all of the projections 37*b*–41*b* project from what may be termed the upper portions of their slides while all of the projections 42*b*–46*b* project from what may be termed the lower portions of their slides.

Each of the slides is adapted to be moved between an outward inoperative position in which its outward movement is limited by the shoulder 61 provided by the enlargement of one or two of the portions 26–29 and 32–35 as shown with respect to the three top slides on each side in FIGURE 5 and in which its projection, such as 37*b*, is completely removed from the longitudinal guideway 47 and an inward position as shown with respect to the two bottom slides on each side in FIGURE 5 in which its projection intersects the longitudinal guideway 47 and hence serves as stop means to stop a coin or similar element from moving downwardly through the longitudinal guideway. The stopping or blocking function is, of course, performed by the upper edge of the slide projection in each case. The upper edge of each of the projections 37*b*–41*b* is higher or nearer the upper end of the longitudinal guideway 47 than the upper edge of the opposed one of the projections 42*b*–46*b*. Thus when the projection 37*b* intersects the longitudinal guideway 47 it stops downward movement of the coin virtually at the top of the longitudinal guideway, but when the slide 37*a* is withdrawn to inoperative position and the slide 42*a* is in operative position the upper edge of the projection 42*b* will stop the coin farther down in the longitudinal guideway. Thus, even though the slides 37*a* and 42*a* are directly opposite each other their projections are staggered as shown and are effective to stop downward movement of the coin at different zones of the longitudinal guideway 47. This applies to the slides all the way down the longitudinal guideway. Also when opposed slides are in operative position they "nest," i.e., the projection of the left hand slide is disposed above the projection of the right hand slide in the direction toward the top of the longitudinal guideway 47.

Each slide is provided with an outward projection or rib as indicated at 37*c* on the slide 37*a* adapted to be engaged by the fingers of the person operating the apparatus to facilitate movement of the slide. Also, the projections or ribs 37*c*, etc., serve as limit stops when engaging the inner ends of the openings 5–14 in the front member 2 to limit inward movement of the slides.

When the front member 2 is applied to the back member 3 the planar inner face of the front member 2 lies flush against the portions 25–36 of the back member 3 and is desirably adhesively attached thereto, confining the slides 37*a*–46*a* between the front and back members while permitting them to slide in the transverse guideways 37–46. The front member 2 and the back member 3 together constitute a mounting device. Each slide when in its inward or operative position uncovers the corresponding legend and when retracted or withdrawn outwardly covers the legend. The thickness of the cards 48*a*–57*a* is substantially equal to depth of the portions 48–57 below the guideways 37–46.

At the beginning of the day all of the slides are in operative position. The apparatus is hung on a wall or otherwise arranged so that the longitudinal guideway 47 is disposed at an angle to the horizontal. A coin 58 is dropped into the upper end of the longitudinal guideway 47, the notch 4 facilitating insertion of the coin. It is stopped or blocked in its downward movement by engagement with the projection 37*b*. When the child has brushed his teeth he moves the slide 37*a* to inoperative position as shown in FIGURE 5 covering the legend "Brush My Teeth" on card 48*a* and also retracting the extension 37*b* out of the longitudinal guideway 47 and permitting the coin 58 to move downwardly by gravity in the guideway 47 until it strikes the projection 42*b*. After the child has done his exercises he moves the slide

42*a* from operative to inoperative position as shown in FIGURE 5 covering the legend "Do My Exercises" on card 53*a* and permitting the coin 58 to move downwardly in the longitudinal guideway until it is stopped by the projection 38*b*. As the child performs the various chores related to the legends he retracts the corresponding slides and when all of the slides have been retracted the coin reaches the bottom of the longitudinal guideway 47 where it may be removed through an opening 59 in the front member 2, which opening is larger than the coin to permit the coin to be withdrawn therethrough. In each position of the coin in the guideway 47 it may be seen through one of the openings 15–24, which openings are smaller than the coin, but it cannot be removed until its reaches the opening 59.

It will be appreciated that my control apparatus has almost unlimited application and is of value in any situation in which it is important to insure the performance of a series of operations. For example, the element adapted to move through the longitudinal guideway may be a key such as a key to an aircraft engine or a key to a lock when it is important that the engine be not started or the lock unlocked until a series of operations related to the legends on the cards selected for use in the apparatus have been performed.

While I have shown and described a present preferred embodiment of the invention it is to be distinctly understood that the invention is not limited thereto but may be otherwise variously embodied within the scope of the following claims.

I claim:

1. Control apparatus comprising a generally planar guideway for an element adapted to advance therealong, a series of detents ranged along the guideway each movable between an operative position blocking advance of the element along the guideway and an inoperative position permitting advance of the element along the guideway and guide means extending substantially parallel to the general plane of the guideway guiding the detents in movement between said positions.

2. Control apparatus comprising a mounting device having a generally planar guideway for an element adapted to advance therealong and a series of detents ranged along the guideway each movable transversely of the guideway between an operative position intersecting the guideway blocking advance of the element along the guideway and an inoperative position relatively remote from the guideway permitting advance of the element along the guideway, the mounting device having guide means extending substantially parallel to the general plane of the guideway guiding the detents in movement between said positions.

3. Control apparatus comprising a generally planar mounting device having a guideway extending at an angle to the horizontal down which an element acted on by the force of gravity is adapted to advance and a series of detents ranged along the guideway each movable between an operative position blocking advance of the element down the guideway and an inoperative position permitting advance of the element down the guideway, the mounting device having guide means guiding the detents in the general plane of the mounting device in movement between said positions.

4. Control apparatus comprising a generally planar mounting device having a guideway extending at an angle to the horizontal down which an element acted on by the force of gravity is adapted to advance and a series of detents ranged along the guideway each movable transversely of the guideway between an operative position intersecting the guideway blocking advance of the element down the guideway and an inoperative position relatively remote from the guideway permitting advance of the element down the guideway, the mounting device having guide means guiding the detents in the general plane of the mounting device in movement between said positions.

5. Control apparatus comprising a mounting device having a longitudinal guideway for an element adapted to advance therealong, a series of continuous transverse guideways ranged along the longitudinal guideway and intersecting the longitudinal guideway, and a slide in each of the transverse guideways movable therein between an operative position on the mounting device blocking advance of the element along the longitudinal guideway and an inoperative position on the mounting device permitting advance of the element along the longitudinal guideway.

6. Control apparatus comprising a mounting device having a longitudinal guideway for an element adapted to advance therealong, a series of transverse guideways ranged along the longitudinal guideway and intersecting the longitudinal guideway, certain of the transverse guideways being on one side of the longitudinal guideway and other of the transverse guideways being on the opposite side of the longitudinal guideway, and a slide in each of the transverse guideways movable therein between an operative position on the mounting device blocking advance of the element along the longitudinal guideway and an inoperative position on the mounting device permitting advance of the element along the longitudinal guideway.

7. Control apparatus comprising a mounting device having a longitudinal guideway for an element adapted to advance therealong, a series of transverse guideways ranged along the longitudinal guideway and intersecting the longitudinal guideway, the transverse guideways being arranged in pairs with the respective guideways of each pair in opposed relationship on opposite sides of the longitudinal guideway, and a slide in each of the transverse guideways movable therein between an operative position on the mounting device in which a portion thereof blocks advance of the element along the longitudinal guideway and an inoperative position on the mounting device permitting advance of the element along the longitudinal guideway, said portions of slides in opposed transverse guideways blocking advance of the element at different locations along the longitudinal guideway.

8. Control apparatus comprising a mounting device having a longitudinal guideway for an element adapted to advance therealong, a series of transverse guideways ranged along the longitudinal guideway and intersecting the longitudinal guideway, the transverse guideways being arranged in pairs with the respective guideways of each pair in opposed relationship on opposite sides of the longitudinal guideway, and a slide in each of the transverse guideways movable therein between an operative position on the mounting device in which a portion thereof blocks advance of the element along the longitudinal guideway and an inoperative position on the mounting device permitting advance of the element along the longitudinal guideway, said portion of one of a pair of opposed slides being disposed relatively near one end of the longitudinal guideway and said portion of the other of said pair of opposed slides being disposed relatively near the opposite end of the longitudinal guideway.

9. Control apparatus comprising a guideway for an element adapted to advance therealong, a series of detents ranged along the guideway each movable between an operative position blocking advance of the element along the guideway and an inoperative position permitting advance of the element along the guideway and legends exposed to view when the detents are in operative position and covered by the detents when the detents are in inoperative position.

10. Control apparatus comprising a longitudinal guideway for an element adapted to advance therealong, a series of transverse guideways ranged along the longitudinal guideway and intersecting the longitudinal guide-

way, a slide in each of the transverse guideways movable therein between an operative position blocking advance of the element along the longitudinal guideway and an inoperative position permitting advance of the element along the longitudinal guideway and a legend covered by a slide when the slide is in inoperative position and exposed to view when the slide is in operative position.

11. Control apparatus comprising a mounting device comprising front and back members disposed in face-to-face relation formed to provide therebetween a longitudinal guideway for an element adapted to advance therealong and a series of continuous transverse guideways ranged along the longitudinal guideway and intersecting the longitudinal guideway and a slide in each of the transverse guideways movable therein between an operative position on the mounting device blocking advance of the element along the longitudinal guideway and an inoperative position on the mounting device permitting advance of the element along the longitudinal guideway.

12. Control apparatus comprising front and back members disposed in face-to-face relation formed to provide therebetween a longitudinal guideway for an element adapted to advance therealong and a series of transverse guideways ranged along the longitudinal guideway and intersecting the longitudinal guideway and a slide in each of the transverse guideways movable therein between an operative position blocking advance of the element along the longitudinal guideway and an inoperative position permitting advance of the element along the longitudinal guideway, the front member having openings therethrough other than the guideways through which the slides may be manually moved between operative and inoperative positions.

13. Control apparatus comprising front and back members disposed in face-to-face relation formed to provide therebetween a longitudinal guideway for an element adapted to advance therealong and a series of transverse guideways ranged along the longitudinal guideway and intersecting the longitudinal guideway and a slide in each of the transverse guideways movable therein between an operative position blocking advance of the element along the longitudinal guideway and an inoperative position permitting advance of the element along the longitudinal guideway, the front member having openings therethrough other than the guideways through which the slides may be manually moved between operative and inoperative positions and also having opening means therethrough through which a portion of the element may be seen whereby the position of the element along the guideway may be known.

14. Control apparatus comprising front and back members disposed in face-to-face relation formed to provide therebetween a longitudinal guideway for an element adapted to advance therealong and a series of transverse guideways ranged along the longitudinal guideway and intersecting the longitudinal guideway, a slide in each of the transverse guideways movable therein between an operative position blocking advance of the element along the longitudinal guideway and an inoperative position permitting advance of the element along the longitudinal guideway, the front member having openings therethrough through which the slides may be manually moved between operative and inoperative positions and also having opening means therethrough through which a portion of the element may be seen whereby the position of the element along the guideway may be known, and legends exposed to view through the first mentioned openings through the front member when the slides are in operative position and covered by the slides when the slides are in inoperative position.

15. Control apparatus comprising front and back members disposed in face-to-face relation at an angle to the horizontal formed to provide therebetween a longitudinal guideway inclined to the horizontal shaped to receive and guide a coin or similar element adapted to move downwardly in the longitudinal guideway under the force of gravity, the front and back members also being formed to provide a series of transverse guideways disposed between the front and back members ranged along the longitudinal guideway and intersecting the longitudinal guideway, and a slide in each of the transverse guideways movable therein between an operative position blocking downward movement of the coin or similar element in the longitudinal guideway and an inoperative position permitting such downward movement.

16. Control apparatus comprising front and back members disposed in face-to-face relation at an angle to the horizontal formed to provide therebetween a longitudinal guideway inclined to the horizontal shaped to receive and guide a coin or similar element adapted to move downwardly in the longitudinal guideway under the force of gravity and to confine the coin or similar element so that it cannot be removed from the longitudinal guideway until it reaches the bottom thereof, the front and back members also being formed to provide a series of transverse guideways disposed between the front and back members ranged along the longitudinal guideway and intersecting the longitudinal guideway, and a slide in each of the transverse guideways movable therein between an operative position blocking downward movement of the coin or similar element in the longitudinal guideway and an inoperative position permitting such downward movement, the front member having at the bottom of the longitudinal guideway an opening therethrough through which the coin or similar element may be removed when it reaches the bottom of the longitudinal guideway.

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