

Feb. 7, 1950

O. E. ZUERCHER

2,496,767

TEST DEVICE

Filed June 10, 1947

2 Sheets-Sheet 1

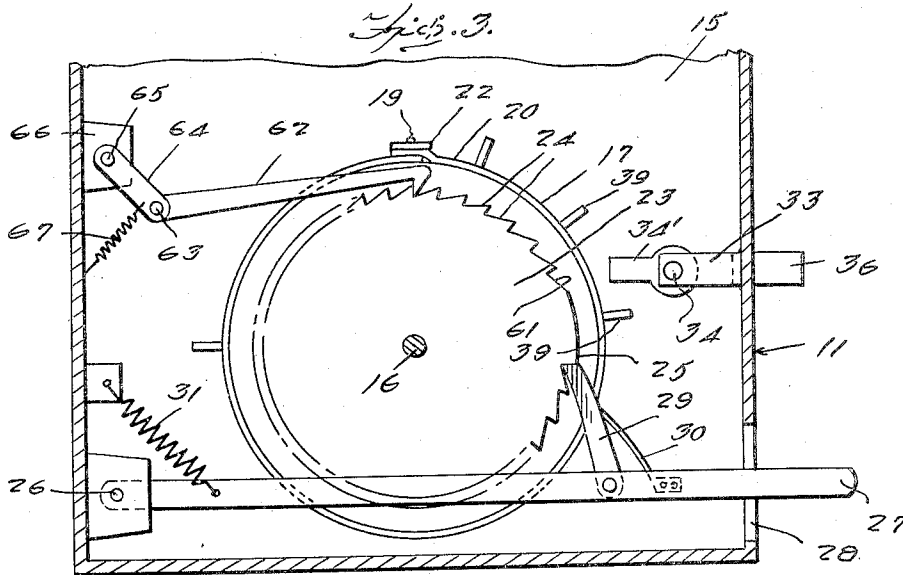
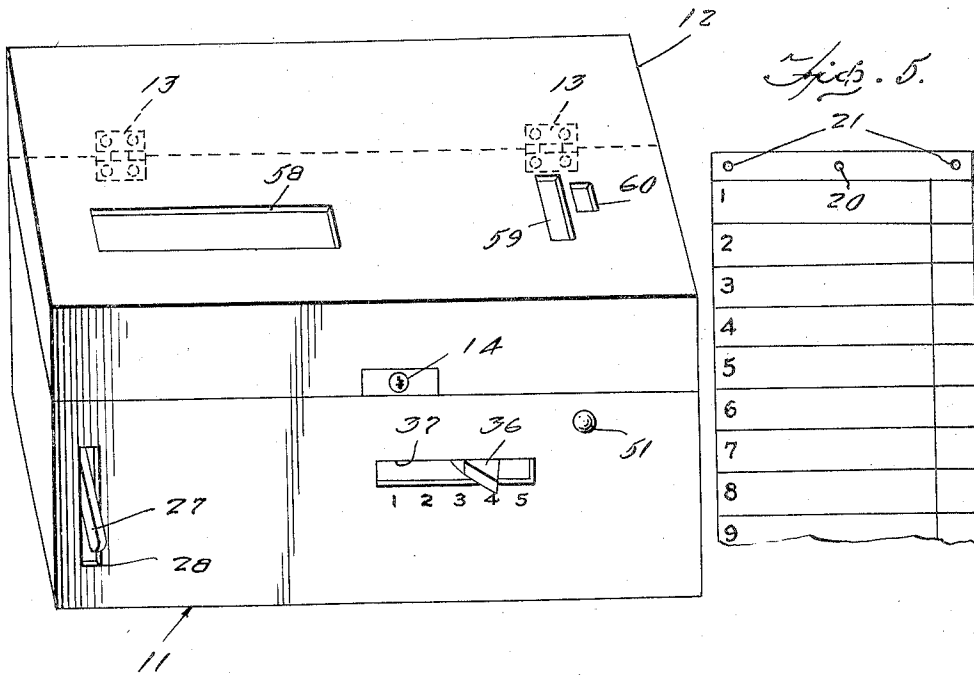


Fig. 1.

INVENTOR.

Oswin E. Zuercher

BY

McNarrow, Berman & Davidson
ATTORNEYS

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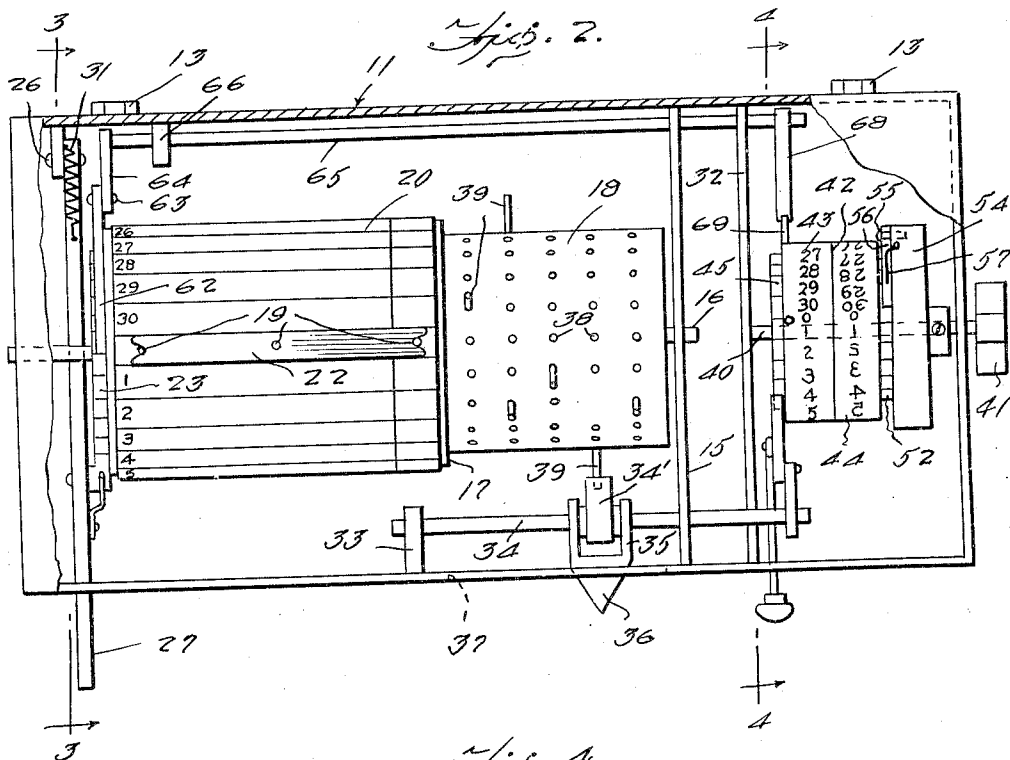
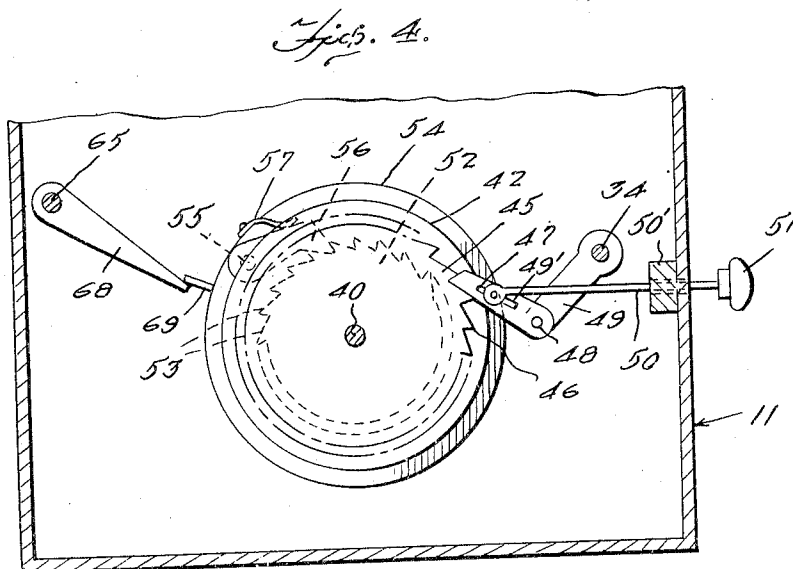
O. E. ZUERCHER

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2 Sheets-Sheet 2



INVENTOR.
Oswin E. Zuercher
BY

McMorrow, Berman & Davidson
ATTORNEYS

UNITED STATES PATENT OFFICE

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TEST DEVICE

Oswin E. Zuercher, Hatfield, Pa.

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2 Claims. (Cl. 35-48)

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This invention relates to quiz devices, and more particularly to a mechanical apparatus for testing a person's knowledge and for grading the tests.

A main object of the invention is to provide a novel and improved testing machine which is very simple in construction, easy to use and dependable in operation.

A further object of the invention is to provide an improved testing apparatus for testing a person's information and automatically scoring the number of correct answers to a group of questions, said apparatus being inexpensive to manufacture, accurate in performance and requiring only a minimum amount of manipulation.

Further objects and advantages of the invention will become apparent from the following description and claims, and from the accompanying drawings, wherein:

Figure 1 is a perspective view of a quiz device constructed in accordance with the present invention.

Figure 2 is a plan view, partly in horizontal cross-section, of the quiz device of Figure 1.

Figure 3 is a fragmentary cross-sectional view taken on line 3-3 of Figure 2.

Figure 4 is a fragmentary cross-sectional view taken on line 4-4 of Figure 2.

Figure 5 is a fragmentary plan view of a blank question sheet employed with the quiz device of Figure 1.

Referring to the drawings, 11 designates a generally rectangular housing having a top cover 12 hinged at the rear bottom edge thereof to the top edge of the rear wall of the body of the housing, as shown at 13, 13. A suitable lock 14 is provided at the front bottom edge of the cover for locking said cover in closed position.

Secured in the housing body is a transverse partition 15 and journaled in the left end wall of said body, as viewed in Figure 2, and in the partition 15 is a longitudinal shaft 16. Shaft 16 carries secured thereto at its left portion a first drum 17 and at its right portion a second drum 18. Drum 17 is provided with spaced pins 19. A question sheet 20 having numbered question spaces, as shown in Figure 5, may be secured to drum 17 by wrapping the sheet around the drum and engaging the ends of the sheet with the pins 19 through apertures 21 provided at the sheet ends, said ends being clamped to the drum by a clamping strip 22 overlying the secured sheet ends and secured to the pins by any suitable means, such as nuts threaded on the pins or

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by employing headed bolts threaded into the drum 17 in place of the pins 19.

Drum 17 carries at its left end a ratchet disc 23 formed with clockwise directed teeth 24, as viewed in Figure 3, except for a blank portion 25. Pivotaly secured to the rear wall portion of the housing body at 26 is a lever 27 extending through a vertical slot 28 formed in the front wall of the housing body. Pivotaly secured to the forward portion of lever 27 is an upstanding dog 29 biased rearwardly by a spring arm 30 secured to the lever 27 so that the dog 29 is biased rearwardly into engagement with the ratchet teeth 24. A spring 31 connecting the rear portion of lever 27 with the rear housing wall portion above the pivotal connection 26 biases the lever upwardly to maintain said dog 29 in engagement with the aforementioned ratchet teeth. By pressing the outer end of the lever 27 downwardly and then releasing said outer end, the dog 29 and the spring 31 cause the drum 17 to rotate counterclockwise, as viewed in Figure 3, through an arc corresponding to the distance between successive ratchet teeth 24. The number of ratchet teeth 24 is equal to the number of question spaces on the question sheet 20.

Secured to the right of partition 15 in the housing body, as viewed in Figure 2, is another partition 32. Projecting inwardly from the intermediate portion of the front wall of the housing is a lug 33. Journaled in lug 33 and partition 32 is a longitudinal shaft 34 and slidably keyed thereon adjacent the drum 18 is arm 34'. Rotatably and slidably secured to shaft 34 and straddling arm 34' is a yoke member 35 having a forward extension 36 which projects through a horizontal slot 37 formed in the front wall of the housing body. Drum 18 is formed with a plurality of rows of longitudinally spaced apertures 38, each row corresponding to a question space on the question sheet 20, there being the same number of rows as question spaces. The number of apertures in each row corresponds to the number of possible answers that may be given to each question. Removable pegs 39 are inserted in the apertures at locations corresponding to the correct answers, one such peg being provided for each longitudinal row of apertures. When the arm 34' is positioned so as to overlie a peg 39 protruding from the drum 18, counterclockwise rotation of the drum, as viewed in Figure 3, will cause the arm 34' to be engaged by the peg and will cause shaft 34 to be rotated

clockwise until the peg moves upwardly past the arm.

Journalled in partition 32 and the right end wall of the housing, as viewed in Figure 2, is a longitudinal shaft 40, the shaft projecting through said right end wall and having secured thereto a knob 41. Rotatably mounted on shaft 40 is a drum member 42 comprising a first drum element 43 carrying numerical indicia arranged in the same sequence around the element as the numbered question spaces on the question sheet 20 and a second drum element 44 whose periphery carries the same indicia as drum element 43 but in the form of raised reversed numerals for printing said numerals on a record sheet. At its left end, as viewed in Figure 2, drum member 42 carries a ratchet disc 45 whose teeth 46 are directed clockwise, as viewed in Figure 4. The number of teeth 46 is equal to the number of indicia on the drum elements 43 and 44 and hence to the number of questions on the question sheet 20. The periphery of ratchet disc 45 is engaged by a pawl member 47 which is pivotally secured at 48 to the end of a lever 49 carried by shaft 34. When shaft 34 is rotated clockwise in the manner above described, pawl member 47 causes ratchet disc 45 to be rotated counterclockwise through an arc corresponding to the distance between ratchet teeth 46. This rotates the drum member 42 through an arc corresponding to the distance between adjacent indicia carried thereon.

Pivotally secured to pawl member 47 at a slot 49' therein is a rod 50 extending slidably through a guide block 50' secured to the front wall of the housing and through an aperture in said front wall and carrying at its outer end a knob 51. When knob 51 is pulled outwardly, pawl member 47 is disengaged from the periphery of the ratchet wheel 45 so that the drum member 42 is freed therefrom.

At its right end, as viewed in Figure 2, drum member 42 carries a ratchet disc 52 whose teeth 53 are directed counterclockwise as viewed in Figure 4. Secured to shaft 40 adjacent drum member 42 is a drum 54. Pivotally secured to the peripheral portion of drum 54 at 55 is a dog 56 which is biased by a spring 57 secured to drum 54 and bearing on said dog into ratchet engagement with the ratchet teeth 53 of disc 52. When knob 41 and shaft 40 are turned clockwise, as viewed in Figure 4, dog 56 drives drum element 42 in the same direction. In a counterclockwise direction of rotation of said knob and shaft, dog 56 cannot transmit torque to drum member 42. It is thus impossible to rotate drum member 42 counterclockwise except by means of the pawl member 47 when actuated as above explained by the rotation of shaft 34 in a clockwise direction, as viewed in Figure 4.

The top panel of cover 12 is formed with an elongated longitudinal window 58 overlying the drum 17 and through which the question spaces of the question sheet 20 may be consecutively viewed as said drum is rotated in stepwise fashion by lever 27. At the right end portion of said top panel is a first window 59 for viewing the topmost indicia numeral on drum element 43 and a second window 60 through which a printing impression may be obtained from the topmost raised printing numeral on drum element 44.

When the last question space is reached at the conclusion of a test the dog 29 will be in engagement with the last ratchet recess 61 at the periphery of ratchet disc 23. Further downward

manipulation of lever 27 will be ineffective to rotate drum 17 because of the blank portion 25 at the disc periphery. To reset the drum 17 to the starting position it is necessary to advance the drum 17 counterclockwise, as viewed in Figure 3, with respect to dog 29 until the blank portion 25 has been moved upwardly past the dog. This is done automatically by a pawl 62 engaging the top of ratchet disc 23 and pivotally connected at 63 to the end of an arm 64 carried by a longitudinal shaft 65 journalled in an inwardly projecting lug 66 secured to the rear wall of housing 11 and in the transverse partitions 15 and 32. A spring 67 connected to the arm 64 and the housing end wall biases said arm downwardly. At the right end of shaft 65, as viewed in Figure 2, is secured an arm 68 which projects toward drum element 43. Said drum element carries an outwardly projecting pin 69 engageable with arm 68 when the drum element is reversely rotated to its reset position. Since, as above explained, this can only be done by rotating knob 41 and shaft 40 clockwise, as viewed in Figure 4, pin 69 engages arm 68 from the underside of said arm and raises said arm, rotating the shaft 65 counterclockwise until the pin 69 moves upwardly past the engaged end of arm 68. The rotation of shaft 65 rotates arm 64 and moves pawl 62 forwardly over the toothed periphery of ratchet disc 23. When the pin 69 moves past the end of arm 68, shaft 65 is released and returned by spring 67 to its normal position. In returning to its normal position the pawl 62 rotates ratchet disc 23 counterclockwise through the necessary angle required to advance the disc with respect to dog 29 over the blank portion 25, resetting said dog in the starting notch of the ratchet disc 23.

In operation, a test sheet is secured to drum 17, as above described, the drum being in its starting position so that the first question space will appear in the window 58 and the drum member 42 being likewise in starting position so that the zero indicia appear in windows 59 and 60. The front wall of housing 11 is marked adjacent slot 37 with numbers corresponding to the choice of possible answers to the questions on the test sheet. Extension 36 is accordingly positioned by the person taking the test adjacent an answer numeral at slot 37 which he believes corresponds to the correct answer to the question appearing in the window 58. He then depresses the exposed end of lever 27, causing the drum 17 to be advanced one question space on question sheet 20. If the extension 36 is correctly positioned with respect to the first question, arm 34' will be engaged by a peg 39 as the drum advances, causing shaft 34 to rotate and causing pawl member 47 to advance the drum member 42 in a corresponding manner. If the choice of the position of extension 36 was incorrect, arm 34' will not be engaged by a peg and no score will be registered at windows 59 and 60.

The above procedure is continued until all questions have been answered. The total score of correct answers will appear at window 59 and may be imprinted on a suitable score sheet by inking the raised numeral at window 60 and pressing the score sheet thereagainst. To reset the apparatus for the next person taking the test, knob 51 is pulled outwardly, disengaging pawl member 47 from ratchet disc 45 and knob 41 and shaft 40 are then turned clockwise, as viewed in Figure 4, until the pin 69 on drum element 43 has moved upwardly, past the arm 68. At this point,

question drum 17 is in its starting position, as above explained, and drum member 42 is likewise in starting position. Knob 51 is then moved inwardly to engage pawl member 47 with ratchet disc 45 and the test may be repeated.

Where the test questions are changed, the pegs 39 may be removed and replaced in other openings 38 corresponding to the correct answers to the new questions.

While a specific embodiment of a testing apparatus has been disclosed in the foregoing description, it will be understood that various modifications within the spirit of the invention may occur to those skilled in the art. Therefore, it is intended that no limitations be placed on the invention other than as defined by the scope of the appended claims.

What is claimed is:

1. A quiz apparatus comprising a housing, first support means in said housing, a drum journaled in said first support means, means for securing a test sheet to said drum, a plurality of pegs adjustably secured to the drum and projecting radially therefrom, means for rotating the drum step-by-step through successive position to a final position, corresponding to the successive and final questions on the test sheet, a member pivotally secured to the housing adjacent the drum for rotation around an axis parallel to the drum axis, means for longitudinally adjusting said member so as to be aligned with and engageable by a peg responsive to the step-by-step rotation of the drum, second support means in said housing, a rotary element carrying consecutively arranged numerical indicia at its periphery, means for rotating said rotary element through an angle corresponding to the space between adjacent indicia responsive to the engagement of said

member by a peg, manual means for reversing the rotary member to reset it to a starting position, and means for automatically resetting said drum from its final position to its starting position responsive to the reverse movement of the rotary member to its starting position, the movement of the drum from its final position to its starting position being in the same direction as its successive step-by-step movement.

2. A multi-question quiz apparatus, comprising a support, a pair of parallel shafts journaled in said support, a drum fixed to one of said shafts, a counter operatively connected to the other shaft, said drum being formed with a circumferential series of longitudinally extending rows of longitudinally spaced sockets, each row corresponding to a question, a correct answer designating peg insertable in an appropriate socket of each row, a combined answer selector and counter actuator rotatably slidable on said second-mentioned shaft for movement therealong to a selected answer designating position for each question, means for rotating said drum one step for each question, and a peg being engageable with said counter actuator to actuate said counter one step whenever said answer selector is positioned to indicate a correct answer.

OSWIN E. ZUERCHER.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,670,480	Pressey	May 22, 1928
1,929,872	Lavery et al.	Oct. 10, 1933