

March 1, 1960

W. V. STONE

2,926,487

TOOTHBRUSH HOLDER AND ANIMATED BRUSHING TIMER

Filed Sept. 12, 1957

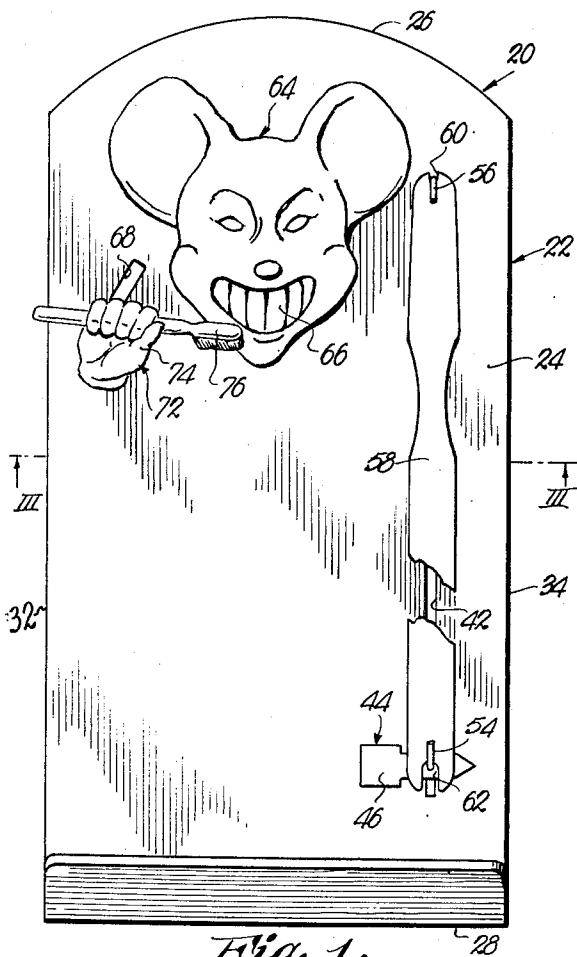


Fig. 1.

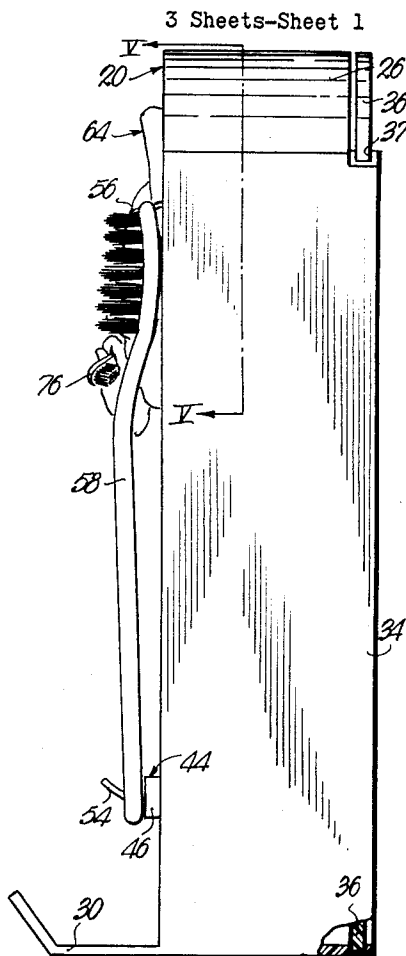


Fig. 2.

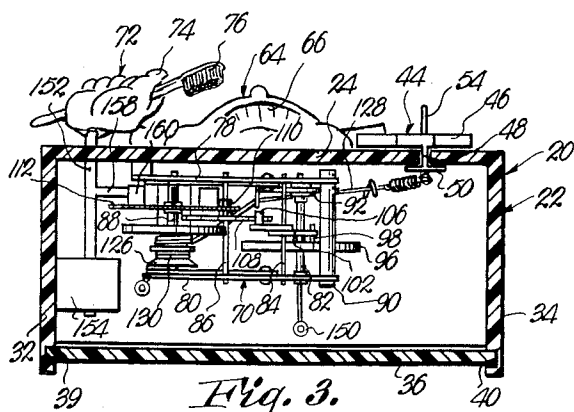


Fig. 3.

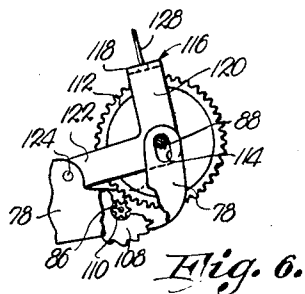


Fig. 6.

INVENTOR.
Walter V. Stone
BY *[Signature]*
ATTORNEY.

March 1, 1960

W. V. STONE

2,926,487

TOOTHBRUSH HOLDER AND ANIMATED BRUSHING TIMER

Filed Sept. 12, 1957

3 Sheets-Sheet 2

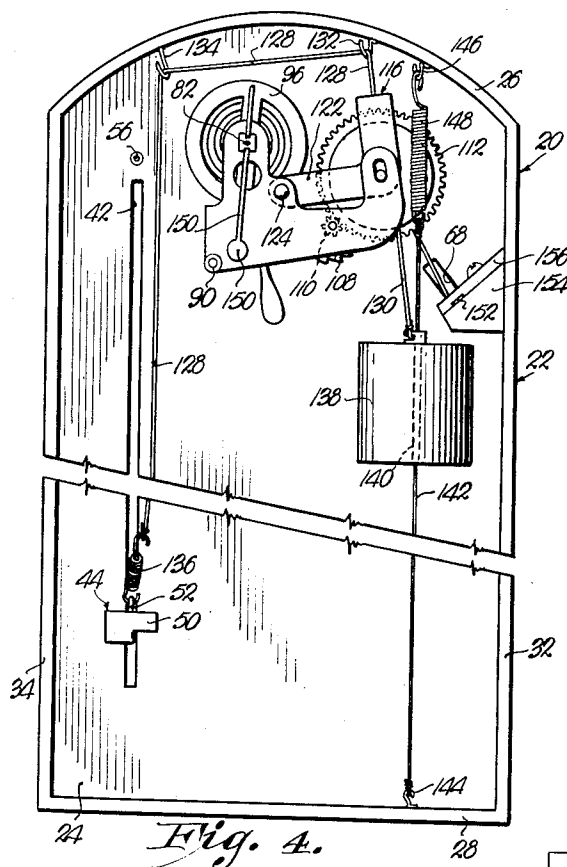


Fig. 4.

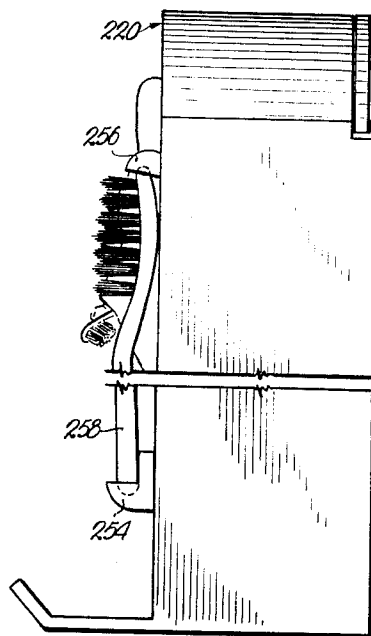


Fig. 7.

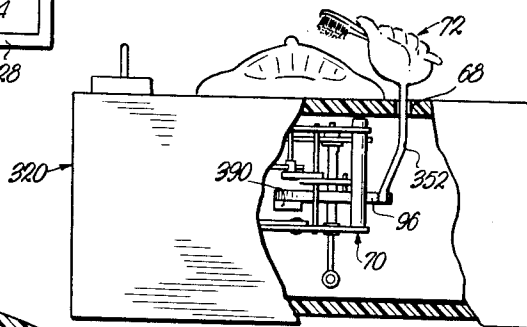


Fig. 8.

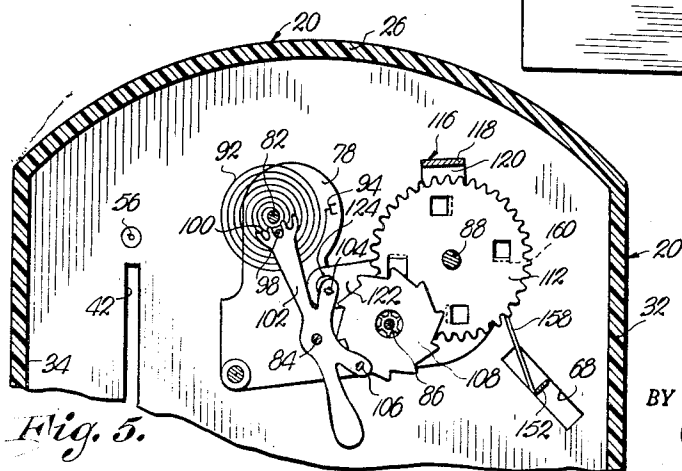


Fig. 5.

INVENTOR.
Walter V. Stone
BY *W. V. Stone*
ATTORNEY

March 1, 1960

W. V. STONE

2,926,487

TOOTHBRUSH HOLDER AND ANIMATED BRUSHING TIMER

Filed Sept. 12, 1957

3 Sheets-Sheet 3

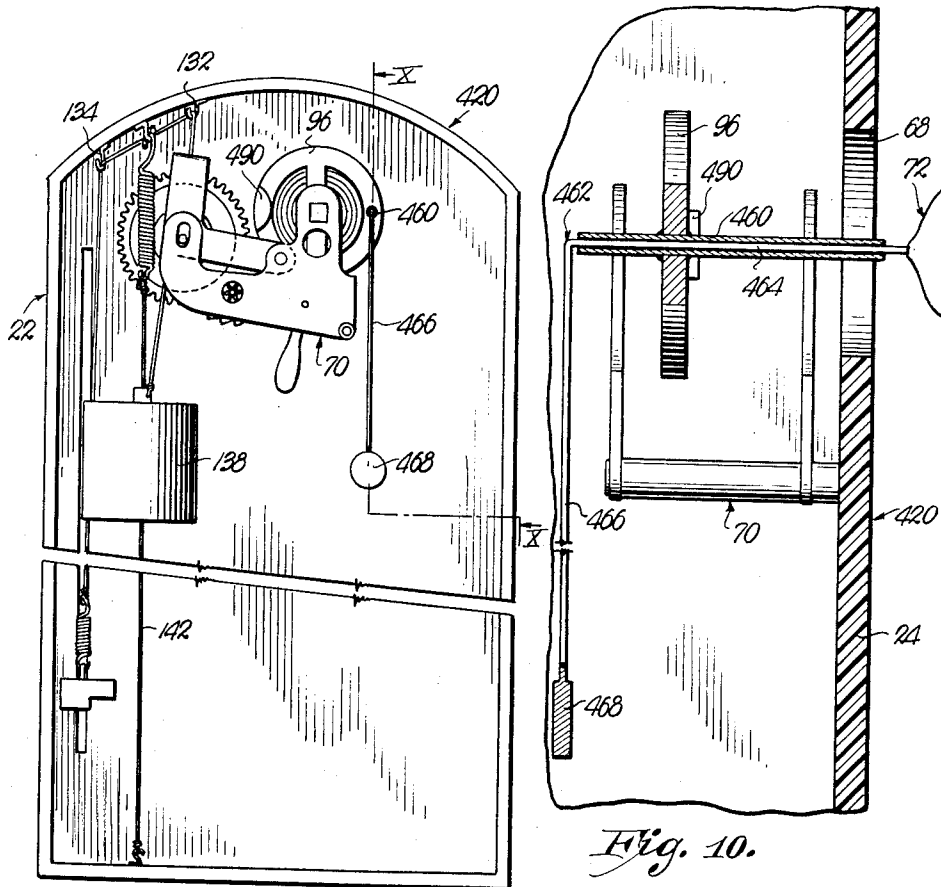


Fig. 9.

Fig. 10.

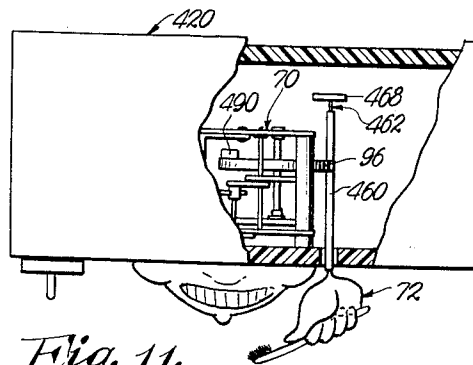


Fig. 11.

INVENTOR.
Walter V. Stone
BY *[Signature]*
ATTORNEY.

1

2,926,487

TOOTHBRUSH HOLDER AND ANIMATED BRUSHING TIMER

Walter V. Stone, Topeka, Kans.

Application September 12, 1957, Serial No. 683,622

12 Claims. (Cl. 58—152)

This invention relates to devices in the nature of a utilitarian toy adapted to hold a toothbrush between intervals of use thereof, to measure and indicate the elapsing of some predetermined period of time after and responsive to removal of the toothbrush for use thereof, and to present an animated display during such interval calculated to encourage children to brush their teeth during such interval.

Another object of the invention is to provide such a device in which the animated display includes the representation of a caricatured figure engaged in the act of brushing its teeth by means of a movable hand and simulated toothbrush held therein.

Another object of the invention is to provide such a device wherein the movable parts thereof may be actuated by simple, reliable and inexpensive mechanism comparable in complexity and cost to that of a low cost clock.

Another object of the invention is to provide such a device wherein the action of restoring a toothbrush to the position in which it is held by the device during periods of non-use serves to ready the working parts of the device for the next cycle of operation thereof.

Still other important objects of the invention, including significant details of construction by which it is rendered reliable even when constructed in relatively inexpensive fashion, will become clear or be made apparent as the following description of the invention progresses.

In the accompanying drawings:

Figure 1 is a front elevational view of one embodiment of device contemplated by the invention;

Fig. 2 is a side elevational view of such embodiment;

Fig. 3 is a cross-sectional view taken on line III—III of Fig. 1;

Fig. 4 is a rear elevational view of such embodiment with the rear cover thereof removed to expose the internal working parts;

Fig. 5 is an enlarged, fragmentary, cross-sectional view of such embodiment taken on line V—V of Fig. 2;

Fig. 6 is an enlarged, fragmentary, elevational view, with parts broken away for clarity of illustration, showing the cogwheel and closely associated parts of the working mechanism;

Fig. 7 is a side elevational view of a modified embodiment of device;

Fig. 8 is a rear plan view, with parts broken away and shown in cross-section, of a further modified embodiment of a device contemplated by the invention;

Fig. 9 is a rear elevational view of a still further modified embodiment of a device as contemplated by the invention, with the rear cover thereof removed to expose the internal, working parts;

Fig. 10 is an enlarged, fragmentary, cross-sectional view taken on line X—X of Fig. 9; and

Fig. 11 is a bottom plan view, with parts broken away and shown in section, of the embodiment of Figs. 9 and 10, further illustrating the working parts thereof.

Referring now to the drawings, and particularly Figs.

2

1-6 inclusive, which illustrate a first embodiment of the invention, the numeral 20 generally designates such first form of device. Device 20 is provided with a housing 22, which may be formed of plastic, metal or other material, having a front panel 24, an arched top 26, a bottom 28 provided with a forwardly extending stabilizing portion 30, a pair of sides 32 and 34 and a rear cover plate 36 which may, if desired, be removably received through a slot 37 in top 26 with its lower extremity received within a groove 38 in bottom 28 and grooves 39 and 40 in side walls 32 and 34 respectively. The exact form in which the housing 22 is constructed is not deemed to be particularly material, and may be varied to suit commercial requirements.

The front panel 24 is provided with an elongated, upright slot 42 in which is reciprocally received an assembly generally designated 44 which includes an arrow or other indicating element 46 having parts 48 extending through the slot 42 and connected to a rear follower 50 provided with an eye 52 thereon, the assembly 44 further including on the front side thereof a forwardly, preferably upwardly bent pin 54. The assembly 44 carrying pin 54 and indicating element 46 on the front side of panel 24 and parts 50 and eye 52 on the rear side of panel 24 is adapted to reciprocate vertically along the slot 42 in panel 24 under conditions hereinafter to be more fully explained.

Just above the upper extremity of slot 42 a forwardly extending and preferably downwardly bent pin 56 is attached to the panel 24 in any suitable manner. The spacing between the pins 56 and 54, and accordingly the length of slot 42, is such that, when the assembly 44 is adjacent the lower extremity of the slot 42, a toothbrush 58 may be inserted therebetween. With this embodiment of the invention, the toothbrush is preferably provided with notches 60 and 62 respectively in its upper and lowermost ends which are adapted to receive the pins 56 and 54 respectively therewithin. It will thus be apparent that, when an upwardly biasing force is applied to the assembly 44 and pin 54, as hereinafter explained, the device 20 is adapted for holding and storing the toothbrush 58 during periods of non-use thereof between the movable lower pin 54 and the stationary upper pin 56.

A caricatured representation generally designated 64 of the face of an animal or other figure calculated to catch the fancy of children is provided in any suitable manner on the front of panel 24 and includes a representation of the teeth 66 of such animal or figure. A relatively short and slightly arcuate slot 68 is provided in the panel 24 to clear the working connections hereinafter referred to between the driving mechanism generally designated 70 within the housing 22 and a member generally designated 72 shiftably mounted on such working connections immediately in front of the panel 24 and preferably including the representation 74 of a hand, paw or the like holding a simulated toothbrush 76 adjacent the teeth 66 of the figure 64.

With reference now particularly to Figs. 3, 4, 5 and 6, the mechanism 70 within the housing 22 will be understood as analogous in a number of respects to the mechanism conventionally provided in ordinary clocks, with which those skilled in the art will be familiar, so that the description of the mechanism 70 may be directed mainly to the manner in which it differs from such clock mechanisms. Mechanism 70 broadly includes a frame provided by spaced, opposed side plates 78 and 80 in which are rotatably journaled a flywheel shaft 82, an escapement arm shaft 84, an escapement wheel shaft 86 and a cogwheel shaft 88. Side plates 78 and 80 may be suitably interconnected in any fashion as by cross pins 90. Flywheel shaft 82 carries a spiral clock spring 92 having its outer end connected to the frame plate 78 as

at 94 and its inner end connected to the shaft 82. Shaft 82 also carries a flywheel 96 having a laterally extending pin 98 thereon adapted to mesh with one of the notches 100 in one end of an escapement arm 102 mounted on the shaft 84. Escapement burrs 104 and 106 cooperate in the usual fashion with the teeth of an escapement wheel 108 mounted on the shaft 86. Also mounted on the shaft 86 is a pinion wheel 110 adapted to mesh with a cogwheel 112 on the shaft 88.

Although the shaft 88 may, if desired, be mounted in arcuate slots 114 in the frame members 78 and 80, it is preferably mounted in shiftable fashion relative to the frame plates 78 and 80 in the manner best illustrated in Figs. 4 and 6, wherein it will be seen that there is provided a sub-frame assembly 116 having a top piece 118, and a pair of L-shaped side members 120 extending downwardly therefrom. The shaft 88 is rotatably received adjacent the vertex of each of the L-shaped members 120, and the leg 122 of each member 120 remote from the top 118 of assembly 116 is pivotally mounted as at 124 on the corresponding frame plate 78 or 80. By virtue of the slots 114 in the frame plates 78 and 80, the extent of swinging movement of the assembly 116, and therefore the shaft 88, is so limited that at the lower extremity thereof the teeth of the cogwheel 112 will be engaged with the pinion gear 110, while same will be disengaged from each other when the assembly 116 is at the upper limit of its swinging movement.

As shown in Fig. 3 the shaft 88 also carries a windlass drum 126 to which a pair of flexible cords 128 and 130 are attached and adapted to be oppositely wound as the shaft 88 is rotated. The top 118 of sub-frame assembly 116 is provided with an opening to clear the cord 128, which extends above the assembly 116 to a low friction, slidable hook or other holder 132, across a portion of the top of the housing to another such hook or holder 134, thence downwardly to a point of connection with the eye 52 of assembly 44, which connection is preferably accomplished through a small coil spring 136 adjacent and coupled with the eye 52 of assembly 44. The cord 130 is connected to a vertically shiftable weight 138 which is preferably provided with a vertical bore 140 through which passes a vertical guide cord or member 142 secured to the bottom 28 of housing 22 as by a hook 144 and to the top 26 of housing 22 as by a hook 146, a coil spring 148 preferably being interposed between the top of guide cord 142 and hook 146 where the cord or member 142 is flexible in character. The guide cord 142 serves to limit the weight 138 to a vertical path of travel.

It will now be clear that as the assembly 44 is reciprocated from an upper portion of the slot 42 toward the lower end thereof, the force and movement of the cord 128 relative to the drum 126 will tend to lift the sub-frame assembly 116 to the upper limit of its path of travel, thereby disengaging the cogwheel 112 from the pinion gear 110 and permitting the cord 128 to unwind from the windlass drum 126. At the same time, as the shaft 88 and windlass drum 126 are rotating responsive to the pulling force upon cord 128, the cord 130 will be wound upon another portion of the windlass drum 126, thereby lifting the weight 138 to a higher position on the guide cord 142. The weight 138, of course, represents potential energy which may be applied to the shaft 88 through the windlass drum 126 as soon as the holding force on assembly 44 is released. When such holding force on assembly 44 is released, the sub-frame assembly 116 returns under the pull of the cord 130 to its lower position meshing the cogwheel 112 with the pinion gear 110, whereupon the kinetic energy of the raised weight 138 being applied to shaft 88 through cord 130 and windlass drum 126 will tend to rotate the shaft 88 in a direction to drive the shaft 86 and escapement wheel 108 while the cord 130 is paying out to lower the weight 138 and the

cord 128 is being wound upon the windlass drum 126 to raise the assembly 44 and its indicating elements 46.

A pendulum 150 is mounted on the end of shaft 82 and serves to control the action of the escapement arm 102 in such manner as to regulate the rate of rotation of the escapement wheel 108, and thereby the shaft 86, the pinion gear 110, the cogwheel 112, the shaft 88 and the windlass drum 126, such timing action being accomplished in the obvious manner, as will be clear to those skilled in the clockwork art. In order to fully avail the user of the device 20 of the timing function of the mechanism 70, time calibrations (not shown) may be printed or otherwise indicated upon the front panel 24 of the housing 22 in proximity to the path of travel of the indicating element 46. Since a period of three minutes is normally considered proper by dentists for the brushing of children's teeth, the pendulum 150 is preferably so chosen that the windlass drum 126 will wind sufficiently to raise the indicating element 46 from its lowermost position to its uppermost position during such period.

In order to provide for animated movement of the member 72 and its hand and brush parts 74 and 76 relative to the teeth 66 of the figure 64, the member 72 may be mounted upon an elongated leaf spring 152 having one extremity thereof rigidly secured to the housing 22 by a block 154 and cooperating clamp plate 156 and thence extending through the slot 68 to a point of interconnection with the member 72. The leaf spring 152 further includes a lateral extension 158 extending into proximity to one side of the cogwheel 112. It may now be noted that the cogwheel 112 is constructed with a number of tabs 160 cut and bent to extend laterally therefrom at spaced intervals thereabout, the lateral extension 158 of leaf spring 152 being so disposed as to be periodically tripped by the tabs 166 on the cogwheel 112 as the latter rotates. As the extension 158 is so tripped, the leaf spring 152 is bent from its normal position and then released to vibrate within the limits defined by the length of the slot 68. Such vibration of the leaf spring 152 obviously causes the member 72 and its hand and brush parts 74 and 76 to also vibrate or oscillate upwardly and downwardly in manner simulating the action that might occur if the figure 64 were brushing its teeth. Such animated action has been found to capture and retain the fancy of children and to be of great assistance to parents in creating a desire in the children to brush their teeth in order to witness the animated action described. Obviously, such actions as well as the cycle of timing for the preferred period of brushing by the child both commence upon his removal of the toothbrush 58 from between the pin 54 of assembly 44 and the stationary pin 56. Likewise, it will be apparent that, after the brushing of the child's teeth is completed, the assembly 44 will be pulled down so that the brush 58 may again be emplaced between the pins 54 and 56, such action in thus returning the assembly 44 to a position adjacent the lower extremity of the slot 42 serving to raise the weight 138 and ready the device 20 for the next cycle of operation.

In Fig. 7 is illustrated a modified form of device generally designated by the numeral 220, which may be in all respects similar to the embodiment of the invention shown in Figs. 1-6 inclusive and previously described or the embodiments hereinafter to be described in connection with Fig. 8 or Figs. 9-11 inclusive, except that the pins 54 and 56 have been replaced by opposed cups 254 and 256 adapted to receive and hold the opposite ends of a toothbrush 258 not provided with notches such as 60 and 62.

In Fig. 8 is illustrated another embodiment of device generally designated 320, which again may be similar in other respects to the embodiment of Figs. 1-6 inclusive or the modification of Fig. 7, except that the animated member 72 is not mounted on a leaf spring such as 152, but rather is rigidly secured by an arm 352 directly to

5

the margin of the flywheel 96 and the weight 138 after its guide cord 142 and other associated parts have been moved from the side of housing 22 in which same are disposed in the embodiment of Figs. 1-6 inclusive to the opposite side. It may be noted that there is preferably also provided a counterweight 390 on the flywheel 96, which is disposed oppositely to the connection of arm 352 with the flywheel 96, in order to balance the weight of the arm 352 and the member 72, which is mounted directly upon the flywheel 96 in this embodiment of the invention. The manner in which such shifting of the location of the weight 138 and its associated parts to the opposite side of the housing 22 is accomplished will be made clear by the illustration and explanation of the embodiment of Figs. 9-11 inclusive. In connection with Fig. 8, however, it may be noted that the arm 352 may be either rigid or slightly flexible, such as being constructed of leaf spring material, and that such embodiment of Fig. 8 tends to produce an animated movement of the member 72 which is more arcuate in character than that achieved with the construction of Figs. 1-6 inclusive, the slot 68 accordingly being somewhat more curved in the embodiment of Fig. 8.

Attention may finally be directed to Figs. 9-11 of the drawings wherein is illustrated a further and currently preferred, modified form of the invention. The device illustrated by Figs. 9-11 inclusive is generally designated by the numeral 420 and will immediately be perceived to be generally similar to those above described. However, it will be noted that the weight 138 and guide cord 142 are shifted to the side of the housing 22 opposite to the location of the flywheel 96 of the mechanism 70 (which, as illustrated, may be oriented in fashion opposite to that shown in Fig. 4). In effectuating such relocation of the weight 138 and its associated parts, essentially all that is required is an appropriate relocation of the hooks 132 and 134, as in the manner illustrated.

Of greater significance in connection with the embodiment of Figs. 9-11 inclusive, however, is the manner in which the animated member 72 is mounted. In this embodiment the flywheel 96 has attached thereto and extending in opposite directions therefrom an elongated tube 460 whose longitudinal axis is parallel to the axis of rotation of the flywheel 96. An L-shaped member generally designated 462 has a horizontal arm 464 rotatably received within and extending through the tube 460 and a vertical leg 466 carrying at its lower extremity a weight 468 to constitute the arm 466 and weight 468 a pendulum. The front end of the leg 466 extends through the arcuate slot 68 and is rigidly connected to the animation member 72. A suitable counterweight 490 is provided on the flywheel 96 oppositely to the tube 460 to balance the weight of the tube 460, the member 462 and the member 72.

It will be noted that the animated action of the member 72 in this embodiment of the invention is thus made dependent not only upon the oscillating rotation of the flywheel 96 but also upon the pendulum induced rotation of the leg 466 of the member 462 relative to the tube 460 and the pendulum 96. This combined action tends to produce a somewhat random appearing motion on the part of the animation member 72 which even more closely resembles the action that actually occurs during the brushing of teeth than the animated actions provided by the previously described embodiments of the invention. The length of the pendulum leg 466 may be so chosen as to vary the nature of that component of the combined motion of the member 72.

It will now be apparent that the structure disclosed is ideally adapted for attaining all of the above mentioned objects of the invention. It will also be perceived, however, that certain minor modifications, changes and variations of arrangement can be utilized without departing from the true spirit and intention of the invention.

Accordingly, it is to be understood that the invention

6

shall be deemed limited only by the scope of the claims that follow.

Having thus described the invention what is claimed as new and desired to be secured by Letters Patent is:

1. In a utilitarian toy, a housing; relatively shiftable display means external to the housing, including a shiftable member separate from the housing and stationary means presenting a visually observable representation on the housing, said shiftable member and said stationary means respectively constituting different portions of an animated display; power mechanism within the housing; structure operably coupling the mechanism with the member for shifting the member when the mechanism is operated; a stationary element on the housing adapted to engage one extremity of a removable article; an at least partially exposed assembly shiftable mounted on the housing for movement toward and away from the element within a limited path of travel and adapted for engaging the opposite extremity of said article when adjacent that end of said path of travel remote from said element; means yieldably urging the assembly toward the element adapting the assembly and the element for releasably holding said article; and control means operably coupling the assembly with the mechanism and arranged to prevent operation of the mechanism except when the assembly is freed for movement toward the element under the influence of said urging means by removal of said article from opposite engagement with the assembly and the element, the position of said assembly relative to said element providing an indication of the time elapsed subsequent to removal of said article.

2. A toy as set forth in claim 1, wherein said mechanism includes a shiftable device for storing potential energy as it is shifted away from a normal disposition thereof and for releasing said energy to operate the mechanism as the device shifts back toward said normal disposition thereof under the influence of said energy, and said control and urging means include apparatus operably coupling the assembly with the device for shifting the device away from its said normal disposition when the assembly is shifted away from the element by application of external force to the assembly and for shifting the assembly toward the element as the device shifts toward its said normal disposition under the influence of said energy.

3. A toy as set forth in claim 2, wherein said mechanism includes escapement means for controlling the rate of shifting of the device toward its said normal disposition, whereby the mechanism is adapted to act as a timer and the assembly is adapted to act as an indicator of elapsed time of such shifting of the device.

4. A toy as set forth in claim 3, wherein said device comprises a weight, and said mechanism includes a rotatable shaft, first flexible means coupling the weight with the shaft for rotation of the latter in one direction when the weight is shifted toward said normal disposition thereof by the action of gravity, and second flexible means coupling the assembly with the shaft for rotation of the latter in an opposite direction when the assembly is shifted away from the element by the application of external force.

5. A toy as set forth in claim 4, wherein said mechanism includes a rotatable part which is oscillated during operation of the mechanism, and a pendulum operably coupled with the part.

6. A toy as set forth in claim 4, wherein said structure includes resilient means interconnecting the member and the housing, and said mechanism includes a rotatable part having a protuberance thereon disposed for alternate displacing engagement and disengagement with the resilient means as the part is rotated, said part being oscillated during operation of the mechanism.

7. A toy as set forth in claim 4, wherein said mechanism includes a rotatable part which is oscillated during operation of the mechanism, and said structure in-

7

cludes an arm mounting the member on the part for movement therewith.

8. A toy as set forth in claim 4, wherein said mechanism includes a rotatable part which is oscillated during operation of the mechanism, and said structure includes a generally L-shaped piece having a horizontal leg pivotally mounted on said part eccentrically of the latter and a depending pendulum leg, said member being secured to said horizontal leg.

9. A toy as set forth in claim 1, wherein said mechanism includes a rotatable part which is oscillated during operation of the mechanism, and a pendulum operably coupled with the part.

10. A toy as set forth in claim 1, wherein said structure includes resilient means interconnecting the member and the housing, and said mechanism includes a rotatable part having a protuberance thereon disposed for alternate displacing engagement and disengagement with the resilient means as the part is rotated, said part being oscillated during operation of the mechanism.

11. A toy as set forth in claim 1, wherein said mecha-

8

nism includes a rotatable part which is oscillated during operation of the mechanism, and said structure includes an arm mounting the member on the part for movement therewith.

12. A toy as set forth in claim 1, wherein said mechanism includes a rotatable part which is oscillated during operation of the mechanism, and said structure includes a generally L-shaped piece having a horizontal leg pivotally mounted on said part eccentrically of the latter and a depending pendulum leg, said member being secured to said horizontal leg.

References Cited in the file of this patent

UNITED STATES PATENTS

465,441	Weisser	Dec. 15, 1891
868,872	Knight	Oct. 22, 1907
1,767,183	Lux	June 24, 1930
1,973,390	Plants	Sept. 11, 1934
2,641,866	Schiller	June 16, 1953
2,824,418	Hilbert	Feb. 25, 1958