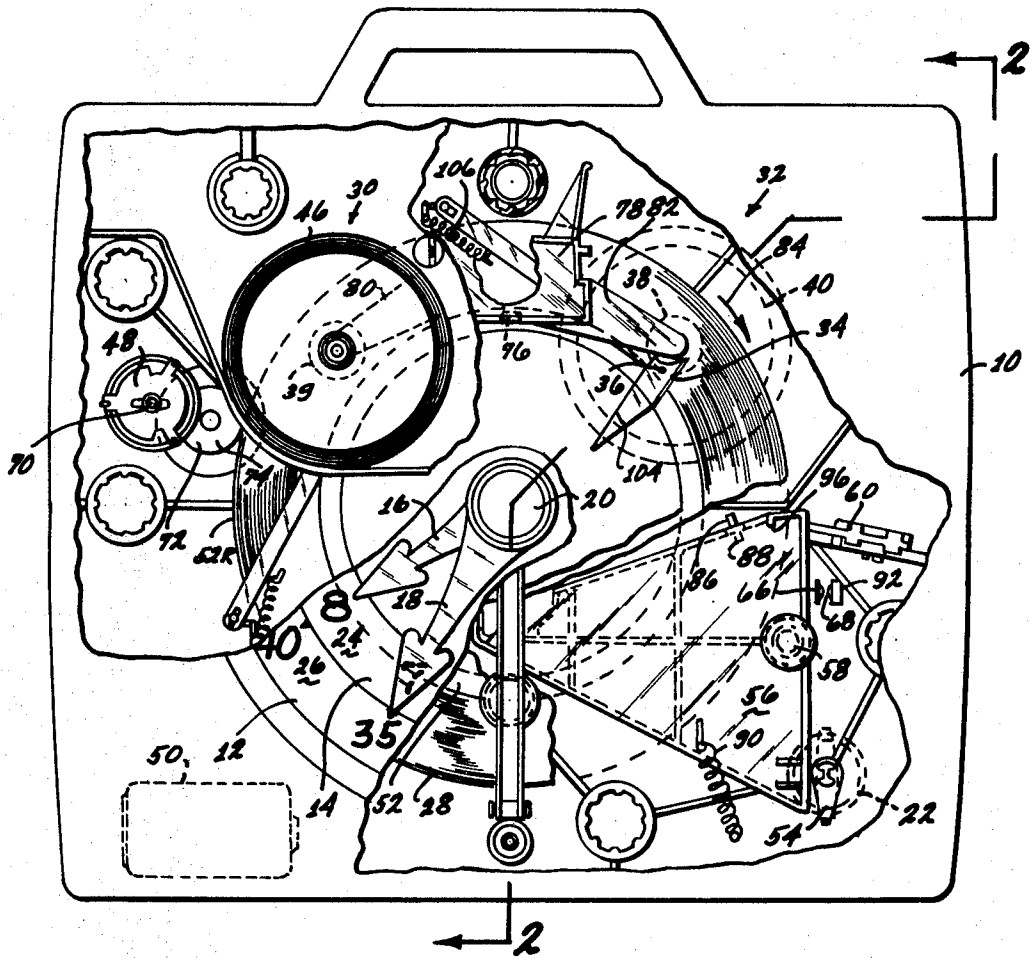
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TALKING CLOCK

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Fig. 1



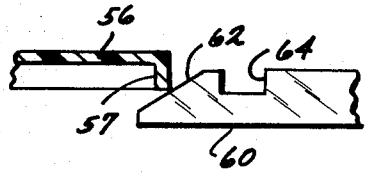


Fig 1A

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TALKING CLOCK

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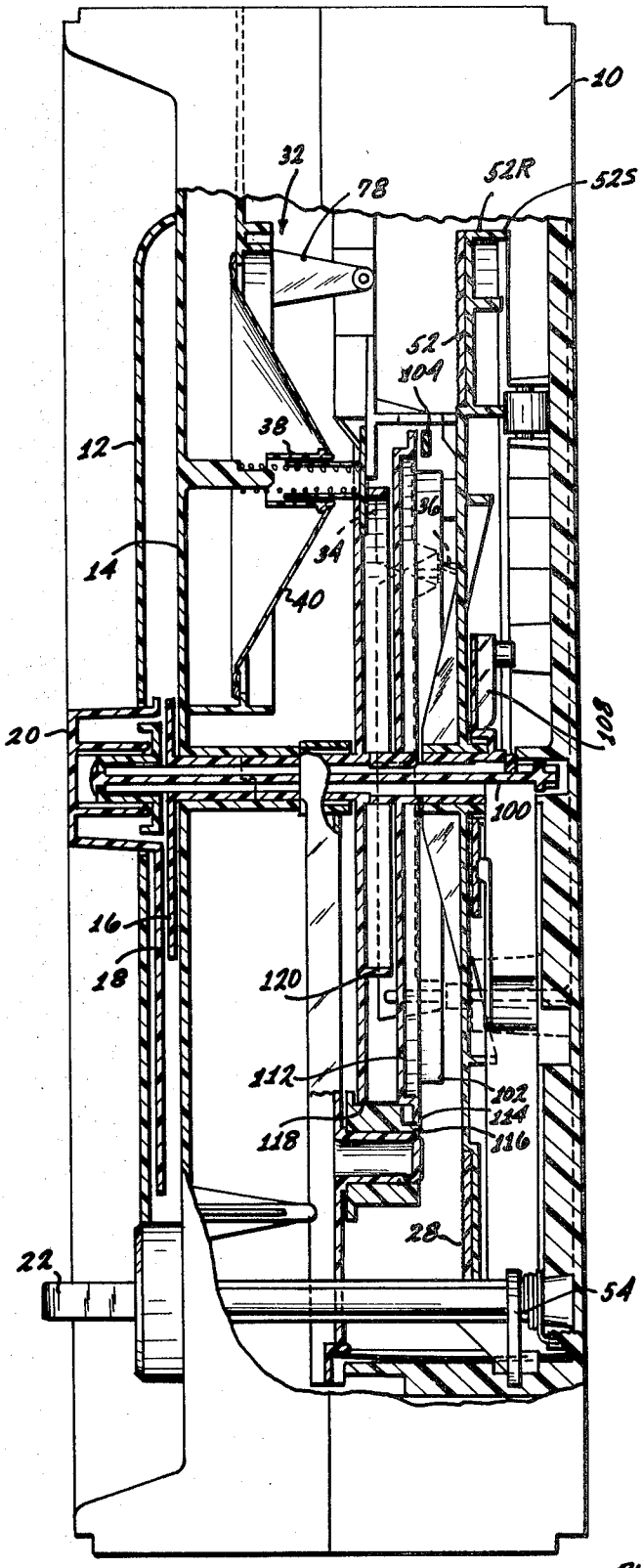


FIG. 2

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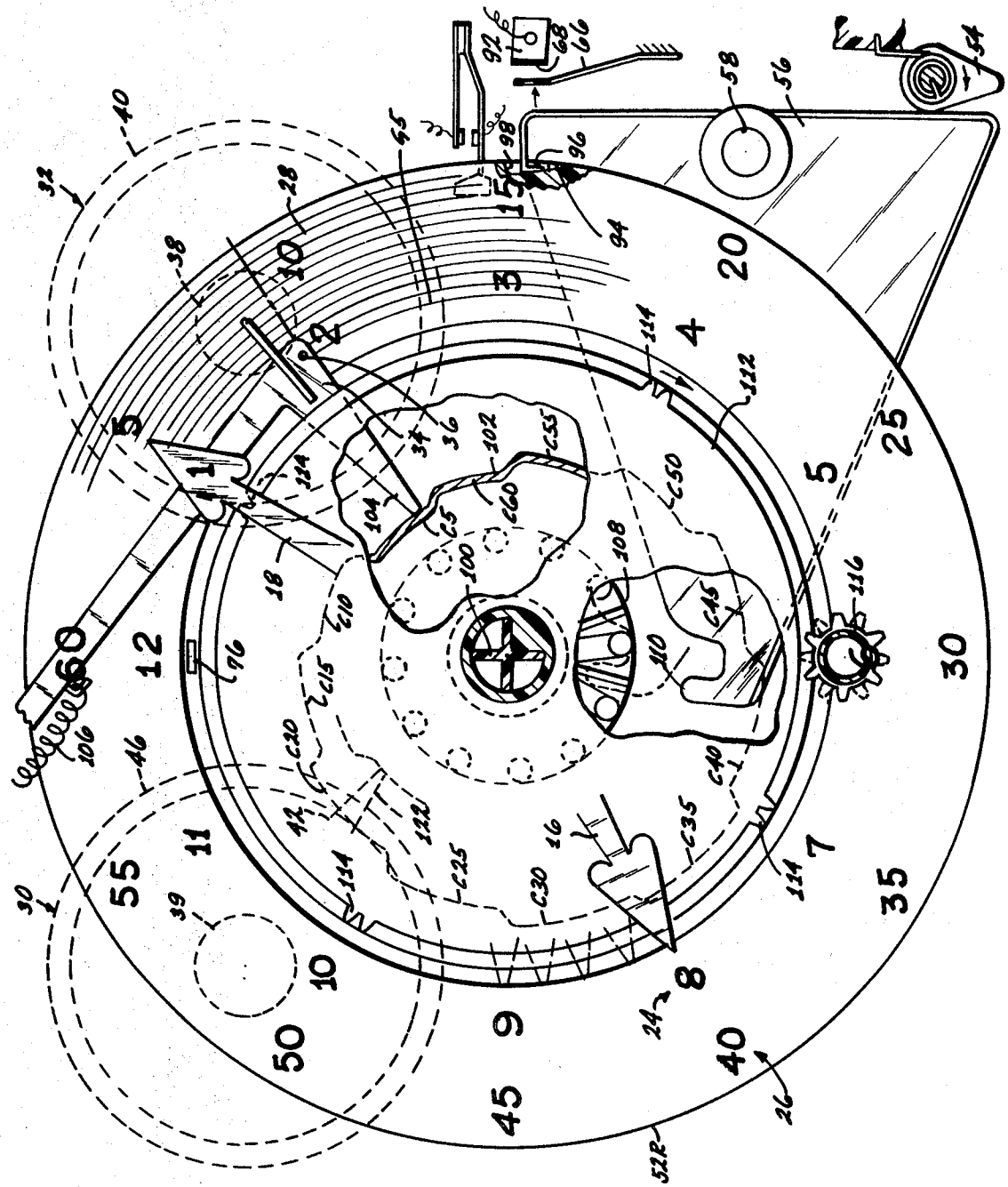


FIG. 3

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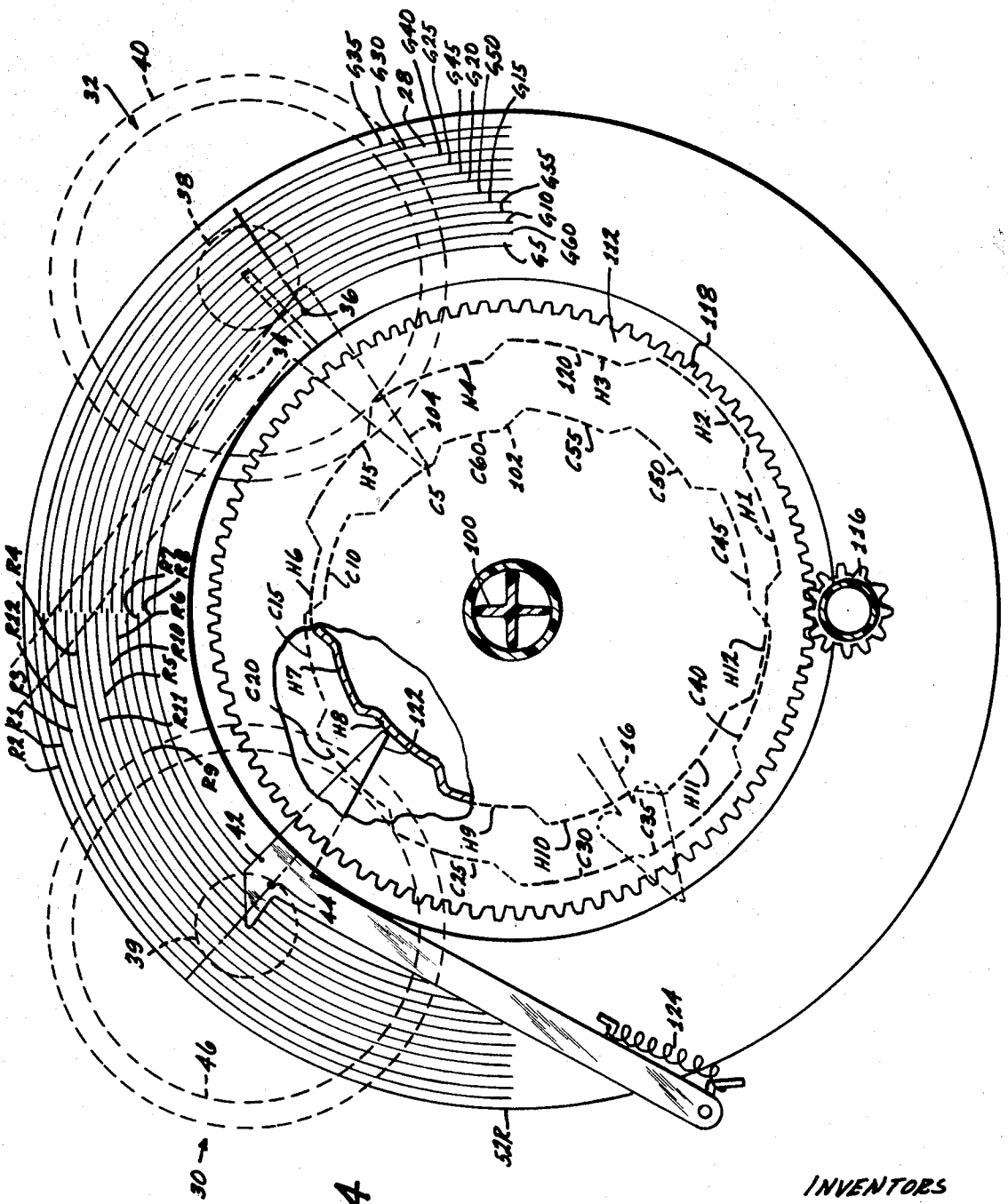


Fig. 4

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3,581,410

TALKING CLOCK

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Int. Cl. G09b 19/12
U.S. Cl. 35—39 4 Claims

ABSTRACT OF THE DISCLOSURE

A toy clock with a phonograph which states the time at which the hands are set. The clock includes a record with twenty-four nearly concentric grooves, twelve of them defining the hour and twelve defining the closest five minute interval after the hour. Two tone arms are provided, one engaging an hour groove and the other a minute groove, and the hour and minute sayings are played in succession.

BACKGROUND OF THE INVENTION

Field of the invention

This invention relates to toys, and more particularly to a toy clock which states the time.

Description of the prior art

Toy clocks with hands that can be easily reset are commonly used as playthings and as devices to teach children how to "tell time." However, such clocks are generally of little instructional value unless an adult is constantly available to tell the child the time indicated by the clock hands at each new setting. The entertainment value also generally suffers in the same way, where a child wishes to test and improve himself without having to constantly ask for adult help.

OBJECTS AND SUMMARY OF THE INVENTION

An object of the present invention is to provide a simple clock which plays a recording stating the time at which its hands are set.

Another object is to provide a device for instructing children to tell time.

Still another object is to provide a toy clock which is of maximum entertainment and educational value.

In accordance with the present invention, a toy clock is provided with a phonograph device that plays a saying, or voice recording, indicating the time at which the hands are set. The phonograph device includes many record tracks, some defining the hour and the others defining the minutes after the hour. Two tone arms are provided for engaging the record tracks, one engaging an hour-indicating track and the other engaging a minute-indicating track. The modulated or sound-producing portions of the tracks are arranged so that the hour indication sounds first, and the minute indication plays immediately thereafter to provide a complete voiced time indication.

The novel features of the invention are set forth with particularity in the appended claims. The invention will be best understood from the following description when read in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a front elevation view with parts broken away, of a talking clock constructed in accordance with the invention;

FIG. 1A is a plan view of a portion of the clock of FIG. 1;

FIG. 2 is a sectional view taken on the line 2—2 of FIG. 1;

FIG. 3 is a partial front elevation view with parts broken away, of the talking clock of FIG. 1; and

FIG. 4 is a partial front elevation view with parts broken away, of the talking clock of FIG. 1.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

FIG. 1 illustrates a talking clock comprising a case **10** with a transparent circular front cover portion **12**, a clock face **14** displayed behind the transparent cover portion, and a pair of clock hands **16** and **18** over the face that indicates the time. A knob **20** which protrudes from the center of the clock face can be turned by a child to move the clock hands **16**, **18** so that any time setting can be displayed. A child can rotate a start knob **22** to cause the talking clock to play voice recordings that state the time. For example, the clock may state "My hands read 8:35."

While an ordinary clock generally has a face which indicates only twelve hour markings, the illustrated talking clock includes an inner ring portion **24** with twelve hour markings and also an outer ring portion **26** with twelve numbered minute markings. The numbered minute markings are provided to aid in teaching the child that the hour is broken up into sixty minutes. In order to reduce complexity, the illustrated talking clock has provisions for indicating time intervals spaced by five minutes. Cam apparatus is provided to urge the minute hand toward the closest five-minute indication if the minute hand is set between the five minute intervals.

The clock comprises phonograph apparatus including a record **28** with twenty-four grooves. Twelve of the grooves define hour sayings with an introduction, such as "My hands read eight." The other twelve grooves define minute sayings such as "Thirty-five." The grooves have only a very slight spiral, so they are nearly circular and nearly concentric, and are substantially radially spaced from each other. Except for a short lead-in section at the beginning of each groove, the grooves extend almost 360° around the record. Separate playback mechanisms **30** and **32** are provided for playing the hour and minute sayings, respectively. The minute playback mechanism **32** comprises a tone arm **34** with a needle **36** which can engage any one of the twelve minute-indicating grooves. The record grooves are modulated in depth, and the needle modulations are transmitted through a speaker piston **38** to a speaker cone **40** for acoustical amplification. In a similar manner, the hour playback mechanism **30** has a tone arm **42** with a needle **44** that engages an hour groove, the needle oscillations being transmitted by a speaker piston **39** and amplified by another speaker cone **46**.

For a particular setting of the clock hands, the minute and hour needles engage particular record grooves, and the record **28** makes one revolution. During the first two-thirds of the record revolution, the hour needle **44** is engaged with a modulated hour groove portion to reproduce the hour saying. During this period, the minute tone arm is engaged with an unmodulated portion of the minute groove and it produces substantially no sound (actually only a low level of noise). During the last third of the record revolution, the minute tone arm is engaged with a modulated portion of the minute groove which reproduces the minute saying while the hour groove is unmodulated and therefore nominally silent. The mechanism is driven by a motor **48** which is energized by an ordinary dry cell **50**. It is constructed so that after the start knob **22** is rotated to start the mechanism, a turntable **52** on which the record and other mechanisms are mounted makes one complete revolution and then stops.

A better understanding of the details of the mechanism can be had by considering the chain of events occurring in the operation of the device for a given setting. When

the start knob **22** is rotated clockwise by approximately a quarter-turn, a cam **54** fixed to the knob presses against a start/stop lever **56**. The lever **56** is mounted at a bearing area **58** in a manner which allows pivoting and slight rocking about the pivot point. The force of cam **54** on lever **56** causes the lever to pivot clockwise. A contact block **60**, also shown in FIG. 1A, has a ramp **62** which forces the lever **56** to tilt until it is behind the block, as the lever pivots clockwise. When the lever **56** reaches the end of the contact block ramp **62**, a lip portion **57** thereof falls into a notch **64**, so it cannot pivot back under the urging of a return spring **90**. The lip portion also presses an electrical contact **66** of a switch **92** against a second contact **68** thereof. These contacts are in series with the electrical cell **50** and motor **48**, and their closing causes the motor **48** to be energized and to turn the turntable **52**.

The motor **48** has an output shaft **70** that drives a friction drive wheel **72**. The drive wheel **72** has a small diameter portion **74** that is in frictional engagement with a rim portion **52R** of the turntable to drive it. Prior to starting the toy, the speaker pistons **38, 39** are held away from the tone arms **34, 42** by a lift arm **78**. As soon as the turntable begins to rotate, a lift arm cam **76** on the turntable is moved out of engagement with the lift arm **78**. This allows two end portions **80** and **82** of the lift arm to move away from the speaker pistons **38, 39** and allow them to bear against the tone arms **34, 42**. Prior to starting the toy, when the lift arm raises the speaker pistons away from the tone arm **34, 42**, the tone arms can be moved radially over the record grooves for re-positioning into different grooves as the clock hands are turned. After several degrees of turntable rotation, when the lift arm cam **76** disengages from the arm, the speaker pistons **38** and **39** are free to move down and bear against the needles **36** and **44** to transmit the recorded sounds to the speaker cones.

The record rotates in a clockwise direction indicated by arrow **84** for one revolution. As mentioned above, during the first approximately two-thirds of the revolution the hour playback mechanism **30** announces the hour and during the last approximately one-third revolution the minute playback mechanism **32** announces the minute. At the end of the revolution, a stopping cam **86** fixed to the back of the turntable engages a member **88** on the start/stop lever **56**, causing lever **56** to tilt backward. The lever **56** is therefore made to disengage from the slot **64** of the contact block **60**. When thus disengaged, the lever **56** rotates counterclockwise under the force of a return spring **90**. The lever **56** rotates counterclockwise and disengages from the switch **92**, thereby de-energizing the motor. The turntable coasts a small distance but is stopped in a predetermined position, as shown in FIG. 3, when a protrusion **96** on the start/stop lever enters an indented portion **94** of the rim portion **52S** and abuts a holding portion **98** on the turntable rim. Thus, rotation of the start knob **22** causes the turntable to make one complete revolution and stop at the same position at which it started, to prepare for the playing of another time saying.

After the turntable has stopped, a child can turn the knob **20** to change the time setting indicated by the clock hands **16, 18**. Rotation of the knob **20** also automatically causes movement of the tone arms **34, 42**, which results in movement of the minute and hour needles to the record grooves with sayings corresponding to the time indicated by the clock hands. As shown in FIG. 3, the knob is fixed to a shaft **100** which is fixed to the minute hand **18** and which is also fixed to a minute cam **102**. A minute cam follower **104** on the tone arm **34** engages the minute cam **102**. A minute spring **106** biases the minute tone arm so that its cam follower **104** is constantly engaged with the cam **102**. This causes positioning of the minute needle **36** over a particular record groove defined by the minute cam.

The minute cam **102** has twelve face portions corresponding to twelve five-minute intervals in each hour. When the time setting knob **20** has been turned so the minute hand **18** points to five minutes after the hour, the cam portion C5 engages the minute cam follower **104**. This causes the minute needle **36** to be positioned over groove G5. If the clock is then started, the minute saying will state it is five minutes after the hour.

A child may sometimes set the minute hand inbetween the five-minute intervals, which might cause confusion. To prevent such a setting, an index wheel **108** is fixed to the shaft **100**, the wheel having twelve depressed areas separated by raised areas. An indexing lever **110** bears against the wheel and tends to rotate the wheel so that it lies in a depressed area. When the indexing lever **110** is within a depressed area, the minute hand points precisely to one of the twelve five-minute clock positions which are indicated at the outer ring area **26** of the clock face.

As the knob **20** and minute hand **18** are rotated, the clock hour hand **16** must be slowly advanced to change the hour setting. A gear wheel **112** is fixed to the shaft **100** to rotate with it. The gear wheel **112** has four pairs of teeth **114** spaced around its periphery. These teeth can engage a transfer pinion **116** that is rotatably mounted on the clock housing. Every time the minute hand **18** rotates a quarter-turn, another pair of teeth **114** on the gear wheel passes by the pinion **116** to rotate the pinion by two teeth. As shown in FIG. 4, the pinion **116** is engaged with a spur gear **118** that is pivotally mounted around the shaft **100**. An hour can **120** is fixed to the spur gear **118** to rotate with it.

As in the case of the minute cam, the hour cam **120** has twelve cam portions H1 through H12 which engage an hour tone arm cam follower **122** which is mounted on the hour tone arm **42**. A spring **124** urges the hour tone arm cam follower **122** against the hour cam. This causes the hour needle **44** to be engaged with one of the hour grooves R1 through R12 on the record. The spur gear **118** is also fixed to the hour clock hand **16** to move it.

The spur gear **118** has 96 teeth. Thus, at every quarter revolution of the minute hand, when the pinion **116** is advanced by two teeth and it advances the spur gear **118** by two teeth, the spur gear and the hour hand fixed thereto are advanced by $\frac{1}{48}$ of a revolution. This causes the hour hand to advance by one-fourth of an hour every time the minute hand advances by fifteen minutes. Accordingly, the hour hand is always at a position on or between the hour numerals, which corresponds closely to the positions taken by the hour hand of an ordinary clock.

Thus, the talking clock of the invention can be easily set to the closest five-minute interval of any clock reading, by merely turning a single knob **20**, and it can be made to play a voice message telling the time to which it is set by merely moving a start knob **22**. This enables a child to learn to tell time without constant adult instruction, and enables him to derive enjoyment out of constantly testing and confirming his ability to tell time. While the talking clock generally does not contain a timepiece mechanism which would move the hands to indicate the actual time, such a mechanism could be included.

Although particular embodiments of the invention have been described and illustrated herein, it is recognized that modifications and variations may readily occur to those skilled in the art, and consequently, it is intended that the claims be interpreted to cover such modifications and equivalents.

What is claimed is:

1. A talking-teaching clock comprising:

a housing;

means defining a simulated clock face mounted on said housing;

hour and minute hands rotatably mounted on said housing to indicate the hour and minute;

knob means mounted on said housing and connected to said minute hand for enabling turning of said minute hand;

gear means coupled to said minute hand to turn said hour hand in accordance with rotation of said minute hand;

record means movably mounted in said housing and including a plurality of hour tracks and a plurality of minute tracks having voice recordings stating the hour and minute, respectively;

separate hour and minute tone arms for engaging said hour and minute tracks, respectively;

means swingably mounting each of said tone arms in said housing;

a speaker engageable by each of said tone arms for mechanically producing audible sounds defined by the tracks engaged by said tone arms;

hour and minute cams coupled to said hour and minute hands, respectively;

hour and minute cam follower means carried by said hour and minute tone arms, respectively, for selecting one of said hour tracks and one of said minute tracks to be engaged by said tone arms;

spring means connected to said tone arms for swinging said tone arms to positions where said cam follower means engages an associated one of said cams; and

lift arm means mounted in said housing for separating said tone arms and said speakers, whereby said tone arms are free to be swung to said positions by said spring means.

2. The talking-teaching clock described in claim 1 wherein:

said plurality of minute tracks comprise less than sixty tracks, to indicate only times spaced by a plurality of minutes; and including

indexing means for automatically aligning said minute hand with a predetermined one of said times spaced by a plurality of minutes, after said minute hand has been manually moved to a position adjacent said predetermined one of said times.

3. The talking-teaching clock described in claim 1 wherein:

said tracks extend along substantially concentric circles spaced substantially radially from each other on said turntable; and including;

an electric motor for moving said record means;

manually operable switch means for commencing the operation of said motor; and

means for terminating the operation of said motor upon the completion of one revolution of said turntable.

4. An educational toy for teaching the time of day, comprising:

a housing;

means defining a simulated clock face mounted on said housing;

hours and minute hands mounted on said housing to permit movement with respect to said simulated clock face to visually indicate different time settings;

record means including a plurality of hour-defining sound tracks and a plurality of minute-defining sound tracks, said record means comprising a turntable having a record with a plurality of radially spaced substantially circular grooves;

playback means for engaging particular hour-defining and minute-defining sound tracks in accordance with the positions of said hour and minute hands, respectively, to reproduce the sounds defined by said tracks, said playback means comprising separate hour and minute tone arm means each swingably mounted in said housing for engaging said hour-defining and minute-defining sound tracks, respectively, hour and minute cam means coupled to said hour and minute hands, respectively, a cam follower carried by each tone arm means and engageable with an associated one of said cam means for positioning each of said tone arm means to engage one of said grooves in accordance with the positions of said hands with respect to said clock face, and a spring connected to each of said tone arm means for normally biasing said tone arm means into engagement with said cam means.

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46—177; 58—14; 274—1A