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BELL RINGING MEANS FOR TOY LOCOMOTIVES

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This invention relates to a novel bell ringing device for use on electrically or mechanically operated toy locomotives, and has generally in view to provide a simple, inexpensive, thoroughly reliable and efficient device of this character which is effective in operation to simulate the sound of the bells on large passenger and freight service locomotives.

A special object of the invention is to provide a bell ringing device which may readily be mounted for operation on toy locomotives as at present constructed and which requires only very minor alterations and additions to the locomotive structure.

Another special object of the invention is to provide a bell ringing device for toy locomotives which is mechanically operable by a movable part of the locomotive, which may be rendered operative and inoperative at will, and which is equally effective to simulate the sound of the bells on large passenger and freight locomotives whether the toy locomotive is moving forwardly or rearwardly.

Another object of the invention is to provide a bell ringing device which is strong and durable and which may optionally include either a single clapper or a pair of clappers for successive operation.

Another object of the invention is to provide simple, easily operated means to render the device either operative or inoperative.

With the foregoing and other objects in view, which will become more fully apparent as the nature of the invention is better understood, the same consists in the novel features of construction, combination and arrangement of parts as will be hereinafter more fully described, illustrated in the accompanying drawing and defined in the appended claims.

In the drawing, wherein are illustrated certain practicable embodiments of the invention, and wherein like characters of reference denote corresponding parts in related views:—

Figure 1 is a view partly in side elevation and partly in section of a portion of a toy locomotive illustrating the adaptation thereto of a bell ringing device in accordance with one embodiment of the invention, the parts being shown in normal position.

Figure 2 is a view similar to Figure 1 illustrating by full and dotted lines the mode of operation of one of the clappers.

Figure 3 is a rear elevation of the mechanism shown in Figures 1 and 2.

Referring first to the practical embodiment of

the invention illustrated in Figures 1 to 3 of the drawing, A designates, generally, a portion of a toy locomotive which may be of any suitable construction to be propelled in any suitable manner, either electrically, mechanically, or manually, and which is inclusive of an axle 10 carrying a pair of wheels 11, said locomotive being illustrated in the present instance as being of either an electrically or mechanically propelled type and as being inclusive of a motor frame, designated as 12, having spaced side plates 13 between and through which the axle 10 extends. As shown, the shaft 10 is suitably provided with a radially extending pin 14 which constitutes one of the minor additions to the locomotive structure to adapt the present bell ringing device thereto.

Pivoted, as at 15, to one of the side plates 13 of the motor frame 12 is a bracket arm 16 which carries a bell 17 and which is limited in its pivotal movement in one direction by a stop pin 18 carried by said frame plate, the bell being disposed in an operative position when said bracket arm is engaged with said stop pin, as illustrated in full lines in Figures 1 and 2, and being manually swingable with said arm to an inoperative position, as illustrated by dotted lines in Figure 1, through the instrumentality of an arm or handle 19 which is fixed to the bell and which extends therefrom to a suitable position for convenient finger engagement, the bell being retained in its inoperative position when moved to that position either by frictional engagement of the bracket arm 16 with the frame plate 13 or in any other suitable or preferred manner.

Mounted in the frame 12 and extending between the side plates 13, 13 thereof, approximately midway between the axle 10 and the bell 17, is a pair of pins 20 and 21 which preferably are spaced equal distances from the axle 10 and also equal distances to either side of a plane including the axis of the axle and one side of the bell 17.

Relatively stiff and rigid arms 22 and 23 are pivoted on the pins 20 and 21, respectively, and extend therefrom towards the axle 10, while suitably secured at their inner ends to said arms are leaf springs 24 and 25, respectively, which extend, respectively, towards and across the inner and the outer faces of the bell 17 at one side thereof and which are equipped at their free ends with clappers 26 and 27, respectively, for cooperation with the bell.

The leaf springs 24, 25 are connected together by a contractile coil spring 28 which tends constantly to pull said leaf springs relatively in-

wardly against stop pins 29 and 30, respectively, which extend between the frame plates 13, 13 and which, like the pins 20, 21, preferably are located equal distances to either side of a plane including the axis of the axle 10 and the aforesaid side of the bell 17 so that when the leaf springs are in their normal positions engaging said pins the clappers 26, 27 are spaced, respectively, substantially equal distances from the inner and the outer faces of the said side portion of said bell. Moreover, the arms 22, 23 are of such length that when the leaf springs 24, 25 are in their normal positions engaging the stop pins 29 and 30, the free ends of said arms 22, 23 extend slightly towards the axle 10 beyond the circular path of movement of the free or outer end of the pin 14, whereby, during rotation of the axle 10 in either direction, the end of said pin 14 engages first one and the other of said arms 22, 23.

Assuming forward movement of the locomotive and rotation of the axle 10 in a counterclockwise direction as viewed in the drawing, it is apparent that the end of the pin 14 first engages the end of the arm 23 and by such engagement during continued rotation of the axle swings the arm 23 in a clockwise direction, thereby swinging the leaf spring 25 outwardly relative to the bell 17 against the tension of the spring 28 which is stretched due to the leaf spring 24 being prevented by reason of its engagement with the stop pin 29 from swinging with the leaf spring 25. Following a predetermined amount of swinging movement of the arm 23 and the leaf spring 25 by the pin 14, the end of said pin and the end of said arm each positions where, due to their pivotal movements, they begin to recede relative to each other, whereupon, following a slight amount of continued rotation of the axle, the free end of the pin 14 passes across the free end of the arm 23 and releases the same. When this occurs, the leaf spring 25, due to its own flexure and under the pulling force of the coil spring 28, is rotated suddenly in a counterclockwise direction with the result that it strikes violently against and is arrested by the stop pin 30. However, due to the weight of the clapper 27 and to the free end portion of the leaf spring being unrestrained, the momentum imparted to the leaf spring and the clapper by the coil spring 28, with consequent tendency of the clapper to continue to move in a clockwise direction after the leaf spring strikes the stop pin 30, results in flexure or bending of the leaf spring about the stop pin until the clapper strikes and rings the bell. Thereupon, the clapper rebounds from the bell and within a short period of time resumes its normal position, without, however striking the bell a second time, although some vibration of the leaf spring 25 may occur before the clapper finally comes to a position of rest. This operation obviously is repeated once during each successive rotation of the axle 10, so that during movement of the locomotive at a normal rate of speed the successive ringing of the bell closely simulates the ringing of the bell of a large locomotive.

After the pin 14 engages, actuates and releases the arm 23, it engages the free end of the arm 22. Due, however, to the flexibility of the leaf spring 24 and to the engagement of said leaf spring with the stop pin 29 at a point intermediate the ends of said leaf spring, the latter yields to permit sufficient clockwise rotation of the arm 22 to permit the pin 14 to pass by the same and without

offering any serious braking effect on the movement of the locomotive.

Obviously, upon backward movement of the locomotive the operation recounted in the foregoing is reversed. That is to say, the clockwise rotation of the pin 14 actuates the arm 22 in the same manner that counter-clockwise rotation of said pin actuates the arm 23, and said pin 14 is permitted to pass by the arm 23 for the same reason that said pin, when rotating in a counterclockwise direction is permitted to pass by the arm 22.

As aforesaid, the bell 17 is disposed in an operative position relative to the clappers 26, 27 when the bracket arm 16 is in engagement with the stop pin 18. However, by swinging the bell to a position as illustrated, for example, by dotted lines in Fig. 1 of the drawing, it is disposed out of the path of movement of the clappers 26, 27 so that actuation of said clappers has no effect to ring the bell.

Since the only alterations and additions to a toy locomotive of standard type in order to adapt thereto the bell ringing device illustrated in Figures 1 to 3 resides in adding the pin 14 to the axle 10 and forming holes in the side plates of the motor frame to receive the pivot and stop pins heretofore described, the fact that the device may be applied to a locomotive with facility and economically will be manifest. It also is apparent that the device itself is of simple, economical construction due in a large measure to the bell ringing elements being duplicates of each other.

Obviously the construction shown in Figures 1 to 3 may be located at the front of the locomotive or at any other suitable location instead of at the rear thereof.

Without further description it is thought the features and advantages of the invention will be readily apparent to those skilled in the art, and it will of course be understood that changes in the form, proportion and minor details of construction may be resorted to, without departing from the spirit of the invention and scope of the appended claims.

I claim:—

1. In a toy locomotive, a bell, a clapper, means to actuate the clapper to ring the bell, and a pivotal mounting for the bell whereby the same is movable to operative and inoperative positions relative to said clapper.

2. In a toy locomotive, a bell, a pair of pivoted arms, flexible clapper carrying members extending from said arms, spring means urging said members towards each other, stops against which said members are urged by said spring means, the clappers being spaced from the bell when said members are in engagement with said stops, and rotatable means operable when rotated in either direction to swing one of said arms to move its related clapper away from the bell and to energize said spring means and to subsequently release the arm, whereby the spring means is permitted to act to swing the clapper towards and against the bell to ring the same.

3. The arrangement as set forth in claim 2 in which the bell is pivotally mounted to be swung to operative and inoperative positions relative to the clappers.

4. In a toy locomotive, a bell, an axle and wheel one of which is provided with a projection, a pair of arms pivoted at points between the bell and the axle and extending towards the axle to be

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engaged and swung and subsequently released by
said projection, flexible elements extending from
said arms, clappers carried by said elements, a
spring connecting said elements and urging them
5 towards each other, and stops against which said
elements are urged by said spring, the clappers
being spaced from the bell when the flexible ele-
ments are in normal positions engaged with said
stops, whereby when either arm is swung to move
10 the flexible element thereof outwardly relative to
the bell the spring is energized to act upon re-
lease of the member to swing said element forc-
ibly against its related stop thus to cause the
element to flex to produce contact of the clapper
15 carried thereby with the bell.

ments cooperating with the bell and arranged
respectively within and outside of the bell, means
for supporting said clapper elements in a posi-
tion to cause the same to make successive strokes
to sound the bell and a single rotatable actuat-
ing means operatively related to both of the clap-
per elements. 80

6. In a toy locomotive, a bell, two clapper ele-
ments for cooperation with said bell arranged
respectively within and outside of the same, 85
means for actuating the clapper elements and
a movable mounting for the bell to permit the
same to be withdrawn from operative relation to
the clapper elements.

5. In a toy locomotive, a bell, two clapper ele-

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