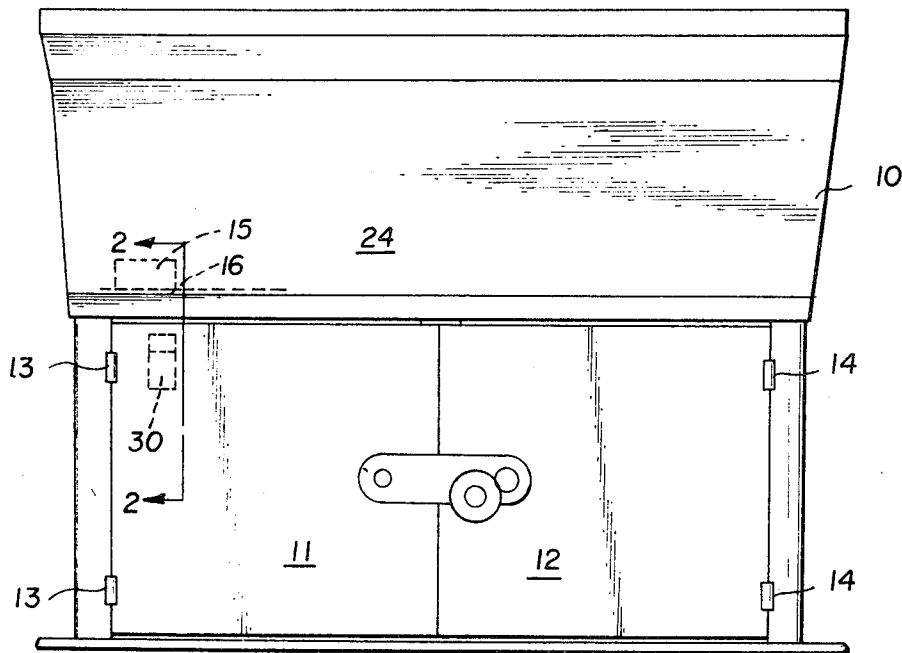


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[45] Patented July 13, 1971
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[56] References Cited
UNITED STATES PATENTS
1,367,651 2/1921 Ashley..... 116/86
1,854,126 4/1932 Ferguson..... 116/86
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[54] TOY WITH DOOR-ACTUATED SOUNDER
5 Claims, 3 Drawing Figs.
[52] U.S. Cl..... 46/175
[51] Int. Cl..... A63h 5/00
[50] Field of Search..... 46/175;
116/85, 86

ABSTRACT: A bellows sounder is operated by both opening and closing a door on a toy building. The sounder comprises a vibrating reed actuated by the closing of the bellows, and a cam on the door and a follower on the toy are arranged for moving the follower on both opening and closing of the door to expand the bellows which then close under spring pressure to generate the sound.



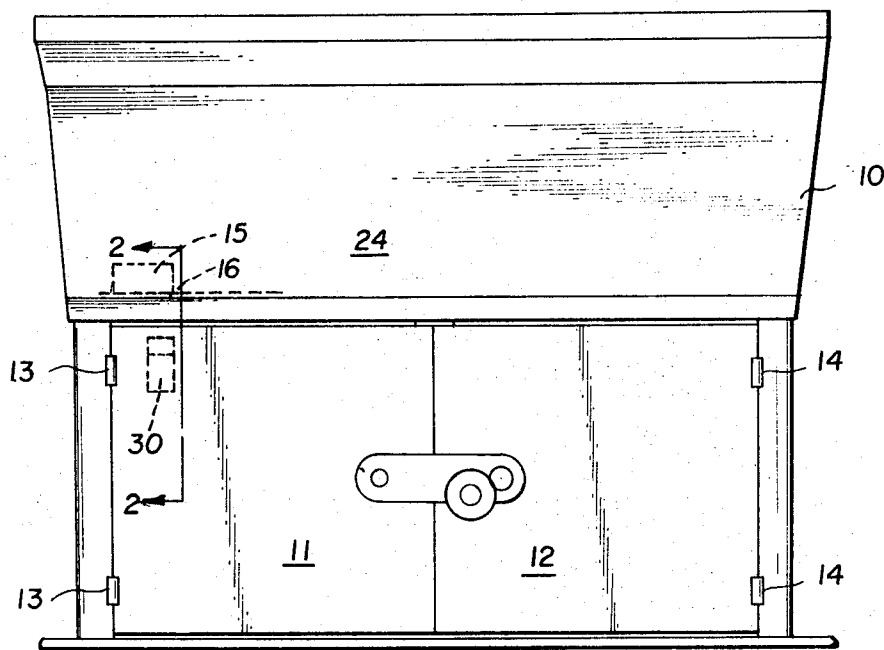


FIG. 1

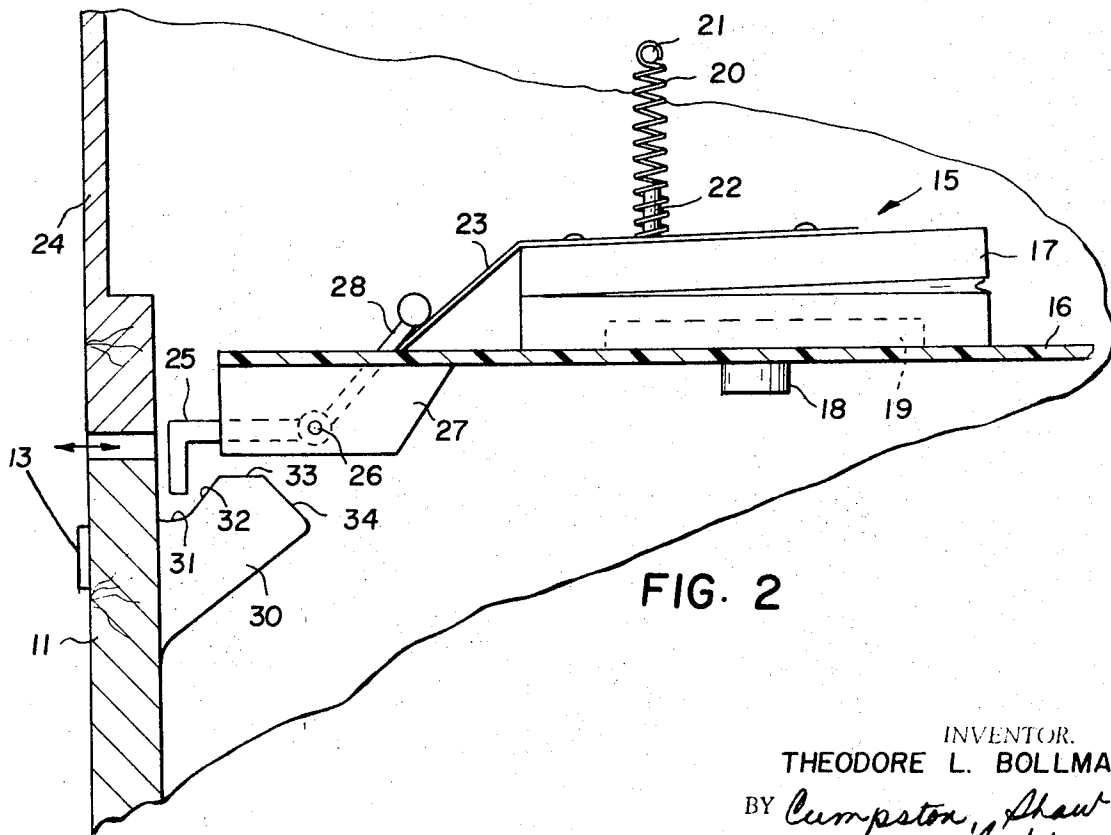


FIG. 2

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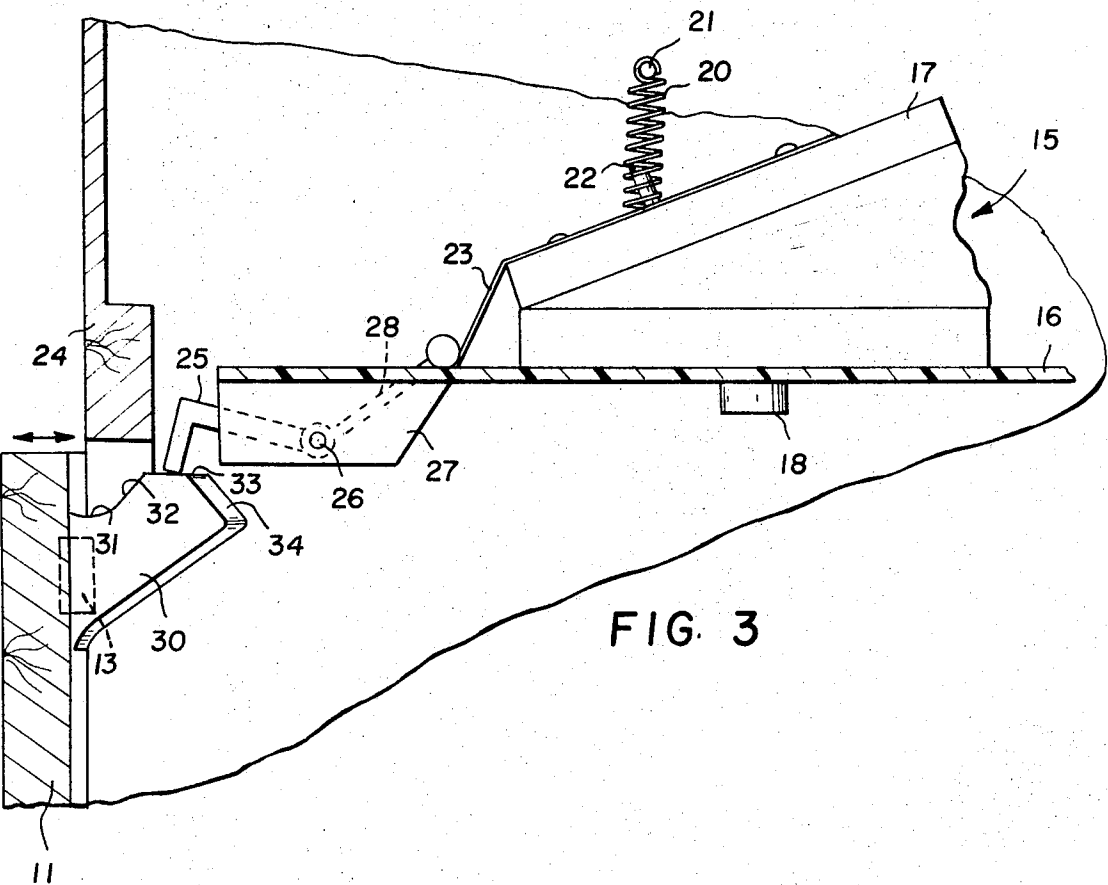


FIG. 3

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TOY WITH DOOR-ACTUATED SOUNDER

THE INVENTIVE IMPROVEMENT

The toy arts contain a wide variety of sounders, and some of them have been actuated by the opening or closing of doors on toy buildings. The inventive sounder was designed for the door of a toy barn and uses a bellows sounder to make a "moo" noise as the door is opened or closed. The objects of the invention include, without limitation, making the bellows sounder work uniformly on both opening and closing of the door, and disposing the sounder safely inside the toy in an out-of-the-way place and yet make it operable by a simple device on the door. Several unsuccessful attempts to accomplish such an arrangement were made before the invention was hit upon.

SUMMARY OF THE INVENTION

The inventive sounder is arranged inside a toy having a door hinged for opening and closing. A cam on the door is spaced from the hinge for moving in an arc as the door opens and closes, and a follower is pivotally mounted on the toy with a spring for biasing the bellows toward a closed position. The follower rests in a normally assumed position when the bellows are closed. The follower lever expands the bellows upon motion of the follower from its normally assumed position. The cam on the door has opening and closing cam surfaces arranged so that the closing surface of the cam moves the follower from its normal position as the door closes, and then the cam allows the follower to return to its normally assumed position when the door is closed. The opening surface of the cam moves the follower from its normally assumed position upon opening of the door, and a sounding reed in the bellows is driven by exhaust from the bellows as the bellows closes from an expanded position.

DRAWINGS

FIG. 1 is a front elevation of a toy provided with a preferred embodiment of the invention door-actuated sounder;

FIG. 2 is an elevational cross section of a fragment of the toy of FIG. 1 taken along the line 2-2 thereof and showing the inventive sounder and door arrangement; and

FIG. 3 is a cross-sectional view corresponding to the view of FIG. 2 and showing the door ajar to actuate the sounder.

DETAILED DESCRIPTION

The drawings show one preferred embodiment of the inventive door-actuated sounder arranged in barn 10. A pair of doors 11 and 12 are hung on hinges 13 and 14 for closing the front of barn 10. Door 11 is provided with sounder actuating means that operates as door 11 is opened and closed as indicated by the arrows in FIGS. 2 and 3.

Sounder 15 is preferably mounted above door 11, inside of toy 10 on panel 16 in an out-of-the-way place behind barn wall 24 where it will not be damaged by play. Sounder 15 includes bellows 17, an intake and exhaust port 18 extending through panel 16, and a vibrating reed 19 disposed inside bellows 17 for actuation to make a sound as bellows 17 close to exhaust air through port 18. A compression spring 20 extends between a lug 21 on toy 10 and another lug 22 on the top of bellows 17 for biasing bellows 17 toward the closed position illustrated in FIG. 2. A strip 23 secured to the top of bellows 17 extends beyond the hinge end of bellows 17 in a cantilevered extension by which bellows 17 are opened.

A cam follower 25 is pivoted on pin 26 in a housing 27 integral with panel 16 to dispose follower 25 in the region of the top of door 11. Follower 25 has a lever 28 at the opposite side of pivot pin 26 engaging cantilever strip 23.

A cam 30 is arranged on the inside of door 11 near the upper edge of door 11 and spaced from hinge 13 so that cam 30 moves through an arc as door 11 opens and closes. Cam 30 has a notch 31 adjacent door 11 and an opening surface 32

sloping upward from the bottom of notch 31 to the top 33 of cam 30. A closing surface 34 slopes downward from the cam top 33.

The operation of the inventive arrangement is best shown in FIG. 3 where door 11 is shown slightly ajar with follower 25 at the top 33 of cam 30. This can occur after follower 25 has moved up the opening surface 32 as door 11 is opened, or up the closing surface 34 as door 11 is closed. Either circumstance moves follower 25 to the FIG. 3 position where lever 28 is depressed to move cantilever strip 23 downward and raise or expand bellows 17 while compressing spring 20.

If door 11 is opened from the position illustrated in FIG. 3, follower 25 rides down surface 34 and off the end of cam 30 to assume the same position it has in FIG. 2. If door 11 is closed from the position illustrated in FIG. 3, follower 25 rides down surface 32 to its normally assumed position illustrated in FIG. 2. In either event, lever 28 is raised, and compression spring 20 is free to force bellows 17 back to the closed position illustrated in FIG. 2. This exhausts air through port 18 and vibrates the reed 19 in bellows 17 to produce the desired sound.

Thus, it will be seen that the invention accomplishes its objects in disposing the desired type of sounder in an out-of-the-way location in a toy building, with the only accessible moving parts being follower 25 arranged in the region of the upper edge of door 11. A simple cam 30 on door 11 operates sounder 15 to the same effect upon either opening or closing of door 11. The toy is rugged, durable, and capable of withstanding rough play, yet the sound produced is a satisfying and entertaining "moo" for each opening or closing of door 11.

Persons wishing to practice the invention should remember that other embodiments and variations can be adapted to particular circumstances. Even though one point of view is necessarily chosen in describing and claiming the invention, this should not inhibit broader or related applications within the spirit of the invention. For example, parts can be reversed to have a cam surface face downward with the follower facing upward, with the bellows opening downward instead of upward, etc. and other springs and levers can be arranged within the spirit of the invention.

I claim:

1. In a toy having a door hinged for opening and closing, a sounder comprising:

- a. a cam on said door;
- b. said cam being spaced from said hinge for moving in an arc as said door opens and closes;
- c. a follower pivotally mounted inside said toy;
- d. bellows mounted inside said toy in a manually inaccessible region;
- e. a spring biasing said bellows toward a closed position;
- f. said follower having a lever engaging a portion of said bellows;
- g. said follower having a normally assumed position corresponding to said closed position of said bellows;
- h. said follower lever being arranged for expanding said bellows upon motion of said follower from said normally assumed position;
- i. said cam having opening and closing cam surfaces;
- j. said closing surface of said cam being disposed for moving said follower from said normally assumed position on closing of said door;
- k. said cam being shaped to allow return of said follower to said normally assumed position when said door is closed;
- l. said opening surface of said cam being disposed for moving said follower from said normally assumed position on opening of said door; and
- m. a sounding reed in said bellows for making a sound as said bellows close from an expanded position.

2. The sounder of claim 1 wherein said opening and closing surfaces of said cam are both oblique to the horizontal.

3. The sounder of claim 1 wherein said bellows include an extension tab engaged by said follower lever for expanding said bellows.

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4. The sounder of claim 1 wherein said cam is arranged in the region of the top of said door and said follower is arranged in the region of the top of said door frame.

5. The sounder of claim 4 wherein said cam has a downwardly extending notch adjacent said door, said opening

surface of said cam sloped upward from the bottom of said notch to the top of said cam, and said closing surface of said cam slopes downward from the top of said cam away from said opening surface.

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