W. H. BALCKE AND W. A. READY.

TOY.

APPLICATION FILED MAR. 18, 1918.

1,316,474.

Patented Sept. 16, 1919.

2 SHEETS—SHEET 1.

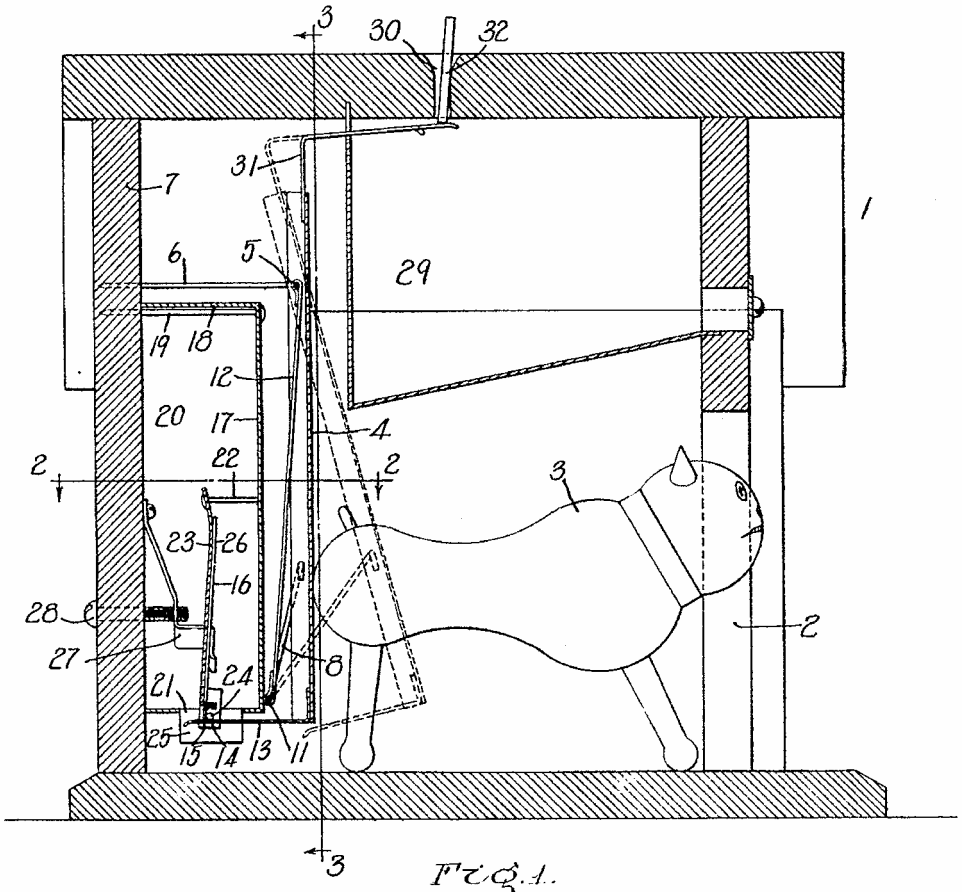

FIG. 1.

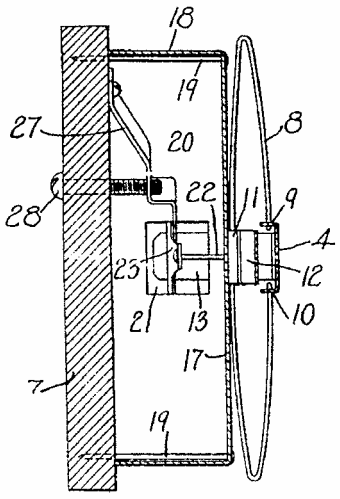

FIG. 2.

Inventors:
Walter H. Balcke,
William A. Ready,
by their attorney, Charles V. Fooding.

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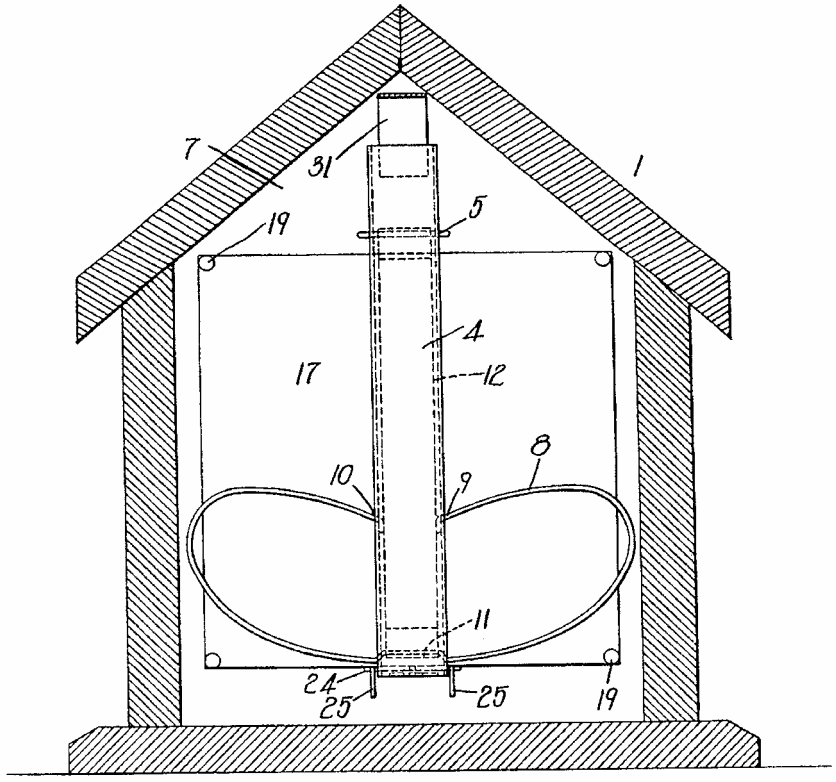

FIG. 3.

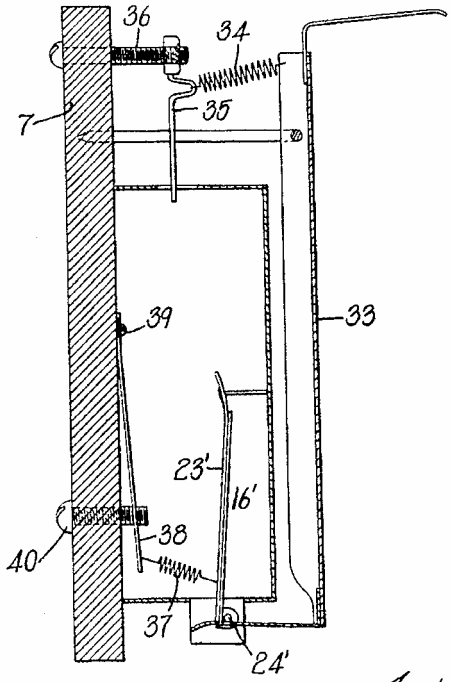

FIG. 4.

Inventors:
Walter H. Balcke
William A. Ready
by their attorney, Charles S. Fooding.

UNITED STATES PATENT OFFICE.

WALTER H. BALCKE, OF WINCHESTER, AND WILLIAM A. READY, OF BRIGHTON, MASSACHUSETTS, ASSIGNORS TO NATIONAL COMPANY, OF BOSTON, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

TOY.

1,316,474. Specification of Letters Patent. Patented Sept. 16, 1919.

Application filed March 18, 1918. Serial No. 223,027.

To all whom it may concern:

Be it known that we, WALTER H. BALCKE, a citizen of the United States, residing at Winchester, in the county of Middlesex and State of Massachusetts, and WILLIAM A. READY, a citizen of the United States, residing at Brighton, in the county of Suffolk and State of Massachusetts, have invented new and useful Improvements in Toys, of which the following is a specification.

This invention relates to improvements in toys and more particularly to toy banks.

The object of the invention is to provide a bank having an amusement device associated therewith which may be utilized as a means for stimulating saving or inducing others to insert coins in said bank merely for the sake of seeing the device operate.

Another object of the invention is to provide a device which may be manually set and held in such a position by means adapted to be released or tripped by waves of sound, such as may be produced by whistling, by the clapping of the hands or otherwise.

The invention consists in the combination and arrangement of parts set forth in the following specification and particularly pointed out in the claims.

Referring to the drawings:

Figure 1 is a vertical longitudinal section through a device embodying this invention.

Fig. 2 is a section taken on the line 2—2 of Fig. 1.

Fig. 3 is a transverse section taken on the line 3—3 of Fig. 1.

Fig. 4 is a detail vertical section of the flapper, trigger and sound tripping instrumentalities for said trigger, shown in modified form.

Like numerals refer to like parts throughout the several views of the drawings.

In the drawings, 1 indicates a casing of any suitable design; in the present instance said casing is made the shape of a small dog house having an opening 2 in the front wall thereof, said opening being large enough to admit a toy dog 3 which constitutes, in the present embodiment of the invention, the movable member thereof.

Adjacent to the opposite end of the casing 1 from the opening 2 is an actuator or what will be more often referred to in the following specification as a flapper 4 which is pivoted to rock about a horizontal axis 5 disposed near the upper end of said flapper, said pivot being in the form of a staple 6 supported on the rear wall 7 of said casing. Means are provided for actuating said flapper 4 to eject the movable member 3 from said casing through the opening 2, said means preferably including a spring 8. Many types of springs may be employed for actuating said flapper but the preferred form embodies one having the form of an ellipse which is arranged with its long diameter extending transversely of the flapper 4 and with opposite ends 9 and 10 of said spring secured preferably to opposite sides of said flapper substantially equal portions of said ellipse lying upon opposite sides of said flapper.

The opposite side of said ellipse from the side including the ends 9 and 10 is preferably pivotally mounted upon the lower end 11 of a link 12 which is pivotally suspended from the axis 5 of said flapper. The pivotal portion of the spring 8 which is located at the lower end of the link 12 is preferably disposed at a substantially greater distance from the axis 5 than are the ends 9 and 10 so that when the flapper 4 is moved toward said link, the moment of force or pressure acting upon said flapper to force it from its full line position to its dotted line position, see Fig. 1, will be substantially decreased as said flapper is moved from said dotted line to said full line position or when said flapper is in its extreme rear position nearest said link 12. Such a variation in the force exerted by said spring is due to the fact that the axes of the ends 9 and 10 of said spring, which are pivoted upon said flapper, will, when said flapper is in its last named position, lie more nearly in a plane containing the axis of the pivot 11 and the axis of the pivot 5 than when said flapper is in its forward or dotted line position, for although the spring will, in its full line position, be under its greatest tension the force of said spring will be directed almost directly against the axis of the flapper and thereby neutralize the greater amount of the force of said spring, or in other words, only a very small component will remain in the plane perpendicular to the flapper, this component being just sufficient to start the flapper in

motion when the same is released by the trigger 6.

When the spring is in such a condition a very small force will suffice to maintain the flapper in its set position.

At the time when the flapper 4 is at its rearmost position, it will lie in a substantially perpendicular position and any rearward movement of the link 12 will be prevented at this time by reason of the fact that the lower end of said link engages a fixed element in the casing. Means are provided for holding the flapper 4 in its rearmost or set position so as to maintain the spring 8 under tension. This means preferably includes a resilient latch 13 which is preferably secured to the lower end of the flapper 4 and extends laterally toward the rear thereof. The extreme end of said latch is perforated at 14 to receive the end 15 of a trigger 16, hereinafter more fully described.

At the rear of the flapper 4 is placed a diaphragm 17, said diaphragm preferably consisting of a thin sheet of metal disposed parallel with the front wall of the casing 1 and in alinement with the opening 2 in said wall, and moreover said diaphragm is particularly susceptible to sound waves which may enter the casing through said opening and cause said diaphragm to vibrate.

The diaphragm 17 is furthermore surrounded by a rearwardly disposed rim 18 which extends to and engages the rear wall of the casing to which it is secured preferably by nails 19 which pass through the diaphragm 17. The rim 18 maintains the diaphragm 17 at a predetermined distance from the rear wall of said casing so as to provide a chamber 20 at the rear thereof.

The diaphragm 17 is engaged near the center thereof and upon the opposite side from said flapper 4 by a small magnet, 22, preferably a permanent magnet, which is operatively connected with the trigger 16 and forms, together with said trigger, a sound trip. The magnetic forces of the magnet 22 are sufficient to maintain said magnet in contact with the diaphragm in opposition to the tension of the spring 8 when said spring 8 is depressed and the flapper 4 set.

The trigger 16 preferably embodies in its construction a thin resilient member 23, to the upper end of which the magnet 22 is secured. The lower end of said resilient member is fastened to a transversely disposed pin 24 which is pivotally arranged in bearing members 25, 25 disposed adjacent to the lower edge of the diaphragm 17 and near an opening 21 formed in the supporting rim 18 of said diaphragm, through which the trigger 16 extends.

Arranged against the side of the resilient member 23 nearest the diaphragm 17, is a reinforcing member 26 which is secured to the resilient member adjacent to the portion to which the pin 24 is attached, and said reinforcing member extends beyond the pin 24 and constitutes the end 15 of said trigger which projects through the perforation 14 and holds the latch and flapper in their set positions.

The reinforcing member 26 is substantially straight, while the resilient member 23 is curved, the convex face thereof lying next to the reinforcing member. Under normal conditions, the reinforcing member will contact with only a portion of the resilient member 23, but when pressure is applied to the end 15 thereof by the spring 8 acting against said flapper, said reinforcing member will lie nearly flat against said resilient member, due to the pressure exerted upon said trigger and thus prevent said resilient member from being bent or curved in an opposite direction; in other words, said reinforcing member acts as a stiffener to increase the stiffness of said resilient member as the pressure applied to said trigger is increased.

When the end 15 of said trigger is inserted through the perforation 14 of the latch 13 and said latch is held thereby in its set position, the resiliency of said latch maintains the upper face thereof in contact with the pin 24 so that a very small pressure applied to the upper end of the trigger, where said magnet is located, will be sufficient to retain said flapper in its set position against the action of the spring 8.

In addition to the pressure exerted against said magnet by means of the spring 8 a spring 27 is provided, said spring being adjustably secured to the rear wall 7 of the casing 1 by an adjusting screw 28 which is adapted to adjust said spring to vary the pressure against the side of said trigger disposed toward the diaphragm 17, and this spring is adjusted so as to exert only a slight pressure on the trigger during the initial movements thereof from the diaphragm 17, consequently, when sound waves pass through the opening 2 and vibrate said diaphragm, the attraction between the magnet 22 and said diaphragm will be momentarily interrupted. Such momentary interruption of the magnetic attraction, acting between said magnet 22 and the diaphragm, is due to the fact that the diaphragm, being lighter, will be vibrated by the sound waves much more rapidly than will be the magnet 22 which, of course, receives its vibrations indirectly through the vibrations of the diaphragm.

As the diaphragm moves faster than the magnet, a gap will be formed between said magnet and said diaphragm which, although very slight, is sufficient to weaken the magnetic attraction between said members, and when this occurs the slight pressure exerted upon the trigger 16 by the spring 8 acting through the latch 13, tending to rock the

trigger about its pivot and that of the spring 27 upon said trigger, also tending to rock said trigger upon its pivot, both in the same direction, will suffice to weaken the magnetic forces of said magnet 22 and disengage said magnet from said diaphragm, allowing said trigger to be rocked upon its pivot far enough to free the latch 13 from the end 15 of said trigger.

When the latch is released, the flapper 4 will be forced, by the gradually increasing tension of the spring 8, from its full line to its dotted line position, Fig. 1, and any objects which lie within the path of said flapper will be ejected thereby from the casing.

Arranged in the upper part of the casing 1 above the movable member 3 is a receptacle 29 adapted to hold coins which may be inserted therein through a coin slot 30 formed at the top of the casing 1. To the upper end of the flapper 4 is secured an extension 31 adapted to extend along the under side of the top of said casing and beneath said coin slot when the flapper 4 is in its set position, as shown in full lines, Fig. 1, at which time it will be impossible to insert coins in the receptacle. They will, at this time, rest within the slot 30 against said extension 31, as shown at 32.

When a suitable noise is created in front of the opening 2, for instance, a whistle, such as is necessary to call a dog, or the clapping of the hands, the vibration due to such sounds will cause the diaphragm 17 to be vibrated and the attraction between the magnet 22 and said diaphragm will be broken; thereupon the flapper will be released and the dog or movable member 3 will be ejected from the casing toward the person making the sound.

Simultaneously with this movement of the flapper, the extension 31 will be withdrawn from beneath the coin slot 30 and permit the coin 32 to pass into the coin receptacle 29.

In Fig. 4 we have illustrated a modified form of our invention, in which the flapper 33 is arranged in substantially the same manner as is the flapper 4 in the previous figures. This flapper is operated by means of a spring 34 secured at one end to the upper end of said flapper and at the opposite end thereof to an adjustable member 35, which is movable toward and away from the rear wall 7 of the casing by means of a screw 36, thus increasing or diminishing the pressure exerted upon the flapper 33 by said spring.

In addition to the adjustment just described, means are also provided for adjusting the tension of the resilient member 23′ of the trigger 16′, which means preferably embodies in its construction a spring 37 secured at one end to said trigger near the pivot 24′ thereof, and the opposite end of said spring is secured to one end of a resilient member 38, the opposite end of said resilient member being secured by a screw 39 to the rear wall 7 of said casing, and an adjusting screw 40, having screw threaded engagement with said casing and also with said resilient member, is adapted to be rotated to vary the tension of said spring 37 by increasing or diminishing the deflection of the resilient member 38.

To set either the device shown in Fig. 4 or that shown in Fig. 1 so that they may be operated by sound waves, the flapper 4 is pushed toward the rear preferably by the insertion of the movable member 3 into said casing and against said flapper, and the latch, which has a downwardly deflecting extremity, rides over the end 15 of the trigger until said end alines with the perforation 14 in said latch.

The continued pressure against the flapper causes the opposite side of said perforation to engage said end 15 and move the trigger about the axis of its pivot until the magnet carried thereby engages the diaphragm, which is the extent of the movement of said trigger in this direction.

When pressure is removed from the actuator, the spring thereof which has been placed under tension by the previous movement of said actuator tends to move the latch in a reverse direction until the end 15 of the trigger engages the opposite side of the perforation in said latch, whereupon a further movement of said latch will be prevented by the magnetic force exerted by said magnet upon said diaphragm.

The flapper and trigger will remain in the above mentioned positions until the diaphragm is vibrated by sound waves sufficient to produce a gap between said magnet and said diaphragm which will be caused by reason of the fact that said diaphragm moves much more rapidly than said magnet. The separation between said magnet and said diaphragm materially weakens the effect of the magnetic forces upon said diaphragm, consequently, the tension of the spring propelled flapper on said trigger, together with the tension of the spring which is provided for imparting an initial movement to the trigger, will overbalance the weakened forces exerted by said magnet on said diaphragm and effect the release of said trigger which, in turn, suddenly releases said actuator, permitting the same to strike and eject the movable member from the casing.

The specific embodiment of this invention, hereinbefore described and shown, is but one of the many forms to which the essential features of the invention may be applied, therefore, the spirit and scope of the

invention should be limited only in so far as the same are limited by the spirit and scope of the claims hereto annexed.

Having thus described our invention, what we claim and desire by Letters Patent to secure is:

1. In a device of the class described an actuator, a trigger adapted to maintain said actuator in an operative position, and sound tripping means for said trigger.

2. In a device of the class described, a spring propelled actuator, means including a permanent magnet adapted to hold said actuator in an operative position, and sound actuated tripping means for said actuator holding means.

3. A device of the class described having, in combination, a casing provided with an opening, a movable member arranged within said casing in alinement with said opening, an actuator for said movable member, a diaphragm, a trigger adapted to hold said actuator in its operative position, means for exerting pressure upon said actuator when the same is in its operative position to move said actuator upon the tripping of said trigger, and means including said actuator moving means adapted to effect the tripping of said trigger during the vibrations of said diaphragm.

4. In a device of the class described, an actuator, a spring adapted to move said actuator in one direction, the pressure exerted upon said actuator by said spring being less when said spring is under greatest tension than when said spring is only partially under tension, means including a permanent magnet adapted to maintain said spring under tension, and sound trippings means adapted to effect the release of said spring.

5. In a device of the class described, an actuator, means for moving said actuator including a spring, a trigger adapted to hold said actuator in a position to maintain said spring under tension, a diaphragm adapted to be vibrated by sound waves, and a magnet adapted to be held normally in engagement with said diaphragm adapted to be disconnected therefrom during the vibrations of said diaphragm by means including said spring.

6. In a device of the class described, a spring propelled actuator, a trigger, a latch connected with said actuator adapted to engage said trigger and coöperate therewith to hold said actuator in its operative position, a diaphragm, a magnet adapted to be held normally in contact with said diaphragm by the magnetic forces thereof, adapted to hold said trigger in its set position, and means for effecting the release of said magnet from said diaphragm during the vibrations of said diaphragm.

7. In a device of the class described, a spring propelled actuator, a trigger adapted to hold said actuator under tension, a diaphragm adapted to be vibrated by sound waves, a magnet attached to said trigger adapted to be maintained normally in contact with said diaphragm by the magnetic forces thereof, and means for exerting pressure upon said trigger in opposition to said magnetic forces adapted to coöperate with the vibratory movements of said diaphragm to overbalance said magnetic forces and thereby effect the release of said magnet from said diaphragm.

8. A device of the class described having, in combination, an actuator, a spring adapted to propel said actuator, a trigger adapted to hold said actuator in a position to maintain said spring under tension, a diaphragm adapted to be vibrated by sound waves, a magnetized member attached to said trigger, adapted to be held normally in contact with said diaphragm by the magnetic forces thereof, said magnetic forces being weakened by the vibrations of said diaphragm, and a spring adapted to effect the separation of said magnetized member from said diaphragm at the time when said magnetic forces are weakened by the vibrating of said diaphragm.

9. In combination, a casing provided with an opening, a toy arranged within said casing in alinement with said opening, a spring propelled actuator adapted to be operated to eject said toy from said casing through said opening, a diaphragm arranged within said casing opposite said opening, means for maintaining said actuator in its operative position including a permanent magnet adapted to be maintained normally in contact with said diaphragm by the magnetic forces thereof, and means including a spring adapted to operate during the vibrations of said diaphragm to disengage said magnet from said diaphragm.

10. In combination, a casing, a coin receptacle within said casing, said casing having a coin slot communicating with said receptacle, an actuator arranged within said casing, means for moving said actuator to eject a toy from said casing, means for holding said actuator in its operative position, a gate connected with said actuator, adapted to project across said coin slot when said actuator is in its operative position to prevent the insertion of coins therein, and sound tripping means adapted to effect the release of said actuator, whereby said gate may be withdrawn from said slot and said actuator will eject the toy from said casing.

11. In combination, a diaphragm adapted to be vibrated by sound waves, a magnet adapted to be held normally in contact with said diaphragm by magnetic force, and means for exerting pressure upon said magnet in opposition to said magnetic force to overcome said magnetic force during the vibrations of said diaphragm and effect

the release of said magnet from said diaphragm.

12. In combination, a diaphragm adapted to be vibrated by sound waves, a trigger, means for operating said trigger including a spring, a magnet adapted to exert an influence upon said diaphragm to maintain said trigger in its operative position, and means for exerting pressure upon said trigger adapted to overbalance the forces exerted by said magnet upon said diaphragm during the vibrations of said diaphragm, whereby said trigger may be released.

13. In combination, a diaphragm adapted to be vibrated by sound waves, a trigger, a permanent magnet attached to said trigger, adapted to be held normally in contact with said diaphragm by magnetic force, and means for exerting pressure upon said trigger in opposition to said magnetic force adapted to overbalance said magnetic force during the vibrations of said diaphragm to effect the release of said magnet from said diaphragm.

In testimony whereof we have hereunto set our hands in presence of two subscribing witnesses.

WALTER H. BALCKE.
WILLIAM A. READY.

Witnesses:
SYDNEY E. TAFT,
HATTIE E. STRATTON.