Nov. 2, 1937. S. KRAKOWSKI 2,097,818

ALARM MECHANISM FOR CLOCKS

Filed April 13, 1936

Fig. 4.

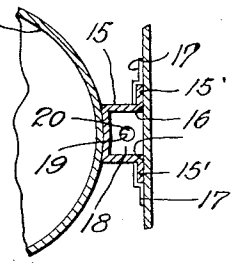


Fig. 1.

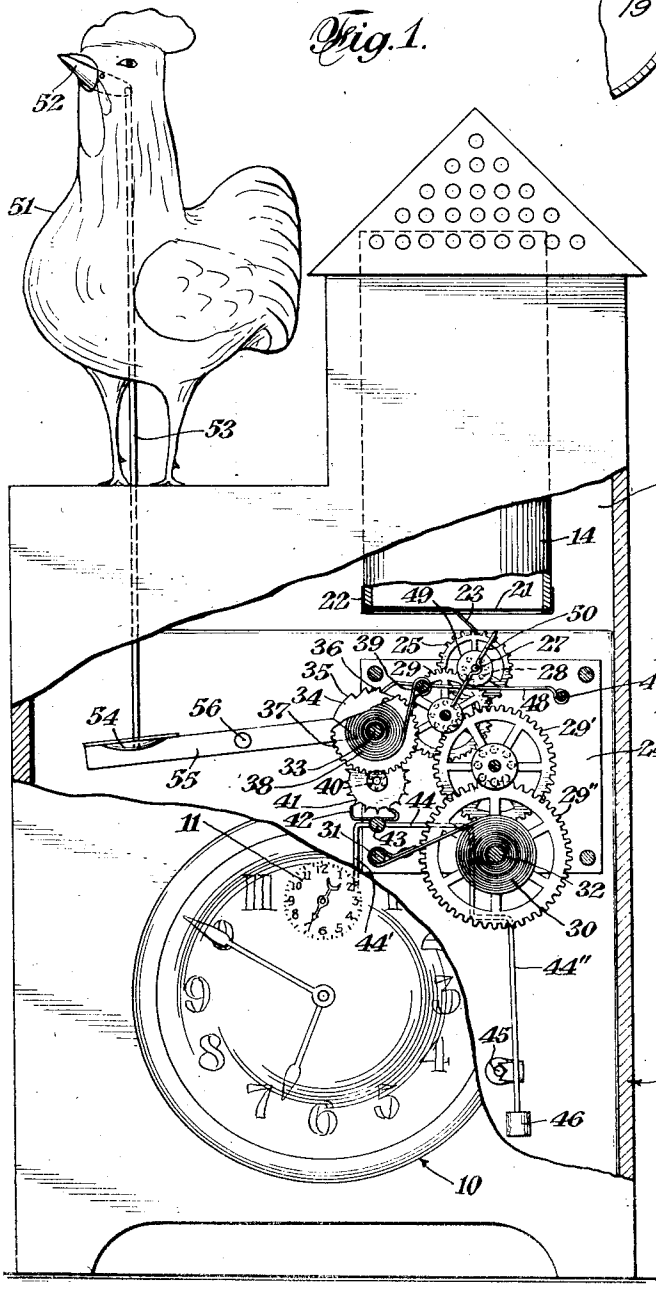


Fig. 2.

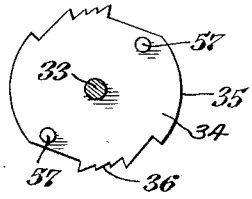
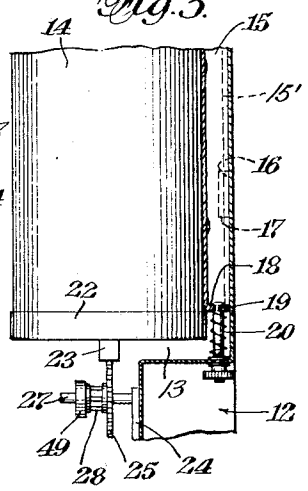


Fig. 3.



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ALARM MECHANISM FOR CLOCKS

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13 Claims. (Cl. 58—16)

The present invention relates to sound mechanisms for clocks, and it has for its object to provide sound alarm mechanisms in which the alarm sound is of a vibratory character, preferably of an uneven, intermittent kind, and more preferably in imitation of some nature sound, such as the crowing of a rooster, or the like.

In alarm clocks heretofore in use the alarm sound was generally provided by a bell and clapper which were activated by a coil spring, released by a timing mechanism. The present invention utilizes the same time release, but provides for spring activated means for operating a vibrating device instead of a bell.

In the accompanying drawing illustrating one preferred embodiment of the alarm mechanism of the present invention,

Fig. 1 is a view in front elevation of a clock having the vibratory alarm mechanism of the present invention, with the frame partly cut away to disclose a detailed view of such vibratory mechanism and the activating means for the same;

Fig. 2 is a view of the control disc which both releases the vibrating arrangement and controls the duration and the number of vibrations to be produced; and

Fig. 3 is a detailed view of the sound producing member of the present invention, showing the method of mounting the same and of adjusting it; and

Fig. 4 is a fragmentary top plan view of the adjustable mounting means of the sound producing member of the present invention.

Referring more specifically to the accompanying drawing, the numeral **10** designates, generally, an alarm clock, having the usual clock mechanism, including the alarm dial, **11**, with the usual time release device usually associated therewith and not necessary to be here shown in detail, all set in a case, **12**, provided with a recess or chamber preferably extending upwardly and partly rearwardly of the main chamber of the case **12**, such as shown at **13**. Within the recess or chamber, **13**, is mounted, preferably adjustably, a sound box, **14**. The adjustable mounting for the sound box, **14**, may be of any desirable and suitable type and may consist, as illustrated, of a U-shaped member, **15**, carried vertically on the sound box, **14**, which member is provided with oppositely directed flanges, **15'**. These flanges may be engaged and slidable within the channels, **16**, provided by a pair of guide cleats, **17**, which are mounted on the wall of the chamber, **13**.

The U-shaped member, **15**, may be provided, at the center of its lower end with the horizontally extending portion, **18**, which may be provided with an opening, **19**, engaging fixedly the end of a threaded pin, **20**, passing through the floor of the chamber **13**, and which is engaged, on the exterior of the case, by a beaded nut, by means of which the sound box may be raised or lowered, as may readily be understood.

The lower end of the sound box **14** is provided with a sounding board, **21**, which may be formed in the shape of a cover or lid, with a flange **22**, so that it may be removable, for the purpose of changing or replacing. The sounding board, **21**, may be of any suitable rigid, vibratory material, such as mica, or the like, and has secured thereto, in any suitable manner, one end of a vibrating reed, **23**, the free end of which is bent downwardly, preferably diagonally downwardly. The vibrating reed, may also be of any suitable material, preferably metallic.

Positioned within the clock case, **12**, adjacent the chamber, **13**, is a frame, **24**, of the type usually employed for mounting clock movements, upon which is mounted the gear wheel, **25**, in a position adapted to have its teeth engage the free, depending edge of the vibrating reed, **23**. The gear wheel, **25**, is carried fixedly upon a shaft, **27**, which also carries a pinion, **28**, which is engaged and activated by the gear wheel **29**, which is part of a gear train comprising the additional gear wheels, **29'** and **29''**, which is mounted within the frame **24**. The last gear wheel of the train, **29''**, is engaged by one end of the coiled clock spring **30**, the other end of which is anchored to the frame, as at **31**. The wheel, **29''**, is mounted on a winding shaft, **32**, which is operable from the exterior of the case, **12**, in the usual manner, permitting the winding of the spring, **30**, without disturbing the gear train.

It may here be stated that the frame **24** may be, in actual practice, combined with the main clock frame, to obtain advantages of economy in cost and space.

Mounted within the frame **24**, substantially alongside the wheel 29, upon a second winding shaft, **33**, which extends to the exterior of the clock, for the purpose of winding, as will hereinafter be made clear, is a disc, **34**, whose circumference may be provided with the even portions, **35**, and with the irregularly cut out portions, **36**. Carried, also, on the shaft **33** is a gear wheel, **37**, and one end of the clock spring, **38**, the other end of which is anchored to the frame, as at **39**. The

gear wheel 37 engages the pinion 40, preferably co-mounted with the scape wheel, 41, at a point preferably below the said gear wheel, 37, the scape wheel 41 being in turn engaged by the escapement, 42, which is mounted on the rotatable shaft, 43, together with the substantially U shaped arm or rod, 44. One end of the rod, 44, designated as 44', is so positioned that it is in close proximity to the time release mechanism of the clock and is adapted to be engaged by it and to be released at a pre-determined time. The other end of the rod, 44, designated as 44'', may extend downwardly, alongside the clock movement, in close proximity to an alarm stop mechanism, which may consist of the push and pull pin, 45, operable from the exterior of case, 12, which mechanism, 45, may engage the end 44'' to halt or prevent its movement and thereby halt or prevent the movement of all parts controlled by the escapement. The end 44'' may also carry, adjacent its free terminus, a balance weight, 46, preferably adjustable in place, to govern and reduce the rate of the vibration of the arm 44 and of the escapement, to prevent too rapid unwinding of the clock spring, 38.

Mounted freely, by one of its ends, as at 47, substantially below the gear wheel 25, is a leaf spring, 48, the free end of which may be slightly downwardly bent and is adapted to rest upon the edge of the disc 34. The spring 48, is so mounted that when its edge rests upon the even portion of the disc circumference, 35, its middle will contact the brake or friction wheel, 49, or other suitable device which may be carried on the shaft 27, and thus prevent the turning of the gear wheel 25. The shaft 27 may also carry the fan, 50, to retard the rotation of the gear wheel 25 and to prevent too rapid unwinding of the spring 38, which activates it.

It is apparent that when the alarm release mechanism of the clock releases the end 44' of the arm 44, permitting the shaft 43 to rotate, it will release the escapement, 42, which will oscillate and permit the scape wheel, 41, and the gear wheel, 37, to turn, by the action of the spring, 38, simultaneously turning the disc, 34, until the free edge of the leaf spring, 48, is dropped into one of the cuts or serrations in the circumference of the disc, releasing the braking pressure upon the brake wheel, 49, and permitting the gear train, 29, 29', and 29'', which is activated by the spring 30, to turn the gear wheel, 25, whose teeth will vibrate the reed, 23, to produce a sound, until the brake leaf spring is again pressed against the brake wheel when its edge is raised by the slant of the serration as the disc turns. The turning of the disc 34 will continue with the consequent sounds, until the time mechanism of the clock again locks the arm 44 in position or until the springs 30 and 38 are unwound. By varying the arrangement of the serrations of the disc in position, number and shape, varying intermittent sounds may be produced, and by varying the character of the vibrating reed, sounding board and sound box, the quality of such sounds may be varied in numerous ways.

To make the alarm clock of the present invention more realistic, especially when the disc arrangement is such as to imitate the sound of a bird or animal, a figure of such bird or animal, 51, may be mounted upon the frame, such bird or animal having a hinged lower beak or jaw, 52, as the case may be, the rear end of which may be attached to or rest on one end of a rod, 53, which passes through the clock case, to have its lower end rest in a cup or depression, 54, in one arm of a lever, 55, which is pivoted on the wall of the case, as at 56. The other end of the lever, 55, is tapered diagonally and is adapted to be engaged by the pins, 57, on the face of the disc 34, to raise and lower the jaw or beak as the disc turns.

It may here be stated that the alarm device of the present invention is readily adaptable for use with electric motors instead of clock springs, in connection with the electric clocks now prevalent.

This completes the description of one preferred embodiment of the present invention and its adaption for use with a clock, and it is to be understood that I do not wish to be limited to the embodiment herein described, as, obviously, many variations may be made therein, without the use of the inventive faculties and within the spirit and scope of the present invention and the claims hereto appended.

What I claim is:

1. A sound alarm device comprising a sounding board, a sound box above the said sounding board, a vibrating reed set into the said sounding board, a rotatable shaft carrying a toothed wheel, the teeth of the said wheel engaging the free edge of the said vibrating reed, means to rotate the said toothed wheel shaft and braking means adapted to stop and release the said shaft for rotation.

2. The device of claim 1, wherein the sounding board and sound box are adjustably mounted with respect to the toothed wheel.

3. The device of claim 1 wherein the braking means comprises a friction wheel carried on the toothed wheel shaft, a rotatable shaft carrying a disc, the said disc having one or more serrations in its circumference, a leaf spring pivoted by one of its ends, its other end being bent diagonally and adapted to rest on the circumference of the said disc, the central portion of the said leaf spring being adapted to press against the friction wheel when its free edge rests on a smooth portion of the disc and to release the said shaft when the free end rests within a serration thereof, and means to rotate the said disc shaft.

4. A sound alarm device comprising a sounding board, a sound box above said sounding board, a vibrating reed set in the said sounding board, a rotatable shaft carrying a toothed wheel, the teeth of the said wheel engaging the free edge of the said vibrating reed, means to rotate the said toothed wheel shaft and braking means adapted to stop and release the said toothed wheel shaft for rotation, said braking means comprising a friction wheel carried on the toothed wheel shaft, a winding shaft carrying a disc, the said disc having one or more serrations on its circumference, a leaf spring pivoted by one of its ends, its other end being bent sideways to the main portion thereof and adapted to rest on the circumference of the said disc, the central portion of the said leaf spring being adapted to press against the said friction wheel when its free edge rests on a smooth portion of the disc circumference and to release the said friction wheel when its free end rests within a serrated portion of the said disc, and a clock spring anchored on the said disc carrying winding shaft and adapted to rotate the same.

5. The device of claim 4 wherein the sounding board and sounding box are adjustably mounted with respect to the toothed wheel.

6. The device of claim 4 wherein the serrations on the circumference of the said disc are grouped in spaced series.

7. The device of claim 4 wherein the serrations on the circumference of the said disc are grouped in spaced series of uneven and irregular shape.

8. A sound alarm device comprising a sounding board, a sound box above the said sounding board, a vibrating reed set in the said sounding board, a rotatable shaft carrying a toothed wheel, the teeth of the said wheel engaging the free edge of the said vibrating reed, means to rotate the said toothed wheel shaft and braking means adapted to stop and release the said toothed wheel shaft for rotation, said braking means comprising a friction wheel carried on the toothed wheel shaft, a winding shaft carrying a disc, the said disc having one or more serrations upon its circumference, a leaf spring pivoted by one of its ends, its other end being bent sideways to the main portion thereof and adapted to rest on the circumference of the said disc, the central portion of the said leaf spring being adapted to press against the said friction wheel when its free edge rests on a smooth portion of the disc and to release the said friction wheel when its free edge rests on a serrated portion of the said disc, a clock spring anchored by one end on the said winding shaft and adapted to rotate the same, and means adapted to be engaged and released by the alarm release mechanism of an alarm clock to control the rotation of the said winding shaft.

9. The device of claim 1, wherein the means to rotate the toothed wheel shaft comprises a winding shaft, a clock spring anchored by one end upon the said winding shaft and geared means adapted to transmit the rotation of the winding shaft to the toothed wheel shaft.

10. The device of claim 1, wherein the means to rotate the toothed wheel shaft comprises a winding shaft carrying a geared wheel, a clock spring anchored by one end upon the winding shaft, a pinion upon the toothed wheel shaft and a gear train engaging the said geared wheel and the said pinion and adapted to transmit the rotation of the said winding shaft to the toothed wheel shaft at an increased rate of rotation.

11. The device of claim 4, wherein the means to rotate the toothed wheel shaft comprises a winding shaft carrying a geared wheel, a clock spring anchored by one end upon the winding shaft, a pinion upon the toothed wheel shaft and a gear train engaging the said geared wheel and the said pinion and adapted to transmit the rotation of the said winding shaft to the toothed wheel shaft at an increased rate of rotation.

12. The device of claim 8, wherein the means to rotate the toothed wheel shaft comprises a winding shaft carrying a geared wheel, a clock spring anchored by one end upon the winding shaft, a pinion upon the toothed wheel shaft and a gear train engaging the said geared wheel and the said pinion and adapted to transmit the rotation of the said winding shaft to the toothed wheel shaft at an increased rate of rotation.

13. The device of claim 8, wherein the means to control the rotation of the disc carrying winding shaft comprises a co-mounted scape wheel and pinion, a geared wheel mounted on the disc carrying winding shaft engaging the said pinion, and escapement adapted to engage the said scape wheel, an arm adapted to control the said escapement, said arm being adapted to be engaged and released by a timing mechanism.

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