

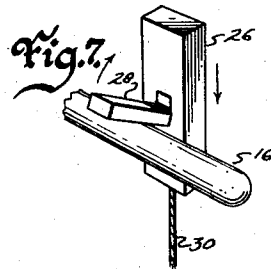
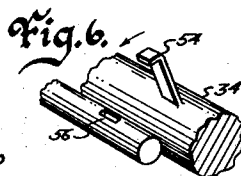
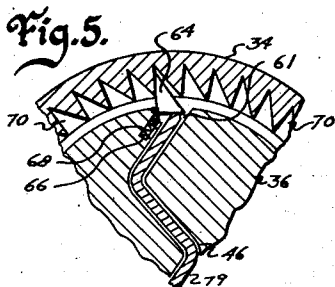
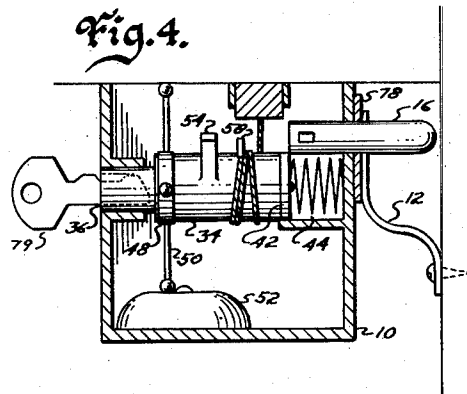
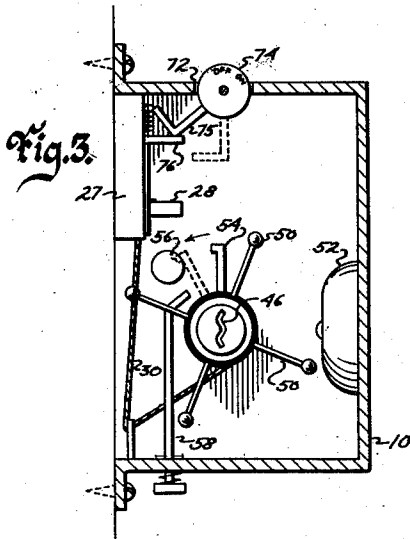
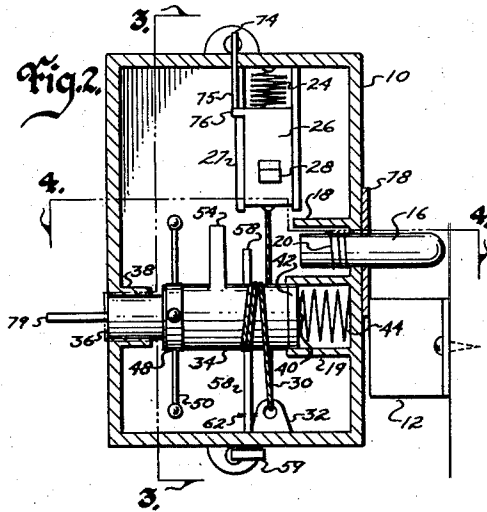
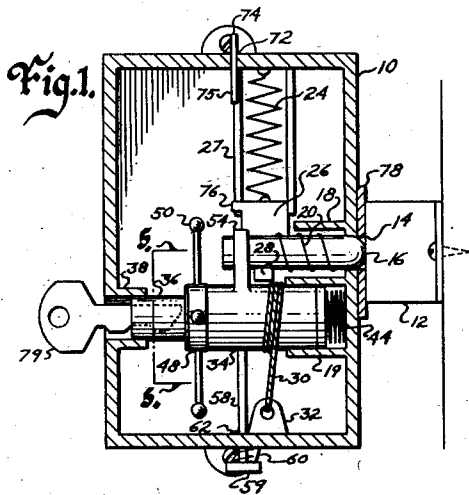
Aug. 27, 1957

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2,804,040

BURGLAR ALARM

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2,804,040

BURGLAR ALARM

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8 Claims. (Cl. 116—86)

My invention relates to alarm systems used about the various openings in a building to detect the entry into the building by a prowler or other unauthorized trespassers. More specifically, I have invented a burglar alarm that can be used on either doors or windows and which effectively resists "jamming" of its parts by a prowler. Furthermore, my burglar alarm is of much more simple design and is more economical of manufacture than any of the alarm systems known to me.

Burglar alarms per se are old in the art for man has long sought to protect his home, his belongings and his family from the unknown intruder. The most common burglar alarms today are electrically controlled and adapted to sound the alarm system whenever an opened door or window closes the circuit. Although reasonably effective, these electrical systems are expensive to install in the home and, of course, are useless in the event of a power failure. Furthermore, their utility is lost if the professional burglar can cut the wires leading to such an alarm.

It follows, therefore, that a self acting alarm which is not reliant upon electrical power would have certain advantages over the electrical systems. These self acting alarms are generally much more economical than the electric alarms for the electrical elements tend to be more expensive than elements which are purely mechanical. Then too, these self acting alarms cannot be "jammed" by any power failure or the like. However, the mechanical self acting alarms with which I am familiar have certain disadvantages. Some of them are designed to sound an alarm as a swinging door is opened. But since the action of a sliding window sash is different than a swinging door, these "door" alarms cannot be adapted to be used on a window. This same problem applies to those self acting alarms that are used on windows in that their alarm releasing means is not versatile enough to permit their effective use on both sliding windows and swinging doors.

Another disadvantage of these mechanical self acting alarms is that they employ various systems of coil springs and gear wheels to operate the alarm. The first disadvantage of this type of assembly is in the greater expense of manufacture. Coil springs, as compared to compression springs, are much more expensive for among other things they require a special spring steel out of which they are fabricated. Good compression springs, of course, are made out of any ordinary grade of wire. The gear wheels that are often employed in these systems must be precision made and require various keys and shafts on which to operate. All of these factors add to the expense of the apparatus.

The discussion of the coil springs and gear wheels gives rise to another great disadvantage of the prior art. It seems that the inventors of the alarm systems of which I have knowledge have not fully appreciated the value of protecting their alarms from being rendered ineffective by the professional burglar. The complex workings of the coil spring-gear wheel assembly lends itself well to being jammed by a well placed knife or screw driver.

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It has already been discussed how a cut wire will prohibit the electrical alarm from functioning. It has been my observation that many good alarms have detracted from their utility by lending themselves susceptible to being jammed.

5 A further disadvantage of many burglar arms is that the sounding device many times cannot be distinguished from the many horns, bells and other common sounds that might be heard anytime in a dwelling along a busy thoroughfare. If the sounding device cannot be heard or distinguished from other sounds of the night, the alarm is obviously of no use.

10 Therefore, in view of the foregoing, it is the principal object of my invention to provide a self acting mechanically operated burglar alarm that will effectively resist jamming of its parts by any tools or the like.

15 It is a further object of my invention to provide a self acting mechanically operated burglar alarm that can be adapted to use on doors and windows alike.

20 It is a further object of my invention to provide a self acting mechanically operated burglar alarm that has a sounding means that can easily be heard by the dweller of a home and can easily be distinguished from other sounds.

25 It is a further object of my invention to provide a self acting mechanically operated burglar alarm that is inexpensive to manufacture, durable in use and refined in appearance.

These and other objects will be apparent to those skilled in the art.

30 My invention consists in the construction, arrangements, and combination, of the various parts of the device, whereby the objects contemplated are attained as hereinafter more fully set forth, specifically pointed out in my claims, and illustrated in the accompanying drawings, in which:

35 Fig. 1 is a section through the alarm on a plane parallel to the door or window on which the alarm is mounted and shows the alarm in its locked and loaded position,

Fig. 2 is a similar section to that shown in Fig. 1 except that it shows the alarm in its unlocked and released positions,

40 Fig. 3 is a section taken on line 3—3 of Fig. 2,

Fig. 4 is a section taken on line 4—4 of Fig. 2,

Fig. 5 is an enlarged partial section taken on line 5—5 of Fig. 1,

Fig. 6 is an enlarged detail of the locking system, and

45 Fig. 7 is an enlarged detail of the alarm releasing apparatus.

Referring to the drawings I have used the numeral 10 to designate the case in which the alarm is housed. Numeral 12 designates a bracket which is of resilient material and which is rigidly secured to a window frame in any convenient manner when the alarm is to be used on a window. The bracket is secured to the window frame opposite hole 14 in case 10 when the window is closed. The position of the window frame in such an instance is shown by the vertical lines at the right of case 10 in Figs. 1, 2 and 4. Registering with the hole 14 is bullet-nosed plunger 16 which is slidably mounted in guide 18. Guide 18 has been omitted from Figs. 3 and 4 for clarity. Plunger 16 is embraced by compression spring 20 which is secured at one end to case 10 near hole 14 and secured at its other end to plunger 16 in any convenient manner at a point on the plunger away from hole 14. Fig. 2 shows spring 20 in its normal state whereas Fig. 1 shows spring 20 to be under tension.

65 Secured at the top of case 10 above and to one side of plunger 16 is spring 24 which is shown in Figs. 2 and 3 to be in its natural compressed state. At the lower end of spring 24 is secured bar 26 slidably mounted in guide 27. Arm 28 is hingedly secured to bar 26 and normally extends laterally in a horizontal position from the side of bar 26 adjacent plunger 16 as shown in Fig. 3. Arm 28

can pivot only upwardly but resists any downward rotation past its horizontal position.

Secured in any convenient manner to the bottom of bar 26 is cord 30 which extends through eyelet 32 at the bottom of case 10. Cord 30 is then entwined about and secured to spool 34 which slidably and rotatably engages guides 18 and 19 at one end. Extending through spool 34 is lock cylinder 36 which protrudes from spool 34 at one end to engage guide 38 and which is rotatably secured to spool 34 at its other end by means of pin 40 and disc 42. Immediately behind disc 42 and enclosed by guides 18 and 19 is spring 44 which is in its normally expanded state as shown in Figs. 2 and 3. Lock cylinder 36 has a key hole 46 which is adapted to receive a crimped key as shown in Fig. 5. Rigidly secured to the end of spool 34 away from spring 44 is a ring 48 which has stems 50 radiating from its perimeter. These stems are of such length that as spool 34 rotates they can engage both the door or window upon which the case is mounted and also bell 52 which is mounted opposite said door or window. The vertical line to the left of the case in Fig. 3 represents the face of either a door or a window sash. It can easily be seen in Fig. 3 that these stems engage both the bell 52 and the surface upon which the alarm is mounted.

Arm 54 is rigidly secured to spool 34 and is at right angles to the longitudinal axis of the spool. Arm 54 has a bent end portion that is capable of registering with slot 56 in plunger 16 when the arm 54 and slot 56 are abreast of each other. This function is brought about by rotating the spool and arm as indicated by the arrow in Figure 3. An unlocking rod 58 extends vertically from the bottom of the case and is adapted to engage arm 54 at times and rotate arm 54 out of slot 56. Rod 58 has a button 59 at its lower end with a spring 60, which is normally in its expanded state, between the button and the outside bottom face of the case. Just inside the bottom face of case 10 and rigidly secured to rod 58 is shoulder 62 which limits the outward movement of the rod. The end of rod 58 opposite button 59 is bent so as to engage arm 54 when rod 58 is moved upward. This is shown very clearly in Figure 3.

A triangular notch 61 is in cylinder 36 at the point where the cylinder protrudes from spool 34. One side of this notch 61 registers with key hole 46 so that a key extending into the key hole will also protrude part way into the notch. This is shown very clearly in Figure 5. A triangular latch member 64 is pivoted in any convenient manner to the upper edge of notch 61. A hole 66 in one side of notch 61 embraces spring 68 which is secured at one end in any convenient manner to the bottom of hole 66 and at the other end to latch 64. Spring 68 tends to rotate latch 64 into notch 61. The entire inside perimeter of spool 34 directly over notch 61 is formed by a series of notches 70 which are capable of engaging latch 64 when the latch is in the position shown in Figure 5. As may be seen in Figure 5, the notches 70 and latch 64 complement each other in such a way that the notches 70 will tend to catch or bind on the latch whenever the latch is in the upward position.

A slot 72 in the top of casing 10 pivotally houses indicator 74 in any convenient manner. An L-shaped arm 75 is rigidly secured to the lower portion of the indicator and when gravity alone acts upon the pivoted arm 75 and indicator 74, a predetermined area of the indicator is exposed through the slot 72 in the top of case 10. Rigidly secured to the top of bar 26 is arm 76 which is positioned to engage L-shaped arm 75 when spring 24 is compressed. Arm 76 tends to rotate the indicator and arm 75 about its pivot point, thus exposing a different area of the indicator through the slot 72 in the top of the casing 10. Therefore, by distinguishing the two mentioned areas on indicator 74, it is possible to determine whether or not spring 24 is compressed.

The logical operation of my device is as follows. The

alarm and case are placed on a vertical member of a window sash adjacent the frame as shown in Figure 1. At this time, the various parts of the device appear to be as shown in Figs. 2, 3 and 4. Then, the bracket 12 is secured to the frame at a point opposite hole 14 when the sash is down and the window closed. To so place the bracket, it is necessary to push plunger 16 into the case as shown in Figure 1. Pushing plunger 16 into the case expands spring 20 and only bracket 12 keeps spring 20 from forcing plunger 16 out of the hole 14. At this time, spring 24 is compressed and arm 76 on bar 26 has engaged the L-shaped arm 75 on indicator 74 and pivoted the indicator so that the area of the indicator reading "off" is exposed through slot 72. This is an indication to the operator that the alarm is not wound. To wind the alarm, the key 79 is placed in lock cylinder 36. The nose of the key enters notch 61 and forces latch 64 into engagement with notches 70 in spool 34 as shown in Figure 5. Then as the key 79 and cylinder 36 are turned in a counter-clockwise direction, spool 34 is forced to turn also and cord 30 is thus wound around the spool. The winding of cord 30 causes tension in spring 24 and allows bar 26 to be lowered. As bar 26 with hinged arm 28 passes plunger 16, arm 28 engages plunger 16 and is forced to pivot upward as bar 26 continues downward. This phenomena is shown in Figure 7. As soon as arm 28 passes by plunger 16, the arm resumes its horizontal position, and upon releasing the key, spring 24 will pull bar 26 upward to a point where arm 28 catches on the bottom side of plunger 16. Since arm 28 will pivot in one direction only, arm 28 will catch on plunger 16 and will prohibit any upward movement of bar 26 until the plunger has been released. At this time, the arm 76 on bar 26 has disengaged arm 75 on indicator 74, and the weight of arm 75 has caused the indicator to rotate in such a position that the area exposed through slot 72 is that portion reading "on." This indicates to the operator that the alarm is wound.

During the daytime or other periods when the alarm is not needed, it is possible to lock my device in the following manner:

The key 79 is placed in the lock cylinder 36. When an inward force is exerted on the key, the lock cylinder 36 and spool 34 slide inward compressing spring 44. When spring 44 is completely compressed, the arm 54 on spool 34 is abreast of slot 56 in plunger 16. By rotating the lock cylinder 36 and spool 34 in a counter-clockwise direction as shown by the arrow in Figure 3, the bent end portion of arm 54 engages the slot 56 and thus prohibits the plunger 16 from moving under any circumstances. This will lock the whole alarm and the operator can tell at a glance that the device is locked because the lock cylinder will be extending into guide 38.

When the foregoing operations have been completed, the elements will be in the position shown in Figure 1 where the releasing plunger 16 is loaded, the alarm is wound, and the whole device is locked. In the evening as the operator approaches the alarm, he will see that the indicator reads "on" indicating that the alarm is wound and he will see the cylinder lock depressed in guide 38 which will indicate that the alarm is locked. To unlock the device the operator must press upward on button 59 which will move unlocking rod 58 upward to disengage arm 54 from slot 56. Spring 44 will then force the lock cylinder 36 and spool outward so that arm 54 will clear the end of plunger 16 and be free to rotate. The key is then removed and the alarm is set for action.

As a burglar forces a window upward, the bullet nose of plunger 16 will become disengaged from bracket 12 and spring 20 will force the plunger outward as shown in Figs. 2 and 4. As the plunger moves outward, it disengages arm 28 which permits spring 24 to compress, thus pulling cord 30 upward and rotating spool 34. As spool 34 rotates, the stems on ring 50 also rotate and strike bell 52 and the surface on which the alarm is

mounted. The bell is the conventional means of alarm, but I have found that when the alarm strikes the door or window upon which the device is mounted, the wall cavities in a dwelling accentuate the vibrations set up in the door or window and carry a very audible and very distinguishable and unusual sound throughout the building. By setting up these vibrations in the structure of the building, the sound carries farther and creates a sensation at the ear of the dweller that will not easily be mistaken for any common sound in the night.

It is easily seen that my alarm can be used on any door merely by eliminating the bracket 12 and placing the plunger up against the door jamb. As the door swings open, the alarm moves away from the door jamb and the plunger 16 is released to set off the alarm in the manner described above. If any complications arise in whether the door swings right or left, inward or outward, the bracket 12 can be employed in any instance to permit usage of the alarm.

It is important to note that it is impossible to jam the alarm by prohibiting the lock cylinder 34 from rotating, as without the key being present in the small notch 62, latch 64 will be restrained in the notch by spring 68 which will allow the spool 34 to rotate free of the lock cylinder 36. Thus, if a burglar can somehow jam lock cylinder 36, the alarm will still go off. Apertured plate 78 is placed over hole 14 to prevent a knife or the like from being pushed through the slight crack between a door and door jamb to bind against the plunger when my alarm is used on a door without bracket 12.

In view of the foregoing, it is obvious that I have attained at least the principal objects of my invention.

Some changes may be made in the construction and arrangement of my burglar alarm without departing from the real spirit and purpose of my invention, and it is my intention to cover by my claims, any modified forms of structure or use of mechanical equivalents which may be reasonably included within their scope.

I claim:

1. In a burglar alarm adapted for use upon a closure for an opening in a building, a case adapted to be secured to the closure, a spring actuated releasing means, a bracket adapted to be operatively secured to the building adjacent to said opening, said bracket engaging and holding said releasing means in a restrained position, said bracket adapted to be so positioned as to free said releasing means when said closure is opened, a spring with one end secured to said case and the other end operatively connected to one end of a flexible cord, means for holding said spring under tension as long as said releasing means is restrained, a spool rotatably mounted on said case, the other end of said flexible cord entwined and secured to said spool, a plurality of stems radiating from the perimeter of said spool, a bell, said stems adapted to create audible vibrations on the bell and the closure whenever said spool is permitted to rotate.

2. In a burglar alarm adapted for use upon a closure for an opening in a building, a case adapted to be secured to the closure, a spring actuated releasing means, a bracket adapted to be operatively secured to the building adjacent to said opening, said bracket engaging and holding said releasing means in a restrained position, said bracket adapted to be so positioned as to free said releasing means when said closure is opened, a spring with one end secured to said case and the other end operatively connected to one end of a flexible cord, means for holding said spring under tension as long as said releasing means is restrained, a spool rotatably mounted on said case, the other end of said flexible cord entwined and secured to said spool, a lock cylinder rotatably secured within said spool, said cylinder adapted to receive a crimped key, means for turning said spool with said lock cylinder when said key is in said lock cylinder, a plurality of stems radiating from the perimeter of said spool, a bell, said stems adapted to create audible vibrations on the bell

and said closure whenever said spool is permitted to rotate.

3. In a burglar alarm adapted for use upon a closure for an opening in a building, a case adapted to be secured to the closure, a spring actuated releasing means, a bracket adapted to be operatively secured to the building adjacent to said opening, said bracket engaging and holding said releasing means in a restrained position, said bracket adapted to be so positioned as to free said releasing means when said closure is opened, a spring with one end secured to said case and the other end operatively connected to one end of a flexible cord, means for holding said spring under tension as long as said releasing means is restrained, a spool rotatably and slidably mounted on said case, the other end of said flexible cord entwined and secured to said spool, a lock cylinder rotatably secured within said spool, said cylinder adapted to receive a crimped key, means for turning said spool with said lock cylinder when said key is in said lock cylinder, a second spring at the end of said spool and said lock cylinder, a rigid arm with a bent end portion extending radially from said spool, a slot in said releasing means, said bent portion of said arm capable of registering with said slot when said second spring is compressed by the combined sliding and rotating movement of said spool and said lock cylinder, means for disengaging said arm from said slot, a plurality of stems radiating from the perimeter of said spool, a bell, said stems adapted to create audible vibrations on the bell and said closure whenever said spool is permitted to rotate.

4. In a burglar alarm adapted for use upon a closure for an opening in a building, a case adapted to be secured to the closure, a spring actuated releasing means, a bracket adapted to be operatively secured to the building adjacent to said opening, said bracket engaging and holding said releasing means in a restrained position, said bracket adapted to be so positioned as to free said releasing means when said closure is opened, a spring with one end secured to said case and the other end operatively connected to one end of a flexible cord, means for holding said spring under tension as long as said releasing means is restrained, an indicator protruding through a slot in said case and operatively connected to said spring to show whether or not said spring is under tension, a spool rotatably mounted on said case, the other end of said flexible cord entwined and secured to said spool, a plurality of stems radiating from the perimeter of said spool, a bell, said stems adapted to create audible vibrations on said bell and the closure whenever said spool is permitted to rotate.

5. In a burglar alarm adapted for use upon a closure for an opening in a building, a case adapted to be secured to the closure, a spring actuated releasing means, a bracket adapted to be operatively secured to the building adjacent to said opening, said bracket engaging and holding said releasing means in a restrained position, said bracket adapted to be so positioned as to free said releasing means when said closure is opened, a spring with one end secured to said case and the other end operatively connected to one end of a flexible cord, means for holding said spring under tension as long as said releasing means is restrained, an indicator protruding through a slot in said case and operatively connected to said spring to show whether or not said spring is under tension, a spool rotatably mounted on said case, the other end of said flexible cord entwined and secured to said spool, a lock cylinder rotatably secured within said spool, said cylinder adapted to receive a crimped key, means for turning said spool with said lock cylinder when said key is in said lock cylinder, a plurality of stems radiating from the perimeter of said spool, a bell, said stems adapted to create audible vibrations on said bell and the closure whenever said spool is permitted to rotate.

6. In a burglar alarm adapted for use upon a closure for an opening in a building, a case adapted to be se-

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cured to the closure, a spring actuated releasing means, a bracket adapted to be operatively secured to the building adjacent to said opening, said bracket engaging and holding said releasing means in a restrained position, said bracket adapted to be so positioned as to free said releasing means when said closure is opened, a spring with one end secured to said case and the other end operatively connected to one end of a flexible cord, means for holding said spring under tension as long as said releasing means is restrained, an indicator protruding through a slot in said case and operatively connected to said spring to show whether or not said spring is under tension, a spool rotatably and slidably mounted on said case, the other end of said flexible cord entwined and secured to said spool, a lock cylinder rotatably secured within said spool, said cylinder adapted to receive a crimped key, means for turning said spool with said lock cylinder when said key is in said lock cylinder, a second spring at the end of said spool and said lock cylinder, a rigid arm with a bent end portion extending radially from said spool, a slot in said releasing means, said bent portion of said arm capable of registering with said slot when said second spring is compressed by the combined sliding and rotating movement of said spool and said lock cylinder, means for disengaging said arm from said slot, a plurality of stems radiating from the perimeter of said spool, a bell, said stems adapted to create audible vibrations on the bell and said closure whenever said spool is permitted to rotate.

7. In a burglar alarm adapted for use upon a closure for an opening in a building, a case adapted to be secured to the closure, a spring actuated releasing means, a bracket adapted to be operatively secured to the building adjacent to said opening, said bracket engaging and holding said releasing means in a restrained position,

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said bracket adapted to be so positioned as to free said releasing means when said closure is opened, a spring with one end secured to said case and the other end operatively connected to one end of a flexible cord, means for holding said spring under tension as long as said releasing means is restrained, a spool rotatably mounted on said case, the other end of said flexible cord entwined and secured to said spool, a plurality of stems radiating from the perimeter of said spool; said stems adapted to create audible vibrations on the closure whenever said spool is permitted to rotate.

8. In a burglar alarm adapted for use upon a closure for an opening in a building, a case adapted to be secured to the closure, a spring actuated releasing means, a bracket adapted to be operatively secured to the building adjacent to said opening, said bracket engaging and holding said releasing means in a restrained position, said bracket adapted to be so positioned as to free said releasing means when said closure is opened, a spring with one end secured to said case and the other end operatively connected to one end of a flexible cord, means for holding said spring under tension as long as said releasing means is restrained, a spool rotatably mounted on said case, the other end of said flexible cord entwined and secured to said spool, a plurality of stems radiating from the perimeter of said spool, and a bell; said stems adapted to create audible vibrations on said bell whenever said spool is permitted to rotate.

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