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AUTOMATIC FIRE ALARM

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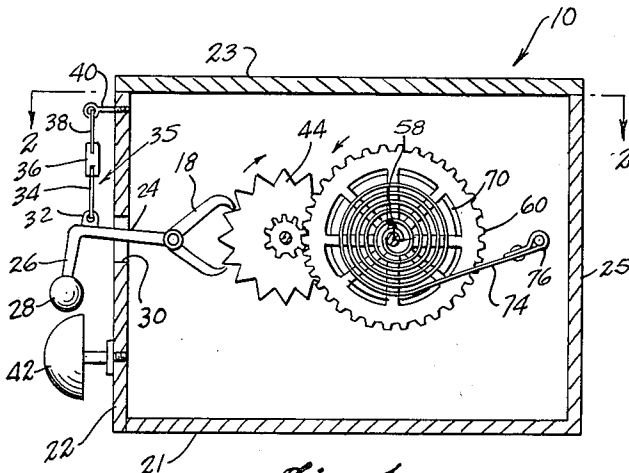


Fig. 1.

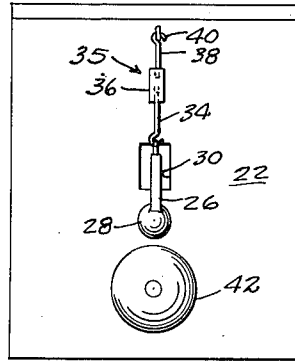


Fig. 3.

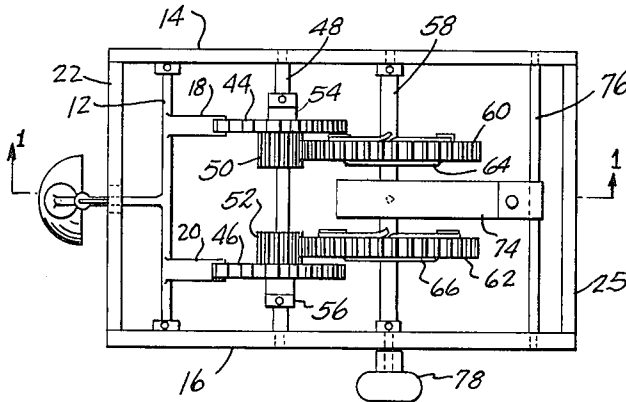


Fig. 2.

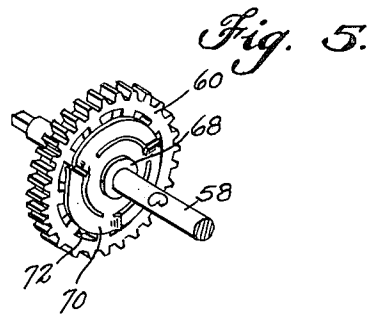


Fig. 5.

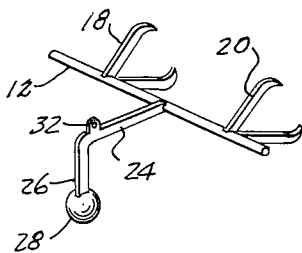


Fig. 4.

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## AUTOMATIC FIRE ALARM

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2 Claims. (Cl. 116—106)

This invention relates to fire alarms and more particularly to fire alarms which operate automatically.

It is the primary object of this invention to provide an automatic fire alarm which is simple, yet rugged, in construction and which will provide positive action to sound an alarm in case of fire.

Other objects may be obtained by employing this invention which embodies among its features an escapement arbor journaled within an alarm box housing adjacent one end thereof and carrying a pair of escapements on the arbor in spaced relation to each other, each of the escapements being operatively connected to an escapement wheel which is actuated by spring means through a train of gears, an alarm actuating arm secured at one end on the arbor and between the escapement, the other end of the arm carrying a hammer, and a fusible link connected at one end to the arm intermediate its ends and connected by an anchor to the housing at its other end, a gong carried by the housing externally thereof and in such relation to the hammer end of the alarm actuating arm that upon fusing of the fusible link the hammer will strike the gong in response to actuation of the alarm actuating arm by the pair of escapements and escapement wheels under the influence of the spring drive means.

Other objects and advantages will become apparent from the following detailed description, forming the specification, and taken in conjunction with the accompanying drawing, wherein:

Figure 1 is a vertical cross sectional view of the fire alarm embodying this invention taken on the line 1—1 of Figure 2;

Figure 2 is a top plan view taken on the line 2—2 of Figure 1;

Figure 3 is a front elevational view;

Figure 4 is a perspective view of the escapement arbor having the pair of escapements and alarm actuating arm secured thereon; and

Figure 5 is a perspective view driving gear and ratchet arrangement whereby the spring can be wound to supply actuating power to the device.

With continued reference to the drawings, a generally rectangular closed housing, generally indicated at 10, an escapement arbor 12 extends transversely of the housing 10 and is journaled at opposite ends in the respective sides 14 and 16 of the housing 10. The escapement arbor 12 has mounted thereon a pair of escapements 18 and 20 and carried by the arbor 12 in spaced relation to each other. Secured to the escapement arbor 12 and extending laterally therefrom toward the end 22 of the housing 10 and oppositely to the direction in which the escapements 18 and 20 extend, is an alarm actuating arm 24. Intermediate the ends of the arm 24, the arm is bent out of its horizontal plane so as to provide a depending finger 26 carrying a hammer or striker 28 at its end. It will be seen, that the alarm actuating arm 24 is secured at one end on the escapement arbor 12 and carries a hammer 28 at its other end. An opening 30 is provided in the end wall 22

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to permit the arm 24 to pass therethrough, and the opening 30 is of such size as to permit oscillation of the alarm actuating arm 24 freely therein.

Adjacent the finger 26, the arm 24 is provided with an ear or lug 32 in which a suitable opening has been provided to receive and secure one end of a wire 34 which has its other end secured in a piece of fusible metal 36, and another wire 38 has one end secured in the fusible metal 36 at a location thereon spaced from the end of the wire 34, and the other end of the wire 38 is anchored in an eye in the pin 40 carried by the end 22 of the housing 10 adjacent the top wall 23 thereof. The wires 34 and 38 and the fusible metal link 36 therebetween maintains the hammer 28 in spaced relation above a gong or bell 42 carried by the end wall 22 and adjacent the bottom wall 21 of the housing 10.

A pair of escapement wheels 44 and 46 mounted on a shaft 48 journaled at its opposite ends in the respective sides 14 and 16 of the housing 10 and to the side of the arbor 12 remote from the end 22 of the housing 10. The escapement wheels 44 and 46 have secured thereto respective pinions 50 and 52 also mounted for rotation upon the shaft 48 and in mutually opposed relation to each other, and each escapement wheel is also provided with respective hub and collar arrangements 54 and 56 also mounted on the shaft 48 whereby the escapement wheels and their respective pinions may be secured upon the shaft 48 so as to rotate therewith. The escapement wheel 44 is adapted to operatively engage the escapement 18 while the escapement wheel 46 is operatively connected or associated with the escapement 20.

A second shaft 58 is journaled at one end in the side 14 of the housing 10 and extends through the other side 16 through a suitable opening therein so as to be rotatably mounted within the housing 10 and extending transversely thereof in spaced parallel relation with the shaft 48 and the arbor 12. A pair of large driving gears 60 and 62 are mounted for rotation upon the shaft 58 with the gear 60 meshing with the pinion 50 and the gear 62 meshing in driving engagement with the pinion 52. Each of the driving gears 60 and 62 have operatively associated therewith respective ratchets 64 and 66, each of the ratchets having a hub 68 secured on the shaft 58 and which is fitted into a suitable central opening in the associated driving gear so that each of the driving gears 60 and 62 may rotate relative to the hub 68. The hub 68 carries at one end thereof a relatively thin spring metal wheel 70 which comprises a plurality of segments separated from each other along the circumference of the wheel and having one end of each of the segments turned inwardly so as to engage with one of the spokes 72 in the respective driving gears. The opposite end of each of the circumferential sections or segments of the wheel 70 which closely overlies the spokes 72 being bent outwardly from the spokes so that this end will ride over the spokes as the respective driving gears are rotated relative to the wheel 70 of the respective ratchets. Thus, each of the gears 60 and 62 are mounted upon the respective ratchets 64 and 66 for rotation relative thereto in one direction but rotatable therewith in the other direction.

The purpose of the ratchets 64 and 66 is to permit winding of the clock spring 74 secured at one end upon the shaft 58 between the spaced gears 60 and 62 and having its other end secured upon a strut 76 secured at its opposite ends in the respective sides 14 and 16 of the housing 10 and adjacent the end wall 25 remote from the end wall 22, the strut 76 being in spaced parallel relation to the shaft 58, and hence in spaced parallel relation also to the shaft 48 and the arbor 12.

The end of the shaft 58 that extends through the side 16 of the housing 10 is provided with a key 78 which may

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be turned so as to wind the spring 74, the spring 74 providing the spring drive means of the fire alarm. As the key 78 is turned, the driving gears 60 and 62 will not rotate since the respective ratchets will slide over the spokes 72 as the shaft 58 is turned by the key 78.

With the spring fully wound, the ratchets 64 and 66 will be in driving engagement with the respective gears 60 and 62, and the alarm actuating arm 24 will be in its raised spaced position with respect to the gong 42 and held in this position by the fusible link comprising the wires 34 and 38 and the fusible metal connector 36, while the upper arm of each of the escapements 18 and 20 are in contact with a tooth on the respective escapement wheels 44 and 46.

With the apparatus in the position shown most clearly in Figure 1, with the upper arm of each of the escapements pressing against one of the teeth of the associated escapement wheel, and held in this position under the tension of the fusible link, generally indicated at 35, the operating mechanism will be locked against operation, even though the spring 74 is thoroughly wound.

Since the fusible link 35 holds the entire device locked against operation, in the case of fire in the vicinity of the alarm, the fusible metal connecting piece 36 will melt thus permitting the wires 34 and 38 to part and releasing the alarm actuating arm 24 and also releasing the escapements 18 and 20 so that the gears 60 and 62 will drive the respective pinions 50 and 52 causing rotation of the escapement wheels 44 and 46 which will cause continued operation of the escapements 18 and 20 thereby causing the hammer 28 to repeatedly strike the gong 42 so sounding the alarm.

While there are shown and described the preferred embodiment of the invention, it is to be understood that the structure is susceptible to change and modification within the practicability of the invention and therefore should be limited only by the scope of the claims appended hereto.

What is claimed is:

1. In a fire alarm, a housing, an escapement arbor

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journalled within said housing adjacent one end thereof, a pair of escapements mounted on said arbor in spaced relation, a pair of spring actuated escapement wheels, each of said pair of wheels being operatively connected to one of said escapements, an alarm-actuating arm secured at one end upon said arbor and between said escapements, a hammer carried by said arm at the other end thereof, a fusible link connected at one end to said arm and anchored at its other end upon said housing, and a gong carried by said housing externally thereof, said hammer adapted to strike said gong, and drive means operatively connected to said escapement wheels, said means being operative upon fusing of said link thus causing actuation of said arm by said escapements and escapement wheels.

2. In a fire alarm, a housing, an escapement arbor journalled within said housing transversely thereof and adjacent one end of said housing, a pair of spaced apart escapements secured on said arbor, a shaft journalled for rotation within said housing and in spaced parallel relation to said arbor, a pair of spaced escapement wheels mounted on said shaft for rotation therewith, each of said pair of wheels operatively connected with one of said escapements, an alarm-actuating arm secured at one end upon said arbor and between said escapements, a hammer carried by said arm at the other end thereof, a fusible link connected at one end to said arm and anchored at its other end upon said housing, a gong carried by said housing externally thereof, and spring drive means within said housing operatively connected to said shaft to cause rotation thereof upon fusing of said link thus causing actuation of said arm by said escapements and escapement wheels and causing said hammer to strike repeated blows upon said gong.

#### References Cited in the file of this patent

#### UNITED STATES PATENTS

1,771,691	Riley	July 29, 1930
2,609,786	Turner	Sept. 9, 1952