

June 2, 1925.

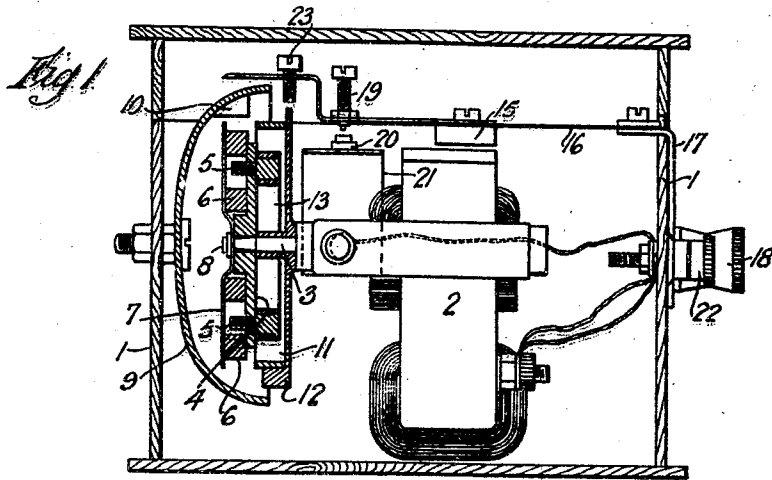
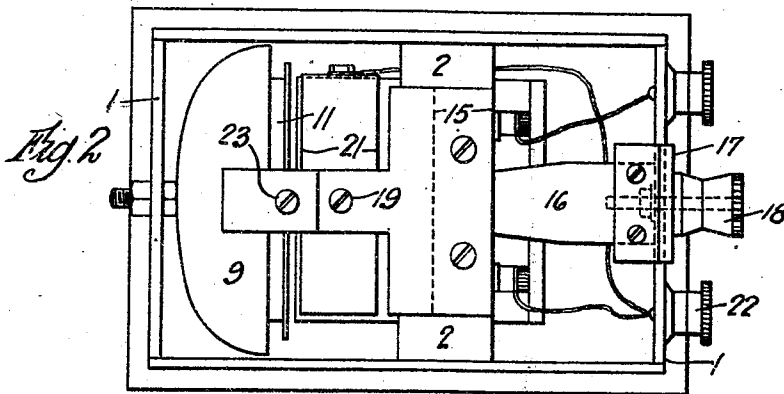
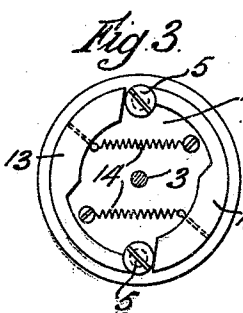
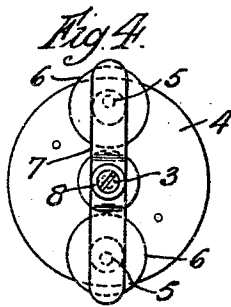
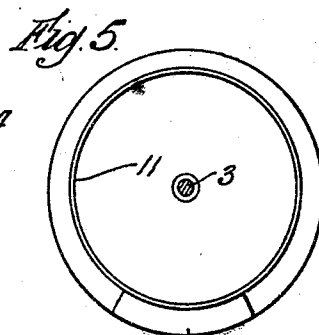
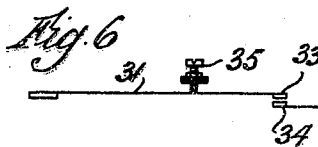
A. S. WADDINGTON

1,539,979

ALARM DEVICE

Filed Aug. 16, 1924

2 Sheets-Sheet 1



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June 2, 1925.

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ALARM DEVICE

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2 Sheets-Sheet 2

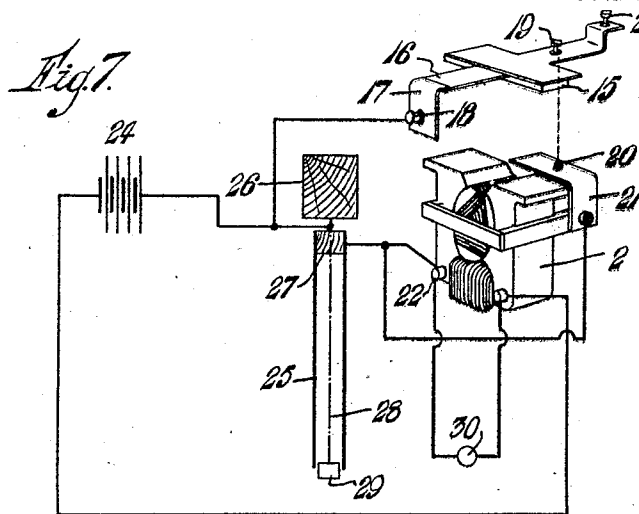
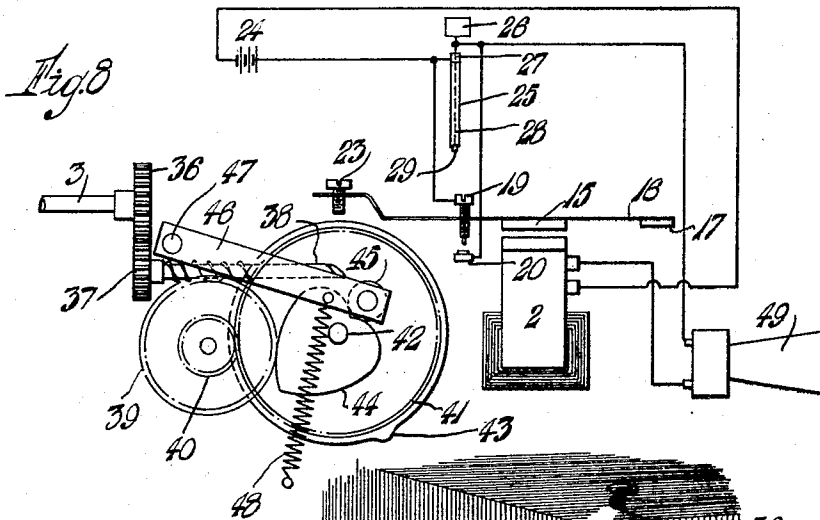
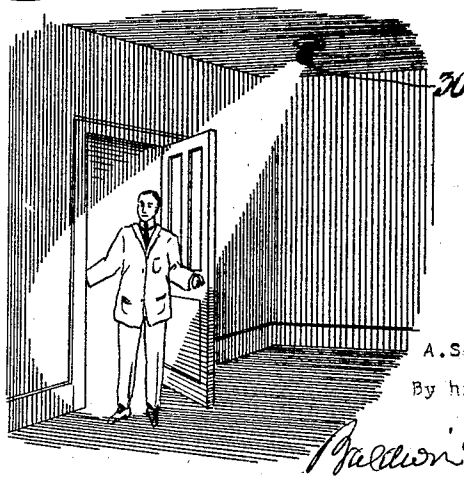


Fig. 9.



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UNITED STATES PATENT OFFICE.

ARTHUR SAMUEL WADDINGTON, OF LONDON, ENGLAND, ASSIGNOR OF ONE-HALF TO
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ALARM DEVICE.

Application filed August 16, 1924. Serial No. 732,591.

To all whom it may concern:

Be it known that I, ARTHUR SAMUEL WADDINGTON, a subject of the King of Great Britain, residing at 182 Thames Road, Chiswick, London, England, have invented new and useful Improvements in Alarm Devices, of which the following is a specification.

This invention relates to improvements in apparatus of the type comprising a circuit which is automatically closed by means operable by inertia, an alarm actuated by the closing of the circuit, and means for breaking the circuit after a predetermined lapse of time.

According to the present invention I provide a motor which is set into motion by the closing of the circuit, and I provide means actuated by the rotation of the armature shaft of the said motor for automatically shutting off the supply of current to the motor after a predetermined interval of time.

In one form of construction the armature shaft is provided with one or more hammers which strike an alarm bell, and with one or more centrifugally operated clutch members, which, when the armature shaft has obtained a given speed, engage a drum rotatably mounted on the said shaft, the drum being provided with means such as a projection or cam adapted to break the circuit which conveys current to the field windings of the motor. The circuit is automatically closed when the apparatus is moved by a contact mounted on an armature suspended by a spring close to the poles of the motor in such a manner that when the apparatus is moved, the armature moves relatively to the motor and the contact touches a second contact which is fixed in relation to the motor. So long as current flows through the windings the spring suspended armature is attracted to the poles, thus keeping the circuit closed until it is broken by the cam.

In a modification the contact carried by the spring suspended armature is moved out of engagement with the fixed contact to break the circuit by a projection on a disk geared to the rotating armature shaft. The disk has fast with it a heart shaped cam against which a spring actuated lever bears, and serves to zeroize the disk after the circuit has been broken.

The apparatus may conveniently be em-

ployed to operate an electric horn on a motor vehicle whenever the vehicle is moved or shaken as would occur, for example, when any person opened a door, or stepped upon the running board thereof.

The circuit may if desired be closed from a distance by other means operable by inertia. Such means may comprise a metallic tube and a metallic weight suspended within the tube but normally out of contact therewith; the tube and weight are connected in the motor circuit in such a manner that, when the tube is moved, it makes contact with the weight and so closes the circuit.

Preferably means are provided for adjusting either the sensitiveness of the armature suspension and/or the other circuit-closing devices which complete the circuit when the apparatus is moved or vibrated.

In the accompanying drawings which illustrate the invention, Figure 1 is a sectional elevation, Figure 2 a plan of Figure 1, Figures 3, 4 and 5 detail views, Figure 6 a detail of a modification, Figure 7 a diagram showing the wiring, Figure 8 a diagram showing a modification, and Figure 9 a detail drawing.

Referring to Figures 1 to 5, 1 is a case in which an electric motor 2 is secured. 3 is the armature shaft of the said motor having fast on it a disk 4. 5 are studs secured in the disk 4 and serving to limit the movement of weights 6 which are free to move a certain amount in a plane parallel with the disk 4. 7 is a plate which is held in position by a screw 8 and serves to retain the weights 6. 9 is a bell secured to the case 1 and provided with a projection 10 against which the weights 6 strike when the disk 4 is rotated. 11 is a brake drum so mounted that it can rotate freely on the armature shaft 3. The brake drum is weighted at 12 and the exterior periphery of the flange is eccentric, the weighted part 12 being coincident with the greatest amount of eccentricity.

13 are brake shoes pivoted on the studs 5 to the disk 4. 14 are springs which normally keep the shoes 13 in the position shown in Figure 3. 15 is an armature mounted on a flexible strip of conducting material 16 one end of which is secured to a bracket 17 provided with a terminal 18. 19 is an adjustable contact screw which can make contact with a stud 20 carried by a

bridge piece 21 insulated from the motor 2 and connected to the terminal 22. 23 is an adjustable screw.

Referring now to Figure 7, which shows an electrical diagram for use in connection with the arrangement just described, 24 is a battery. 25 is a brass tube suspended from a support 26 of insulating material and having a plug 27 of insulating material at its upper end, from the centre of which a metal chain 28 is suspended. 29 is a metal weight suspended from the chain 28. 30 is a lamp connected in parallel with the terminals of the motor.

In operation the screw 23 is adjusted so that if the contact screw 19 be touching the stud 20 when the drum 11 is rotated, the part 12 will come in contact with the screw 23 and break the contact between the screw 19 and stud 20. The screw 19 can be set so close to the stud 20 that any movement of the case 1 will cause the strip 16 to vibrate which will result in contact being made between the screw 19 and the stud 20. When this occurs, current flows through the motor 2 and the armature 15 is attracted by the field magnets of the motor, so that so long as current is flowing through the field coils, the contact screw 19 remains in contact with the stud 20. When current flows through the motor, the armature shaft 3, together with the disk 4, is rotated, the weights 6 are then flung out by centrifugal force and make contact with the projection 10 on the bell 9, thus giving an alarm. As soon as the armature shaft 3 has gathered sufficient speed, the brake shoes 13 are moved outwards by centrifugal force and make contact with the brake drum 11. When this occurs, the brake drum 11 is rotated and the part 12 thereof comes against the screw 23 and breaks contact between the contact screw 19 and stud 20, thus shutting off current from the motor.

When the motor is at rest, the part 12 of the brake drum 11 returns to its original position, as shown in Figure 1. The motor may also be put into action and the bell 9 rung if the support 26 be moved. This support may, for example, obviously be secured to a door or to a window or may be hooked on to coats or other garments hanging from a rack. When the support 26 is moved, the plug 29 makes contact with the tube 25 and allows current to flow through the motor 2. When this occurs, the armature 15 is attracted by the pole pieces of the motor and contact is made between the screw 19 and stud 20 so that the bell is sounded in the manner previously described, until the piece 12 of the brake drum 11 comes against the screw 23 and breaks contact.

Whenever current is flowing through the motor, a portion thereof also flows through the lamp 30 which may conveniently be lo-

cated near to the support 26 so as to shine on the person causing the support to move, as is shown diagrammatically in Figure 9.

Figure 6 shows an alternative arrangement for completing the motor circuit when its support, which may, for example, be a window, is moved. The arrangement comprises two strips 31, 32, of flexible conducting material having contact studs 33, 34. Preferably the strips are of different length or flexibility and one of them is also preferably provided with a screw 35 by means of which the gap between the studs 33, 34, can be adjusted.

Figure 8 shows an alternative form of apparatus for limiting the duration of the alarm, the apparatus being shown connected to a Klaxon or the like electric horn. In this modification the armature shaft 3 has fast on it a pinion 36 in mesh with a pinion 37 fast on a worm shaft 38 which latter gears with a worm wheel 39 fast with a pinion 40 in mesh with a gear wheel 41 mounted on a shaft 42. The gear wheel 41 is provided with a projecting cam 43 adapted to make contact with the screw 23. Fast on the shaft 42 is a heart-shaped cam 44 on to which a roller 45 mounted on a rod 46 pivoted at 47 is drawn into contact by a spring 48. 49 is a Klaxon horn.

In operation when current is supplied to the motor 2 either by moving its case 1 (not shown) or by moving the insulated support 26, the gear wheel 41 is rotated and after the peak of the cam 44 has passed the roller 45, the cam 43 breaks contact between the screw 19 and stud 20, and current is shut off from the motor.

The armature shaft 3, however, continues to rotate owing to the roller 45 which is pressed into contact with the cam 44 by the spring 48 until the cam 44 and gear wheel 41 have returned to their original position, as shown in Figure 8.

What I claim is:—

1. An alarm mechanism comprising a motor including an armature, a normally open circuit therefor including a vibration operated circuit closer, means operated upon energization of said motor for maintaining said circuit closed, an alarm, means operated by rotation of the armature for sounding the alarm, and means including a centrifugally operated clutch operated by the rotation of said armature for actuating said circuit closer to open the circuit when said armature attains a predetermined speed.

2. An alarm circuit comprising a motor including an armature and a field, a normally open circuit therefor including a vibration operated circuit closer, means operated upon the energization of the field of said motor for maintaining said circuit closer in closed position, an alarm means operated by rotation of said armature for op-

erating said alarm and means including a centrifugally operated clutch operated by rotation of said armature for moving said circuit closer to open position for opening said circuit when the armature attains a predetermined speed.

3. An alarm mechanism comprising a motor including an armature, a normally open circuit therefor including a vibration operated circuit closer, means whereby energization of said motor will normally hold the circuit closed, an alarm means operated by rotation of the armature for sounding the alarm, and means for actuating the circuit closer to open the circuit when the armature attains a predetermined speed.

4. An alarm mechanism comprising a motor including an armature having a shaft, a normally open circuit therefor including a vibration operated circuit closer, means whereby energization of said motor will normally hold the circuit closed, an alarm, means-operated by rotation of the armature shaft for sounding the alarm, a disk fast on

the armature shaft, a drum loosely mounted on said shaft, weights pivoted on the disk and adapted to engage the drum under the influence of centrifugal force when the armature shaft attains a predetermined speed and means whereby the rotation of the drum will actuate the circuit closer to open the circuit.

5. An alarm mechanism comprising a motor including an armature having a shaft, a normally open circuit therefor including a vibration operated circuit closer, means whereby energization of said motor will normally hold the circuit closed, a disk fast on the shaft, movable means carried by the shaft, an alarm operated by said means when said disk is rotated and means actuated by the rotation of the armature shaft when it attains a predetermined speed for actuating the circuit closer to open the circuit.

In testimony that I claim the foregoing as my invention I have signed my name this seventh day of August, 1924.

ARTHUR SAMUEL WADDINGTON.