

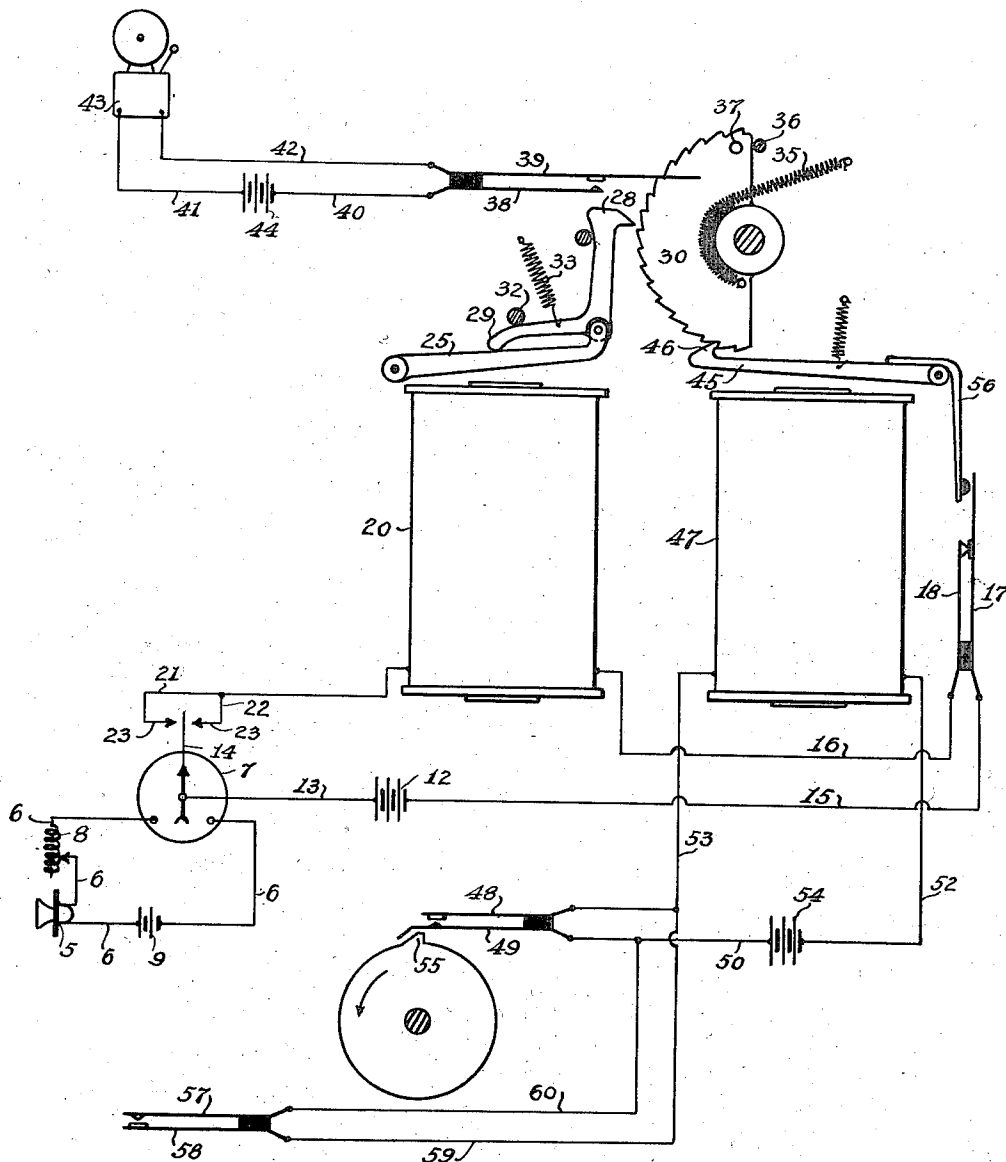
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R. M. HOPKINS ET AL

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NONACCUMULATIVE BANDIT ALARM RETARD DEVICE

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INVENTORS:

Richard M. Hopkins,
William J. Kleinknecht.

By

Harold D. Penney, ATTORNEY

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NONACCUMULATIVE BANDIT ALARM
RETARD DEVICE

Richard M. Hopkins, Rutherford, N. J., and
William J. Kleinknecht, Stratford, Conn., as-
signors to American District Telegraph Com-
pany, New York, N. Y., a corporation of New
Jersey

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This invention relates to alarms and accumu-
lator devices and methods of operation thereof, and
more particularly to sound-sensitive accumulator
alarms and devices, whereby an alarm, which will
not be set off by one or a very few disturbances,
will be set off by a considerable number of such
disturbances. In such devices as heretofore con-
structed an accumulator is moved an increment
each time said sound-sensitive device is actuated;
and the alarm is operated by the accumulator only
after accumulated movements thereof, as caused
by repeated sound disturbances.

These accumulator devices have the defect of
being set off by a number of very infrequent dis-
turbances, thereby causing undesired false
alarms.

Therefore one object of the invention is to pro-
vide an apparatus or device of this kind which
will not be set off by very infrequent disturbances
and which will be set off by sufficiently frequent
disturbances. To this end, another object of the
invention is to provide an apparatus or device of
this kind provided with means for periodically
restoring the accumulator to clear it of the ac-
cumulation of very infrequent movements.

Another object of the invention is to provide
an apparatus or device of this kind which may be
at will or automatically cleared as a matter of
routine.

Other objects of the invention are to improve
generally the simplicity and efficiency of such
methods and apparatus and to provide a device
or apparatus of this kind which is certain, and
reliable in operation, and economical to manu-
facture and install.

Still other objects of the invention will appear
as the description proceeds; and while herein de-
tails of the invention are described and claimed,
the invention is not limited to these, since many
and various changes may be made without de-
parting from the scope of the invention as claimed
in the broader claims.

The inventive features for the accomplishment
of these and other objects are shown herein in
connection with an improved alarm device which,
briefly stated, includes the accumulator operat-
ing the alarm and means periodically operated
at suitable intervals of, for instance, every fifteen
minutes for restoring the accumulator. The ac-
cumulator is cleared at said timed intervals, so
that, unless the number of disturbances necessary
to carry the accumulator to an alarm position are
received within that stated interval, no alarm
will result.

The object of such an arrangement is to over-

come false alarms due to extraneous disturbances
at infrequent intervals. Thus, if every half hour
a heavy street car were to pass a bank having the
heretofore known common type of accumulator
and create sufficient disturbances to step up the
accumulator, it would, in the course of five hours,
send through about ten impulses and thereby set
off an alarm. To overcome this, the usual method
is to adjust the sound responsive apparatus so
that it will be less sensitive to these extraneous
noises. In doing this however, it of course has
the defect of being made less sensitive to the
noises which it is expected to detect. An object
of the invention is to overcome this defect.

In the accompanying drawing showing, by way
of example, one of many possible embodiments
of the invention, the figure is a diagrammatic
view of the apparatus.

This system is controlled by an alarm initiating
device, for instance a sound sensitive device such
as a microphone 5 connected by conductors 6 in
series with a sensitive galvanometer 7, a variable
resistance 8, and a source of current 9 to form a
sound controlled circuit.

A stepping electro-magnet-current-source 12
has one pole connected by a conductor 13 to the
galvanometer needle 14 and its other pole con-
nected by conductors 15, 16 and normally closed
switch 17, 18 to one end of the coil of a stepping
electro-magnet 20 having its other end connected
by conductors 21, 22 to a pair of normally disen-
gaged contacts 23, whereby when variation in said
sound-controlled circuit caused by sound vibration
of the microphone diaphragm causes vibration of
said needle 14 into contact with one of said con-
tacts 23, said stepping magnet 20 is energized and
caused to attract a normally retracted pivoted
active armature 25.

A bell-crank shaped active pawl 28, 29 pivoted
at its angle part to the free end of said armature
25 has a lower arm 29 lying along the armature,
the other arm being formed into an end pawl hook
28 engageable with a toothed accumulator sector
30. A stop 32 engageable with the free end of said
arm 25 limits retracting movement of the arma-
ture and serves to force the hook 28 from the
sector when the armature is retracted by a spring
33 engaging an intermediate part of the inactive
arm for retracting the armature when the magnet
is deenergized, said spring serving for drawing
the hook against the sector when the armature
is attracted, whereby on each operation of the
microphone and consequent attraction of the
armature, the sector is moved in increment against

the action of a restoring spring 35 for restoring the sector to initial position against a stop 36.

An actuating pin 37 on the sector is adapted to engage and close a normally open alarm switch 38, 39, which switch is some distance from said pin and engageable and closable by the pin after considerable accumulated movement of the sector. Conductors 40, 41, 42 connect an alarm 43 and alarm current source 44 in series between the elements of the alarm switch 38, 39, whereby whenever said switch is closed, an alarm is sounded.

A pivoted detent armature 45 having a hooked free end 46 forms a detent pawl normally yieldably engaged with said teeth to hold the sector against restoring movement, whereby said increments of movement of the sector may, if sufficiently frequent, be accumulated until said pin 37 engages and closes the alarm switch and sounds the alarm.

If the sound disturbances are not sufficiently frequent, the sector will be restored by the action of a clearing or restoring electro magnet 47 adapted when energized to attract the detent armature 45 and retract the detent pawl 46 to restore the sector as will now be explained. A normally open clearing switch 48, 49 is connected by conductors 50, 52, 53 in series circuit with the clearing or restoring magnet coil 47 and current source 54, whereby when a rotary restoring cam 55 periodically engageable with the member 49 of said clearing switch closes the latter at frequent intervals, for instance fifteen minute intervals, the clearing magnet is energized thereby to attract the armature 45 and allow the spring 35 to restore the sector, thus eliminating disturbances accumulated at infrequent intervals, while permitting the accumulation of disturbances between engagements of the cam.

Without the switch 17, 18, the accumulator could not be restored if the cam engagement took place while the armature 25 was drawn down, as the hook 28 would be engaged with the accumulator teeth. Therefore the normally closed cut-out switch 17, 18 is interposed in the motor circuit to be opened (each time the accumulator is cleared) by an actuating arm 56 carried by the detent armature 45 for opening the motor circuit during restoring to release active armature 25 and insure the disengagement the active pawl whenever the detent pawl 46 is disengaged. There is also provided a normally open routine conditioning switch 57, 58 connected by conductors 59, 60 in parallel with the switch 48, 49 for routine closing, for restoring the sector as at office or bank as at closing time. This switch 57, 58 may be manually or automatically operated in any desired manner.

Thus it is seen that a periodical clearance of the sound accumulator 30 takes place every time contact of the cam 55 is made at, say, 15 minute intervals, which actuates the restoring magnet 47, permitting the sound accumulator 30 to be reset.

This timed contact of the cam 55 can be readily arranged from the clock mechanism which in some present systems is used for timing the hours when the alarm protection is in effect, and which is also used for limiting the length of time that the alarm signaling device sounds.

The operation is obvious from the foregoing. If only a few sound disturbances received at the microphone 5 are insufficient to cause the pin 37 to move to alarm position before contact is caused by the cam 55, this contact will cause magnets 20 and subsequently, 47 to be energized, the accumulator will be restored and no alarm will be sounded.

However, if the sound disturbance or disturbances are continuous or frequent as by drilling, torch or electric cutting or other burglar operations, the accumulator will be stepped to alarm position before the contact of cam 55, and an alarm will be sent.

I claim as my invention:

1. An alarm apparatus comprising a sound actuated device adapted to be located in a building and operative by noise of burglar operation therein and by infrequent street noises exterior to the building; an accumulator member movable by said device an increment each time the device is operated; alarm means operable by the member after accumulated movements thereof; and timed means for automatically periodically restoring the member to initial position, often enough to prevent alarm by said infrequent street noises, and far enough apart to allow the sending of an alarm by said burglar operations, thereby to prevent the sending of false alarms by said street noises, while maintaining the apparatus in condition to send alarms from burglar operation.

2. An apparatus comprising a sound sensitive device; a motor circuit controlled by said device; a stepping motor in and controlled by said circuit; an accumulator member; engagement means operated by the motor and engageable with said member to move it an increment each time the motor is operated and withdrawn from the member when the motor is deenergized; means tending to restore the member to initial position; a translating means operable by the member after accumulated movements thereof; a detent engaging the accumulator member for holding the member against restoring movement; a clearing electro magnet adapted when energized to attract the detent from the accumulator member to allow the member to be restored; a normally open clearing switch connected in series circuit with the clearing magnet coil; restoring means for closing said clearing switch; and means carried by the detent to open the motor circuit when the detent is attracted.

3. An apparatus comprising a sound sensitive device; a motor circuit controlled by said device; a stepping motor in and controlled by said circuit; an accumulator member; engagement means operated by the motor and engageable with the member to move it an increment only when the motor is operated; means tending to restore the member to initial position; a translating means operable by the member after accumulated movements thereof; a detent engaging the accumulator member for holding the member against restoring movement; a clearing electro magnet adapted when energized to attract the detent from the accumulator member to allow the member to be restored; a normally open clearing switch connected in series circuit with the clearing magnet coil; restoring means for periodically closing said clearing switch at frequent intervals; and an actuating means carried by the detent for opening the motor circuit to release the engagement means from engagement with the accumulator to allow the accumulator member to be restored.

4. An apparatus including in combination an alarm circuit, a stepping accumulator associated with said circuit for control thereof; another circuit having therein an element responsive to common infrequent sounds, and an oscillative member; means disposed between said member

and said accumulator for stepping the latter responsive to said common sounds, means for holding the accumulator after each step, and means for periodically releasing the accumulator to normally prevent operation of the alarm circuit, said element adapted also to be vibrated by surreptitious sounds whereby likewise to step the accumulator, the steps caused by said latter sounds being additive to the first steps, whereby to operate the alarm circuit before the normal release period.

5. An apparatus comprising in combination an electric circuit having therein an alarm, spring controlled ratchet means cooperating with said circuit for control thereof, another circuit having therein an element responsive to common infrequent sounds, said latter circuit including an oscillative member; means disposed between said member and the first means for stepping the ratchet a one tooth interval against the action of the spring responsive to said sounds, and means for periodically releasing the ratchet so as to prevent operation of the alarm, said element adapted also to be actuated by surreptitious sounds, whereby the alarm may be operated before a normal release.

6. In combination with an electric circuit including an alarm, a spring controlled ratchet cooperating with said circuit for control thereof, another circuit including an element which is responsive to common infrequent sounds, said latter circuit including an oscillative member, interposed means cooperating with said member and having a pawl engaging the ratchet for

stepping the latter a one tooth interval responsive to said sounds, means for holding the ratchet after each step, and means for periodically releasing the ratchet so as to normally prevent operation of the alarm, said element adapted also to be actuated by surreptitious sounds, whereby to operate the alarm the end of a release period, said respective vibrations being additive.

7. In an apparatus comprising in combination an electric circuit including an alarm, and a second circuit having therein an oscillative member which is movable responsive to infrequent normal sounds; a stepping ratchet cooperating with the first mentioned circuit for operation thereof, means for stepping said ratchet, said means including a pivoted lever, a pawl carried by said lever and engageable with the teeth of the ratchet, another circuit including an electro magnet, said magnet having its armature adjacent to and coacting with said lever, the last mentioned circuit having contacts coacting with said member, so that said latter circuit may be closed on said sounds in order to step the ratchet, means for holding the ratchet after each step, and means for periodically releasing the ratchet so as to normally prevent actuation of the alarm circuit, said member being also adapted to be oscillated by sounds caused surreptitiously, said respective sounds being additive, whereby with the second mentioned sounds, the alarm may be operated before a normal release of the ratchet.

RICHARD M. HOPKINS.
WILLIAM J. KLEINKNECHT.