Jan. 11, 1944. A. M. DONOFRIO 2,338,803

PREDETERMINING TIME DELAY

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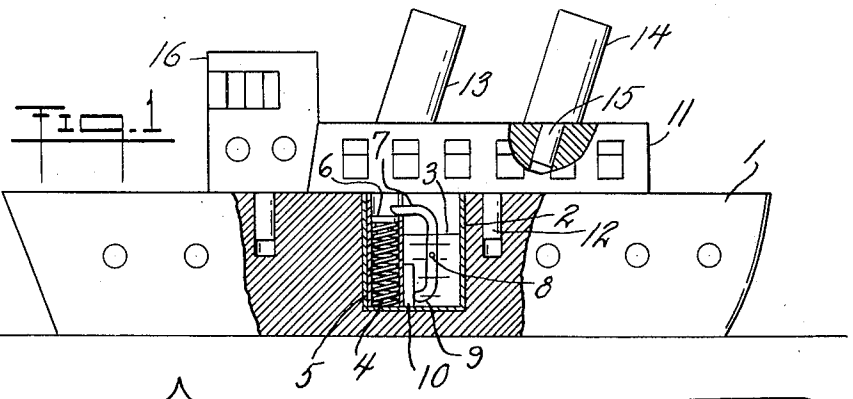


FIG. 1

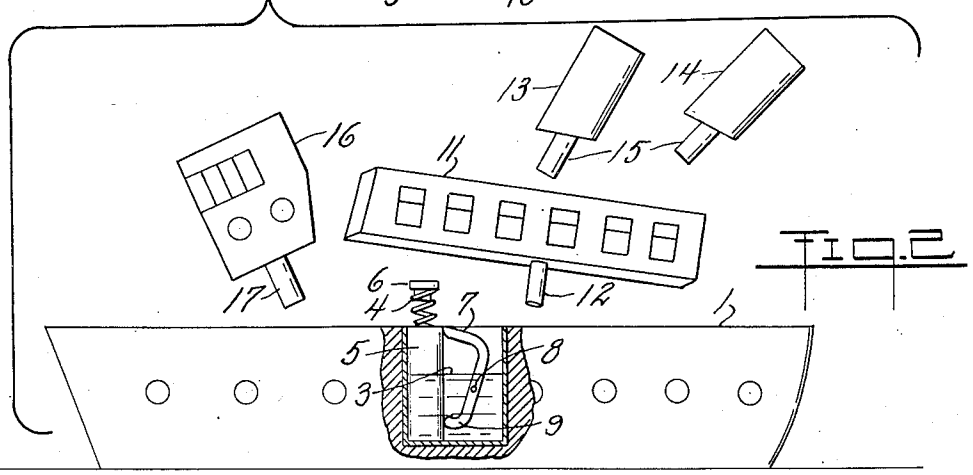


FIG. 2

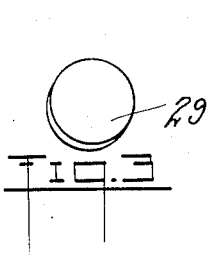


FIG. 3

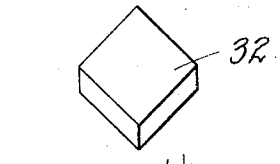


FIG. 4

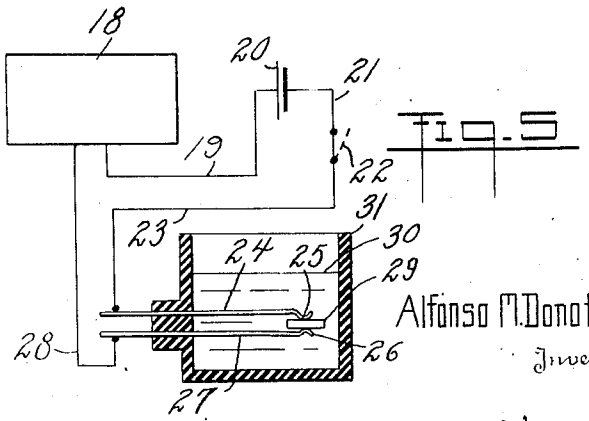


FIG. 5

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PREDETERMINING TIME DELAY

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2 Claims. (Cl. 161—1)

This invention relates to timing, when operatons are to occur, by a dissoluble element.

This invention has utility when embodied in effervescent salt compound effecting positioning of an actuation member and dissoluble in clearway for electrical or mechanical functioning.

Referring to the drawing:

Fig. 1 is a side elevation, with parts broken away, showing an embodiment of the invention in a toy battleship adapted for time delay release hereunder as symbolically responsive to bomb action or explosion;

Fig. 2 is a view of the device of Fig. 1, wherein a time delay has functioned for the set-off or explosion-like operation;

Fig. 3 is a perspective view of the dissoluble body of predetermined time delay effervescent salt compound, when such is a cylindrical section;

Fig. 4 is a perspective view of a polygonal type of effervescent tablet for the functioning hereunder, wherein there may be purpose in holding the device against angular shifting or advantage for different spaced relations with the same time delay; and

Fig. 5 shows an embodiment of the invention for electric control in lieu of the mechanical control as disclosed in Fig. 1.

A toy herein is shown as vessel hull or body 1 having pit 2 therein as a vessel containing bath 3. Spring 4 in guide 5 has throw head 6, which head 6 may be retained to compress the spring 4 when trigger 7 having pivot 8 is in holding position therefor. This held position for the trigger 7 may be effected by having remote arm 9 of this trigger lever 7, 9, so thrown when tablet 10 is between this movable member portion 9 of the trigger and fixed mounting, herein shown as side wall of the guide 5.

In the functioning hereunder, this cap-like tablet or effervescent predetermined formed body 10 may be placed to set the member 9 and thereby the trigger 7 is in holding position for the projectable body 6 against the action of compressed helical spring 4. In the predetermined timing hereunder, this toy as set afloat or otherwise used as an amusement device, may have the vessel 2 sufficiently filled with water to submerge the body 10. This body of effervescent compound accordingly does not dissolve to leave a salt skeleton, but as the gas emanating action is effected, the body in practice seems to blow as a full clearway that the member 9 may clear to swing into the initial contact or abutting relation with the body 5. The spring 4 is a factor in effecting this operation, and as there is thus snap release of the projectile 6 upon movement of the trigger portion of the lever 7 clear therefrom, such upward projection of the body 6 is herein shown as effecting dispersion of elements of the toy, such as cabin portion 11 having its dowel 12 clear the hull 1. In this expulsion operation of the projector element 6, funnels 13, 14, may have their dowels 15 clear the cabin portion 11, and pilot house 16 may have its dowel 17 clear the hull of the toy vessel 1. Accordingly, as this explosion operation has been to the amusement of the onlookers, it is only necessary to assemble and in the assembling put in the cap or predetermining time body member on resetting of the trigger. If this be with the absence of bath 3 there may be a deferred action until the next time a bath is introduced and accordingly a time delay thereafter. In the event there is to be repetition of the operation, the bath 3 may be left, or may be recharged in the event the bath liquid might become too strong to effect the solvent rate for which the predetermined schedule hereunder is adopted.

In carrying out this practice, there may be in the effervescent compound a composition of say 20 per cent citric acid, 20 per cent tartaric acid, and 60 per cent sodium bicarbonate. The acids and bases may to an extent neutralize notwithstanding the effervescent response. This mass, made up in say five grain capsules of approximately ⅝ inch in diameter and for 15 seconds timing compressed to ⅛ inch thick, are about one hundred to a 3 fluid ounce vessel, as a pharmaceutical bottle.

In the event there be desire to increase the timing say to 1 minute, the compression on this same diameter capsule may reduce the thickness to say $\frac{1}{16}$ inch and thereby delay the timing from the 15 seconds to 1 minute. This smaller or thinner tablet of the cylindrical form will accordingly pack somewhat more than one hundred and as many as one hundred and fifty or upward in a 3 ounce bottle.

On the basis of experience that this effervescing is an effective solvent for fully clearing the spacing between the members set, this may be used in conjunction with electric toys, whether for depth bomb, torpedo, battleship of such type of toy, or even in actual warfare practice or burglar alarms or other occasion for appropriate time delay as electrically controlled. Accordingly, with this installation 18, line 19 therefrom may be to electric energy source 20 with line 21 therefrom past manually controllable switch 22

and by line 23 to spring arm 24 having terminal 25 normally flexed to abut opposing terminal or contact 26 of spring arm 27 connected by line 28 to the installation 18 having therein the safety signal, whether burglar alarm to be seen or heard, as light or siren, bell or annunciator, or whether such be in torpedo ejection in warfare, or likewise for war depth bomb, time bomb, or from aerial weapon of warfare in lieu of sea or land.

Herein the time delay is effected by effervescent body or tablet 29 in bath 30 retained in vessel or receptacle 31. In the selection of circuit for an installation of this character with low voltage, water bath 30 is not a sufficient electrolyte to effect communication between the spring arms or members 24, 27 as having insulation connection or spacing into the bath or vessel 30. Furthermore, the time interval for dissolving, in the experience with this effervescent salt, especially as the neutralizing action between the acid and base, has not meant that the initial water bath 30, even tap water, has served as electrolyte under such low voltage. A definite timing is thus effected by the dissolving of the spacer or effervescent predetermined formed or packed body 29. As such is dissolved in the time delay lapse, the effervescing action so disperses the compound that no fragments of the compound are present to interfere with positive direct contacting between the terminals or contacts 26, 25, thereby closing the circuit for functioning as the device has been pre-set at the manual switch 22 and the control has been adopted by the submergence or bath 30.

In adopting polygonal body 32 as the time delay, the larger area flat sides may be adopted when there is relatively close spacing between the control members to be positioned. When there is a larger travel latitude the oblong sides of the member 32 may be adopted in the spacing. Again there may be occasion to hold the body angularly against shifting which is adaptable in the polygonal type as against the cylindrical type of body 29.

The self neutralizing effervescent salt has been effective under low voltage for electric contact completion in submergence with avoidance of electrolytic disturbance. In the event there may be purpose to avoid such hazard, the contacts may be clear of the bath and operated say from the functioning of the trigger.

What is claimed and it is desired to secure by Letters Patent is:

1. A control device comprising a pair of spaced members adapted for relative movement and to perform an operation when caused to approach each other, means urging said members toward each other, a tablet of soluble material adapted to hold said members in mutually spaced relation, a solvent adapted to attack said tablet to destroy the same upon immersion of the latter therein, the material of said tablet being effervescent under the action of said solvent thereon to expel the tablet material completely from between said members.

2. A control device comprising a pair of spaced members adapted for relative movement and to perform an operation when caused to approach each other, means urging said members toward each other, a tablet of soluble material adapted to hold said members in mutually spaced relation, a solvent adapted to attack said tablet to destroy the same upon immersion of the latter therein, the material of said tablet being effervescent under the action of said solvent thereon to expel the tablet material completely from between said members, and being selectively precompressed during formation of said tablet to determine the rate of dissolution of the tablet in said solvent.

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