

1 516 989

PATENT SPECIFICATION

(11) 1 516 989

(21) Application No. 24809/75 / (22) Filed 10 June 1975 /
(44) Complete Specification published 5 July 1978
(51) INT CL² A01K 69/08, 69/00
(52) Index at acceptance A1A 20 23



(54) DEVICE FOR AUTOMATIC RAISING OF FISH TRAPS CRAYFISH POTS, NETS AND THE LIKE

(71) I, CLARENCE WILLIAM CHALLENGER, Australian citizen, of 39 Brian Avenue, Commonwealth of Australia, do hereby declare the invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to a device for automatically raising fish traps, crayfish pots, nets and the like, hereinafter collectively referred to as "trap", without the aid of ropes and the like.

Hitherto fishermen and particularly cray or rock lobster fishermen have been more or less compelled to operate in relatively shallow water generally not in excess of two hundred feet in depth. One disadvantage when fishing in deeper waters is the additional cost of longer and heavier hauling lines and the amount of labour and the time required to bring the trap to the surface. A further disadvantage which also applies to traps laid in shallow water is that the floats attached to the line tend to lift the trap off the bottom when a heavy swell is running so that the trap walks along the bottom.

The present invention preferably provides a device for automatically raising traps which eliminates the need for long lengths of hauling line and reduces the amount of time and labour required to raise the trap and remove the catch therefrom.

According to the invention we provide a device for automatically raising traps, comprising a container of compressed gas, a buoyancy means associated with said trap, a control valve to allow gas to pass from the gas container to the buoyancy means to displace water from the buoyancy means, and an electrical circuit activated by a signal transmitted through the water other than through a cable to actuate the control valve.

The buoyancy means may comprise a deflated balloon fitted inside a holder or it may comprise a cylinder which is attached

to the trap or it may be one or more compartments formed in one or more members from which the trap is formed. In particular the walls of the trap may be formed of a length of plastics pressure resistant pipe wound in a spiral form with one end connected to the gas cylinder and the other end open.

A radio or sound signal is used to activate the electrical circuit to operate the valve. Because of the fact that radio waves do not penetrate water to any extent unless they are of very low frequency, a sound signal is to be preferred and in order to avoid the device being triggered accidentally it is preferable to use a coded signal.

The invention will be better understood by reference to the following description of the specific embodiments shown in the accompanying drawings wherein:—

Fig. 1 is a plan view of a crayfish pot constructed in accordance with the invention;

Fig. 2 is a sectional view of the pot of Fig. 1;

Fig. 3 is an inverted plan view of the pot of Fig. 1;

Fig. 4 is an end view of a second embodiment;

Fig. 5 is a cross section of the buoyancy chambers of the embodiment of Fig. 4;

Fig. 6 is a longitudinal section of the buoyancy chambers of the embodiment of Fig. 4;

Fig. 7 is a block circuit diagram of a preferred form of signal receiver; and

Fig. 8 is a block circuit diagram of a preferred form of signal decoder and solenoid driver.

Referring now to the embodiment shown in Figs. 1, 2 and 3 of the drawings the crayfish pot is formed by winding a length of plastics pressure resistant pipe into a spiral form to form a substantially flat bottom 11 and a substantially cylindrical wall 12, the turns decreasing in diameter to form a rounded top 13 which is fitted with a

conventional frusto conical mouth 14 formed of rigid plastics or other suitable material. The turns of the pressure resistant pipe are held in position by a series of ribs 15 formed of metal or other suitable material. One end 16 of the pressure resistant pipe is situated at the bottom of the trap and is open. The other end 17 is adjacent the mouth 14 and is fitted with a tap, or valve 18. A container 19 of carbon dioxide is fitted into the bottom of the pot and is connected through a control unit 20 and a length of pipe 21 to the end 17 of the pressure resistant pipe.

The control unit 20 is constructed as shown in the block circuit diagram of Figs. 7 and 8 and comprises a signal detector and decoder coupled to a solenoid driver which actuates a solenoid valve as hereinafter described. When the solenoid valve is opened gas flows from the container 19 through the pipe 21 to the end 17 of the plastics pressure resistant pipe.

In operation, the pot, after having been fitted with a container 19 filled with CO₂ under pressure, is baited and then the pressure resistant pipe filled with water by inserting a hose into the end 16 and opening the tap 18. When filled, the tap 18 is closed the hose removed and the pot dropped into the water. The pot sinks to the bottom and when the fisherman returns to the location he transmits a coded signal by placing a signal generator into the water. The control unit 20 picks up the signal and opens the solenoid valve. The gas passing from the container 19 expels the water from the pressure resistant pipe through the end 16. The pot becomes buoyant and rises to the surface. As it rises to the surface excess gas is discharged through the open end 16 of the pressure resistant pipe. The pot is recovered and the catch removed. The container 19 is recharged and replaced with a fresh container rebaited, the pressure resistant pipe filled with water and then returned to the water.

The trap shown in Figures 4, 5 and 6 of the drawings is a conventional slotted type of pot and is fitted with two cylindrical buoyancy chambers each comprising a metal cylinder 31, the ends of which are provided with holes 32. Each cylinder 31 is fitted with a heavy duty rubber bladder 33 held in place by a series of lengths of rubber 34 the ends of which are anchored in holes in the walls of the cylinder. The lengths of rubber 34 serve to hold the bladder in position when the latter is deflated. One end of each of the bladders is connected to a gas container 35 through a control unit 36 similar to that of control unit 20 of the above described first embodiment. The gas line is fitted with a pressure relief valve 37 and a manual valve 38. The operation of this

trap is similar to that of the first embodiment. The manual valve 38 is opened to allow the gas in the bladders 33 to escape to atmosphere being forced out of the bladders by the action of the rubbers 34 which are placed in tension when the bladder is inflated and bear on the bladder. When the bladders 33 have completely collapsed the valve 38 is closed, the container 35 recharged or replaced with a fresh container and the pot baited. When placed in the water the chambers 31 fill with water through the holes 32. When control unit 36 is activated the gas fills the bladders to expel the water from the cylinder 31. This renders the pot buoyant and it rises to the surface. As it rises to the surface the pressure relief valve 37 vents excess gas to prevent the bladders 33 from bursting.

The signal receiver shown in Fig. 7 of the drawing comprises a microphone or similar sound detector 41 which is connected through amplifier 42 and 43 to a detector 44 which generates a signal which is fed to a pulse width detector 45 of the decoder and solenoid driver shown in Fig. 8. The components of the signal passing through the detector 44 are fed through a reset timer 46 and clock 47 to a 12 bit shift register 48 which feeds a decoder 49. The decoder output passes through a decoder time delay 50 and an output timer 51, to the solenoid driver 53 which activates a solenoid valve (not shown). The output timer 51 is also connected to the reset timer 46 through a repeat inhibit timer 52. The design of the decoder is such that the solenoid driver cannot be actuated by a signal other than that put out by the signal generator. Even if a signal of the same combination as that generated by the signal generator is picked up by the detector the analysis of the pulse width and the timing of the various components of the signal will ensure that except through a most extraordinary coincidence the control unit will not be activated by a stray signal. The code is set by changing the decoder matrix.

The components of the signal receiver, decoder solenoid driver and the solenoid valve are preferably embedded in a block of resin such as an epoxy resin so that they will be rendered waterproof at a depth greater than that at which they will normally operate. Preferably the battery providing the electric power for the control unit is encased in the plastics material.

Whilst the invention has been described with particular reference to two specific embodiments it is not limited thereto. The invention could be applied to fishing nets by fitting a pressure resistant pipe to the periphery of the net and connecting the pipe to a gas container through a control unit as in the two above described embodiments.

(26)

In order that the area in which the traps have been laid may be easily located a float may be attached to one of the traps and balloon filled with a light weight gas such as helium or hydrogen attached to the float. A radio transmitter or a light may be attached to the balloon so that the vessel will be able to pick up the balloon without any undue difficulty. Alternatively the balloon may be provided with a metallic reflecting surface so that it can be readily located by radar equipment carried by the fishing vessel.

Alternatively the trap itself may be fitted with a small radio transmitter adapted to be actuated when the trap floats to the surface to enable the position of the trap to be readily ascertained by the fishing vessel.

WHAT I CLAIM IS:—

1. A device for automatically raising fish traps, crayfish pots and nets comprising a container of compressed gas, a buoyancy means associated with said trap, pot or net, a control valve to allow gas to pass from the gas container to the buoyancy means to displace water from the buoyancy means and an electrical circuit activated by a signal transmitted through the water other than through a cable to actuate the control valve.

2. A device as claimed in Claim 1, wherein the signal is a radio signal.

3. A device as claimed in Claim 1, wherein the signal is a sound signal.

4. A device as claimed in Claim 1, 2 or 3, wherein the buoyancy means is a balloon or bladder fitted inside a holder.

5. A device as claimed in Claim 4, wherein the holder comprises a metal cylinder the ends of which are provided with openings through which water may pass into or out of the cylinder, the balloon or bladder when deflated being held in place by one or more

lengths of extendable rubber.

6. A device as claimed in Claim 4 or 5, wherein the balloon or bladder is connected to a pressure relief valve to allow excess gas to escape as the trap rises to the surface.

7. A device as claimed in Claim 1, 2 or 3, wherein the buoyancy means is provided by one or more compartments formed in one or more of the components from which the trap, pot or net is constructed.

8. A device as claimed in Claim 7, wherein the said component comprises a length of plastics pressure resistant pipe wound into a spiral to define the bottom, sides and top of a trap or pot, one end of the pipe being open and the other end being fitted to said control valve.

9. A device as claimed in any one of the preceding claims wherein the control valve is a solenoid valve adapted to be actuated by a control unit comprising a signal receiver, a signal decoder and a solenoid driver.

10. A device as claimed in Claim 9, wherein the control unit is substantially as herein described with reference to Figures 7 and 8 of the accompanying drawings.

11. A trap fitted with a device as claimed in any one of the preceding claims.

12. A trap substantially as herein described with reference to Figures 1 to 3 of the accompanying drawings.

13. A trap substantially as herein described with reference to Figures 4 to 6 of the accompanying drawings.

14. A trap as claimed in Claim 11, 12 or 13 fitted with location signalling means.

For the Applicants,
MATTHEWS, HADDAN & CO.,
Chartered Patent Agents,
33 Elmfield Road,
Bromley, Kent.

(26)

In order that the area in which the traps have been laid may be easily located a float may be attached to one of the traps and balloon filled with a light weight gas such as helium or hydrogen attached to the float. A radio transmitter or a light may be attached to the balloon so that the vessel will be able to pick up the balloon without any undue difficulty. Alternatively the balloon may be provided with a metallic reflecting surface so that it can be readily located by radar equipment carried by the fishing vessel.

Alternatively the trap itself may be fitted with a small radio transmitter adapted to be actuated when the trap floats to the surface to enable the position of the trap to be readily ascertained by the fishing vessel.

WHAT I CLAIM IS:—

1. A device for automatically raising fish traps, crayfish pots and nets comprising a container of compressed gas, a buoyancy means associated with said trap, pot or net, a control valve to allow gas to pass from the gas container to the buoyancy means to displace water from the buoyancy means and an electrical circuit activated by a signal transmitted through the water other than through a cable to actuate the control valve.

2. A device as claimed in Claim 1, wherein the signal is a radio signal.

3. A device as claimed in Claim 1, wherein the signal is a sound signal.

4. A device as claimed in Claim 1, 2 or 3, wherein the buoyancy means is a balloon or bladder fitted inside a holder.

5. A device as claimed in Claim 4, wherein the holder comprises a metal cylinder the ends of which are provided with openings through which water may pass into or out of the cylinder, the balloon or bladder when deflated being held in place by one or more

lengths of extendable rubber.

6. A device as claimed in Claim 4 or 5, wherein the balloon or bladder is connected to a pressure relief valve to allow excess gas to escape as the trap rises to the surface.

7. A device as claimed in Claim 1, 2 or 3, wherein the buoyancy means is provided by one or more compartments formed in one or more of the components from which the trap, pot or net is constructed.

8. A device as claimed in Claim 7, wherein the said component comprises a length of plastics pressure resistant pipe wound into a spiral to define the bottom, sides and top of a trap or pot, one end of the pipe being open and the other end being fitted to said control valve.

9. A device as claimed in any one of the preceding claims wherein the control valve is a solenoid valve adapted to be actuated by a control unit comprising a signal receiver, a signal decoder and a solenoid driver.

10. A device as claimed in Claim 9, wherein the control unit is substantially as herein described with reference to Figures 7 and 8 of the accompanying drawings.

11. A trap fitted with a device as claimed in any one of the preceding claims.

12. A trap substantially as herein described with reference to Figures 1 to 3 of the accompanying drawings.

13. A trap substantially as herein described with reference to Figures 4 to 6 of the accompanying drawings.

14. A trap as claimed in Claim 11, 12 or 13 fitted with location signalling means.

For the Applicants,
MATTHEWS, HADDAN & CO.,
Chartered Patent Agents,
33 Elmfield Road,
Bromley, Kent.

