W. R. BOWKER,

TORPEDO FOR TRANSPORTING AND FIRING EXPLOSIVES.

APPLICATION FILED OCT. 21, 1920.

1,385,109. Patented July 19, 1921.

2 SHEETS—SHEET 1.

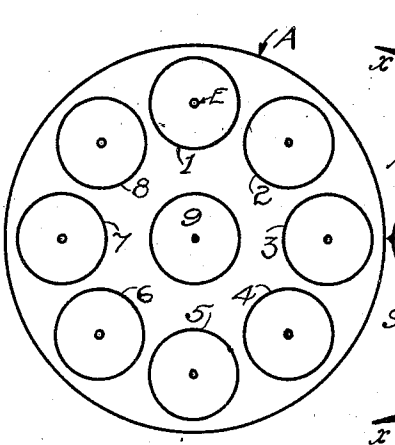

Fig. 1

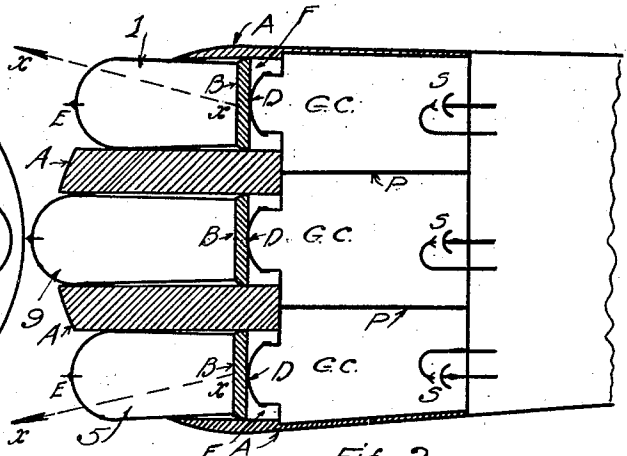

Fig. 2

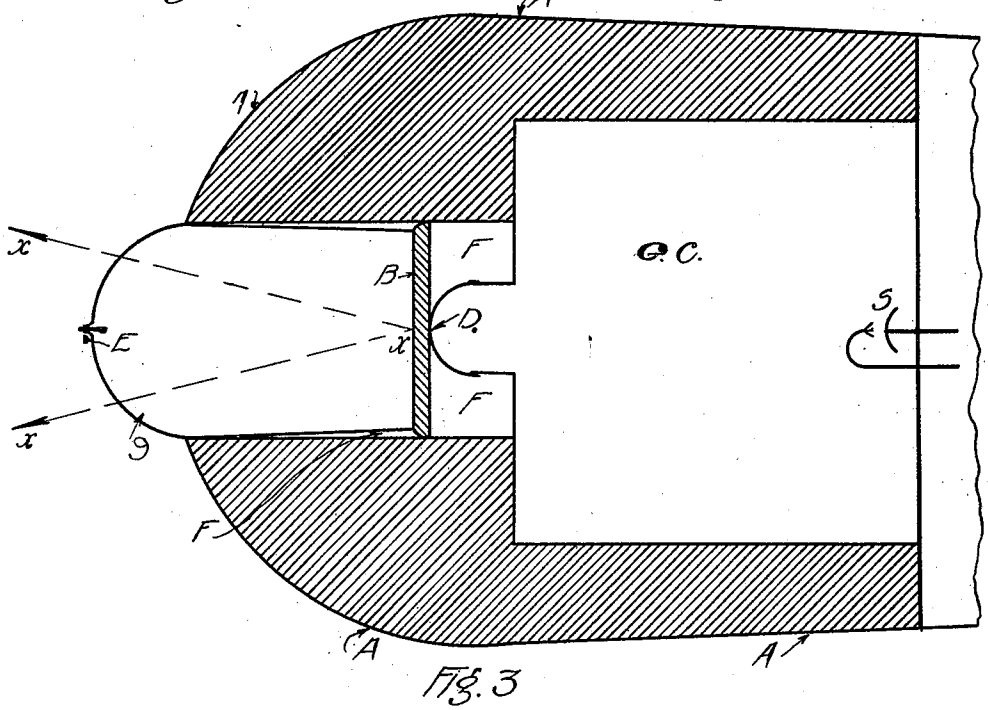

Fig. 3

Inventor

William Rushton Bowker.

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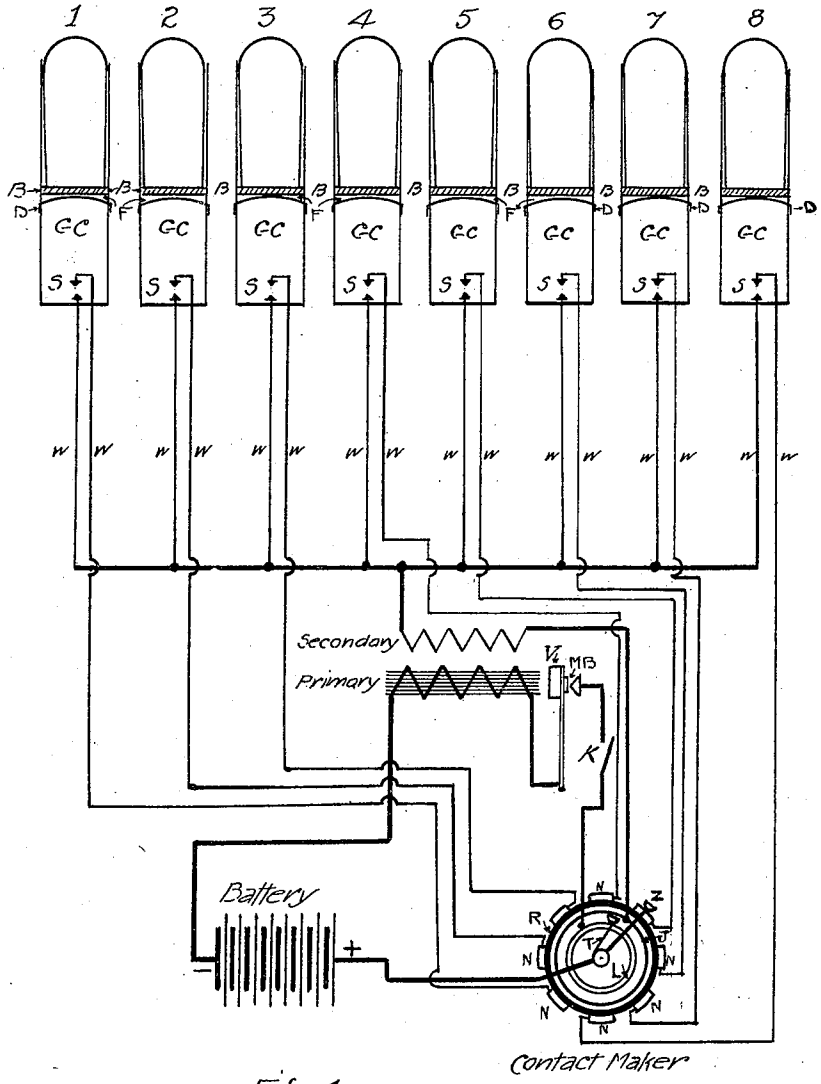

Fig 4

Inventor

William Rushton Bowker.

UNITED STATES PATENT OFFICE.

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TORPEDO FOR TRANSPORTING AND FIRING EXPLOSIVES.

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Application filed October 21, 1920. Serial No. 418,384.

To all whom it may concern:

Be it known that I, WILLIAM RUSHTON BOWKER, an electrical engineer, a citizen of the United States, residing at Coronado, in the county of San Diego, State of California, have invented a new and useful Torpedo for Transporting and Firing Explosives, of which the following is a specification.

My invention relates to improvements in the destructiveness of naval warfare apparatus, by utilizing very powerful explosive charges contained in suitable containers or receptacles and transported by the main torpedo body.

The torpedo at present in use, consists of a submersible cigar shaped vessel, propelled to the object to be destroyed at a suitable rate of speed. This traveling torpedo transports a suitable quantity of a highly explosive and destructive material, which explodes when the nose of the torpedo hits, strikes or comes into contact with the object to be destroyed. This involves the total loss of the torpedo which represents an expense or cost of several thousands of dollars.

The object of my invention is to provide the main torpedo body with a multiple or plurality of detachable explosive containers or vessels, which can be automatically released either simultaneously or at short intervals of time by means of gas pressure of sufficient power to impart to the ejected explosive container a sufficient motive power or momentum for the said explosive vessel to continue its journey to the object of destruction after having been ejected from the main body of the torpedo.

The purpose of the main torpedo body is to transport the plurality of explosive containers through or along only a part of the intervening space that lies between the object to be destroyed and the vessel that releases the torpedo; so that the main torpedo body can be automatically stopped due to lack of momentum; it being controlled to travel only a certain well defined distance and this provides for it to rise from its submersible loaded condition to the surface and become visible when the load is released, and provides for the recovery of said main torpedo body which can be recharged or refitted with a new set of explosive charges and utilized many times, it not being destroyed or lost when in naval action, thus saving the expense and financial loss of the torpedo as a whole.

The improvement in this invention provides for the ejecting and detaching of the explosive charges from the main body of the torpedo which torpedo body provides for the two fold function of transporting the explosive charges part way of the total journey, and also is provided with gas chambers and sparking mechanism which causes the high powered gas in the inclosed gas chambers to be exploded, the expansive force and great pressure resulting therefrom being sufficient to eject and force the detachable explosive container out and away from the main body of the torpedo.

The object of the invention is two fold: viz: to provide for the recovery of the main torpedo body and its assembled mechanism and appliances and to provide a moving torpedo which automatically comes to rest and refloats to the surface of the water and from which several explosive vessels or charges can be ejected or fired, so as to increase several fold the chance of hitting the object to be destroyed, because these explosive containers can be set along the axis at different angular displacements in relation to the main axis of the torpedo body, so as to fan out and travel in divergent directions toward the target or object to be hit or destroyed.

I attain these objects by the apparatus, appliances, mechanism or contrivances shown in the accompanying drawings in which Figure 1 is an end view of the multiple torpedo, Fig. 2 is a longitudinal cross section showing the torpedo head or nose and one of the detachable explosive containers. Fig. 3 is an enlarged longitudinal view in section showing one of the detachable explosive containers, its gas chamber and torpedo nose or head. Fig. 4 is a schematic diagram showing the plurality of detachable explosive containers and their sealed gas chambers with sparking devices.

Similar letters and numerals refer to similar parts throughout the several views. Referring to Figs. 1, 2 and 3, A represents the nose or forward end of the torpedo body. In Figs. 1 Nos. 1, 2, 3, 4, 5, 6, 7, 8 and 9 represent nine detachable explosive vessels, chambers, receptacles or containers and 9 in Fig. 3 represents one of the nine multiple explosive containers and in Fig. 4 Nos. 1, 2, 3, 4, 5, 6, 7, and 8 represent a plurality of eight of the nine explosive vessels or containers. In Figs. 2, 3, and 4, GC represent the gas chambers and S the spark

gaps of said gas chambers which are provided with renewable sealed gas tight puncture caps D. In Fig. 2 P represents the partition which separates the multiple gas chambers GC so that each acts separately from the others. The dotted lines X—X along 1 and 5 Fig. 2 and along 9 Fig. 3 represent an axis along which the several explosive chambers may be set or assembled at desirable angular displacements to provide for travel along divergent paths or directions after having been ejected or forced out by the released gas pressure when ignited by the sparking device. In Figs. 2, 3 and 4, F represents a vacant space between the base or rear end of the explosive containers and the end of the gas chambers. In Figs. 2, 3, and 4, B represents a leather or metal washer or piston ring which permits of free movement and guidance in the cylindrical bore or space that retains the assembled explosive containers previous to being fired, ejected or released by gas pressure from the transporting body of the torpedo. In Figs. 1, 2, and 3 E represents the percussion or detonating cap or device which explodes the charge when it hits or strikes any object.

In Fig. 4, primary and secondary, represent the primary and secondary windings of an induction or spark coil supplied with electrical energy derived from a battery. W are the wires that form the conducting path so as to complete the electrical circuit for sparking purposes. MB is the make and break of the induction or spark coil and K is an opening or closing switch in the primary circuit. The contact maker is provided along its periphery or circumference with multiple contacts, N, each one of which is connected in the secondary circuit to one of the terminals of the spark plug S, located in the gas ignition chamber GC. A contact arm or finger Z rotates around the contact maker and comes successively into metallic contact with each of the multiple contacts N, closing the several sparking gaps of the secondary circuits by metallic contact with the terminal annular ring J to which one end of the secondary circuit is connected and the multiple contacts N supported on an insulating ring R. The said contact lever or arm Z is entirely insulated from every part of the contact maker excepting that it makes a permanent continuous metallic sliding contact with terminal ring J and an intermittent contact with terminals N, the said lever or arm Z being rotated at a pre-determined rate of speed by means of a clock mechanism, the combination forming what is technically called a "time contactor." The annular metallic ring L is connected in the primary circuit which includes the battery, induction coil primary, key K and the contact arm or lever T which is metallically connected to one of the battery terminals which said contact arm T and metallic ring L complete the primary circuit connections, the said contact arm T being insulated from all and every part of the contact maker excepting the battery terminal and the annular metallic ring L with which it makes a continuous sliding contact, the said contact lever or arm T, being rotated simultaneously with contact arm Z by means of the clock mechanism. If it is desired to fire or release all the explosive containers simultaneously, the contact maker as shown in Fig. 4 can be simplified by substituting an annular terminal ring to replace the contact studs or terminals N and by substituting a common return wire for one side of all the spark plug terminals to replace the several separate and distinct circuit lines or wires that connect to each separate multiple contact post, stud or terminal N.

The multiple torpedo in action is released from the vessel, war ship, destroyer or submarine as in present day use. The torpedo as an assembled unit is gaged or calibrated to travel a predetermined distance due to a definite motive power which can be automatically controlled and stopped or by a definite momentum applied to it when released. The torpedo transports the detachable plurality of explosive containers each one of which is charged with the necessary explosive material for destructive purposes. A clockwork mechanism is calibrated or set to act at a predetermined interval of time, the function of said clockwork mechanism or time contactor being first to release and close the primary circuit key, K, which closes and completes the primary circuit which causes the induction or spark coil to become energized, the primary circuit of which induces a current or energizes the secondary circuit. The rotating contact maker causes the secondary circuit to be successively and intermittently closed when each contact terminal or stud N becomes metalically connected with the rotating contact arm Z. A spark passes between the spark gap terminals S located in the gas chamber GC which spark ignites and explodes the gas mixture in the gas chamber. The said gas explosion results in an enormous expansive force and pressure which punctures and disrupts the cap seal D, which force is free to act and press out, eject or release the explosive head, container or vessel, imparting to it sufficient momentum to cause it to travel in a predetermined direction so as to hit or strike any desired object aimed at; which object when struck, forces into action the percussion cap or detonating device which explodes the inclosed charge with destructive results. At short intervals of time, each of the plurality of explosive containers are successively forced out, ejected and released from the main torpedo body and travel along their

path of destruction. As each explosive cartridge or container is released, the main torpedo body becomes successively lighter and lighter, its floatability, displacement and buoyancy being so designed that when all the charges have been released it floats on the surface, becomes visible and can be recovered, brought aboard ship or land, and recharged or reloaded with a plurality of explosive cartridges or containers.

The method of procedure to reload for action is to clean out and drain the gas chambers GC and supply to each gas chamber a sufficient quantity of an explosive agent, either solid, liquid or gas, which when sealed in the gas chamber by attaching a new gas seal evaporates or mixes and becomes diffused with the inclosed volume of air. The quantity of the explosive agent being such that when evaporated or mixed and diffused, combines with the air to form an explosive admixture, which when ignited or fired will result in a maximum explosibility for energy propelling purposes. After filling and sealing the gas chambers the explosive cartridges or containers can be assembled in the torpedo body. The clock mechanism time contactor can then be set for action, the torpedo released from ship or land and its practical operation repeated by releasing or ejecting the explosive cartridges along their path of destruction. The time contactor and contact maker act automatically by the controller clock mechanism which can be regulated or calibrated to act at a predetermined interval of time. The fluid, liquid, gas, chemical or explosive agent that is necessary to form the gas explosion that occurs in the gas chambers for propelling purposes, may be gasolene, a hydro-carbon or any suitable agent either solid, liquid or gas to produce the desired result. The explosive agent utilized in the detachable explosive containers or cartridges may also be any suitable agent to produce the desired results.

While I have confined my description to a typical appliance, contrivance, mechanism or device, I do not limit myself to any particular number, form, shape or construction, detail of the gas chamber or of the sparking device, or to any particular number, shape, form or size of explosive containers or cartridges or to any material, metal or alloy or matter of which it is composed, or assembled, or to any particular explosive agent contained or inclosed or transported by said explosive container, or to any particular liquid, chemical fluid, gas, solid, or explosive agent necessary to produce the desired propelling force or energy in the said gas chamber, or to any method, way or means of refilling or placing the said explosive agent in said gas chamber, or to any particular sparking device or spark plug, or to any particular kind of induction or spark coil or method of wiring the electrical circuits, or to any particular type of clock mechanism for timing or rotating or operating the contact maker or time contactor; or limit the assembly of the detachable explosive heads, either with their axis horizontal, or vertical, or at any definite numerical angular or degree displacement or location either from the horizontal or vertical line or to any particular method, way or means of refitting, recharging or assembling the said explosive containers in said main torpedo body, or to any kind of material or materials used in constructive details; or to any numerical value of buoyancy, floatability or displacement of the aggregated parts of the multiple torpedo. The hereinstated principles of action, constructive details, assembly, design and equipment and the application and functioning in practical operation must be such as to produce the most efficient results to meet circumstances and conditions.

I am fully aware that prior to my invention there are torpedoes, but they function by transporting the explosive charge as a fixed part of the main torpedo body, the whole assembled unit being destroyed or lost when exploded, whereas in my invention the main torpedo body is utilized only as a transporting agent for a plurality of detachable explosive containers or cartridges which said explosive containers are the only parts of the device or torpedo that are destroyed or lost when in action and my invention functions on a different operative action than the ones in present day use. I therefore do not claim such a type of torpedo broadly but I claim.

1. The combination in a multiple torpedo, of a plurality of explosive receptacles containing an explosive agent, the said explosive receptacles being each provided with a detonating device; a plurality of gas explosive chambers provided with spark gaps and a puncture sealing cap, the said gas explosive chambers being filled with an energy propelling agent, an electrical induction sparking coil, an electrical battery, a multiple point timing contactor and electrical circuit connecting wires, all substantially as set forth.

2. In a torpedo the combination of a moving submersible vessel provided with multiple compartments; the said compartments each receiving and containing an explosive receptacle provided with a detonating head and containing an explosive agent; the said plurality of explosive chambers being detachable from the main body of the torpedo; the axis of said explosive torpedo receptacles being adjusted along directive lines of different angular displacements with reference to the main axis of the assembled torpedo, a plurality of gas explosive chambers, each unit chamber being provided with a spark-

ing device and a puncture sealing cap; each said gas explosive chamber being filled with an energy propelling explosive agent; an electrical sparking coil, an electrical battery adjustable timing contactor and electrical conducting wires that complete the electrical circuit including the sparking coil, the spark plugs, the battery and time contactor all substantially as set forth.

3. A submersible torpedo, having a plurality of recesses, containing a plurality of detachable explosive receptacles provided with detonating caps, and an explosive agent; the said detachable explosive receptacles being assembled with axes at different angular degrees of displacement; a plurality of gas explosive chambers provided with sparking plugs and a puncture sealing cap, an electrical induction sparking coil, an electrical battery, an adjustable multiple point timing contactor and electrical conducting wires that connect and complete the electrical circuit consisting of the spark plugs, battery sparking coil, switches and timing contactor all substantially as set forth.

4. A torpedo provided with a plurality of recesses; which transport a plurality of detachable explosive receptacles, adapted to be detached and ejected from said recesses; a plurality of explosive gas chambers provided with spark plugs, and renewable puncture sealing caps, said chamber being filled with an energy propelling explosive agent; an electrical sparking coil, an electrical battery, a multiple point timing contactor and electrical conducting wires and switches, all substantially as described.

WILLIAM RUSHTON BOWKER.