H. E. ELROD.

AUTOMOBILE PROJECTILE.

APPLICATION FILED FEB. 17, 1916.

1,231,867.

Patented July 3, 1917.

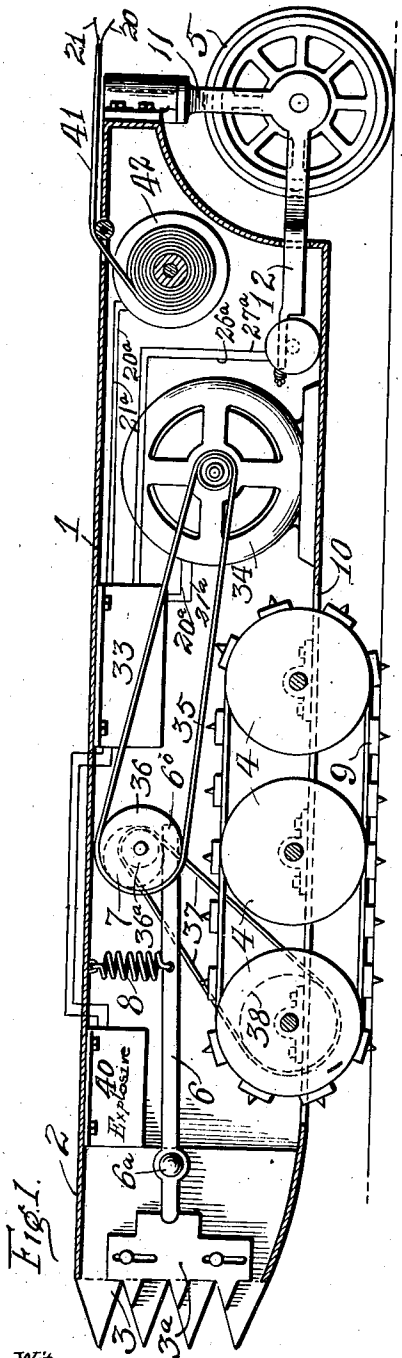


Fig. 1.

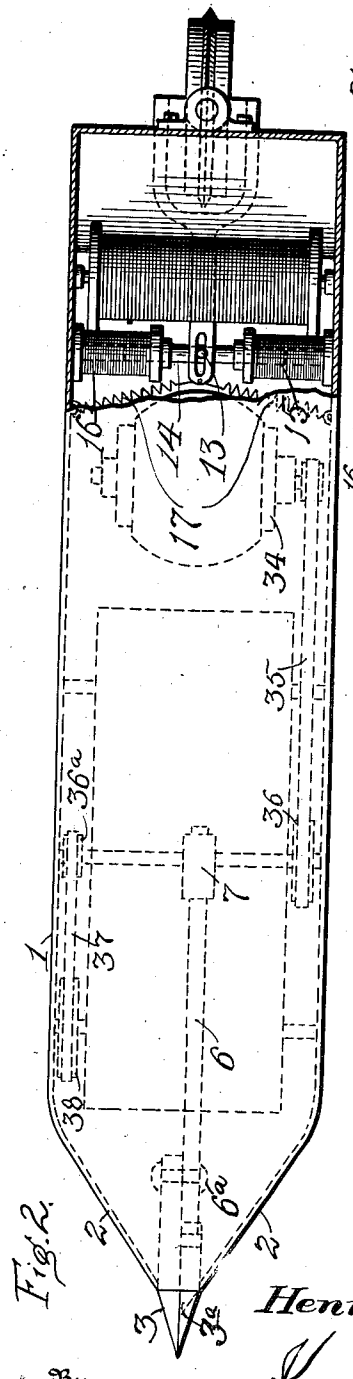


Fig. 2.

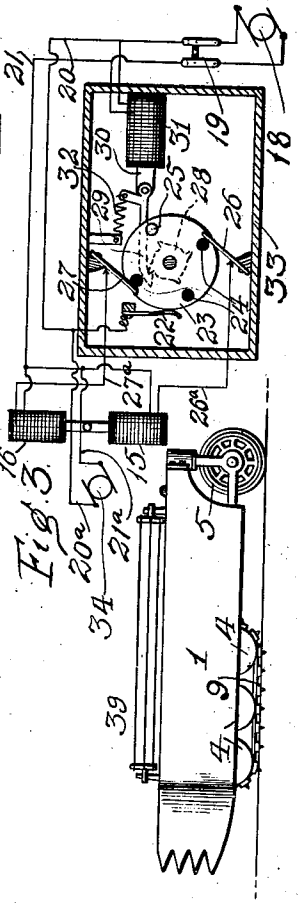


Fig. 3.

Fig. 4.

Witness:

Chas. L. Griesbauer.

Inventor

Henry E. Elrod,

By Knight Bros

Attorneys.

UNITED STATES PATENT OFFICE.

HENRY E. ELROD, OF DALLAS, TEXAS.

AUTOMOBILE PROJECTILE.

1,231,867. Specification of Letters Patent. Patented July 3, 1917.

Application filed February 17, 1916. Serial No. 78,990.

To all whom it may concern:

Be it known that I, HENRY E. ELROD, a citizen of the United States, residing at Dallas, in the county of Dallas and State of Texas, have invented certain new and useful Improvements in Automobile Projectiles, of which the following is a specification.

This invention relates to a self-propelling vehicle adapted to be controlled from a remote point and carrying upon it, one or more instrumentalities for offense in warfare or for attacking defensive barriers.

One object of the invention is to provide a vehicle having at its forward end, means for reducing a barrier such as a wire entanglement, and to this end, one feature of the invention consists in providing an automatic wire clipping device at the forward end of the vehicle, and so disposing and fashioning the same, as well as the prow of the vehicle that with severance of the wire entanglement in a vertical line once achieved, the vehicle will wedge itself through and enlarge the opening without involving any of its mechanism with the entanglement.

Another object is to provide propelling means that will not only be effective in insuring progress of the vehicle over ordinary terrain, but over the aforesaid entanglements when lying prone or at a height below the severing range of the prow, and to so relate this propelling means with the shell or housing of the vehicle, as to insure clearing the propelling means from such entanglements as the driving surface of the propelling means draws within the housing.

Another object is to provide for automatically steering the vehicle from a remote point, to which end another feature of the invention consists in providing a steering member, also running upon the ground, adjustable upon a vertical axis and having oppositely acting electromagnetic actuators, preferably in the form of a pair of solenoids acting upon a common core, engaging the tiller, together with means for selectively energizing the circuits of the respective actuators. The means for selectively closing the circuits of the actuators may be either tuned circuit closers responding to specific electrical oscillations of different periods adapted to be transmitted through space; or these circuit closers may be of a form adapted to be actuated by successive impulses of an electromagnet in circuit with an electric conductor reaching to the point of control and paid out during the progress of the vehicle, said electromagnet being responsive to momentary interruptions or other modifications in the current supplied through said conductor.

A further object is to provide the vehicle with means of offense rendered active at will from the distant point of control, to which end another feature consists in providing an explosive container, either in a form which will involve destruction of the vehicle, thus lending to the vehicle the charatcer of a torpedo, or in the form that will deliver an explosive charge without injury to the vehicle, such for instance as a gun mounted upon the vehicle, in accordance with the method of providing ships with torpedo tubes; said explosive being ignited either for detonation in the vehicle, or for expulsion from and detonation outside the vehicle; the initial ignition of the explosive being effective by space transmission of electrical energy.

The invention will be understood upon reference to the accompanying drawing, showing one illustrative embodiment thereof, in which drawing—

Figure 1 is a vertical longitudinal section of a complete vehicle with its various elements of equipment;

Fig. 2 is a plan view of the same with the portion of the shell or casing, which lies over the electrically actuated steering mechanism and the cable drum, removed;

Fig. 3 is a schematic view of electrical equipment for actuating the steering mechanism by temporary interruption of the current utilized for propelling the vehicle and

Fig. 4 is a view on a reduced scale of a complete vehicle having exposed thereon, suitable collecting conductors for the reception of electrical energy transmitted through space for actuating the different elements of control.

1 represents a shell or housing having a vertically positioned wedging prow 2 terminating in a bill composed of relatively movable serrated members 3, 3^a, adapted to cut wire or other like barrier-forming material encountered in the progress of the vehicle; 4 represents driving wheels of any suitable number and positioned to afford support of necessary stability for the vehicle in its travel; and 5 represents a rear steering wheel.

The cutters 3, 3ª are operated by a lever 6 fulcrumed at 6ª and having its rear end 6ᵇ in position to receive a cam 7 adapted to depress the end of the lever in opposition to a return spring 8 in order to oscillate the lever and develop reciprocating motion in the movable member 3ª of the cutter.

Traction surface for the wheels 4 is provided by any suitable construction of endless belt 9 constructed with spurred bearing shoes. According to the present invention, this driving member is so related to the housing 1 that in passing up through the rear end of the opening 10, any wire or other material adhering to the traction member will be stripped off.

The steering wheel 5 has a caster mounting 11 with substantially vertical axis of rotation and a tiller 12 projecting forward into engagement, through slot and pin connection 13, with a core 14 of magnetic material that serves in common for solenoids 15 and 16, the arrangement being such that if the solenoid 15 is energized, the tiller will be drawn to the left and the steering wheel will divert the travel of the vehicle to the right, but if the solenoid 16 is energized, the tiller will be drawn to the right and the steering wheel set to divert the travel of the vehicle to the left. 17 represents a pair of springs adapted to return the tiller 12 to intermediate position whenever the solenoids are both deënergized. With this arrangement, the direction of the vehicle may be accurately controlled by energizing at will, either solenoid 15 or 16 until the vehicle attains the desired course and then deënergizing both solenoids, so that the tiller resumes its fore and aft position and maintains the new direction of travel.

In order to close a circuit of either solenoid at will, each circuit may be provided with a circuit closer controlled by electrical energy transmitted through space and each tuned to respond only to a predetermined frequency; but I prefer to employ a device such as shown in Fig. 3, wherein 18 represents any suitable source of current; 19 a switch controlling the supply of current to the conductors 20 and 21; 22 a brush connecting wire 20 constantly with a disk 23 of conducting material; 24 pins of non-conducting material and 25 a pin of conducting material on said disk; 26, 27 brushes connected through wires 26ª, 27ª with the solenoids 15 and 16, and positioned to bear upon the pins 24 or 25, according to the positions of said pins; and 28 a ratchet carried by the disk 23 and acted upon by the pawl 29 of the core 30 under control of a solenoid 31, and having a return spring 32, so that each time the solenoid is deënergized and then energized, the pawl 29 will develop a stroke sufficient to rotate the disk a distance of one pin. With this arrangement, it is simply necessary to suitably introduce the solenoid 31 into the circuit 20, 21, by connection in shunt, as shown, or in series if preferred, or otherwise make it amenable to the flow and interruption of current in said circuit in order to bring the brushes 26, 27 successively onto the different pairs of diametrically opposite pins 24, 25. There are such number of pins of the respective kinds and they are so positioned that the brushes may rest upon two dead pins when both solenoids will be deënergized; that one step of rotation will bring, say the brush 26 on a live pin 25 and the brush 27 on a diametrically opposite dead pin 24; that the next step in rotation will bring both brushes upon diametrically opposite dead pins 24; that the next step will bring the brush 27 on a live pin and the brush 26 upon a dead pin, and so on with each alternate step bringing the brushes on dead pins to permit the steering wheel to resume its straight position, and with the energizing steps that occur between the dead steps, alternated between the two brushes. Thus by merely opening and closing the switch 19, any desired phasing of the distributer 23 may be developed and the vehicle may be steered at will.

The current distributer for the steering mechanism will preferably be located in the housing 33, whether it be of the space transmission type or of the circuit interruption type.

In order to propel the vehicle and operate its cutter, I preferably employ a motor 34 fed by the circuit wires 20ª, 21ª, and thus under control of the switch 19. With this arrangement of current distributer for the steering mechanism, the switch 19 can remain normally closed to supply the motor 34 and it will merely be necessary to interrupt the flow of current momentarily to develop the step-by-step movement in the distributer 23, which will not be sufficient to materially interfere with the propulsion of the vehicle. Driving connection from the motor 34 may be conveniently arranged through a belt 35 and pulley 36 on the shaft of cam 7, and a second belt 37 running from a reducing pulley 36ª on the shaft of pulley 36 to a pulley 38 on the shaft of one of the wheels 4.

39 suggests a collector or aerial which would be provided on the vehicle in case it should be desired to control any of its functions by space transmission of electrical energy, and 40 represents a container for explosive which may take any of the forms already suggested.

In order to supply current to the vehicle from a distant source of supply, that is to say in order to maintain the circuit 20, 21, from the source 18, the conductors of this circuit are embodied in a cable 41 wound upon a drum 42 in the vehicle in a well-

known manner and have their ends at the inner end of said cable in distributing relation to the wires 20^a, 21^a, as shown in Fig. 1.

I claim:—

1. A self-propelling vehicle having at its end a cutting device; the forward end of the vehicle being wedge-shaped, and the cutting device lying in the direction of the edge of the wedge; said cutting device comprising a pair of relatively reciprocating serrated cutters, and means for propelling said vehicle and operating said cutting shear, comprising a driving shaft having belt connection with a traction means for said vehicle and having a cam for operating said cutting shear.

2. A self-propelling vehicle having at its end a mechanically operated cutting shear; the forward end of the vehicle being wedge-shaped, and the cutting device lying in the direction of the edge of the wedge; the edge of the wedge being vertically disposed, said cutting shear comprising a stationary shear made up of a portion of said wedge, and a reciprocatory shear mounted for movement relative to the stationary shear, a pivoted lever for operating said reciprocatory shear, a cam for moving said lever in one direction, and a spring for moving it in the opposite direction.

3. A self-propelling vehicle having at its end a mechanically operated cutting shear; the forward end of the vehicle being wedge-shaped, and the cutting device lying in the direction of the edge of the wedge; the edge of the wedge being vertically disposed, and the vehicle embodying an inclosing shell, the walls of which extend rearwardly in continuation of the thick portion of the wedge, one of the elements of the said shear comprising a portion of the vehicle shell, and the other element of the shear comprising a bar mounted for reciprocatory movement and adapted to be actuated by a rocking lever pivoted upon the first-mentioned portion of the shear and having one end engaging in a recess in the other portion of the shear; said lever having its other end resting upon a cam, said cam being driven by a prime mover carried by said vehicle.

4. A motor vehicle comprising a shell or casing, and traction mechanism mounted within the shell or casing and protruding beneath the same for contact with the surface over which the vehicle travels; said traction means comprising wheels and an endless belt traveling over said wheels and provided with shoes for contact with the surface; the shell or casing being adapted to strip from the traction means, objects entangled therewith.

The foregoing specification signed at Dallas, Texas, this 24th day of January, 1916.

HENRY E. ELROD.