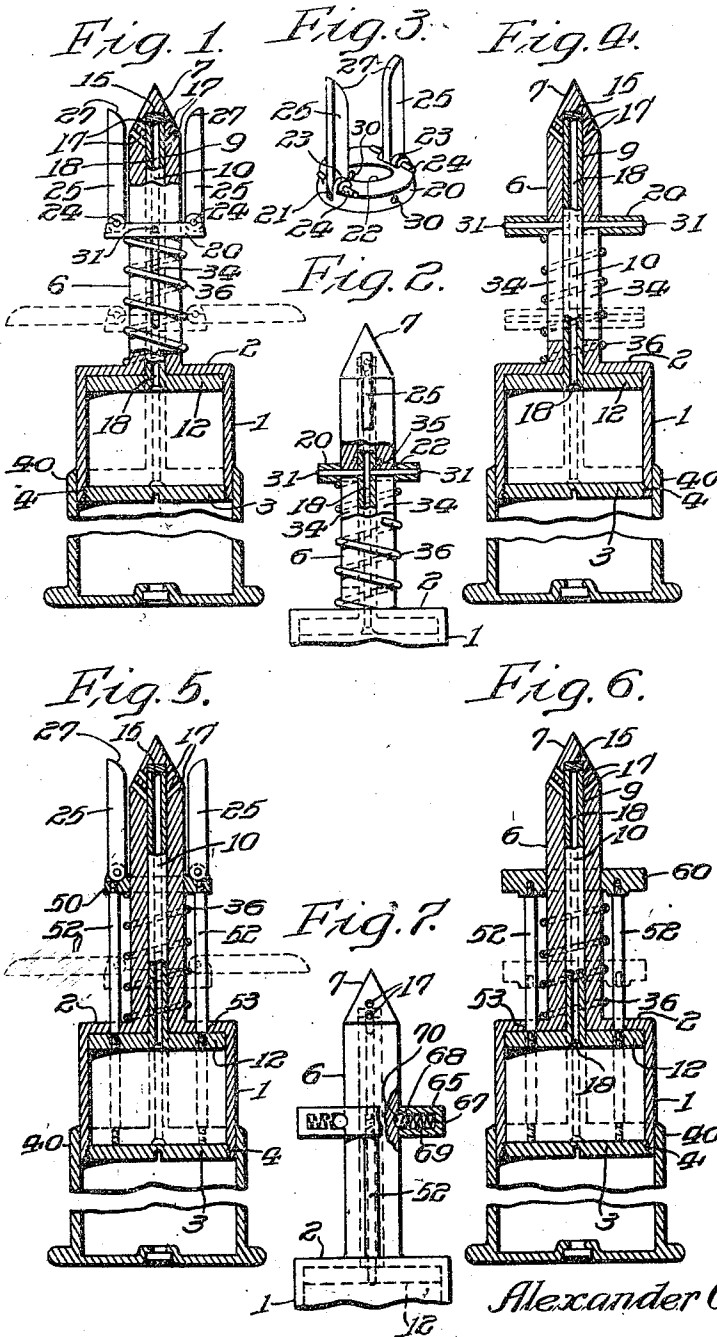


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PROJECTILE.

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PROJECTILE.

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To all whom it may concern:

Be it known that I, ALEXANDER O'RAWE, a subject of the King of Great Britain, and a resident of the city of Philadelphia, county of Philadelphia, and State of Pennsylvania, have invented certain new and useful Improvements in Projectiles, of which the following is a specification, reference being had to the accompanying drawing.

A principal object of my invention is to provide a projectile comprising means to eject a liquid beneath the surface of the object at which it is discharged, and which, therefore, may be employed to narcotize or stupefy human beings or animals when utilized with a suitable narcotic agent, or to liberate a fluid capable of giving off a narcotizing or stupefying gas within the interior of a ship or other object penetrated which will serve to render human beings or animals in the vicinity thereof temporarily unconscious.

Further objects of my invention are to provide a projectile having the foregoing characteristics which may either be discharged from a gun or the like in the ordinary manner by a suitable explosive, or by a compressed gas, or which may be hurled for short distances from a suitable sling or other projecting instrument or even by hand, and which shall be so arranged as to be capable of retaining the contained fluid for such periods of time as may be desired before use and to discharge the same after contact with the object at which it is projected without rupturing or fracturing the projectile.

Still further objects of my invention are to provide a projectile having the aforementioned characteristics which shall be simple in construction and devoid of intricate parts, and which may be readily filled with any desired liquid or emptied thereof without the employment of special tools or devices.

My invention further includes all of the other various novel objects and features of construction and arrangement hereinafter more definitely specified.

In the accompanying drawing, Figure 1 is a central longitudinal section through a projectile constructed in accordance with one form of my invention, certain parts being shown in elevation; Fig. 2 is a fragmentary side elevation partially in fragmentary central section of the form of projectile shown

in Fig. 1, the projectile having been turned through an arc of 90° from its position as shown in Fig. 1; and Fig. 3 is a perspective view of a detail of the device. In Figs. 4, 5 and 6, are shown slightly modified forms of my invention, the said figures respectively comprising central longitudinal sections thereof, certain fragmentary parts being shown in elevation for the sake of clearness, and in Fig. 7 is shown a fragmentary side elevation, partially in fragmentary central section of still another form of the device.

Referring now more especially to that embodiment of the invention shown in Figs. 1, 2 and 3, the same may comprise a hollow preferably cylindrical body portion 1 having a front end 2, and a preferably removable rear end 3 secured within the body in any suitable manner, as by the screw threads 4, completely and permanently closing the open end of the body after the device is assembled. Projecting axially outwardly above the exterior surface of the end 2 is the preferably cylindrical neck 6 of a diameter considerably smaller than the exterior diameter of the body, and preferably formed integrally therewith, the end of the neck terminating in a suitable conical point 7 whereby its penetrative powers are enhanced. The neck preferably extends for a considerable distance beyond the end 2 and is provided with an axial, preferably cylindrical interior passage 9, suitable for the reception of the hollow piston rod 10 to that end of which adjacent the body is fixedly connected the piston 12 which forms a close working fit within the body and may, if desired, be supplied with suitable packing (not shown) in order to prevent leakage between it and the sides of the body in the well known manner. The piston rod 10 is hollow and of such length that when the piston 12 is positioned in the body 1 adjacent the end 2, as shown in Fig. 1, the upper end of the rod when the projectile is viewed in the position shown in the figure, will reach nearly to the outer end of the passage 9 which preferably terminates adjacent the point 7 of the neck, in which position the end of the piston rod will contact with the surface of a disk of rubber or other suitable resilient material 15, located in the end of the passage and forming a tight closure against the end of the rod.

Adjacent the end of the passage 9 and extending outwardly from the passage through

the wall of the neck, are a plurality of small openings 17 affording communication through the wall of the neck with the interior of the passage, the sum of the areas of said openings being preferably somewhat greater than the area of the tubular passage 18 within the piston rod.

Surrounding the interior of the neck and slidable thereon, is a suitable annular collar 20 provided with a plurality of preferably diametrically opposed, vertically extending slots 21 opening toward the upper face of the collar and preferably terminating at their inner extremities a short distance from the central opening 22, so that while the exterior surface as well as the upper face of the collar will be interrupted by the slots, the surface of the central opening as well as of the under side will be continuous. Disposed on either side of each of the slots and preferably extending above the upper face of the collar are the small ears 23 having suitably disposed apertures for the reception of the pivot pins 24 passing transversely through the ears and serving to pivotally secure a wing 25 within each slot, the lower ends of the wings being provided with suitable apertures for the reception of the pins. While the wings may be of any desired construction, they may preferably be formed substantially as shown in the drawings and comprise a substantially rectangular bar, the upper end of which is beveled or curved outwardly from the axial line of the projectile as best shown in Fig. 1, thereby providing an outwardly flaring surface 27 adjacent the end of the wing for a purpose to be hereinafter described, and the lower ends being rounded to facilitate their rotation in slots 21 about pivot pins 24.

In Fig. 1 a form of projectile is illustrated in which two wings are employed, but if desired any desired number, such as four or six, may be utilized, preferably arranged in diametrically disposed pairs spaced equidistantly from each other around the collar.

The collar 20 is rigidly secured in any suitable manner to the piston rod 10 and for this purpose may be provided with small, diametrically opposed apertures 30 for the reception of inwardly extending pins 31 which, passing through suitable longitudinal slots 34 in the wall of the neck, are preferably frictionally retained in suitable openings 35 in the piston rod. If desired, however, the ends of the pins may be secured in the piston rod in any other suitable manner or the pins may be entirely dispensed with and other suitable means employed for securing the collar to the rod. The slots are of a length slightly greater than the extreme length of travel of the piston 12 within the body, and are so disposed with relation to the neck that when the piston is adjacent the end 2, the collar will be adjacent the

outer ends of the slots, and when the collar is retracted adjacent the rear end of the slots the piston will assume a position adjacent the end 3 of the body. For the purpose of normally maintaining the collar at the outer extremity of its path of movement suitable means are provided, as, for instance, a coiled spring 36 disposed between the end of the projectile and the under surface of the collar and surrounding the neck, and serving to force the collar, carrying with it the piston rod and piston, to the position shown in full lines in Fig. 1.

In the drawings, the projectile is shown as mounted in the end of a cartridge case 40 of usual construction and designed to contain a suitable explosive for discharging the projectile from a gun or cannon, in the usual manner, but if desired, other means, such as compressed air or the like, or even manually operated means, may be employed for the purpose of projecting the device against the target, and the cartridge case dispensed with.

In the operation of the device, the body 1 is first filled with the desired liquid by manually or otherwise retracting the collar 20 from its outermost position to adjacent the end 2 of the body which will cause the piston 12 to traverse the body and expel the contained air therefrom through the hollow piston rod and the openings 17. The end of the neck is then inserted in a vessel containing the liquid sufficiently far to cover the openings 17 and the collar released, when the pressure of the spring 36 will cause the collar to traverse the neck to its outermost position and the piston to simultaneously traverse the body, whereby the liquid will be drawn up into the body behind the piston by the vacuum formed by the movement thereof so that the body will be filled or nearly filled with the fluid. The projectile is now in condition to be discharged and may be projected in any desired manner toward the target with the surface of which the point 7 will first contact. As the target is penetrated the continuing forward movement of the projectile will bring the surfaces 27 of wings 25 into contact with the surface of the target if the wings have remained substantially parallel to the axis of the neck and will open the wings outwardly substantially parallel to the surface of the collar. Or if the wings have already during the flight of the projectile, assumed an outwardly opened position through the resistance of the air, or other causes, as soon as the neck has penetrated sufficiently far to bring the surface of the expanded wings and adjacent surface of the collar into contact with the surface of the target the continuing forward movement will serve to retract the collar and wings to substantially the position shown

in dotted lines in Fig. 1, thereby forcing the piston 12 toward the rear end of the body and ejecting the fluid contents through the hollow piston rod and openings 17 into the material of which the target is composed and beneath the surface thereof, or should the wall of the target be thinner than the length of the neck, then into the space, such as the interior of a ship, behind the wall. It is not intended that the wings and collar shall penetrate the target for any considerable distance but rather that they shall remain in contact with the surface thereof, and it is, therefore, advisable to make the effective area of the same as great as possible in order to provide an extended contacting surface, the larger surface affording a greater resistance to penetration. It may be preferable in practice to form the hinged joints between the collar and the wings in such manner that a sufficient amount of friction will be afforded to resist the opening movement of the wings before actual contact with the target in order to prevent the same from opening outwardly while in the barrel of the cannon or during the flight of the projectile through the air, but it is thought that such provision may be unnecessary as it is not believed that any detrimental results will be effected should the wings partially open during the flight of the projectile through the resistance of the air or even in the gun barrel.

In Fig. 4 is shown a slightly modified form of the device in which the wings are entirely omitted and the collar 20 enlarged in area so that its diameter shall be almost equal to that of the body of the projectile. The collar is secured to the piston in a manner similar to that already described by the pins 31 extending through the collar and slot 34 and into the piston rod. When the projectile is constructed as shown in this figure, the impact of the outer face of the collar against the surface of the target is sufficient to retract the piston and discharge the liquid as hereinbefore described.

In Fig. 5 is shown another slightly modified form of the device in which the collar 50 is not secured directly to the piston rod 10, but is provided with two or more exterior piston rods 52 extending from the under side of the collar through suitable apertures 53 in the end of the projectile and into the piston 12 within the body 1. The piston rods may be secured within the collar and the piston in any desired manner and in the drawing are shown as provided with suitable right and left hand threads adjacent each end which engage suitable similarly threaded apertures in the collar and in the piston. In this form of the invention, wings 25 preferably secured to the collar as hereinbefore described may

be provided, the spring 36 serving to maintain the collar in outwardly extending position in a manner previously referred to, but the slots in the neck being omitted.

In Fig. 6 is shown still another form of the device similar to Fig. 5, except that the wings are omitted and a collar 60 of extended area provided as previously described in connection with Fig. 4, the same being connected to the piston by piston rods 52 passing through the apertures 53 in the end of the body as hereinbefore described in connection with Fig. 5. If desired, in both of these forms of the invention suitable provision may be made for packing to surround the piston rods 52 where the same pass through the wall of the body in order to secure a tight joint at this point, although it is believed that in practice if the piston 12 be properly fitted no packing will be needed.

In Fig. 7 is shown a still further modified form of the device in which both the spring and the wings 25 are omitted, a collar 65 of extended area and of a diameter slightly less than the diameter of the body 1 being provided and connected to the piston either by means of piston rods 52 as described in connection with Figs. 5 and 6 or by a pin and slot arrangement, as referred to in connection with Figs. 1 to 4 inclusive. The collar is provided with a plurality of apertures 67 extending radially outward from the central opening of the collar, but preferably not entirely through the body thereof, in each of which is located a ball 68 and a suitable compression spring 69 serving to force the ball toward the center of the collar and into a suitable notch 70 upon the exterior of the neck when the collar is in position upon the projectile as shown in Fig. 7. The engagement of the balls within the notches serves to maintain the collar in normal position until its contact with the target when the impact against the collar is sufficient to move the collar toward the body, forcing the balls out of the notches and entirely into the apertures 67 against the pressure of the springs 69 thus permitting the collar to traverse the neck in the manner hereinbefore described to discharge the liquid contents of the projectile. It will be evident that if desired, this form of the device may be provided with wings 20 as hereinbefore described.

I do not desire to limit myself to the use of any particular fluid or liquid with my improved projectile, as various different sorts may be used, depending upon the result it may be desired to accomplish as for instance, whether it be desired to liberate volatile liquid within the interior of a ship or the like, after the penetration of the side thereof by the neck of the projectile, or whether it may be desired to narcotize or stupefy a human being or animal at which the projectile may be fired, in which case,

for example, the projectile may be charged with hyoscin or other drug having like properties, and capable of producing a temporary narcotization or unconsciousness when injected within the tissues. Furthermore, I do not desire to limit myself to a projectile having a body comprising an end relatively at right angles to the longitudinal axis thereof, as the body may be tapered adjacent the base of the neck or of a conical shape, nor do I desire to limit myself to a device otherwise constructed in exact accordance with those embodiments of my invention which I have described herein, as it will be evident that various changes and alterations may be made in the details of construction and arrangement thereof without departing from the spirit and scope of my invention as defined in the appended claims.

Having thus described my invention, I claim and desire to protect by Letters Patent of the United States:

1. A projectile containing a fluid and comprising means operative by the forward movement of said projectile after its contact with an object to discharge said fluid adjacent the forward end of said projectile.

2. A projectile comprising a hollow body portion, an outwardly projecting neck, and means operative by the contact of the projectile with an object to eject the contents of said body beneath the surface of said object penetrated by said neck.

3. A projectile comprising a hollow body portion and an outwardly projecting neck, a piston slidable in said body, and means operative to move said piston in said body to eject the contents of said body adjacent the forward end of said neck as said neck penetrates a target.

4. A projectile comprising a hollow body portion, an outwardly projecting neck, a piston slidable in said body, a hollow piston rod slidable in said neck, and means operative to retract said piston as said neck penetrates a target to eject the contents of said body through said neck.

5. A projectile comprising a hollow body portion and an outwardly projecting neck, a piston slidable in said body, a hollow piston rod slidable in said neck, and means slidable on the exterior of said neck operative to engage the surface of an object struck by said projectile to retract said piston and said rod to eject the contents of said body as said neck penetrates said object.

6. A projectile comprising a hollow body portion and an outwardly projecting neck, a piston slidable within said body portion, an annular collar surrounding said neck and operatively connected to said piston, and means operative to normally maintain said piston in said body adjacent said neck, said collar being operative to retract said piston from its normal position to eject the

contents of said body after the contact of the projectile with the target.

7. In a projectile, the combination with a hollow body having an outwardly extending neck, of a piston, means operative to normally maintain said piston adjacent the forward end of said body, an annular collar surrounding said neck operatively connected to said piston, and a plurality of outwardly movable wings mounted on said collar and operative to engage the surface of an object penetrated by said projectile to retract said piston to eject the contents of said body.

8. A projectile comprising a hollow body portion, an outwardly projecting neck having an internal passage and a plurality of openings extending from said passage through said neck adjacent the end thereof, a piston slidable in said body portion, a hollow piston rod slidable in said neck and connected with said piston, a slidable collar surrounding said neck, resilient means operative to maintain said piston adjacent the forward end of said body, and a plurality of outwardly opening wings on said collar operative to contact with the surface of an object penetrated by said neck to move said collar on said neck and retract said piston within said body to eject the contents of said body.

9. A projectile comprising a hollow body and an outwardly extending neck, a hollow piston rod slidable in said neck and a piston slidable in said body, means operative to normally seal the end of said piston rod removed from said piston, a plurality of openings in the wall of said neck adjacent the outer end thereof, and means operative to move said piston in said body to eject the contents of said body through said piston rod and said openings as said neck penetrates the object at which said projectile is discharged.

10. A projectile comprising a hollow body portion and an outwardly extending neck having a longitudinal passage and an opening communicating with said passage through the wall of said neck, a hollow piston rod slidable in said neck and a piston rigidly connected to one end thereof and slidable in said body portion, means operative to normally seal the other end of said piston rod, means operative to retract said piston upon the contact of said means with the surface of an object struck by said projectile to eject the contents of said body through said opening, and means comprising a plurality of outwardly opening wings operative to assume a position substantially at right angles with the axis of said projectile upon the engagement of said aforesaid means with said surface.

11. A projectile comprising a hollow body portion and an outwardly extending neck of relatively smaller diameter and having a

longitudinal passage and a plurality of openings communicating with said passage through the wall of said neck, a hollow piston rod slidable in said neck, a piston rigidly connected to one end thereof and slidable in said body portion, means operative to normally seal the other end of said piston rod, means comprising a collar slidable on said neck and operatively connected to said piston operative to retract said piston upon the contact of said collar with the surface of an object struck by said projectile to eject the contents of said body through said openings, and a plurality of outwardly opening wings adjacent said collar operative to as-

sume a position substantially at right angles with the axis of said projectile.

12. A projectile containing a fluid and comprising means operative by the forward movement of said projectile as it penetrates an object to discharge said fluid within said object adjacent the forward end of said projectile.

In witness whereof, I have hereunto set my hand this 16th day of December, A. D., 1914.

ALEXANDER O'RAWE.

Witnesses:

GEORGE K. HELBERT,
ALEXANDER PARK.