

Oct. 15, 1968

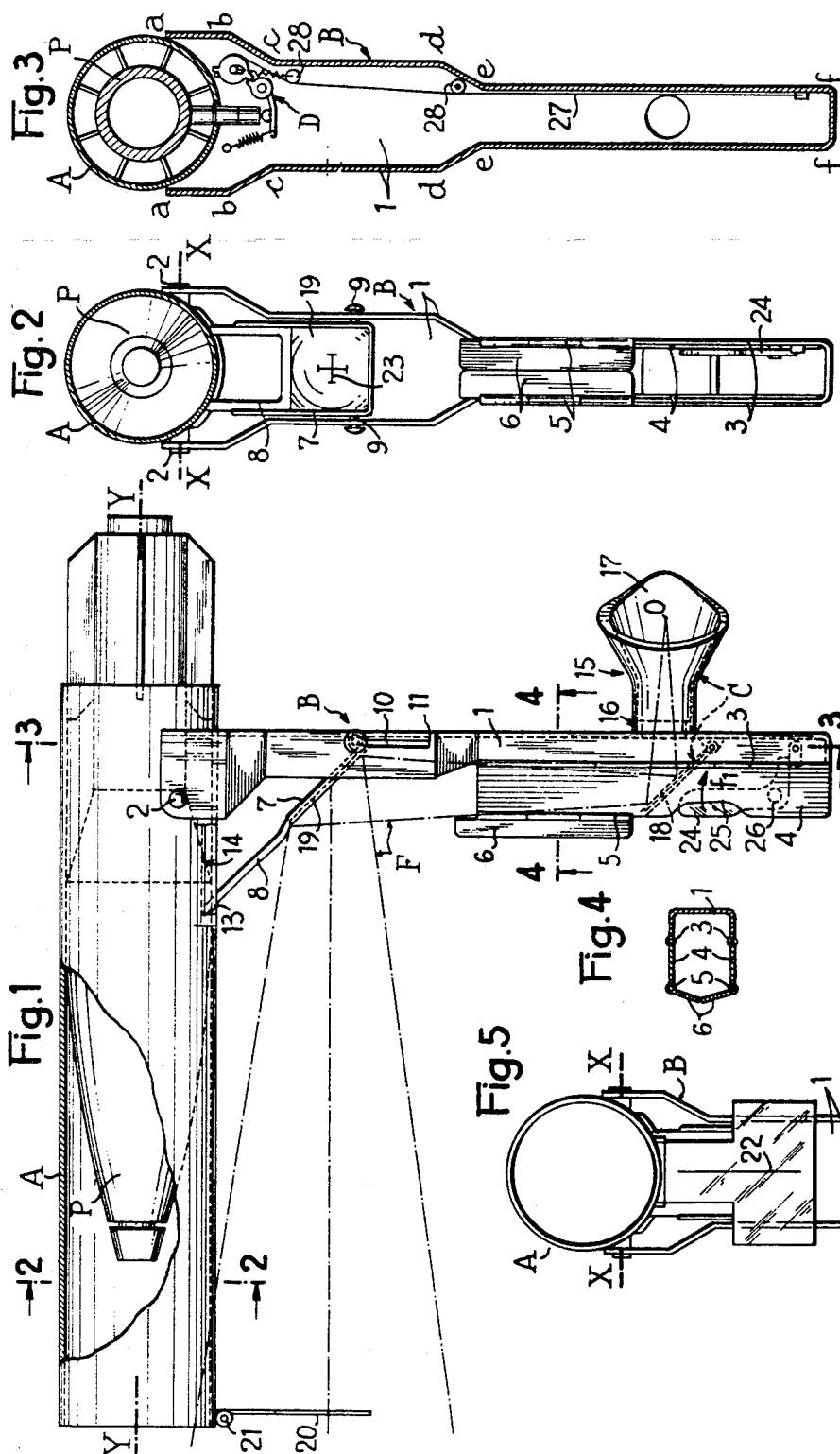
M. FRANCOIS

**3,405,469**

COLUMN-MOUNTED PORTABLE FIREARM FOR A PROJECTILE

Filed Dec. 3, 1966

2 Sheets-Sheet 1



Oct. 15, 1968

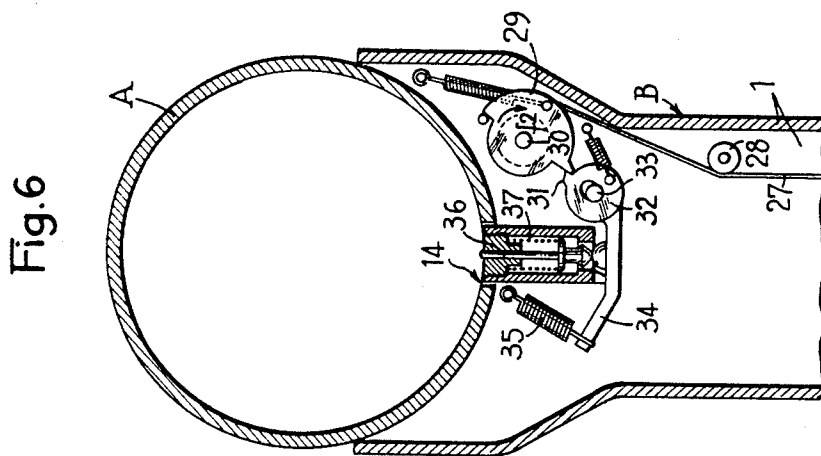
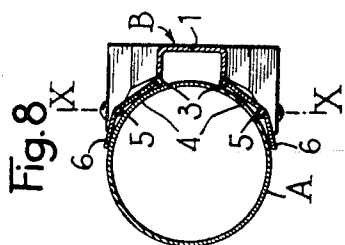
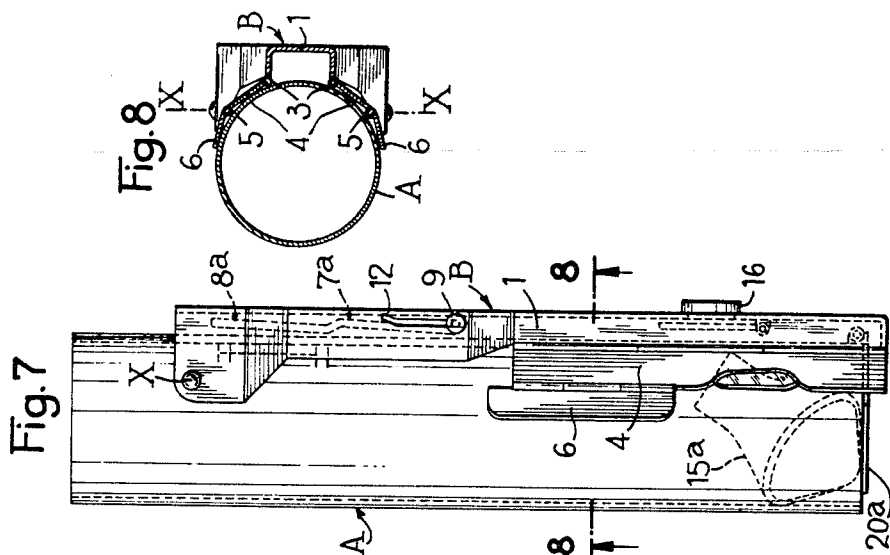
M. FRANCOIS

3,405,469

COLUMN-MOUNTED PORTABLE FIREARM FOR A PROJECTILE

Filed Dec. 9, 1966

2 Sheets-Sheet 2



1

2

3,405,469

## COLUMN-MOUNTED PORTABLE FIREARM FOR A PROJECTILE

Marcel Francois, Chatenay-Malabry, France, assignor to  
Compagnie Francaise Thomson Houston-Hotchkiss  
Brandt, Paris, France, a French body corporate

Filed Dec. 9, 1966, Ser. No. 600,414

Claims priority, application France, Dec. 15, 1965,  
42,325

5 Claims. (Cl. 42—1)

### ABSTRACT OF THE DISCLOSURE

A portable firearm for launching a projectile in which the launching tube has a throughway passageway defining the bore for the projectile so that the tube has substantially no recoil, the tube being pivoted to the upper end of a column so as to be capable of being folded substantially alongside the column for storage and transportation, the firearm including a periscope sight and grip means at the lower part of the column.

The present invention relates to individual firearms.

It is known that in close combat, such as combat between a tank and a combatant at a distance of around 50–100 metres, the combatant cannot aim accurately and effectively if he is visible and therefore exposed to the fire of the tank.

Now, in known individual arms the distance between the axis of fire and the optical axis of the firer or shooter is very small and firing can only be effected if the head of the firer is in fact exposed to the fire of the enemy.

The object of the present invention is to provide a portable firearm for close combat and for example anti-tank combat which is so improved as to enable the combatant holding the firearm in his hands to aim at the target and fire while being completely hidden from its view behind a shield so that the combatant is secure against danger from the target and can take his time to go through the normal firing procedure and in particular wait until the target—if it is a moving target—is at the best angle and distance for its destruction.

The firearm according to the invention comprises a launching tube supported by a pillar, a periscopic sight, a firing device and a firing grip.

According to another feature of the invention, the firearm is foldable and the launching tube is adapted to serve as a container for storing and transporting the projectile and the detachable accessories such as the peep sight or eye-piece.

Further features and advantages of the invention will be apparent from the ensuing description with reference to the accompanying drawings.

In the drawings:

FIG. 1 is a side elevational view, with a part cut away, of a firearm according to the invention in its firing position;

FIG. 2 is a front elevational view with the launching tube shown in section on line 2—2 of FIG. 1;

FIG. 3 is a cross-sectional view taken along line 3—3 of FIG. 1;

FIG. 4 is a horizontal sectional view taken along line 4—4 of FIG. 1 through the grip;

FIG. 5 is a partial end elevational view of the firearm showing the transparent and foldable front sight mounted on the front end of the launching tube;

FIG. 6 is a partial vertical sectional view corresponding to the upper part of FIG. 3 but on an enlarged scale;

FIG. 7 is an elevational view of the firearm in its folded-up position;

FIG. 8 is a cross-sectional view taken along the line 8—8 of FIG. 7.

In the illustrated embodiment, the firearm is a launching device for launching a projectile P which is preferably, but not exclusively, a self-propelling projectile having a rear fin structure.

This firearm comprises the combination of a launching tube A, a support B consisting of a column structure for this tube, and firearm holding means consisting of hand grip means, a periscopic sight C and an igniting device D for igniting the charge which propels and/or launches the projectile P.

Tube A is a cylindrical tube which is open throughout its length, very light and composed of sheet metal, light alloy, plastics material, cardboard, agglomerated glass fibres or any other material—at least in the case of a self-propelling projectile, namely a projectile which is launched without recoil. In the case of some other projectile, any recoil can be avoided by known conventional means, for example having an auxiliary launching reactor.

As concerns the supporting column structure B it is also very light and composed of metal or alloy or of a plastics material which is sufficiently strong and, if desired, reinforced by a metal reinforcement. It consists of a U-section body 1 having a preferably plane web and two flanges which respectively comprise three plane parallel portions *ab*, *cd*, *ef*, which are interconnected by two inclined portions *bc* and *de* (FIG. 3).

In the portions which are spaced the greatest distance apart, namely portions *ab* of the two flanges the tube A is pivotally mounted by means of two transverse journals 2 having a common axis X—X.

Pivoted to the edges of the closely spaced portions *ef* of the two flanges by means of hinges 3 are two flaps 4, these hinges being such that the flaps are pivotable between the position shown in FIG. 4, in which they are parallel to each other, and the position shown in FIG. 8 in which they diverge from their hinges. Pivoted to the upper portions of the edges of these flaps 4 by means of hinges 5 are two other flaps 6. The latter can either be folded towards each other, while the flaps 4 are parallel to each other, so as to form with the body 1 (FIGS. 1, 2 and 3) a hand grip in the middle part of the column structure B, or folded outwardly (FIGS. 6 and 7) so as to permit engaging therebetween the tube A which is swung about the axis X—X.

The tube A can be held stationary in the firing position so that its axis Y—Y is perpendicular to the web of the body 1 of the column structure B, by a foldable stay. The latter consist of the combination of two U-section members 7 and 8 which are rigidly welded together. Member 7 carries two pivot and guide pins 9 which are movable in two slots 10 formed in the flanges of the body 1. The pins 9 are pivotable about the lower ends 11 of these slots and about upper inclined end portions 12 (FIG. 7). The inclined end portions 12 serve as a support for the pins in the operative position of the stay. The other member 8 is adapted to bear, in an operative staying position, by the ends of its flanges against an abutment 13 which projects from the tube A just forward of a longitudinal opening 14 whose purpose will be explained hereafter.

The periscopic sight C comprises a detachable mount 15 which is a slide fit on a hollow shoulder 16 projecting from the rear face of the body 1. This mount terminates in a peep sight or eye-piece 17, which merely comprises a sighting hole. The periscopic sight further comprises a plane mirror 18, a second mirror 19 which is carried by the member 7 and can be plane but is preferably convex so as to increase the field of vision, and a transparent flap 20 which is pivotally mounted at 21 on the forward end of the tube A. This flap carries a front sight line 21 (FIG. 5) and, if desired, elevation or range

graduations. The mirror 19 carries a reticle cross wires 23. The field of sighting F converges at 0 in the peep sight in line with the pupil of the eye of the firer or shooter and is shown in dot-dash line in FIG. 1.

The igniting device for igniting the propelling and/or launching charge comprises in the grip a lever 24 constituting a trigger owing to its forward projection through an aperture 25 in one of the flaps 4 to which this lever is pivoted at 26. When it is urged in the direction of arrow  $f_1$  (FIG. 1), this lever actuates a percussion device for example in the following manner: the lever 24 in pivoting pulls on the lower end of a small cable 27 which is guided by rollers 28 and is wound around a cam 29 (FIGS. 3 and 6). The cam is rotatably mounted at 30 on the body 1 and the cable 27 causes the cam to turn in the direction of arrow  $f_2$  in opposition to the action of a return spring. Owing to its action on a lug 31, this cam causes a member 32 to turn about a pivot pin 33 and put a percussion spring 35 under stress by means of an arm 34 which is integral with the member 32. When the lug 31 escapes from the cam, the spring 35 suddenly biases the lever 34 which throws a percussion element 36 forwardly in opposition to the action of a weak return spring 37. This percussion element penetrates the tube A by way of the aforementioned aperture 14.

The firearm operates in the following manner:

With reference to FIGS. 1 to 5 showing the firearm in its firing position, the tube A is brought to a position in which it is perpendicular to the column structure B and held stationary with respect to the latter by the supporting stay 7, 8. The transparent screen 20 is lowered to depend vertically from the tube A. The self-propelling projectile P is placed in this tube so that the percussion element 36, which is held in its withdrawn position by the spring 37, is in alignment with the percussion primer or detonator.

Further, the flaps 4 of the column structure B are in their positions shown in FIG. 4 and the flaps 6 are folded in such manner as to form a grip 1, 4, 6 having a closed section which is easy for the person using the firearm to grip in one of his hands.

The firearm is ready to be used. It is merely necessary for the person carrying the firearm to place one of his eyes on the peep sight 17 to observe the surrounding battlefield on the sole condition that the part of the beam of vision (line F) between the mirror 19 and the transparent flap 20 is located above the relief of the ground or surroundings (trench wall, tree, hedge, etc.) concealing the firer from the view of the enemy. This is possible owing to the length of the column structure B and the periscope C. Thus the firer can aim at the target at leisure. To launch the projectile P in the direction of the target, it is merely necessary, while continuing to aim the firearm at the target, to depress the trigger 24, which first loads the percussion element 36, since the cam 29 which acts on the lug 31 first puts the spring 35 under tension, and then suddenly releases the percussion element as soon as the lug 31 escapes from this cam. The percussion element 36 strikes the primer or detonator and ignites the propelling and/or launching charge of the projectile P.

As already mentioned, if it concerns a self-propelling projectile, no recoil of the tube A occurs which the firer would not support, bearing in mind that the firearm is held by a more or less folded arm. Moreover, the tube is not subjected to any pressure by the propelling gases. The tube can therefore be very thin and consequently extremely light, which is an advantage not only as concerns the firing position but also when transporting the firearm.

On the other hand, if the projectile must be fired with a launching charge, steps must be taken to arrange that the barrel be a non-recoiling barrel, for example by arranging, as mentioned hereinbefore, that this launching charge be in the form of a small detachable reactor

which is expelled at the same time as the projectile and falls in the vicinity of the firer.

When the firearm is no longer to be used and must be for example transported, it is easy to arrange that it has a very small overall size by folding it into the position shown in FIGS. 7 and 8. For this purpose, the pins 9 of the stay 7, 8 are disengaged from the ends 12 of the slots 10 and shifted from the position shown in FIGS. 1 and 2 to the position shown in FIG. 7.

The ends of the member 8 assume a position sufficiently below the tube 1 to permit folding the stay 7, 8 to the position 7a, 8a shown in FIG. 7 and this permits swinging the tube A about the axis X—X of its journals 2. However, prior to this, the sight mount 15 is removed from its support 16 and placed at 15a in the tube A in which it is retained by the flap 20 which is folded to the position 20a (FIG. 7).

Further, the flaps 4 and 6 are swung to the positions shown in FIGS. 7 and 8 and this permits swinging the tube A downwardly against the column structure B, these flaps 4 and 6 being on both sides of this tube as clearly shown in FIGS. 7 and 8.

It will be observed that the interior of the tube A is empty except for the small part thereof occupied by the sight mount at 15a and can receive, for example, another projectile intended to be transported with the firearm to the firing point.

Although a specific embodiment of the invention has been described, many modifications and changes may be made therein without departing from the scope of the invention as defined in the appended claims.

Thus, the periscopic device can be different from that described and comprise a more complicated optical system, although excellent results are obtained with the very simple illustrated device. If the periscope comprises lenses the sight mount 15 is provided with an eye-piece.

The manner in which the tube A is held stationary relative to the column structure B in its firing position can if desired be achieved by a device other than the stay 7, 8—for example by means of a ratchet wheel which is rigid with one of the journals 2 of the tube A and cooperates with a retractable pawl carried by one of the flanges of the column structure B, or vice versa.

If desired the grip, consisting of the combination of the support 1 and the pair of flaps 4 and 6, could be replaced by a grip preferably of the detachable type secured to the end of the support pillar B, namely at the end opposed to that carrying the journals 2. In this case the pillar B could have a closed section and consist for example of a tube which has a constant diameter or a diameter increasing in steps from the grip to the tube A.

If desired, the pillar B could be telescopic, which is another way to reducing the overall size of the firearm for transportation.

Having now described my invention what I claim as new and desire to secure by Letters Patent is:

1. A portable firearm comprising a projectile launching tube, a support on which said tube is mounted, a periscopic sight, a firing device, and a firing grip, said sight, firing device and firing grip being carried by said support, said support comprising a U-section element having two flanges, said tube being pivotally mounted on and located between said flanges, said grip comprising two pairs of flaps, the flaps of each pair of flaps being hinged together and one of the flaps of each pair being hinged to each one of said flanges, whereby the flaps are foldable to an operative position in which they form with said U-section element a grip assembly having a closed cross-section and unfoldable to a transporting position in which the pairs of flaps are spread apart to receive said tube therebetween in the folded position of said tube.

2. A firearm as claimed in claim 1, wherein said U-section element increases in cross-sectional size from the

5

end thereof remote from said tube to the end adjacent said tube.

3. A portable firearm comprising a projectile launching tube, a support on which said tube is pivotably mounted, a periscopic sight, a firing device, a firing grip, said sight, firing device and firing grip being carried by said support, and a disengageable stay element interconnecting said tube and column structure at points remote from the pivotal mounting of said tube on said column structure, said periscopic sight comprising mirrors one of which mirrors is carried by said stay element.

4. A firearm as claimed in claim 3, wherein said mirror carried by said stay element is a convex mirror to increase the field of vision.

5. A portable firearm comprising in combination: a projectile having a propelling charge which accompanies the projectile as it expels the projectile out of the firearm, a projectile launching tube having a throughway passage-way defining a bore for the projectile so as to substantially avoid rearward thrust on said tube by the gases of said charge when launching the projectile, the projectile being disposed in said bore, support means for holding said tube in position when launching the projectile, said support means consisting of an elongated column structure, pivot means pivotably interconnecting said column structure and said tube adjacent one end of said column structure whereby said tube is pivotable between a launching position in which said tube extends transversely of said column structure and a storage and transportation

6

position in which said tube is folded substantially alongside said column structure, means for maintaining said tube in said launching position when launching the projectile, holding means for holding the firearm in position when launching the projectile, said holding means consisting of hand grip means carried by said column structure, periscopic sight means, and launching charge igniting means carried by said column structure and operatively connectible to said propelling charge of the projectile in said launching position of said tube and disconnectible from said propelling charge in said storage position of said tube whereby ignition of said propelling charge is precluded in said storage position of said tube.

#### References Cited

##### UNITED STATES PATENTS

|           |         |               |          |
|-----------|---------|---------------|----------|
| 1,184,078 | 5/1916  | Cooke         | 42—1     |
| 1,260,285 | 3/1918  | Cordell       | 42—1     |
| 1,290,937 | 1/1919  | Duerr         | 42—1     |
| 1,295,688 | 2/1919  | Butler        | 42—94    |
| 2,424,944 | 7/1947  | Patchett      | 42—72    |
| 2,814,118 | 11/1957 | Evans et al.  | 42—1     |
| 2,970,519 | 2/1961  | Musser et al. | 89—1.705 |
| 2,981,151 | 4/1961  | Stevenson     | 89—1.705 |

##### FOREIGN PATENTS

|         |        |          |
|---------|--------|----------|
| 696,495 | 9/1940 | Germany. |
|---------|--------|----------|

BENJAMIN A. BORCHELT, *Primary Examiner.*