

March 15, 1932.

D. SAMAIA

1,850,034

BOMB THROWER DIVISIBLE IN TWO PARTS ADAPTED TO BE CARRIED ON MAN'S BACK

Filed Nov. 12, 1929

3 Sheets-Sheet 1

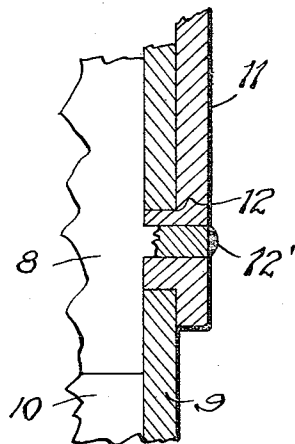


Fig. 8.

Fig. 2.

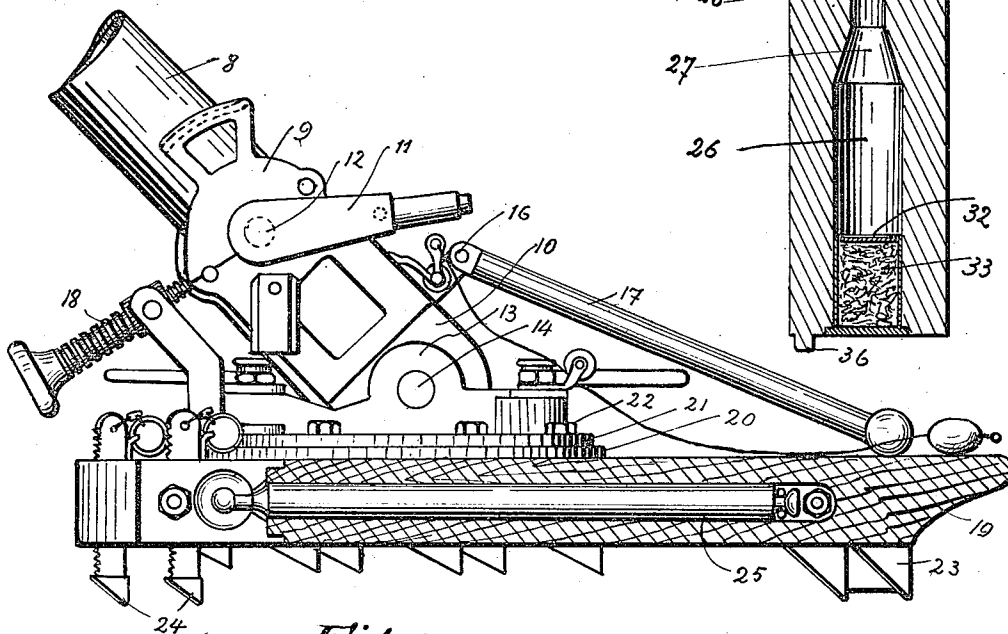
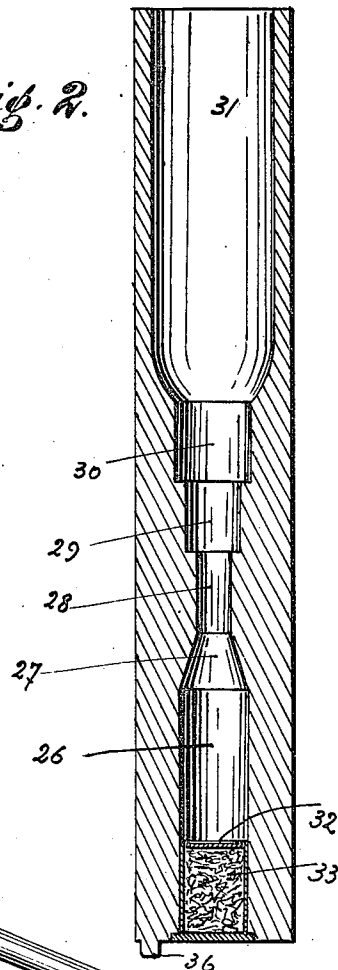


Fig. 1.

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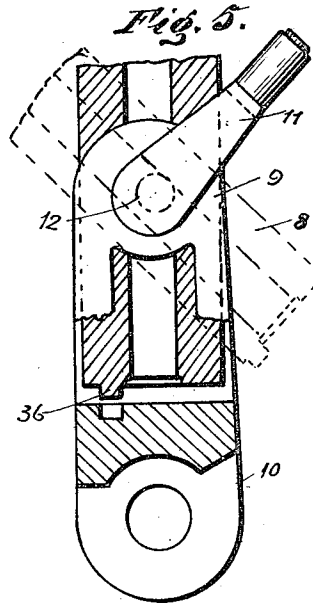
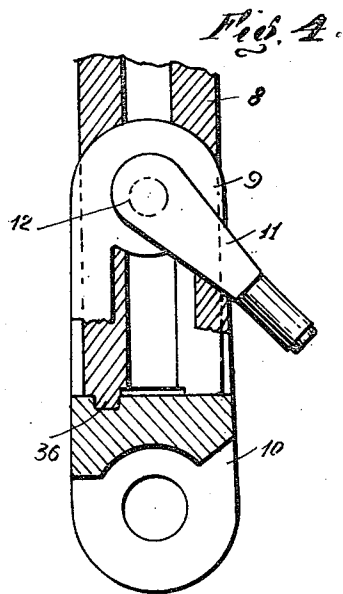
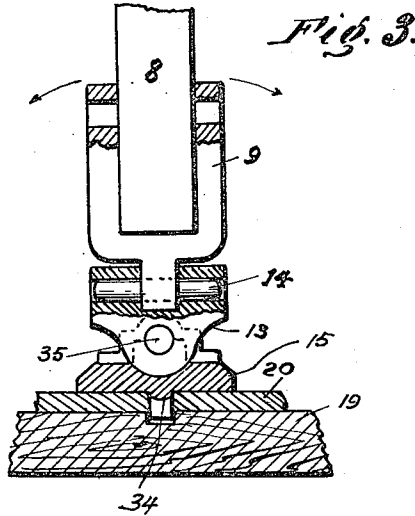
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3 Sheets-Sheet 2



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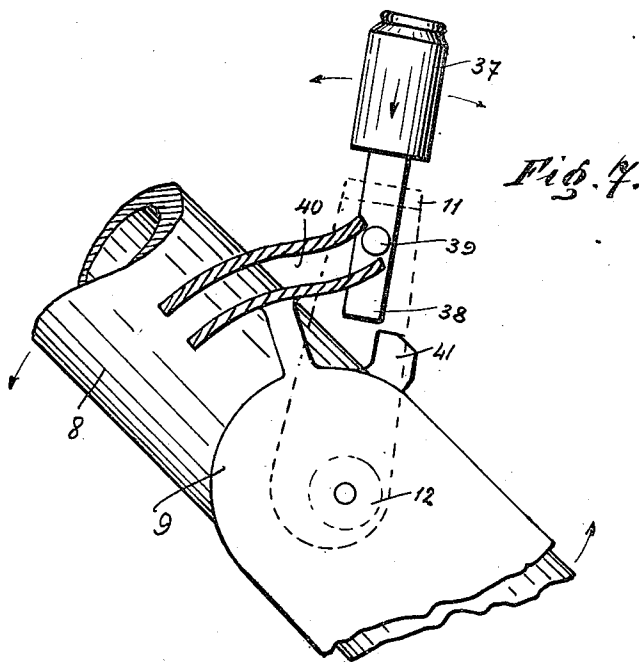
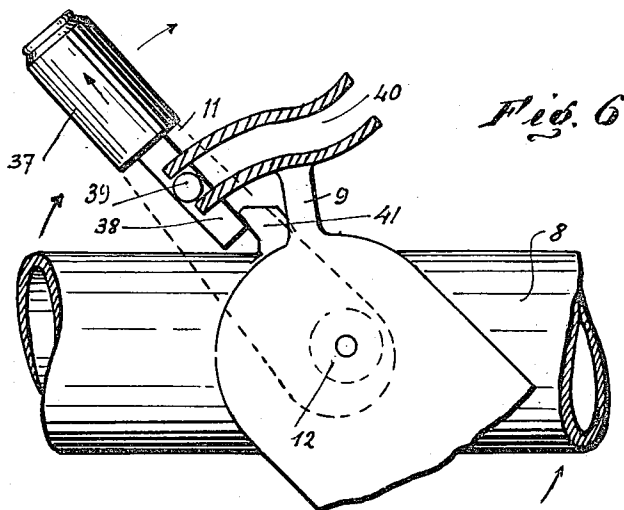
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BOMB THROWER DIVISIBLE IN TWO PARTS ADAPTED TO BE CARRIED ON MAN'S BACK

Filed Nov. 12, 1929

3 Sheets-Sheet 3



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## UNITED STATES PATENT OFFICE

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BOMB-TROWER DIVISIBLE IN TWO PARTS ADAPTED TO BE CARRIED ON  
MAN'S BACK

Application filed November 12, 1929, Serial No. 406,686, and in Italy November 23, 1928.

The present invention relates to a breech-loading bomb thrower which is light and can be divided in two parts adapted each to be carried on man's back, the novel bomb-thrower exhibiting, besides, the following main characteristic features:

(a) Special profile of the barrel bore, in order to secure the complete combustion of the launching charge and to adjust the pressure of the gases;

(b) Great stability, with very limited recoil and minimum stresses on the various parts;

(c) Base easily adaptable to the irregularities of the ground, with the possibility of setting the lugs horizontally even when the ground is not horizontal;

(d) Aiming in all directions without need of shifting the base;

(e) Safety devices which permit firing: (1) only after the breech has been completely closed so as to be ready for firing; (2) only after a member intended to avoid accidental firing has been revolved in one rather than in another direction.

An execution form of the invention is illustrated by way of example in the accompanying drawings, in which:

Figure 1 is a view showing the general arrangement of the bomb-thrower.

Figure 2 is a longitudinal section through the launching tube with the special bore profile.

Figure 3 is a detail section showing how the bomb-thrower is made to rest on its base, and detail of the movement which permits of the lugs being brought into horizontal position even when the base is not horizontal.

Figures 4 and 5 show the detail of the movement which permits of the barrel being shifted in order to load the cartridge or launching charge into it from the rear.

Figures 6 and 7 diagrammatically show the arrangement for opening and closing the barrel, the closing being rendered semi-automatic.

Fig. 8 is a fragmentary view partly in section showing the eccentric mounting for the barrel.

As will be seen from Fig. 1, the arm com-

prises the bomb-thrower proper and the base.

The bomb-thrower proper comprises: the launching tube or barrel 8; a two-legged support 9, in the bottom portion 10 of whose solid body a hole is formed for reception of the spindle 14 connecting it to the frame; an operating fork 11 (Figures 6 and 7); a carriage divided into two parts viz. the upper part 13 to which the support 9 is connected by the spindle 14 and which is pivotally mounted as will be seen below about a horizontal axis 35 normal to the axis of the lugs (Figure 3) in order to enable the correction for lateral listing of the arm. Eccentric sleeves 12 are carried by the arms of the fork and are journalled in the legs of the support 9 and receive the terminal of the trunnions 12' of the barrel 8. The bottom part 15 (Figure 3) is adapted to revolve on the plate 20 and guided by the circular rim 21 as well as by a spindle 34 normal to the said plate, the part 15 serving for pointing in azimuth; a stirrup 16 with pivoting handle 17 which, when in horizontal position serves for pointing in azimuth and when in vertical position serves to correct the listing.

For the pointing in altitude two coaxial screw spindles 18 are provided, which move in the vertical plane passing through the axis of the launching tube; this device is operated by means of a handwheel and is arranged at the front and connected to the support 9 at the top and to the carriage at the bottom.

The base essentially comprises: a wood platform 19; a plate 20 and a circular rim 21, these parts being connected to one another by anchor bolts 22. In order to anchor the said base to the ground a plate or plough-share 23 is applied to the platform at the rear, extending the whole length of the platform, and two further harpoon-shaped plough-shares 24 adapted to slide in vertical direction may be applied to the front portion of the platform. The said harpoons are provided with teeth which permit of the harpoons being fixed in any desired position; the ends of the bolts 22 are projecting below and tooth-shaped so that they may be considered as further harpoons.

Two metal arms 25, connected to the plat-

form sides by means of ball-joints can be opened out and loaded with earth-filled bags or other weights; they also serve to facilitate the shifting of the bomb-thrower.

In Figure 2 the profile of the bore of the barrel or launching tube may be seen. 26 is the chamber for reception of the launching charge; 27 is a connecting portion in the form of a truncated cone between the said chamber and the reduced portion 28; 29 is a gas expansion chamber; 30 is a further gas expansion chamber in which the projectile tail may find accommodation if projectiles fitted with tails are used; 31 is the lodging for the bomb; 32 is a cardboard disc; 33 is the launching charge, this charge and the said disc being contained in a case the bottom (inclusive of its edge) of which is lodged in a recess formed in the thickness of the breech.

In the barrel having the described internal profile, the gases behave as follows: In the chamber 26, in which the deflagration of the launching charge occurs, the gases, before the deflagration is completed, owing to their extreme elasticity, tend to move toward the forward portion of the barrel and act upon the bomb; their expanding action, however, is hemmed by the narrow passage 28 due to which the pressure in the chamber 26 is increased and the launching charge is completely burnt; this effect is assisted, though in a very scanty proportion, by the cardboard disc 32 which, in spite of its diameter being larger than that of the reduced section, is obliged to pass through the latter. The now completely disengaged gases go past the reduced section 28 into the bomb lodging 31. On passing through the said throttling, however, the gases acquire a high velocity whereas their pressure sinks and such a fact would be detrimental inasmuch as the gases would impinge the bomb prematurely and act thereon through their velocity alone. For this reason the two expansion chambers 29 and 30 have been provided, in which a portion of the gas velocity is again converted into pressure so that the gases can exert their action more rationally on a larger surface of the bomb. The bomb may be fitted with a tail, this tail being accommodated in the expansion chamber 30. In order to minimize the loss of available chamber space, the tail may be hollow, with open bottom end. By so doing the further advantage is reached that the propelling action of the gases is exerted direct on the bottom of the bomb instead of on the bomb tail, as would be the case if the tail were solid.

From Figure 3 it will be gathered that the lower portion 15 of the frame rests on the circular plate 20 and forms a single compact and solid mass with the wood platform 19 for withstanding the shocks due to the recoil.

In the center of the plate 20 a recess is formed for reception of a spindle 34 secured to the bottom portion of the frame. The

spindle 34 serves as a guide for the bomb-thrower when the latter is revolved in an horizontal plane for pointing in azimuth; the spindle also facilitates the operation of connecting the bomb-thrower to the base.

From Figure 3 it is apparent that the two portions 13 and 15 of the frame rest upon each other by two semicylindrical surfaces the convex semicylindrical surface of the upper portion 13 being adapted to revolve in the concave surface of the bottom portion 15. With this arrangement, which permits the upper portion 13 to revolve about the spindle 35 (set at right angles to the axis of the lugs) the barrel of the bomb-thrower may be given a lateral inclination to the right or to the left in order to bring the lugs in horizontal position when required, thus correcting the lateral listing.

Figure 4 shows the position occupied by the throwing tube 8 when ready for firing, that is to say when the back end of the breech bears against the support 9 and in conjunction therewith forms a tight closure. A tooth 36 projecting from the breech and solid therewith serves to lock the launching tube to the support in firing position.

Figures 4 and 5 show that the two sides or shanks of the support 9 project above the support body and afford bearings for the eccentric sleeves 12 of the operating fork 11. Due to the eccentricity of the sleeve 12, when the breech is being opened, for instance, the sleeves 12 revolve about an axis arranged eccentrically relatively to the trunnions 12' so that the barrel is raised (Figure 5), the locking tooth 36 released and the throwing tube allowed to pivot in order to be opened. After this pivoting movement, the throwing tube occupies the position indicated in dotted lines in Figure 5; now the case containing the launching charge can be introduced into the tube till the edge of said case rests in the seat formed in the breech thickness for this purpose. In order to close the breech, the same operations are performed in reversed sequence, the tube being finally brought into shooting position by means of the eccentric which acts on the lugs in such a manner that the tube is lowered into its seat and its rear end forms a tight joint with the solid portion of the support; in this manner all stressing of the pieces 12 by the lugs is avoided and the recoil forces are transmitted to the ground across masses standing in direct contact.

From Figures 6 and 7 it will be seen that the operating fork 11 is provided with a handle 37 having an inward extension, providing a tooth 38 which serves to lock the fork in the position it occupies when the breech is closed. In order to automatically release the fork from said position, a pin 39 is provided on the tooth 38, the pin being arranged to slide in a groove 40 formed in a member carried by one of the stationary shanks 9 for the sup-

carried thereby, harpoon members adjustably mounted on the base, and arms pivotally connected with the sides of the base, as and for the purpose set forth.

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port of the launching tube 8. A portion of the groove length is an arc the center of which coincides with the center of the pieces 12, and the following length extends the direction of the tangent of the said arc. When the handle 37, along with the fork 11, is being moved about its spindle, if the pin 39 on the tooth 38 lies in the arc-shaped portion of the groove 40, the tooth 38 performs no movement relatively to the fork 11; instead, if the pin 38 lies in the tangentially direct portion of said groove (Figure 7), the tooth 38 moves in vertical direction relatively to the fork 11; as a consequence of this movement the tooth 38 disengages itself from the tooth 41 of the launching tube 8 and allows the fork to move freely.

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Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

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1. A device of the class described comprising a supporting base, a support adjustably connected therewith and constituting a breech block, a launching barrel carried by the support and cooperative with the breech block, said support having spaced side members, lugs carried by the side members, a fork having its arms connected with the lugs and operable to move the barrel toward or away from the breech block, a tooth carried by the barrel adapted to engage in a recess in the breech block when the barrel is in its launching position.

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2. A device of the class described comprising a supporting base, a support adjustably connected therewith, a launching barrel connected with the support, said support constituting a breech block for the barrel, a fork member having eccentric sleeves associated with its arms for raising or lowering the barrel with respect to the breech block, and a tooth carried by the fork member adapted to engage a tooth carried by the barrel as and for the purpose set forth.

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3. A device of the class described comprising a supporting base, a support adjustably connected therewith and including spaced sides, a launching barrel associated with the support, said support constituting a breech block for the barrel, a fork member having its arms eccentrically connected with the sides of the support and operable to raise and lower the barrel with respect to the breech block, one side of the support having a grooved member thereon, a tooth carried by the fork member and engageable in the groove of the member and adapted to coact with a tooth carried by the barrel for locking the launching barrel with the breech block.

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4. A device of the class described comprising a supporting base, a launching barrel mounted thereon for universal movement, said base having a ground engaging plow

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