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BOMB NOSE FUSE

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Fig. 1.

Fig. 5.

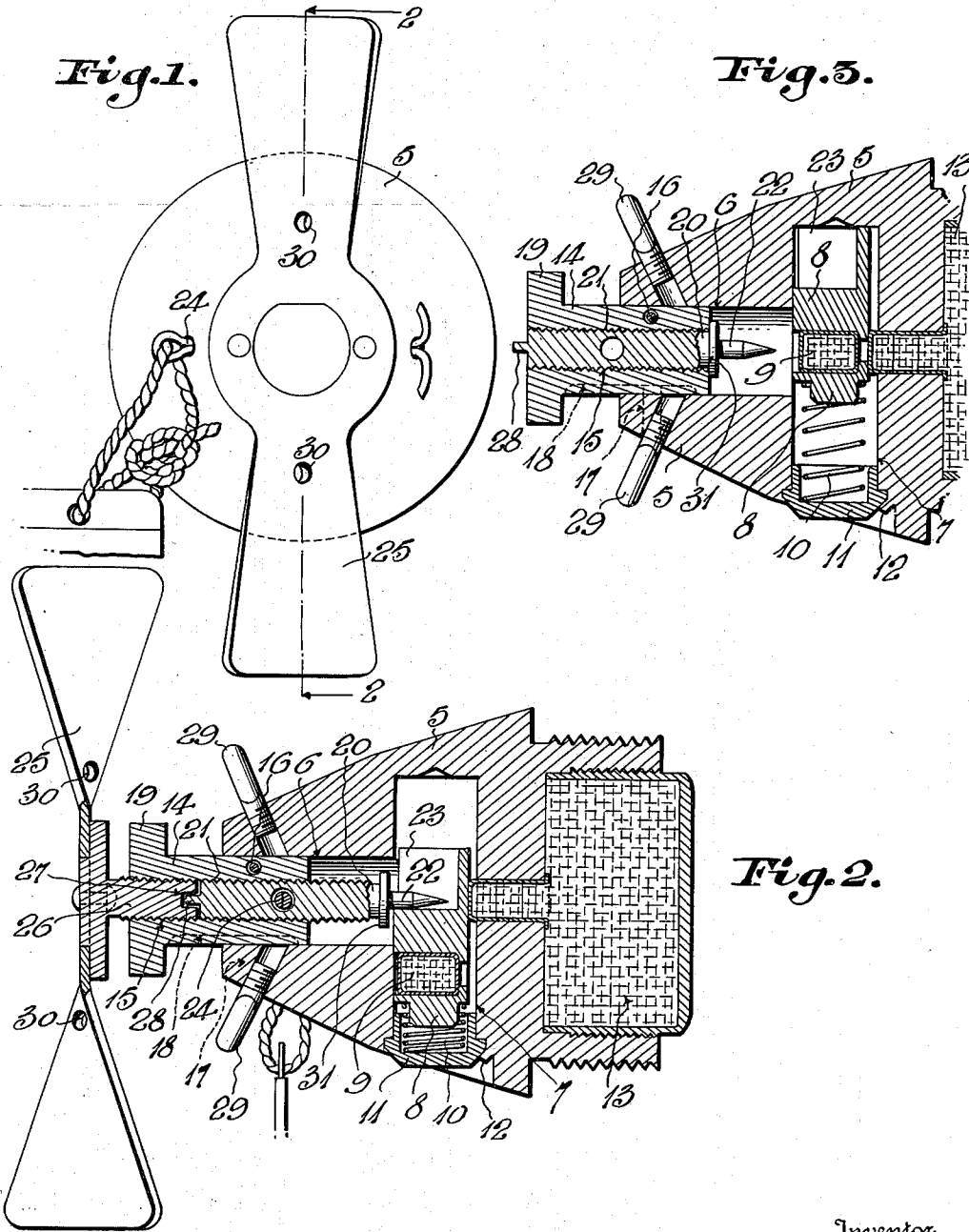


Fig. 2.

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BOMB NOSE FUSE

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5 Claims. (Cl. 102—39)

The invention relates to an improved nose fuse designed primarily for aerial drop bombs but not necessarily restricted thereto.

The improved fuse is of the general type in which a firing pin and a detonator to be fired thereby, are both held normally in safety positions but are armed ready for operation when the bomb travels a safe distance from the craft by means of which it is launched, detonation being effected by impact. Fuses of this general character have heretofore been of rather complicated and expensive nature and have usually required a great many machine operations and special machinery for performing same. The present invention, however, aims to provide a greatly simplified construction which may be easily and inexpensively manufactured without necessarily requiring special shop equipment, the construction, however, being such that no loss in safety, sensitivity, or efficiency, results from the simplification.

In the improved construction, I utilize a single pin to hold a detonator carrier in safety position when said pin occupies a normal rearward position, and to fire the detonator upon impact after said pin has been moved, under the influence of a propeller, to a forward armed position, in which latter position, it allows movement of said detonator carrier to armed position. While this general idea has heretofore been proposed, I make unusually simple and inexpensive provision whereby the pin is directly driven by the propeller and is forwardly threaded to its armed position, doing away with parts heretofore used for this purpose and consequently reducing cost and enabling more easy and rapid manufacture.

With the foregoing and minor objects in view, the invention resides in the novel subject matter hereinafter described and claimed, description being accomplished by reference to the accompanying drawing.

Fig. 1 is a front elevation of a fuse constructed in accordance with the invention.

Fig. 2 is a vertical longitudinal sectional view as indicated by line 2—2 of Fig. 1, showing the normal safety positions of parts.

Fig. 3 is a fragmentary view similar to Fig. 2 but illustrating the parts in armed position.

A preferred construction is shown in the drawing and will be rather specifically described, with the understanding, however, that within the scope of the invention as claimed, variations may be made.

A forwardly tapered fuse body 5 is shown for connection in any preferred way with the nose

of a bomb. This body is provided with an axial cylindrical bore 6 and with a transverse bore 7 intersecting said bore 6. A carrying bolt 8 for the usual detonator 9 is slidably mounted in the bore 7 and a spring 10 is provided to move said bolt from the safety position of Fig. 2 to the armed position of Fig. 3. This spring may well thrust against a plug or cap 11 which closes one end of the bore 7, the body 5 being preferably crimped at 12 to hold said plug or cap in place. When the bolt 8 is in the armed position of Fig. 3, the detonator 9 is in position to fire the explosive 13 upon firing of said detonator.

A plunger 14 is slidable in the bore 6 and is itself provided with an axial bore 15, a shear pin 16 being employed to hold said plunger against movement with respect to the fuse body 5, until said plunger is driven rearwardly by impact, causing shearing of said pin 16. The plunger is also held against rotation in the bore 6 by means of a pin or screw 17 driven into an opening in the body 5 and engaging a longitudinal key-way or groove 18 in the periphery of said plunger. This plunger is provided at its front end with an enlarged striking head 19 spaced forwardly from the body 5, and when this head strikes the ground or any stationary object, the plunger is operated to cause the firing pin, hereinafter described, to fire the detonator 9.

The firing pin 20 is threaded at 21 in the bore 15 of the plunger 14, and the rear end of this firing pin is provided with a reduced portion 22 received normally in a recess 23 in the bolt 8, to hold this bolt in the safety position shown in Fig. 2. A safety pin 24 passes through aligned openings in the fuse body 5, the plunger 14 and the firing pin 20 to hold all parts in the positions of Fig. 2 from the time of manufacture until the bomb is placed in the usual rack or the like upon the craft by which it is to be carried, said pin 23 being then withdrawn.

A propeller 25 is provided for rotating the firing pin 20 in a direction to thread it forwardly as the bomb descends, said propeller being suitably connected with the front end of said firing pin 20. In the present showing, the propeller 25 is provided with a rearwardly projecting axial stub 26 which is threaded into the front portion of the plunger bore 15, the rear end of said stub being separably connected with the front end of said firing pin, the connection being preferably accomplished by providing said stub with a groove 27 and providing said firing pin with a rib 28 removably received in said groove. The conventional arming wire (not shown) may be passed through

either of the eyes 29 on the fuse body 5, and engaged with either of the openings 30 in the propeller 25, to hold the latter against accidental rotation after withdrawal of the safety pin 23, said arming wire being of course pulled from engagement with the eye and propeller when the bomb is dropped.

With the parts positioned as in Fig. 2, with the exception that the safety pin 24 is withdrawn, the bomb descends. During descent, the propeller 25 rotates the firing pin 20 in a direction to forwardly thread said pin in the plunger 14, thereby withdrawing the pin end 22 from the recess 23 of the bolt 8 and allowing the spring 10 to shift this bolt to the armed position of Fig. 3. The propeller preferably continues to drive the firing pin 20 for a few revolutions after arming of the bolt 8 has been effected, the forward movement of the pin being limited by means of a shoulder 31 thereon striking the rear end of the plunger 14. By the time this occurs, the propeller stub 26 has threaded entirely out of the plunger 14 and the connection 27, 28 allows said propeller to become entirely disconnected from the fuse. When the plunger head 19 strikes any object on the continued descent of the bomb, the plunger 14 and firing pin 20 are driven rearwardly from the armed position of Fig. 3, causing the pin end 22 to fire the detonator 9, which in turn fires the explosive 13 and that within the bomb.

From the foregoing, taken in connection with the accompanying drawing, it will be seen that novel and advantageous provision has been made for carrying out the objects of the invention, and while preferred features have been shown, attention is again invited to the possibility of making variations within the scope of the invention as claimed.

I claim:

1. In a bomb nose fuse having detonator carrying means and means for moving said detonator carrying means to armed position; a firing pin active when in a rearward position to hold said detonator carrying means in safety position and active to fire the detonator when driven rearwardly by impact from a forward armed position, said firing pin having direct threaded engagement with another portion of the fuse, and a propeller connected with the front end of said firing pin for rotating the same in a direction to cause forward threading of said firing pin to said armed position, in which it releases said detonator carrying means.

2. In a bomb nose fuse, a fuse body, detonator carrying means in said body, firing pin carrying means slidable longitudinally of said body and held against movement except under impact, a firing pin having a threaded connection directly with

said firing pin carrying means, said firing pin normally engaging said detonator carrying means and holding the same in safety position, a propeller connected with the front end of said firing pin for rotating the same to cause forward movement of said firing pin to armed position, and means for moving said detonator carrying means to armed position when said firing pin releases said detonator carrying means.

3. In a bomb nose fuse, a fuse body, detonator carrying means in said body, a plunger slidable longitudinally in said body, means holding said plunger against movement with respect to said body except under impact, a firing pin threaded in said plunger and normally engaging said detonator carrying means to hold the same in safety position, a propeller connected with the front end of said firing pin for rotating the same to cause forward movement of said firing pin to armed position, and means for moving said detonator carrying means to armed position when said firing pin releases said carrying means.

4. In a bomb nose fuse, a fuse body having an axial bore which opens through its front end and a transverse bore which intersects said axial bore, a spring-armed detonator-carrying-bolt slidable in said transverse bore, a plunger slidable in said axial bore and itself having an axial bore, means for holding said plunger against movement with respect to said fuse body except under impact, a firing pin threaded in said axial bore of said plunger and normally engaging said detonator-carrying-bolt to hold the same in safety position, and a propeller connected with the front end of said firing pin for rotating it in a direction to thread said firing pin forwardly to armed position in which it releases said detonator-carrying-bolt.

5. In a bomb nose fuse, a fuse body, detonator carrying means in said body and means for moving said detonator carrying means to armed position, a plunger slidable longitudinally in said fuse body and projecting forwardly therefrom, means for holding said plunger against movement with respect to said fuse body except under impact, a firing pin threaded in said plunger and normally engaging said detonator carrying means to hold the same in safety position, and a propeller in front of said plunger and having a rearwardly projecting axial stub, said stub being threaded removably into the front end of said plunger and having a separable driving connection with the front end of said firing pin, said propeller and its stub serving to forwardly thread said firing pin to armed position in which it releases said detonator carrying means, said stub then unthreading completely from said plunger and separating completely from said firing pin.

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