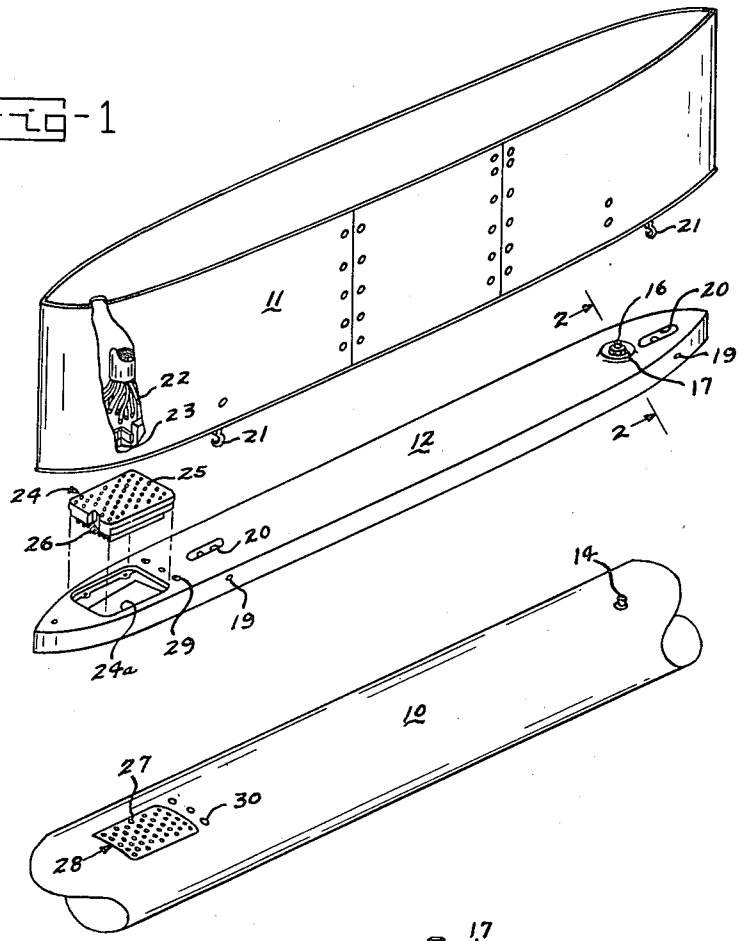
June 14, 1960 C. N. PAXTON 2,940,362

MISSILE LAUNCHER ADAPTER

Filed June 22, 1956

Fig-1



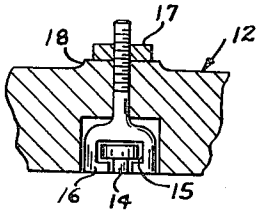


Fig-2

INVENTOR.
CHARLES N. PAXTON

BY Wade Kooney and
Frank C. Leach Jr.
ATTORNEYS

United States Patent Office 2,940,362 Patented June 14, 1960

2,940,362

MISSILE LAUNCHER ADAPTER

Charles N. Paxton, Encino, Calif., assignor to the United States of America as represented by the Secretary of the Air Force

Filed June 22, 1956, Ser. No. 593,304

1 Claim. (Cl. 89—1.7)

This invention relates to an adapter for a missle and, more particularly, to an adapter for a missile in which the adapter has electrical, mechanical, fluid and other connections between the missile and its launching member.

In preparing projectiles such as a missile for launching, various types of connections must be employed between the missile and the launching member or other fixed structure. These include electrical and fluid connections as well as mechanical connections that support and restrain the missile up to the time of launching. In order to prevent disturbance to the missile's flight, these connections between the missile and the launcher must be completely released from the missile prior to its launching.

In prior arrangements, the requirements for complete release of all the connections between the missile and the launching member have involved considerable complexity that has presented a problem relating to the facility and ease with which the missile may be loaded onto the launching member. Due to handling of the missiles under field conditions, it has been difficult to maintain certain delicate adjustments of various members that form the connections between the missile and the launching member. The present invention satisfactorily eliminates these problems by providing an adapter that makes all the critical attachments between it and the missile during manufacture of the missile. This, of course, also aids in simplifying the loading problem of the missiles under field conditions.

An object of the present invention is to provide an adapter for mounting a missile on a launcher or other fixed structure.

Other objects of this invention will be readily perceived from the following description.

This invention relates to the combination of a missile, a launching member and an adapter. The adapter supports the missile through connecting means therebetween. The combined adapter and missile are mounted on the launching member by suitable means. When a predetermined force is applied to the missile, the connecting means between the adapter and the missile is broken and the missile is released from the adapter.

The attached drawing illustrates a preferred embodiment of the invention, in which

Fig. 1 is an exploded perspective view with portions broken away of the present invention; and

Fig. 2 is a sectional view taken along the line 2—2 of Fig. 1.

Referring to the drawing and particularly Fig. 1, there is shown a projectile 10 such as a guided missile that is supported by a portion of an airplane such as a pylon 11 through an adapter 12. A shearing pin 14 is secured to the top surface of the missile 10 and connects the missile with the adapter 12 into a single, combined unit. The head of shearing pin 14 is disposed within a cutaway portion or recess 15 of a bolt 16 (see Fig. 2). A nut 17 acting against a raised portion 18 of the adapter

12 is attached to the threaded end of the bolt 16 on top of the adapter 12. In assembling the missile 10 to the adapter 12 during manufacture of the apparatus, the bolt 16 is passed over the head of the shearing pin 14 and the adapter 12 is then placed over the end of the bolt 16 after which the nut 17 is threaded onto the end of the bolt 16.

The adapter 12 has a plurality of rods 19 extending therethrough (two shown) with each passing through a slot or opening 20 in the adapter 12 so that hooks 21, which are connected to the pylon 11, inserted within the slots 20 cooperate with the rods 19 to support the adapter 12 and the missile 10 during the manufacture thereof as a unitary structure positively held together solely by the previously described bolt and shear pin arrangement. If desired, the hooks 21 may be actuated by suitable mechanism (not shown) for movement in a vertical direction to aid in loading the adapter 12 and missile 10.

While all types of connections may be employed between the pylon 11 and the missile 10 through the adapter 12, only the electrical connections are shown in detail. A plurality of electrical lines 22, which have contacts 23 extending therefrom, is disposed within the pylon 11. An electrical plate 24, which is mounted in an opening 24a in the adapter 12, has a plurality of contacts 25 that cooperate with the contacts 23 of the pylon 11 to provide electrical connections therebetween. Each of the contacts 25 is connected to a contact 26 at the other end thereof that engages a corresponding contact 27 in an electrical plate 28, which is mounted on the top surface of the missile 10. Thus, it will be seen that electrical power from the airplane is supplied through the lines 22 and the contacts 23, 25, 26, and 27 to suitable electrical lines within the interior of the missile 10. Such electrical power may be employed, for example, to actuate the missile 10 when it is desired to release the missile. While no other connections have been shown between the launching member 11 and the missile 10 through the adapter 12, it will be observed that the adapter 12 has a plurality of openings 29 in alignment with a plurality of openings 30 in the missile 10; accordingly, any type of mechanical or fluid connections, for example, could be passed through these openings from the pylon 11. It will be noted that the electrical connections between the missile 10 and the adapter 12 and any other type of connections may be easily made during assembly of the adapter 12 with the missile 10 and any necessary adjustments may be made at such time. Then, when it is desired to connect the electrical lines from the pylon 11, to the missile 10, it is only necessary to connect the contacts 23 of the pylon 11 with the contacts 25 in the adapter 12.

The present invention is easily assembled by disposing the shear pin 14 within the cutaway portion or recess 15 of the bolt 16, as previously explained. The bolt 16 is then secured to the adapter 12 by the nut 17. It will be understood that the shear pin 14 must be of sufficient strength to support the weight of the missile 10 without shearing and yet be capable of shearing when motive power is applied to the missile 10 for launching. The assembly of the adapter 12 and the missile 10 then may be stored in the field, for example, prior to being mounted on a launching member 11. When it is desired to mount the missile 10 and the adapter 12 on a launching member, the hooks 21 are inserted within the slots 20 to support the adapter 12 through the rods 19. At this time, the connections are made between the adapter 12 and the launching member 11.

After the missile 10 and adapter 12 have been mounted on the launching member 11, the missile 10 is released from the adapter 12 and the launching member 11 when a force is applied to the missile 10 to actuate it by break-

ing the shear pin **14**. All the connections between the missile **10** and the adapter **12** are broken when the missile is launched. Considering the electrical connections, for example, the contacts **26** are easily disengaged from the contacts **27** and a smooth surface is left on the missile **10**. While the launching member **11** has been referred to as a portion of an airplane, it will be understood that it may be any type of fixed launching member, if desired.

The present invention has the advantage of highly simplifying the loading of missiles in the field. Another advantage of the present invention is that various types of missiles may be installed interchangeably on a single launching structure by the use of various types of adapters. The shape of the adapter and the connection means between the missile and the adapter and the adapter and the launcher is determined by the type of missile and the connections required. It is only necessary that all disconnections at the time of launching be between the missile and the adapter.

For purposes of exemplification, a particular embodiment of the invention has been shown and described according to the best present understanding thereof. However, it will be apparent that changes and modifications in the arrangement and construction of the parts thereof may be resorted to without departing from the true spirit and scope of the invention.

I claim:

In combination, a projectile, a launching member, an adapter device, and means for releasably attaching said adapter device between said launching member and said projectile comprising a raised portion incorporated on the upper surface of said adapter device adjacent the lower surface of said launching member and incorporating a relatively small threaded opening extending therethrough on the upper surface thereof and a relatively enlarged recessed opening on the bottom surface thereof, a main, rigid projectile-supporting bolt member having a relatively elongated upper threaded portion in threaded, overlapping engagement within the relatively small upper opening extending through said raised portion and a relatively enlarged, lower head portion extending through and terminating at the lower end thereof in

flush relation to the lower surface of and confined in contacting and supporting relation with the relatively enlarged recessed bottom opening of said adapter device and incorporating a relatively reduced recessed opening portion opening onto the lower surface of said adapter device, a nut in engagement with said relatively elongated upper threaded portion of said bolt member in flushed retaining position on the raised portion of said adapter device, single mounting means for supporting the entire weight of said projectile integrally formed on the upper surface of said projectile and consisting of a shear pin having a relatively reduced head portion affixed within the relatively enlarged lower head portion of said bolt member for releasably connecting said projectile to said adapter device under a predetermined shear force, and means for releasably attaching said combined adapter device and projectile comprising a plurality of longitudinally disposed, relatively elongated openings incorporated in the upper surface of said adapter device, a plurality of rigid supporting rods integrally formed within said adapter device and extending in transverse relation through the relatively elongated openings and a plurality of hook elements integrally formed on the lower surface of said launching member normally in engagement with said rigid supporting rods for directly supporting said adapter device in suspended condition therein and indirectly supporting the projectile carried thereby until the predetermined shear force of said single mounting means is exceeded.

References Cited in the file of this patent

UNITED STATES PATENTS

1,483,992	Sperry	Feb. 19, 1924
2,422,660	Elder	June 24, 1947
2,699,908	Fletcher	Jan. 18, 1955
2,731,885	Nolan	Jan. 24, 1956
2,771,811	Lauritsen	Nov. 27, 1956
2,788,712	Kuller	Apr. 16, 1957

FOREIGN PATENTS

672,346	Great Britain	May 21, 1952