March 13, 1962 C. P. HEROLD 3,024,703

MULTIPLE QUICK DISCONNECTOR

Filed Feb. 12, 1959 3 Sheets-Sheet 1

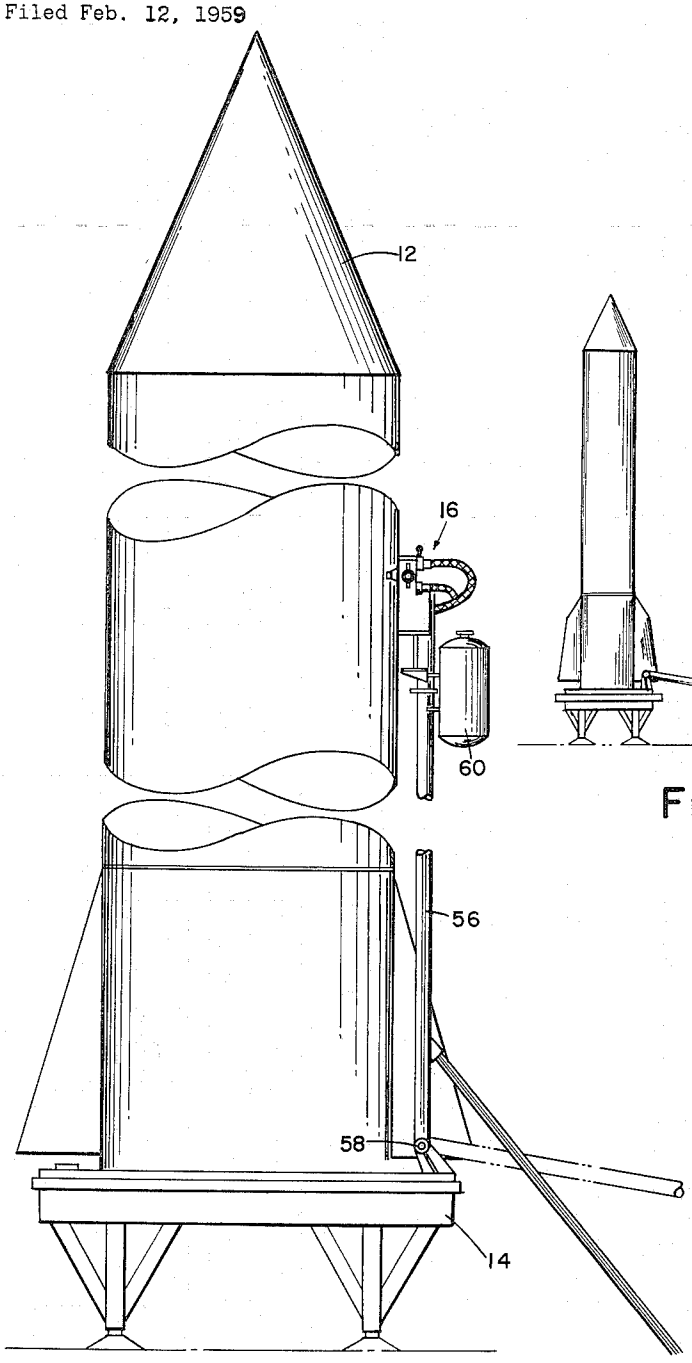


Fig. 1.

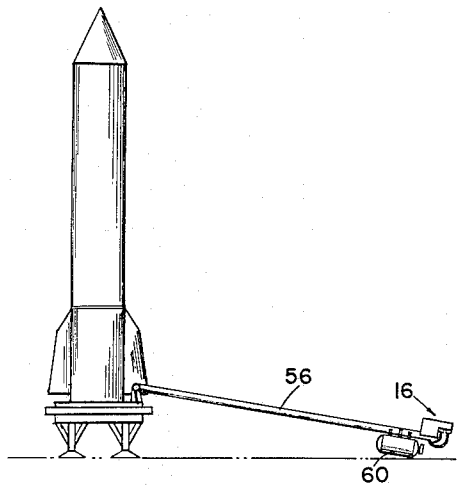


Fig. 2.

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MULTIPLE QUICK DISCONNECTOR

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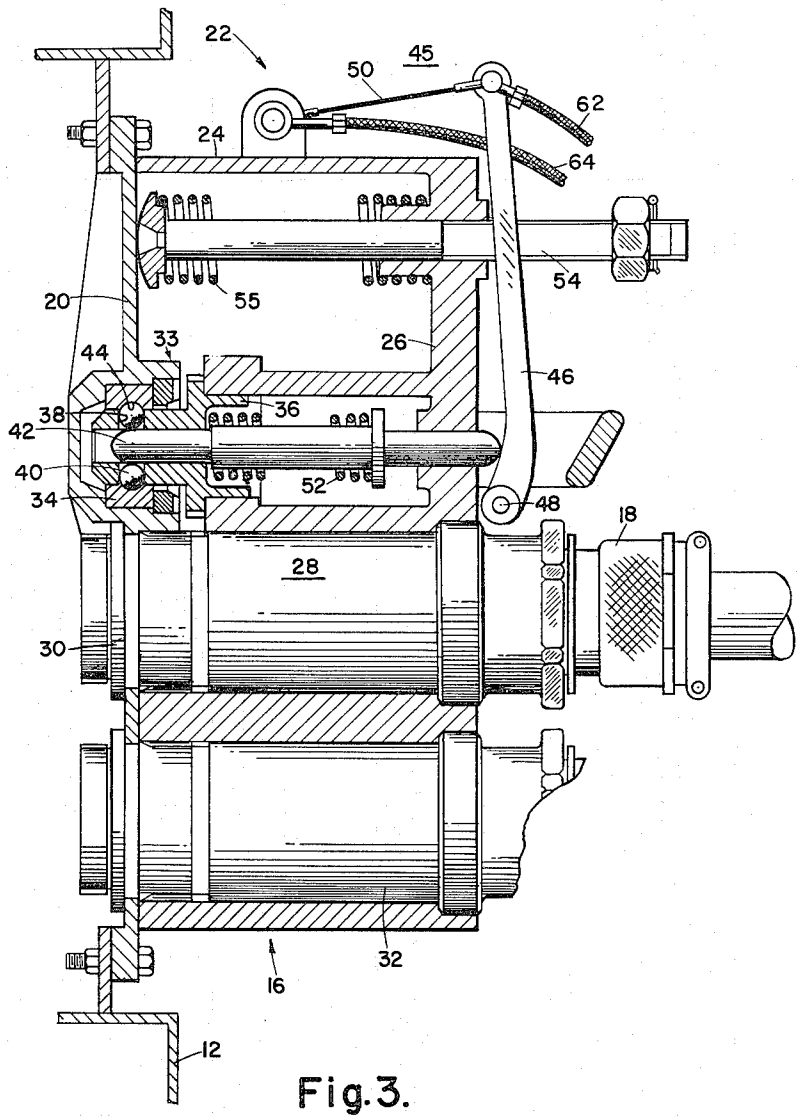


Fig. 3.

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MULTIPLE QUICK DISCONNECTOR

Filed Feb. 12, 1959 3 Sheets-Sheet 3

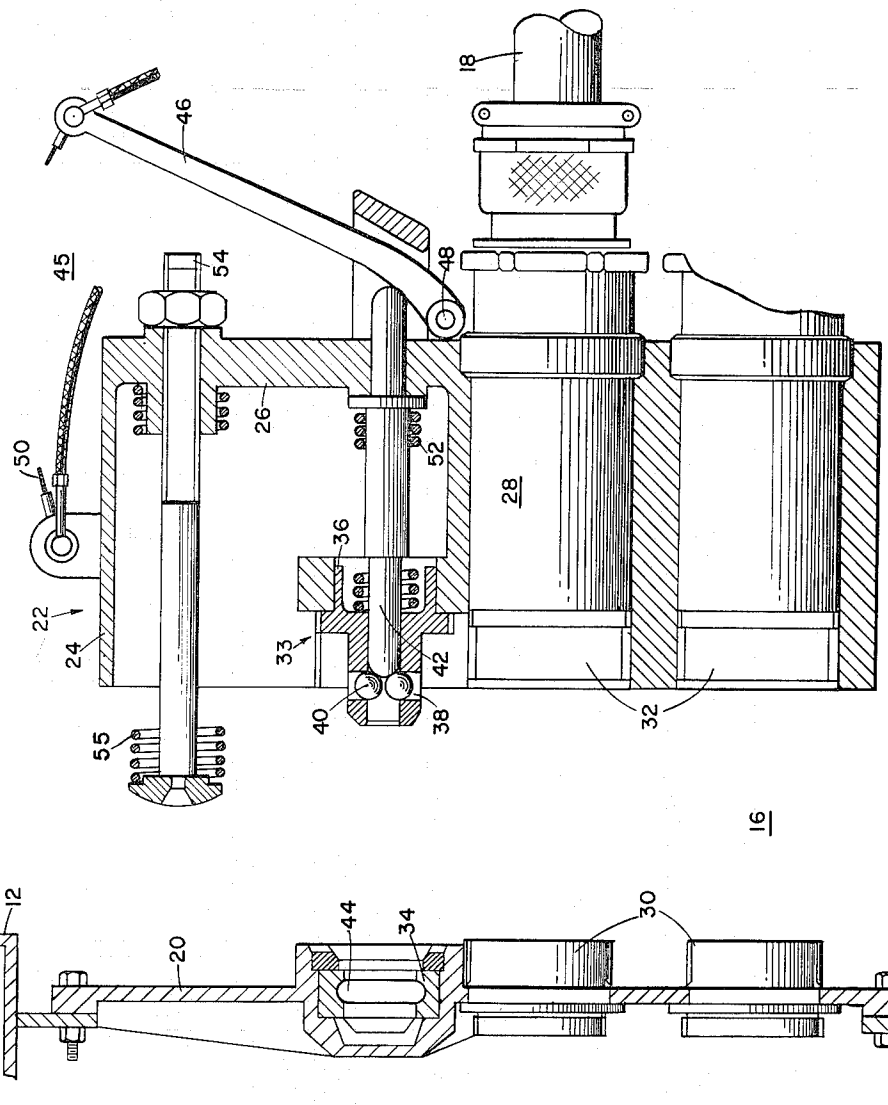


Fig. 4.

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United States Patent Office

3,024,703
Patented Mar. 13, 1962

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3,024,703

MULTIPLE QUICK DISCONNECTOR

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Filed Feb. 12, 1959, Ser. No. 792,926
2 Claims. (Cl. 89—1.7)
(Granted under Title 35, U.S. Code (1952), sec. 266)

The invention described herein may be manufactured and used by or for the Government for governmental purposes without the payment of any royalty thereon.

My invention relates to means for connecting missiles erected on launching pads with sources of supply and external testing instruments, and more particularly to a unitary connector for disconnecting the conduits from the missiles at the time of firing thereof.

Conventionally, final testing of the missiles is conducted while the missiles are mounted on the launching pads and electrical energy for the testing is provided from sources external to the missiles. Also, certain compartments of the missiles are supplied with refrigerant from external sources thereof while the missiles are erected on the launching pads.

Since the circuits to be supplied and tested and the compartments to be refrigerated are disposed adjacent the forward ends of the missiles, considerable weight thereof is saved by employment of conduits external to the missiles to enclose wires for the electrical supply and testing, and to conduct refrigerant to the compartments to be cooled.

The conduits are disconnected from the missiles responsive to firing for unfettered launching thereof.

An object of my invention is to provide a unitary connector for releasably connecting conduits to the missiles.

Another object of my invention is to provide such a connector disposed to disconnect the conduits from the missiles responsive to firing thereof.

A further object of my invention is to provide such a connector with a pivoted mast tilted away from the missiles for rotation therefrom responsive to release.

Other aims and objects of my invention will appear from the following explanation.

In carrying out my invention, connectors for removably securing conduits to missiles are respectively provided with terminal and plate members with corresponding parts of couplings secured thereto for respective attachment to the conduits and the missiles. The coupling parts are slidable to complete connection therebetween responsive to engagement of the members and a device with radially-displaceable balls and a resistance link is disposed between the members to secure the connection and to release the members responsive to firing the missiles.

The terminal members include spring biased plungers to engage the plate for disengagement of the coupling parts responsive to the release.

A mast is pivoted on the launching pad of the missile to support the conductor releasably secured to the missile for rotation therefrom at launching. A storage container for refrigerant is disposed on the mast adjacent the terminal to reduce the length of conduit leading from the container.

For more complete understanding, reference is directed to the following description and the accompanying drawing, in which:

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FIGURE 1 is an elevation of a missile supported on a launching pad with a pivoted mast thereof secured to the missile by a connector;

FIGURE 2 is a diminished view similar to FIGURE 1 with the mast disconnected from the missile;

FIGURE 3 is an enlarged view of the connector with the housing secured to the plate; and

FIGURE 4 is a view similar to FIGURE 3 with the housing disengaged from the plate.

Accordingly, a missile **12** is disposed on a launching pad **14** and a connector **16** is provided for securing conduits **18** to missile **12**. Connector **16** includes a plate **20** secured to the surface portion of missile **12** and a terminal **22** with a housing **24** having a base **26**. Base **26** is secured to a mast **56** pivoted at **58** on pad **14**.

Couplings **28** each includes parts **30** and **32** respectively secured in plate **20** and base **26**, and housing **24** is disposed for engagement with plate **20** for parallel relation of base **26** therewith, and slidable engagement of the corresponding parts of the couplings to complete connection of the conduits to the missile.

Connector **16** includes a latch mechanism **33** with a ring **34** disposed in plate **20** and a cylindrical member **36** disposed for engaging ring **34** includes radial holes **38** with balls **40** therein.

A rod **42** is axially disposed in member **36** for slidable axial operation to a cocked position in engagement with balls **40** for radial displacement thereof to respective simultaneous engagement with holes **38** and a semi-toroidal groove **44** in ring **34** to secure terminal **22** to plate **20**.

A lock mechanism **45** is provided with a lever **46** pivoted at **48** on terminal **22** and retained in a closed position by an electrical resistance link **50** secured to terminal **22** to retain rod **42** in the cocked position. The rod is biased to a normal position out of engagement with the balls by a spring **52**. Link **50** is disposed for application of a current thereto to release terminal **22** from plate **20** responsive to firing of the missile.

Plungers **54** are biased from terminal **22** by springs **55** for engagement of the plungers with plate **20** for separation of parts **30** and **32** of the couplings responsive to the release.

As shown in FIGURE 1 missile **12** is erected on pad **14** for launching. Mast **56** is angled outward from missile **12** for rotation therefrom responsive to release of terminal **22** from plate **20** for rotation of the mast from the missile. Mast **56** is disposed to enclose conduits **18** for protection thereof, and a container for storage, such as a refrigerant storage container **60** is disposed on mast **56** adjacent terminal **22** to limit the length of conduit **18** leading therefrom.

As shown in FIGURE 3 the mechanical advantage of lever **46** is high to require low tensile strength of link **50** for retention of the link in the closed position. Conductors **62** and **64** connect link **50** to a separate source of electrical energy for application thereto of the value of current required to fuse the link.

While the foregoing is a description of the preferred embodiment, the following claims are intended to include those modifications and variations that are within the spirit and scope of my invention.

I claim:

1. Apparatus for servicing and launching a missile com-

prising: a pad for support of said misile; pivot means mounted on said pad; a mast having the lower end thereof attached to said pivot means for pivoting on said pivot means; conduits extending through said mast for servicing said missile; a terminal secured to said conduits and said mast; a plate attached to said missile, said plate and said terminal being in engagement to complete communication of said conduits with the missile; means attached to said terminal for disengaging said terminal from said plate; and ejection means connected to said terminal for providing a force to pivot said mast from the missile responsive to the disengagement of said terminal from said plate.

2. A device as set forth in claim 1 wherein said ejection means connected to said terminal for providing a force to pivot said mast from the missile comprises a plurality of spring-actuated plungers.

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