July 13, 1965 G. E. McLAIN 3,195,097

ELECTRICAL DISCONNECT DEVICE

Filed July 16, 1963 2 Sheets-Sheet 1

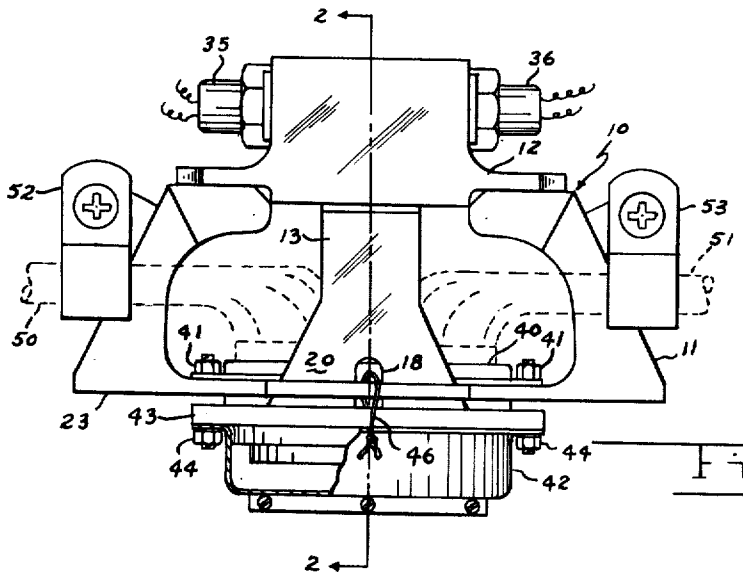


Fig. 1

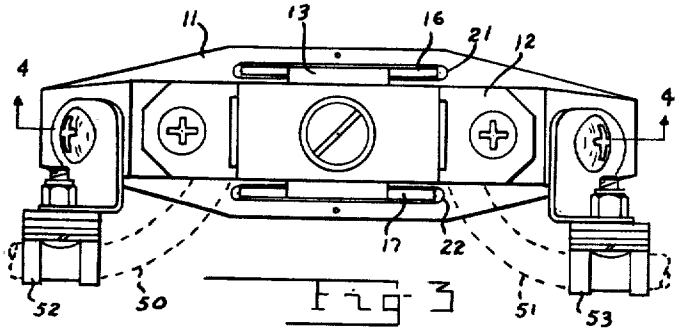


Fig. 3

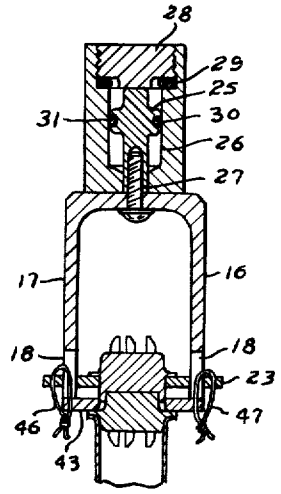


Fig. 2

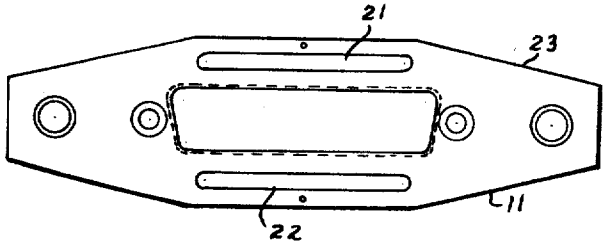


Fig. 5

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ELECTRICAL DISCONNECT DEVICE

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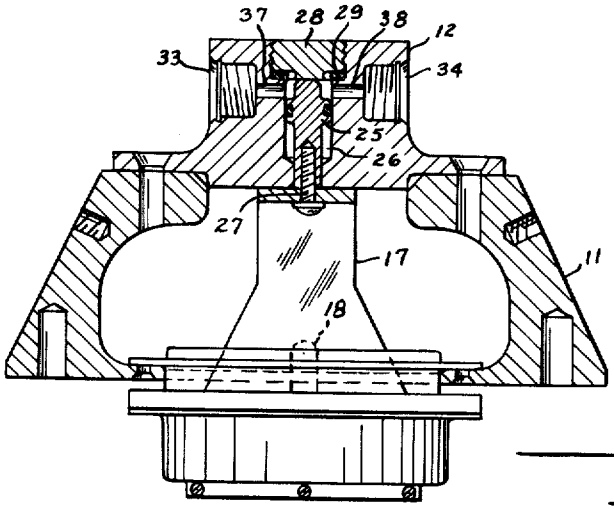
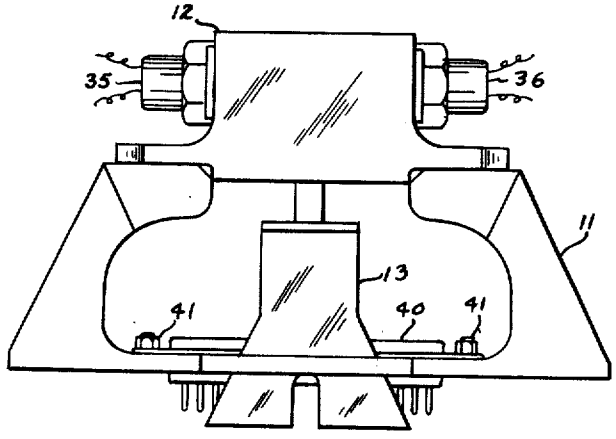


Fig-4



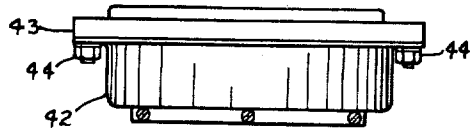


Fig-5

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3,195,097

ELECTRICAL DISCONNECT DEVICE

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1 Claim. (Cl. 339—45)

This invention relates to a squib-actuated electrical disconnect device.

One object of the invention is to provide an electrical disconnect device wherein mechanical means are used for positively separating electrical connectors.

Another object of the invention is to provide an electrical disconnect device which is more reliable than prior art devices.

A further object of the invention is to provide an electrical disconnect device which will provide a straight line separation of the female plug from the male plug.

A further object of the invention is to provide a squib-actuated electrical disconnect device wherein the disconnect device is left undamaged after separation.

These and other objects will be more fully understood from the following detailed description taken with the drawing, wherein:

FIG. 1 is a front elevation view of an electrical disconnect device according to the invention.

FIG. 2 is a sectional view of the device of FIG. 1 along the line 2—2 with the lock wires shown in full.

FIG. 3 is a top view of the device of FIG. 1 with the electrical squibs omitted.

FIG. 4 is a sectional view along the line 4—4 of FIG. 3 with the plug members shown in full.

FIG. 5 is a bottom view of the plug body support member of the device of FIG. 1.

FIG. 6 is a front elevation view of the device of FIG. 1 after separation of the electrical connectors.

Referring more particularly to FIG. 1 of the drawings reference number **10** refers to an electrical disconnect device having a plug body support member **11**, an ejector operator housing member **12**, and a substantially U-shaped ejector member **13**.

The ejector member **13** has two elongated slide members **16** and **17**, shown in FIG. 2, each having a U-shaped notch **18** therein. The elongated slide members **16** and **17** are flared at the bottom portion **20** and fit into elongated slots **21** and **22** in the base **23** of the plug body support member **11** as shown in FIG. 5. As shown in FIGS. 2 and 3 a piston member **25** located within a cylindrical chamber **26** is secured to ejector member **13** by means of a screw **27**. The chamber **26** is sealed by means of a threaded plug **28** and seal **29**. An O-ring **30** is located in an annular groove **31** on the piston **25**. Two internally threaded chambers **33** and **34** adapted to receive electrically operated squibs **35** and **36** are located in the ejector operator housing **12**. Communicating passages **37** and **38** are provided between the chambers **33**, **34** and the cylindrical chamber **26**. A male plug **40** is secured to the base **23** by means of bolts **41**. The female plug **42** is secured to a plate member **43** by means of bolts **44**. The ejector member **13** abuts against the plate **43**. The male plug **40** is retained in electrical engagement with

the female plug **42** by means of lock wires **46** and **47**. Electrical connector cables shown schematically at **50** and **51** provide electrical leads to the male plug and are connected to the plug body support **11** by means of brackets **52** and **53**. However, this forms no part of the invention. Also the leads for the female plug are not shown since they form no part of the invention.

In the operation of the device of the invention the male plug **40** is held in engagement with the female plug **42** by means of lock wires **46** and **47**. When it is desired to separate the male and female plugs the squibs **35** and **36** are fired. The expanding gas enters cylindrical chamber **26** through passages **37** and **38**, thus causing the piston to move the ejector member to the position shown in FIG. 6. This breaks the wires **46** and **47** and separates the female plug **42** from the male plug **40** without damaging the disconnect device.

There is thus provided a squib-actuated electrical disconnect device which provides positive mechanical means for straight line separation of electrical connectors which is more reliable than prior art devices.

While a certain specific embodiment has been described in detail, it is obvious that numerous changes may be made without departing from the general principles and scope of the invention.

I claim:

An explosively energized mechanically operated electrical disconnect device comprising: a plug body support member; a first means on said plug body support member for holding a first plug; a second means adjacent said plug body support member for holding a second matching plug member; a pair of lock wires for securing said first plug holding means to said second plug holding means to thereby retain said first plug and said matching plug in electrical engagement; an ejector housing member attached to said plug body support member; a cylindrical chamber within said ejector housing member; a piston within said cylindrical chamber; an ejector member having two elongated side members and a cross member interconnecting said side members to thereby provide a substantially U-shaped member; said elongated side members being flared at the end remote from said cross member; said flared end being located in abutting relation to said second plug holding means; means for attaching said cross member to said piston; means, within said ejector housing member, for holding an electrically operated explosive squib and a communicating passage between said squib holding means and said cylindrical chamber.

References Cited by the Examiner

UNITED STATES PATENTS

2,489,984	11/49	Shoemaker.	
2,688,734	9/54	Welling	339—45
2,847,652	8/58	Kokalas	339—45
3,009,730	11/61	Gantschnigg et al.	89—1 X

FOREIGN PATENTS

635,056	1/62	Canada.

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