July 28, 1959 D. D. MUSGRAVE 2,896,509

BOMB-RACKS

Filed Sept. 19, 1957 2 Sheets-Sheet 1

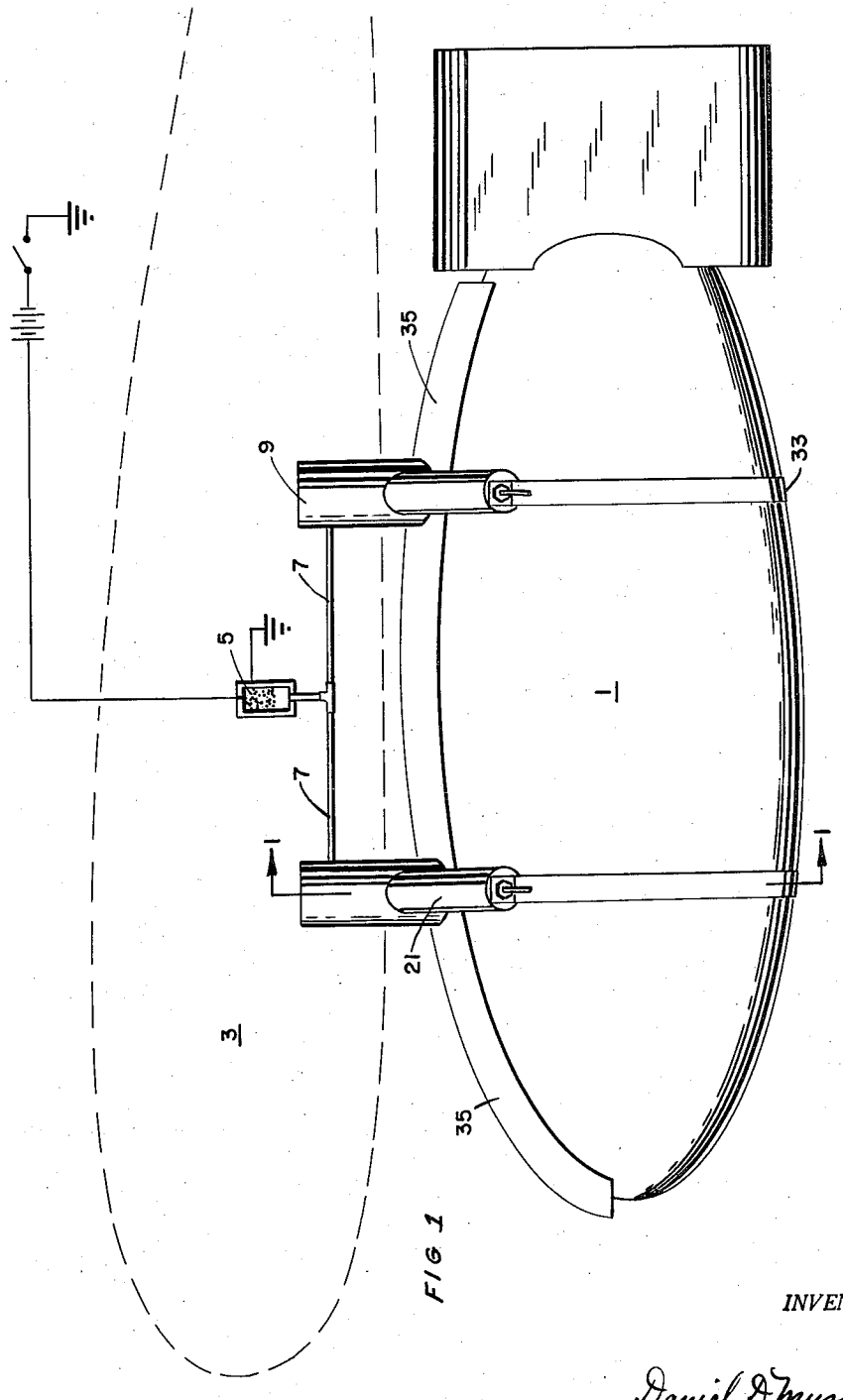


FIG 1

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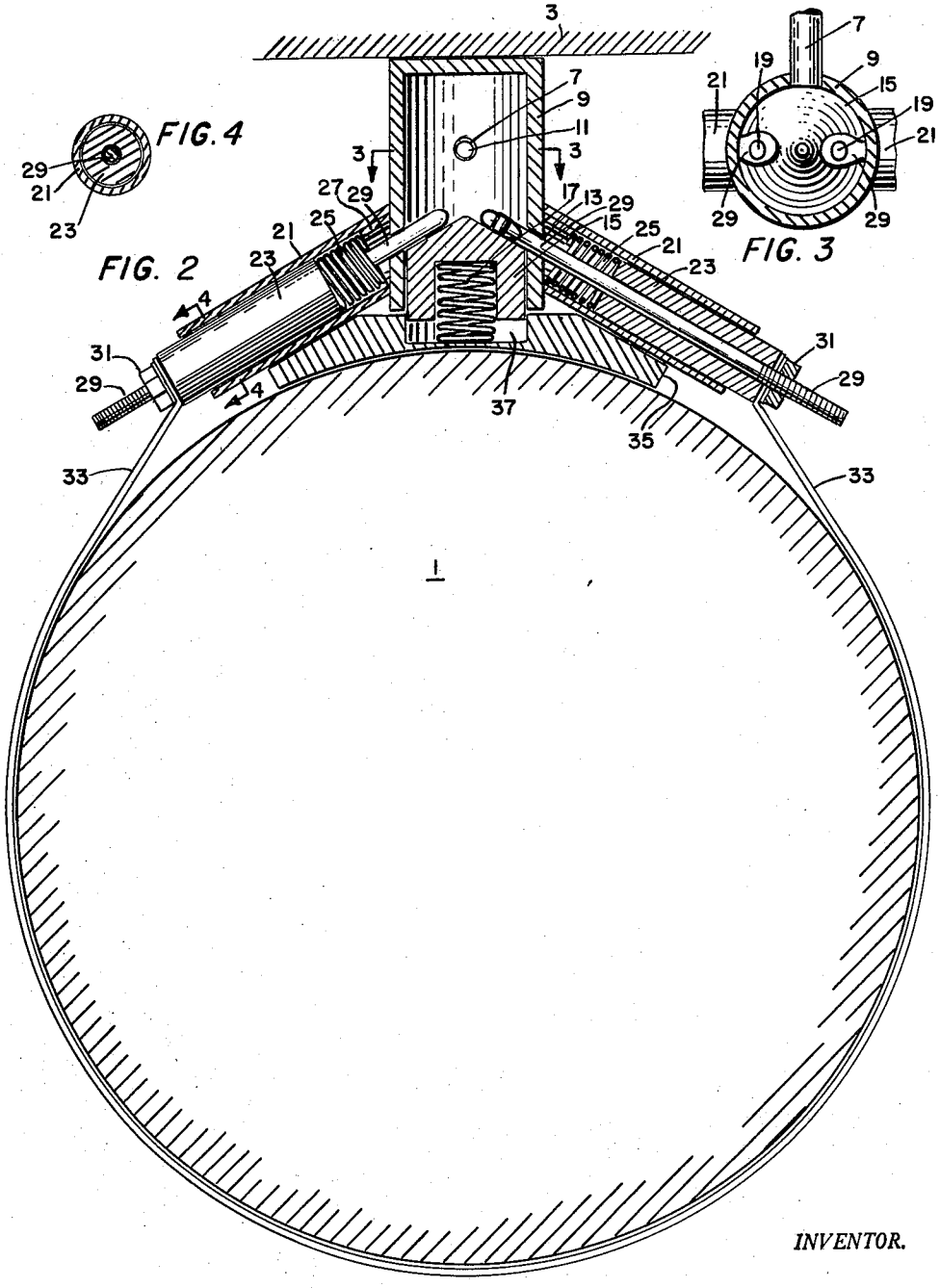


FIG. 2

FIG. 4

FIG. 3

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2,896,509

BOMB-RACKS

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1 Claim. (Cl. 89—1.5)

This invention relates to load-dropping devices of the type ordinarily known as bomb-racks, but its usefulness is not limited to dropping of explosive loads. Many other objects, warlike and otherwise, are suspended and released from carrier structures such as aircraft.

In the suspension of loads preparatory to deliberate dropping, it has been common practice to affix to the load a lug, ring or some other mechanical protuberance which is capable of engagement with a member in the dropping device. Such protuberances offer certain disadvantages both in loading on the ground, and in dropping. The shape, size and location of the lug or ring on the load must be exactly compatible with the characteristics of the member with which it engages. The load must be lifted to the suspension system with the lug or ring top-most. When the load is dropped the protuberances have a detrimental effect on accuracy.

In consideration of the aforementioned difficulties, the primary object of this invention is the provision of a bomb-rack which suspends lugless bombs.

Another object is to permit the use of flexible bands to suspend bombs in bomb-racks.

Another object is to assure that the bands will be forcibly separated from the load at the time of dropping.

These and other objects and advantages of the present invention will become more apparent upon reference to the following specification, taken in connection with the accompanying drawings, wherein:

Figure 1 is an external side elevation of a bomb-rack according to this invention.

Figure 2 is a cross section through the rack as indicated by Line 2—2 on Figure 1.

Figure 3 is a horizontal section on the plane indicated by Line 3—3 on Figure 2.

Figure 4 is a section through the portion of the device indicated by Line 4—4 on Figure 2.

Referring to the drawings somewhat more in detail, and particularly to Figure 1, the bomb-rack is shown carrying a bomb 1. The rack itself is affixed by any convenient method to the carrying structure 3, which in this case is an airfoil. A pressure source is provided on the carrier, it being an explosive cartridge unit 5, and from it suitable conduit or pipe 7, conveys the gases to the bomb-rack for use. The explosive cartridge unit may be ignited in the well-known manner by a simple electric circuit as shown.

In Figure 1 it may also be noted that pipe 7 leads to several cylinders 9, from which extend other cylinders 21. Under the bomb pass bands 33 which terminate near the ends of cylinders 21.

Referring now to Figure 2 we see a section through a typical band-suspension-release unit. A complete rack might have one or a plurality of such units. The bomb 1 is suspended from the unit by band 33 the ends of which are secured to a pair of connecting rods 29 by nuts 31. The extremities of rods 29 are threaded to permit adjusting the tension on band 33. At their other end, these rods have loops or eyes which may be engaged with lugs 19 on a central moveable piston 15. Piston 15 is movable in cylinder 9 and is kept in engagement with connection rods 29 by spring 17. Between the cylinder 9 and the load 1 is interposed an adapter 35, shaped to suit the irregularities of rack and load and permit band 33 to be tightened and act as a sway-brace. Adapter

35 has a recess or seat 37 to accommodate the travel of piston 15 and to receive an impulse from it, as will be described later.

Still referring to Figure 2, it may be noted that cylinder 9 is closed at its upper end and has in its sidewall a port 11 through which pipe 7 protrudes to convey gases from the pressure source. Such gases will, of course, act upon the head of piston 15 and a portion of them will pass through cuts 13 in the sidewall of cylinder 9 emerging in cylinders 21. Cylinders 21 may be suitably joined, as by welding, to cylinder 9. In each cylinder 21 is situated as cylindrical piston 23, bored to permit the passage of a connecting rod 29. Between each piston 23 and the wall of cylinder 9 is interposed a compression spring 25 which rests partly against a stop 27 in cylinder 21. The carrier structure for the rack, which might be an aircraft, is indicated at 3.

It should be noted that the figures are merely illustrative of a possible embodiment of this invention, and the arrangements shown should not be considered limiting. The angles between cylinders particularly may be varied to suit circumstances. Other changes may be made without departing from the spirit of the invention. The included angle between lugs 19 may be varied as necessary.

The operation of the rack is as follows: Adapter 35 with piston 15 and spring 17 in recess 37 are placed on the load and raised to the rack with the load. Before piston 15 is completely inserted into cylinder 9, connecting rods 29 are engaged on lugs 19. Load 1 is now raised till adapter 35 touches cylinders 21. Springs 25 and pistons 23 are inserted into cylinders 21 and each end of band 33 is secured to one of the connecting rods 29 by a nut 31. The ends of band 33 have suitable holes to slip over rod 29. When nuts 31 are tightened, band 33 will draw the load and the adapter tightly against the cylinder assembly. The load is suspended, ready for release.

When release is desired, pressure system 5 is ignited, and gases under pressure pass through pipe 7 to cylinder 9. Piston 15 is driven down and exerts a force on adapter 35 and load 1. The pressure has also entered cylinders 21 and as soon as piston 9 displaces, connecting rods 29 are released permitting pistons 23 to throw the band clear of the load.

Having described my invention, what I claim as new and desire to secure by Letters Patent is:

A mechanism for suspending and releasing a store comprising a main support cylinder having a pair of lateral openings therein, a main piston disposed within said main cylinder, resilent means interposed between the store and said main piston urging said piston to a first position in said cylinder, a sling to support said store, auxiliary pistons and apertured rods at the ends of said sling, a pair of auxiliary cylinders carried by said main support cylinder about said openings for receiving the ends of said rod and piston means, the ends of said rods passing thru said lateral openings into said main cylinder, detent means on said main piston separably engaging the apertures at the ends of said rods when said main piston is at said first position whereby said main piston releases said rods upon the introduction of pressure to said main cylinder.

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