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

This invention relates to dummy ammunition cartridges, and more especially to an improved dummy ammunition cartridge which is susceptible of repeated use to an extent greatly exceeding that heretofore realized.

Except for firing, dummies are required to perform all the functions of live cartridges. They are used extensively during the development of weapons and weapon systems. An example of this is the recent use of 30,000 dummies for one such development. Other uses are for checking out the operation of mechanisms of weapons and weapon systems for acceptance purposes, for trouble shooting and during the overhaul or repair of weapons, in conjunction with live cartridges in firing test programs, and for the training of personnel. For economy, it is desirable that dummies be capable of repeated use. This requires that they be resistant to separation of parts or to fracture thereof and to deformation.

Different methods have been utilized in the manufacture of dummies. According to one method, a cartridge case is crimped to a bullet or projectile in the conventional manner. Brazing or welding have been employed upon to prevent loosening of the projectile in the case or separation from it during deceleration of the dummy upon its seating in the chamber when crimping alone could not prevent these. The number of times a dummy of this latter brazed or welded type can be used is limited by a deformation of the shoulder of the cartridge case which causes the dummy to seat too deep in the chamber.

According to another method, the dummy is machined from metal bar stock in the configuration of the complete cartridge. When the weight of this dummy is to be matched with live ammunition, components have been machined from metals of different densities and assembled with thread or forced fits. Such solid type dummies while not subject to parts separation or to excessive shoulder deformation can, however, be damaging to weapons and have proved impractical in a type of weapon which feeds and chambers the cartridge by contact of rammers with the extractor flange. This latter is so because the flange fractures after one to eight uses of the dummy.

In accordance with the present invention, these difficulties are avoided by making the head or base of the dummy capable of movement with respect to the rest of the dummy. This permits use of a novel solid type dummy while retaining the desirable advantages of a non-deforming shoulder but minimizing damage to the weapon. This results from the ability of the dummy to adjust its dimensions to those required upon chambering and in this respect to simulate the behavior of the cased type dummy or live cartridge. Upon extraction and ejection, the dummy cartridge returns to its original dimensions.

The invention will be better understood from the following description when considered in connection with the accompanying drawing and its scope is indicated by the appended claims.

The single FIGURE of the drawing is a sectional view of a dummy cartridge which includes a body 10, a nose 14 and a head 12. The nose 11 may consist of a metal having a density different from that of the body 10 and has a rear extension 13 which is threaded into the body. In one embodiment of the invention the body consists of aluminum and the nose and head consist of steel.

The head 12 is formed with an extension 14 which has a transverse slot or aperture 15 and extends into a recess 16 in the end of the body 10. A spiral spring 17 extends between the bottom of the recess 16 and the inner end of the extension 14, this spring being maintained in a somewhat compressed state by a pin 18 which extends through the slot or hole 15 in the extension 14 and is fitted into holes at the opposite sides of the recess 16. With this arrangement, the head or base 12 is capable of movement to shorten the cartridge in response to pressure upon the head, 12. The head may be made appreciably hard to resist deformation since its movement minimizes wear on the weapon parts.

It has been found that movement of the head prevents fracture of the exterior flange by rammer type weapons. In an evaluation of the novel dummy cartridge in a rammer type automatic weapon, wherein forty times was the number of cycles per cartridge arbitrarily determined upon, no fracture of the actual weapon which occurred in testing approximately one hundred cartridges. It would appear that this is due to the fact that the energy delivered to the flange is determined largely or altogether by the mass of the movable head instead of the mass of the entire cartridge.

The ability of the head to move with respect to the remainder of the dummy cartridge is the outstanding feature of the invention. Design requirements of the spring are not critical. It is conceivable the spring might be replaced by other resilient material such as rubber, plastic or the like, and that, in the case of certain linking designs, feed and other weapons mechanism, the spring or other resilient material may be omitted. In any case, the movable head increases the possible reuses of the dummy from about twenty to over forty.

We claim:

1. A dummy cartridge to take the place of a live cartridge for gun-testing purposes having substantially the same exterior configuration as a live cartridge and comprising: a body portion, a nose portion and a head portion, said body portion being generally cylindrical and having a forward portion and a rear portion, said body rear portion having a longitudinal recess therein, said heat portion being substantially cylindrical and juxtaposed said body rear portion, said body rear portion and said head portion having substantially identical maximum outer diameters, said head portion having an extending thereon forwardly placed, slidable in said body longitudinal recess, said body longitudinal recess of a depth greater than the length of said extension, means for maintaining said head
extension slidably within said longitudinal recess, and resilient means interposed between said extension and said body portion within said longitudinal recess, whereby said resilient means opposes longitudinal compressive forces which may be exerted on said dummy cartridge during use.

2. The dummy cartridge of claim 1 further characterized by said means for maintaining said extension slidably within said longitudinal recess being of the slot and pin type wherein said extension is provided with a longitudinally elongated slot transversely therethrough, and a pin attached to said body rear portion and passing freely through said elongated slot.

3. The dummy cartridge of claim 2 further characterized by said resilient means being a spiral spring.

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