July 13, 1965 W. E. JAYCOX 3,193,959

SAFETY CHAMBER PLUG FOR FIREARMS

Filed March 26, 1963

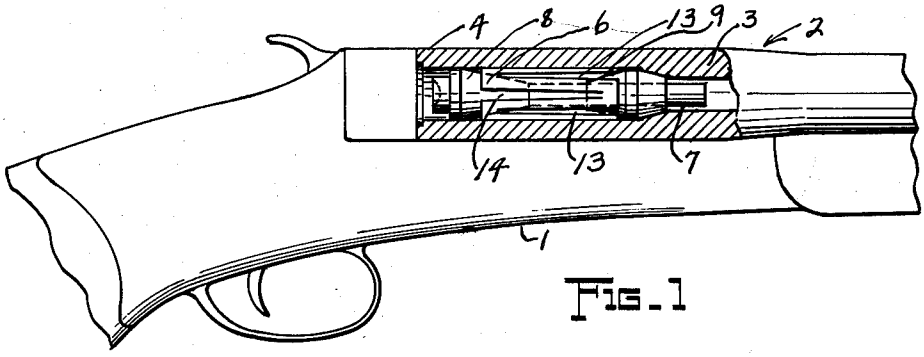

Fig. 1

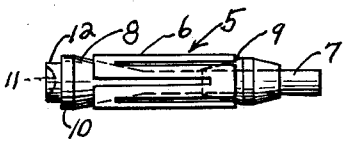

Fig. 2

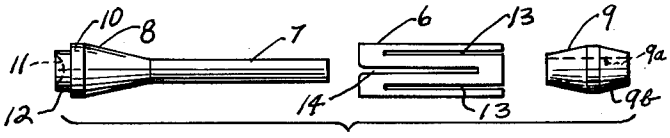

Fig. 3

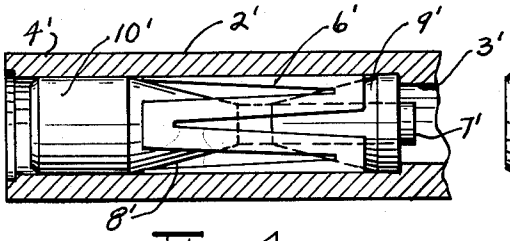

Fig. 4

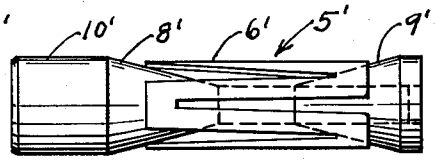

Fig. 5

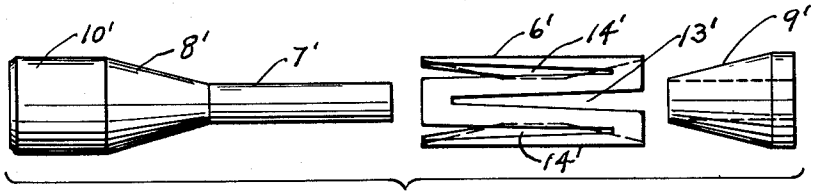

Fig. 6

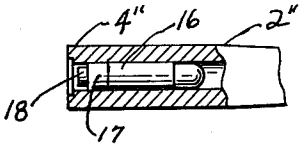

Fig. 7

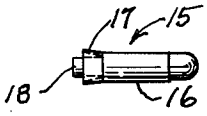

Fig. 8

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SAFETY CHAMBER PLUG FOR FIREARMS

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This invention relates to safety devices for fire arms and, more particularly, to such devices designed to prevent unauthorized loading of such fire arms.

Wherever fire arms are on display for sale to the general public such as in gun shops or gun departments of stores, they are likely to be handled frequently by irresponsible persons who may load the same with ammunition and thus create a hazard in the subsequent handling of such fire arms in that they may be fired with consequent risk of injury to others in the vicinity.

In such places where fire arms are on sale, it is quite common for prospective customers to handle the fire arms and to test the action thereof in one way or another so that it is desirable that any such safety devices employed in connection with the fire arms should not interfere with such testing of the action of the fire arm.

It is therefore a principal object of the invention to provide a safety device for fire arms designed to prevent unauthorized loading thereof with ammunition while permitting demonstration of the operating action of the fire arm.

Another object of the invention is to provide such a safety device which may be readily inserted into the chamber of a gun or other fire arm and be locked therein without necessity to use special tools for such purpose and which safety device when so locked cannot readily be displaced without the use of some instrument such as a cleaning rod not usually readily available to unauthorized persons under the circumstances above referred to.

A further object of the invention is to provide such a safety device which can be readily emplaced in the chamber of such fire arm and locked therein without injury to the fire arm to the chamber thereof.

A still further object of the invention is to provide a safety device of the nature indicated which is adapted for use in various types of fire arms such as rifles, shot guns, revolvers, etc., without any change in the basic design of the safety device.

A further object of the invention is to provide such a safety device which is capable of being used in fire arms having chambers of various sizes or diameters without the necessity to provide a different size such safety device for each different chamber diameter.

Additional objects of the invention are to provide such a safety device which is of relatively simple construction, which is positive and reliable in its action, and which can be readily fabricated from relatively inexpensive materials.

In the light of the foregoing, the safety device of the invention comprises a plug unit insertable into the firing chamber of a fire arm from the breech end thereof and arranged to be wholly received within said chamber when the breech thereof is closed, said unit including means engageable with the interior of said chamber during insertion of said unit into said chamber to position said unit immovably within said chamber so that said unit cannot be displaced therefrom except by application of pressure to said unit from the forward end thereof.

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In one form, the safety device of the invention preferably comprises an expansible member which when the device is inserted into the chamber of a fire arm is expandable circumferentially into contact with said chamber, and means cooperable with said expansible member to effect such expanding action in such manner that the operation of inserting the safety device into the chamber of the fire arm serves without more to cause the safety device to become locked in proper position within said chamber to prevent subsequent loading of ammunition thereinto.

In another form, the safety device of the invention may comprise a plug unit having a forward cylindrical body portion of a diameter slightly smaller than that of the firing chamber into which the plug unit is to be inserted, said unit having a rear outwardly flaring resilient conical portion the maximum diameter at the rear end of which is larger than the maximum diameter of said chamber, whereby when said unit is inserted into said chamber from the breech end thereof said conical portion will be compressed into tight frictional engagement with the interior of said chamber.

Other objects, advantages and features of the invention will become apparent from the following detailed description, taken in conjunction with the accompanying drawings in which:

FIGURE 1 is a fragmentary view in side elevation and partly in section of a typical rifle showing the safety device of the invention in locked position within the chamber thereof;

FIGURE 2 is a side elevation of the safety device alone;

FIGURE 3 is an exploded view showing the elements of the safety device of FIGURES 1 and 2 separated from one another;

FIGURE 4 is a fragmentary vertical sectional view of the chamber of a shot gun showing a modification of the safety device of the invention emplaced in said chamber;

FIGURE 5 is a side elevational view of the safety device of FIGURE 4 alone;

FIGURE 6 is an exploded view of the safety device of the modification of FIGURES 4 and 5;

FIGURE 7 is a fragmentary vertical sectional view of the chamber of a small caliber fire arm showing another modification of the safety device of the invention emplaced therein.

FIGURE 8 is a side elevation of the safety device of FIGURE 7 alone.

Now referring to the drawing and describing the invention in detail, with reference to FIGURES 1, 2 and 3, the numeral 1 indicates a rifle having a barrel generally indicated by the numeral 2 provided with a firing chamber 3 and a breech portion 4. The safety device generally indicated by the numeral 5 and constructed in accordance with the invention is adapted to be inserted into and to be positioned in locked condition within the chamber 3 in the manner shown in FIGURE 1 with the rear end of the safety device adjacent the breech end of the barrel, said device 5 having been inserted into the chamber 3 from the breech end of the barrel.

The safety device 5 comprises an expansible member 6 which is expandable into firm interlocking engagement with the chamber 3, and means for effecting such expansion of the expansible member, whereby the action of inserting said device into the chamber will serve to effect locking engagement of said expansible member with said chamber. As shown in FIGURES 1, 2 and 3, said means

comprises core means consisting of a stem element 7, a cone element 8 fixed to or integral with the stem element 7 at one end of the latter, and a second cone element 9 receivable on the stem element 7 for sliding movement therealong. As seen best in FIGURE 3, the cone element 8 flares outwardly from one end of the stem 7 so that the stem end of the cone element 8 merges with the stem 7 and the largest diameter of the conical configuration of the cone element 8 merges with a cylindrical portion 10 of such larger diameter. The outer face of the cylindrical portion 10 may be provided with a recess 11 to receive the pointed nose portion of the bullet of a cartridge which might be attempted to be inserted in the chamber 3 after the device 5 was emplaced in said chamber. As shown the said recess 11 may be provided in a boss 12 extending from the outer face of the cylindrical portion 10. The stem element 7 is adapted to extend through the bore of the expansible member 6, the cone element 8 and stem 7 being proportioned so that the stem element 7 will extend through the bore of the member 6 and protrude beyond the end thereof opposite to the end of said member engaged by the cone element 8 for a sufficient distance so that the cone element 9 may be slidably received on the stem 7 without effecting maximum expansion of the member 6.

In connection with the foregoing, it will be noted that when the device 5 is assembled as in FIGURE 2, the portions of the cone elements 8 and 9 of narrowest diameter extend into the bore of the member 6 in a manner such that when the cone elements 8 and 9 are moved toward one another they will coact with the member 6 with a wedging effect tending to expand the cylindrical diameter of the member 6. It may be further noted that the cone element 9 is in the form of a sleeve having a bore 9*a* of a diameter to fit snugly upon the stem 7 for frictional engagement therewith of a nature such that the cone element 9 will maintain any position on the stem 7 to which it is adjusted against the spring action of the expansible member 6 tending to move the cone elements away from one another in the expanded condition of the member 6. In the latter connection it is noted of course that the member 6 is of a resilient nature such that when expanded it tends to spring back to a relaxed condition of smaller cylindrical diameter.

To the foregoing end, the expansible member 6 is preferably made of a resilient material and of a construction to provide the desired condition of flexibility. Preferably also in order to prevent injury to the firing chamber of the fire arm, it is desirable to make the safety device of materials which are softer than that of the firing chamber. For these purposes it has been found satisfactory to fabricate the safety device of the invention from suitable plastic materials having desired strength, stiffness and shape retaining characteristics yet which are capable of providing the desired flexibility and resilience. Suitable plastic materials for these purposes include molded nylon and molded polyethylene. For example, the stem 7 and cone element 8 and expansible member 6 may be formed of molded nylon while the cone element 9 may preferably be formed of molded polyethylene for the reason that the nature of the latter material enables the cone element 9 to have better frictional engagement with the stem 7 than would be the case if molded nylon were also used for the cone element 9. Of course all of the parts of the safety device 5 could be formed of molded nylon or all parts of said device 5 could be formed of molded polyethylene or other suitable materials.

As illustrated, the expansible member 6 comprises a cylindrical sleeve having a central bore through which the stem 7 may extend, each end of the bore being preferably flared outwardly to provide conical portions conforming to the configuration of the cone elements 8 and 9. To make the sleeve member 6 sufficiently flexible to accommodate the desired radial expansion thereof, the said sleeve member 6 is preferably provided with a plurality of alternating longitudinal slots 13 and 14, the slots 13 extending from the forward edge of the sleeve member 6 to points adjacent to but spaced from the rear or breech end of said member 6, and the slots 14 extending from the rear or breech end of the sleeve to points adjacent to but spaced from the forward end or edge of the member 6.

The cone element 9 may, if desired, be tapered at its forward end as at 9*b* to provide a tapered nose portion similar to that of the forward end of a bullet which would be contained in the cartridge normally received in the chamber 3.

In the use of the safety device hereinbefore described, it is to be noted that various sizes of such devices will normally be provided for use in fire arms having corresponding chamber sizes. However it is to be noted also that a particular device 5 which may be designed especially for use in a fire arm having a corresponding chamber size will also be suitable and operatively usable with fire arms having a range of chamber sizes varying both as to length and as to interior diameter. In this connection it is pointed out that in rifles particularly the chamber size usually tapers or diminishes in interior diameter slightly as the distance from the breech end increases toward the bore of the barrel. Thus a particular device 5 designed for employment in a chamber of particular size may also be used in a tapered chamber of somewhat larger size by inserting the device 5 farther into the chamber from the breech end. Also even if there is little or no taper to the chamber a device 5 of a particular size may be employed in a chamber of somewhat larger size by pre-expanding the expansible member 6, as by pre-adjusting the cone element 9 to a position closer to the cone element 8 so that the cone elements 8 and 9 exert an outwardly wedging effect upon the expansible member 6 to pre-expand the same to a diameter approximating that of the chamber in which the device 5 is to be inserted and thus the safety device of the invention because of its construction is usable for a fairly wide range of firing chamber sizes.

In any event the safety device 5 either in its relaxed condition of FIGURE 2 or in a preexpanded condition will approximate the diameter of the firing chamber in which it is to be used so that it may be inserted into such chamber from the breech end and so that the periphery thereof or a portion of such periphery will frictionally engage the interior of the chamber 3 and as soon as said device 5 meets frictional resistance to further movement inwardly of the chamber during the process of insertion thereof, pushing action exerted upon the cone element 8 will tend to move the same forwardly, or rightwardly having reference to FIGURE 1, and to move the stem 7 likewise in said direction relative both to the expansible member 6 and to the cone element 9 with the result that the distance between the cone elements 8 and 9 is shortened resulting in outward wedging action of the same upon the member 6 to radially expand the same for a tighter circumferential engagement of the member 5 with the interior wall of the chamber 3 so that the same becomes firmly locked in position therein and the device 5 cannot then be further moved forwardly or rightly having reference to FIGURE 1, within the chamber 3. Thus the chamber 3 becomes firmly plugged to prevent insertion of ammunition thereinto. Under such condition if a cartridge is then attempted to be inserted into the chamber from the breech end, the bullet end of the cartridge will simply engage the cone element 8 or the recess 11 in the boss 12 thereof which will only tend if anything to further expand the member 6 but will prevent insertion of the cartridge into the chamber 3.

In the relaxed condition of FIGURE 2, the expansible member 6 assumes its minimum diameter or minimum circumferential configuration and in FIGURE 1 it will be noted the relatively different disposition of the ele-

ments of the device 5 with the cone elements 8 and 9 closer together denotes the expanded locked condition of the device 5 within the chamber 3.

When it is desired to remove the safety device 5 from locked condition in the chamber 3, it is necessary to insert some instrument such as a cleaning rod into the barrel from the muzzle end thereof so as to engage the device 5 and back it out from the breech end of the chamber. In this connection the instrument being inserted from the muzzle end of the barrel will engage the stem 7 to move it leftwardly, having reference to FIGURE 1, and thus move the cone element 8 in the same direction relative to the cone element 9 so as to permit the member 5 to relax to its normal minimum diameter or circumferential configuration so that the device 5 is thus readily removed from the chamber.

From the foregoing it will be apparent that the safety device of the invention is not only of relatively simple construction which may be fabricated relatively inexpensively but provides a versatile device which can be used in firing chambers of a range of different sizes, which does not require any tools for purposes of emplacing the device in the firing chamber in locked condition and which does require for removal an instrument such as a cleaning rod or the like which is not normally readily available to persons who may have occasion to handle fire arms as prospective customers or in a casual manner in gun shops and like places, and such instruments not normally being available to children or immature persons who might handle fire arms in homes or the like, so that the safety device of the invention has the foregoing advantages, among others, over devices for like purposes previously in use.

The safety device shown in FIGURES 4, 5, and 6, is similar in most essential aspects to that previously described in connection with FIGURES 1, 2, and 3. In reference to the device of FIGURES 4, 5, and 6 insofar as the elements thereof correspond to those of device of FIGURES 1, 2, and 3 previously described they are marked with corresponding numeral indicia bearing a prime designation. While the device 5′ of FIGURES 4, 5, and 6 has a configuration more nearly approximating that of a standard shot gun shell as compared with the configuration of the device 5 of FIGURES 1, 2, and 3 which somewhat approximates that of a rifle or like cartridge, it will be apparent that either of these devices may be used interchangeably in rifles and shot guns and other fire arms covering various ranges of chamber sizes. It may be noted in connection with both of the forms 5 and 5′ of the safety device that in order to increase the range of chamber sizes to which any particular size of such device is applicable it may only be necessary to provide a plurality of cone elements 9 or 9′ of various sizes for interchangeable replacement on the stem 7 or 7′ of such device in order to enable the same device to accommodate a wider range of chamber sizes.

It will be noted, of course, that the smallest diameters of the cone elements 8 and 9 will approximate or be less than the minimum diameter of the bore of the expansible member 6 or 6′ and the maximum diameters of the cone elements 8 and 9 will be larger than the minimum diameter of the bore of said member 6 or 6′ (referring, in both instances, to the relaxed condition of said member 6 or 6′) so that when the device 5 or 5′ is in assembled condition the relative movement of the cone elements 8 and 9 toward one another will exert wedding action upon the expansible member tending to radially expand the latter. It may also be noted that when the safety device is received within the firing chamber in frictional engagement therewith, the action of the cone elements is such that relative movement of the cone element 8 toward the cone element 9 results in uniform type frictional engagement of the member 6 or 6′ with said chamber along the entire circumferential periphery of the member 6 or 6′ providing a relatively large frictional bearing area between the said device and the firing chamber which serves to more firmly lock the safety device in position therein so that the same is not easily displaced therefrom.

Referring now to FIGURES 7 and 8 showing a further modification, the safety device 15 therein shown is of a simplified construction adapted particularly for use in fire arms of small caliber. To this end the device 15 comprises a forward cylindrical body portion 16 of a diameter to fit snugly within the chamber 3″ in the manner in which a cartridge of corresponding caliber would fit therewithin, and a rearward outwardly flaring or conical resilient portion 17 having a maximum diameter somewhat larger than the interior diameter of the chamber 3″ so that when the device 15 is inserted into the chamber 3″ from the breech end thereof the outwardly flaring or conical resilient portion 17 will tightly engage the chamber at the entrance thereof and be compressed as the device is forced into the chamber so that the device is firmly locked therewithin during the process of insertion into the position shown in FIGURE 7.

The device 15 is preferably made of a suitable molded plastic material such as molded nylon or molded polyethylene as above described with reference to the devices 5 and 5′. The device 15 may be conveniently molded of the plastic material in the form indicated to provide a single unitary body including the forward solid cylindrical portion 16 and the outwardly flared conical resilient portion 17 with the body including a core portion 18 of reduced diameter to provide an annular space between said core portion and the said outwardly flared or conical resilient portion 17 whereby the latter may have a relatively thin wall of the desired strength and stiffness and at the same time provide the necessary flexibility and resilience for the purpose for which it is designed.

As illustrated the reduced diameter core portion 18 will preferably extend rearwardly of the rear end edge of the conical portion 17 to provide means to be engaged by the user's hand or other means for pushing the device 15 into the chamber 3″. It may also be desirable to provide the conical portion 17 with a plurality of circumferentially spaced weakening lines extending longitudinally of the device from the rear end of the conical portion to the front end thereof in order to provide greater flexibility of the said conical portion 17 for necessary compression thereof during insertion of the device 15 into the chamber 3″ to firm locked condition therein in the manner illustrated by FIGURE 7. When said device is positioned as in FIGURE 7 it cannot be readily displaced from the chamber 3″ except by insertion of an instrument such as a cleaning rod or the like from the muzzle end of the barrel of the gun to engage the forward end of the device and back the same out of the chamber to and out of the breech end thereof.

It should be noted in connection with the device 5 of FIGURES 1, 2 and 3 that the rearwardly extending boss 12 is of reduced diameter as compared with the diameter of the cylindrical portion 10 so that when the device is employed, for example, in bolt action rifles the bolt may serve as the means for effecting insertion of the device 5 into the firing chamber. In this connection it may be noted that the foremost portion of the bolt such as the firing pin may engage the rear end of the boss 12 as the bolt is slid forwardly to effect such insertion of the device 5 into the firing chamber and under such condition the cartridge extractor will not engage the device 5 in any manner because of the provision of said rearward extension or boss 12 of reduced diameter. This is advantageous in that it enables the bolt to serve as the inserting means for inserting the device into the firing chamber and at the same time prevents the extractor from engaging the device 5 so as to either tend to remove the same when the bolt is withdrawn or to otherwise injure the device 5.

It may be noted also that the core 18 of reduced diameter may serve a similar function and have the corresponding advantages when the device 15 of FIGURES 7 and 8 is employed with bolt action rifles.

From the foregoing it will be seen that the safety device of the invention will operate adequately and efficiently to plug the firing chamber so as to prevent unauthorized insertion of ammunition thereinto and at the same time the safety device will not interfere in any way with the desired demonstration or testing of the action of the fire arm to the extent desirable or necessary for the purposes of such demonstration to prospective customers in gun shops and like places.

I claim:

1. A safety device for fire arms, comprising a plug unit insertable into the firing chamber of such fire arm from the breech end thereof and arranged to be wholly received within said chamber when the breech thereof is closed, said unit including an expansible cylindrical sleeve circumferentially expansible into tight engagement with the interior of said chamber, said sleeve having a central longitudinal bore therethrough, each end of said bore being outwardly flared in a conical configuration, means within said chamber to resist forward movement of said plug unit and means coacting with said sleeve to so expand the same when said plug unit engages said resistance means, said coacting means comprising core means including a stem portion longer than said sleeve and extending through the bore thereof, a cone element integral with said stem portion at one end thereof and cooperable with one end conical configuration of said sleeve bore to expand said sleeve circumferentially, a second cone element slidably received on said stem portion and similarly cooperable with the other end conical configuration of said sleeve bore, one of said cone elements having a cylindrical portion of a maximum diameter larger than the maximum cylindrical diameter of said sleeve in relaxed condition, the maximum diameter of the cylindrical portion of said last mentioned cone element being larger than the minimum diameter and smaller than the maximum diameter of a firing chamber into which said unit is to be inserted.

2. A safety device for fire arms, comprising a plug unit insertable into the firing chamber of such fire arm from the breech end thereof and arranged to be wholly received within said chamber when the breech thereof is closed, said unit including an expansible cylindrical sleeve circumferentially expansible into tight engagement with the interior of said chamber, said sleeve having a central longitudinal bore therethrough, each end of said bore being outwardly flared in a conical configuration, means within said chamber to resist forward movement of said plug unit and means coacting with said sleeve to so expand the same when said plug unit engages said resistance means, said coacting means comprising core means including a stem portion longer than said sleeve and extending through the bore thereof, a cone element integral with said stem portion at one end thereof and cooperable with one end conical configuration of said sleeve bore to expand said sleeve circumferentially, a second cone element slidably received on said stem portion and similarly cooperable with one end conical configuration of said sleeve bore, one of said sleeve elements having a cylindrical portion of a maximum diameter larger than the maximum cylindrical diameter of said sleeve in relaxed condition, the maximum diameter of the cylindrical portion of said last mentioned cone element being larger than the minimum diameter and smaller than the maximum diameter of a firing chamber into which said unit is to be inserted.

3. A safety device for fire arms, comprising a plug unit insertable into the firing chamber of such fire arm from the breech end thereof and arranged to be wholly received within said chamber when the breech thereof is closed, said unit including an expansible cylindrical sleeve circumferentially expansible into tight engagement with the interior of said chamber, said sleeve having a central longitudinal bore therethrough, each end of said bore being outwardly flared in a conical configuration, means within said chamber to resist forward movement of said plug unit and means coacting with said sleeve to so expand the same when said plug unit engages said resistance means, said coacting means comprising core means including a stem portion longer than said sleeve and extending through the bore thereof, a cone element integral with said stem portion at one end thereof and cooperable with one end conical configuration of said sleeve bore to expand said sleeve circumferentially, a second cone element slidably received on said stem portion and similarly cooperable with the other end conical configuration of said sleeve bore, each of said cone elements having a cylindrical portion of a maximum diameter larger than the maximum cylindrical diameter of said sleeve in relaxed condition, the maximum diameters of the cylindrical portions of said cone elements being larger than the minimum diameter and smaller than the maximum diameter of a firing chamber into which said unit is to be inserted.

4. A device as in claim 1, wherein the second cone element is slidably along said stem in frictional engagement therewith.

5. A device as in claim 1, wherein said sleeve has alternating circumferentially spaced longitudinal slots therethrough, one slot extending from one end of said sleeve to a point adjacent to but spaced from the other end of said sleeve and the next adjacent circumferentially spaced slot extending from said other end of said sleeve to a point adjacent to but spaced from said one end of said sleeve.

6. A safety device for fire arms, comprising a plug unit insertable into the firing chamber of such fire arm from the breech end thereof and arranged to be wholly received within said chamber when the breech thereof is closed, said unit including an expansible cylindrical sleeve circumferentially expansible into tight engagement with the interior of said chamber, said sleeve having a central longitudinal bore therethrough, each end of said bore being outwardly flared in a conical configuration, means within said chamber to resist forward movement of said plug unit and means coacting with said sleeve to so expand the same when said plug unit engages said resistance means, said coacting means comprising core means including a stem portion longer than said sleeve and extending through the bore thereof, a cone element integral with said stem portion at one end thereof and cooperable with one end conical configuration of said sleeve bore to expand said sleeve circumferentially, a second cone element slidably received on said stem portion and similarly cooperable with the other end conical configuration of said sleeve bore, one of said cone elements having a cylindrical portion of a maximum diameter larger than the maximum cylindrical diameter of said sleeve in relaxed condition, the maximum diameter of the cylindrical portion of said last mentioned cone element being larger than the minimum diameter and smaller than the maximum diameter of a firing chamber into which said unit is to be inserted, wherein the first mentioned cone element includes a rearward extension of reduced diameter such that said extension may be engaged by a portion of the bolt of such fire arm to effect insertion of said device into said firing chamber without engagement of the cartridge extractor of such fire arm with said device.

7. A devqice as in claim 1, wherein the second cone element is slidable along said stem in frictional engagement therewith, and wherein said sleeve has alternating circumferentially spaced longitudinal slots therethrough, one slot extending from one end of said sleeve to a point adjacent to but spaced from the other end of said sleeve, and the next adjacent circumferentially spaced slot extending from said other end of said sleeve to a point adjacent to but spaced from said one end of said sleeve.

8. A device as in claim 1, wherein the second cone element is slidable along said stem in frictional engagement therewith, and wherein the first mentioned cone element includes a rearward extension of reduced diameter such that said extension may be engaged by a portion of the bolt of such fire arm to effect insertion of said device into said firing chamber without engagement

of the cartridge extractor of such fire arm with said device.

9. A device as in claim **1**, wherein the second cone element is slidable along said stem in frictional engagement therewith, and wherein the first mentioned cone element includes a rearward extension of reduced diameter such that said extension may be engaged by a portion of the bolt of such fire arm to effect insertion of said device into said firing chamber without engagement of the cartridge extractor of such fire arm with said device, and wherein said sleeve has alternating circumferentially spaced longitudinal slots therethrough, one slot extending from one end of said sleeve to a point adjacent to but spaced from the other end of said sleeve, and the next adjacent circumferentially spaced slot extending from said other end of said sleeve to a point adjacent to but spaced from said one end of said sleeve.

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