July 12, 1955

H. ST. AMANT

2,712,705

FIREARM CARTRIDGE PROTECTOR

Filed May 22, 1952

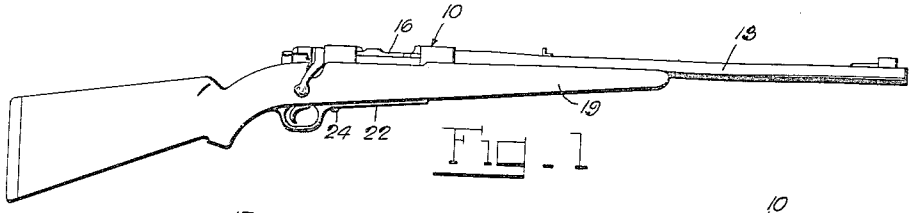



Fig. 1

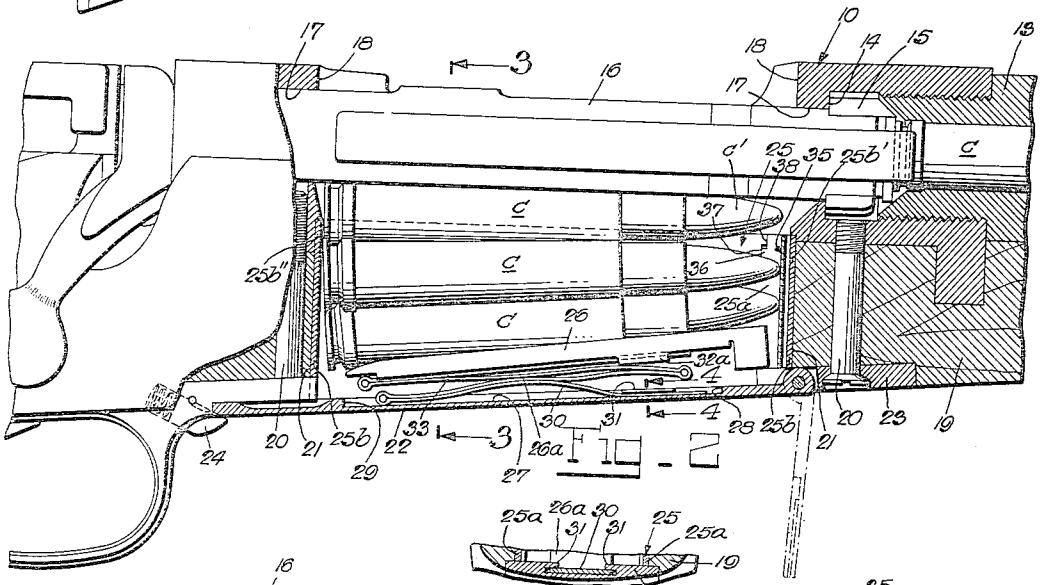



Fig. 2




Fig. 4

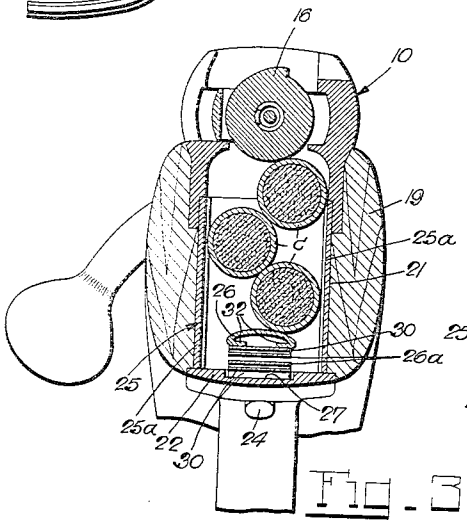



Fig. 3

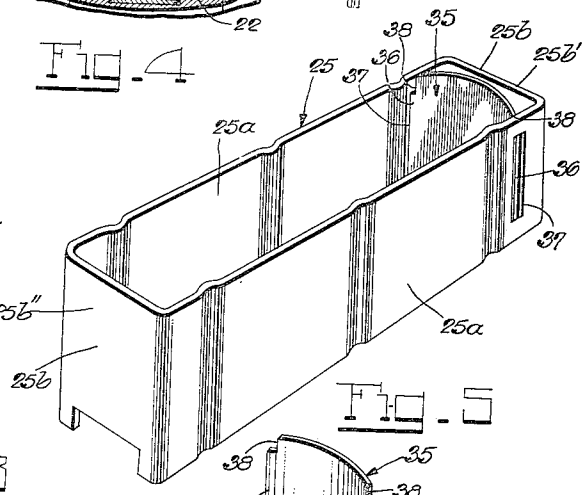



Fig. 5

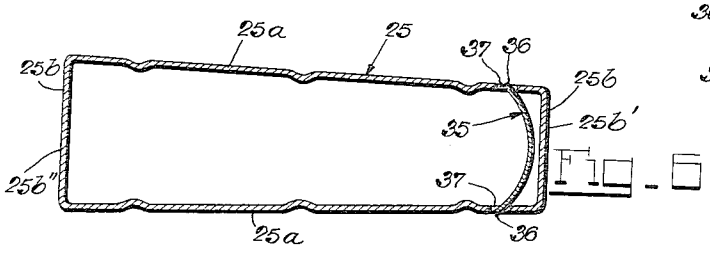



Fig. 6

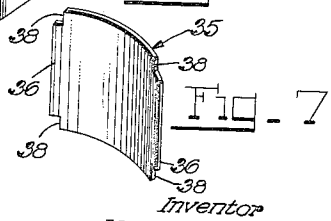



Fig. 7

Inventor
Horace St. Amant

by: Earle & Steward
Attorneys.

United States Patent Office

2,712,705

Patented July 12, 1955



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# FIREARM CARTRIDGE PROTECTOR

Horace St. Amant, Cheshire, Conn., assignor to Olin Mathieson Chemical Corporation, a corporation of Virginia

Application May 22, 1952, Serial No. 289,281

5 Claims. (Cl. 42—50)

This invention relates to firearms of the box-magazine type.

There has been considerable complaint about the damage suffered by cartridges in the steel magazines of firearms or guns caused by the recoil of the latter on firing, and the dangers involved in firing these damaged cartridges. Especially severe criticism in this respect has been voiced by many big-game hunters who frequently find high-power soft-nosed cartridges in the magazines of their guns so battered as to render them useless and even dangerous for firing. Thus, cartridges of the soft-nose type are frequently flattened or otherwise deformed in the magazine by the gun's recoil and the ensuing impact between the cartridges and magazine, with the result that these deformed cartridges will frequently jam in the gun when advanced into the firing chamber, or will take an erratic course if they do not jam in the gun and are fired. It requires little imagination to realize how exasperating and even dangerous gun failure from this source is to game hunters. Thus, any jammed cartridge will most likely not be noticed by a hunter until the very moment when game is in the sight of his gun and he wants to fire, resulting in frequent loss of game, not to mention wasted cartridges. Moreover, hunters sometimes endanger their lives when gun failure from this source occurs at an encounter with big game of the dangerous variety. The recoil of a gun is also damaging to steel-jacketed cartridges in the magazine thereof. Thus, the impact between these cartridges and the magazine in consequence of the recoil of the gun will frequently drive a steel jacket deeper into its cartridge case, with the result that there is insufficient expansion space in the latter when the same is fired and excessive pressures develop therein which may well burst the cartridge case and even cause damage to the gun itself. It follows, therefore, that even the latest firearms of the box-magazine type are not only unreliable in their performance and sometimes a source of great exasperation to the user, but involve some risk to the user's welfare as well.

Accordingly, it is the primary aim and object of the present invention to provide a gun of the box-magazine type which is not afflicted with any of the above-mentioned serious defects in performance, and which is instead reliable in its performance at all times and involves no personal danger to the user despite the recoil of the gun with every shot.

This object has been accomplished by Carl E. Ruple whose earlier conceived rubber shock-absorbing pad on the front wall of the box-magazine of a firearm is fully disclosed in his copending application Serial No. 288,815, filed May 20, 1952.

It is an object of the present invention to provide in the box-magazine of a gun a metal shock absorber which will hardly show any signs of wear even after long use and will not be adversely affected by the powder gases and heat to which the magazine is subjected in normal use of the gun, and which will greatly reduce, if not eliminate altogether, the impact between the magazine and the



cartridges therein on each recoil of the gun, so that the cartridges will assuredly not be damaged and may safely and reliably be fired in sequence.

A further object of the present invention is to provide in the magazine of a gun of this type a metal shock absorber which will reliably perform its aforementioned function without requiring any structural change in the conventional cartridges or without interfering in the least with the accustomed loading of the magazine with cartridges.

Another object of the present invention is to provide in the magazine of a gun of this type a metal shock absorber which does not require any changes in the conventional construction of the various gun parts, except a minor change or changes in the magazine itself.

It is another object of the present invention to provide a metal shock absorber of the aforementioned type which is of exceedingly simple construction, lends itself to efficient mass production at very low cost, and may readily be assembled with magazines of guns at the factory or replaced therein at any time by the owner of a gun.

Further objects and advantages will appear to those skilled in the art from the following, considered in conjunction with the accompanying drawings.

In the accompanying drawings, in which certain modes of carrying out the present invention are shown for illustrative purposes:

Fig. 1 is a side view of a magazine-type gun embodying the present invention;

Fig. 2 is an enlarged fragmentary part-sectional and part-elevational view of a part of the gun shown in Fig. 1;

Fig. 3 is a cross-section through the gun as taken on the line 3—3 of Fig. 2;

Fig. 4 is a fragmentary section taken on the line 4—4 of Fig. 2;

Fig. 5 is a perspective view of the magazine used in the gun;

Fig. 6 is a transverse section through the magazine; and

Fig. 7 is a perspective view of a detail element of the magazine.

For the purpose of describing the invention, the same is shown incorporated in the box-magazine of a bolt-action type of firearm. It will be appreciated, however, that the particular firearm illustrated herein is merely for the purpose of describing one application of the invention and that the latter is applicable to other firearms of the type having a box-magazine.

Referring now particularly to Fig. 2, the bolt-action firearm embodies, in the main, a receiver indicated generally at **10** and having threadedly secured to its forward end a barrel **13**, the forward end of the receiver being provided with locking shoulders **14** for coaction with the locking lugs **15** on the forward end of an upturn and pull-back breech-bolt **16**. The breech-bolt **16** is adapted to reciprocate in the central bore **17** of the receiver which has a loading and ejecting opening **18** in the top wall thereof intermediate its opposite ends. The locking lugs **15** of the bolt **16** are adapted to slide in guide grooves of the receiver and to be rotated through a quarter turn when the bolt is in its extreme forward position to coact with the locking shoulders **14** of the receiver to lock the bolt in breech-closing position.

The receiver and barrel assembly is mounted on a solid stock **19** and secured thereto by assembling-screws **20**. The stock **19** is provided with a box-magazine receiving aperture **21** which is substantially in alignment with the opening **18** of the receiver. The open bottom end of the aperture **21** in the stock is adapted by a floor plate **22** which is hinged at its forward end to the underside of the stock by means of a hinge-strap **23** which is seated in a recess in the stock and secured therein

by one of the aforesaid assembling-screws 20. The rear end of the hinged floor plate 22 is adapted to be engaged by a spring-loaded latch 24 which serves to hold the floor plate in its normal closed position (Fig. 2).

Mounted in the aperture 21 in the stock 19 is a box-magazine 25 in the form of a substantially rectangular sheet-metal frame having opposite side walls 25*a* and opposite end walls 25*b* arranged to engage securely the adjacent walls of the aperture 21 (Figs. 2 and 3). The open bottom of the box-magazine 25 is normally closed by the hinged floor plate 22.

The box-magazine 25 is of the top-loading type adapted to accommodate a column of staggered cartridges *c* for their successive feed into the breech of the barrel 13 for chambering by the breech-bolt 16, the feed means for the cartridges in the box-magazine 25 comprising a cartridge follower 26 and a follower spring 26*a* for supporting and actuating the follower 26. The lower end of the follower spring 26*a* is releasably secured to the hinged floor plate 22, and to this end the upper surface of the floor plate 22 is provided with a relatively shallow recess 27 (Figs. 2 and 3), having a front end wall 28 and a rear end wall 29, the over-all length of the recess 27 being somewhat greater than the length of the lowermost leaf 30 of the follower spring 26*a*. The width of the recess 27 corresponds substantially to the width of the aforesaid leaf 30 of the follower spring 26*a*, and the spring leaf 30 is adapted to be seated in the recess 27 in the floor plate 22. For releasably mounting the bottom leaf 30 of the follower spring 26*a* in the recess 27, the opposite side walls of the recess adjacent the forward end of the latter are provided with inwardly projecting overhanging lips 31 (Figs. 2 and 4) beneath which the free end of the spring leaf 30 is securely held in the recess 27. The follower 26 is in the form of a relatively stiff sheet-metal strip which is slightly curved cross-sectionally and has its opposite side margins 32 turned inwardly (Fig. 3) so as to reenforce the strip and afford a seat against which rests the top-most leaf 33 of the follower spring 26*a*. The inwardly turned side margins 32 of the strip are provided intermediate their respective lengths with downwardly offset portions 32*a*, respectively, (Fig. 2) which are turned inwardly to form opposite lips for securely holding the follower 26 on the top leaf 33 of the follower spring 26*a*. By unlatching the hinged floor plate 22 and swinging it open, the cartridge follower 26 and follower spring 26*a* are withdrawn from the box-magazine 25, in which case the follower 26 and its spring 26*a* may readily be detached as a unit from the floor plate 22.

The gun described so far may be entirely conventional in every respect and forms no part of the present invention. The invention to be described presently lies in the provision of a shock absorber 35 in the cartridge magazine 25 (Figs. 2, 5 and 6). The shock absorber 35 is, in the present instance, in the form of a leaf-type spring which is mounted in the magazine 25 near the front wall 25*b'* thereof. In the example shown, the leaf spring 35 extends across the side walls 25*a* of the magazine 25 with clearance from the adjacent front wall 25*b'* thereof, and the leaf spring is provided with opposite ears 36 which are received in aligned slots 37 in the opposite sidewalls 25*a*, respectively, of the magazine for the secure, though releasable, anchorage of the leaf spring in the magazine. Preferably, the leaf spring 35 is permanently pre-bent (Fig. 7), and is also preferably somewhat flexed or pre-loaded when anchored with its ears 36 in the respective slots 37 in the magazine, so that the remaining side edges 38 of the spring (see also Fig. 7) normally bear with a yielding force against the adjacent side walls 25*a* of the magazine. Preferably also, the portion of the anchored and pre-loaded leaf spring 35 nearest to the front wall 25*b'* of the magazine is in such proximity to this front wall 25*b'* (Figs. 5 and 6) that the spring 35 may resiliently be bent into engagement therewith without permitting the ears 36 of the spring to leave their respective slots 37, with the result that the spring will, on release, return to the normal position shown in Figs. 2, 5 and 6. Further, the ears 36 of the leaf spring 35 are preferably so short that they do not, or onl very slightly, project beyond the respective slots 37 in the magazine so as not to interfere with the usual tight mount of the latter in the receiving aperture 21 in the stock 19. As shown in Fig. 2, the magazine 25 is preferably of such length that the cartridges *c* therein fit between the rear wall 25*b''* of the magazine 25 and the shock absorber spring 35 therein sufficiently loosely to permit ready loading of the magazine with cartridges and the unimpeded feed of the latter into chambering position by the spring-urged follower 26, without allowing these cartridges any appreciable longitudinal play. Thus, with the exception of the uppermost cartridge in the magazine whose nose *c'* is spaced from the adjacent receiver 10 sufficiently to preclude any impact with the latter on a recoil of the gun, the noses of the other cartridges *c* in the magazine are closely adjacent the shock absorber spring 35 and will resiliently bend the latter momentarily toward the adjacent front wall 25*b'* of the magazine on each recoil of the gun without appreciable, if any, damage to the cartridges.

It is by the simple expediency of this shock absorber spring 35 that the hereinbefore mentioned serious defects in the performance of conventional box-magazine firearms are overcome, and the latter are rendered reliable in their performance and no longer involve any personal danger to the users thereof. The instant shock absorber spring 35 is further eminently practical for manufacturing and assembly reasons. Thus, the shock absorber spring will reliably perform its designated function without requiring any structural changes either in the conventional cartridges or in the conventional construction of the various gun parts other than the provision of the aligned slots 37 in the opposite side walls 25*a*, respectively, of the magazine. Further, the shock absorber spring does not in the least interfere with the accustomed loading and handling of the gun. The shock absorber spring further adds neither bulk nor weight of any consequence to the gun. Of great importance is the fact that the instant shock absorber spring 35 has a long useful life. Thus, the shock absorber spring will hardly show any signs of wear even after long use, and will not be adversely affected by the powder gases and heat to which the magazine is subjected in the normal use of the gun. Finally, the shock absorber spring is an exceedingly simple article which lends itself to efficient mass production at very low cost, and may readily be assembled with magazines of guns at the factory or later replaced therein at any time by the owners of these guns, merely by snapping the ears of the spring into the aligned slots in the magazine.

While the shock absorber spring 35 is incorporated in the box-magazine 25 of the double-column cartridge feed type shown by way of example in the drawings, it is obvious that the shock absorber spring may be incorporated with equal advantage in a box-magazine of the well-known single-column cartridge feed type.

While the shock-absorber spring 35 is preferably somewhat pre-tensioned when anchored in the magazine, the same may be anchored in the latter without any pre-tension if this is desired. Further, while the shock-absorber spring 35 may, if desired, be normally flat, it is preferably pre-bent (Fig. 7) to achieve more favorable spring characteristics for the purpose in mind. For instance, the pre-bent shock absorber spring will under a given force flex less than a non-bent spring of the same gauge steel, wherefore the pre-bent shock absorber spring is preferable in the interest of economy as well as from the standpoint of light weight and ease of handling of the spring. Also, the shock absorber spring may be

anchored in the magazine in ways other than that shown and perform its designated function to equal advantage. Thus, by way of example, the shock absorber spring would satisfactorily perform its designated function if one side of the same were rigidly or permanently mounted on the adjacent sidewall of the magazine, while the other side of the spring has an ear **36** received in the slot **37** in the other sidewall of the magazine.

The invention may be carried out in other specific ways than those herein set forth without departing from the spirit and essential characteristics of the invention, and the present embodiments are, therefore, to be considered in all respects as illustrative and not restrictive, and all changes coming within the meaning and equivalency range of the appended claims are intended to be embraced therein.

I claim:

1. A recoil-absorbing box-magazine for use with a firearm, comprising a rigid frame having opposite sidewalls and opposite endwalls for the reception of a plurality of cartridges in orderly column arrangement, said sidewalls being provided with aligned slots, respectively, near one endwall of the frame confronting the noses of the inserted cartridges; and a leaf-type spring in said frame extending across said sidewalls thereof and having opposite ear extensions received in said aligned slots of said sidewalls, respectively, for the releasable anchorage of said spring in said frame, said leaf spring confronting those noses of the inserted cartridges in said frame which are within the confines of the latter, and being resiliently bent on impact with the adjacent cartridge noses.

2. A recoil-absorbing box-magazine as set forth in claim 1, in which said leaf spring is normally resiliently



bent between said sidewalls toward said one endwall of the frame.

3. A recoil-absorbing box-magazine as set forth in claim 1, in which said leaf spring is permanently curvilinearly pre-bent and normally further resiliently bent between said sidewalls toward said one endwall of the frame.

4. A recoil-absorbing box-magazine as set forth in claim 1, in which said leaf spring is permanently curvilinearly pre-bent toward said one endwall of the magazine and said ear extensions extend in the curvilinear plane of said spring, and said slots are sufficiently wide to permit unobstructed movement therein of said ear extensions when said leaf spring is resiliently bent on impact with the adjacent cartridge noses.

5. A recoil-absorbing box-magazine as set forth in claim 1, in which said leaf spring is normally resiliently bent between said sidewalls toward said one endwall of the frame and said ear extensions extend curvilinearly with said spring, and said slots are sufficiently wide to permit unobstructed movement therein of said ear extensions when said leaf spring is further resiliently bent on impact with the adjacent cartridge noses.

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