B. B. HOTCHKISS.

RIFLE-BULLET.

No. 192,829. Patented July 10, 1877.

Fig. 1.

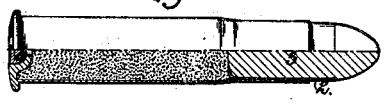


Fig. 2.

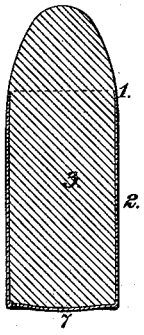


Fig. 3.

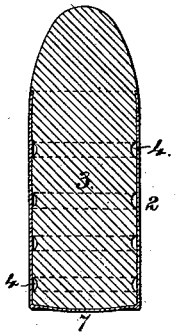


Fig. 4.

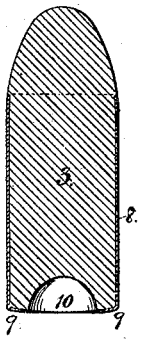


Fig. 5.

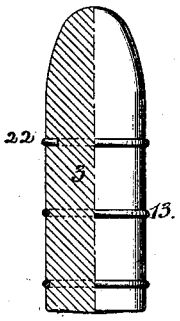


Fig. 6.

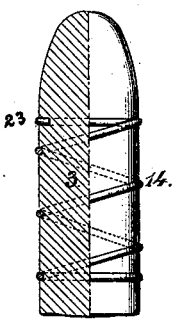


Fig. 7.

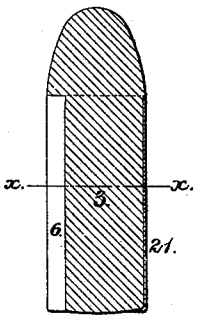


Fig. 9.

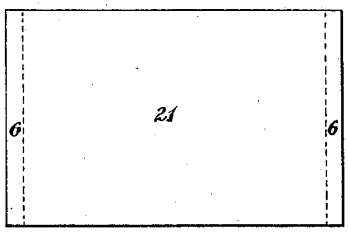
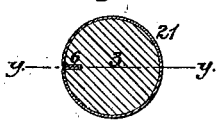


Fig. 8.



Witnesses;

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Fig. 10.

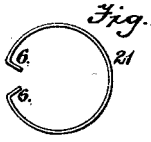

Fig. 11.

Inventor;

B. B. Hotchkiss,

by Munson & Philipp.

Attorneys.

UNITED STATES PATENT OFFICE.

BENJAMIN B. HOTCHKISS, OF NEW YORK, N. Y.

IMPROVEMENT IN RIFLE-BULLETS.

Specification forming part of Letters Patent No. **192,829**, dated July 10, 1877; application filed February 19, 1877.

To all whom it may concern:

Be it known that I, BENJAMIN B. HOTCHKISS, of the city, county, and State of New York, (now temporarily residing in Paris, France,) have invented a certain new and useful Improvement in Rifle Balls or Bullets, of which the following is a specification:

The object of this invention is to remove the necessity of providing rifle balls or bullets with a grease or similar lubricant, the presence of which, whether the ball be provided or not with a paper protector, as is now common, causes the same to corrode. This corrosion, when the ball or bullet is fixed within a copper or similar metallic case containing the charge of powder, causes the destruction or deterioration of the powder-charge.

This invention consists in providing a leaden or similar ball or bullet with a packing of harder metal, which shall, from its nature, provide a bearing-surface, which, while readily taking the rifling of the bore of the gun, will not "lead" the same, and requires no lubricant.

In the drawings, Figure 1 is a part plan and part sectional view of a complete cartridge which is provided with my improved ball or bullet; Fig. 2, a longitudinal section, showing the ball provided with a packing-shell; Fig. 3, a similar view, showing another construction of ball; Fig. 4, a similar view, showing another construction of ball and packing; Fig. 5, a part section and part plan view of a third form of the packing; Fig. 6, a similar view of a still further modification of the packing; Fig. 7, a longitudinal section of another construction of ball and packing on line *y y* of Fig. 8; Fig. 8, a transverse section of Fig. 7 on the line *x x*; Fig. 9, a plan view of a mode of constructing one form of the packing; and Figs. 10 and 11, views showing the manner of forming said packing and applying it to the ball.

It is a fact well understood that the lead balls or bullets now universally adopted for fire-arms will, after several discharges of the arm, accumulate a deposit of their metal in the rifling or grooves of the gun, which fouling soon prevents the rifling from rotating the ball, and thus injures the accuracy of its flight through the air. To prevent this defect it has long been the custom to lubricate leaden balls, to decrease the friction of their contact with the bore of the gun, and thus lessen their liability to deposit the soft metal composing them in the gun-bore.

When the copper cartridge-case replaced the paper article it at once became necessary to protect the said copper case from the deleterious effects of its contact with the grease or lubricant upon the ball, which in a very short time causes the copper shell to corrode, and thus impair, if not wholly destroy, the charge of powder. A patch of paper interposed between the copper shell and the lubricated ball was adopted, and then a paper covering surcharged with a greasy compound was employed. Neither of these expedients has proven to be wholly efficient, since in the one case the grease will in time work through the paper into contact with the shell, and in the latter case the greasy paper is always in direct contact therewith, the corrosion of the shell resulting from its contact with grease, which contact it must have in either of the above cases, communicating with and destroying the powder with which the cartridge is charged.

By my invention the ball is provided externally with a packing or shell which is composed of a metal harder than the ball, soft enough to readily shape itself to engage the grooves of the rifle, and of a nature which requires no lubricant. This packing or shell is, preferably, a copper cup shaped in dies by drawing, so as to slide over the rear end of the ball, as in Fig. 2, where the ball is shown as partially enveloped by such a cup, 2, which is held in place by pressing down its forward end 1 into the soft metal of the ball.

A ball thus constructed may be supported in the end of the cartridge-case, as is seen in Fig. 1, and when discharged it will obviously be ejected from the cartridge-case, and be forced to take the rifling of the gun as it is projected through its bore.

To facilitate the displacement of the packing to an extent which will cause it to fill up the rifling of the gun, it may be desirable to provide the ball with grooves 4 in its sides, to permit the packing-shells to be more readily upset to take the rifling, as in Fig. 3.

Having a solid base, 7, the packing 2 can

in no wise be disturbed in its position upon the ball by the gases resulting from the burning charge, while grooves 4 allow the pressure of the gases to swage the packing into them, thus preventing any longitudinal displacement of the packing upon the ball; or this union of the two, which prevents their separation, may be accomplished mechanically in the formation of the ball.

In Fig. 4 the ball 3 is shown with a conical recess, 10, in its base, which construction adapts it to be more readily expanded when its propelling-charge is fired to force its packing into the rifling, as is well understood. In this instance the packing is a solid hollow tube or sleeve, 8, having its base end turned inwardly to form a continuous lip, 9, overlapping the base of the ball. This form is desirable from the cheapness of its production, its lip 9 preventing the gases from entering between the packing and ball, and thus forcing them asunder.

The packing may be formed from a flat plate of metal, as 21, Fig. 9, whose edges 6 are bent upward at right angles, and the said plate curved, as is seen in Fig. 10. Thus formed, it is adapted to be placed upon a ball which is provided with a longitudinal slit, as 11, (see Fig. 11,) into which the edges 6 will protrude. Thus disposed, the whole may be secured together by compression in a die, when the parts will assume the positions shown in Figs. 7 and 8.

If found necessary, of course the end of this form of the packing might be turned inward upon the base of the ball, as in the case of that shown in Fig. 4.

Owing to the liability of copper to corrode, it may be desirable to form this improved packing of some other metal, as tin, or a composition in which tin is a predominant element, as zinc, or forms the exposed surface, as tinned iron.

A simple and highly efficient form of this invention is illustrated in Figs. 5 and 6, the former showing the ball as provided with concentric rings, 13, of wire, and the latter showing a continuous wire, 14, wound spirally one or more times around the ball. One or more rings, 13, or spirals 14 may be provided. The wire used may be copper or other composition when it is applied after the ball is cast, in which case it will be pressed into the surface.

In thus applying this form of the packing the wire ring 13 may be bent in a manner similar to that shown in Fig. 10, so that its ends form toes 22, which, being forced into the top of the ball 3, secure the rings in place. In a like manner the free ends of the spiral may be secured to the ball, as shown at 23, Fig. 6; but as it is contemplated to introduce this wire form of the packing into the bullet-mold it will be preferable to form it of tinned wire, which, when the hot lead comes into contact with it in the process of casting the ball, will be firmly soldered in position upon the exterior of the ball.

In this mode of applying the packing to the ball it is immaterial whether the rings 13 or spiral 14 are provided with toes 22 23, or have their ends secured together before the ball is cast around them.

This invention, providing, as it does, a soft metallic packing for the softer leaden ball, which packing is capable of taking the rifling without the necessity of any lubrication, greatly enhances the value of fixed ammunition, which may, through its use, be made and stored in large quantities without danger of deterioration.

What therefore is claimed is—

A lead or soft-metal bullet provided with a separate packing-shell, formed of a harder metal and mounted upon it, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

B. B. HOTCHKISS.

Witnesses:
H. T. MUNSON,
LEWIS H. TODD.