

F. W. FREUND.
Metallic-Cartridge.

No. 160,763

Patented March 16, 1875

Fig. 1

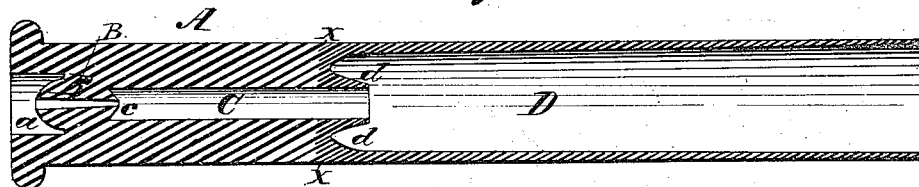
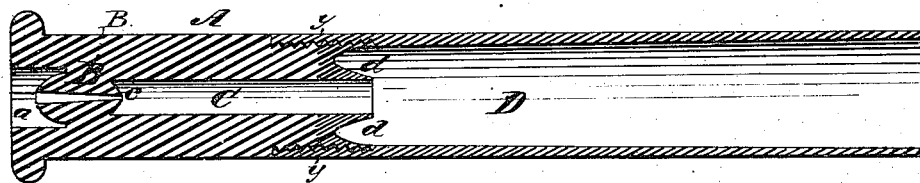


Fig. 2



Witnesses.
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UNITED STATES PATENT OFFICE.

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IMPROVEMENT IN METALLIC CARTRIDGES.

Specification forming part of Letters Patent No. 160,763, dated March 16, 1875; application filed February 4, 1874.

To all whom it may concern:

Be it known that I, FRANK W. FREUND, of Denver, county of Arapahoe, Territory of Colorado, have invented a new and Improved Re-loading Rifle-Cartridge; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a longitudinal central section, and Fig. 2 a like section, showing the thinned portion of the cartridge screwed upon the thick rear portion, as at *y y*.

One general fault with cartridges of heavy charge for breech-loading guns has been that the bulk of powder has occupied the rear end of the cartridge, and consequently in the extreme rear end of the barrel, where the barrel is subjected to the heaviest strain of the explosion, so that when the cartridge is exploded such explosion simultaneously expands both the cartridge and the barrel, which, contracting unequally, makes it difficult to withdraw the cartridge, and still more difficult to reinsert the cartridge after it has been reloaded. This difficulty I obviate in my improved cartridge by making it considerably longer than the cartridge in common use, and by constructing it with a solid or thickened head of such length as will cause the bulk of the powder to be located (when the cartridge is inserted in the barrel) at a point considerably in advance of the extreme rear end of the barrel. By my invention I overcome or avoid the objectionable expansion both of the barrel and the cartridge, which is incident to the use of the cartridges as now commonly constructed.

In the drawings, D, Fig. 1, indicates a portion of my cartridge, which is made thinned from about the point *x x* to the mouth or muzzle, while in rear of the point *x x* the cartridge is made solid or thickened, as indicated at A B. From the point *x x* to the muzzle I harden the steel of which it is composed, making it of fine spring temper, and from said point *x x* to the rear termination of the shell I leave the steel soft or unhardened. I construct the part of my shell shown at A B, in rear of the point *x x*, in a solid or thick condition, for the reason, first, that I thus prevent an expansion of the shell against the barrel; and, second, I

make it of metal which is soft or unhardened, because, from actual trial, I have discovered that practically such metal will not granulate and become weakened by the shock of explosion, and so split and break. The part D is made of spring temper, so that it will, if expanded by explosion, immediately return to its normal condition.

In the drawings, *a* represents the anvil for the percussion-cap, with a fine perforation passing through the solid part B, and making connection with a reduced powder-chamber; C, which in turn makes connection with the main powder-chamber D.

The object of constructing the cartridge with a reduced powder-chamber, C, in connection with a main powder-chamber, D, is, first, to so divide the charge of powder that the least shock of explosion shall fall upon the rear end of the cartridge as well as the extreme rear end of the gun, while at the same time the heaviest shock will fall upon the gun-barrel at a point considerably forward of its extreme rear end; second, by thus dividing the charge of powder the shock of explosion is divided and distributed in the cartridge, and the main chamber D relieved of a portion of the shock and power of the explosion.

The main powder-chamber terminates in an annular recess or gas-cup, *d d*, and the reduced powder-chamber C also terminates in a like recess or gas-cup, *e*, as shown in Figs. 1 and 2.

The recoil of an explosion is received in and checked by recesses *c d*, and thus the shock of discharge is lessened in its effect both upon the cartridge and the gun-barrel itself. Besides this the gas is more or less prevented from being forced through the small aperture in the anvil *a*, leading into the reduced chamber C. It is believed, also, that if the bulk of the powder lies close to the rear end of the barrel the danger from accident is greater than when the charge is located farther forward, as when at the rear the explosion is near the joint or fastening of the breech, and being near the fire-tube connecting with the powder the fire-tube becomes worn more easily than when the bulk of the powder is removed to a point forward in the barrel.

The advantages of my improved shell, it will be seen, are, first, that its rear portion is

made of solid metal of such thickness that no expansion of it can take place in the act of explosion; second, that such rear portion, which constitutes about one-third of the length of the shell, is made of soft metal, and thus resists a granulation and weakening of the shell, to which it would be subject under the successive jar and shock of constant refring if it were made of hardened metal; third, that the bulk of powder occupies a position in the shell which, when the shell is inserted in the barrel, will be considerably forward of the extreme rear end of the gun-barrel; fourth, that an enlarged and a reduced powder-chamber are in conjunction utilized to divide the shock of an explosion, check recoil, and lessen liability to accident near the joint or fastening of the breech; fifth, that at a point in the main chamber D upon which the greatest force of the explosion falls the metal is made elastic or springy, so that if expanded by explosion it will at once return to its normal condition, and thus allow its easy retraction from the gun-barrel, as well as sub-

sequent insertion thereof. These advantages, in a measure, relieve the breech end of the gun from undue strain when fired, and add to the safety as well as to the convenience and facility of manipulating the gun.

I will here state that the comparatively solid and thick portion of my shell A B, which is in rear of the line *xx*, may be made of brass, copper, or other suitable soft metal, instead of soft steel, and united to the forward portion D by screw-thread, as indicated at *yy* in Fig. 2.

What I claim as my invention is—

1. A cartridge-shell made, substantially as described, of one piece of metal, with a small powder-tube, C, between a fire-tube and a main powder-chamber, D.

2. A cartridge-shell made, substantially as described, with a thin hard-metal portion, D, and a thick soft-metal portion, A B.

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Witnesses:

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