

W. BALL.
Gun Primer.

No. 8,820.

Patented March 23, 1852.

Fig. 1.

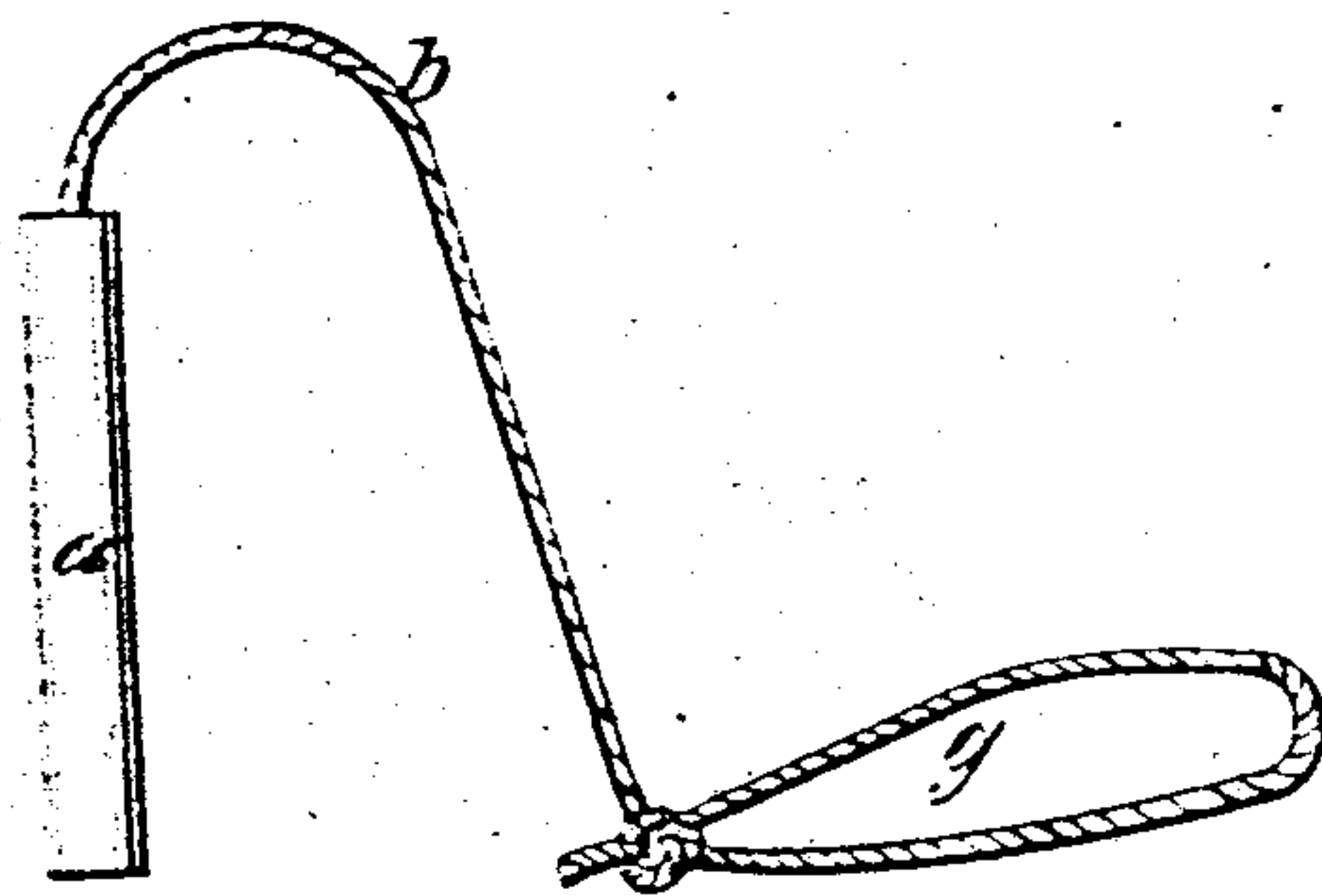
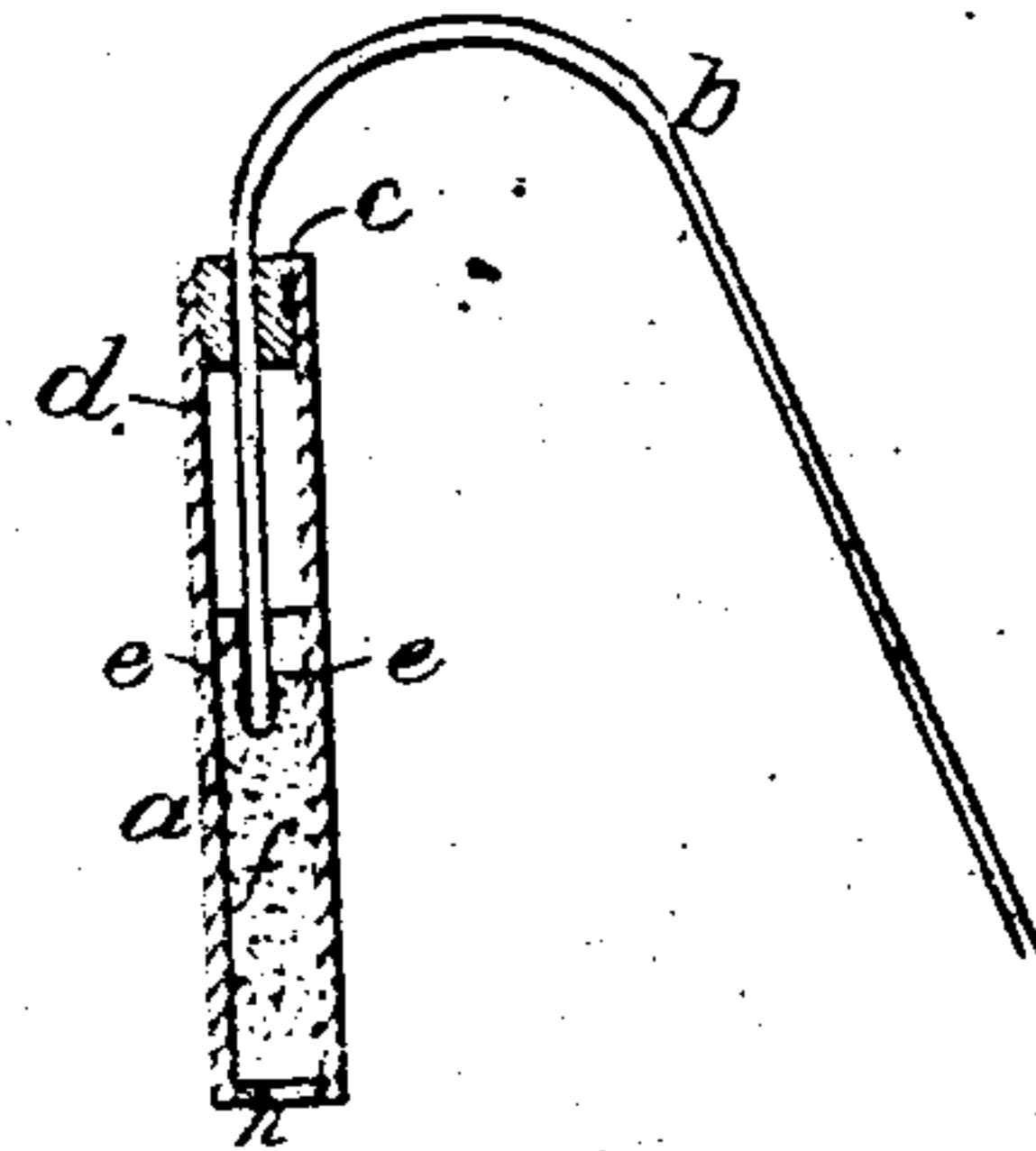


Fig. 2.



UNITED STATES PATENT OFFICE.

WILLIAM BALL, OF CHICOPEE, MASSACHUSETTS.

IMPROVEMENT IN FRICTION-PRIMERS FOR CANNON.

Specification forming part of Letters Patent No. 8,820, dated March 23, 1852.

To all whom it may concern:

Be it known that I, WILLIAM BALL, of Chicopee, in the county of Hampden and State of Massachusetts, have invented an Improvement in Friction-Primers for Cannon or Ordnance; and I do hereby declare the nature of my invention and the manner in which the same is made or compounded to be fully set forth and described in the following specification, accompanying drawings, and letters, figures, and references marked thereon.

The friction-primers heretofore in common use have generally consisted of a small tube partially filled with gunpowder and having a plug of sand-paper inserted in one end, through the center of which plug a string was passed whose end within the tube had been previously or was afterward coated with a composition of phosphorus and various other matters, which composition would take fire by friction when the string was pulled out of the tube, thereby setting fire to the charge of gunpowder. The phosphoric composition, being surrounded by the gunpowder, soon absorbs oxygen, and in consequence thereof phosphoric acid is produced, which not only destroys the composition on the string and renders it inexplorable, but it acts on the gunpowder and produces such a change in it as to materially injure it. Besides, the manner in which the strings are inserted and held in the tube renders them, when pulled by an artilleryman, very liable to be cut or broken off. These defects in the construction of friction-primers I have endeavored to remedy in that which I shall now proceed to describe.

Figure 1 of the aforementioned drawings denotes a view of one of my improved primers, and Fig. 2 is a central and longitudinal section of the same.

In its external appearance it does not differ essentially from the common primers above alluded to, but in its internal arrangement it is somewhat varied therefrom. Like them it is made of a tube, *a*, of paper or other suitable material, and a discharging-string, *b*, inserted therein. The said string is passed and partially drawn through a small cylindrical piece of thick and hard leather or rawhide, *c*, which is inserted and connected or confined in one end of the tube, the end of the string being drawn en-

tirely through, so as to project about one-half the length of the tube beyond the open end thereof. This done, a piece or strip of sand-paper having a small quantity of a priming composition (made of fulminating-mercury and detonating-silver in the proportion of five parts of the former to one of the latter) sprinkled upon or near one end of it is rolled upon the string between the open mouth of the tube and the end of the string immediately adjacent thereto. The piece of sand-paper should be in its width about one-third the length of the tube, and it should have the priming composition laid along its edge where it first comes in contact with the string, and when rolled on the string the lower end of the latter should project beyond its lower end about one-quarter of an inch. When the priming is laid upon the paper it should be moistened or wet with alcohol, in order to prevent explosion from accident. In order to insure the explosion of the priming by friction of the string, the end of the latter, which projects the short distance of a quarter of an inch beyond the roll of sand-paper, should be dipped in shellac varnish and before the latter is dry the part so dipped should have powdered emery or sand sprinkled upon it, or it should be plunged in emery or sand, for the purpose of forming thereon a pellet or knob, *e*, which shall have a rough or sharp scratching-surface. The string is then drawn through the leather cylinder or plug *c* in such a manner as to carry the roll of sand-paper into the interior of the tube and against the lower end of the plug, as seen at *d* in Fig. 2. The charge or load *f* of the primer (made of twenty-four parts of chlorate of potash, seven of sulphur, four of gunpowder, and two of crude antimony) is next introduced into the tube, so as to nearly fill the space below the sand-paper and to rest in contact with the paper and pellet or knob *e* of the string. This done, the extreme end of the tube should be sealed up, as at *h*, with a little gum-shellac or some drying composition which will be suitable to protect the charge from the absorption of moisture. The exterior surface of the primer being next varnished over, and a loop, *g*, made at the end of the string, as seen in the drawings, the primer is completed and ready to be used. When used the tube of the primer is inserted in the vent-hole of the can-

non and the charge of it is exploded by a person standing by the side of the cannon and pulling the string horizontally or obliquely (not vertically) by means of a hook inserted in the loop or the string.

The cylinder of leather acts as a kind of breech to cause the charge to explode downward with force, and being a soft or yielding substance in comparison with wood or metal, it prevents the string from being cut off when pulled at right angles. It does away with the little lock or pulley fixture in common use for the string to pass over, and which generally costs about three dollars, and is indispensable to the friction-primers as ordinarily made and used.

The fulminating-mercury in comparison with detonating-silver is slow of action when fired, and requires much friction to explode it. The detonating-silver is very expensive, but its combination with the fulminating-mercury renders but little friction necessary to fire the mercury, as the silver requires but a slight friction to ignite it, and when ignited it communicates

fire to the mercury, which in its turn explodes the charge. The priming compound of fulminating-mercury and detonating-silver will not set fire with certainty to gunpowder, but it will set fire with certainty to the charge composed of the ingredients as above described.

I claim—

The combining with the discharging-string and tube of the primer a cylinder or plug of leather, c, or other like substance inserted and secured in the upper end of the primer and having the exploding-string passing through it, as above set forth, the said plug or cylinder serving the purpose of a breech to confine the charge when exploded, as a protector of the sand-paper and priming against the absorption of humidity, and as a bearing for the string to draw over when pulled.

In testimony whereof I have hereto set my signature this 3d day of November, A. D. 1851.

WM. BALL.

Witnesses:

PHILANDER H. STREET,
WM. WHEELER.