D. A. HOPKINS.

Muzzle-Loading Fire-Arm.

No. 36,464. Patented Sept 16. 1862.

Fig 1

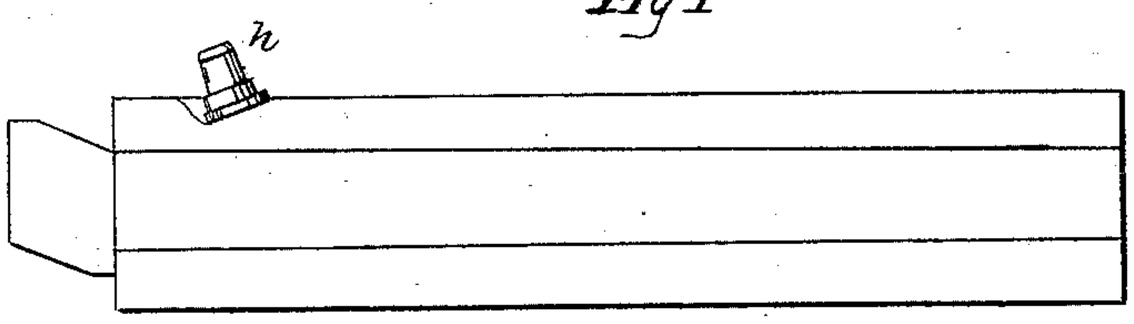


Fig. 2

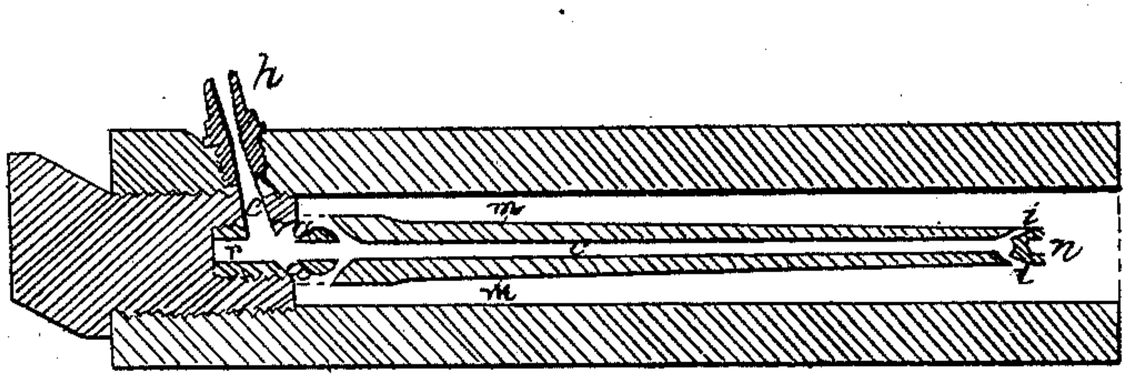
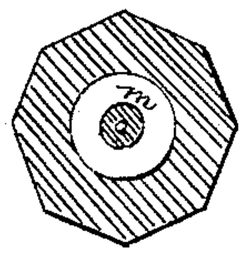


Fig. 3



Witnesses. { S. A. Robert
H. A. Patterson

David A. Hopkins

UNITED STATES PATENT OFFICE.

DAVID A. HOPKINS, OF BROOKLYN, NEW YORK.

IMPROVEMENT IN TIGES FOR FIRE-ARMS.

Specification forming part of Letters Patent No. **36,464**, dated September 16, 1862.

To all whom it may concern:

Be it known that I, DAVID A. HOPKINS, of the city of Brooklyn, in the county of Kings and State of New York, have invented certain Improvements in the Construction of Guns; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

The nature of my said improvements in guns consists in—

First. Providing that part of guns occupied by the charge of powder with a tige or stem, in combination with openings starting at opposite sides of the tige and connecting the rear end of the charge-chamber with the cone or nipple, causing the charge to be fired upon opposite sides of the tige at the same instant, whereby the bending of the tige, which frequently results from firing the charge only upon one side thereof, is prevented. Said tige is made of steel or other suitable material and secured in the gun in the usual manner and position.

Second. Providing a passage or opening whereby, when the charge of powder is fired, flame may pass from a point or points at or near one end of the charge to a point or points at or near the other end thereof without igniting it at or near the center, as hereinafter set forth, for purposes that will plainly appear. Said opening is most conveniently located along the center of the tige above named, and communicates with the outside thereof by connecting-openings located at or near the ends thereof.

Third. Providing small chambers located, respectively, one at the forward end and the other in the rear of the charge-chamber which surrounds the tige and connecting with said chamber, said small chambers being so arranged that the powder they receive shall be burned therein, instead of being driven forward when the charge is fired, the object in providing said chambers being hereinafter set forth.

Figure 1 is a side elevation of my improved gun, in this case my improvement being applied to a muzzle-loading small-arm of the usual construction, only so much of the barrel being here shown as is necessary in illustrating my invention. Fig. 2 is a longitudinal and nearly-vertical section of the same, the line of section being through the center thereof. Fig. 3 is a vertical transverse section of the same, the point of section being about three inches forward of the breech.

h is the cone or nipple made, and secured to the gun in the customary way.

m is a tige or stem, made much smaller than the bore of the gun and occupying a position about equally distant from all the sides thereof.

o is an opening or passage along the center of the tige from the rear end thereof to lateral openings *i i*, which connect it with the outside of the tige. Said lateral openings *i i* are made too small to admit grains of musket-powder.

a a are lateral openings located opposite each other and connecting *o* with the outside of the tige at the point where it enters the breech of the gun.

e is a passage connecting with and leading from *o* to the cone.

r is a powder-chamber made by the continuation of *o* back of *e*.

n is a powder-chamber made in the forward end of the tige, but not connecting with *o*.

While preferring the use of both *n* and *r*, each located as herewith shown and described, I have reason to know that either if employed without the other would in most cases accomplish the object sought by their construction, and that *n* would be of great value even if located in the side of the barrel, instead of being in the end of the tige, as here shown.

Before proceeding further it may be well to state that the leading object of my device is to secure the complete ignition of a charge of powder of sufficient quantity to give a projectile of any required length an initial velocity equal to or exceeding that with which round shot are usually fired without igniting a larger amount of powder before the projectile begins to move than in cases where only a moderate charge is employed in guns without the tige, the ignition of the greater part of the powder in my gun taking place after the projectile begins to move forward and in a ratio regulated by the distance which it moves from its starting-point.

The charge of powder for a gun with my improvement should be sufficient to fill up around and just cover the forward end of the tige, the

tige being made of a length regulated by the amount of powder which it is intended to use as a charge.

When a gun is in proper position for loading, the powder readily finds its way through *a a* and *e* to the cone, filling *r* and *n* without filling *o* forward of *a a*. The projectile should be gently pressed upon the powder, which thereby becomes so fixed in its place that the gun may afterward be handled in any manner without more than a few grains finding their way into *o* forward of *a a*.

The tige is made tapering forward from a point near where it enters the breech of the gun for the purpose of lessening the friction and resistance arising from impingement of unburned powder upon the tige and interior of the gun, which takes place when unburned powder is driven against the projectile or other opposing substance. The resistance from the unburned powder of a large charge is very great in guns of usual construction.

The tige greatly retards the ignition of the powder at the rear end of the charge by preventing the penetration of fire along the center, causing most of the powder to be driven forward unburned.

Lateral openings connecting *o* with the outside of the tige should only be located at or near the ends thereof, as herewith shown, as by making such openings at or near the center of the tige too much powder would be ignited before the inertia of the projectile could be overcome, resulting in a violent strain upon the gun, which it is important to avoid. It is also important that said lateral openings should in all cases be located upon opposite sides of the tige, which would be liable to be forced from its true position and bent were said openings made only upon one side thereof.

When the powder in *e* is fired, the flame passing out through *a a* ignites the rear end of the charge, and rushing unobstructed through *o* issues at *i i*, igniting the forward end of the charge before the projectile begins to move. As the projectile moves forward, it permits the unignited powder to be driven past *i i* and *n*. Its complete ignition is effected by the flame issuing therefrom, the burning powder in *r* insuring a continuous flame from *i i*.

Chambers *n* and *r* are constructed and arranged, as herewith shown, in such a manner that fire can only act upon the forward part of the powder they contain, for the purpose of causing them to retain powder to burn and send forth flame until all the charge shall have been driven past the forward end of the tige.

Having thus fully described the construction and operation of my said improvements in guns, I claim only as constituting my invention—

1. Two or more openings connecting the rear end of the charge with the cone, whereby the charge is first fired upon opposite sides of the tige at the same instant, for the purpose stated.

2. The passage *o*, or its equivalent, and the combination thereof with lateral openings located and connecting therewith, substantially as shown and described, whereby flame may pass from a point or points at or near one end of the charge to a point or points at or near the other end thereof without igniting it at or near the center, for the purpose set forth.

3. The powder-chambers *n* and *r*, located and arranged substantially as shown and described, for the purpose specified.

DAVID A. HOPKINS.

Witnesses:
L. A. ROBERTS,
H. A. BATTERSON.