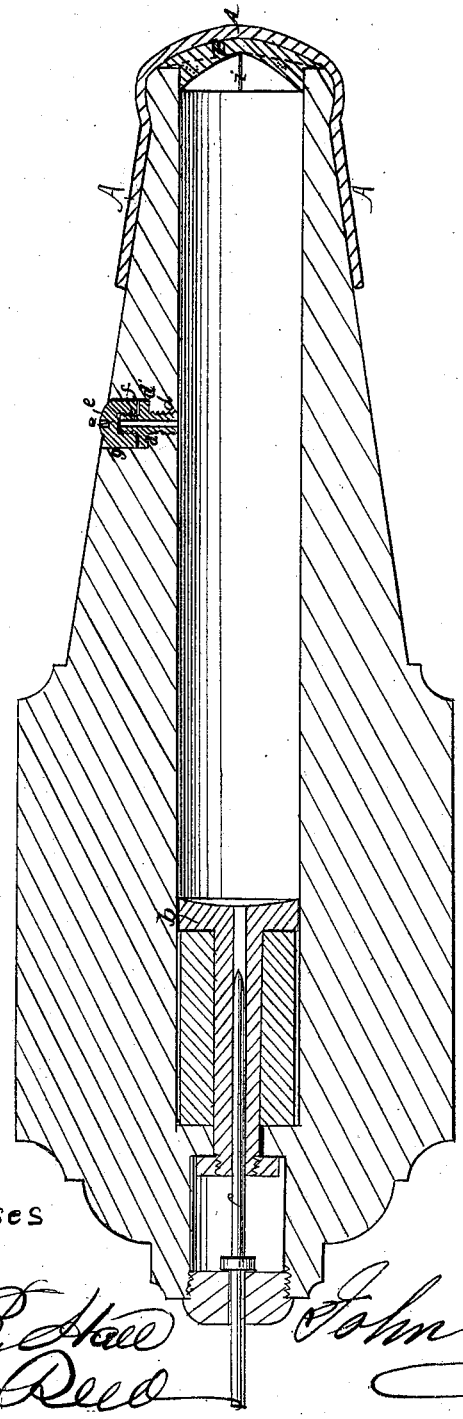
J. F. CLEU.

Ordnance.

No. 45,020.

Patented Nov. 15, 1864.




Witnesses

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## IMPROVEMENT IN TAMPION-CAPS FOR THE MUZZLES OF ORDNANCE EXHAUSTED OF AIR.

Specification forming part of Letters Patent No. **45,020**, dated November 15, 1864.

*To all whom it may concern:*

Be it known that I, JOHN F. CLEU, of the city, county, and State of New York, have invented a new and useful Improvement in Ordnance and Fire-Arms; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawing, forming part of this specification, said drawing representing a central longitudinal section of a piece of ordnance having my invention applied.

The object of this invention is to increase the range or penetration of projectiles fired from a piece of ordnance or fire-arm; and to this end it consists in fitting the muzzle of the piece or arm with an air-tight cap and exhausting the air from the bore in front of the charge and projectile, so as to produce a more or less perfect vacuum therein, and furnishing some portion of the barrel of the piece with a valve for the preservation of the vacuum in the bore after the disconnection of the exhausting apparatus and until the opening provided for the connection of said apparatus can be closed by an air-tight screw plug or cap or its equivalent.

It further consists in the combination of a muzzle-cap of india-rubber and a tampion of wood or other stiff material for closing the muzzle of the piece and excluding the air during and after the exhausting process, which are easily destroyed or penetrated by the projectile when the charge is fired.

The invention is applicable to either breech-loading or muzzle-loading guns. The gun represented is muzzle-loading, but is fitted at the breech with an anti-recoil piston, *b*, and with a needle, *c*, for producing the ignition of fulminate priming arranged within the cartridges. This needle should be fitted air-tight to the breech or provided with an air-tight packing; or if the gun is made with an ordinary vent the said vent should be fitted with an air-tight primer, or some means should be provided for the exclusion of the air thereat. The recoil-piston and needle do not constitute parts of this invention and are not necessary to its success.

*e* is the valve which provides for the egress of air from the bore when the exhausting apparatus is in operation, but prevents its ingress. This valve may be of india-rubber, metal, or other meterial. It is attached or applied to a metal tube, *d*, which is screwed into a hole drilled transversely through one side of the gun between the muzzle and the part occupied by the projectile and suitably tapped. The said tube is made with a collar, *d'*, for the reception of which the hole in the gun is counterbored, and outside of the said shoulder it is made with a screwed teat, *f*, for the reception of a screw-cap, *g*.

A is the muzzle-cap, made of soft vulcanized india-rubber, of a size to draw tightly over the muzzle and exclude the air, and B is a thin tampion, of wood or other stiff material, which fits into the end of the bore and has a shoulder to fit against the face of the muzzle. The tampion B is intended to prevent the head of the india-rubber cap A from being pressed into the gun by the pressure of the atmosphere when the air is exhausted from the bore. The said tampion is cut nearly through radially to its axis in two or more places, as shown at *i i*, so that it may be easily split and fall to pieces when struck by the projectile as the latter passes out from the gun.

The operation of the invention is as follows: The gun having been loaded and shotted, and having had the cap *g* removed and the tampion B and india-rubber muzzle-cap A applied to the muzzle, the suction-pipe of an exhausting air-pump or other exhausting apparatus is connected with the nozzle *g*, and the said apparatus set in operation till the air has been exhausted from the bore of the gun. The suction-pipe is then disconnected, and the valve *e* preserves the vacuum in the bore until the screw-cap *g* has been screwed onto the nozzle *f*, which is done as quickly as possible after the disconnection of the suction-pipe. The vacuum being now preserved in the bore, the gun is ready for firing immediately or at any convenient time. When the firing is effected, the projectile, coming in contact with the tampion, splits it and breaks through the head of the india-rubber, taking the pieces of the tampion with it and passing onward while the pieces of the tampion drop. The projectile, having had all atmospheric resistance removed from it in the bore of the gun, takes a much greater range or acts with a much

greater penetrative effect. The portion of the india-rubber cap remaining around the muzzle of the gun is pulled off before the application of another cap.

This invention may be used with great advantage for firing under water, for which it is more especially intended.

What I claim as new, and desire to secure by Letters Patent, is—

The combination of the muzzle-cap A, of india-rubber, and the tampion B, of wood or other stiff material, partially or wholly divided by radial cuts *i i*, the whole being applied to the muzzle of a piece of ordnance, substantially as and for the purpose herein set forth.

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Witnesses:
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