CRANSTON & BATES.

Bomb Lance.

No. 29,573. Patented Aug. 14, 1860.

Fig. 1.

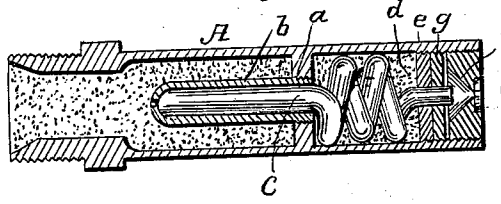
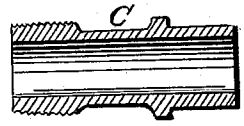


Fig. 2



Fig. 3.



Witnesses:

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UNITED STATES PATENT OFFICE.

RICHMOND CRANSTON AND HENRY BATES, OF NEW LONDON, CONNECTICUT.

IMPROVEMENT IN PROJECTILES OF FIRE-ARMS.

Specification forming part of Letters Patent No. **29,573**, dated August 14, 1860.

To all whom it may concern:

Be it known that we, RICHMOND CRANSTON and HENRY BATES, both of New London, in the county of New London and State of Connecticut, have invented a new and Improved Bomb-Lance; and we do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 represents a longitudinal central section of a bomb-lance constructed according to our invention. Fig. 2 is a transverse section of the same, and Fig. 3 is an implement used in charging it.

Similar letters in the three views refer to corresponding parts.

To enable those skilled in the art to make and use our invention, we will proceed to describe it.

A represents the shell of the bomb, which contains the powder. This shell is constructed, in the usual manner, of metal, and of such a thickness that when it flies into fragments by the force of the explosion those pieces do as much damage as possible. A partition, *a*, is rigidly secured in the inside of this shell, and screwed into the center of this partition is the short fuse-tube *b*, which contains the end of the fuse-rope *c*.

In order to arrange the bomb so that its explosion takes place after it has left the gun for a certain time, it is necessary to place the fuse in such a situation that the spark communicated to the same by the explosion of the gun has to travel through a certain length of fuse before it reaches the charge of the bomb. To accomplish this, a quantity of the fuse-rope is coiled up in the chamber *d*, beyond the partition *a*, and after placing the shell A in a vertical position a quantity of molten pitch or other resinous substance is poured into it, and when it has partially cooled, while it is still in a plastic state, a washer, *e*, is placed on the top of the same, having a hole in its center, through which the end of the fuse-rope is drawn, and the pitch is squeezed down by means of a gaging-tube, C, which is represented in Fig. 3. By thus squeezing the pitch down the different layers or turns of the coil of fuse-rope in the chamber *d* are kept separate, so that the spark has to travel through the whole length of the fuse in order to reach the charge in the bomb; and by squeezing the pitch down while it is yet in a plastic state the surplus pitch is forced out by the sides and through the center of the washer *e*, so that it can be removed and that sufficient room is left for a protecting-washer, *g*, and for the breech-nut *h*. The washer *g* is also provided with an opening in its center, through which the end of the fuse-rope is passed before it is cut, and this washer serves to protect the washer *e* against the influence of the fire from the gun. By these means the end of the fuse is presented to the fire from the gun in the proper position, so that the spark entering through the opening in the breech-nut cannot miss the same, and at the same time the distance at which the bomb explodes can be adjusted by coiling a larger or smaller quantity of fuse in the chamber *d*, the spark being compelled, by the action of the compressed pitch, to travel through the whole length of the fuse before it reaches the charge in the shell A.

Our object in using pressure to compress the pitch is to cause it to bind tightly around every part of the fuse-rope, for if the latter is not firmly held in its place the force of the powder charge within the propelling-gun will drive the fuse forward, and, bursting the tube *b*, cause a premature explosion of the powder within the bomb-shell A. This explosion would take place before the missile was discharged from the gun, so that the latter would be liable to be shattered, and thus endanger the life of the individual holding the weapon.

The broad idea of a spirally-laid fuse within a bomb we are aware is old, and is not claimed by us. Various methods have been employed to hold the fuse firmly, so that it could not be driven forward or discharged by the gun into the magazine of the shell. Brimstone, type-metal, and other substances have been employed, but their use is attended with more or less expense and danger.

By the compression of the pitch or resinous substance around the surface and between the folds of the fuse in the manner herein described the resinous matter on cooling of the packing becomes so firmly fixed that the discharge of the gun cannot disturb it. It is also impervious to moisture, is protected from in-

jury even under the most violent handling, and is always ready for instant use.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

The employment of the washer *e*, in combination with the tube C, or its equivalent, and chamber *d*, so that the pitch, while in a plastic state, may be compressed around the fuse-rope, and the surplus pitch be allowed to escape, substantially as and for the purpose herein shown and described.

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