(No Model.)

F. W. LUSCOMB & D. A. COREY.

BOMB LANCE.

No. 385,416. Patented July 3, 1888.

Fig. 1.

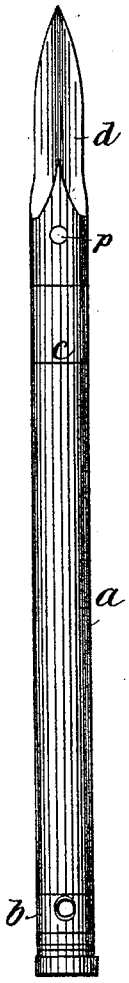


Fig. 2

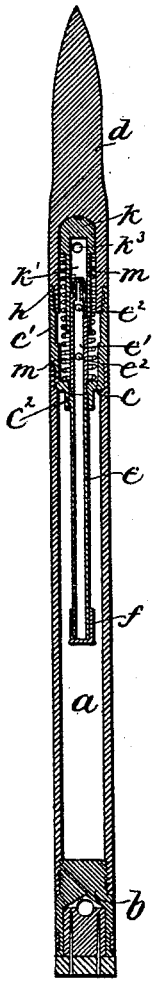


Fig. 3.

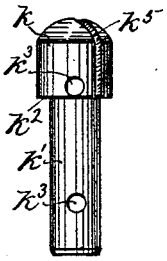


Fig. 4.

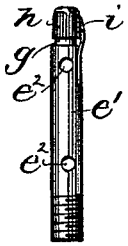


Fig. 5.

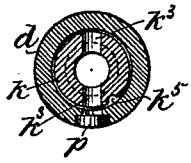
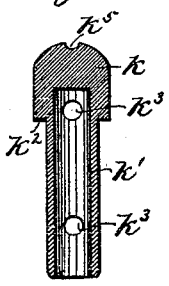


Fig. 6.



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UNITED STATES PATENT OFFICE.

FREDERICK W. LUSCOMB AND DAVID A. COREY, OF NEW BEDFORD, MASSACHUSETTS, ASSIGNORS TO WILLIAM LEWIS, OF SAME PLACE.

BOMB-LANCE.

SPECIFICATION forming part of Letters Patent No. 385,416, dated July 3, 1888.

Application filed February 8, 1888. Serial No. 263,401. (No model.)

To all whom it may concern:

Be it known that we, FREDERICK W. LUSCOMB and DAVID A. COREY, of New Bedford, county of Bristol, and State of Massachusetts, have invented an Improvement in Bomb-Lances, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

Our invention relates to a bomb-lance such as employed for killing whales; and it consists, mainly, in novel features of construction of the devices for igniting the explosive charge of the lance.

The invention is embodied in a lance composed mainly of a tube or magazine for the explosive, said tube being closed at its forward and rear ends and provided with a point-section and a recess in advance of the first stopper, containing the devices for igniting the fuse, by means of which the charge is exploded at the end of the desired interval of time after the lance has been shot. The means for exploding the charge comprise a fuse-tube extending through the stopper at the forward end of the magazine and terminating in a nipple that receives an ordinary percussion-cap, and a hammer between the recess in the first stop and point-section, that acts by its inertia to strike and explode the cap when the lance is shot from the usual gun employed for this purpose.

The parts thus far described have been used in bomb-lances for many years, and the present invention consists, mainly, in details of construction of the hammer and means for controlling its position with relation to the body of the lance, and for affording a vent for the gases generated by the combustion of the fuse, so that the fuse-tube is relieved from strain and the charge of explosive in the magazine is not ignited prematurely.

In the present invention the nipple for the percussion-cap is formed at the end of a portion of the fuse-tube that projects beyond the front closing-stopper of the magazine toward the point-section, and the hammer is composed of a metallic plug having a tubular stem that fits over the nipple and portion of the fuse-tube on which it is supported, the said tubular hammer being provided with lateral passages and with external recesses or grooves for the passage of gas from the fuse-tube, and being acted upon by a stout spring that normally holds the hammer off from the cap, but yields sufficiently under the inertia of the hammer when the lance is suddenly thrown forward to permit the hammer to strike and explode the cap. As soon, however, as the hammer has acquired the velocity of the main body of the lance the spring will react and throw the hammer forward, so that, in fact, it merely strikes a sharp blow on the cap when the lance is first shot, and immediately afterward is moved forward from the cap and retained in its normal position, instead of remaining upon the exploded cap, as is the case in lances of this kind as heretofore made. The point-section is provided with a lateral opening, which is normally closed and sealed before the lance is shot, but which is easily opened by the pressure of the gases inside, and thus affords a vent for the gases generated by the combustion of the fuse.

Figure 1 is a side elevation of a lance embodying this invention; Fig. 2, a longitudinal section thereof; Figs. 3 and 4, side elevations of the hammer and of the cap and its support, respectively; Fig. 5, a transverse section of the hammer and point-section of the lance; and Fig. 6, a longitudinal section of the hammer, Figs. 3 to 6 being on a larger scale than Figs. 1 to 2.

The main portion of the lance, comprising the tube *a* and its rear and front stoppers, *b c*, and point-section *d*, may be substantially as in lances heretofore used, the said stoppers *b* and *c* being screwed into the ends of the tube *a*, and the point-section *d* being screwed into the tubular extension *c'* of the front stopper, *c*, and being itself recessed or made hollow in the portion adjacent to said stopper, as clearly shown in Fig. 2.

The stopper *c* has a central threaded passage, *c²*, into which is screwed the fuse-tube *e e'*, which, for convenience in construction, is preferably made in two parts, one screwed in from below and the other from above the stopper, and when in place forming a continuous tube of uniform diameter fitting closely upon the fuse, the said fuse being of the length required to afford the proper time to elapse between

the shooting of the lance and the explosion of its charge contained in the magazine.

When, as is now generally practiced, the magazine is filled with an explosive requiring it, the lower end of the fuse-tube is provided with a detonating-cap, *f*, which is ignited by the fuse, and by its explosion causes the explosion of the charge in the magazine *a*. The portion *e'* of the fuse-tube in front of the stopper (best shown in Fig. 4) is surmounted by a nipple, *g*, to receive a percussion-cap, *h*, of usual construction, and is provided with a spring-finger, *i*, that retains the cap on the nipple, preventing it from being accidentally dislocated in the handling of the lance before it is discharged. The tube *e'* is also provided with one or more lateral perforations, e^2, to permit the free escape of the gases from the interior of the said tube. The cap *h* is exploded by a hammer, *k*, the construction of which is best shown in Figs. 3 and 6, the said hammer consisting of a mass of metal fitting loosely within the recesses in the point-section *d* of the lance, as shown in Fig. 2, and having a tubular extension or stem, *k'*, that fits loosely over the portion *e'* of the fuse tube and acts as a guide by which the head portion *k* of the hammer is directed against the cap upon which the face at the end of the bore in the hammer *k* strikes. The hammer *k* is also provided with a shoulder, k^2, against which one end of a stout spring, *m*, bears, the other end of said spring bearing against the plug *c*, as shown, so that the said spring acts to normally keep the hammer pressed forward against the point-section and away from the cap, as shown in Fig. 2. When, however, the lance is suddenly thrown forward by being shot out of the gun in the usual manner, the hammer *k* does not immediately acquire the velocity of the lance, but remains substantially stationary for a moment by its inertia, so that the cap carried forward by the lance strikes against the under part of the head portion *k* of the hammer and is exploded; but almost immediately thereafter the hammer acquires the velocity of the body of the lance, so that the spring again moves it forward to its normal position. (Shown in Fig. 2.)

The hammer *k* is provided with one or more lateral vent-passages, k^3, from the bore in its stem *k'*, and is also provided with an external groove, k^5, extending along the side and over the top of the head portion, so as to afford space for the passage of gases between the outside of the hammer and the recess in the point portion *d*. The said point portion *d* is itself provided with a lateral escape-passage, d^5, which is counterbored or notched at its upper part, so as to form a seat or shoulder for the plug *p*, of wax or other sealing material, as shown in Fig. 5, which prevents the entrance of water or moisture to the interior of the lance, but which is easily removed by internal pressure, and thus permits the free escape of gases before they can acquire sufficient pressure to endanger the rupture of the fuse-tube *e*, which sometimes happens when no vent is afforded.

One of the vent-holes e^3 from the fuse-tube is preferably below the portion of the said tube normally overlapped by the stem of the hammer, as shown in Fig. 2, and thus affords a vent from the fuse-tube into the recess between the front stopper and point portion without passing through the interior of the hammer, so that a free vent is afforded from the fuse-tube both at the inside and outside of the hammer.

A lance of this construction is not likely to be accidentally exploded in handling before it is shot, but is very certain in operation when shot, and not likely to be prematurely discharged by the bursting of the fuse-tube, as frequently happens in lances of this general character as heretofore constructed.

We claim—

1. The combination of the magazine with a front stopper and point-section, and fuse-tube secured in the said stopper and projecting forward toward the point-section and provided with a nipple at its forward end, with a hammer contained within a recess at the front of said stopper, and having a tubular shank surrounding the said nipple and a portion of the fuse-tube, and a spring by which the said hammer is normally retained at the forward end of said recess, but permitted to move backward with relation to the said nipple, substantially as and for the purpose described.

2. The combination of the magazine having a stopper in the forward end, with a fuse-tube fastened in and extending through the said stopper, provided with a nipple at its forward end and a lateral vent-passage in the part in advance of the stopper, a hammer having a tubular shank surrounding said nipple, and a portion of the fuse-tube provided with vent-passages from said recess that contains the said hammer and nipple, substantially as and for the purpose described.

3. The combination of a magazine of a bomb-lance closed at its forward end and provided with a point-section, and having a recess at the front of the magazine and a lateral vent-passage and sealing-plug therein, with a fuse-tube extending from the magazine into the recess in advance thereof and provided with a nipple, and a hammer having a tubular stem surrounding said nipple, substantially as described.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

FREDERICK W. LUSCOMB.
DAVID A. COREY.

Witnesses:
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