

J. P. SCHENKL.

Shell-Fuse.

No. 39,682.

Patented Aug. 25, 1863.

Fig: 2.

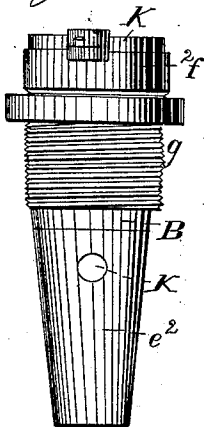


Fig: 1.

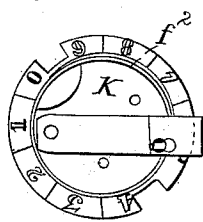


Fig: 3.

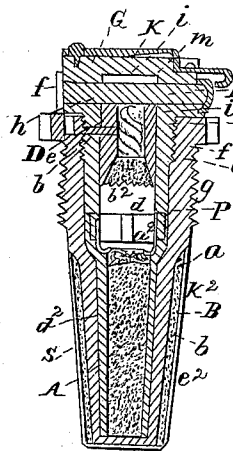


Fig: 4.

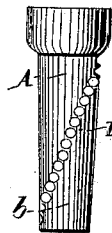


Fig: 5.

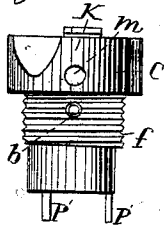


Fig: 6.

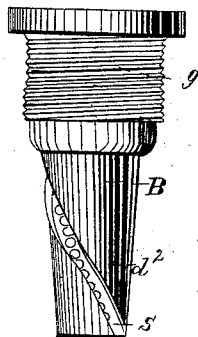


Fig: 7.

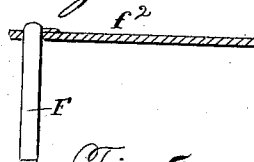
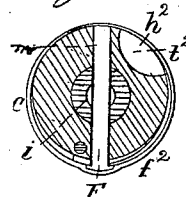


Fig: 8.



Witnesses.

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IMPROVEMENT IN COMBINED TIME AND PERCUSSION FUSE FOR SHELLS.

Specification forming part of Letters Patent No. **39,682**, dated August 25, 1863.

To all whom it may concern:

Be it known that I, JOHN P. SCHENKL, a resident of Boston, in the county of Suffolk and State of Massachusetts, have invented an Improved Percussion and Time Fuse for Ordnance-Projectiles; and I do hereby declare the same to be fully described in the following specification and represented in the accompanying drawings, of which—

Figure 1 is a top view, Fig. 2 a side elevation, and Fig. 3 a longitudinal section, of it.

The percussion and time fuse hereinafter described not only substantially embodies the invention patented in Letters Patent No. 35,897, granted to me on the 15th day of July, A. D. 1862, but contains one or more additional improvements of much value to its operation, such additions constituting the subject of my present invention.

In the drawings, the time-fuse is shown at A, of which *a* is the powder-charge, and *b* the encompassing-case. This fuse A contains an annular grooved percussion-cap, *a'*, and is placed within an auxiliary case or holder, B, made of suitable metal, and having an internal chamber to correspond with the size and shape of the fuse. This fuse-chamber leads downward out of a chamber, *d*, of larger diameter, and provided with a female screw, *e*, for the reception of the male screw *f*, formed on the outside cylindrical surface of a percussion-striker, carrier, and fuse-rotator, C, Figs. 4 and 5 being side views of the fuse A and the rotator C. A screw, *g*, cut or formed on the outside of the upper part of the case B, serves for the fixation of the percussion and time fuse within a shell or shrapnel. The carrier or fuse-rotator C is provided with a chamber, *h*, to contain a cylindrical striker, D, which is fastened within the upper part of the said chamber by a single connection, *b'*. The said striker is hollow, or contains a chamber for reception of an explosive mixture or composition, *b''*, the bottom of the chamber being open, and the lower edge of the striker being serrated, in order that when it may be driven against the charge in the groove of the annular percussion-cap it may readily fire such charge by concussion and friction. There is a hole, *i*, formed through the upper part of the striker, and so as to open into a transverse passage, *m*, which passes entirely through the head *k* of the rotator C, and is not only for the

reception of a wrench-pin or stopper, E, which goes through the striker, but constitutes the vent of the percussion and time fuse while its fuse composition may be on fire. It will be observed that the passage *m* opens through the side or sides of the rotator C and not through the upper end. There is a great advantage in having the fire outlet or outlets so arranged, for in that case the air, while the fuse may be in the act of being driven with great velocity through it—that is, during flight of a projectile—has no such tendency to interrupt the free escape of the flame and gases from the fuse-case as it would have were the outlets to lead directly out of the upper end of the rotator and in the direction of the flight of the projectile. Two studs or pins, *p' p'*, project from the rotator C and into corresponding holes formed in the upper end of the fuse-case *b*, and serve to so connect the rotator with the fuse-case as to enable the latter to be rotated by the former while in the act of being revolved. The fuse-case *b*, as well as the fuse-holder B, has a series of holes arranged in a semi-helix, as shown at *r* in the one, and at *s* in the other, the whole being in manner and for the purpose as represented in the specification and drawings of my patent above mentioned. The holes of the range *s* of the holder B open into a helical channel or groove, *d'*, formed in the outside of the holder B, and for the purpose of containing paste gunpowder, or some other explosive composition or device.

Fig. 6 represents an elevation of the holder B as it would appear with the groove *d'*, and without an encompassing annular chamber, *e'*, which extends either partially or wholly around the fuse-holder, and is shown in Fig. 3. This latter chamber is intended as a magazine for holding a charge of loose powder, to be held close up to the fuse-holder, and to be exploded by the fire which may stream through any two of the fuse case and holder holes which may be set in line with each other. The firing and explosion of this charge within the body of a shell instantly insures the firing of the powder-charge of such shell.

It sometimes happens, during the flight or impact of a shell or projectile, that the powder-charge may be thrown or directed so much out of the immediate vicinity of the fuse as not to be readily fired thereby; but by having

a reservoir or magazine of powder attached to the fuse-holder, or arranged with respect to it as described—that is, either in a groove, d^2 , or in an annular chamber, e^2 , or in both—the explosion of the powder of such will insure the firing of the shell-charge even when more or less out of contact with or away from the fuse.

In order not only to hold the wrench-pin on the head of the rotator, but to provide a means of readily extracting such pin therefrom preparatory to inserting a shell (provided with the fuse) in a piece of ordnance, I make use of a tape or band, f^2 , which I double or fold at one end, and pass the pin through the doubling, the same being as shown in Fig. 7. After the pin, so connected with or applied to the tape or band, may have been inserted in the passage m , the band is to be wound around the head of the rotator C and so as to cover the pin, (the same being as shown in Fig. 8, which is a horizontal section of the said head, the pin, and the band,) after which the free extremity of the band should be sewed or fastened to that portion of the band which it may overlap. By tearing or separating the fastening, the band may be removed from the head of the rotator, and will serve as a means by which the pin may be extracted therefrom. The pin may be used as a means of aiding or effecting the rotation of the part C; but its main purpose is to so plug the fire or flame outlet m as to prevent the admission of water or moisture into such passage, and from thence into the interior of the percussion and time fuse.

In order that the fastening h^2 of the tape or band may be readily broken asunder, the head of the rotator C may be provided with a notch or recess, t^2 , arranged directly in rear of the tape fastening or near to the same. Into this notch an artillerist can easily introduce the end of his forefinger, or an instrument, and by means of the same readily tear or break away the fastening.

In order that the magazine e^2 may be supplied with powder, I make it with a hole, k^2 , arranged in any desirable part of it. After the powder may have been put in place, this hole should be suitably plugged or sealed.

When inserted or fixed in a shell or projectile, and the latter is in the act of flight from a gun, the operation of my said improved percussion and time fuse may be thus described. On explosion of the charge of the gun, the striker D, by its inertia and the sudden forward

movement of the projectile, will be caused to break its connection with the rotator, and to violently strike into the percussion-cap, and so as to explode the priming thereof, and thereby set fire to the fuse composition. This latter, after having burned the requisite period of time, will discharge some of its flame through the two-fuse case and holder holes that may open into each other. The flame, after going through them, will fire the powder of the groove or auxiliary magazine, which, exploding in its turn, will set fire to the bursting-charge of the shell.

The fuse-holder and the rotator are to be provided with a scale, an index-latch, and a range of countersunk recesses such as are described in my said patent, and for the purpose or purposes therein specified.

By constructing the percussion-cap as an annulus provided with a circular groove for reception of detonating priming, the cap has an open space through it, by which the flame of the charge of the striker can easily pass to the head of the fuse composition. So by making the bottom of the striker in manner as specified, it will be open for the free passage of not only the flame of the detonating powder of the cap, but for the free escape of the flame of explosion of the charge of the striker.

I claim—

1. The combination of the band or tape f^2 with the wrench-pin E and the rotator C, and to operate in the manner therewith, and for the purpose or purposes substantially as hereinbefore described.

2. The combination and arrangement of the notch or recess t^2 with the rotator C, and the tape or band f^2 , applied to it and the wrench-pin E, as specified.

3. The rotator as made, with the outlet m arranged so as to open out of its side or sides, in manner and for the purpose described.

4. The fuse-case, as not only constructed with a helical range of holes, but with a powder-chamber arranged either on the outer surface of such fuse-case or in a groove thereof, and with respect to the range of holes, and for the purpose of igniting the main or bursting charge of a shell, as specified.

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Witnesses:

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