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DELAYED ACTION DEVICE FOR IMPACT FUSES.

APPLICATION FILED DEC. 31, 1912.

1,079,383. Patented Nov. 25, 1913.

Fig. 1.

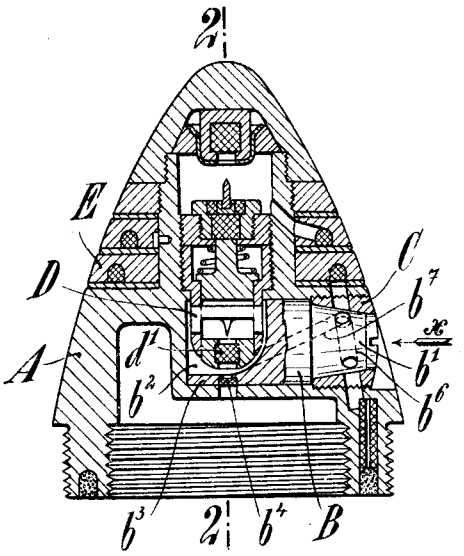



Fig. 2.

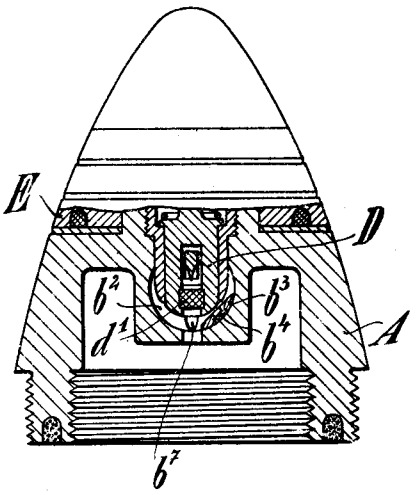
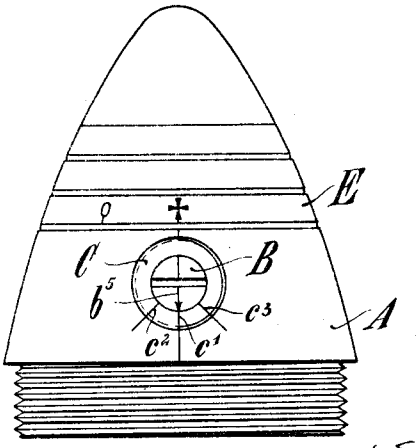



Fig. 3.




Witnesses;
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# UNITED STATES PATENT OFFICE.

KARL WIESER, OF BREDENEY, GERMANY, ASSIGNOR TO FRIED. KRUPP AKTIEN-GESELLSCHAFT, OF ESSEN-ON-THE-RUHR, GERMANY.

## DELAYED-ACTION DEVICE FOR IMPACT-FUSES.

1,079,383. Specification of Letters Patent. Patented Nov. 25, 1913.

Application filed December 31, 1912. Serial No. 739,562.

*To all whom it may concern:*

Be it known that I, KARL WIESER, residing at Bredeney, Germany, a subject of the Emperor of Germany, have invented a certain new and useful Improvement in Delayed-Action Devices for Impact-Fuses, of which the following is a specification.

This invention relates to impact fuses with a delayed-action device which is constructed to be connected and disconnected at will, wherein the shifting member consists of a turn-cock mounted transversely to the longitudinal axis of the fuse, which arrangement is desirable under certain conditions for combination fuses provided with double ignition.

The object of the invention is the construction of such fuses wherein any undesirable retardation of the ignition is avoided when the delayed-action device is disconnected.

One embodiment of the invention is illustrated in the drawing showing a combination fuse provided with double ignition, wherein the turn-cock is also constructed to connect the time fuse, which is provided with a time train, either with the shrapnel bursting charge or the shell bursting charge.

Figure 1 shows a longitudinal section through the axis of the fuse; Fig. 2 an elevation partly in section along line 2—2 of Fig. 1 and seen from the left with a different position in some of the details and Fig. 3 an elevation of the fuse seen in the direction of the arrow in Fig. 1.

The turn-cock B is revolubly mounted in the body of the fuse A and the axis of revolution of the cock B intersects the longitudinal axis of the fuse at right angles. In order to secure the cock against displacement, a ring C is provided and threaded in the body of the fuse, which ring incloses a tapered part $b^1$ of the turn-cock. The inner end of this turn-cock B has a recess $b^2$ wherein the rear end of the impact hammer D, containing the fulminate $d^1$, enters. The recess $b^2$ is made so large that of the inner end of the turn-cock B, only a narrow segmental tongue $b^3$ remains. A retarding charge $b^4$ is arranged in the tongue $b^3$, which charge is inserted in the passage leading from the impact hammer to the bursting charge of the shell, as is illustrated in Fig. 1, with the therein shown position of the turn-cock. With this position of the turn-cock, the mark $b^5$, located on its outer face, registers with a mark $c^1$ provided on the ring C. The end of the impact hammer D entering the recess $b^2$ is shaped in such a manner as illustrated in the drawing, that the turn-cock may be turned to either side of its position, as located in Figs. 1 and 3, that the tongue $b^3$ as shown in Fig. 2 will open the passage for the ignition flame coming from the impact hammer.

The mark $b^5$ of the turn-cock B registers with a mark $c^2$ according to the angular position illustrated in Fig. 2; and it registers with the mark $c^3$ of the ring C when the turn-cock is revolved from the position it has in Fig. 1 into a position symmetrical to the position it has in Fig. 2 as regards the longitudinal axis of the fuse. The turn-cock B is furthermore provided with two channels $b^6$ and $b^7$. The channel $b^6$ penetrates the tapered part $b^1$ of the turn-cock and connects the time train E and the bursting charge of the shrapnel, when the cock B is turned into such an angular position, that the mark $b^5$ registers with the mark $c^3$. The channel $b^7$ leads from the conical surface of the tapered part $b^1$ in an inwardly inclined direction and terminates in the recess $b^2$ to one side of the tongue $b^3$. As shown in Fig. 2, the arrangement is such, that the channel $b^7$ connects the time train with the channel leading to the bursting charge of the shell when the turn-cock has the position wherein the mark $b^5$ registers with the mark $c^2$. If the mark $b^5$ registers with the mark $c^1$, the time train will be cut off from the bursting charge of the shell as well as from that of the shrapnel.

As will be evident from the above description, the fuse will act on impact firing with delayed-action, compare Fig. 1 when the mark $b^5$ registers with the mark $c^1$; and without delayed-action, see Fig. 2 when the mark $b^5$ registers with either mark $c^2$ or $c^3$. When firing with the time train, shrapnel or shell action will be obtained depending on whether the mark $b^5$ registers with mark $c^3$ or mark $c^2$. Should the projectile prematurely meet with an obstruction during time train firing, the impact hammer will in both cases cause instantaneous ignition.

By means of the recess $b^2$ it is possible to place the impact hammer so close to the bursting charge of the shell, that with the

delayed-action device disconnected no considerable delay of the ignition can occur on impact; which often happens when a greater space lies between the impact hammer and the bursting charge of the shell. Finally, on account of the arrangement of the recess, the fuse possesses a very compact construction.

I claim:—

1. In an impact fuse, a delayed-action device comprising a revoluble member in said fuse, having a retarding charge, said member being provided with passages and adapted to connect and disconnect the time train of the fuse with the bursting charge of a shell and a shrapnel respectively.

2. In an impact fuse, a delayed-action device comprising a revoluble member in said fuse, having a retarding charge, said member being provided with a channel adapted to connect the time train of the fuse with the bursting charge of shell, with said member in one position; and cut out the passage of the igniting flame from said time train to said bursting charge, with said member in another position.

3. In an impact fuse, a delayed-action device comprising a revoluble member in said fuse, having a retarding charge, said member being provided with a longitudinal channel connecting the time train of the fuse with the bursting charge of the shell, with said member in one position, the axis of revolution of said member being perpendicular to the longitudinal axis of the fuse.

4. In a combination impact and time fuse having a time train and an impact hammer; a turn-cock, situated with its axis at right angles to the axis of the fuse; a recess at the inner end of said turn-cock forming a projecting tongue inserted between said hammer and the bursting charge of the shell, a retarding charge in said tongue; said tongue causing delayed-action in the fuse when said fongue is situated centrally relative to said hammer; a free passage for the flame from said hammer, when said tongue is turned to one side, said turn-cock simultaneously connecting one and disconnecting another passage from said time train to either of the bursting charges for the shrapnel and the shell.

5. In a combination impact and time fuse having a time train and an impact hammer; a turn-cock, situated with its axis at right angles to the axis of the fuse; a recess at the inner end of said turn-cock forming a projecting tongue inserted between said hammer and the bursting charge of the shell, of a retarding charge in said tongue; said tongue causing delayed-action when said tongue is situated centrally relative to said hammer, and causing free passage for the flame from said hammer to a bursting charge, when said tongue is turned out of its central position; a transverse channel in said turn-cock and a longitudinal channel therein; said transverse channel connecting the time train of the fuse with the bursting charge of the shrapnel when said turn-cock stands to one side of the central position; and said longitudinal channel connecting said time train with the bursting charge of the shell when said turn-cock stands to the other side of the central position.

6. In an impact fuse, a delayed-action device comprising a revoluble member in said fuse, having a retarding charge, the axis of revolution of said member being perpendicular to the longitudinal axis of the fuse, said member being provided with passages and adapted to connect and disconnect the time train of the fuse with the bursting charge of a shell and a shrapnel respectively, said device working with delayed-action on impact when said member stands in its central position.

7. In an impact fuse, a delayed-action device comprising a revoluble member in said fuse, having a retarding charge, the axis of revolution of said member being perpendicular to the longitudinal axis of the fuse, said member being provided with passages and adapted to connect and disconnect the time train of the fuse with the bursting charge of a shell and a shrapnel respectively, said device working with delayed-action on impact when said member stands in its central position and without delayed-action when said member is turned out of its central position.

8. In an impact fuse, a delayed-action device comprising a revoluble member in said fuse, having a retarding charge, said member being provided with passages and adapted to connect and disconnect the time train of the fuse with the bursting charge of a shell and a shrapnel respectively, said device working with delayed-action on impact when said member stands in its central position and without delayed-action when said member is turned out of its central position and simultaneously connecting said time train with the one and disconnecting it with the other of said bursting charges by means of said passages.

9. In an impact fuse, a delayed action device comprising a revoluble member having its axis of revolution perpendicular to the fuse axis, said member having a recess, an impact member entering said recess, a fulminate in said impact member, a projecting tongue formed in said revoluble member and carrying a retarding charge, whereby, on turning said revoluble member a certain amount, said retarding charge will be shunted out of the path of the igniting flame.

10. In an impact fuse, a delayed action device comprising a revoluble member having its axis of revolution perpendicular to the fuse axis, said member having a recess, an impact member entering said recess, a fulminate in said impact member, a projecting tongue formed in said revoluble member and carrying a retarding charge, said tongue being so narrow, that a slight turning of said revoluble member will cause said tongue to be entirely removed from the path of the igniting flame.

11. In a combination impact and time fuse having an impact member and a time train, a delayed action device comprising a revoluble member having its axis of revolution transverse to the fuse axis, said revoluble member being provided with two passages and having a recess entered by said impact member, a fulminate in said impact member, a narrow projecting tongue formed in said revoluble member and carrying a retarding charge, said impact member being constructed to allow said revoluble member to be turned both to the one and to the other side of the fuse axis, whereby said tongue may be entirely removed from the path of the igniting flame: and the one of said passages being adapted to connect said time train with the shrapnel charge when said revoluble member is turned to the one side of the fuse axis and the other of said passages adapted to connect said time train with the grenade charge when said revoluble member is turned to the other side of the fuse axis.

12. In a combination impact and time fuse having an impact member and a time train, a delayed action device comprising a revoluble member having its axis of revolution transverse to the fuse axis, said revoluble member being provided with two passages and having a recess entered by said impact member, a fulminate in said impact member, a narrow projecting tongue formed in said revoluble member and carrying a retarding charge, said impact member being constructed to allow said revoluble member to be turned both to the one and to the other side of the fuse axis, whereby said tongue may be entirely removed from the path of the igniting flame: and the one of said passages running into said recess of said revoluble member beside said tongue and being adapted to connect said time train with the grenade charge when said revoluble member is turned to the one side of the fuse axis and the other of said passages adapted to connect said time train with the shrapnel charge when said revoluble member is turned to the other side of the fuse axis.

The foregoing specification signed at Barmen, Germany, this 11th day of December, 1912.

KARL WIESER. [L. S.]

In presence of—
HELEN NUFER.
ALBERT NUFER