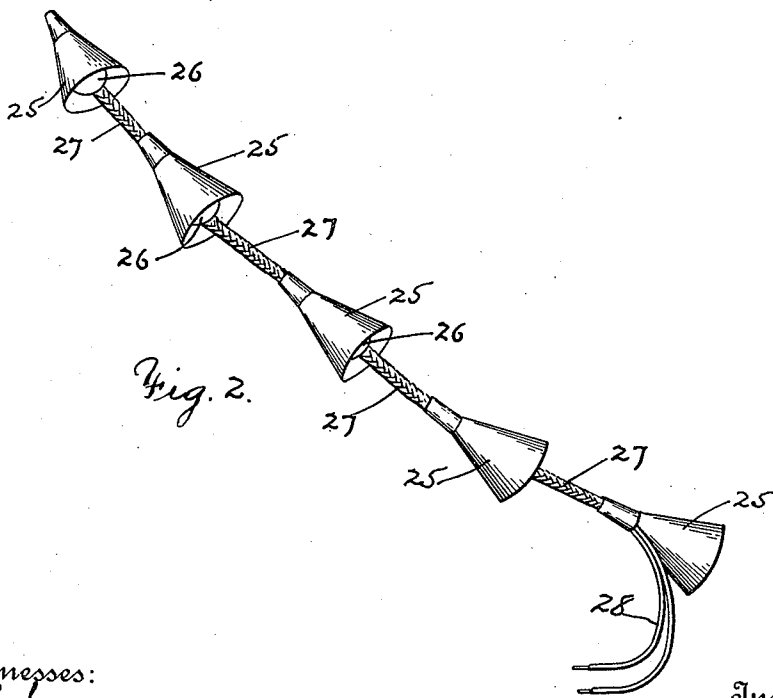
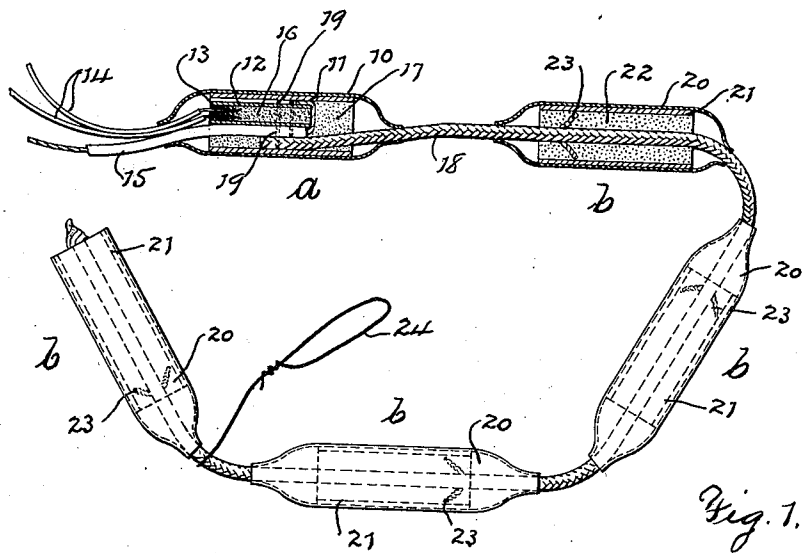


981,677.

Patented Jan. 17, 1911.



Witnesses:  
A. D. Serrell  
 Chas. H. Smith

Inventor  
Henry J. Pain  
 By HIS Attorney  
Charles Serrell

# UNITED STATES PATENT OFFICE.

HENRY J. PAIN, OF NEW YORK, N. Y.

PYROTECHNICS.

981,677.

Specification of Letters Patent. Patented Jan. 17, 1911.

Application filed March 31, 1910. Serial No. 552,699.

*To all whom it may concern:*

Be it known that I, HENRY J. PAIN, a citizen of the United States, residing in the borough of Manhattan, city, county, and State of New York, have invented an Improvement in Pyrotechnics, of which the following is a specification.

My present invention relates to pyrotechnics and particularly to a flash apparatus adapted for use in marine, military or other signaling operations or in target practice at night or in pyrotechnic displays or in divers other ways.

The apparatus made in accordance with my present invention preferably comprises an initial or primary flash cartridge, means for igniting the same, a plurality of other or secondary cartridges, and means for connecting the primary and plurality of secondary flash cartridges in such a manner that the said cartridges may be fired successively at predetermined intervals, as hereinafter more particularly described.

In the drawing, Figure 1 is a partial central cross section and elevation of the apparatus comprising my present invention, and Fig. 2 is a perspective view of a modified form thereof.

Referring to the drawing and particularly to Fig. 1, the device comprising my invention consists in a primary flash cartridge indicated at *a* and a plurality of secondary flash cartridges, each of which is indicated at *b*, all of which cartridges are connected as hereinafter described.

The primary cartridge *a* preferably comprises a casing or wrapper 10 which may be of a general cylindrical configuration as shown in Fig. 1, or of any other desired configuration, and is preferably made of tarred paper, but may as will be understood, be constructed of any other suitable material. Within the wrapper 10 is an open-ended cylindrical member 11 preferably made of pasteboard and over which the wrapper 10 is closely wound. Within the cylinder 11 is an auxiliary cylinder 12 and this auxiliary cylinder 12 may also be made of pasteboard or any other suitable material.

At one end of the auxiliary cylinder 12, a plug 13 of insulating material is fitted and leading into and passing through this plug 13 are circuit wires 14, which as will be understood, are properly covered with suitable insulation exteriorly of the plug 13 but which are bared at their inner extremi-

ties which extend appreciably beyond the inner side of the plug 13 within the auxiliary cylinder 12. Leading into the cylinder 11 there is also a fuse 15 which as will be understood may be of any ordinary construction.

The auxiliary cylinder 12 is approximately filled with meal powder 16, it being understood that any suitable ignition powder may be employed to fill the auxiliary cylinder 12. The space within the cylinder, other than that occupied by the auxiliary cylinder 12 and fuses, is substantially filled with a flash powder indicated at 17.

18 designates a time fuse made in any well known manner extending into and embedded within the flash powder 17 in the cylinder 11 and as is indicated in Fig. 1, the auxiliary cylinder 12, the fuse 15 and the fuse 18 may be conveniently secured together by a strip or tape indicated at 19 or any other suitable means for accomplishing this purpose.

Each one of the secondary cartridges preferably comprises a wrapper or casing 20 constructed similarly in all respects to the casing 10 of the primary cartridge as hereinbefore described. In each secondary cartridge there is also a cylindrical member 21 made from a tube of pasteboard or similar material, within which is a charge of flash powder indicated at 22.

The time fuse 18 extends from the primary cartridge *a* through each one of the secondary cartridges *b* and within each of these secondary cartridges *b* I may provide an auxiliary fuse as indicated at 23, leading from the time fuse 18 and extending into the flash powder 22.

The hereinbefore described apparatus may also be provided with a loop of copper or other suitable material as indicated at 24, by and from which the device may be suspended from a suitable support.

It will be apparent that this apparatus may be fired electrically by connecting the wires 14 to a suitable source of electricity and closing the circuit, or may be fired by hand by lighting the fuse 15, and that the fuse 18 may be so made and the secondary cartridges *b* placed thereon in such spaced apart positions that the cartridges may be fired at any predetermined intervals.

By reference to Fig. 2, it will be seen that instead of employing the apparatus as shown in Fig. 1, I may extend the corresponding

ends of the casings or wrappers of the cartridges to bell-shape configurations as indicated at 25 surrounding the receptacle or envelop 26 containing the flash powder through which the time fuse 27 extends, the reference numeral 28 in this figure representing the circuit wires by means of which the primary cartridge may be fired electrically.

I claim as my invention:

- 10 1. A pyrotechnic device comprising a primary flash cartridge consisting of a casing, a tube, flash powder within the tube, means for firing the primary cartridge, a plurality of secondary cartridges and continuous integral means extending through and so connecting the secondary cartridges with the primary cartridge that the same may be fired successively at predetermined intervals.
- 20 2. A pyrotechnic device comprising a primary flash cartridge consisting of a casing, a tube, flash powder within the tube, an auxiliary tube, ignition powder within the said auxiliary tube, means for igniting the said
- 25 ignition powder, a plurality of secondary cartridges, each consisting of a casing, a

tube within the casing, flash powder within the tube, and means extending through and so connecting the said secondary cartridges with the primary cartridge that the same may be fired successively at predetermined intervals.

3. A pyrotechnic device comprising a primary flash cartridge consisting of a casing, a tube, flash powder within the tube, an auxiliary tube, ignition powder within the said auxiliary tube, means for igniting the said ignition powder, a plurality of secondary cartridges, each consisting of a casing, a tube within the casing, flash powder within the tube, a time fuse extending through each of the said secondary cartridges into the primary cartridge and so connecting the same that the cartridges may be fired successively at predetermined intervals.

Signed by me this 28th day of March, 1910.

HENRY J. PAIN.

Witnesses:

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