J. J. DETWILLER.
Pyrotechnic Signal.

No. 217,591. Patented July 15, 1879.

Fig.2

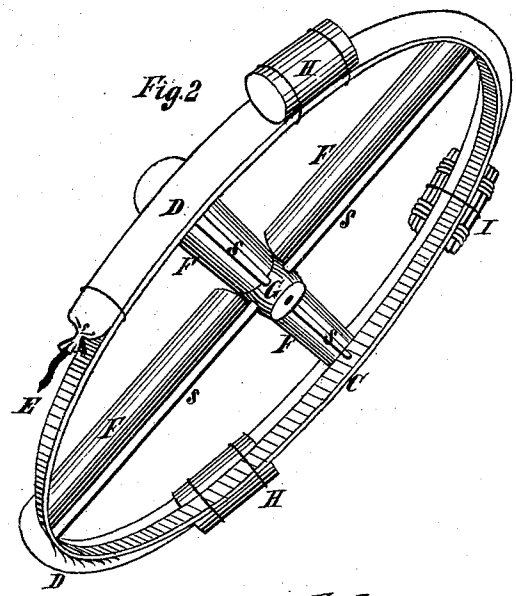


Fig.1.

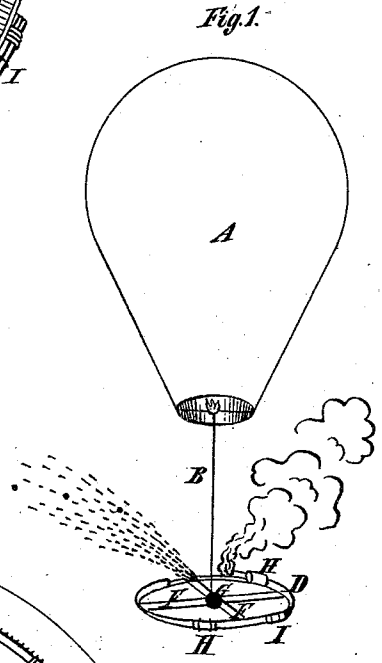
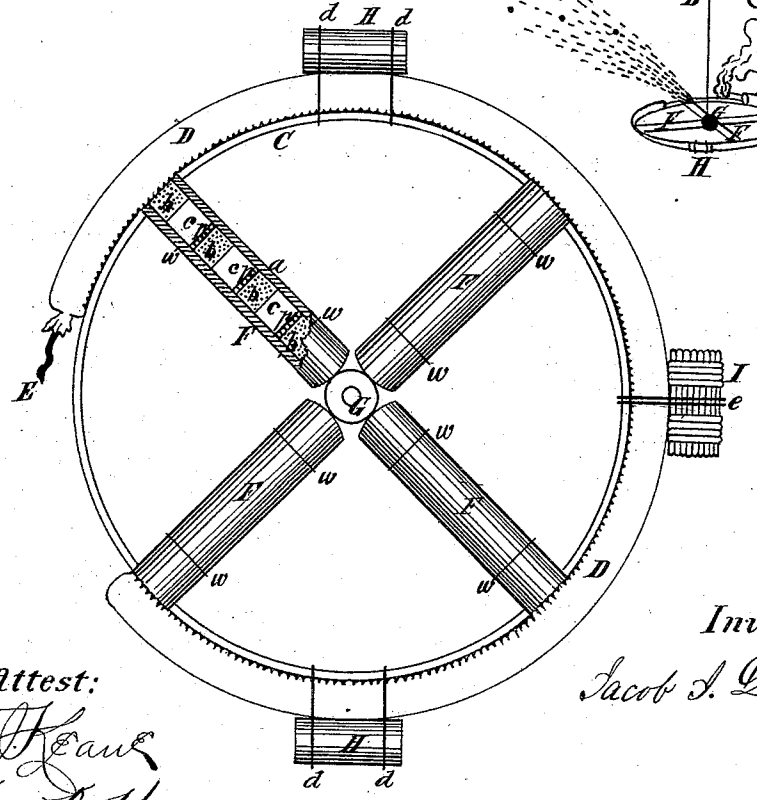


Fig.3.



Attest:
J. Keane
Fred K. Haynes

Inventor:
Jacob J. Detwiller

N. PETERS, PHOTO-LITHOGRAPHER, WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

JACOB J. DETWILLER, OF GREENVILLE, NEW JERSEY.

IMPROVEMENT IN PYROTECHNIC SIGNALS.

Specification forming part of Letters Patent No. **217,591**, dated July 15, 1879; application filed May 8, 1879.

To all whom it may concern:

Be it known that I, JACOB J. DETWILLER, of Greenville, in the county of Hudson and State of New Jersey, have invented certain new and useful Improvements in Pyrotechnic Signals, of which the following is a specification.

These improvements relate to pyrotechnic signals adapted for use in connection with a balloon, and which are ignited and operated after being carried up into the air.

One improvement consists in the combination of a torch or constant signaling and illuminating device and a separate and independent signal, such as a star, attached to the torch to be ignited thereby, but to burn independently thereof, the whole being adapted for use with a balloon, and preferably attached thereto in such manner that it will after ignition be released therefrom by the torch and allowed to drop away from the balloon prior to its operation.

Another improvement consists in the combination of a torch or constant signaling and illuminating device and a separate and independent audible signal attached to the torch to be ignited thereby, but to burn independently thereof, and so that it will after ignition be released from said torch, the same being adapted for use with a balloon.

Another improvement consists in a novel fire-work for use with a balloon.

Other improvements consist in details hereinafter described and claimed.

In the accompanying drawings, Figure 1 is a perspective view of a balloon and fire-work embodying my improvements. Fig. 2 is a perspective view of the fire-work on a larger scale detached; and Fig. 3 is a top view, partly in section, of the fire-work detached from its balloon.

Similar letters of reference indicate corresponding parts in all the figures.

A designates a balloon, which may be of any suitable kind—for instance, composed of a paper case or envelope inflated with rarefied air, according to the plan set forth in Letters Patent No. 193,599, granted to me July 31, 1877. B designates a cord or other similar device fastened to the balloon and suspending a fire-work therefrom. This fire-work consists, essentially, of a torch or constant signaling and illuminating device and a separate and independent visible or audible signal, or both, connected so as to be ignited thereby, but to burn independently thereof. In this example of my invention such fire-work comprises a circular frame or hoop, C, of wood or other desirable material, around which is arranged a torch, D, preferably consisting of a thin paper case crimped along one side to admit of its arrangement in circular form, containing a composition such as that known as "colored fire," adapted, when ignited, to burn slowly and emit constantly a brilliant colored light. This torch may advantageously be provided with a stem or fuse, E, to facilitate its ignition.

F designates a series of Roman candles extending radially from a central hub, G, and fastened by cords or wires *w* to spokes *s* extending from the said hub to the frame or hoop C, and combined with the torch D, so as to be ignited by the latter. These Roman candles may be of ordinary form, consisting severally of a case, a slow-burning composition, *b*, then what in fire-works is known as a "star," *c*, then a charge of gunpowder, *p*, for ejecting the same, and so on repeatedly throughout its length. It will be observed that these Roman candles are so arranged as not to entail danger of igniting the balloon when they are operated.

H designates a number of devices consisting of a shell or case containing a composition known as a "star," and attached to the frame or hoop C and torch D by bands or cords *d* of combustible material, so that they may be ignited by the torch, and be thereby released by the burning away of such bands or cords, and allowed to part from the balloon before operating.

I designates an audible signal, which may be of any suitable kind capable of producing an explosion, and is attached to the frame or hoop C and torch D by combustible bands or cords *e;* hence it is ignited by the torch and released from the balloon by the burning of its bands or cords.

I do not confine myself to this arrangement of the parts in the form of a wheel, as my invention is susceptible of use in many other

ways. As the torch burns it maintains a constant illumination, and indicates where to look for the signals, which are given at intervals.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination of a torch or constant signaling and illuminating device and a separate and independent signal, such as a star, attached to the torch to be ignited thereby, but to burn independently thereof, substantially as specified, and adapted for use with a balloon.

2. The combination of a torch or constant signaling and illuminating device and a separate and independent signal, such as a star, attached to the torch to be ignited thereby, but to burn independently thereof, and to be released from the torch after ignition, substantially as specified, and adapted for use with a balloon.

3. The combination of a torch or constant signaling and illuminating device and a separate and independent audible signal attached to the torch to be ignited thereby, but to burn independently thereof, and to be released from said torch after ignition, substantially as specified, and adapted for use with a balloon.

4. The combination of a torch or constant signaling and illuminating device, arranged in circular form, and a series of separate and independent signals attached to the torch to be ignited thereby, but to burn independently thereof, substantially as specified, and adapted for use with a balloon.

JACOB J. DETWILLER.

Witnesses:
EDWIN H. BROWN,
T. J. KEANE.