Jan. 11, 1944. P. G. HOLT 2,338,719

SURFACE MARKING SIGNAL

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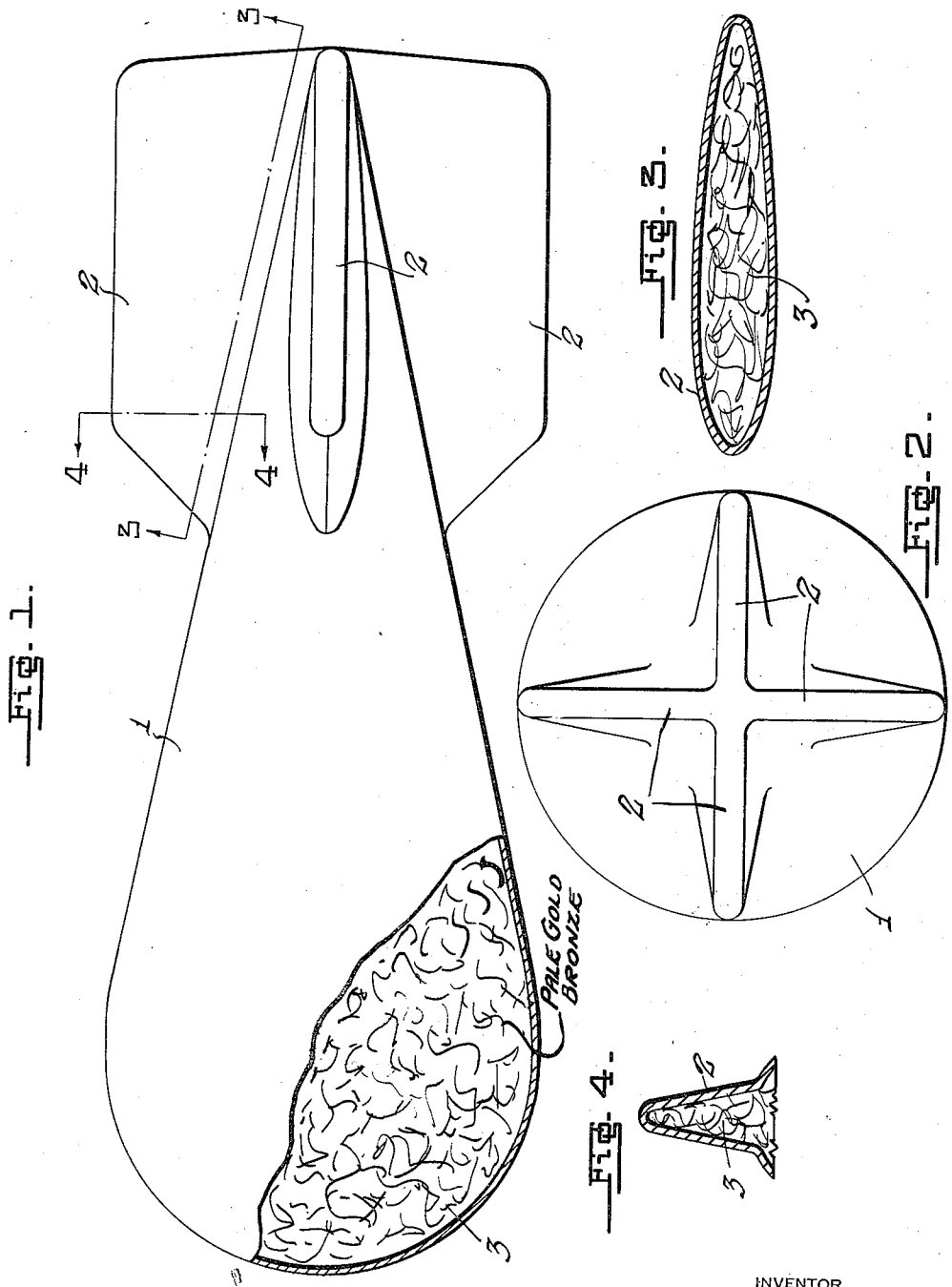



Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

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## SURFACE MARKING SIGNAL

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Application November 20, 1942, Serial No. 466,302

3 Claims. (Cl. 35—25)

(Granted under the act of March 3, 1883, as amended April 30, 1928; 370 O. G. 757)

This invention relates to a device which, when dropped from an aircraft, provides for the marking of a continuous, homogeneous, and visible spot on the surface below, in a time interval approaching that minimum time required for free fall from the same altitude.

An object of this invention is to provide a marking on surfaces such as open water or extended areas covered with snow or ice on which there are no distinguishable points or markings. Such markings may be used for making drift measurements of the aircraft by a relative bearing method.

A further object of this invention is to provide visible targets to be used for bombing practice.

A further object of this invention is to mark the location of a previously seen object or occurred event.

The invention consists of a powder contained in a streamlined shell. The shell is such that on striking water or other surface below the aircraft, it will break and release the powder. The container is either made of such a material as to be porous to air but not to the powder therein contained, or is provided with a suitable vent; this is to prevent exploding at high altitudes.

The powder is of a composition which will spread into a single homogeneous visible spot when it is released on the surface. The powder may be metallic or non-metallic in composition. As examples, suitable materials are pale gold bronze powder and sodium fluorescein salt.

One form of this invention now successfully in use, is shown by way of example, in the accompanying drawing, in which,

Fig. 1 shows the side view of the signal shell.

Fig. 2 is a rear view thereof, and

Figs. 3 and 4 are sections taken along the lines 3—3 and 4—4, respectively, of Fig. 1.

The shell 1 may be made of molded paper pulp approximately $\frac{1}{16}$" thick, chemically treated for water proofing and rigidity. Any other suitable material may be used in place of paper pulp, but should preferably be such as will make the shell waterproof for at least three hours when immersed in water.

If the shell illustrated is made 10" long, about 2 lbs. of pale gold bronze powder 3 (floating) may be packed under vibration of .03 inch and securely sealed therein. The total weight in this case should not exceed 3 lbs. complete. The outside finish should be smooth. It is to be understood that the specific configuration of the shell and fins 2 is optional, the form shown in the drawing being merely illustrative of one specific design.

The shell should be porous to the passage of air but not to the passage of the powder 3, to prevent exploding when subjected to the pressure at an altitude of 30,000 ft. at a maximum rate of change of 5,000 ft. per minute.

The material used should be such that the shell shall break on striking the water when dropped from a height of 100 ft. above the water. It should, however, be strong enough to withstand breakage in ordinary handling.

The bronze powder should have the following properties:

| Chemical | Maximum | Minimum |
|---|---|---|
| | *Per cent* | *Per cent* |
| Copper | 85 | 80 |
| Zinc | 20 | 15 |
| Grease or lubricant | 1.0 | ---------- |
| Other | .5 | ---------- |

| Physical | Maximum |
|---|---|
| | *Per cent* |
| Total residue retained on No. 140 mesh | 0 |
| Total residue retained on No. 325 mesh | 30 |

Apparent density—22.5 grams per cubic inch—max.

The design should be such as to bring the center of gravity of the completed signal well forward in the nose of the shell.

It is to be understood that many changes in form, size and materials may be made within the scope of the present invention which is defined in the claims below.

This invention may be used by or for the Government of the United States of America for governmental purposes without the payment to me of any royalties thereon or therefor.

I claim:

1. A dummy bomb containing powder for marking purposes and adapted to burst upon impact comprising a casing of frangible material porous to the passage of air but impervious to the passage of said powder whereby said casing will not be deformed or fractured due to changes in pressure such as will obtain in an aircraft as a result of sudden changes in altitude.

2. The combination of claim 1 wherein said casing is molded from paper pulp.

3. The combination of claim 1 wherein said powder is pale gold bronze.

PLINY G. HOLT.