

(No Model.)

H. T. HIRSCH.
PYROTECHNIC BALLOON.

No. 574,865.

Patented Jan. 5, 1897.

Fig. 1.

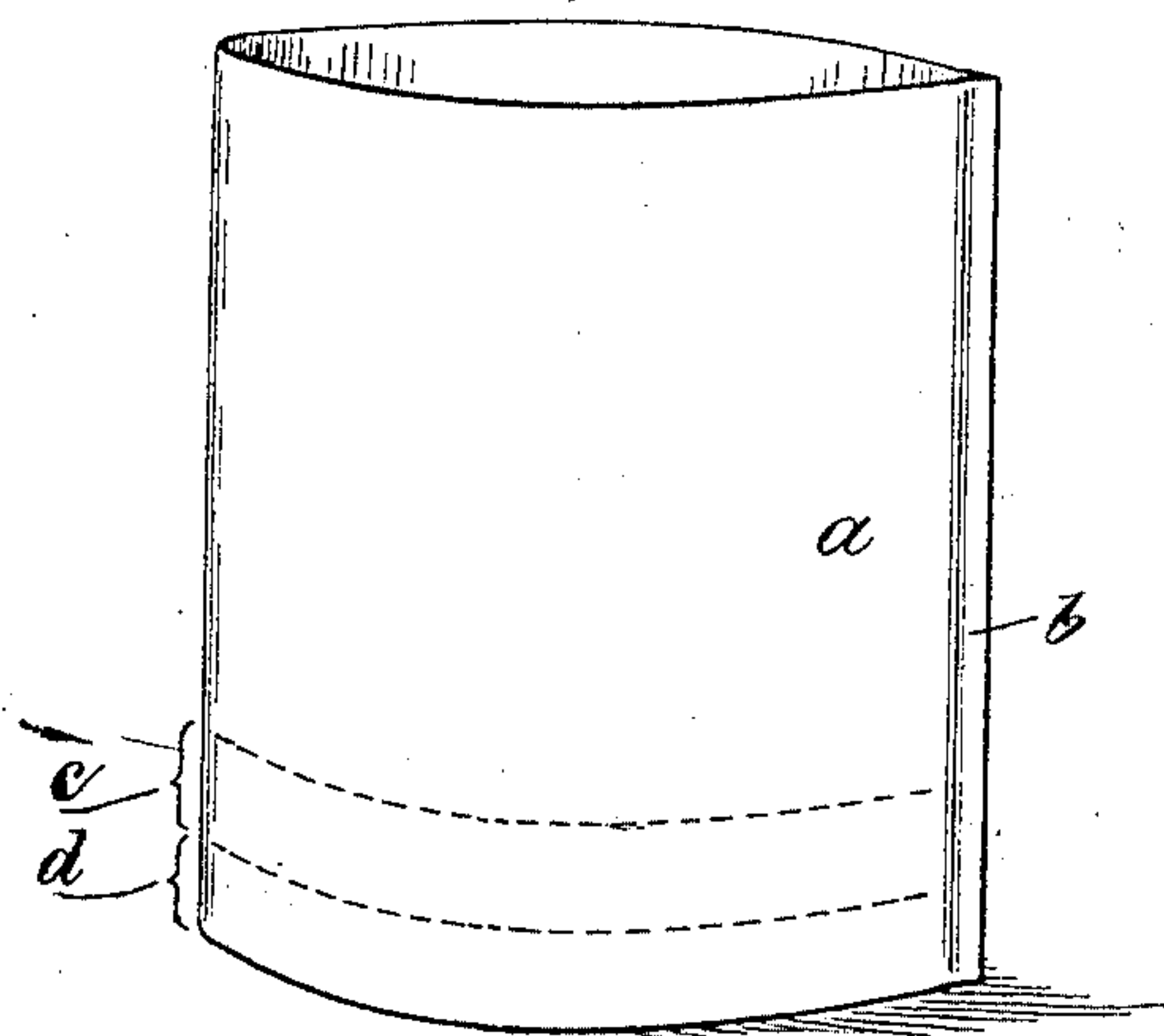


Fig. 2.

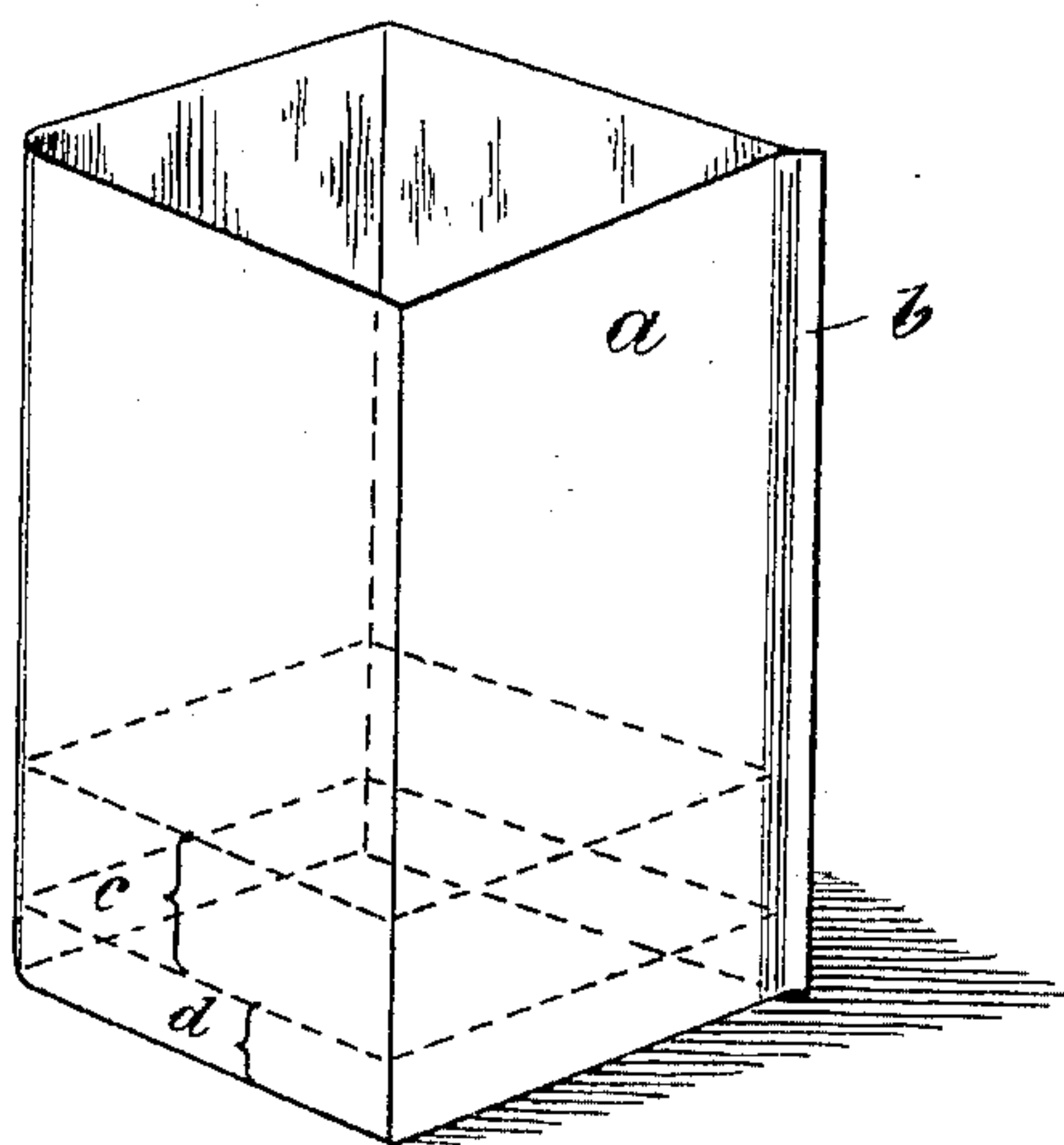
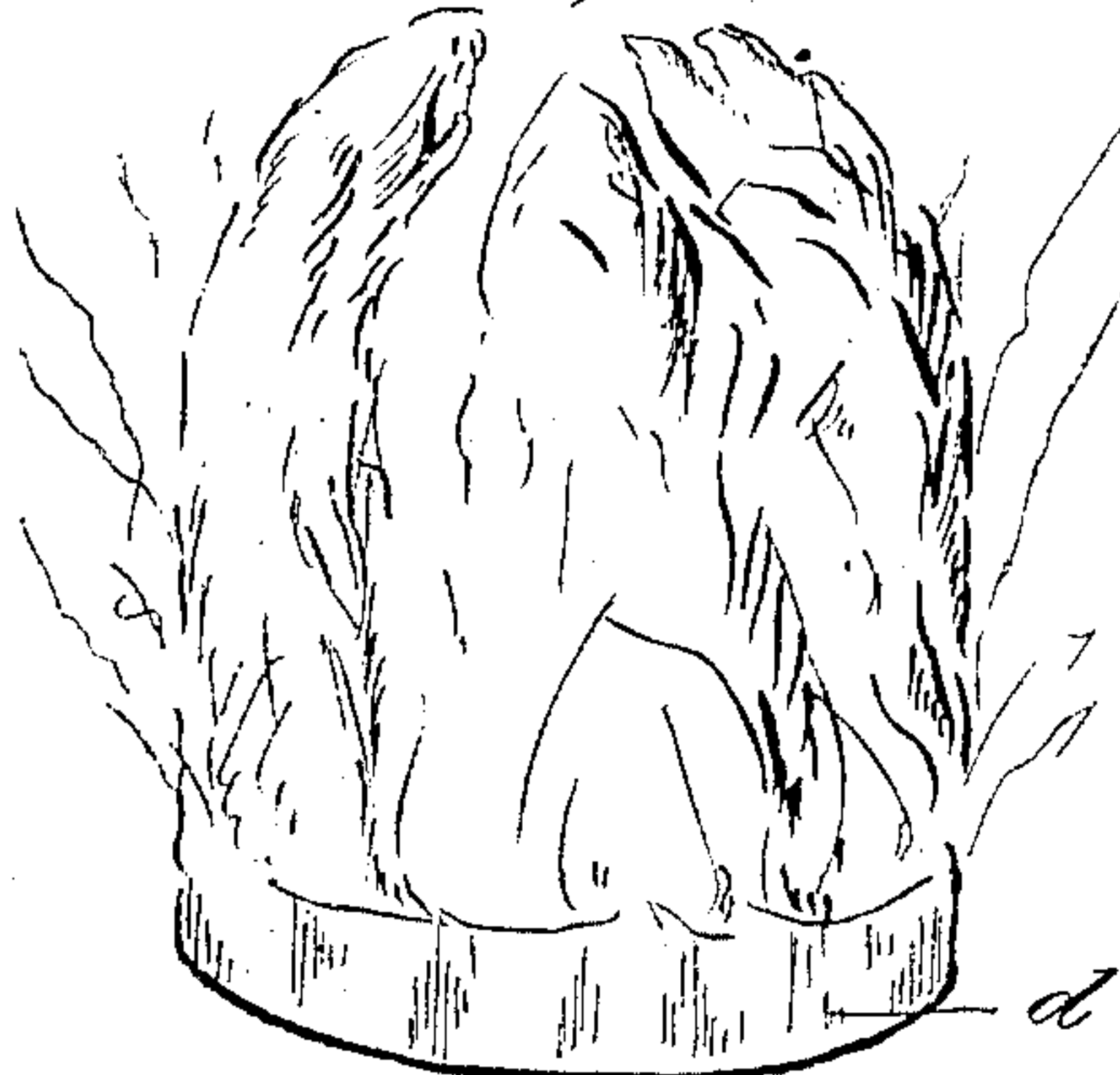


Fig. 3.



WITNESSES:
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PYROTECHNIC BALLOON.

SPECIFICATION forming part of Letters Patent No. 574,865, dated January 5, 1897.

Application filed October 29, 1896. Serial No. 610,421. (No model.)

To all whom it may concern:

Be it known that I, HENRY T. HIRSCH, a subject of the Emperor of Germany, and a resident of New York, in the county and State of New York, have invented a certain new and useful Pyrotechnic Balloon, of which the following is a specification.

The purpose of the present invention is to provide a pyrotechnic device especially useful as an indoor amusement and therefore absolutely free from the ordinary dangers of fire. In attaining this end I employ a combustible tissue-paper structure to which is attached a combustible material of such a character as will be latent until the ashes of the tissue-paper have arisen in the air, whereupon the combustible material will become active and the balloon will show one or more bright lights of pyrotechnic character produced by the combustion or explosion of particles of the material.

The invention will be fully described hereinafter, and defined in the claims.

In the accompanying drawings, illustrating my invention, Figure 1 is a perspective view of one form of the balloon prior to its use. Fig. 2 illustrates the balloon spread in position to be fired, and Fig. 3 represents the balloon almost consumed by the fire and immediately before it rises to produce its pyrotechnic display.

In constructing the balloon I provide a sheet *a* of tissue-paper, which should be very thin and by preference of good quality. This is preferably saturated with a solution of saltpeter to render the paper readily and evenly combustible. Two opposite edges of the paper are suitably joined by a seam *b* to form a tube, as shown in the drawings. This tube, if ignited at its upper edge, will burn rapidly, the ashes collapsing or falling down, as shown in Fig. 3. When all but the lowermost extremity of the tube has been burned, the current of hot air generated by the burning will lift the ash film forming the remains of the paper and cause the ashes to float rapidly upward in the air. When the last heat dies out, a few moments later, the ashes will descend.

To a structure thus characterized I apply the material which produces the pyrotechnic

effects, which is preferably finely-powdered aluminium. This will not burn immediately upon the action of the fire consuming the tissue-paper, but must be some moments subjected to such heat before the combustion takes place. In order that the action of the aluminium may be properly timed with reference to the burning of the paper, it is applied to the lower part of the tube within the space inclosed by the brace *c* in Figs. 1 and 2. By this arrangement the balloon rises to the height of eight or ten feet before the material, such as aluminium or its equivalent, is heated sufficiently to burn. The space inclosed by the bracket *d* in Figs. 1 and 2 is preferably left free from the pyrotechnic material to furnish a band of fuel whereby to generate heat for elevating the film of ashes into which the paper will be transformed.

No particular means by which to hold the pyrotechnic material on the paper are absolutely essential. Most effective results, however, are obtained by the use of an adhesive medium possessed of a large proportion of oil contradistinguished from common glue or mucilage, because the former is readily combustible and leaves no ashes, while glue and mucilage are more refractory combustibles and leave a heavy ash, tending to retard the ascent of the balloon.

The pyrotechnic material may be applied conveniently as a fine powder, which is dusted onto the surface of the paper, to which has been previously applied a thin film of some adhesive like mucilage or oil, or the powder may be mixed with the adhesive and then applied. In the latter case it is sometimes convenient to use printing-ink as the adhesive.

To use the balloon, the tube is spread and stood erect with the end having the pyrotechnic material downward, as in Fig. 2. The upper edge of the tube should now be ignited in a plurality of places. Then the tube burns downward, the ashes fall inward, as shown in Fig. 3, and next float up into the air. The pyrotechnic stars are now given forth, after which the ashes descend and the mission of the balloon is performed.

The pyrotechnic material might be composed of chemicals other than aluminium.

Instead of a tube other forms of paper structure adapted to stand and be consumed, as described, may be employed.

What I claim as my invention is—

- 5 1. A fire-balloon having a combustible tissue structure and a pyrotechnic substance attached to the tissue structure and ignited by the burning thereof, substantially as described.
- 10 2. A fire-balloon having a combustible structure collapsing upon burning whereby to form a light, ash film or body adapted to be lifted or floated in the hot air generated, substantially as described.
- 15 3. A fire-balloon having a combustible structure collapsing upon burning, whereby to form an ash-film shell adapted to be floated by heat from the burning of the structure, and a pyrotechnic substance attached to the
20 structure and ignited by the burning thereof after the ash film rises, substantially as described.
4. A fire-balloon formed of a combustible

tissue tube collapsing inward upon burning, whereby to form an ash-film shell within 25 which the heat from the burning of the shell is confined and by which heat the shell is floated in the air, substantially as described.

5. A fire-balloon having a combustible structure and a pyrotechnic substance at- 30 tached to the structure by an oily adhesive medium, substantially as described.

6. A fire-balloon having a combustible tissue structure the ashes of which arise by the heat of the burning tissue, and a pyrotechnic 35 substance attached to the structure by a suitable adhesive medium, substantially as described.

Signed at New York, in the county of New York and State of New York, this 27th day of 40 October, A. D. 1896.

HENRY T. HIRSCH.

Witnesses:

WM. H. CAPEL,
ISAAC B. OWENS.