

(No Model.)

J. A. SUMOVSKI.
BALLOON.

No. 510,492.

Patented Dec. 12, 1893.

Fig. 1.

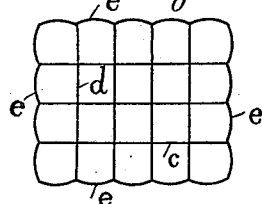
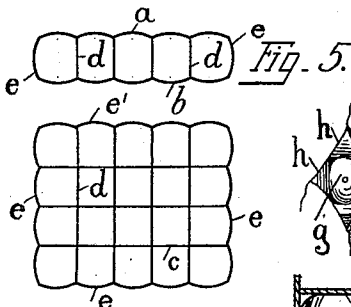
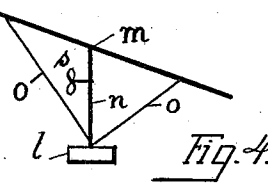
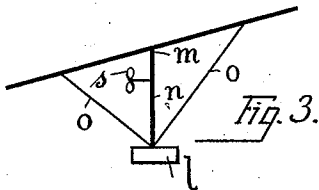
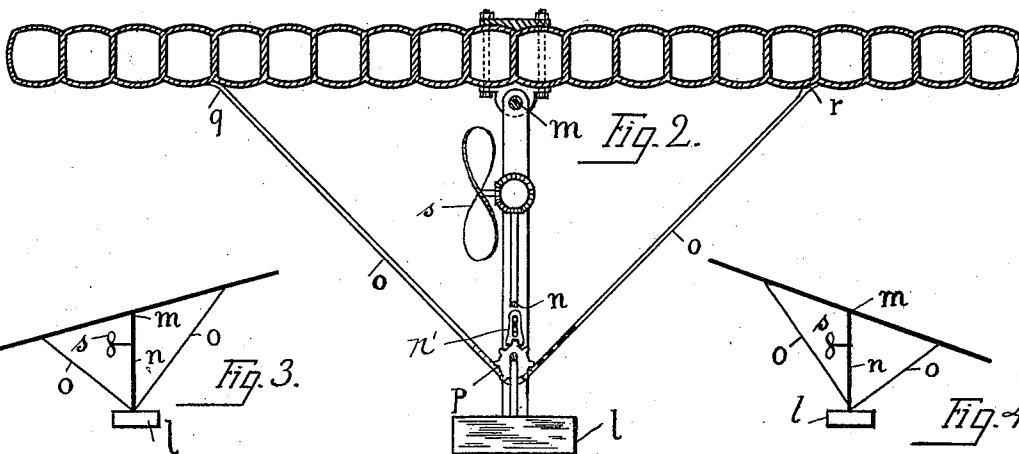
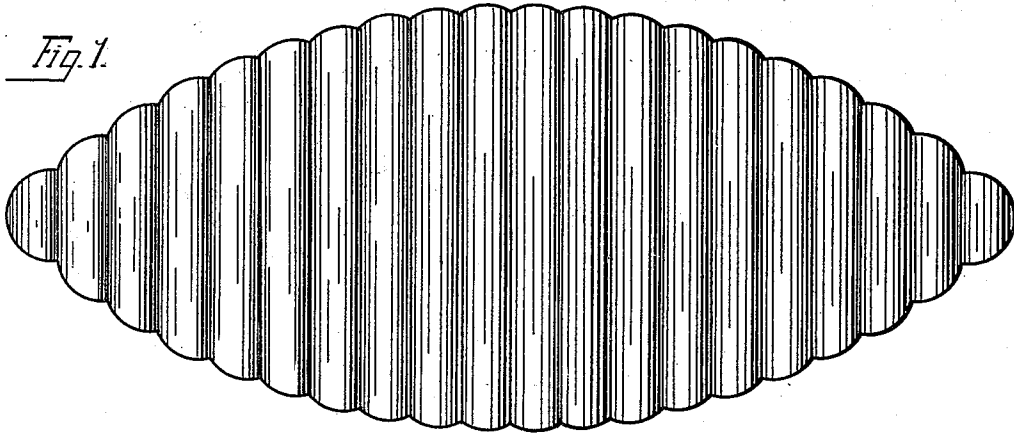


Fig. 6.

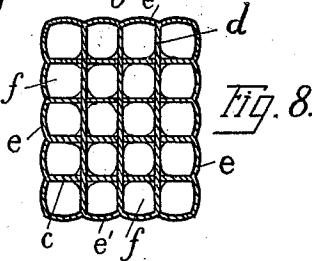
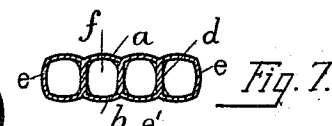
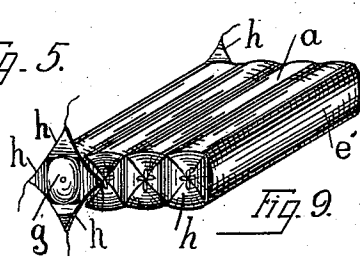
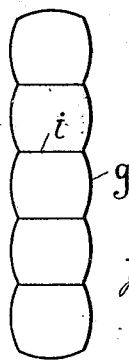


Fig. 8.

Fig. 11.



Witnesses:
E. H. Sturtevant
E. W. Amos

Fig. 10. Inventor:
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UNITED STATES PATENT OFFICE.

JOACHIM ADOLFOWICZ SUMOVSKI, OF KURSK, RUSSIA.

BALLOON.

SPECIFICATION forming part of Letters Patent No. 510,492, dated December 12, 1893.

Application filed January 23, 1893. Serial No. 459,344. (No model.)

To all whom it may concern:

Be it known that I, JOACHIM ADOLFOWICZ SUMOVSKI, a subject of the Emperor of Russia, residing at Kursk, a city of the Russian Empire, have invented certain new and useful Improvements in Balloons, of which the following is a specification.

The object of this invention is certain improvements in balloons and consists of a flat shape envelope provided with partitions forming compartments or chambers, each of which may be separately filled with gas or receive a bag or casing charged with gas.

In the accompanying drawings, Figures 1 and 2 are a plan and a vertical longitudinal section respectively of this improved balloon. Figs. 3 and 4 are diagrams showing how the balloon should be set or arranged when it is required to ascend or descend obliquely. Fig. 5, is a diagrammatic view of the cell structure of the balloon case. Fig. 6, is a plan view of the same. Figs. 7 and 8, are sectional views of the cell case adapted to receive air pockets or bags. Fig. 9, is a perspective view showing the manner of inclosing the independent air bags in the case. Fig. 10, is a plan view of a compartment air bag, and Fig. 11, is a sectional view of a modification.

The simplest mode of forming the balloon is as follows: Two pieces of material of equal size *a* and *b*, Figs. 5 and 6, are connected together by longitudinal or transverse partitions *c* or *d*, and are joined at their edges by strips of material *e*, *e'*, in such a manner as to form a flat cushion like casing closed on all sides and subsequently divided by the partitions *c* and *d* into gas tight chambers separately filled with gas. Instead of filling the said chambers with gas, each chamber may be provided in the course of the manufacture of the envelope with a hollow bulb *f* filled with gas, Figs. 7 and 8, the sides which are formed of flexible material. The hollow bulbs may also be inserted in a collapsed condition in the chambers and subsequently inflated with gas when the envelope is completed through openings which can be readily closed.

By dispensing in the envelope shown in Figs. 5 and 6, with the longitudinal partitions *e* and the edge strips marked *e'*, an envelope

is produced, the two end chambers of which are left open. In each of these open chambers is inserted a bolster like bag *g* close at its two circular or spherical ends (Fig. 9) and made of flexible material which is inflated with gas after it has been placed in position. Each bag is somewhat longer than the corresponding chamber or compartment, so that the spherical ends project slightly beyond the envelope. To prevent this tubes or bags slipping out of the envelope, flaps or bands *h* fixed to the envelope and to its partition walls or forming extensions of the envelope and of its partitions, are attached crosswise over these tubes or bags.

In Fig. 9, the three bags on the right hand side are shown fully closed, while the end of the fourth bag on the left hand side is shown uncovered, the flaps *h* being thrown back. The tubes *g* may be likewise divided into compartments by transverse partitions *i*, Fig. 10; and moreover, instead of filling each one of these compartments with gas, they may be supplied with a hollow case or bulb *k*, Fig. 11, filled with gas in the course of the manufacture of this tube or bag.

The balloon manufactured according to one of the methods above described is preferably made to assume the shape shown in Figs. 1 and 2, and is attached by a frame *n* to the car *l* in such a manner as to be capable of turning, relatively to the car, upon its transverse axis *m*, or upon an axis parallel to the former but placed somewhat lower as shown in the drawings and firmly connected to the balloon, the car being suspended to the same.

The adjustment of the balloon in an oblique position (see Figs. 3 and 4) is effected by means of a chain *o* passing in the middle over a chain wheel *p* Fig. 2, arranged on or in the car, while its ends are connected to the balloon at *q* and *r*. The chain wheel may be fixed in any suitable position by any suitable form of gravity pawl *n'* engaging the chain wheel. The fixing of the chain wheel makes the balloon rigid.

s, Figs. 2, 3 and 4 shows a screw of the form ordinarily used for balloons propelled by screws, and which is driven by a motor placed in the car.

When the balloon is constructed of bags in

the manner shown in Fig. 9, two, three, or more tubes or bags can be inserted telescopically one within the other for the purpose of making them resistant and thoroughly impermeable, these tubes or bags being connected together by their coverings, or in any other suitable manner, so that the wall of each bag may consist of two or more layers of material connected together.

10 Having now particularly described and ascertained the nature of this invention and in what manner the same is to be performed, I declare that what I claim is—

1. In combination, the casing having elongated bags inserted therein having cells, substantially as described.

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2. In combination, the casing divided into compartments, elongated bags adapted to said compartments, each of said bags being provided with cells and inflated bags in said 20 cells, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOACHIM ADOLFOWICZ SUMOVSKI.

Witnesses:

W. HAUPT,

C. G. VOGT.