

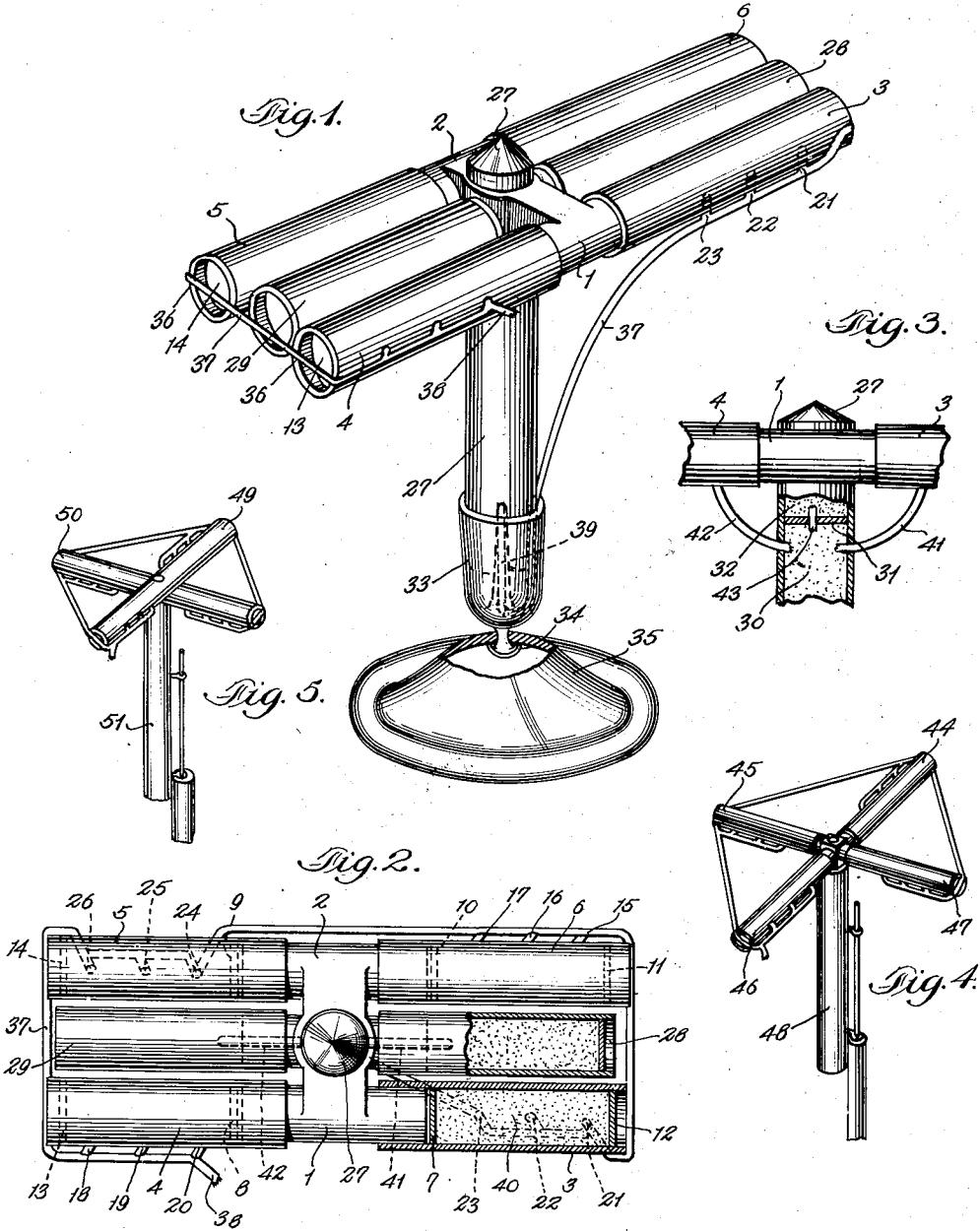
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T. G. HITT

ROCKET

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Inventor.

Thomas G. Hitt.

By *Marion Feurick Lawrence*  
Attorneys

# UNITED STATES PATENT OFFICE.

THOMAS G. HITT, OF SEATTLE, WASHINGTON.

## ROCKET.

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This invention relates to improvements in rockets particularly to stickless arenic rockets.

An object of this invention is to provide an absolutely stickless rocket having an automatic balancer attached thereto which is adapted to burn away as the rocket ascends.

The rocket, as described and claimed in this application, may be fired from similar positions as other arenic pieces, in front of a grandstand or otherwise, without subjecting the spectators to the danger of falling sticks and other elements of disadvantage which have been common in rockets of other constructions.

One of the principal objects of this invention is to provide a form of rocket which will, when fired, rise from the ground in a substantially vertical direction without the use of a guiding element such as a stick and will function to ascend with a deep roar, discharging a pyrotechnic display such as stars or other elements, followed by a flash detonation.

A further object of this invention is to provide a rocket, the ascension of which may be regulated to accommodate the vision of the spectators in a grandstand or otherwise which many times requires a low elevation of the object or display in order to be seen or observed satisfactorily from an upper tier of seats.

Another object of this invention is to provide a rocket having a balancer attached thereto filled with suitable explosive material for lifting the rocket and turning the balancer by means of gases escaping from holes therein, and display chambers and destructive chambers so arranged within the different elements of the rocket and balancer that the contents of the different chambers will be fired or discharged at predetermined periods as may be desired. The form of rocket in this invention provides a lifting power above equal to or more than the power below.

Other objects of this invention will appear from the following detailed description of the device and as disclosed in the single sheet

of drawings which is herewith made a part of this application.

In the drawings—

Figure 1 represents a perspective view of the assembled rocket.

Figure 2 represents a top plan view of the rotary or balancing element of the rocket.

Figure 3 illustrates a vertical sectional view of a portion of the rocket.

Figure 4 illustrates a perspective view of a rocket, being one modification of this invention.

Figure 5 illustrates a perspective view of a rocket, being another modification of this invention.

Numerals 1 and 2 designate sections of suitably formed wooden plugs upon which the lifting chambers 3, 4, 5 and 6 are mounted. Adjacent the ends of the wooden plugs 1 and 2, within the chambers, are located clay or other suitable material partitions 7, 8, 9 and 10 for the purpose of holding the charge within the chamber portions, and similar clay partitions 11, 12, 13 and 14 are provided at the outer ends of the chambers for the purpose of holding the contents of the chambers in position after the lifting and revolving charges of explosive material have been securely tamped into the respective receptacles or chambers. The revolving or lifting charges of explosive within the chambers 3, 4, 5, and 6 may be of any suitable type, such as saltpetre, sulphur, charcoal or any other steadily burning explosives, but preferably of a faster composition than is ordinarily used in one-chamber straight rockets.

One end of each of the chambers is adapted to be slipped on and over the respective end of the wooden plugs 1 and 2.

In this invention, the chamber portions are adapted to have a plurality of holes located therein, the chamber 6 being provided with openings 15, 16 and 17 located along the outer side thereof, while the chamber 4 is provided with a series of openings 18, 19 and 20 along the outer side thereof, thereby providing gas escape openings which will function to rotate the rocket when in opera-

tion. Other openings 21, 22, 23, 24, 25, and 26 are located along the lower sides of the chamber portions 3 and 5 in such a manner that the gases escaping therefrom will tend to steady the rocket and cause it to rise.

A rocket shell or member 27 is adapted to be positioned between the chamber elements and perpendicular to the plane formed by the chambers. Suitable steadying elements 28 and 29 are provided between the chambers in the form of auxiliary containers which are suitably connected with the chamber elements 3, 4, 5, and 6 in such a manner that they will function together as a firm holder and supporter of the rocket 27. The rocket shell 27 is adapted to be provided, in the usual manner, with material 30 of the usual type, comprising saltpetre, sulphur and charcoal, having a clay or other fixed partition 31 above which may be placed a charge of suitable material 32 for destroying the chambers.

The lower end of the rocket element 27 is adapted to be held securely in place for firing by means of a cradle or socket element 33 made from any suitable material and provided at its lower point 34 with a pivoting element adapted to cooperate with a supporting stand 35, thereby providing a means for allowing the rotation of the rocket as the gases escape from the openings in the chambers provided for that purpose. The auxiliary containers 28 and 29 are arranged in combination with the other elements of the rocket to form a pyrotechnic display at a predetermined time in the flight of the rocket. The lower end of the rocket 27 is adapted to be located within the cradle element 33 in such a manner that it may be easily released therefrom when the rocket begins to rise.

Across the outer ends of the chambers 3, 4, 5 and 6 may be cut suitably notched portions 36 and a quick match fuse 37 is adapted to be carried around and over the notches or otherwise suitably held near the end of each chamber having projections therefrom as at 38 for ignition as may be desired. Other suitable branches or sections of the fuse element 37 are extended into each of the openings 15 to 26 inclusive for igniting the charges in the chambers, all of the contacts from the fuse 37 being ignited at practically the same moment.

The quick match 37 extends from the horizontal chambers to the lifting charge 30 in the rocket 27 through the bottom thereof as at 39, the result being that when the quick match 37 is ignited as at 38, it will speedily carry to the openings in the horizontal chambers, thereby releasing a rush of gases which will cause the device to revolve with cradle 33 on the pivot 34. The rocket shell section 27 is adapted to be held within the cradle

33 under sufficient friction for getting up speed, and for allowing the rocket to rise free from the cradle 33 at the proper time, it being understood that various forms of suitable retention and releasing devices may be used without affecting the merits of this invention.

In the modification disclosed, the quick match 37 will give approximately the needed frictional qualities, and when the match is burned down into the cradle, the rocket will readily release itself.

The shell or container 27 has inserted therein the usual ingredients, adapted to be ignited by the quick match 37. At a predetermined time during the rise of the rocket, fuses are ignited and function to explode the auxiliary containers 28 and 29, thereby releasing a pyrotechnic display, the short fuse 43 is then ignited and the charge 32 exploded thereby functioning to destroy the various chambers.

Figure 4 discloses a form of this invention wherein the rocket chambers 44, 45, 46 and 47 are positioned at right angles to each other, and pivotally mounted on the rocket element 48.

Figure 5 illustrates another form of this invention disclosing the chamber portions 49 and 50 pivotally mounted on the rocket element 51 in such a manner that the chamber portions 49 and 50 will revolve in opposite directions to each other within parallel planes.

It will be understood that substitutions and alterations may be made in the above disclosure, as well as in the drawings, within the scope of the appended claims, without affecting the merits of this invention.

What I claim is:—

1. A rocket having a plurality of chambers, a container attached to the plurality of chambers, explosive means within the container for destroying the chambers at a predetermined point in the rise of the rocket, a suitable gas forming material within the chambers, and openings therein through which the gases may escape, thereby causing the chambers to rotate and the rocket to rise, the chambers and container being so arranged in relationship to each other that they will be balanced in the rise, a quick match suitably connected to the chambers and the container for igniting the material within the container and chambers, means for holding the container in rotatable position just previous to the rise of the rocket consisting of a rotatable cradle element, the container being located within the cradle with sufficient frictional resistance to allow for the revolving of the chambers just previous to the rise of the rocket.

2. A rocket having a plurality of chambers, a container attached to the plurality

of chambers, explosive means within the container for destroying the chambers at a pre-determined point in the rise of the rocket, a suitable gas forming material within the chambers, and openings therein through which the gases may escape, thereby causing the chambers to rotate and the rocket to rise, the chambers and container being so arranged in relationship to each other that they will be balanced in the rise, a quick match suitably connected to the chambers and the container for igniting the material within the container and chambers, the chambers being arranged in relationship to the container in such a manner that they may revolve in opposite directions to each other on the ignition of the quick match.

In testimony whereof I affix my signature.

THOMAS G. HITT.