PATENT SPECIFICATION

Application Date: May 22, 1931. No. 15,191/31. 374,247

Complete Accepted: June 9, 1932.

COMPLETE SPECIFICATION.

Flying Rocket.

I, REINHOLD TILING, of Flughafen, Osnabrück, Germany, of German Nationality, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

The known suggestions relating to flying rockets could not lead to practical results as a secure landing was excluded. As flying rockers are not pulled like other aircraft by the propeller but pushed owing to recoil effect of the highly compressed gases expelled towards the rear, a flying rocket has the tendency to deviate from the straight path. In order to overcome this tendency the supporting planes required for the landing are, according to the invention, situated during the firing of the rockets on the rear end of the body behind the centre of gravity of this body and enter into effect only after the propelling of the rockets is terminated, in that they are either shifted forward, oscillated or spread. The flying body therefore acts as projectile during the first phase and as flying machine during the second phase.

Three embodiments of the rocket body of this type are illustrated by way of example in the accompanying drawing in which:—

Figs. 1 and 2 illustrate shiftable supporting planes,

Fig. 3 oscillatable supporting planes and

Figs. 4 and 5 spreadable supporting planes.

On a rocket body *a* (Fig. 1) supporting planes *b* are arranged, which can be shifted on this body. Rudders *c*, *c*¹ built into the supporting planes and arranged on the tail serve for steering. The supporting planes may, for example as shown in Fig. 2, be arranged in such a manner that their outer ends form between them an acute angle, these ends being reinforced by struts for obtaining the necessary stability. Fig. 3 shows diagrammatically a form of construction, in which the supporting planes *b* are arranged to be oscillatable around points *e* on the body *a*. The rockets *f* (Fig. 2) are arranged superposed in the central axis of the aircraft. An extension may be provided under the body, which also serves for accommodating additional rockets arranged parallel to the central axis of the rocket body, so as to obtain a greater or longer propelling force for the rocket.

If all the rockets have been fixed, the shifting or oscillating of the supporting planes mentioned above is effected from the driver's seat by winch mechanism, lever arrangement or automatically.

As the rocket rises the planes *b* are situated behind the centre of gravity of the body but when the highest point of flight is reached the planes *b* shift or are shifted into such a position that their centre of pressure is in line with the centre of gravity of the machine.

Quite thin supporting planes can therefore be employed. In view of the very high flying speed of a rocket aircraft, it will not be possible with the present size of the rudder for the driver to manipulate the steering. For overcoming this difficulty smaller rudders *c*¹ are inserted in the rudders *c* and employed during the high travelling speed, whereas the large rudders, as in the known aircraft, are used for slower speeds and for gliding flight. Consequently, in the case of high speed flight only a portion of the normal planes comes into effect, whereas during the gliding flight either only the large rudder is operated or the interconnected rudders are attended to simultaneously and together.

The forms of construction shown in Figs. 4 and 5 are designed especially for the transmission of dispatches. The supporting planes serve during the rocket activity under the effect of the propelling rocket force as projectile fins, and in order to serve for the gliding flight in spread condition as gliding planes. The rocket is fired and drops parachute like onto the point of destination when the rocket drive is finished.

The flying rocket consists of the aircraft body proper *a*, on which the tail fins *b* are arranged oscillatable around their axles *k* on extension planes *l* rigidly mounted on the aircraft body *a*. The

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angle hinges *k* are slightly upwardly inclined in outward direction. The fins *b* are connected with the extension planes *l* by means of springs *m*. Slidable elements *n* hold the fins *b* in the vertical position as shown in Fig. 4 on a ring *g* of the rocket proper which extends into the aircraft body. Struts *p* mounted on the extension planes *e* serve as stops and as supports for the fins *b* in their spread position shown in Fig. 5.

The operation of this rocket is as follows:—

The flying rocket, after the ignition of the rocket charge, rises like a projectile with the fins in the folded position shown in Fig. 4. When the rocket charge has finished its action or the flying rocket has reached the desired height and position, a recoil charge indicated by *s* in Fig. 4 is ignited either automatically or by the pilot, so that the rocket case accommodating the charge and with it the ring *g* are ejected towards the rear.

This ring *g* bearing against the slidable locking plates *n* shifts these plates beyond the point of articulation of the fins *b*, and the springs *m* then pull automatically the fins into the approximately horizontal spread position shown in Fig. 5. The flying rocket then begins the free fall, the fins *b* braking the flight like a parachute. This braking is further increased in that a rapid rotation of the flying rocket occurs owing to the tail fins being adjusted at a lifting angle, so that the flying rocket drops only slowly to earth. In order to completely or entirely stop the drop shortly before the rocket comes into contact with the ground, rocket aggregates *o* are further connected to the flying rocket, which may be arranged in or on the outer edge of the body, so that they extend tangentially outwards, namely in opposite direction to the direction of rotation of the flying body, so that a lifting force acting in opposition to the free fall is produced owing to the increased rotation of the flying rocket.

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

1.—Flying rocket, characterized by the provision of surfaces normally inoperable to act as supporting surfaces but projected into operable position after the rockets have burned down.

2.—Flying rocket as claimed in claim 1, characterized by supporting planes arranged oscillatable or longitudinally shiftable or shiftable on the rocket body, situated during the ascending movement behind the centre of gravity of the rocket and adapted when passing into the aeroplane like flight or into the gliding flight to oscillate or shift towards and bear against the front portion of the body so that their centre of pressure is in line with the centre of gravity of the machine.

3.—Flying rocket as claimed in claim 1, characterized by oscillatable tail fins which preferably are slightly inclined upwards and outwards from the middle of the flying rocket and hingedly mounted on the rocket body along an obliquely rising line, said tail fins serving as steering fins during the propelling flight and, when the rocket is passing over into the free fall, spread out and thereby impart rotation to the rocket body.

4.—Flying rocket as claimed in claim 3, characterized in that the tail fins are maintained in the stretched or folded position by locking means and that the releasing of said locking means is effected by a recoil charge ignited when the rocket has burned out and the spreading of the fins is effected by means of springs liberated by said locking means.

Dated this 22nd day of May, 1931.

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ERRATUM.

SPECIFICATION No. 374,247.

Page 1, line 11, *for* "rockers" *read* "rockets"

PATENT OFFICE,
July 6th, 1932.

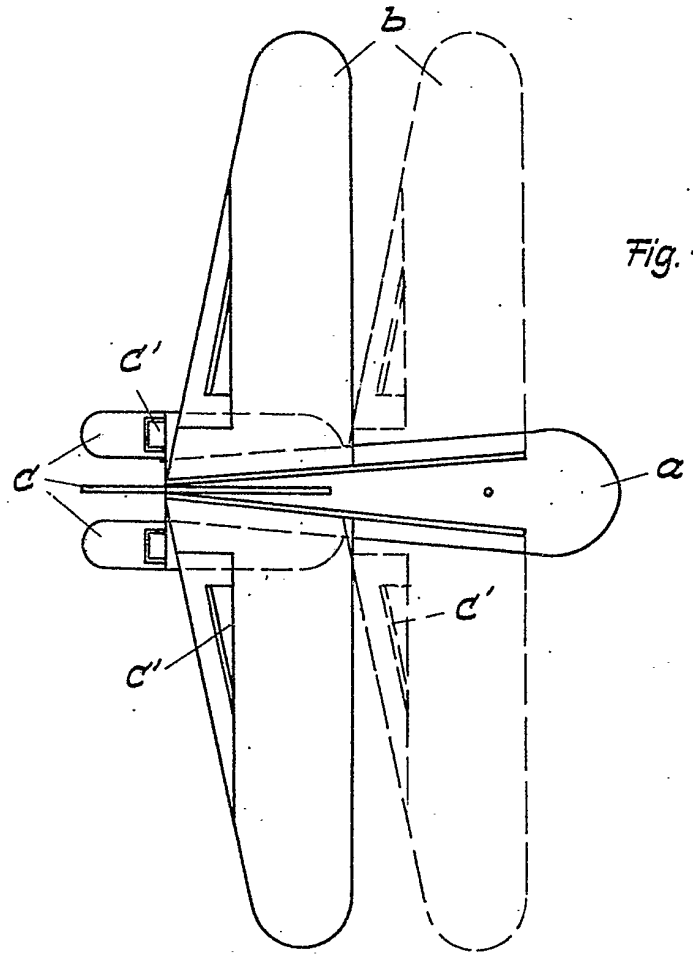
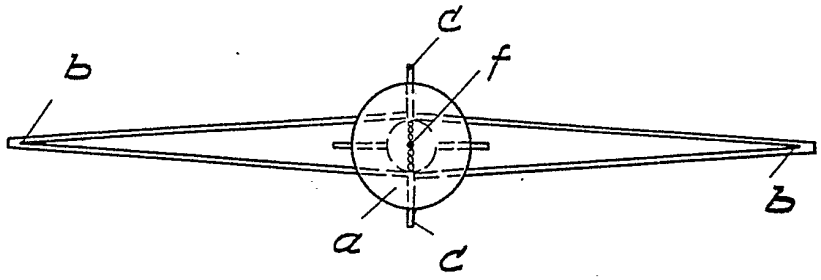


Fig. 1

Fig. 2



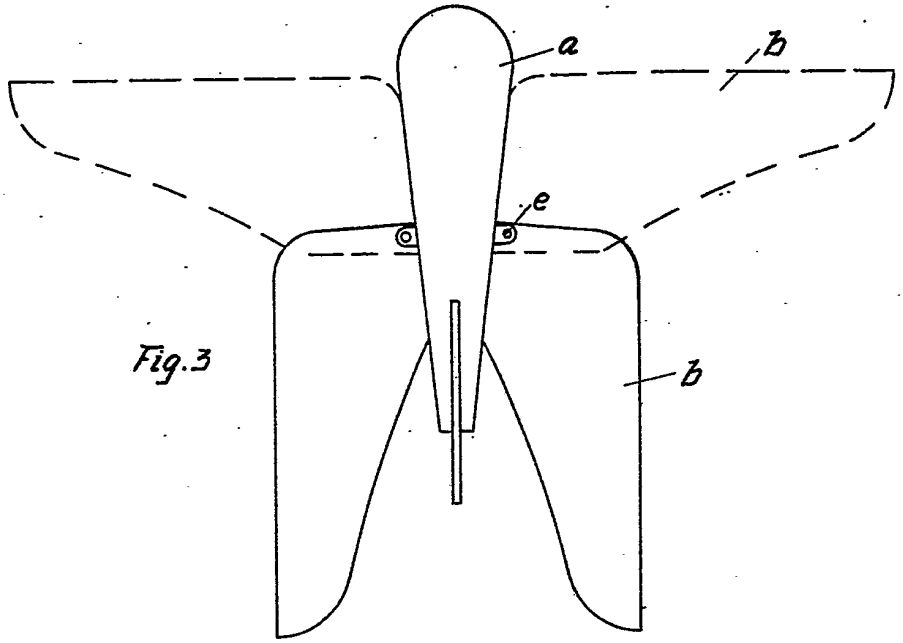


Fig. 3

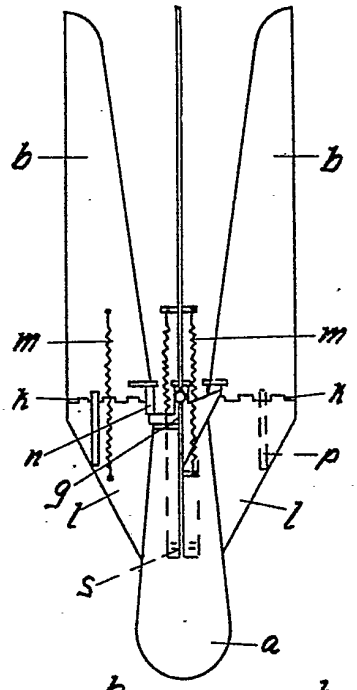


Fig. 4

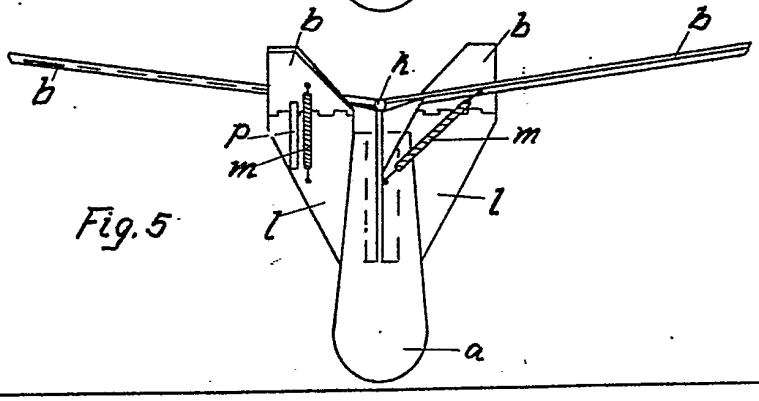


Fig. 5

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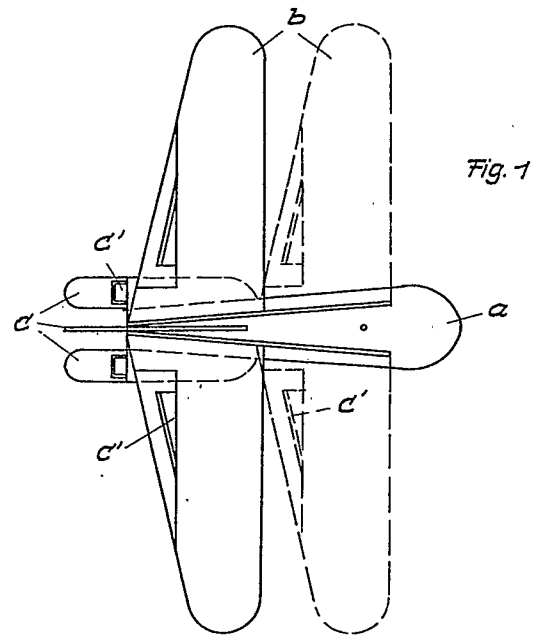
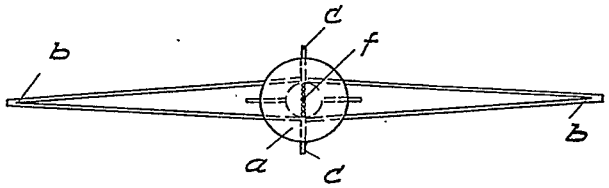


Fig. 1

Fig. 2



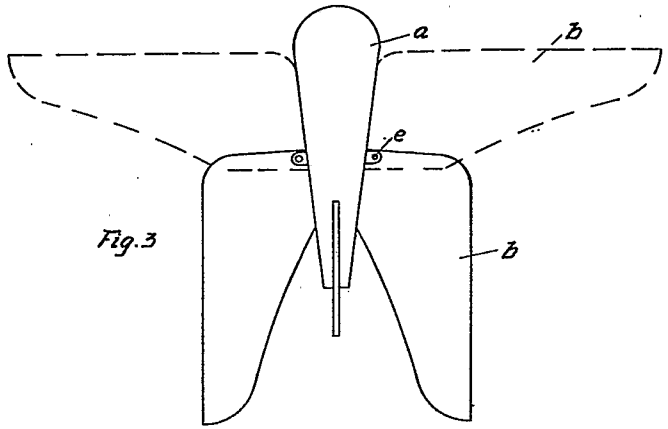


Fig. 3

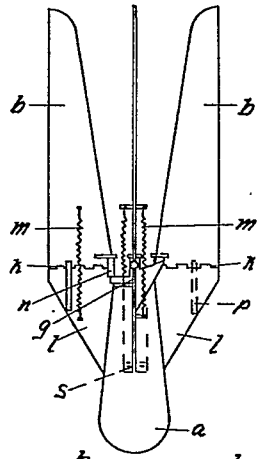


Fig. 4

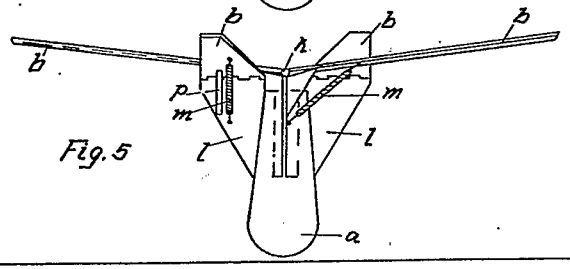


Fig. 5

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