

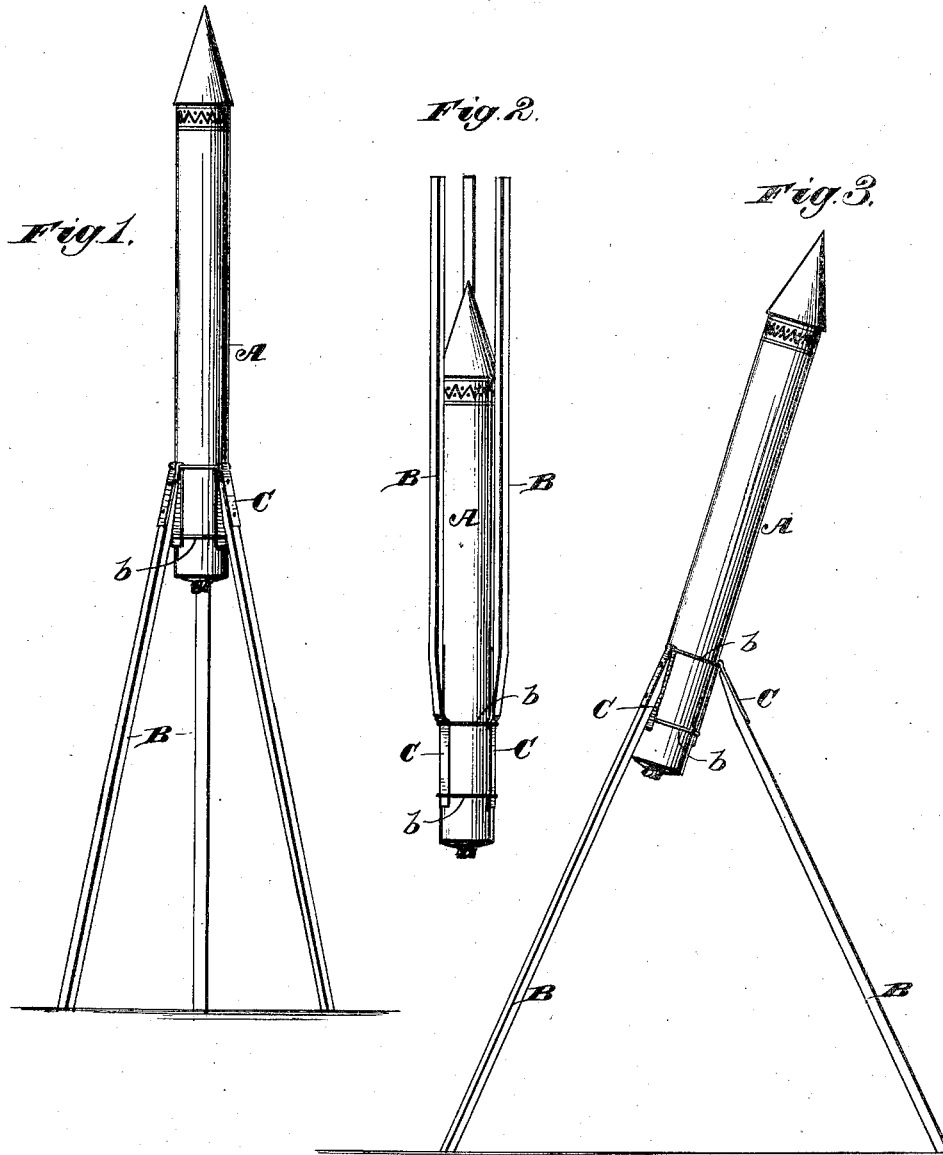
(No Model.)

J. T. HADFIELD.

ROCKET.

No. 303,839.

Patented Aug. 19, 1884.



Witnesses.

Robert Emmett

Ransom Norris

Inventor:

John T. Hadfield.

By *James L. Norris.*

Atty.

UNITED STATES PATENT OFFICE.

JOHN T. HADFIELD, OF MIDDLETOWN, CONNECTICUT, ASSIGNOR TO HIMSELF AND C. B. BIDWELL, OF SAME PLACE.

ROCKET.

SPECIFICATION forming part of Letters Patent No. 303,839, dated August 19, 1884.

Application filed February 2, 1884. (No model.)

To all whom it may concern:

Be it known that I, JOHN T. HADFIELD, a citizen of the United States, residing at Middletown, in the county of Middlesex and State of Connecticut, have invented new and useful Improvements in Sky-Rockets, of which the following is a specification.

My invention relates to stick sky-rockets, and embraces in its construction means whereby the sticks can be folded, so as to shorten the space required for packing, and the rocket can be set at any desired angle preparatory to firing, and has for its object to simplify the means employed for such purposes, and thereby lessen the cost of production, and to the accomplishment thereof means will be illustrated in the accompanying drawings, and a particular description thereof hereinafter given.

Figure 1 of the drawings is a side elevation illustrating the rocket supported by its stick in a vertical position, ready for firing. Fig. 2 is a similar view showing the stick folded upon the rocket as it appears ready for packing for transportation. Fig. 3 is a similar view showing the rocket supported in an inclined position.

In the accompanying drawings, the letter A designates the shell of the rocket, made in the usual way, and B the sticks therefor. These sticks, of which there may be any desired number, (three being illustrated,) are secured to the shell by means of thin metal, leather, paper, (or other suitable material,) straps C, one leaf of which is secured to the ends of the sticks by tacks *a*, and the other leaf to the shell by means of a wire or wires, *b*, passed around the shell and across the leaf. This mode of attachment I consider to be the simplest and cheapest, and as good as any other for the purpose; but I do not confine myself to such method. The metal being thin and flexible, it acts at the joint of the two leaves like a hinge, so that the sticks may be folded up against the sides of the shell, thereby greatly reducing the length of the rockets, and consequently permitting them to be packed in a smaller space. This hinging of the sticks also permits them to be extended below the lower end of the shell, on different sides thereof, so as to afford a prop for supporting the

shell, the free ends of the sticks resting on any suitable base that may be at hand without requiring any specially-provided brace-support, as heretofore. I preferably bevel the inner faces of the sticks at the hinged ends, as shown, so that the sticks will lie closer to the sides of the shell when turned down as supports, thereby taking up less space. By hinging the sticks to the shell they admit of one or more of them being extended outward at a greater angle than the other, so that the rocket will stand at an incline, as shown in Fig. 3. The angle of this inclination can be altered to suit the purposes by merely changing the angle of some of said inclined sticks with reference to the others. If preferred, the same effect of supporting the rocket at an incline by means of the sticks alone can be reached by making some of the sticks of shorter length than the others; but I prefer to make them of one length, as then the rocket can the better be supported either in an upright or inclined position. Another advantage gained by hinging the sticks is that after the rocket has been fired and the shell is descending the sticks will radiate from the sides of the shell, so as to offer more resistance to the descent of the shell, and consequently lessen the force with which it will strike any object in its course, and thus reduce the liability to injure any person who might be struck by the falling shell and stick. These last are some of the advantages to be assigned to the construction; but what I consider to be the most important are the folding of the sticks to decrease the space needed for packing and transportation, the ability to support the rocket by its own sticks or props without the aid of extraneous brace-supports, and the ability to set the rocket at any desired angle by means of its sticks or supports alone preparatory to firing. The sticks might be secured to the shell by wires passing around both the sticks and shell, and the sticks themselves made in sections hinged together by metal straps below the end of the shell, and thus permit the sticks to be folded during transportation, and in the case of a single stick it might be secured and hinged in such manner. For an illustration of the single stick the figures of the drawings, showing

several sticks, will answer, assuming that all except one will be omitted.

Having thus described my invention, what I claim is—

- 5 1. The combination, with a rocket-body and a series of supporting-sticks, of flexible straps, whose ends are secured, respectively, to said body and sticks, substantially as described.
- 10 2. The combination, with a rocket-body, of a series of sticks and flexible straps for securing said sticks to said body, the said straps forming flattened leaves, one flattened leaf being secured to the stick and the other to the rocket-body, substantially as described.
- 15 3. The combination, with a rocket-body, of

a series of sticks beveled at one end, and flexible straps secured at one end of the rocket-body and at the other to the sticks, whereby the sticks may be folded onto the rocket-body for transportation, and, when unfolded, extended at various angles to support the rocket at the desired angle, substantially as described. 20

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

JOHN T. HADFIELD.

Witnesses:

EDWIN F. SHELDON,
T. HOWARD THOMPSON.