2 Sheets—Sheet 1.

J. H. S. HOOPER.

Rockets.

No. 196,019. Patented Oct. 9, 1877.

FIG. 1

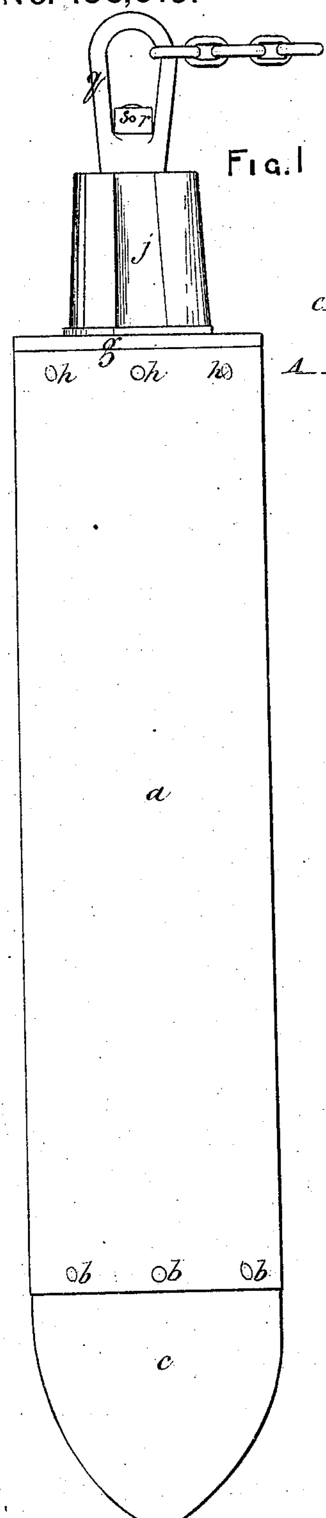


FIG. 2

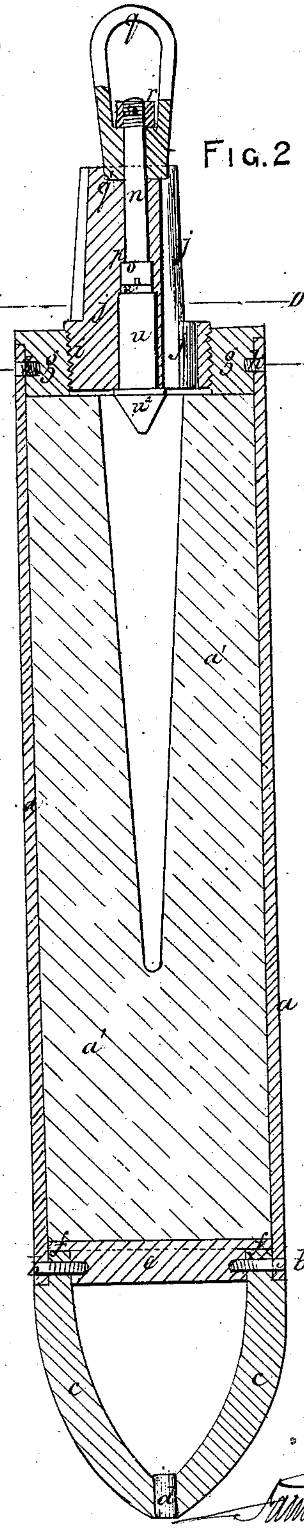


FIG. 3

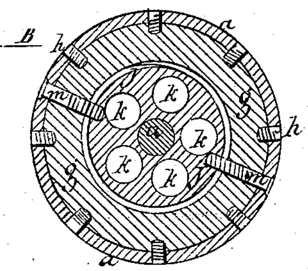
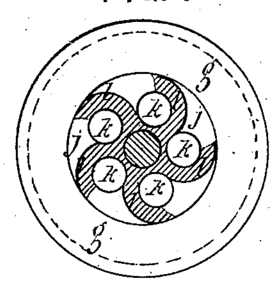


FIG. 4



Witnesses
Geo. Downing
Geo Forbes

James Humphrey Singleton Hooper

N. PETERS, PHOTO-LITHOGRAPHER, WASHINGTON, D. C.

2 Sheets—Sheet 2.

J. H. S. HOOPER.

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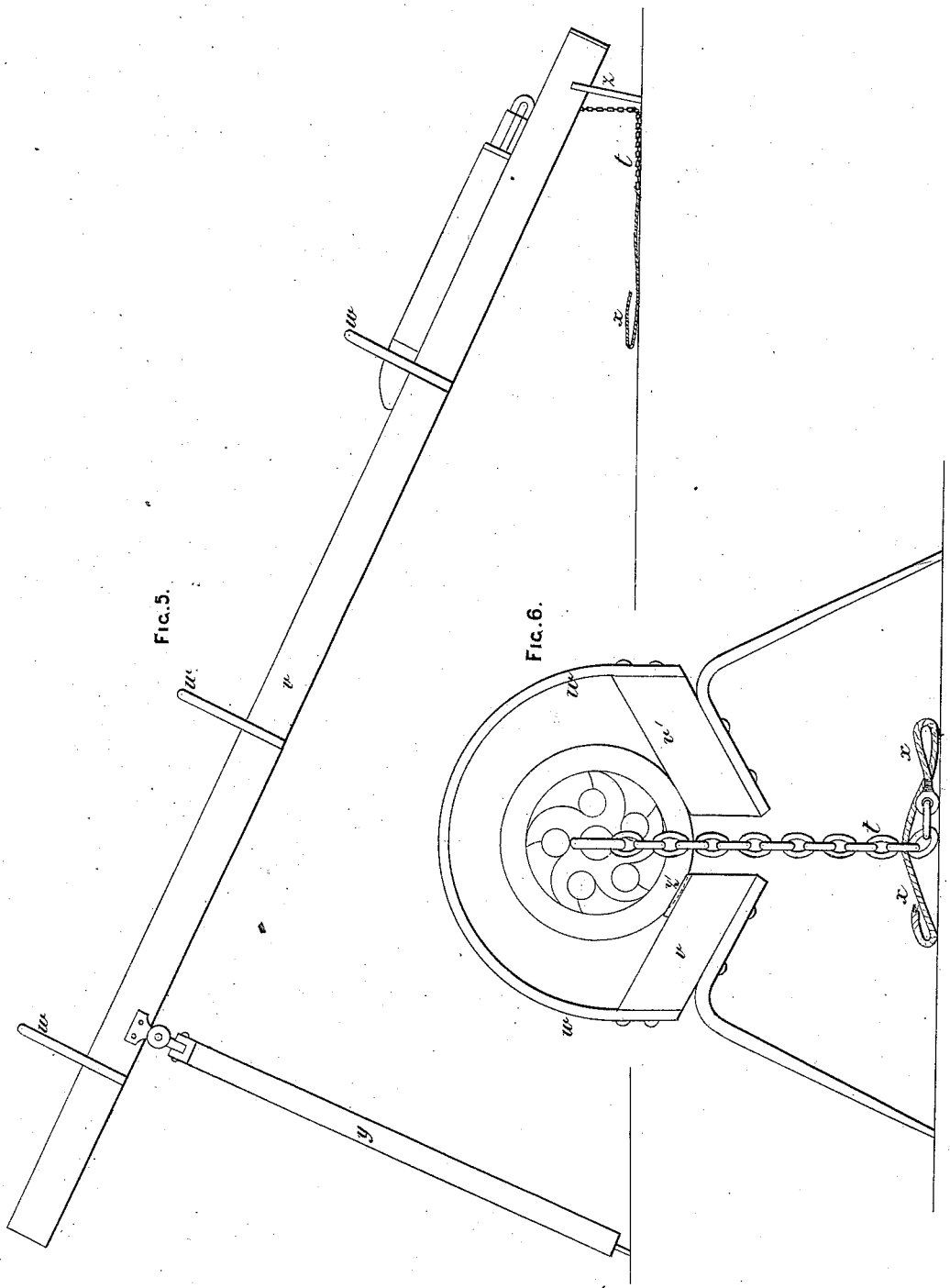

Fig. 5.

Fig. 6.

Witnesses

Geo. Downing

Geo. Forbes

Inventor

Atlee, Dumont, Bray, Singleton, Brooks

UNITED STATES PATENT OFFICE.

JAMES H. S. HOOPER, OF DULWICH, ENGLAND.

IMPROVEMENT IN ROCKETS.

Specification forming part of Letters Patent No. **196,019**, dated October 9, 1877; application filed May 22, 1877.

To all whom it may concern:

Be it known that I, JAMES HUMPHREY SINGLETON HOOPER, R. N., of Sunny Croft, Croxted Road, Dulwich, in the county of Surrey, England, have invented new and useful Improvements in Rockets for Saving Life and other Useful Purposes, and in the apparatus used in connection therewith, which improvements are fully set forth in the following specification, reference being had to the accompanying drawings.

This invention has reference to those rockets known as the "Hale rocket;" and consists of improvements in the means and apparatus for adapting such rockets to life-saving and other useful purposes.

The object of these improvements is to more readily carry out a line to a shipwrecked or stranded vessel with certainty and at any angle, according to the distance or height at which it is desired to throw the rocket, and may be used as a means of communication, and for other useful purposes.

To carry out my improvements I insert through the center of the flange or tail-piece of the Hale rocket a small iron, steel, or other metal spindle, with a head to it, the head being for the purpose of resting on a circular bearing, for the purpose of retaining the spindle in position, made in the interior of the flange or tail-piece. The action of the spindle working on this bearing is what I call my "first swivel." To the end of this pin or small spindle, which projects beyond the end of the flange or tail-piece, I attach a swivel-bow or other mechanical equivalent being capable of rotation, and this I call the "second swivel," thus making a complete double swivel, to which is attached a short length of chain. The swivel and chain being both clear of the rear fire, I can, without burning, attach any description of line.

And in order that my said invention may be properly understood and carried into effect, I will now proceed to describe the same, reference being had to the annexed drawings, and to the letters and figures marked thereon.

Figure 1 represents an external view of rocket known as a "Hale rocket," and shows my improvements attached thereto. Fig. 2 represents a longitudinal section of the same, and shows more fully the internal mechanism and my double swivel. Fig. 3 represents a transverse section of the rear end of the rocket, taken on the line A B. Fig. 4 represents a transverse section through the tail-piece or rotator on the line C D.

To carry out these improvements I insert (for about half its length) through the center or longitudinal axis of the tail-piece or rotator *j* a spindle or bolt, *n*, with a collar or head, *o*, at that end of it which is within the tail-piece or rotator *j*. This tail-piece or rotator is recessed to receive the collar or head of the spindle or bolt *n*, so that the under side of the collar or head *o* bears against the shoulder *p*, formed by the recess in the tail-piece or rotator *j*, by which arrangement, though the spindle or bolt *n* is retained in its position in rotator *j*, and securely held within the same by the collar or head *o*, so that it cannot be withdrawn, yet it is perfectly free to turn or rotate on its own axis, (after the well-known manner of a journal in its bearing,) and this I call, from its having such rotary action about its axis, my "first swivel." Further, to that end of this same spindle or bolt *n* which projects beyond the tail-piece or rotator *j*, I attach an ordinary swivel-bow or shackle, *q*, free to turn or rotate on the aforesaid bolt *n*, but securely retained to the same by the nut *r* on the screwed end of the spindle or bolt *n*. This nut is also further secured from unscrewing by the cross-pin *s* passing through the same.

The second swivel (bow) works on the steel bolt in a recess, *q'*, cut in the rear of tail-piece. The swivel is therefore safely protected from the back fire injuring its working-faces. This last-described swivel-bow *q* (or shackle free to turn on its axis) I call my "second swivel," and to it is attached a small length of chain, *t*, to the end of which is fastened one end of the rope or cord to be carried out.

It will be seen by this combination of parts which I have adopted the greatest liberty is given to the rocket to rotate on its axis free from any impeding action to such rotation by the rope attached as is experienced in the stick-rocket at present in use, and to supersede which is one of the real objects of this invention; for in my method the whole of the parts, both of the rocket proper and also the double

swivel, as well as the chain itself, is equally balanced about the axis of rotation, and therefore these parts do not impede the equal action of rotation, nor tend to cause the rocket to deviate from its true path of flight.

By the double-swivel action of my invention I effectually guard against the danger of one swivel not acting, for should one of them cease to act, there is still the other swivel, which is perfectly capable of performing all that is required, so that the first or the second swivel may severally perform apart from any assistance from the other its proper office of permitting the rocket to rotate without itself or chain attachment and rope rotating; or they (the swivels) both may share more or less equally between them their functions, thus insuring in my case a perfect swivel-action between the rocket proper and the rope.

The cavity at the back of the head *o* of the bolt *n* is plugged with a plug, *u*, which protects the bolt from damage. This plug *u* is made parallel, and the head u^2 is coned, thereby diverting the fire into the flange-holes more readily, and the shoulder under the head, in conjunction with the tightfit, when resting on a similar circular bearing to that on which the bolt-head *n* rests, effectually secures the head of the bolt *n* from damage while the combustion of the composition *a'* is going on in the case *a* during the flight of the rocket, the space between the two bearings being filled with tallow.

Fig. 5 represents a side elevation of the stand from which the rocket is fired, and Fig. 6 the back end view of the same to a larger scale.

This stand consists of two pieces, *v* and *v'*, of wood, iron, or other suitable material, (when of the first-mentioned substance they are covered with thin sheet-iron,) fastened together parallel to each other, with their upper surfaces inclined to one another about one hundred and sixty degrees, or thereabout. These pieces *v v'* are connected, at three or more places, by semicircular bands or hoops *w*, of iron or other suitable material, which bridge from the outside of one piece, *v*, to the outside of the other piece, *v'*. The near sides of these pieces *v* and *v'* are placed at such a distance apart that the chain *t* and rope *x*, connected to the tail of the rocket, may be able to freely pass between them without any danger of its being caught by the sides.

The stand is supported at the front end by two double-jointed legs, *y*, with spikes at their extremities or bases, and is supported at the rear end by two shorter legs, *z*, of iron or other material. There is a small projection, *z'*, on one of the pieces *v* and *v'*, for the rear end of the rocket to rest against when it is fired, which is performed by a slow match or fuse.

Another advantage of my invention is, that the improvements adopted are very light and portable, and require but a simple stand (already described) to fire from, thus doing away with the complicated machinery at present in use with the stick life-saving "boxer" or other rocket.

Having thus described the value and object of my said invention, I claim—

1. The combination, with the Hale rocket, of a swivel, to which the line is attached, secured to the tail-piece of said rocket, whereby the line is carried without being twisted by the rotation of the rocket, substantially as described.

2. The combination, with the tail-piece *j*, of the bolt *n*, rotating freely in said tail-piece, and the swivel *q*, secured to the end of the said bolt, constructed and arranged substantially as described and shown.

3. The combination, with the tail-piece *j*, of the plug *u*, having a conical head, u^2, for protecting the swivel-bolt and diverting the fire into the flange-holes, constructed and arranged substantially as described and shown.

JAMES HUMPHREY SINGLETON HOOPER.

Witnesses:
GEO. DOWNING,
GEO. FORBES.