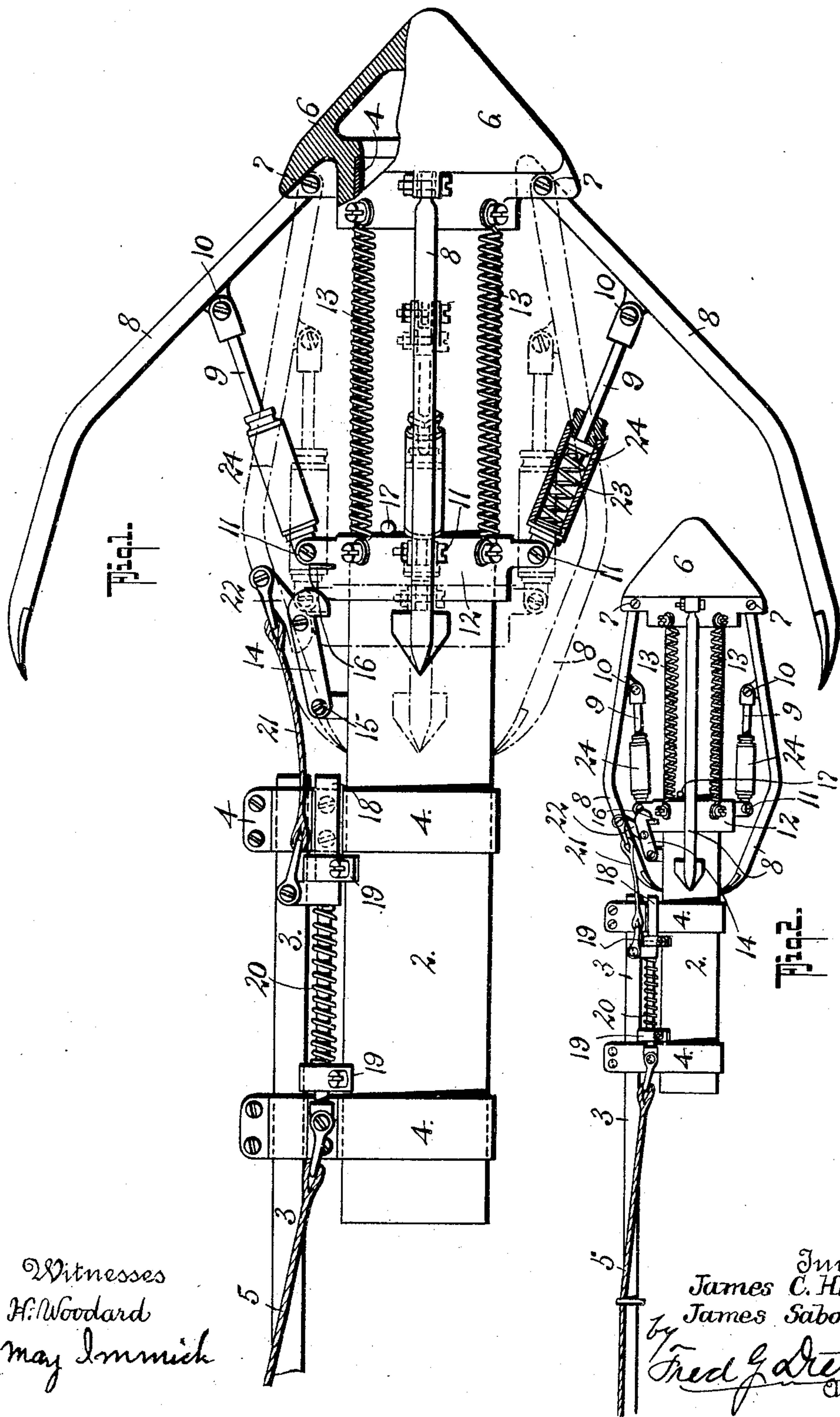


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ROCKET HEAD GRAPPLE.
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JAMES C. HALL AND JAMES SABORNE, OF VANCOUVER, BRITISH COLUMBIA, CANADA.

ROCKET-HEAD GRAPPLE.

952,805.

Specification of Letters Patent. Patented Mar. 22, 1910.

Application filed October 19, 1909. Serial No. 523,411.

To all whom it may concern:

Be it known that we, JAMES C. HALL and JAMES SABORNE, citizens of the Dominion of Canada, residing at Vancouver, in the Province of British Columbia, Canada, have invented a new and useful Rocket-Head Grapple, of which the following is a specification.

This invention relates to a life-saving rocket particularly designed for use for the conveyance of a line from a ship to the shore.

As commonly used these rockets are fired from the shore over a ship and the rocket line or a heavier line connected to it is thereafter made fast by the crew of the ship to a mast or to the rigging in order to establish communication with the shore. Although this system is satisfactory where a coast line is well provided with life-saving stations, a vessel may be in danger off an uninhabited coast where such assistance from the shore cannot be afforded and where lives might be saved if the vessel itself were provided with means by which a line might be thrown to and which would effect a hold on shore. This the rocket head, which is the subject of this application, has been designed to effect, as it is provided with means that when the attached line is backwardly drawn will obtain a secure hold in the ground or other material on which it may fall.

The invention is particularly described in the following specification, reference being made to the drawings by which it is accompanied, in which:

Figure 1 is a side elevation and part section of the rocket head, the full lines indicating the grapple when open and the dot and dash lines when closed, and Fig. 2 is an elevation to a smaller scale showing the head as forming a part of a life-saving rocket.

In these drawings 2 represents the rocket tube, 3 being its stick secured by bands 4 to the tube and 5 the light line attached to the head of the tube which line it is designed to convey to the shore and to secure there in a manner that will enable a man to pass along it and possibly establish a means whereby the remainder of those on board may reach a place of safety. To the head of this tube 2 is secured a cap 6 to the outer edge of which are pivotally mounted at 7 a series of light, strong, grappling arms 8

which are normally folded alongside the tube during the flight of the rocket as shown by dot and dash lines in Fig. 1 but are susceptible of being radially extended to a limit somewhat as indicated by the full lines in the same figure.

The grappling arms 8 are checked in the extended position by the edge of the cap and by links 9 pivotally connected at 10 to each grappling arm and at 11 through a spring case 24 to be described, to a ring 12 endwise slidable on the outside of the tube and against the check pin 17. The fit of this ring on the tube should be such as will preclude the possibility of the expansion of the tube, due to the combustion of the rocket powder, from preventing the movement of the ring. The connection of the grappling arms to this ring also affords the means whereby the arms are drawn down to the closed position as indicated by the dot and dash lines and for holding them in that position until it is desired to release them, and the ring 12 is drawn up to radially extend the grappling arms by tension springs 13 secured between the ring and the cap 6.

The ring 12 is held down against the resistance of the springs 13 by a hook latch 14 pivotally mounted at 15 and engaging a projection 16 from the ring. The release of this latch is effected by a backward pull of the line 5, means being provided to prevent the latch from being released by the backward pull of the line due to the flight of the rocket. In the drawing this is shown as attained by attaching the line 5, which adjacent to the rocket should be of flexible wire cord, to a stem 18 endwise movable in guides 19 against the resistance of a spring 20 that will resist the ordinary pull of the line during flight, but that will yield under a stronger pull to release the latch.

The latch may be withdrawn in a variety of different ways: As shown in the drawing the end of the stem 18 is connected by a slack wire 21 to the free end of a pivotally mounted cam lever 22 the curvature of which cam bearing against the projection 16 on the ring, will withdraw the hook of the latch from engagement with it.

To avoid the possibility of any of the grappling arms 8 being injured by contact with an obstruction during flight, should they be released before the rocket head reaches the ground, each grapple is inde-

pendently movable inward toward its folded position by the provision of a compression spring 23 in the connecting link between the grappling arms and the ring 12 which spring is in a spring case 24 through the cap of which the link rod 9 is endwise movable. By this provision each grappling arm may move inward against the resistance of its spring on meeting with an obstacle and will recover itself thereafter.

In the use of the device the rocket with its connected line 5 may be fired from any convenient part of a ship to the shore, and during its flight the grappling arms will be closed against the tube of the rocket. When it has reached the shore a sharp pull on the connected line 5 will release the ring 12 which under the pull of the springs 13 will be drawn up and will extend the grappling arms 8 radially outward in which position they will, as the line is drawn back, attain an anchoring hold of the ground or of other material in which it may fall, and the line will enable a man to pass from the ship to the shore, when he can haul ashore and make fast a stronger line on which the passengers and crew may be transported from the vessel to the shore. This provision will enable lives to be saved where a vessel is wrecked on an uninhabited coast and not only so but even where life-saving stations are established there will be many cases where a shore fired rocket may fail to reach a vessel against the wind which drove that vessel on the shore while that wind will aid the flight of a rocket fired from the vessel.

The essential feature of the invention lies in the provision of a grapple on the head of a line carrying rocket that will effect a hold of the ground and will afford sufficient resistance to a backward pull as will enable a man to use the line to assist him in reaching shore.

Having now particularly described our invention and the manner of its operation and use, we hereby declare that what we claim as new and desire to be protected in by Letters Patent, is:

1. In a device of the character stated, a rocket including a rocket stick, a powder tube carried thereby, a head closing the outer end of said tube, a series of grappling arms pivoted to said head, a collar slidable on said tube, means continuously tending to move said collar toward said head, link connections between said collar and said grappling arms, and automatically releasable locking devices for holding said collar from moving toward said head to hold said grappling arms folded against said tube.

2. In a device of the character stated, a rocket including a rocket stick, a powder tube carried thereby, a head closing the outer end of said tube, a series of grappling arms pivoted to said head, a collar slidable on said

tube, means continuously tending to move said collar toward said head, link connections between said collar and said grappling arms, automatically releasable locking devices for holding said collar from moving toward said head to hold said grappling arms folded against said tube, and buffer devices included in said link connections.

3. In a device of the character stated, a rocket including a rocket stick, a powder tube carried thereby, a head closing the outer end of said tube, a series of grappling arms pivoted to said head, a collar slidable on said tube, means continuously tending to move said collar toward said head, link connections between said collar and said grappling arms, automatically releasable locking devices for holding said collar from moving toward said head to hold said grappling arms folded against said tube, said link devices each comprising telescopic members, and means continuously tending to extend said telescopic members.

4. In a life-saving rocket, the combination with its tube of a conical head secured thereto, grappling arms pivotally connected to the head, a ring slidable on the rocket tube, links connecting the radial arms to the slidable ring, means for limiting the outward radial movement of the grappling arms, means for securing the ring in the position where the arms are closed against the tube and means coöperative with the flight line for releasing that securing means.

5. In combination with a line carrying rocket having a stick portion and a powder tube carried thereby, a head on said tube having a cup-like flange portion, grapple arms pivoted to said cup-like flange portion to have their movement in one direction limited by the flange of said portion, a collar slidable on said tube, means tending to move said collar toward said head, link connections between said head and said arms to move said arms outwardly as said collar is moved toward said head, a pivoted latch engaging said collar to hold it away from said head, a latch releasing lever carried by said latch, and means for moving said lever to release said latch.

6. In combination with a line carrying rocket having a stick portion and a powder tube carried thereby, a head on said tube having a cup-like flange portion, grapple arms pivoted to said cup-like flange portion to have their movement in one direction limited by the flange of said portion, a collar slidable on said tube, means tending to move said collar toward said head, link connections between said head and said arms to move said arms outwardly as said collar is moved toward said head, a pivoted latch engaging said collar to hold it away from said head, a latch releasing lever carried by said latch, means for moving said lever to

release said latch, said last named means
comprising a spring pressed bar flexibly
connected with said latch releasing lever,
and a line connected with said spring
5 pressed bar to pull said bar against the ten-
sion of its spring to move said latch releas-
ing lever to release said latch.

In testimony whereof we have signed our

names to this specification in the presence of
two subscribing witnesses.

JAMES C. HALL.
JAMES SABORNE.

Witnesses:

ROWLAND BRITTAIN,
ALEXANDER SMITH.