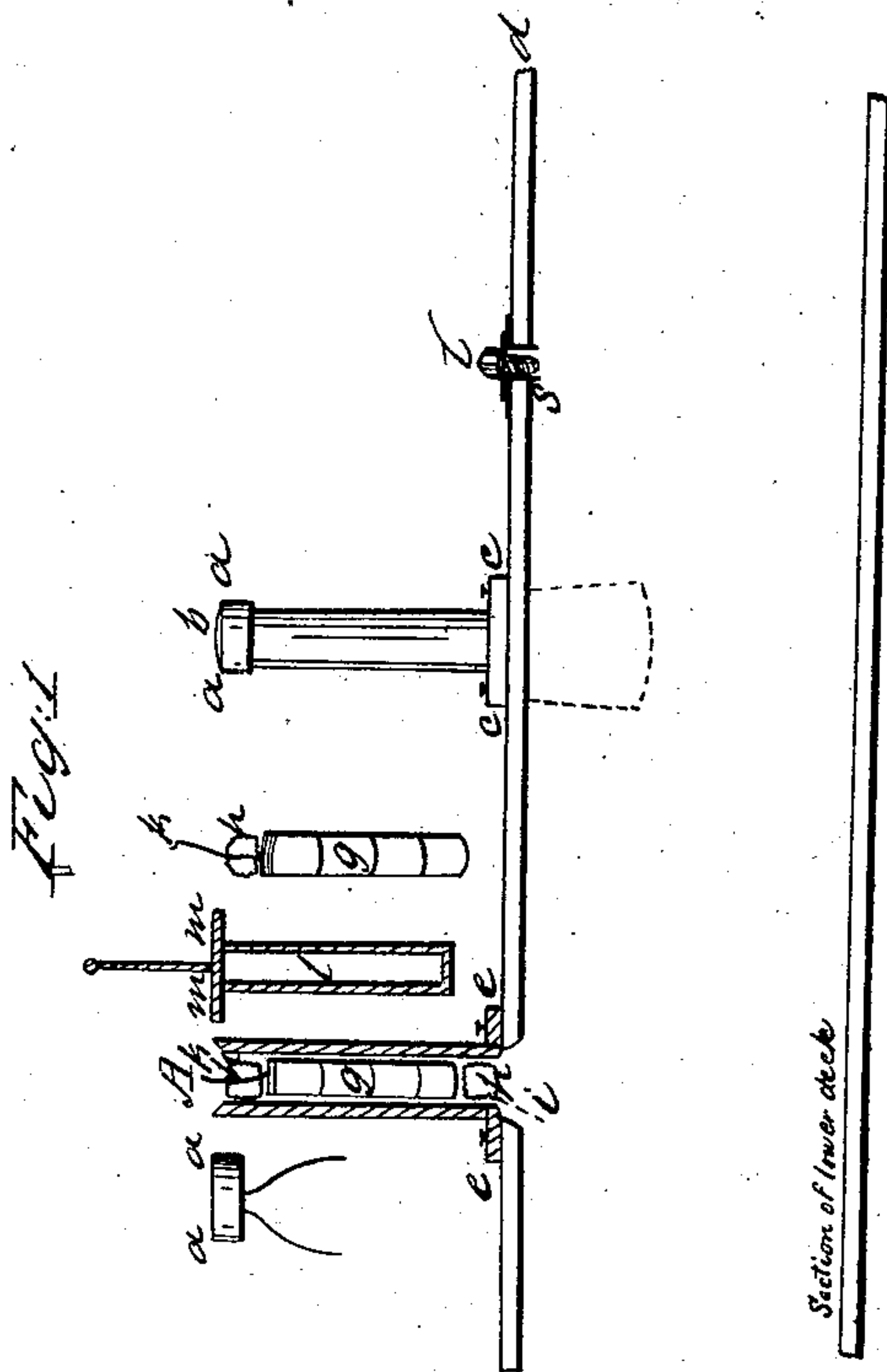


*Patented Mar. 21, 1854.*





# UNITED STATES PATENT OFFICE.

RALPH BULKLEY, OF NEW YORK, N. Y.

## COMPOUND FOR EXTINGUISHING FIRES.

Specification of Letters Patent No. 10,658, dated March 21, 1854.

*To all whom it may concern:*

Be it known that I, RALPH BULKLEY, of the city of New York, in the county and State of New York, have invented a new and Improved Mode of Extinguishing Fires in Ships and in Buildings; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings and to the letters of reference marked thereon.

The nature of my invention consists in providing a ship or a building with an aperture, which aperture is to be used, when the ship or building is internally on fire, for inserting a composition of matter that will burn under circumstances and produce a predominant smoke so vapid in its nature as to extract the oxygen from common air, vapor, or steam and render every aeriform therein inert, and quickly thereby extinguish flame embers and coals of fire in any part, apartment, or apartments thereof.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation.

My mode of extinguishing fire is applicable to any of the known forms of ships or of buildings.

I make an aperture in the deck or in any convenient part of the ship or in any convenient part of a building, and in order to prevent a gush of smoke or flame during the insertion of the composition, I provide tubular fixtures, as shown at Figures 1, 2 and 3 in the accompanying drawing.

*d* in Fig. 1 is a section of the upper deck of a ship.

*A a a* is a perspective view of the tubular fixture. *A, k*, is a sectional elevation of the same; *c c*, its flanch and fastening to the deck; *a a*, its movable cover. *g g* is the composition in its prepared state for burning; *k*, the match to be lighted.

*h, h*, are waddings above and below, so that when forced down by the rammer *l* to gage *m m*, the upper wad *h* will remain in the lower end of the tube and prevent the smoke and flame from entering the tube.

*i* is an aperture in the deck.

*s, t*, is an aperture and screw plug prepared for lowering an ignitable match into the ship's hold to determine, by the ignition or by the nonignition of it, the extinguishment or the continuance of the fire.

*w* is a section of a wire net for suspending the "composition" while burning.

Fig. 2; *y* is an exterior line of a building; *b* is a tubular permanent fixture; *i i* is a hinge cover; *b b* is a section of an aperture with sockets; *i i* its hinge cover; *v v* its hasp and socket. This socket is for the entrance of portable tube *k k k k*, in the hands of firemen or others, shown in sectional lines at Fig. 3. *d d* is a section of a screw, and *o o* is a flanch, either of which are provided for securing the portable tube in socket *b b*. *k k* are extension rods, in which, the "composition" can remain burning until forced out by a succeeding integral. *l l* is a flare for the easy entrance of the integral. This burnable matter for producing "predominant smoke" I in general compose of a mixture of dry fossil and dry vegetable substances, each and all of which, whether in crude or in fabricated form, are in their nature burnable and each and all of which substantially retain their original virtue, and consequently their primitively provided burnable qualities, and which "composition" is a mixture of nitrate of potash, sulfur, and fibrous vegetable substance, in such proportions as will insure its burning in free air or in close places that are internally pressed with smoke and flame, and will, of course, vary with the rapidity of its action required to meet emergencies when openings permit a comparatively considerable escape of smoke and flame; but, whether slow or quick in action, the transmutation thereof is gradual and free from all danger of explosion, and the vapidness of the "predominant smoke" is quick in its effect in extracting the oxygen from the common air, steam or vapor and thereby instantly extinguishing fire in any recess of an inclosure.

The definite quantity of the "composition" herein described that will be required for the extinguishment of fire in ships and buildings will necessarily depend, in a measure, on the tightness of the place in which it is applied. It is however computed that, saving waste, about two to three cubic feet of it is sufficient to extinguish a dangerous fire in a ship of a thousand tons.

This improvement as described is believed to differ in the elementary principles of the materials of which it is composed and in the production and application of a "predominant smoke" for extinguishing common fire in ships and buildings from all other modes or improvements known or



used, and as to its, believed to be, unequal safety, the effective action of "predominant smoke" on elementary constituent principles of air in extinguishing fire consists in the smoke being a negative to each of the constituent principles of the air, while the action of gas, vapor or steam is affusive to the constituents of the air, and it is believed that by the use of this negative safety is added to effectiveness in the extinguishment of fire, for when gas or when steam or vapor is applied direct upon a fire or when steam is produced from water thrown in contact with fire it in either case is adding the aeriform oxygen of water to the oxygen of common air, thereby rendering air a non-supporter of combustion by affusing a constituent quality of it; viz., the oxygen, and by this decomposition of water an additional explosive, elementary principle becomes disengaged, viz., its hydrogen gas. This gas, within an inclosure, in a rarefied state, is liable to combine with the affused oxygen gas, and thus combined is liable itself to become ignited and dangerous, being highly explosive, whereas the "predominant smoke" herein described, being a vapid aeriform, in itself wholly divested of oxygen or spirit and possessing so predominant an affinity for oxygen, it instantly extracts and appropriates to itself the oxygen of the space which is not already consumed by the fire.

A discriminate usefulness of this "composition" is believed to consist in its being a dry compound, for while fluids of any description are liable to congeal in cold climates or deteriorate in warm climates the

compound herein described, being dry and durable, is not liable to change by any changes of climate. It is portable, and it is effective in comparatively small quantities. It is applied without any risk to the operator, and two or even one person is sufficient to apply it on a comparatively large scale, and is of such a nature that it can be continuously applied till the intended object is accomplished.

In packing the compound herein described for use at a future indefinite time the interstices of the integrals may be filled with dry dusty substance to protect the same from the ordinary dampness of the atmosphere.

I am aware that a patent has been obtained for a composition of sulfur and niter for producing "sulfurous acid gas" for extinguishing flame; but I contend that the composition of vegetable and mineral matter described herein for producing a vapid smoke comprises a patentable difference from all other improvements therefor.

What I claim as my invention and desire to secure by Letters Patent, is—

The application to ships and buildings of a composition of fossil and vegetable substances which will transmute by the action of fire in close places and produce a "predominant smoke" that will extinguish common fire, as herein described, using for that purpose the aforesaid compound, or any other substantially the same, and which will produce the intended effect.

RALPH BULKLEY.

Witnesses:

D. M. D. CAMERON,  
SAML. WAITE.