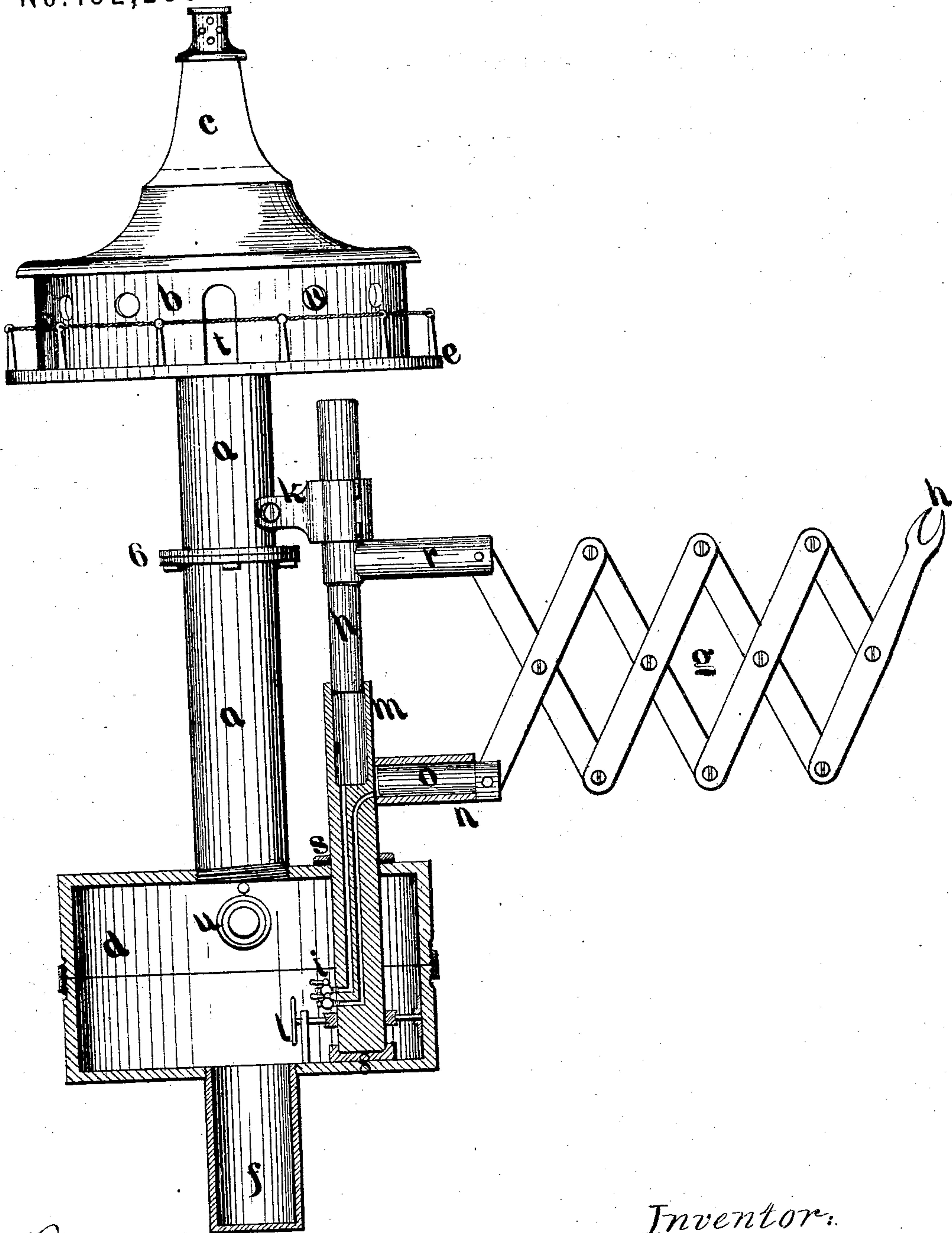


T. SHAW.

Submarine Observatories.

Patented June 23, 1874.

No. 152,253.



Witnesses:

Wm F. Bray
Jos Keenan

Inventor:

Thomas Shaw

UNITED STATES PATENT OFFICE.

THOMAS SHAW, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN SUBMARINE OBSERVATORIES.

Specification forming part of Letters Patent No. **152,253**, dated June 23, 1874; application filed March 26, 1874.

To all whom it may concern:

Be it known that I, T. SHAW, of the city and county of Philadelphia, State of Pennsylvania, have invented a new and Improved Submarine Observatory; and I hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawing, and to the letters of reference marked thereon.

My invention consists in the construction and arrangement of the within-described apparatus for submarine operations, as herein set forth. The object of the invention is to provide for the rescuing of materials from sunken vessels in deep waters.

In order to enable others to use and practice my invention, I will proceed to describe its construction and operation.

On reference to the accompanying drawings, which form part of the specification, Figure 1 represents a side view of the observatory with the lower part shown in half-section, of which—

a is a tube, sufficiently long to reach to the desired depth. Said tube is made in sections of convenient length, which are secured and united by ordinary flange-joints *b*. The diameter is made sufficiently large to permit the descent of a man upon an ordinary ladder suspended to the side of the tube. Said tube is provided, at its upper end, with a round-house, *b*, for the convenience of the workers and storage of materials. Said round-house is provided with a lantern, *c*, to afford signal-lights at night, and has inserted in its side windows *v* and doors *t*. The doors lead to a staging surrounding the round-house *e*, for convenience of landing during a storm. The lower end of the tube *a* is provided with a working-chamber, *d*, made of strong metal, and is provided on the bottom with a chamber, *f*, of sufficient length to reach and penetrate the ground for the purpose of supporting a large part of the weight during active operations, and for the purpose of dispensing with anchors at the bottom, and for the storage of ballast when afloat. A hydraulic cylinder, *m*, is projected from within the chamber *d* through hydraulic packing *s*, and is provided with a "Shaw's" water-bearing at the bottom *8*, and with a ram, *p*, at the top, guided in journals *k* secured to tube *a*. Said ram has a projecting arm, *r*, that is piv-

oted to the upper end of a series of levers or "lazy-tongs," *g*. Said ram *p* has a vertical movement in the upper end of cylinder *m*, and is provided with the ordinary hydraulic packing. Said hydraulic cylinder *m* has a cylinder, *n*, projecting from its side, with which works ram *o*, which is pivoted to the lower end of a lever of the lazy-tongs *g*. Stop cocks *i* communicate, by passage-ways, as shown, with cylinders *o* and *m*, and an ordinary worm-wheel, *l*, is provided to revolve the hydraulic cylinder upon its axis. The tongs *g* terminate in a fork or any other convenient configuration, for the purpose of grasping, guiding, and shoving things in the water. A disk-light, *u*, is provided in as many places as desired throughout the immersed apparatus. Said light is inserted in a metallic casing secured to the wall of the chamber or tube, and has a ring screwed from within to press upon a glass disk provided with gum rings between the casing and ring to secure a tight joint. A covering is hinged at its upper end and provided with gum on the inside to secure a tight joint independent of glass when said covering is allowed to press upon the casing for the purpose of removing the glass for cleaning or other purposes. The cover is raised from within, when desired, by means of a screw.

The apparatus is put in operation in this wise: After being lowered into the water by sections, which are secured to each other by ordinary flanges, the tube *f* is allowed to settle into the ground by its weight, that the apparatus may be held steady against the action of currents or the working of the men and machinery. Anchors are thrown out from the port-holes in the floor of the round-house, when the top is secured from vibration, and the apparatus is ready for work. A small steam-engine is placed in the round-house, or steam or air is furnished from an adjoining boat to operate an engine in the round-house, or fluid pressure can be furnished from any source of power to communicate with stop-cocks *i*, which stop-cocks may be variously located, so long as they are in communication with their respective passage-ways. The operator is enabled by means of fluid pressure controlled by said stop-cocks to raise the ram *p*, and the stop-cocks being of a three-way type, by turn-

ing a quarter-turn, the fluid is allowed to escape within the chamber *d* from the bottom of the ram *p*, and thus cause the lowering of said ram. A similar movement from the other stop-cock thrusts out and withdraws the ram *o*. The several movements of the rams *o* and *p* cause the thrusting out, lowering, raising, and withdrawing of the fork *h* at the will of the operator, for the purpose of guiding and hooking objects in the water, and raising sunken material by hoisting appliances on an attending boat. Any side motion required of tongs *g* is procured by the revolving of cylinder *m* upon its axis by worm-wheel *l*. The cover allows of the removal of the glass disk

for the purpose of cleaning when coated with a partially-opaque film.

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

1. The combination of round-house *b* with tube *a*, chamber *d*, and chamber *f*, for the purpose set forth.

2. The combination of tongs *g* with rams *p* and *o*, when arranged in combination with chamber *d* and diving-tube *a*, for the purpose set forth.

THOMAS SHAW.

Witnesses:

WM. F. BREY,
JAS. KEENAN.