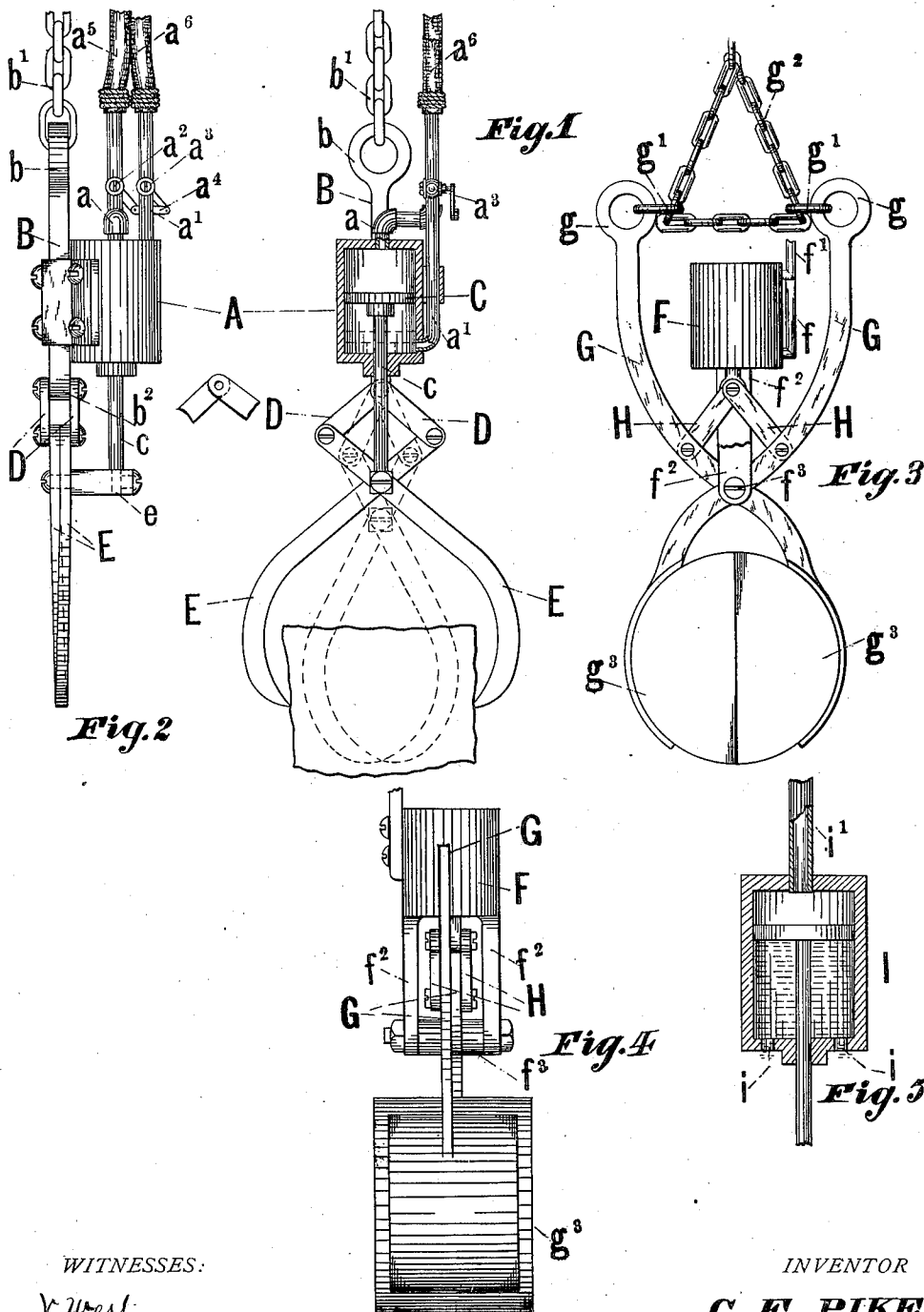


C. F. PIKE.
Operating Submarine-Grappling Tool.

No. 228,557.

Patented June 8, 1880.



WITNESSES:

V. West.
Albert B. Beadle.

INVENTOR

C. F. PIKE,

H. W. Beadle.

ATTORNEY

UNITED STATES PATENT OFFICE.

CHARLES F. PIKE, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO THE
INTERNATIONAL SUBMARINE COMPANY, OF NEW HAVEN, CONN.

OPERATING SUBMARINE GRAPPLING-TOOLS.

SPECIFICATION forming part of Letters Patent No. 228,557, dated June 8, 1880.

Application filed December 2, 1879.

To all whom it may concern:

Be it known that I, CHARLES F. PIKE, of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented new and useful Improvements in Submarine Grappling-Tools; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

This invention has for its object the manipulation of tongs, scoops, and similar tools in submarine operations by a power independent of that exerted by the diver; and it consists, mainly, in the combination, broadly, with the tubes of a hydraulic grasping device, of valves located in the tubes near the device, for the purpose of enabling the diver controlling the same to actuate the valves, as will be fully described hereinafter.

In the drawings, Figure 1 represents a front elevation of a pair of tongs and its attachments, with the cylinder in section; Fig. 2, a side elevation of the same; Fig. 3, a front elevation of a modified form; Fig. 4, a side view of the same, and Fig. 5 a modified construction of the cylinder.

To enable others skilled in the art to make and use my invention, I will now proceed to describe the same fully.

A, Figs. 1 and 2, represents a cylinder of any proper construction, which is essentially provided with suitable pipes $a a'$, leading from openings in the cylinder at opposite ends of the same, as shown.

$a^2 a^3$ represent valves, of any proper construction, located in the pipes, the arms or handles of which are united by a common connecting rod or bar, a^4 , Fig. 2, as shown.

$a^5 a^6$ represent flexible tubes leading from the upper ends of pipes $a a'$ to the boat above, or to any desired point.

B, Figs. 1 and 2, represents a rod or bar rigidly united to the cylinder in any proper manner, the upper end of which is provided with the eye b or other proper means for permitting the attachment of the chain b' , and the lower end with the eye b^2 , Fig. 2, or other proper means for permitting the attachment of the tongs mechanism, hereinafter referred to.

C, Fig. 1, represents the piston-head, located within the cylinder and adapted to move therein, which is provided with the piston-rod c , extending through a proper opening in the lower head of the cylinder, as shown.

D D, Figs. 1 and 2, represent link-bars, strongly pivoted at their upper ends to the lower end of the bar B, and at their lower ends to the upper ends of the tong-levers, as shown.

E E, Figs. 1 and 2, represent the tong-levers, consisting of suitable bars having curved and pointed ends below, as shown, which are crossed near the upper ends, and strongly pivoted at the point of crossing to the bar c , extending outward from the lower end of the piston-rod c , as shown.

The modified form shown in Figs. 3 and 4 will now be described.

F, Figs. 3 and 4, represents a cylinder constructed substantially like that previously described, and provided with same pipes $f f'$, Fig. 3.

$f^2 f^2$ represent arms rigidly united to the cylinder, which extend in a downward direction, and are provided below with bearings for the pivot-shaft f^3 of the scoop or tong levers, as shown.

G G, Figs. 3 and 4, represent the scoop-levers, consisting of suitably-bent bars, provided above with the eyes $g g$, having rings g' g' , Fig. 3, for the lifting-chain g^2 , and below with the scoops $g^3 g^3$, as shown.

f^3 represents the fixed pivot-shaft, before referred to, by means of which the scoop-levers are properly held at the point of crossing.

H H, Figs. 3 and 4, represent link-bars, pivoted at the upper ends to the lower end of the piston-rod of the cylinder and at their lower ends to the scoop-levers, as shown.

The operation is substantially as follows: By properly actuating the valves and admitting thereby the air or water from any proper source of supply, the piston is reciprocated in the cylinder and caused to open or close the tongs or scoops, according to the circumstances of the case, as may be desired. In the form shown in Figs. 1 and 2 the tongs are opened by the upward movement of the piston and closed by its downward movement.

In the form shown in Figs. 3 and 4 the scoops are closed by the upward movement of the piston and opened by its downward movement.

The modified form of cylinder shown in Fig. 5 will now be described.

I represents the cylinder, provided below with the openings *i i* and above with the single supply and discharge pipe *i'*, controlled by any suitable valve. The operation of this cylinder is as follows: The downward movement of the piston is effected by hydraulic or atmospheric pressure received through the pipe *i'* from any proper source of supply. The upward movement of the piston is caused by the pressure of the water alone, the resistance upon the upper side of the same being removed by the escape of the water or air contained in the cylinder through the pipe *i'*.

Some of the advantages of the described construction are as follows: By the employment of a power independent of that exerted by the diver to open and close the tongs he is relieved from the excessive labor which is required to perform this operation, owing to the pressure of the water. By the employment of power, also, rapidity of movement is obtained in opening and closing the tongs or scoops, in consequence of which much valuable time is saved.

In the form of construction shown in Figs.

3 and 4 the power is applied more advantageously—that is, a harder gripe is given the article grasped, with a less expenditure of power.

In all the various forms shown the controlling-valves are located near the grasping device, so that when the tongs are lowered to the place of operation they may be guided to the precise point desired by the diver, and also be applied properly to the object which it is desired to raise, without the exercise of any special muscular force.

I am aware that it is not new to employ steam, pneumatic, or hydraulic pressure by means of a cylinder, piston, and communicating-pipes to actuate submarine grappling-buckets, and therefore I do not broadly claim such employment; but

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

The combination, broadly, with the tubes of a hydraulic grasping device, of valves in the tubes near the device, the construction being such that the same person who guides the device to the object to be grasped may actuate the valves, and apply the same thereto, substantially as hereinbefore set forth.

CHAS. F. PIKE.

Witnesses:

H. W. BEADLE,
V. W. WEST.