S. EAKINS.

Torpedo.

No. 22,472.

Patented Dec. 28, 1858

Fig. 1

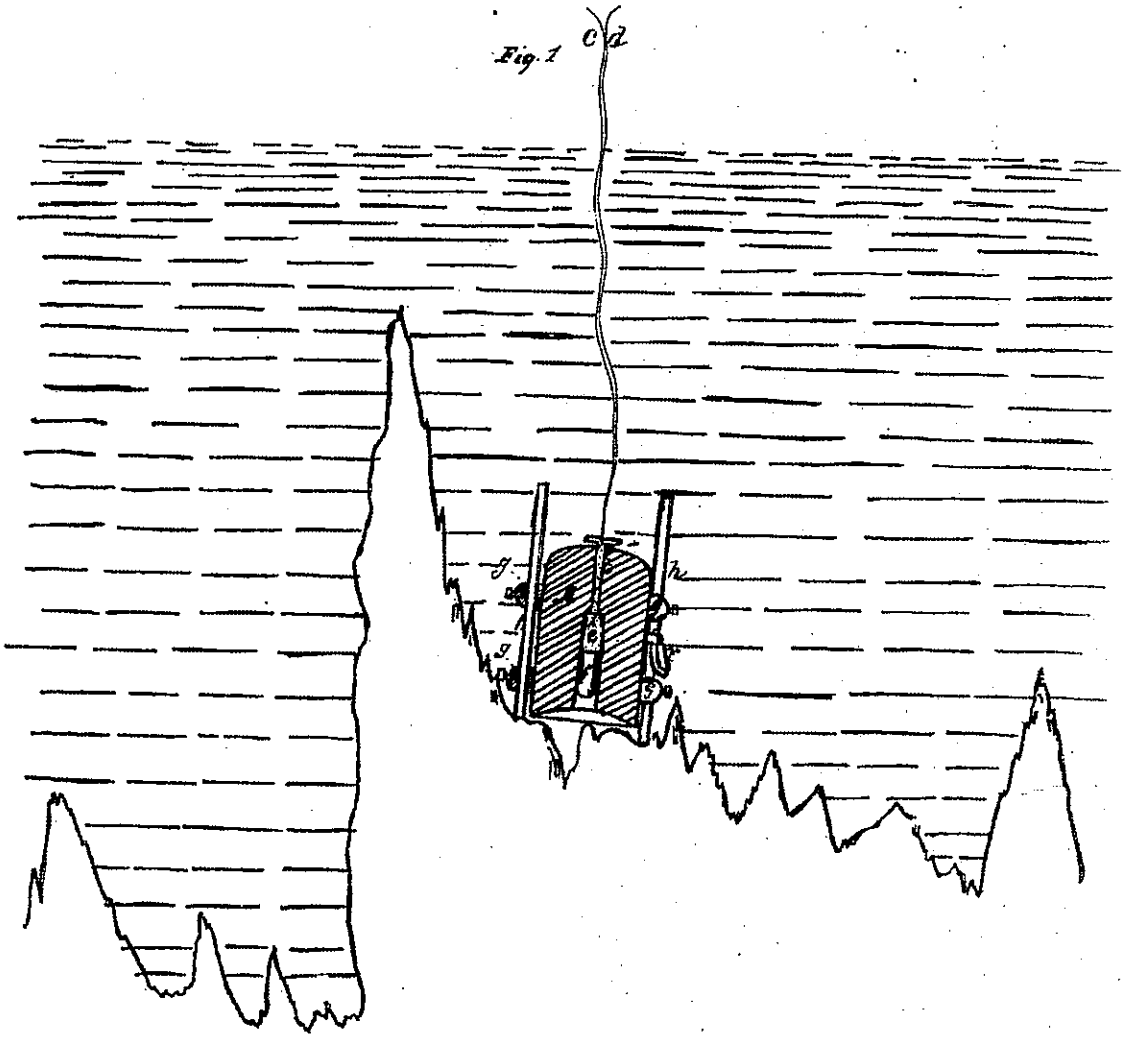
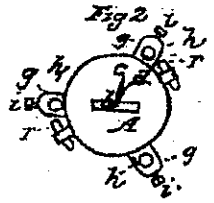


Fig 2



UNITED STATES PATENT OFFICE.

SAM. EAKINS, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO HIMSELF AND M. S. WICKERSHAM.

IMPROVEMENT IN METHOD OF BLASTING OR REMOVING SUBMARINE BODIES.

Specification forming part of Letters Patent No. **22,472**, dated December 28, 1858.

To all whom it may concern:

Be it known that I, SAMUEL EAKINS, of the city of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented a new and useful Improvement in Apparatus for Effecting the Removal of Submarine or Subaqueous Bodies; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a vertical section exhibiting the application of my apparatus. Fig. 2 is a top view of the apparatus.

Similar letters of reference indicate corresponding parts in both figures.

The object of this invention is to effect the removal of submarine or subaqueous rocks or other bodies under water with greater expedition and with less labor than by the common processes of drilling and blasting, and with a much less expenditure of gunpowder than is requisite placed in a mere case and exploded against the surface of the body.

My invention consists in the combination, with a piece of ordnance to be employed under water for the removal of rocks and other bodies by firing balls or other projectiles at them, of a series of adjustable legs so applied as to support it in such varied positions as may be desirable.

To enable others to apply my invention to practice, I will proceed to describe the apparatus employed and the manner of its use.

A is the piece of ordnance from which the ball is discharged against the rock or other body to be removed. This should be specially constructed for the purpose with its walls *a a* of very much greater thickness than is customary in other ordnance, and with a great depth of metal at the breech. Its muzzle should preferably be of concave form, so that its outer margin may rest more firmly against the surface of the body to be operated upon. It should also be furnished on its sides with two or more rings, *r r*, for the attachment of tackles to lower it into the water from a vessel or from a crane on shore, and the vent should be screwed internally to receive a centrally-divided screwed metal plug, *b*, which is made to clamp the terminal portions of two wires, *c d*, from a galvanic battery situated on board the vessel or on shore, or means may be applied to it for firing the charge by chemical agents. *e* is the charge of gunpowder, and *f* the ball. The weight of the ball may bear the same proportion to that of the charge as is used in common ordnance, or any other proportion that is found by practice to be the best. *g g* are lugs cast upon or otherwise firmly secured to the sides of the piece of ordnance to receive the adjustable legs *h h*, of which there should be not less than three, and which should be arranged parallel with the bore or sides of the piece, each passing through not less than two lugs, and being capable of sliding therein when desired, but having set-screws *i i* provided in the lugs to secure them. The said legs should be made of round bar-iron, and may be made with feet of any suitable shape, to rest upon the surfaces of rocks or other bodies, or with hooks or claws to catch in clefts or cavities when it is desired to place the piece in position to discharge its ball in a direction approximating to the horizontal.

The operation is as follows: When the ball is to be projected against a horizontal or not very much inclined and tolerably even surface the legs *h h* do not require to be used, and may be therefore drawn up and secured before sinking the piece of ordnance, so as not to project beyond the muzzle of the piece, as it is desirable, if possible, that the muzzle should be in contact with the surface of the body to be operated upon; but if the surface is somewhat uneven, the legs may be projected slightly beyond the muzzle before the piece is sunk. If, however, the surface is very uneven or inclined, the legs may, after the piece has been sunk, be adjusted and secured by a diver, so that they will support the piece with its muzzle as nearly as possible in contact with the surface. When the piece has been lowered and adjusted the charge is fired and the ball discharged against the surface with tremendous effect, splitting the rock to a great depth and in all directions, as the great weight of the piece of ordnance is aided by the pressure due to the column of water above in preventing recoil.

I have proved by repeated experiments that

the removal of submarine rocks may by this method be effected with a quantity of powder which is quite inconsiderable as compared with the quantity required to be exploded in a case against the surface of the rock, while it possesses the same advantages of obviating the difficulty of drilling rocks under water.

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

The combination, with a piece of ordnance to be employed under water for the removal of rocks or other bodies by the operation herein described, of a series of adjustable legs applied and operating substantially as and for the purpose herein specified.

SAM. EAKINS.

Witnesses:
CHARLES D. FREEMAN,
EDW. AUGS. PARKER.