(No Model.) 2 Sheets—Sheet 1.

J. F. WEBB.

FLOATING CAISSON.

No. 597,597. Patented Jan. 18, 1898.

Fig. I.

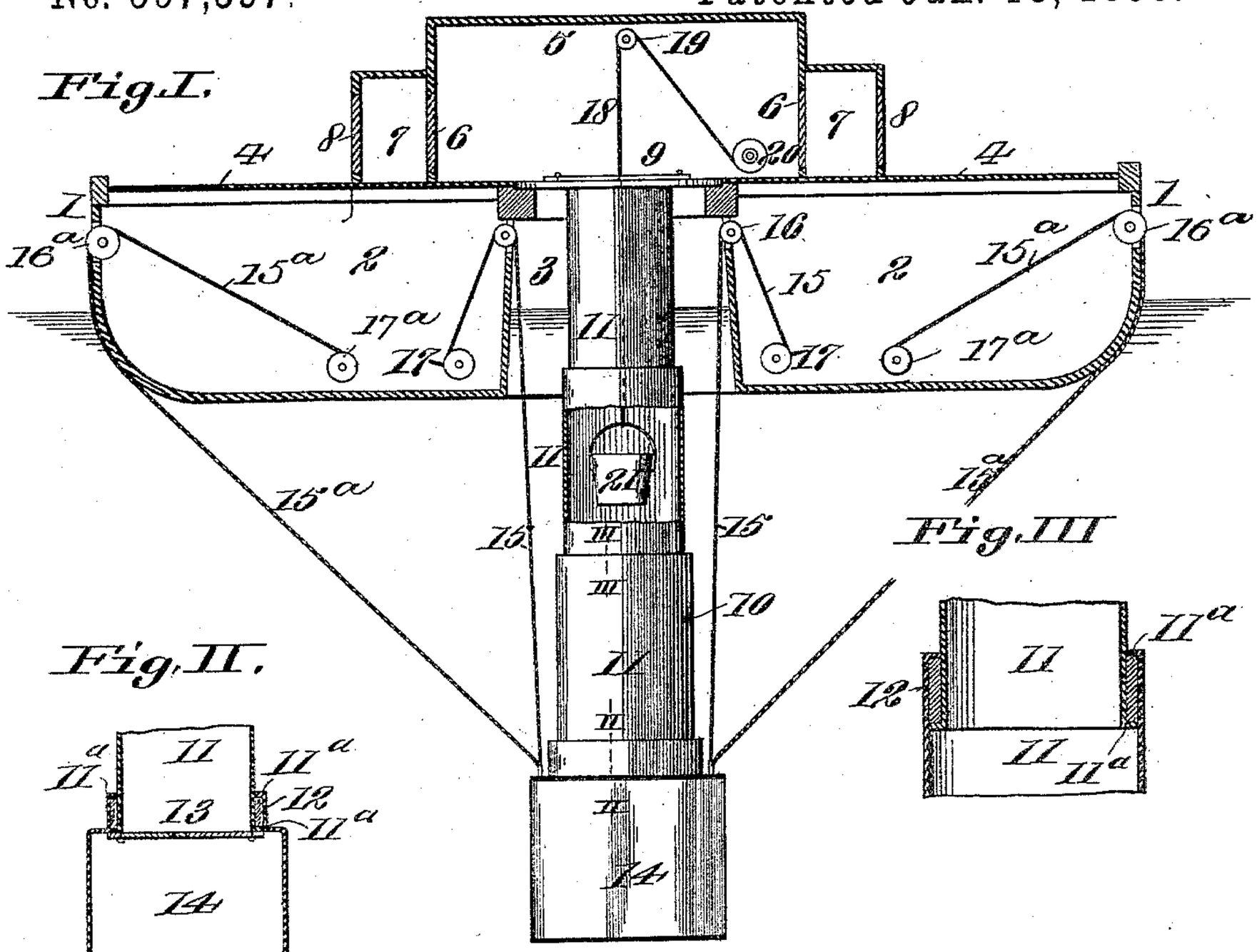
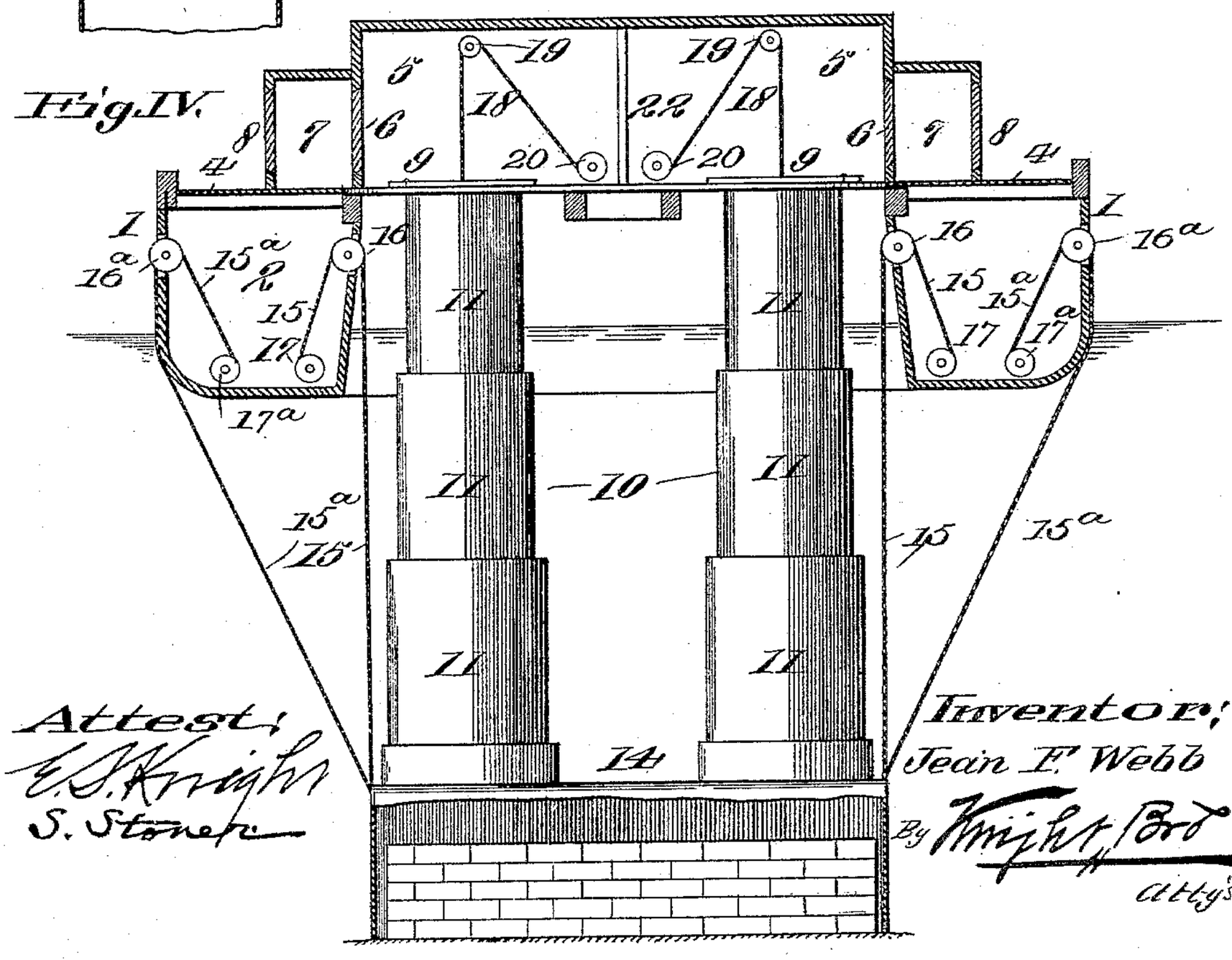


Fig. III.

Fig. II.

Fig. IV.



Attest:
E. S. Knight
S. Stonefr

Inventor:
Jean F. Webb
By Knight Bros
atty's

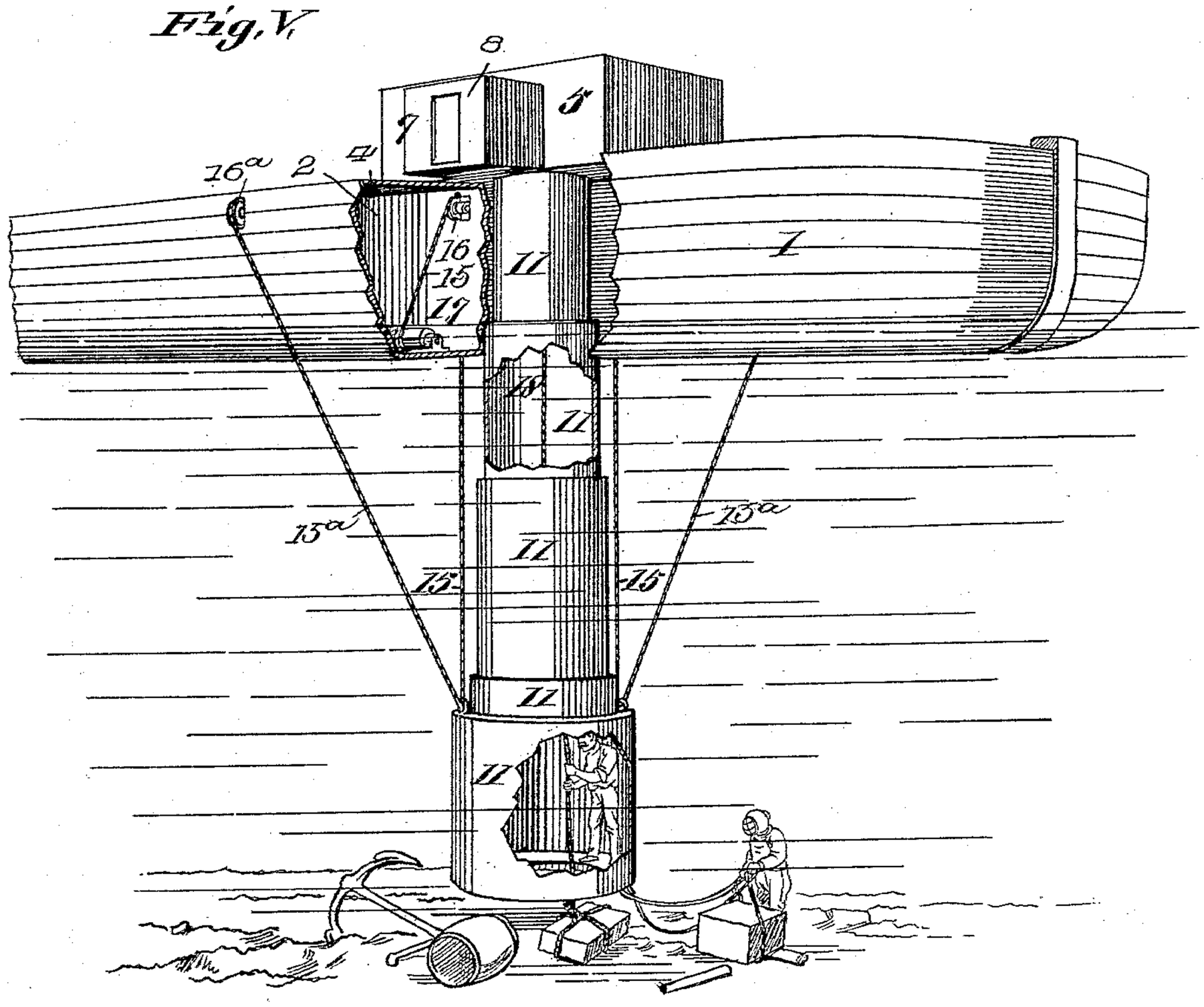
(No Model.) 2 Sheets—Sheet 2.

J. F. WEBB.

FLOATING CAISSON.

No. 597,597. Patented Jan. 18, 1898.

Fig. V.



Attest;
E. L. Knight
M. Finley.

Inventor;
Jean F. Webb
By Knight Bros
attys

UNITED STATES PATENT OFFICE.

JEAN F. WEBB, OF ST. LOUIS, MISSOURI.

FLOATING CAISSON.

SPECIFICATION forming part of Letters Patent No. 597,597, dated January 18, 1898.

Application filed March 29, 1897. Serial No. 629,833. (No model.)

To all whom it may concern:

Be it known that I, JEAN F. WEBB, a citizen of the United States, residing at the city of St. Louis, in the State of Missouri, have invented a certain new and useful Improvement in Floating Caissons, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

The object of my invention is to furnish a safe, convenient, and portable apparatus for all kinds of submarine operations—such as the raising of sunken vessels, the wrecking or dismantling of the same, the saving or recovery of valuables therefrom, the fishery of pearls, oysters, sponges, or other articles of value from the bottom of bodies of water, the inspection and examination of sunken vessels, hidden rocks, or other dangers to navigation, and the blasting out and removal of the same, the preparation of river-beds for bridge-foundations and the building of bridge-piers from the bottom upward by means of an adjustable air-caisson, instead of the present method, and for any and all operations of work to be carried on under water where the depth is not too great for men to work under the air-pressure required to drive the water from a caisson-shaft. I accomplish these objects by means of an air-tight apparatus made, preferably, of steel or iron, reaching from a boat or barge on the surface of the water to any depth required, the essential feature being that of a portable and adjustable caisson, preferably in the form of an air-tight tube, enlarged into a large bell at the bottom and connected with or enlarged into closed chambers or air-locks at the top, into which compressed air is forced with sufficient pressure to force the water downward and out of the lower end, the whole being connected with or suspended from the boat or barge, which contains an air-compressor and power to handle the adjustable features of the caisson.

My invention consists in features of novelty hereinafter fully described, and pointed out in the claims.

Referring to the drawings, Figure I illustrates a vertical cross-section through a boat or barge and an elevation of one of my improved caissons carried thereby. Fig. II illustrates a vertical section taken on line II II, Fig. I. Fig. III illustrates a vertical section taken on line III III, Fig. I. Fig. IV is a similar view to Fig. I, showing the employment of a two-shaft caisson constructed in accordance with my invention. Fig. V is a perspective view illustrating the use of my invention.

In the drawings, 1 designates a boat or barge provided with a hold 2 and a centrally-located central chamber 3.

4 designates the floor of the barge or boat, on which there is a chamber or air-lock 5, having doors 6. The doors 6 open into auxiliary chambers or air-locks 7, provided with doors 8, that open to the exterior atmosphere. The doors 6 and 8 are arranged in the manner stated for the purpose of providing for the least possible escape of air from the chambers or air-locks during the passage of a person or the conveyance of material to or from them.

9 designates trap-doors in the floor 4 within the chamber 5 above the chamber 3. These doors are provided with suitable packing to render their joints air-tight when the doors are closed and a stuffing-box in which the hoisting-rope operates.

10 designates the caisson-shaft, composed of tubular sections 11, telescopically connected at their ends and provided with flanges 11^a, between which are expansion packing-rings 12, that exclude the water from the shaft and render the joints of the sections air-tight to prevent any leakage of air from the shaft. The upper shaft-section 11 has at its lower end trap-doors 13, whose joints are packed in a similar manner to the doors 9 and are provided with a stuffing-box in which the hoisting-rope operates.

At the lower end of the shaft 10 is a bell 14, that is telescopically connected to the lowermost section 11 by a joint similar to those connecting with the shaft-section. This bell is open at its lower end to permit the egress or ingress of men therefrom or thereto in explorations or other operations under water or to permit the access to work carried on therein. The usual air-pressure in caissons supplied by a suitable means to the shaft and bell prevents the ingress of water to the bell, as will be fully understood by any one acquainted with the construction and operation of caissons.

The telescoping shaft and bell are elevated by means of wire ropes or cables 15, connected to the bell 14, passing up through the central chamber and traveling over sheaves 16, and are connected to drums or windlasses 17, onto which they are wound within the hold 2. 15ª are guide-ropes, also connected to the bell 14, passing up around the sides of the boat and traveling over sheaves 16ª and are connected to drums or windlasses 17ª, onto which they are wound also within the hold. When not in use, the shaft 10 is wholly contracted together with the bell and fits in the opening 3 on the interior of the vessel.

18 designates a hoisting-rope that travels over a sheave 19 in the chamber 5 and has connection with a drum or windlass 20, onto which it is wound. This rope carries a hoisting-bucket 21 or a cage or other suitable device in which men or material may be transmitted within the caisson.

The telescoping shaft has many advantages over an unadjustable one in submarine work. Even when a boat is securely anchored on all sides it has a more or less rocking or undulating motion, caused by the waves, which would render it impossible to keep a rigid shaft steady; but the telescopic joints play easily and smoothly up and down without moving or disturbing the heavy bell suspended at the lower end of the shaft. This telescoping principle is capable of much variation to suit different kinds of work and to yet retain all of its essential features. I therefore do not limit myself to the precise construction herein set forth.

In Fig. IV I have shown a modification in which the bell 14 is elongated and enlarged to permit the building of a bridge-pier within it. This caisson has two telescoping shafts 10, which act in perfect unison, the sections being of equal length. This form is very useful in all heavy submarine work—such as the removal of machinery from and the wrecking of sunken vessels, the blasting and removal of rocks or other impediments to navigation, &c.—as it provides room for the operations of many men working together at the same time. This form is provided with two hoisting apparatuses, so that each side may carry on operations independently of the other side. The chamber 5 is therefore divided by a partition 22 into two compartments instead of a single one.

The telescoping or adjustable caisson for submarine work is not intended to entirely supersede the ordinary diving-armor; but in many cases each can do better work when used together. In wrecking operations it will prove a great improvement over present methods to lower this apparatus to the sunken vessel and then have the armor-diver go down through the shaft and explore or operate from the bottom of the caisson, where men can be kept to receive and hoist articles or assist him in many ways. The life-line, air-pipe, &c., being located within the tube, cannot be moved by tides or currents, and the danger of their becoming entangled is greatly lessened.

When used for the inspection of sunken rocks, wrecks, or impediments to navigation, the bell may be made with a closed bottom and provided with double doors arranged to be securely fastened. The inspector takes his position in the bell while it is elevated at the vessel, and as the air-pressure is turned on the bell is gradually driven downward, the shaft becoming elongated, until the desired depth is reached. Should he wish to rise a few feet, it is only necessary for him to give a slight turn to the relief-valve, and the buoyancy of the water will cause the bell to be gently lifted upward. It will rise in this way after the pressure of air is relieved until the weight of the sections below the hull of the vessel equals the buoyancy of the water, and from that point it must be hoisted by the ropes.

I am aware that stationary caissons have long been used, and I am also aware that it has been proposed to mount a caisson upon a floating support, such as a barge or boat; but I believe the feature of a telescoping caisson is entirely original with me.

I claim as my invention—

1. A floating caisson comprising a boat having a hold, a central chamber and a floor, the trap-doors located in the floor over the central chamber, the main air-lock having doors and located over the trap-doors, the auxiliary air-locks to the main air-lock having doors, the telescoping tubular shaft carrying a bell and fitting within the central chamber, and means for lowering and raising the shaft; substantially as described.

2. A floating caisson comprising a boat having a hold, a central chamber and a floor, the trap-doors located in the floor over the central chamber, the main air-lock located over the trap-doors, the auxiliary air-locks to the main air-lock, the telescoping tubular shaft carrying a bell, the hoisting-ropes connected with the bell, sheaves over which the hoisting-ropes are passed through the central chamber, windlasses within the hold to which the hoisting-ropes are connected, the guide-ropes connected with the bell, sheaves over which the guide-ropes pass from the sides of the boat, and windlasses within the hold to which the guide-ropes are connected; substantially as described.

JEAN F. WEBB.

In presence of—
E. S. KNIGHT,
STANLEY STONER.