

APPLICATION FILED MAY 21, 1912.

Patented Apr. 8, 1913.
3 SHEETS—SHEET 1.



INVENTOR
A. E. Luzzi

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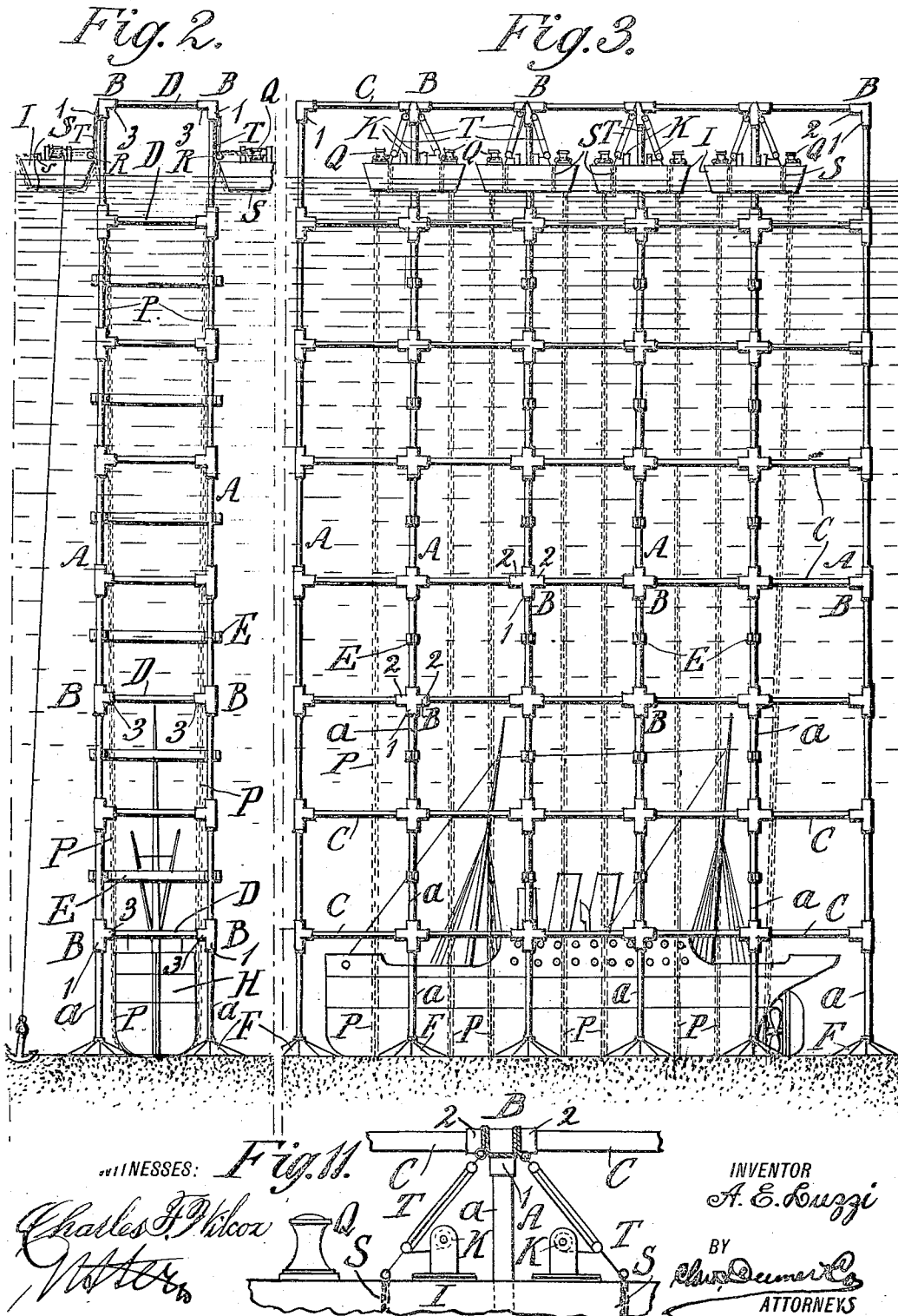
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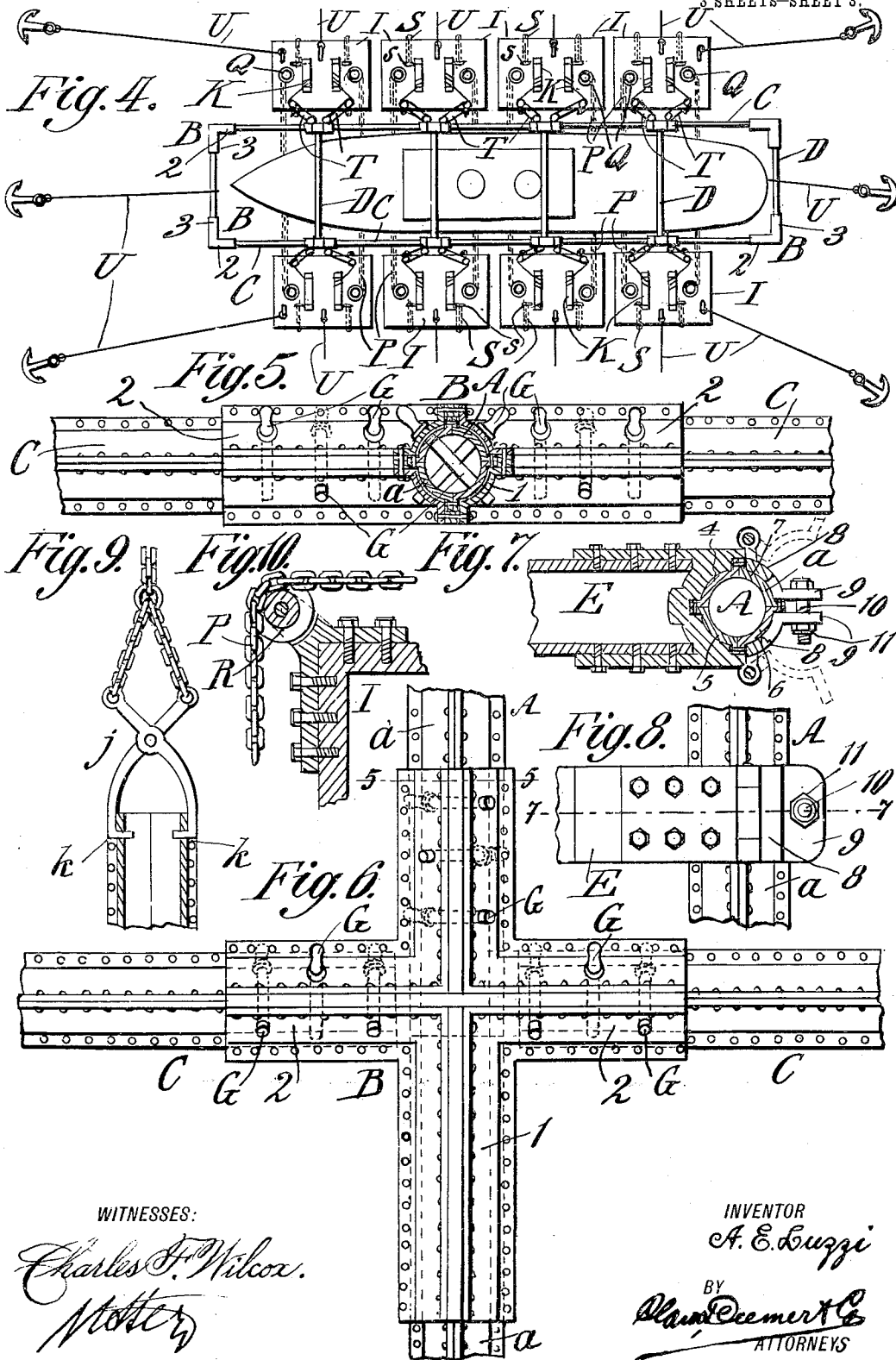
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3 SHEETS-SHEET 3.



WITNESSES:

Charles F. Wilcox.
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UNITED STATES PATENT OFFICE.

ARTHUR E. LUZZI, OF NEW YORK, N. Y.

VESSEL-RAISER.

1,058,188.

Specification of Letters Patent.

Patented Apr. 8, 1913.

Application filed May 21, 1912. Serial No. 698,731.

To all whom it may concern:

Be it known that I, ARTHUR E. LUZZI, a citizen of the United States, and resident of New York, county of New York, and State of New York, have invented certain new and useful Improvements in Vessel-Raisers, of which the following is a specification, reference being had to the accompanying drawing, forming a part thereof, in which similar letters of reference indicate corresponding parts.

This invention relates to vessel raisers, and the principal object thereof is to provide efficient means for releasing and raising sunken heavy-tonnage vessels from a bed or bottom and floating them in such manner that they may be reclaimed and repaired; a further object being to provide a structure of this character which is durable and simple in construction, comprising a plurality of detachable parts susceptible of being readily assembled and disassembled, and which when disassembled may be stored within a limited space.

With the above named and other objects in view I employ a plurality of telescopically and detachably connected frame-sections hereinafter fully described, and specifically set forth in the annexed claims.

In the accompanying drawings, forming part of this specification, Figure 1, is a side view of the lower part of the structure in process of construction; Fig. 2, an end view of the fully assembled structure; Fig. 3, a side view thereof, and Fig. 4, is a plan view; Fig. 5, is a detail plan view, taken on the line 5—5 of Fig. 6; Fig. 6, is a side view of a part of the structure; Fig. 7, a detail plan view of part of the structure taken on line 7—7, of Fig. 8; Fig. 8, an end view of part of the structure; Fig. 9, a side view of a form of tongs for handling and assembling the parts; and Fig. 10, is a sectional view of a roller bearing for a lifting chain employed in using my invention; and Fig. 11, is a detail view illustrating the connections between the frame work constituting my invention and the barges.

Referring to the accompanying drawings, A designates vertical tubular columns composed of metal, preferably steel, which are circular in cross section and respectively comprise a plurality of telescopically connected tubular sections *a*, said sections being connected to each other by means of couplings B, which respectively embody an up-

right tubular part 1, and horizontal extensions 2; these extend oppositely from each side of the tubular part 1, for engagement with the longitudinal tubes C; but each corner coupling has a transversely extended tubular part 3, for engagement with lateral tubular cross bars D, which form part of the completed structure.

The tubular parts above described respectively comprise flanged segmental sections 4, 5, 6 and 7, the flanges thereof being riveted together at their points of intersection. This construction of tube is preferred because of its stability; but I may employ plain tubes, ribbed tubes, or other sections adapted for telescopic connection.

Secured to the bottom end of the lower section *a*, of each column A, is an annularly extended base F. This rests on the bottom for supporting the column, and may be of any adaptable construction. I preferably employ the style of base described and claimed in my co-pending application, Serial No. 692,078, filed April 20th, 1912.

The tubular sections *a*, of the columns A, are of differential strength and thickness, that is, the lower one is of maximum weight and thickness, the next one thereover a little thinner and lighter, and so on to the top, whereby a substantial column is provided.

The structure when assembled is further strengthened by means of tubular cross bars E, these are respectively provided with bifurcated ends for engaging the column sections *a*, and they are secured thereto at points midway between the tubular sections C. The bifurcated end parts of each cross bar E, respectively comprise hinged segments 8, having flanges 9; said segments clamp around the sections *a*, and are secured thereto by means of bolts and nuts 10 and 11, see Fig. 7, of the drawings.

The tubular sections C and D, when the structure is assembled, are in telescopic and detachable engagement with the couplings B, and they are fastened to said couplings by means of coupling-pins G, which pass through said couplings and sections, whereby when all the parts are assembled a strong and durable structure, comprising a plurality of detachable parts, is provided.

In operation, the device being employed for raising a sunken vessel, as H, Fig. 1, of the drawings, the lower base sections of a required number of columns A, are lowered from suitable barges, as I, and ranged along

the sides of the vessel. These are lowered by means of cables J, which are operated by suitable winches K, on the barges; tongs j, being employed to engage openings k, in the upper ends of the column sections, whereby said sections may be dropped on a vertical line and readily released, when set; the setting of the parts of the structure being done by divers. Having set the first or base series of column sections, the next upper sections are lowered and telescopically attached thereto by means of their couplings B. The operation being as follows: A column section, as 12 Fig. 1, of the drawings, has the upper vertical part of a coupling B, fixed to its lower end, and is lowered and telescopically connected to the base section, as 13, by means of the lower end part of the vertical tubular part 1, of said coupling B. Horizontal bars C and D, are then coupled to the horizontal tubular parts of said coupling, and the next vertical section, as 14, is attached, and so on until the entire structure is completed, as shown by Figs. 2 and 3, of the drawings. As the structural operation proceeds the telescopically connected horizontal bars C and D, are securely fastened to the couplings by means of the coupling-pins G; and as the structure grows upwardly the transverse bars E, are set and then clamped and securely fixed by means of the bolts and nuts 10 and 11. To counteract the effect of strong under currents on the parts being lowered block and tackle gearing, as L, is fixed to either lower parts of the structure, the sunken vessel or both, and is connected to the said parts being lowered and to the operating winches, as K, located on the barges, whereby said gearing may be operated for the purpose of guiding the lowered parts into proper position. As an alternative guiding means I employ weights or anchors, as O. These are connected by the cable N, to a part being lowered, as 15, and the diver may manipulate said cable to guide said part into proper position.

Having fully assembled the structure, chains P, are passed beneath the bottom of the vessel H, and their respective ends engage the windlasses, as Q, on oppositely located barges. These chains bear on roller bearings R, secured to the barges. The winches and windlasses are connected with and operated by motors located in the holds of the barges in the customary well known manner, and said windlasses are operated for winding the chains P, and thereby lifting the vessel until it reaches the surface, after which it may be pumped out and repaired sufficiently for purposes of transportation to a dry dock. When the vessel is lifted to a sufficient height to interfere with the lower series of cross bars E, said bars are removed and then, after the vessel is further raised, replaced. This operation

is repeated until the vessel is floated. By means of these removable cross bars, which are detached and reattached by the diver, I maintain a structure of maximum strength during the entire operation of lifting the vessel.

The barges are held securely to the above described structure by means of chains S, which are fixed at one end to a point s, see Fig. 2, of the drawings, passed thereunder and connected to block and tackle gearing T, which is lashed to the upper part of the structure and communicates with the winches, whereby said gearing may be maintained taut to keep the structure and barges in proper relative arrangement. As a further means for keeping the barges in place a suitable number of cables U, are extended at an angle downwardly and outwardly from the barges and anchored to the bottom. These act as guy rods to keep the structure in upright position and minimize the lateral sway thereof which may be caused by the surface action of the water.

I do not confine myself to the specific details of construction as herein shown and described, nor to any specific arrangement of tackle, motive power and lifting mechanism, as under the scope of my invention I am entitled to variations adapted to meet different conditions.

Having thus described my invention; what I claim as new, and desire to secure by Letters Patent, is:

1. In a vessel raiser, the combination, of a plurality of tubular columns each having an extended annular base; with longitudinal and transverse rods connecting said columns, substantially as shown and described.

2. In a vessel raiser, the combination, of a plurality of columns each having an extended annular base; with a plurality of longitudinal rods, and a plurality of removable transverse rods, said rods connecting said columns to each other, substantially as shown and described.

3. In a vessel raiser, the combination, of a plurality of columns each having an extended annular base, and a plurality of longitudinal rods, and a plurality of removable transverse rods, said rods connecting said columns to each other; with a plurality of barges, motive power, block and tackle gearing, and lifting mechanism, substantially as shown and described.

4. In a vessel raiser, the combination, of a plurality of columns each comprising a plurality of detachable tubular sections, with couplings telescopically connecting said sections, said couplings respectively having horizontal tubular extensions, and a plurality of longitudinal and lateral bars telescopically engaging said extensions, substantially as shown and described.

5. In a vessel raiser, the combination, of

two rows of columns each comprising a plurality of tubular sections, and couplings detachably and telescopically connecting said sections, said couplings having horizontal tubular extensions, and bars telescopically engaging said extensions; with a plurality of cross bars transversely connecting said columns, each of said cross bars having bifurcated ends which engage around said columns, and means clamping said ends to said columns, whereby said cross bars may be readily attached and detached, substantially as shown and described.

6. In a vessel raiser, the combination of a plurality of sectional vertical columns, each having an extended annular base, and a plurality of telescopically connected horizontal bars, and a plurality of detachable cross bars; with a plurality of barges, and means comprising chains and block and tackle gearing connecting said barges to said columns, and means for operating said gearing, and a cradle comprising a plurality of chains, and lifting mechanism engaging said chains, and motive power, substantially as shown and described.

7. In a vessel raiser, the combination, of two rows of columns each comprising a plurality of tubular sections, and tubular couplings detachably and telescopically connecting said sections, said couplings having horizontal tubular extensions, and bars telescopically engaging said extensions, with a plurality of cross bars, each of said cross bars having on their ends coupling jaws en-

gaging said columns, and means locking said jaws, whereby said cross bars are detachable, substantially as shown and described.

8. In a vessel raiser, the combination of a plurality of sectional telescopically connected vertical columns, each having a base, and a plurality of tubular couplings connecting the sections of said columns, each of said couplings having horizontal tubular extensions, and a plurality of longitudinally and laterally extended bars telescopically engaging said extensions, and coupling pins removably fastening said bars to said couplings, and a plurality of detachable intermediate lateral bars and means for coupling them to said columns; with a plurality of barges, and chains and block and tackle gearing connecting said barges with said columns, and means for operating said gearing, and a cradle comprising a plurality of chains for engaging under a vessel, and lifting mechanism located on said barges for engaging said chains, and cables and anchors anchoring the barges and the columns to maintain a stable structure, substantially as shown and described.

In testimony that, I claim the foregoing as my invention, I have signed my name in presence of two witnesses, this 15th day of May 1912.

ARTHUR E. LUZZI.

Witnesses:

CHARLES F. WILCOX,
N. STERN.