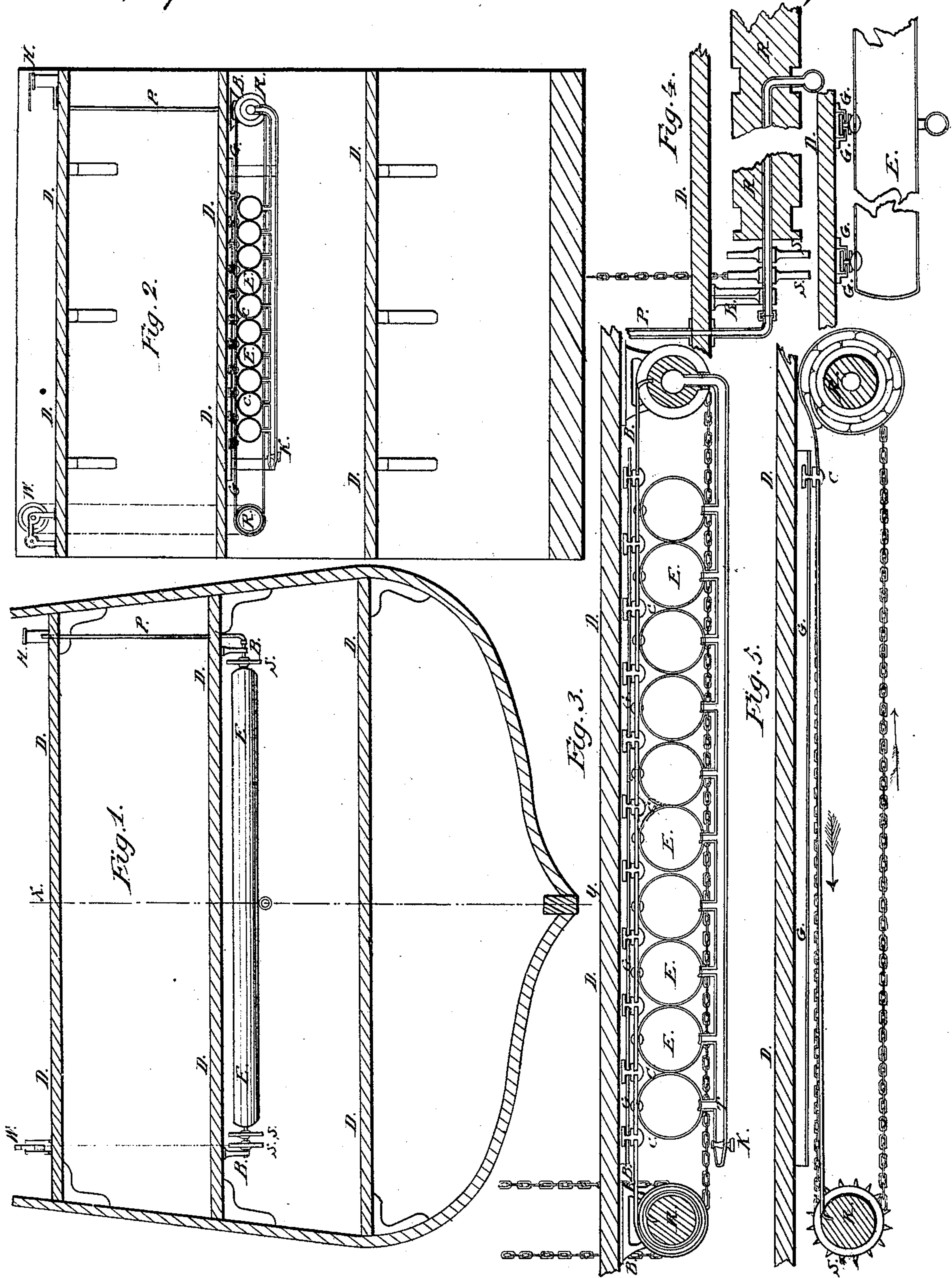


S. Nowlan.
Life Raft.

No 10,657.

Patented Jun. 22, 1858.



UNITED STATES PATENT OFFICE.

SAML. NOWLAN, OF NEW YORK, N. Y.

AIR-CELL FOR GIVING BUOYANCY TO SHIPS AND OTHER VESSELS.

Specification of Letters Patent No. 20,657, dated June 22, 1858.

To all whom it may concern:

Be it known that I, SAMUEL NOWLAN, of the city, county, and State of New York, have invented certain new and useful Improvements in the Arrangement and Construction of Air-Rafts, of which the following is a full, clear, and exact description, reference being had to the accompanying drawing, which forms part of this specification, and in which—

Figure 1 represents a sectional view of a three-decker; Fig. 2 a similar view, being a section through the line $x-y$ in Fig. 1, and representing a longitudinal section or part of a vessel. Figs. 3, 4, 5 and 6 are detail views of an air raft and of other appendances.

My invention consists in the construction of air rafts and in the peculiar arrangement thereof in relation to vessels having one or more decks.

The dangers to which vessels and particularly seagoing vessels are exposed, result almost exclusively from leaks sprung in the sides or bottom of the ship, which are caused by collisions or by gales overstraining the structure or by other similar accidents. The water surrounding the floating body will rush in through the opening and when the weight of the volume of water is equal to that of the displacement, the ship must sink. Although the causes and effects of these accidents are well known, yet, no certain and effectual means have been invented, for preventing the ship from sinking. It has been my endeavor to devise such means, whereby the vessel is, at a moment's notice, rendered unsinkable.

The principle of my invention consists in a permanent arrangement beneath the deck or decks of a series of cylindrical vessels or wrappers made of a yielding strong and thin material, which may be inflated with air from an air pump located outside on the upper deck. These vessels or wrappers are of a volume calculated to contain sufficient quantity of air to keep the vessel afloat. Being made of a pliable material they may be attached to belts or bands and be wound up on reels, in order to remove them to some place out of the way, when not wanted.

The arrangement shown in the annexed drawing is one of the numerous modes of carrying out my invention.

D are portions of the decks extending transversely throughout the whole width of

the ship and longitudinally the length of a compartment; beneath and at or near the juncture of these decks with the partition walls are fixed brackets B which support at a suitable distance from the ceiling or the underside of the deck the journals of two reels $R-R'$ parallel to each other. The reels are connected with each other and with the main pulley or spike wheel W on the upper deck by means of endless chains or cords which embrace pulleys or spike wheels s mounted upon the reelshaft, so as to render their motion dependent on each other, whereby when the main pulley is rotated, the reels are moved in the same direction.

Each reel is provided with 3 annular recesses, two at or near the ends and one in the middle; into these are secured the ends of a belt or band, the length of which is at least equal to twice the distance between the two reels—so that when one of the two reels that are connected together by means of endless chains is entirely unwound the other will have a quantity of belt wound around it as will be equal to the distance between the two reels.

The belt may be made of leather or its equivalent or of metal. In the latter case it should be constructed of links articulated together by means of flat joints so as to be perfectly flexible in the longitudinal direction. Such a metallic band may travel in a groove piece secured to the ceiling. In the former case however *i. e.* when a leather or guttapercha belt is used it should be provided with buttons or studs C which project on the upperside of said belt and are so constructed as to fit loosely in a guide groove G. To these belts are attached independently from each other, by means of rivets or other suitable fastenings the air wrappers E. These are constructed airtight and as above stated of such a flexible thin and tough material, as will allow them to be readily inflated and to resist, if required, a pressure of about 15 lbs. to the inch. The form of these wrappers is cylindrical, extending across the belts so as to occupy nearly the whole width of the compartment. They are fixed to the belts at such distances from each other that when inflated, they will be in contact laterally at their greatest diameters and cover nearly the whole of the ceiling or underside of the deck. In the middle and at the underside, the wrappers communicate with the induction tube by

means of short collars or tubes T, which terminate at their upper end by a valve opening to a pressure from below and closing hermetically against the issue of air
5 from the interior of the wrappers.

The induction tube which connects all the wrappers by means of collar valves just now described is secured at one end to the reel R through which the air is driven. For
10 this purpose half of this reel is made hollow, so that the induction tube is but a continuation through the reel and its journal of pipe P which is attached to the air pump H.

The numerous valves which are placed in
15 the wrappers may be substituted by a single valve placed at the junction of the reel with the induction pipe, which valve is constructed and operates in a similar manner than the ones used in the wrappers. By this
20 arrangement the air contained in all the wrappers may be expelled at once by opening the cock K at the extremity of the induction tube.

The operation will be readily understood
25 from the above description of parts and from the inspection of the drawings. Fig. 5, shows the two reels when the whole apparatus is removed *i. e.* wound up on one of the reels, which is placed as a matter of
30 convenience in the angle formed by the junction of the partition wall and the ceiling. The chains being mounted upon spike wheels at the extremities of the reels, are equally placed along the angles of the
35 compartment so that the ceiling of said compartment is free and nothing is in the way that might cause encumbrance. But as soon as the signal of danger is given, on finding that the ship has sprung a leak and is
40 in a sinking condition the drum h is operated upon, the chains connecting all the reels are moved in the direction of the arrows, whereby the wrappers are rolled out in position to be inflated by the action of the

force pump as shown in Fig. 3. The wrap- 45
pers when inflated will restore the buoyancy of the vessel and keep it afloat. The operation is the same when the vessel shall have sunk below the line of flotation and when the lower compartment or compart- 50
ments are already submerged.

It will be perceived that the material of which the air rafts are made does not require to be excessively strong to resist the external pressure of the water, as the in- 55
ternal pressure can be made to equipoise it by compressing the air accordingly. As each of the wrappers is independent from the others and each having its own collar valve, there is but little or no danger from 60
one or more wrappers bursting during the operation—the function of the other wrappers being thereby not in the least impeded.

Having now fully described my improvement what I claim as my invention and de- 65
sire to secure by Letters Patent is:

1. The herein described arrangement of a series of cylindrical air vessels beneath the deck or decks of vessels in combination with the reels and their appurtenances, whereby 70
the said air vessels may be readily removed from or brought in position at pleasure to operate substantially in the manner as specified.

2. I also claim the flexible induction tube 75
communicating through the hollow reel shaft with the air pump and the air vessels by means of one or more suitable valves arranged in the manner and for the purposes described. 80

In testimony whereof I have signed my name to this specification before two subscribing witnesses.

SAMUEL NOWLAN.

Witnesses:

A. POLLAK,
JOHN S. HOLLINGSHEAD.