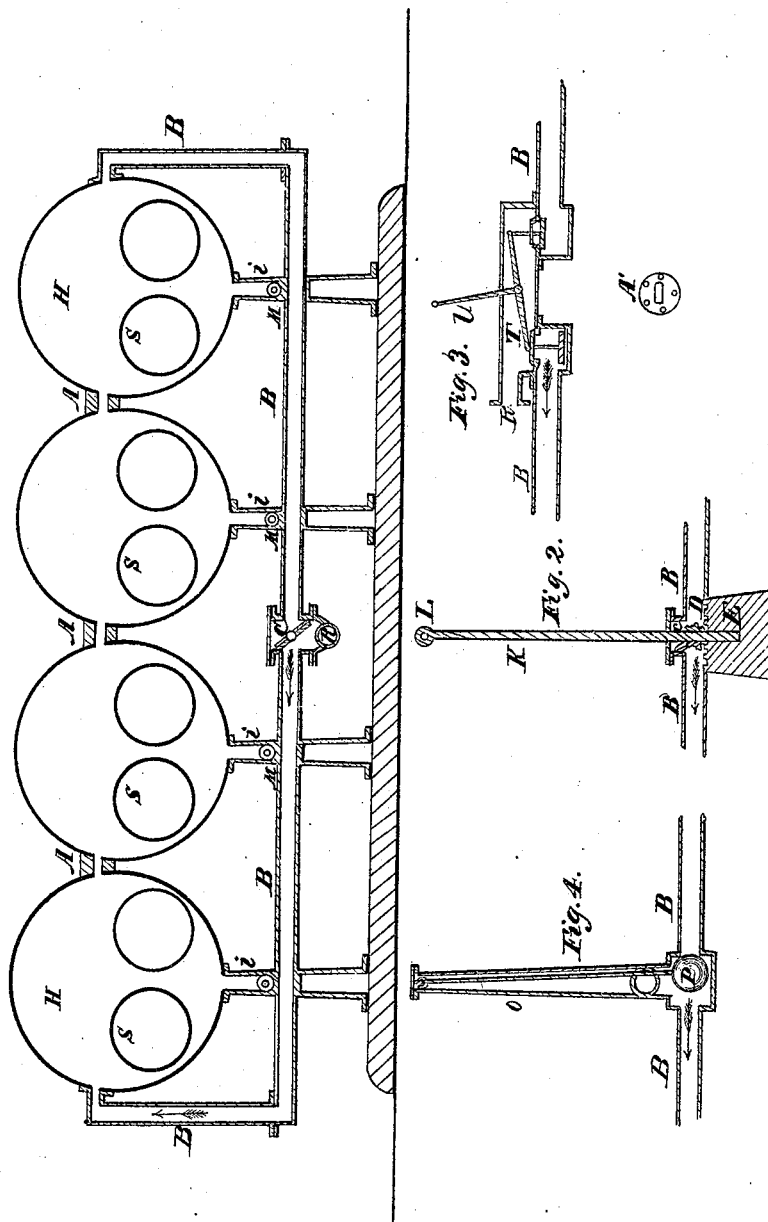


C. Evans,
Steam-Boiler Water-Feeder,
No. 1,762. *Patented Sep. 3, 1840.*

Fig. 1.



UNITED STATES PATENT OFFICE.

CADWALLADER EVANS, OF PITTSBURGH, PENNSYLVANIA.

MODE OF CONNECTING STEAM-BOILERS AND SUPPLYING WATER TO THE SAME.

Specification of Letters Patent No. 1,762, dated September 3, 1840.

To all whom it may concern:

Be it known that I, CADWALLADER EVANS, of the city of Pittsburgh, in the State of Pennsylvania, have invented certain improvements in the manner of constructing and connecting the ranges or tiers of boilers used on board of steam-boats, such as are generally employed on the larger rivers of the United States, where a number of cylindrical boilers are arranged side by side, parallel to each other, the object of said improvements being to prevent the undue flowing of water from one boiler into another, thereby preserving it at the proper height notwithstanding the careening of the vessel, thus obviating one of the great causes of the explosion of such boilers; and I do hereby declare that the following is a full and exact description thereof.

Figure 1 represents a cross section of a range of four boilers of the ordinary construction, and these I connect together by means of short perforated cast iron plates or tubes A, A, A, through which water may flow from one boiler to another. The faces or ends of these are so formed as to adapt them to the curvature of the boilers, and they have a sufficient body of metal around the opening through them to form bearings upon the boilers and to admit of bolts passing through them. An end view of one of them detached, is given at A'. These I place at both ends of the boilers, at such height as that their openings shall be two or three inches above the tops of the flues S, S, or at such other height as may be preferred.

B, B, are the supply pipes through which water is to be forced into the boilers; but instead of a tube leading into the bottom of each boiler, as heretofore practiced, the supply is conducted into the two end boilers H, H, only, the supply pipes entering them at height corresponding with that of the intermediate pieces A, A. The vertical pipes I, I, which occupy the place of the supply pipes as ordinarily used, have no opening into the supply tube but merely form the supports of the boilers, and are made tubular to admit water into them from the boilers, and thus to defend them from the action of the fire; they also constitute a part of the blow off tube. When the boat is on an even keel, the water from the supply pipes will flow in equally to each end boiler, but when the boat is, from any cause,

made to keel or careen over, the apparatus is so arranged that the whole supply shall pass into that boiler which is the most elevated and this is effected in the following manner. A valve C, made oval, so that it shall fit against either side of the bore of the tube in which it is placed, has a stem through its center which passes through a stuffing box; on the outer end of this stem there is a toothed pinion, to be acted upon by a toothed rack. The manner in which it is acted upon is represented in Fig. 2. D, is the pinion on the end of the stem of the valve C, into which gears the segment rack represented on the upper side of the weight E. This weight is attached to the pendulum rod K, whose point of suspension is at L; it will be manifest that, as the boat keels or careens, on either side, this apparatus will act upon the valve C, in the way required. The segment rack may, if desired, be placed on the lower side of the pendulum weight, provided double gearing be used; and by this means also, the effect of the vibration of the pendulum may be increased in any required degree. It is not of essential importance that this part of the apparatus should be rendered self acting as the valve C, may readily be moved by hand, by means of a simple lever under the immediate control of the engineer; nor is it necessary that this valve should fit steam or water tight, as there is no other pressure against it than that resulting from the unequal height of the two outside boilers, which will rarely exceed a few inches.

It will be seen that by the foregoing arrangement any considerable keeling, or careening of the boat will at once close the passage along the supply pipe to the lower boiler, and cause the whole supply to flow to that which is the most elevated, and that no considerable difference can exist in the height of the water in the respective boilers. To each boiler I attach a separate blow off cock, the openings into which are shown at M, M.

Fig. 3 represents another method of changing the direction of the supply water to that boiler which becomes most elevated by the careening of the boat. It will be seen by the drawing that there are two valves suspended to or connected with the vibrating beam T. It will be obvious that by moving the lever U, the direction of the supply water is made to flow to the high

boiler. If you wish to make this apparatus self acting, apply the pinion and weight as represented in Fig. 2. Fig. 4, is also another method of changing the direction of the supply water, being self acting, P, is a sphere, or ball, turned true, and suspended to the rod X, which allows it to move as a pendulum. O, is a pipe merely carried to a proper height to give sufficient length for rod X, R, are openings leading from the force pump. It is obvious that any careening of the boat will cause the ball P, to close the opening leading to the low boiler and that when the boat is on an even keel the ball will remain suspended between the two openings and allow the water to flow into each out side boiler alike.

Figs. 3 and 4 are described for the purpose of showing that many modifications or arrangements can be made to change the direction of the water.

Having thus fully described the nature of my invention and shown the manner in which I carry the same into operation, what

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

1. The placing of the pipes of communication between the respective boilers in the same tier; on board of steam boats, at a point above the level of the tops of the contained flues, so that the water can not flow from one to the other below the requisite water line, and thereby expose the tops of said flues; and in combination therewith I claim the manner of arranging the supply tubes so as to force the water into the outside of the boilers only, at the same elevation with the tubes of communication.

2. I also claim the arrangement of the valve in the supply pipe by which the whole supply, in case of careening, is directed to the most elevated boiler, whether the same be effected in the manner proposed, or in any other which is substantially the same.

CADWALLADER EVANS.

Witnesses:

MORISON FOSTER,
JAMES SPEER.