R. Nelson,

Water Elevator.

No. 21,898. Patented Oct. 26, 1858.

Fig. 3.

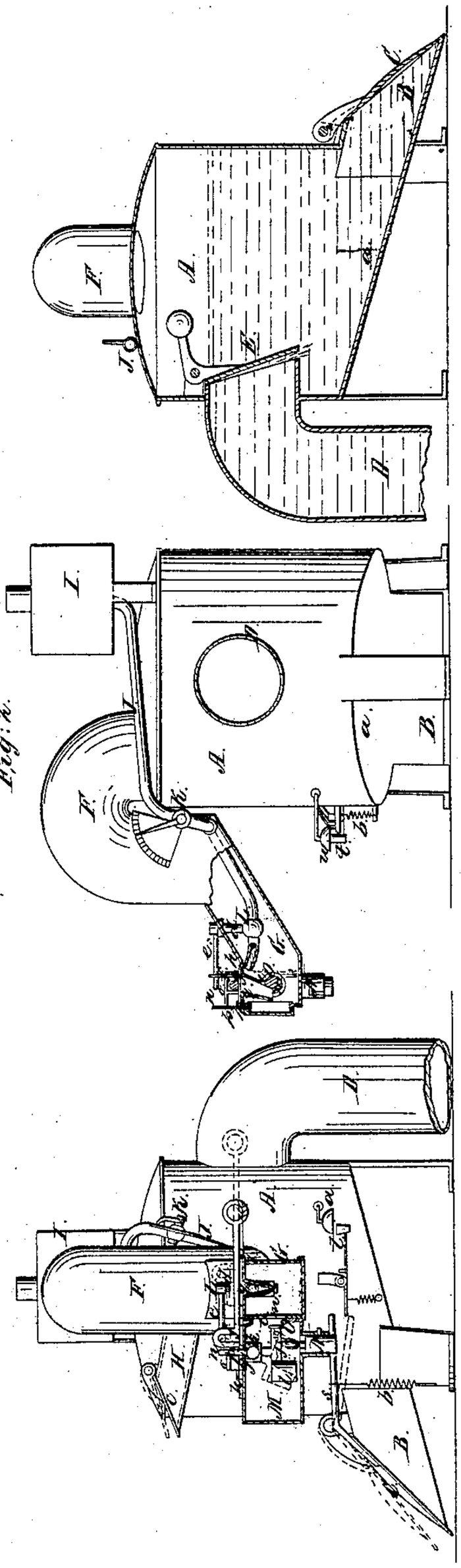
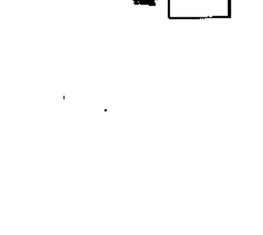


Fig. 2.

Fig. 1.

Fig. 4.



UNITED STATES PATENT OFFICE.

ROBERT NELSON, OF NEW YORK, N. Y.

DEVICE FOR ELEVATING WATER BY THE COMBUSTION OF A VOLATILIZABLE HYDROCARBON.

Specification forming part of Letters Patent No. **21,898**, dated October 26, 1858.

To all whom it may concern:

Be it known that I, ROBERT NELSON, of the city, county, and State of New York, have invented a new and Improved Water-Elevating Device; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the annexed drawings, making a part of this specification, in which—

Figure 1 is a front view of my invention; Fig. 2, a side view of my invention; Fig. 3, a vertical central section of my invention; Fig. 4, a plan or top view of a portion of my invention.

This invention consists in elevating water by producing a vacuum in a suitable receiver by the combustion of the vapor of any volatile hydrocarbon, so applied and used, in connection with suitable mechanism, that the vapor will be generated and ignited from the same source of heat.

To enable those skilled in the art to fully understand and construct my invention, I will proceed to describe it.

A represents a receiver, which may be of copper or iron—boiler-plate would probably answer as good a purpose as any. This receiver may be of cylindrical form, its bottom *a* being inclined and having a spout, B, at its lower part, said spout being provided with a cover or flap, C, having a spring, *b*, or a counterpoise attached, the weight of the cover or flap slightly preponderating and keeping it closed.

D is an induction or suction pipe, the lower end of which extends down into the well or reservoir from which the water is to be elevated. The upper end of the pipe D communicates with the receiver A, and has a valve, E, at its upper end, which valve opens inward in the receiver A, as shown clearly in Fig. 3.

F is a curved pipe, of siphon form, one end of which communicates with the upper part of the receiver A. To the lower end of said pipe an inclined box, G, is attached. The pipe F has a horizontal spout, H, attached to it, said spout being provided with a flap or lid, *c*, which, when not otherwise acted upon, will remain closed by its own gravity. (See Fig. 1.)

I is a box or receptacle in which the hydrocarbon fluid is placed. This box may be placed on the top of the reservoir A, and a tube, J, communicates with the lower end of the box I, said tube passing into the lower part of the pipe F and into the box G, the end of the tube being slightly curved upward, as shown in Fig. 2.

K is a cock placed in the tube J to regulate the flow of the fluid in I, and L is a cock placed in the tube J, near its lower end. The stem *d* of the cock K passes up through the top of the box G and has a lever, *e*, attached to it, the end of said lever being fitted in a vertically-slotted plate, *f*, attached to a slide, *g*, which works between horizontal guides *h h* on the upper part of the box G.

To one side of the box G, and at its outer or lower end, a box, M, is attached, said box containing a lamp, N, which is fitted in a recess or socket at its lower part. (See more particularly Fig. 1.) The box M communicates with the lower part of the box G by means of a valve, O, which is placed within the box M, and is formed by attaching a circular disk, *i*, to one end of a lever, *j*, having its fulcrum *k* at about its center and a weight, *l*, at its opposite end, the weight *l* being sufficiently heavy to keep the valve closed. The face of the disk *i* has a piece of cork, *m*, attached to it. To one end of the fulcrum-pin *k* of the lever *j* an elastic or yielding plate, *n*, is attached, said plate being in a vertical position when the valve is closed and extending above the outermost guide, *h*, of the slide *g*. (See Figs. 1 and 2.) To the slide *g* a horizontal projection, *o*, is attached. This projection is beveled at both sides at its outer part and terminates in a hook, *p*, as shown clearly in Fig. 4. In the top of the lower part of the box G an opening, *q*, is made. Within the lower part of box G a deflector, *r*, is placed, said deflector being opposite the end of tube J and communicating with the opening *q*. (See Figs. 1 and 2.)

To the cover or flap C of the spout B a rod, *s*, is attached, and this rod, just previous to the closing of the cover or flap, actuates a hammer, *t*, of a gong or bell, *u*, which serves as an alarm. This bell or alarm attachment may be arranged in any proper way.

The operation is as follows: The hydrocarbon fluid is placed in I. Turpentine or alcohol may be used, and the valve K is adjusted, as may be desired, to regulate the flow of said

fluid. At the commencement of the operation a torch is inserted in the lower end of box G. In order to warm the air within it, the lamp N is lighted, and the cork *m* is saturated with the hydrocarbon fluid. The operator then shoves the slide *g* in the direction indicated by arrow 1, and in so doing opens the cock L and allows a portion of the hydrocarbon fluid to escape into the box G, the fluid, on account of its volatility, being immediately vaporized by the warm air in G. When the slide *g* is shoved in the direction indicated by arrow 1, its projection shoves out the plate *n* and passes behind it. The slide *g* is then moved in the reverse direction, as indicated by arrow 2, and the valve O is opened in consequence of the hook *p* of projection *o* striking against the plate *n* and the cock L is closed. By the opening of the valve O the cork *m* is brought over the flame of the lamp N, and the fluid with which the cork is saturated is ignited. When the projection *o* passes the plate *n*, the weight *l* closes the valve O, and the vapor in G is exploded by the burning cork *m*, or, rather, the fluid with which it is saturated. The valve in this instance serves as a torch. The air in the receiver A is expelled by the explosion, the flaps C *c* rising to allow its escape, and closing immediately after by the external atmospheric pressure. The receiver A commences filling with water forced up pipe D by atmospheric pressure, said water passing through the spout B. As the water escapes from the receiver A, the cover or flap C of course descends, and just before it has all passed out the bell *u* is sounded and gives notice to the operator to actuate the slide *g* to produce another explosion. When the slide *g* is moved in the direction of arrow 1, the opening *q* is uncovered and the receiver A has full vent to allow the ready escape of the water therefrom. The air rushing into the box G scatters the small flow of the fluid from J, so as to form a spray, which is thereby more readily vaporized and forced into the receiver A. After the machine has been once operated the heat from lamp N is sufficient to keep the box G at a high enough temperature to volatilize the fluid as it is discharged from J. The weight *l* is sufficiently heavy to keep the valve O closed during the combustion of the vapor.

This device is now in practical operation and operates well, raising water a distance of twenty-five feet at the rate of from one thousand to fifteen hundred gallons per minute, with a consumption of one gallon of fluid per hour.

I am aware that a vacuum has been produced in receivers by the explosion of inflammable compounds. Gunpowder has been used, and also inflammable gases compounded with atmospheric air. Many explosive engines have been devised in which it has been essayed to obtain power both directly and indirectly by the explosion either of inflammable solids and fluids or thin vapor or gases; but I am not aware that a water-elevating device has ever been devised in which hydrocarbon fluid has been volatilized and the vapor exploded by the same fire or source of heat for the purpose of producing the requisite vacuum within a receiver. I therefore do not claim, broadly, producing a vacuum within a receiver by expelling the air through the agency of an explosive substance or compound; but,

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

1. Elevating water by producing a vacuum within a proper receiver, A, by means of any hydrocarbon fluid, when so applied and arranged with suitable mechanism that the fluid will be volatilized in proper or desired quantities and exploded by one and the same source of heat.

2. The particular means employed for volatilizing and exploding the hydrocarbon fluid, to-wit, the box M, provided with a lamp, N, and valve O, and attached to the box G, into which the tube J from the box or receptacle I passes, the tube J being provided with a cock, L, which, as well as the valve O, is operated by the movement of a slide, *g*, substantially as herein shown and described.

ROBERT NELSON.

Witnesses:
S. H. WALES,
J. F. BUCKLEY.