E & J. J. Rice.

Sand Pump.

No. 883. Patented Aug. 15, 1838.

Fig. 1.

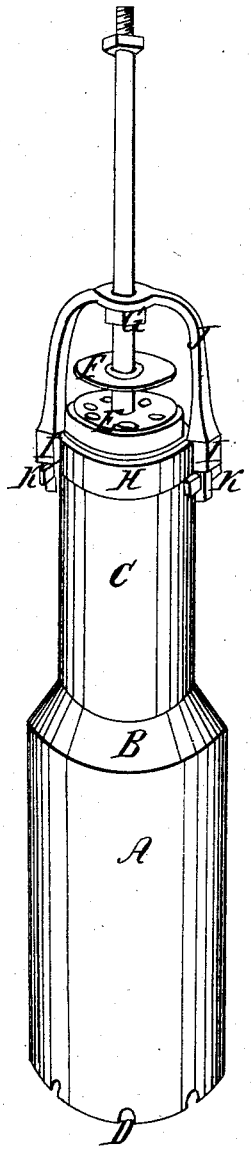


Fig. 2.

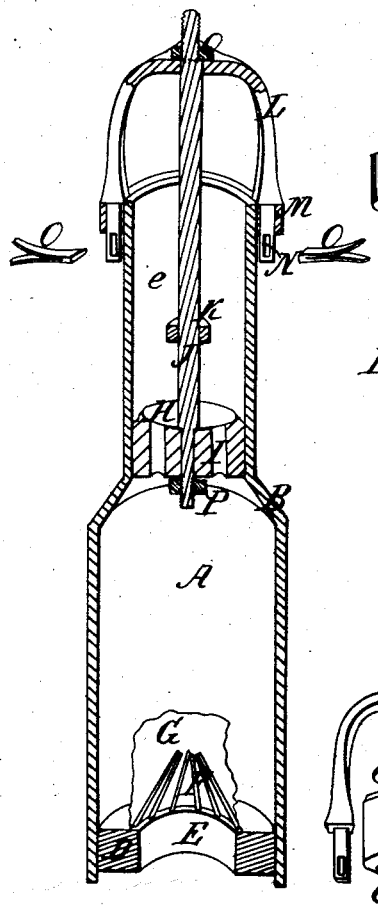


Fig. 4.

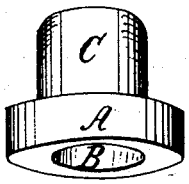
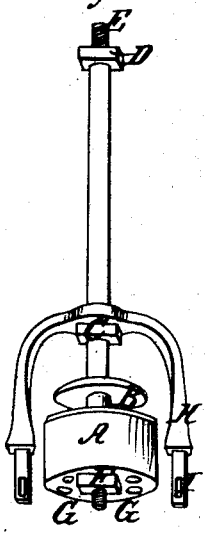


Fig. 3.



UNITED STATES PATENT OFFICE.

JAMES J. RICE AND EBENEZER RICE, OF SALINA, NEW YORK; LAURA RICE ADMINISTRATRIX OF SAID JAMES J. RICE, DECEASED.

GRAVEL-PUMP FOR EXCAVATING WELLS, &c.

Specification of Letters Patent No. 883, dated August 15, 1838.

To all whom it may concern:

Be it known that I, EBENEZER RICE, of Salina, in the county of Onondaga and State of New York, in conjunction with JAMES J. RICE, deceased, late of Salina aforesaid, have invented a new and useful machine which we denominate a "gravel-pump" for the purpose of excavating wells and sinking shafts in soils composed of coarse gravel and sand; and we do hereby declare that the following is a full and exact description.

First a cast iron tube or cylinder represented by Figure 1 in the annexed drawing from eleven to twelve inches in diameter and three fourths of an inch in thickness represented by letter (A.) At about twenty-one inches from the bottom at (B.) it is reduced by bevel of two and one half inches to a neck (C.) of eight and one half inches in diameter and fifteen inches in length, in which the piston of the pump will operate when in use. At its lower extremity it should have triangular spaces of about one inch (D) to prevent it from becoming too firmly fixed in the sand. A bottom of some strong wood not liable to split about two inches in thickness with a circular opening in the center, of at least six inches, is firmly connected to the inside of the pump by bolts, nails, or screws, immediately above the triangular openings. In the upper side of the bottom, are inserted in a secure manner, about twelve pieces of whale-bone of five and six inches, alternate in length, inclining to a point at top so as to form a cone, to prevent the escape of coarse gravel when received in the vacuum. This cone may be formed of slips of tough wood, plates of elastic metal, or any other substitute which will preserve a conical form, easily admitting the substance to be excavated and preventing its escape. Whale bone is found to answer the purpose perfectly, can easily be replaced when broken, is elastic, strong, and cheap. To prevent sand and fine gravel from escaping, a shirt or piece of canvas, of about the size of the inside of the pump, is nailed or otherwise attached to the bottom, immediately and closely around the insertion of the whale-bones. It is about twelve inches in length and open at the top, and collapsing around the cone prevents the passage of all substances from the bottom of the pump except water.

The piston (E.) is in the usual form of cast iron, firmly attached to its rod, and having from eight to twelve holes of an inch or less in diameter, to permit the escape of the water, but should not be so large as to permit coarse gravel to pass, which, by becoming wedged between the outside of the pump and the tubing, would obstruct the removal of the pump when charged or loaded with gravel. Encircling the rod is a thin cast iron cap or valve (F) with leather secured to its under side and allowed to play or slide upon the rod about three inches to a bulb or enlargement of the rod (G.) The upper extremity of the neck is surrounded by a band (H.) attached by rivets, and bent so as to form holes or eyes (I) for the attachment of the bail (J) which encircling the rod at its curve, its extremities pass through the eyes, and for its more ready connection and detachment, are secured by the split, or double wedge elastic keys (*k*).

Fig. 2 represents a longitudinal section of the machine, with the apparatus combind as in operation. A, the body of the pump; B, the bevel; C, the neck; D, the bottom or block, with its circular opening E; F, the whale bones connected with the bottom forming a cone; G, shirt or canvas surrounding whale bones; H, piston with the cap or valve resting upon it; I, hole in the piston to permit water to pass; J, piston rod; K, bulb on piston rod; L, bail; M, eye in the band of the pump for bail; N, key hole in the bail; O, O, double wedge or elastic keys; P, Q, nuts or screws on the extremities of the piston rod.

Fig. 3: A, the piston; B, cap on valve; C, bulb on the piston rod; D, nut on top of the rod; E, screw on top of the piston rod to attach pole or rope; F, nut on bottom of rod to secure piston thereto; G, G, &c., holes in the piston to permit escape of water; H, bail; I, key holes in bail.

Fig. 4 represents the bottom, or block of the machine, with its circular opening, and the canvas encircling the cone of whale bones, in the situation it would appear when exhausted, and filling with gravel. A, bottom; B, circular opening; C, canvas or shirt inclosing cone of whale bones.

Use: This pump, or machine, is inserted in a well, or shaft, which should be properly tubed, with cast or sheet iron or other

proper material with space to permit it to pass readily, and having a rope, or rods connected with the end of the piston, is worked in the manner of a pump, until sufficiently charged with the substance to be removed, when it is raised by a windlass or other power. It is particularly adapted to the excavating of shaft pan brine, and was discovered while excavating wells for that purpose, as no instrument was known, which would readily raise the gravel from the bed without great delay, and difficulty, and at same time leave the sides of the well loose, and pervious to the transmission of the brine; the ordinary process of drilling merely crowding the stones from the shaft, and rendering the sides of the well compact, hard, and nearly excluding the passage of small streams of brine into the well. It can be made of any size corresponding with the tubing, or capacity of the shaft, but the above is recommended as a suitable size, which has been found by practice, to answer a valuable purpose. It may also be used to excavate sand, or gravel, from docks, or rivers, and to raise articles from beneath deep water, when their location is known.

What we claim in behalf of EBENEZER RICE and the legal representatives of JAMES and the legal representatives of JAMES J. J. RICE, deceased, and desire to secure by Letters Patent, is—

The manner in which we have combined and connected the respective parts of the above described machine, for the purpose of excavating wells and shafts, and the removal of sand and gravel therefrom; that is to say, we claim the combination of the exhausting apparatus with the cylinder, the conical bars of whale-bone, or other material, and the canvas surrounding the same, constructed and operating in the manner set forth.

LAURA RICE,
Administratrix of James J. Rice, deceased.

EBENEZER RICE.

Witnesses:
WARREN GREEN,
BENJ. J. GREEN.