No. 660,946. Patented Oct. 30, 1900.

T. BUTLER.

APPARATUS FOR PUMPING WATER, SAND, &c.

(Application filed Mar. 28, 1900.)

(No Model.)

Fig. 2.

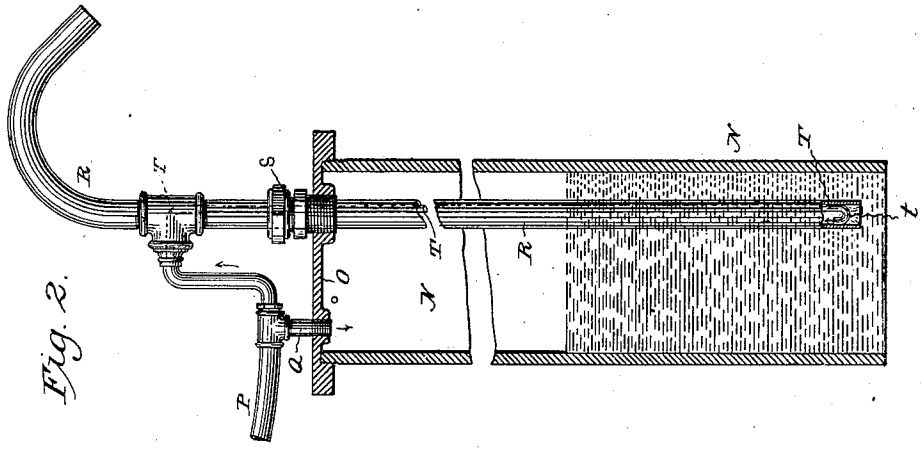
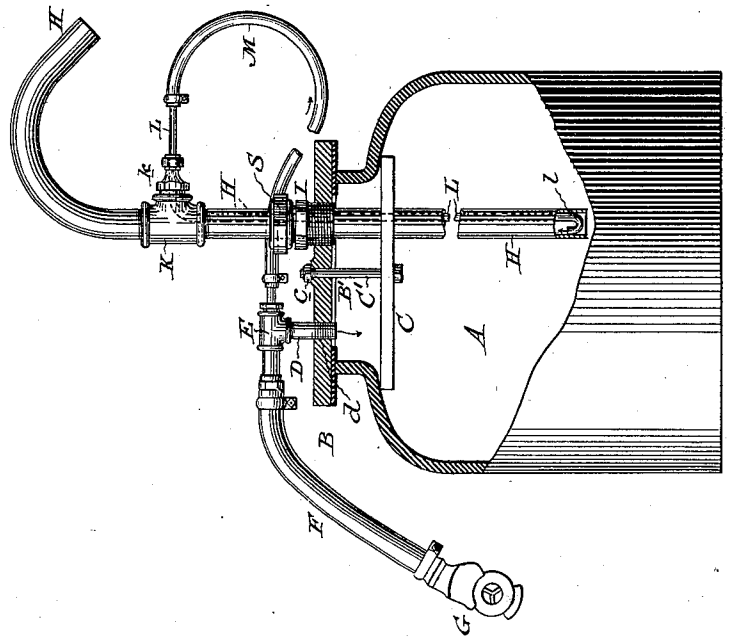


Fig. 1.



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UNITED STATES PATENT OFFICE.

THOMAS BUTLER, OF CLEBURNE, TEXAS.

APPARATUS FOR PUMPING WATER, SAND, &c.

SPECIFICATION forming part of Letters Patent No. 660,946, dated October 30, 1900.

Application filed March 28, 1900. Serial No. 10,503. (No model.)

To all whom it may concern:

Be it known that I, THOMAS BUTLER, a citizen of the United States, residing at Cleburne, in the county of Johnson and State of Texas, have invented certain new and useful Improvements in Apparatus for Pumping Water, Sand, &c., of which the following is a specification.

The object of my invention is to provide an apparatus operated by compressed air to elevate and discharge sand, water, &c.

The principal object of my invention is to provide an apparatus for emptying sand-boxes of locomotives. Heretofore this has usually been done by hand or by the use of cups, dippers, or the like in the hands of an attendant, which is a slow and laborious task. By my improvements I discharge quickly and efficiently the sand from a locomotive sand-box, the apparatus being so constructed that it may be quickly applied to or taken from the sand-box and being adjustable, so as to work efficiently upon any amount of sand which the particular sand-box may contain. The particular sand-pump which I have invented could, however, be used for elevating water or other substances, as will be hereinafter described.

Briefly stated, the apparatus consists of a cap provided with means for detachably connecting it to the casing of the sand-box or the casing of a well, said cap being provided with a passage for compressed air, which enters the casing or box and presses upon the sand, water, or the like which the box or casing contains. The cap is also provided with a stuffing-box through which extends a discharge-pipe adapted to enter the material to be elevated and discharged. This pipe is adjustable in the stuffing-box, so that it may be made to enter the material to the proper extent, whatever be its depth. Within the discharge-pipe is arranged a relatively small air-pipe, the lower end of which is given a half-turn, so that it discharges upward into the discharge-pipe, thereby causing the air to act as an ejector and as an aerator for the material passing out through the discharge-pipe. A compressed-air pipe is connected by suitable couplings with the passage which admits compressed air to the top of the box or casing, and the air-injecting and aerating pipe is preferably connected by a flexible hose or pipe with the compressed-air pipe, so that the upper end of the discharge-pipe may be turned into the desired position and may be also elevated and lowered.

In the accompanying drawings, Figure 1 is a view, partly in elevation and partly in section, of my improved apparatus applied to a locomotive sand-box. Fig. 2 is a similar view of my apparatus as applied to a well.

Referring to Fig. 1, A indicates a locomotive sand-box. B indicates a cap for the opening B′ of this box, to which the apparatus is applied. This cap is made to fit air-tight around the edge of the opening B′ and is preferably clamped thereon by means of a cross-bar C, attached to a bolt C′, passing centrally through the cap B. The head of the bolt C is below the cross-bar, while the nut *c* is arranged on the bolt above the cap. D indicates a short pipe applied to the opening *d* in the cap for the passage of compressed air to the top of the box A. This pipe is connected by a coupling E with a compressed-air pipe F, which latter is connected by suitable couplings G with another air-pipe or other suitable supply for compressed air. H indicates the discharge-pipe. Its upper end is curved and prolonged sufficiently to enable the sand to be delivered at some convenient place. The discharge-pipe passes through a stuffing-box I, of suitable construction, applied to the cap B. The pipe is preferably adjustable vertically in the stuffing-box, so that its lower end may enter the sand to a suitable depth to most efficiently provide for the discharge of the material. Between its upper curved end and the stuffing-box the discharge-pipe is provided with a T-coupling K, which latter is provided with a stuffing-box *k*, through which extends a relatively small pipe L. This pipe is bent within the T-coupling and extends vertically downward to the bottom of the discharge-pipe and is then curved upward at *l*, so as to discharge the compressed air upward into the discharge-pipe, thereby acting as an ejector for the material in the discharge-pipe. The pipe L is connected by a flexible pipe M with the coupling E, the arrangement being such that air supplied through the pipe F will enter the sand-box through the opening *d* and will also

pass through the pipes M and L and enter the discharge-pipe H in the manner before specified. By this apparatus the sand may be quickly discharged from a sand-box of a locomotive. The compressed air entering through the opening *d* presses upon the sand and causes it to enter the discharge-pipe H; but this pressure is insufficient to cause the sand to pass out through the discharge-pipe, as the latter is apt to become clogged; but by combining with the air-pressure above mentioned the air-jet through the pipe L, acting as an ejector, I find that the sand will be continuously and expeditiously discharged. By making the discharge-pipe adjustable and connecting it to the air-supply pipe by means of a flexible pipe or hose I am enabled to regulate the depth to which the discharge-pipe enters the sand and also am enabled to turn the discharge end of the discharge-pipe to the desired position without stopping the apparatus or otherwise interfering with its operation. No valves are used. The apparatus may be quickly applied to and removed from a sand-box, and it is not apt to get out of order.

In Fig. 2 my improvements are shown as applied to a well-casing, such as an oil-well casing. In this instance, N indicates the casing of an oil-well. O indicates the cap or cover of the casing. This may be screw-threaded, as shown, and thus may be removably applied to the upper end of the casing. P indicates the compressed-air supply pipe. Q indicates a pipe leading from the compressed-air pipe, extending through the cover O, and opening into the top of the casing above the oil or water in the well. R indicates the discharge-pipe, which passes through a packing-box S and may be adjusted vertically therein, as well as turned about its axis. T indicates a relatively small pipe which connects with the compressed-air pipe in the manner indicated and extends down through the discharge-tube to the bottom thereof and is turned upward at *t*, so as to discharge compressed air near the bottom of the tube upward, and thereby act as an ejector for the oil or water in the tube. When compressed air is supplied through the pipe P, it passes through the pipe Q onto the top of the casing, presses upon the oil or water therein, and causes it to rise in the discharge-pipe R. At the same time the compressed air passes through the pipe T and out through the opening *t* into the column of oil or water in the discharge-pipe, acting as an ejector, and thus facilitating the rising and discharge of the liquid. The connection between the pipe T and the compressed-air pipe is a flexible one, such that the discharge-pipe may be elevated and depressed and may also be turned about its axis.

I claim as my invention—

1. The combination, substantially as set forth, of an air-tight vessel, a cap fitting air-tight to an opening in the upper end thereof and removably connected therewith, a discharge-pipe carried by the cap extending through it down into the vessel, an entrance for compressed air in the cap opening into the vessel above the open lower end of the discharge-pipe and above the material in the vessel, a pipe supplying compressed air to the vessel through said entrance-opening, a relatively small pipe extending down through the discharge-pipe and discharging compressed air upward in the discharge-pipe near its lower end, and connections between the upper end of said relatively small pipe and the main compressed-air-supply pipe, the organization being such that compressed air is forced into the vessel upon the surface of the material to cause it to enter the lower end of the discharge-pipe while compressed air acting as an ejector enters the discharge-pipe at its lower end and forces the material upward therein.

2. The combination, substantially as set forth, of an air-tight vessel, a cap fitting air-tight to an opening therein and removably connected therewith, a discharge-pipe extending through a stuffing-box in the cap in which it is free to move vertically and to turn about its axis, a compressed-air pipe opening into the vessel through the cap, a relatively small pipe contained in the discharge-pipe and extending through the cap down into the vessel, and discharging upward in the discharge-pipe near the lower end thereof, and a flexible pipe connecting the main compressed-air-supply pipe with the upper end of the relatively small pipe contained in the discharge-pipe.

In testimony whereof I have hereunto subscribed my name.

THOMAS BUTLER.

Witnesses:
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