R. H. ELSEY.

EQUALIZING MULTIPLE AIR LIFT FOR DEEP WELL PUMPING.

APPLICATION FILED JUNE 23, 1908.

911,649. Patented Feb. 9, 1909.

Fig. 1

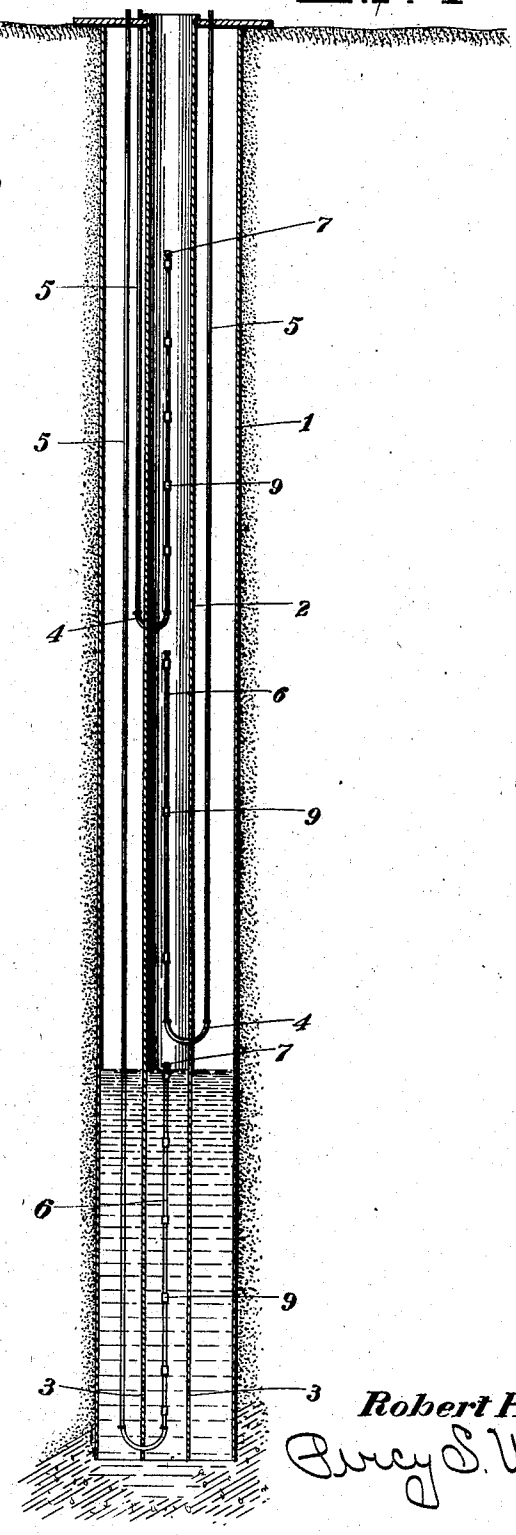
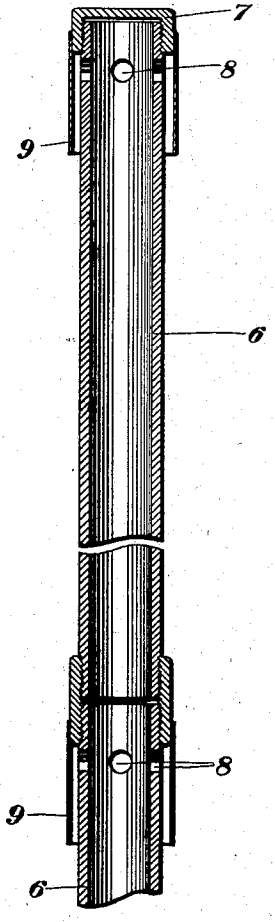


Fig. 2



Witnesses

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EQUALIZING MULTIPLE AIR-LIFT FOR DEEP-WELL PUMPING.

No. 911,649. Specification of Letters Patent. Patented Feb. 9, 1909.

Application filed June 23, 1908. Serial No. 439,933.

To all whom it may concern:

Be it known that I, ROBERT H. ELSEY, a citizen of the United States, residing at Coalinga, in the county of Fresno, State of California, have invented certain new and useful Improvements in Equalizing Multiple Air-Lifts for Deep-Well Pumping; and I do declare the following to be a full, clear, and exact description of the same, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the characters of reference marked thereon, which form a part of this application.

This invention relates to improvements in means for deep well pumping and particularly to that class of pumping mechanism known as air lifts, the object of the invention being to produce an air lift for deep wells which will equalize and multiply the air pressure according to the submergence of the fluid, thereby lifting the fluid easily to the surface of the ground with a mininum of expense and power; also to provide a simple and easily constructed device for the purpose. By equalizing and multiplying the air pressure according to the submergence of the fluid is meant that I aim to have the air pressure discharges spaced in multiple distances apart such distances being determined from the volume of liquid to be raised and the distance it is to be raised each air pressure discharge being adapted to carry the liquid upward from the highest point to which it is lifted by the pressure discharges below. This object I accomplish by means of a fluid tube or casing into which are inserted compressed air supply pipes provided with an air discharge forming lifts for the fluid, said lifts being multiplied according to the depth of submergence of the fluid as above, as are also the air supply pipes; also by such other and further construction and relative arrangement of parts as will appear by a perusal of the following specification and claim.

In the drawings similar characters of reference indicate corresponding parts in the several views.

Figure 1 is a cross section of a well and fluid tube showing my complete apparatus installed therein. Fig. 2 is a vertical sectional view of a tube and air lift mechanism.

Referring now more particularly to the characters of reference on the drawings 1 designates the well and 2 the fluid tube or casing therein, in the bottom of which casing 2 are a plurality of holes 3 through which the liquid enters the said tube 2, these holes being additional feeders above the main suction at the bottom.

Disposed in the sides of the tube 2 at spaced distances are return elbow joint pipes 4 extending from the inside to the outside of the said tube 2 and projecting in an upward direction. Into the outer ends of said joints 4 are screwed air supply pipes 5 projecting to the top of the well.

Into the inner ends of the joints 4 are screwed tubes 6 having top caps 7 in which tubes are provided a plurality of air discharge holes 8 spaced apart at intervals for the purpose as will appear, over which holes are disposed sleeves 9 spaced from the tubes 6 and closed at their upper ends and open at their lower ends.

The device is particularly designed for oil wells and in practice air pressure is applied to the tube 5, the same passing into the tubes 6 where it discharges through the holes 8 and is deflected downward and then upward around the pipe by the sleeves 9, such air pressure forming the lift for the fluid to raise it to the surface of the ground. The lower tube 6 always extends into the liquid from the bottom to the surface of the submergence and the air lifts 8—9 are spaced a desired distance apart to properly equalize the pressure according to the depth of submergence, the intake holes 3 being always between the first and second lifts 8—9, that is the distance between the lifts 8—9 is determined according to the liquid to be lifted, and the distance it must be lifted, each lift being so disposed as to carry the liquid on upward from the highest point it is lifted by the lifts below. The air pressure in the lifts 8—9 raises the fluid in the tube 2 to the next tube 6 above, when the pressure of the air from the lifts 8—9 in said second tube raises the fluid to the next tube and so on until the fluid reaches the surface of the ground, all of the lifts being of course multiplied in the proportion required and likewise spaced the required distance apart to produce perfect equalization of the pressure to the amount of lifting required as described above.

In wells where the submersion equals

fully fifty per cent. of the depth or over, two of the tubes 6 and air tubes 5 will be used, and where the submersion is less than fifty per cent. of the depth then three or more of the tubes having the air lifts may be used, the principal aim being to equalize the pressure as described.

From the foregoing description it will be readily seen that the invention embodies such features as substantially fulfil the objects of the invention as set forth herein, viz:—to produce a multiple air lift-equalizing and multiplying-pressure system for deep well pumping, and which will eliminate back pressure.

While this specification sets forth in detail the present and preferred construction of the device, such deviations from such detail may be resorted to as do not form a departure from the spirit of the invention.

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

An air lift for deep wells comprising a casing, an air tube therein having air holes at spaced intervals thereon, sleeves disposed over said holes and spaced from said tube, and means for supplying air pressure to said tube, as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

ROBERT H. ELSEY.

Witnesses:
PERCY S. WEBSTER,
FRANK H. CARTER.