(No Model.)

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METHOD OF AND APPARATUS FOR MAKING AND RAISING SALT BRINE FROM DEEP VEINS.

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Fig. 1. Fig. 2. Fig. 3.

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METHOD OF AND APPARATUS FOR MAKING AND RAISING SALT-BRINE FROM DEEP VEINS.

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Application filed February 1, 1883. (No model.)

To all whom it may concern:

Be it known that I, GEORGE H. SMITH, of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Methods of and Apparatus for Making and Raising Salt-Brine from Deep Veins; and I do hereby declare that the following is a full, clear, and exact description of the invention, 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, which form a part of this specification.

My invention relates to a method of and apparatus for making brine and raising the same from deep wells or veins in salt deposits, and is hereinafter described and claimed.

A stratum of solid salt of from forty to seventy feet in thickness has been discovered in the county of Wyoming, State of New York, at a depth of one thousand feet and more from the surface. Owing to the depth and probable cost of drainage, it is not thought desirable to mine this salt by shafts and drifts.

Salt has been obtained in considerable quantities by pumping water into wells reaching down to this deposit, and then pumping it out again in the form of brine. A water-supply from outside the wells has been found to be necessary or advantageous, owing to lack of sufficient water at this great depth, and also because the water supplied to the wells can be kept pure and free from ingredients which might be deleterious to the salt, which might not be the case if underground veins of water were relied on to fill the wells and dissolve the salt.

I have invented a method by which deep-well pumping may be dispensed with, all the machinery except the pipes be above ground, and the brine can be obtained more cheaply than has heretofore been done. My method is now in use at a well some fourteen-hundred feet in depth in the town of Middlebury, New York, and gives excellent results. The brine, after being forced out of the well, is evaporated, and salt formed in the usual manner.

The apparatus by which my method is carried out is illustrated in the accompanying drawings, but is subject to modification within the spirit of the invention.

In the drawings, Figure 1 is a side elevation, partly in section, of one form of my apparatus in position in a well. Figs. 2 and 3 are modifications, the general principles of operation being the same.

A represents a deep well, in which a casing, A′, is placed, which extends down below the fresh-water veins, as is usual in oil-wells, at which point the casing is tightly packed with suitable packing, *a*, to exclude all drainage from the well, and also to permit the application of pressure from below to expel the brine. The casing A′ may or may not form one of the tubes or pipes by which the brine is expelled from the well.

B is a supply-pipe, which may be the casing of the well, or may be a separate pipe, as shown. Through this pipe water is forced into the well by any suitable means, and by its pressure forces out the water which has preceded it in the well, and which has become saturated with salt by contact with the deposit of salt. In Fig. 1 the inner pipe is the pressure-pipe, while the casing A′ serves as the conduit for the brine.

D is a force-pump, by which water is forced into the well, while E is a stand-pipe connected with the supply-pipe and serves to give a steady pressure; but this stand-pipe may be omitted.

In Fig. 3 I have shown a well in which the casing is dispensed with; but a packing *a* is used, through which the pressure-pipe B and supply-pipe C pass. In this form air-pressure may be used to force up brine, the water having been first introduced into the well to absorb the salt.

It is obvious that the pump may be dispensed with where there is a natural head or pressure of water above the mouth of the well, as where water can be obtained from water-works, as is the case in Warsaw, New York.

I am aware that it is not broadly new to raise oil and other liquids from deep wells by haudraulic or pneumatic pressure; and I do not broadly claim such devices.

What I claim is—

1. The method of obtaining brine from salt-wells, which consists in forcing fresh water into the well under pressure, permitting it to

absorb salt by contact with the underground deposit, and then expelling the same from the well by the pressure of a column of water or air, all substantially as described.

2. The combination of the force-pump with the inflow and outflow pipes arranged within the well and with reference to a subterranean deposit of salt, substantially as shown and described.

3. The combination of the force-pump, the stand-pipe, and the inflow and the outflow pipes, when all arranged with reference to a subterranean salt deposit at great depth, substantially as set forth.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in presence of two witnesses.

GEORGE H. SMITH.

Witnesses:
H. A. METCALF,
J. H. WARWICK.