

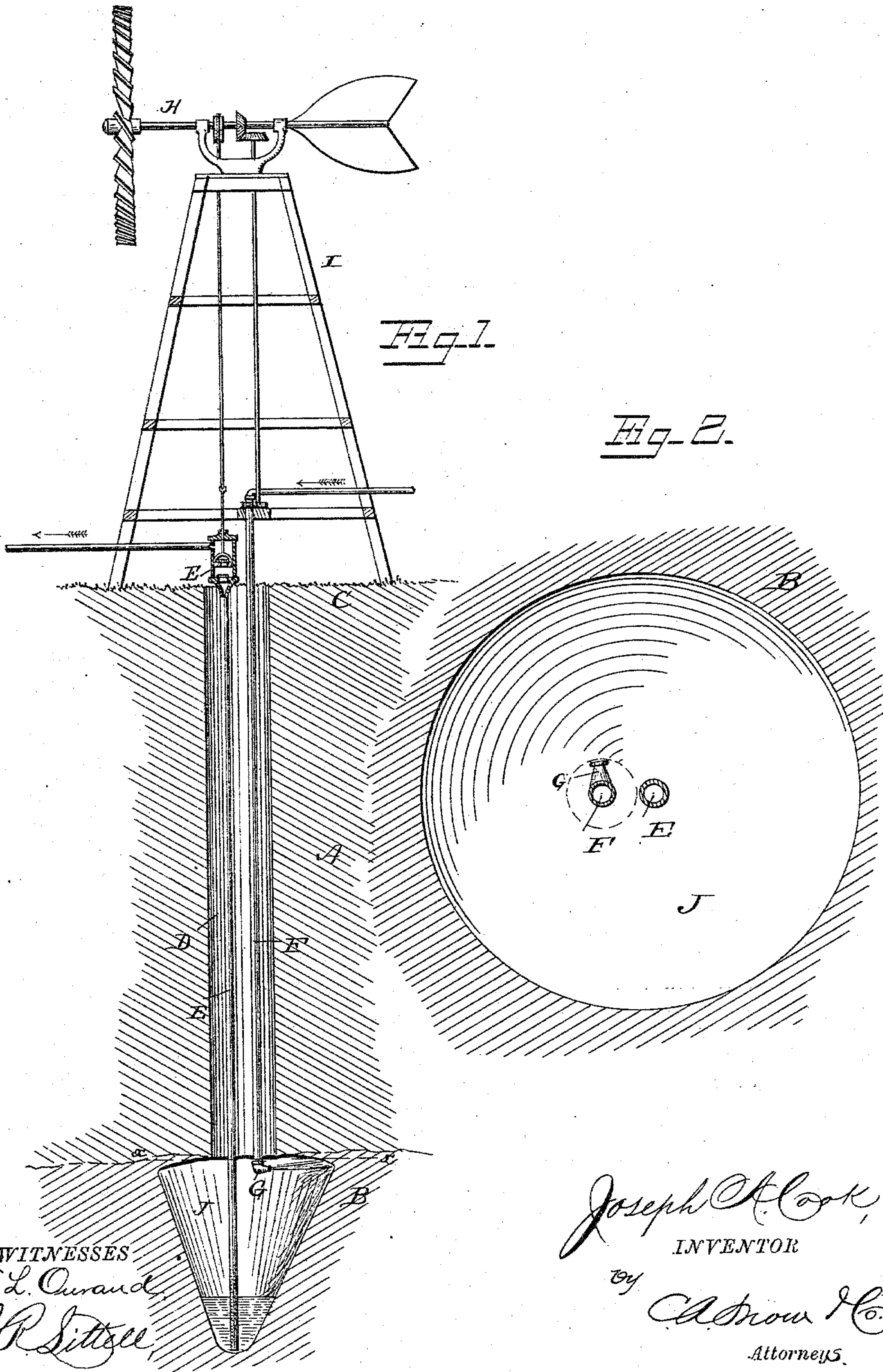
(No Model.)

J. A. COOK.

APPARATUS FOR OBTAINING BRINE FROM SALT BEDS.

No. 287,909.

Patented Nov. 6, 1883.



WITNESSES

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# UNITED STATES PATENT OFFICE.

JOSEPH A. COOK, OF AUBURN, NEW YORK.

## APPARATUS FOR OBTAINING BRINE FROM SALT-BEDS.

SPECIFICATION forming part of Letters Patent No. 287,909, dated November 6, 1883.

Application filed May 14, 1883. (No model.)

*To all whom it may concern:*

Be it known that I, JOSEPH A. COOK, a citizen of the United States, residing at Auburn, in the county of Cayuga and State of New York, have invented a new and useful Apparatus for Obtaining Brine from Salt-Beds, of which the following is a specification, reference being had to the accompanying drawings.

This invention relates to apparatus for obtaining brine from salt-beds; and its object is to provide a simple, inexpensive, and efficient means for effecting this purpose in such a manner that the brine will be of superior strength and quality, and the salt-bed is worked economically and to its best advantage.

In the drawings, Figure 1 is a vertical sectional elevation of a salt-bed and the mechanism by which the brine is obtained from the same. Fig. 2 is a horizontal sectional view taken through the bed and mechanism on the line *x x*, Fig. 1.

Referring to the drawings, A designates the earth in which the salt-bed B is deposited at some distance from the surface, C, of the ground.

D is a well bored or formed through the earth down into the salt-bed, as shown, and through this well extends a suitable pump, E, down a considerable distance into the salt-bed.

F is a pipe or tube, also extending down in the said well, and having a laterally-projecting nozzle, G, at its upper end, and some distance above the bottom end of the pump. In operation the water is run down this pipe F and escapes through the nozzle G, at the bottom thereof, against the side of the salt-bed, so that it washes down and dissolves the latter. The salt water or brine thereby obtained is then pumped out and carried to a suitable tank or storage-vessel by any suitable system of pipes. By reason of thus having the water wash down the sides of the salt-bed to the pump below, a much stronger solution of brine is obtained than if the water were simply deposited in the salt-bed at the same level as the bottom end of the pump, and then pumped up. The strength of the brine can by my improved apparatus be easily regulated by the amount of water passed down through the pipe F, the best results being obtained by running down

the same quantity of water as is pumped up. A continuous stream can by this method be run down and will wash the sides of the bed and be pumped up.

The pump can be operated by means of suitable windmill-power, H, mounted on a frame or derrick, I, arranged over the well; or, if desired, steam mechanism can be employed to continuously operate the pumping mechanism.

The pipe F is rotated either by independent power or by mechanism connected with the pump-operating power. By thus imparting to the said feed-pipe a rotary motion, the stream of water from the lateral nozzle G will, as it is forced against the sides of the salt bed or deposit, move in a circular path, so that a cylindrical chamber, J, is formed in the deposit, down the sides of which the water will run as the nozzle turns and directs the stream around the said chamber. This chamber will have approximately the shape of an inverted cone, the inclined sides enabling the water to readily run down the same to the contracted bottom, where the bottom of the pump opens.

The operation and advantages of my invention will be readily understood. It is very simple and efficient, and by its use the best results are secured, while important economy in space is also effected.

It will be understood that any desired number of nozzles may be employed.

I am aware that it is old to force water through a pipe in a well into a salt-deposit, and exhaust the same through another pipe by means of hydraulic or pneumatic pressure, such a process being shown in the patent to G. H. Smith, No. 273,623, and I therefore do not claim this. In this patent the feed and exhaust pipes are stationary, and one does not extend below the other, nor does the feed-water come against the sides of the deposit, and then flow down the same. In my invention the feed-pipe has a rotary motion, and is provided with a lateral bottom nozzle, through which the water is discharged directly against the sides of the deposit, and flows down the same to the bottom of the chamber, to become more thoroughly impregnated with the salt, and to dissolve the same more readily by the force of the current caused down the sides. The brine is then pumped up by a pump



mechanism that extends down into the accumulation of brine at the bottom of the chamber and below the nozzle of the feed-pipe, all as hereinafter claimed.

5 I claim as my invention—

1. An improved apparatus for obtaining brine from salt beds or deposits, comprising a pump for pumping the salt water or brine from the salt-bed, and a feed-water pipe extending into the salt-bed and terminating in a nozzle above the bottom end of the pump, whereby a stream of water can be thrown from the nozzle and run down the sides of the salt-bed before it is pumped up, as set forth.

15 2. As an improvement in apparatus for obtaining brine from salt beds or deposits in the earth, the combination, with a pump extending down into the deposit, of a feed-water pipe, also extending down into the deposit, and provided with a nozzle at its bottom end, some distance above the bottom of the pump, the said nozzle being arranged to throw a stream of water against the sides of the deposit in a circular path, when the water will run down the sides of the chamber in the salt-bed to the bottom of the pump, as set forth.

25 3. As an improvement in apparatus for obtaining brine from salt beds and deposits in the earth, the combination of a well extend-

ing down to the said bed, a pump arranged in the well and extending into the bed or deposit, and a feed-water pipe capable of a rotary movement, and having a lateral nozzle at its bottom end, some distance above the bottom of the pump, water being forced from this nozzle against the side of the bed, when it runs down the latter and is pumped up, as set forth.

4. As an improvement in apparatus for obtaining brine from salt-beds, the combination of the independent feed-pipe having a lateral nozzle projecting near the top of the chamber in the deposit, so that feed-water will be directed against the sides of the deposit, and will flow down the sides of the same to the bottom of the chamber, with a pump-cylinder extending down to near the bottom of the chamber below the nozzle of the feed-pipe, to exhaust the water after it has run down the sides of the chamber, substantially as and for the purpose set forth.

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

JOSEPH A. COOK.

Witnesses:

H. T. KEELER,

G. B. LONGSTREET.