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A. TEN BOSCH

METHOD FOR REDUCING THE PERCENTAGE OF WATER OF PEATIERIES

Filed April 28, 1924

Fig. 1.

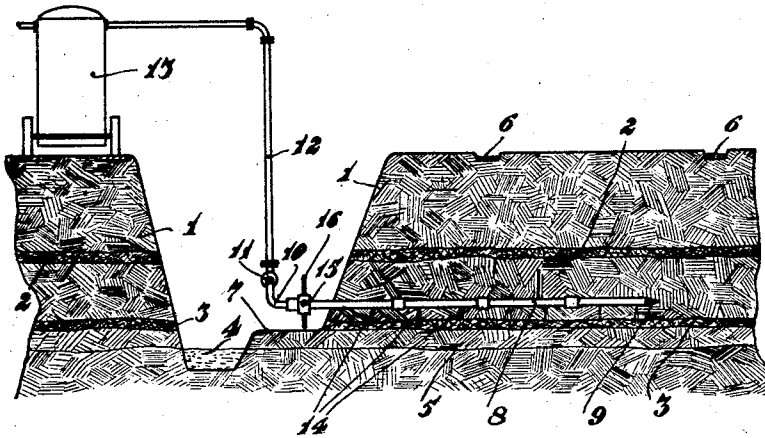


Fig. 2.

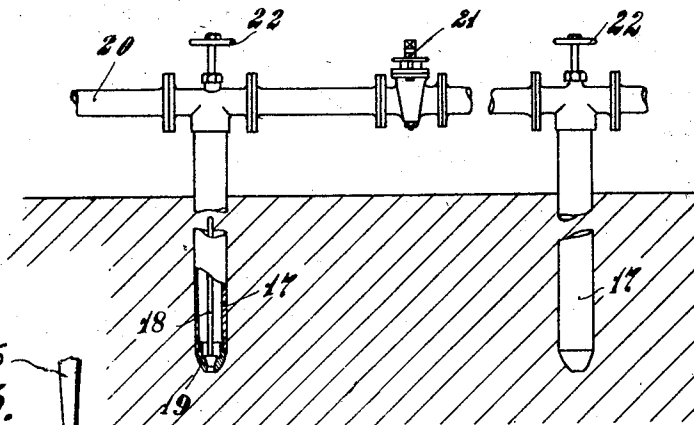
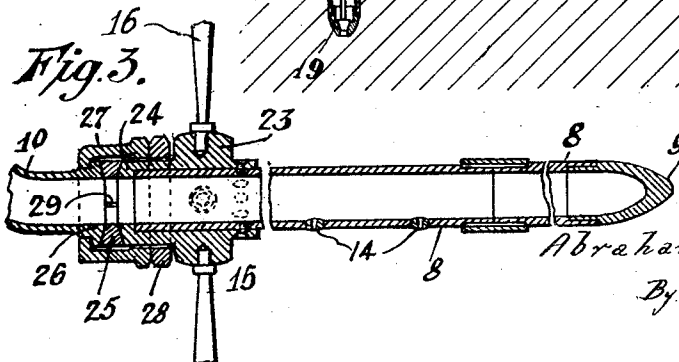


Fig. 3.



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METHOD FOR REDUCING THE PERCENTAGE OF WATER OF PEATERIES.

Application filed April 28, 1924. Serial No. 709,530.

To all whom it may concern:

Be it known that I, ABRAHAM TEN BOSCH, a subject of the Queen of the Netherlands, and residing at 9 Bachmanstraat, The Hague, the Netherlands, have invented certain new and useful Improvements in and Relating to a Method for Reducing the Percentage of Water of Peateries, for which I have filed an application in the Netherlands on April 16, 1923, No. 24,182, and in Germany on April 27, 1923, No. B. 109,442, and in Great Britain, May 1, 1923, No. 11,770, and of which the following is a specification.

The present invention relates to an improved method of reducing the percentage of water in peat deposits, its object being to overcome the difficulties of working peat deposits on a practical scale due to the great expenditure of labor, losses in the product itself, and to the costs of installing and operating the necessary apparatus.

According to the invention, the treatment required to reduce the water-content of the peat takes place in situ—that is, in the peat bog or bank itself; and such treatment may be carried out so far that the further draining of the peat, after the latter has been dug, can be effected in a manner to enable the peat to be sold at a price which will guarantee satisfactory financial returns.

In order to give a complete understanding of the invention, it may be stated that in many cases the virginal peat extends over a layer of sand or clay located above the underground-water level. In the course of time, an almost impenetrable crust forms upon this layer due to the peat water percolating therethrough; and furthermore, after the formation of the bog or bank has been completed, a second crust will form thereover which is practically impenetrable to water. My invention, therefore, proposes to break up the impenetrability of these layers by inserting into the peat above or below said layers—or both above and below them—and at an angle to the vertical, a series of pipes or conduits which will inject a medium capable of dissolving the layers and, at the same time, of attacking or destroying the colloidal condition of the peat.

The accompanying drawing illustrates, by way of example, two forms of apparatus which may be used for carrying out the invention: Figure 1 thereof being a sche-

matic view of one form of apparatus, in elevation, with the ground in section; Fig. 2, an elevational view of the other form, partly in cross-section; and Fig. 3 an enlarged sectional view of a detail of Fig. 1.

Referring to Fig. 1, the peat bank is indicated at 1, with the high peat bed extending downward to the impenetrable layer or crust 2, and the transition bed disposed between said layer 2 and the lower layer or crust 3; the latter being located a slight distance above the underground-water level, indicated at 5. The main trenches dug in the bank, one of which is shown at 4, are filled with water up to the level 5, being fed from auxiliary trenches 6 which collect rain water and supply it thereto.

At one side of the main trenches, the peat is excavated vertically so as to form a working platform or ledge 7 in order to permit the insertion of the fluid supply conduit 8 into the peat between the layers 2 and 3. This conduit consists of a number of pipe sections of suitable length—6 feet, for example—removably coupled together at their adjacent ends; the foremost section having a pointed end or nose 9 attached to it, and the rearmost section being connected to an elbow 10 on a collecting pipe 11 by means of a swivel joint which enables the entire conduit to be rotated for a purpose presently described. The collecting pipe 11, in turn, is secured to a supply pipe 12 which may be connected to any desired source of supply of the steam or other gas or of the acid or salt solution used to attack the crusts or layers 2 and 3 and to break up the colloidal condition of the peat. When steam is employed for this purpose, the supply pipe 12 is connected to a tank or reservoir 13, preferably portable, wherein collects the exhaust steam from the turbines, engines, pumps or the like utilized for operating the presses and other machinery installed in the plant.

The conduit-sections are provided with suitable openings or nozzles 14 for spraying the steam or other working fluid, which are initially so disposed as to direct the jets of fluid downward but which may thereafter be brought into position to cause the jets to project upward, when it is desired to attack the upper layer or crust 2, by rotating the conduit. To effect this move-

ment of the conduit, the previously-mentioned swivel joint may be employed; such joint, as represented in Fig. 3, comprising a hub or sleeve 23 which is fixed to the rear end of the conduit and is provided with a tubular projection 24 that has threaded on it a union 27 and an adjusting nut 28 therefor. The union 27 fits rotatably over the flanged end 26 of the elbow 10, and between said elbow end and the end of the projection 24 there is interposed a ring or washer 25 which is split at 29; the opposite faces of the ring being made slightly concave so as to fit conformably against the convex ends of the parts 26 and 24, such fit being maintained at the desired degree of tightness to avoid leakage by adjusting the nut 28. The sleeve 23 is equipped with radial handles 16, and by turning these handles, the conduit will be rotated bodily about its longitudinal axis, as will be understood, without, however, loosening the joint, since the union 27 can turn freely on the flanged end of the elbow.

Due to the arrangement above described, it will be possible to arrange a plurality of conduits of, say, thirty feet in length, at certain distances apart in the bank with the aid of a few unskilled laborers, and then connect the conduits to the collector pipe by means of the elbow pipes 10, the said collector pipe being disposed perpendicularly to the conduits and closed at its opposite ends. The working fluid is delivered under pressure to the supply pipe 12 and thence to the conduits; and since the conduits are arranged at an angle to the vertical, none of the calories, practically speaking, will be lost and the fluid will thus exert its full effect in penetrating the peat and attacking the coherence between the latter and the water, again assuming, of course that steam is being used, the supply being shut off as soon as vapors commence to rise from the surface of the peat in order to avoid waste of heat. Where solutions of salts or acids are employed, the duration of the treatment can be determined in any suitable way, for instance in accordance with a given maximum percentage of salt or acid to be consumed, and in either case the conduits may be rotated by means of the handles to direct the jets of fluid upward after a desired period of time. The conduits may be withdrawn after a certain portion of the bank has been worked, and then reinserted in another portion, during which time a sufficient quantity of exhaust steam will have collected in the tank 13 to enable the next treatment to be carried out; such treatment being facilitated and assisted if the peat beds and the layers or crusts are penetrated at various points in the working zone by forming vertical bores therein.

In the construction represented in Fig. 2,

the horizontal conduit 8 is replaced by a large number of pipes 17 which are inserted in the high peat bed at an angle to the vertical. These pipes 17 are connected to a common supply main 20 for the working fluid, and each of them encloses a valve rod 18 whose enlarged lower end is designed to close the tapered outlet end 19 of the pipe when said rod is turned in the proper direction by means of a handle 22. In operating this form of apparatus, the working fluid (which is assumed to be steam) is caused to enter first pipe 17, the controlling valve 21 in the supply main between that pipe and the succeeding one having first been closed. The fluid is then allowed to pass through the said pipe and to attack the peat and the layer 2 for a certain period of time, after which the pipe outlet 19 is closed by the valve rod 18, thus trapping in the pipe some of the steam and any water which may condense therein and which thereafter acts to heat the pipe. The valve 21 is then opened and the steam then passes into the second pipe 17, and so on; the heat imparted to each pipe by the steam or hot water therein, or by both, being transmitted therefrom to the peat.

By carrying out the invention according as described above, it is possible to reduce the water-content of the peat in the bank to such an extent that the mass to be lifted out and transported may be further drained in an economical and remunerative manner by means of known mechanical and other devices. The difficulties heretofore encountered and due to the large quantity of water originally present in the peat are entirely avoided.

I claim as my invention:—

1. A method of reducing the water-content of peat in peat banks, which consists in injecting internally of the bank at a point above at least one of the usual substantially impenetrable crusts a medium which will dissolve such crust and attack the colloidal condition of the peat.

2. A method of reducing the water-content of peat in peat banks, which consists in inserting into the bank a system of injecting pipes at a point adjacent one of the usual substantially-impenetrable crusts, and then supplying to said system for injection into the peat internally of the bank a medium which will dissolve such crust and attack the colloidal condition of the peat.

3. A method of reducing the water-content of peat in peat banks, which consists in injecting internally of the bank at a point between the usual upper and lower substantially-impenetrable crusts a medium which will dissolve such crusts and attack the colloidal condition of the peat.

4. A method of reducing the water-content of peat in peat banks, which consists

in injecting internally of the bank at a point above at least one of the usual substantially-impenetrable crusts a hot gaseous medium under pressure which will dissolve
5 such crust and attack the colloidal condition of the peat.

5. A method of reducing the water-content of peat in peat banks, which consists in inserting into the bank at one side thereof
10 and between the usual upper and lower substantially-impenetrable crusts a system of perforated injecting pipes; and then forcing through said pipe system for injection into the peat internally of the bank a medium
15 under pressure which will dissolve such

crusts and attack the colloidal condition of the peat.

6. A method according to claim 5, in which the solvent medium is first injected toward the lower crust, and thereafter the
20 pipes are rotated to inject said medium toward the upper crust.

7. A method according to claim 3, in which the solvent medium is first injected in the direction of the lower crust, and then
25 in the direction of the upper crust.

In testimony whereof I affix my signature.

ABRAHAM TEN BOSCH.