

(No Model.)

R. H. PINKHAM.

APPARATUS FOR REMOVING GRAVEL FROM FROZEN GROUND.

No. 605,512.

Patented June 14, 1898.

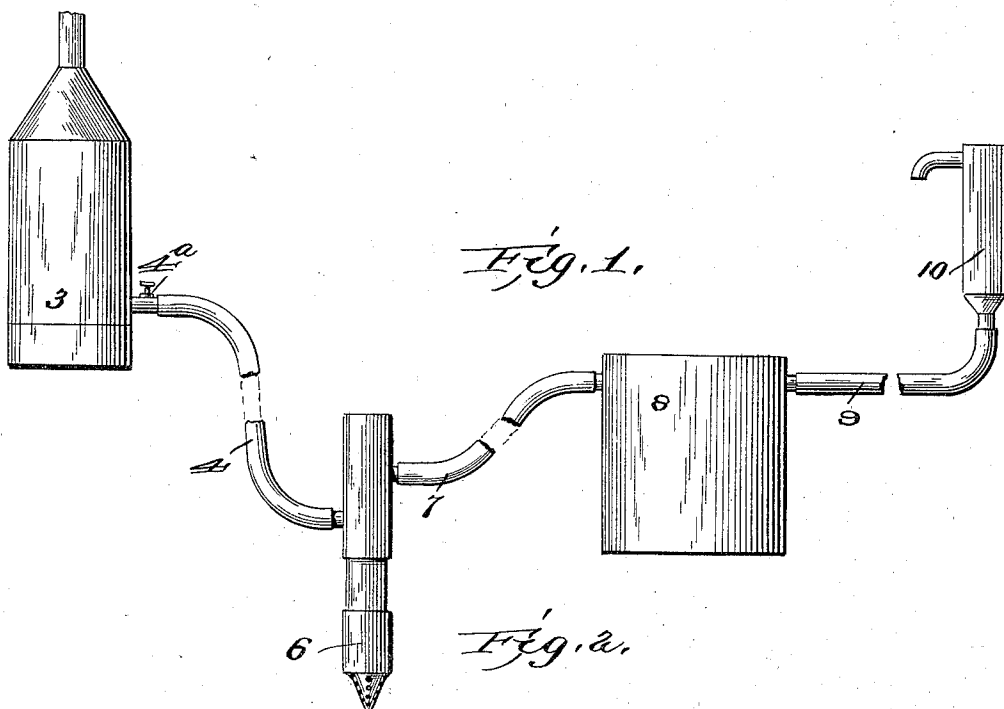
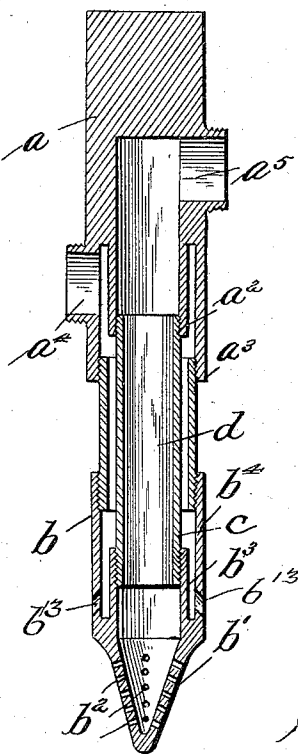


Fig. 2.



Attest
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APPARATUS FOR REMOVING GRAVEL FROM FROZEN GROUND.

SPECIFICATION forming part of Letters Patent No. 605,512, dated June 14, 1898.

Application filed January 29, 1898. Serial No. 663,463. (No model.)

To all whom it may concern:

Be it known that I, RALPH HOWARD PINKHAM, a citizen of the United States, residing at Wakefield, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Apparatus for Removing Gravel from Frozen Ground, of which the following is a specification.

My invention relates to an improved device for extracting gravel, the object of the invention being to provide a device capable of use in the winter, when the ground or gravel to be extracted is frozen solid.

The invention is illustrated in the accompanying drawings, in which—

Figure 1 is an elevation of the complete apparatus in the relative positions assumed in operation. Fig. 2 is an enlarged detail view of the extracting-nozzle.

Referring more particularly to the drawings, the numeral 3 designates a boiler or similar supply for hot water, which may be of any desired construction. This is connected by a pipe 4 with the extracting-nozzle 6, which in its turn connects by a pipe 7 with an airtight tank 8 for the reception of the gravel extracted, from which the water is drawn by a pipe 9, leading to a pump 10. The extracting-nozzle is shown more in detail in Fig. 2. This consists of a head *a* and a shoe *b*, connected by inner and outer concentric pipes. The shoe consists of the conical portion *b'*, designed to penetrate the frozen earth and having a plurality of openings *b²* for the passage of the water. This shoe is provided with upwardly-extending concentric flanges *b³* *b⁴*, which are threaded for connection to the pipes *c* and *d*.

The upper portion or driving-head *a* consists of a solid portion *a* and flanged portions *a²* *a³*, the flanges *a²* and *a³* being threaded for connection with the upper ends of the concentric pipes. A flanged opening *a⁴* provides an inlet-opening to the annular space between the flanges and pipes, the pipe 4 being connected to the flange of this opening. A similar flanged outlet-opening *a⁵* connects

the pipe 7 with the space within the inner pipe *d* and head and shoe.

It will be understood that by means of the driving-head the extracting-nozzle is driven down a suitable distance into the gravel to be extracted, and when in this position, as shown, for example, in Fig. 1, the cock 4^a is opened and the pump set in motion, and the hot water then flows from the boiler through the pipe 4 to the space between the pipes of the extracting-nozzle. From this space the hot water passes out through the surrounding openings *b¹³* and thaws the frozen sand and gravel, which is then drawn by the suction caused by the pump through the openings in the conical point of the shoe and, rising through the extracting-nozzle and pipe 7, passes into the tank 8, where the sand and gravel is deposited while the water is pumped off by the pump.

It will be understood that the tank may be representative of any receptacle into which it is desired to place the sand or gravel extracted. It will be further understood that owing to the threaded connections of the driving-head this may be disconnected and additional pipe-sections added to enable the shoe to penetrate deeper as the extracting progresses.

Having thus described my invention, what I claim is—

An apparatus for removing gravel from frozen ground comprising inner and outer pipes terminating in a tapering perforated shoe adapted to be driven into the ground, a hot-water supply communicating with the space between the pipes, said space having outlet-openings, a pump for raising the material through the interior pipe and an intermediate gravel-receptacle between the pump and the tube, substantially as described.

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

RALPH HOWARD PINKHAM.

Witnesses:

C. H. WELCH,
RODNEY LUND.