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C. A. SAHLSTRÖM.

DRYING RETORT FOR PEAT.

APPLICATION FILED JAN. 21, 1904.

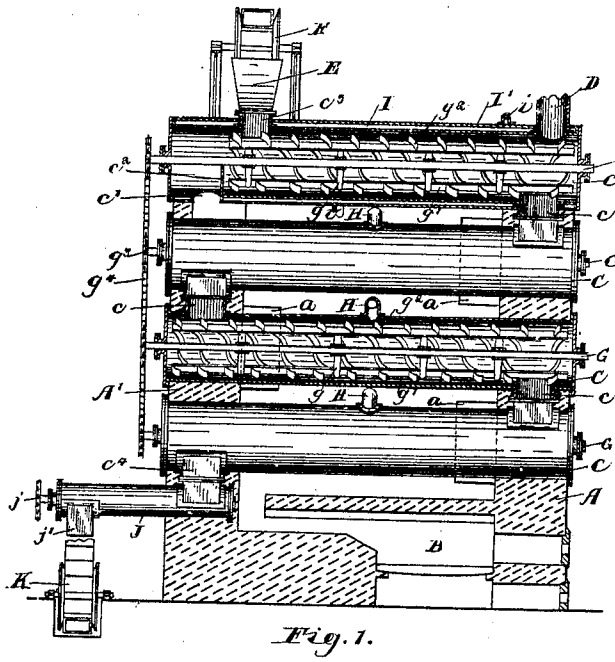


Fig. 1.

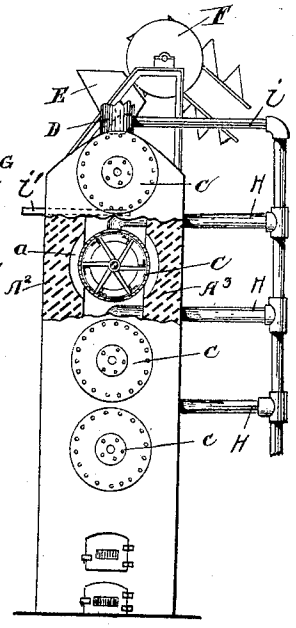


Fig. 2.

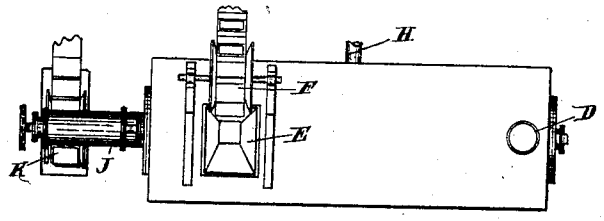


Fig. 3.

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UNITED STATES PATENT OFFICE.

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DRYING-RETORT FOR PEAT.

No. 805,030. Specification of Letters Patent. Patented Nov. 21, 1905.

Application filed January 21, 1904. Serial No. 190,046.

To all whom it may concern:

Be it known that I, CARL ADOLPH SAHLSTRÖM, a subject of the King of Sweden and Norway, residing in the city of Ottawa, county of Carleton, Province of Ontario, Canada, have invented certain new and useful Improvements in Drying-Retorts for Peat and the Like, of which the following is a specification.

My invention relates to improvements in drying-retorts for abstracting the moisture from peat, sawdust, or other like vegetable matter; and the objects of my invention are to devise a machine by means of which the water or moisture may be completely driven off by the application of heat in progressively-increasing temperatures, further objects of the device being to economize the heat to the greatest posible extent; and it consists, essentially, of a structure of brick or other fireproof and heat-non-conducting material having a fireplace or other source of heat located in the lower portion thereof and a plurality of cylinders supported by said structure and connected together in series, rotatable, longitudinal, and spirally disposed blades or paddles for conveying the peat through said cylinders, suitable passages for conveying the heated gases from the source of heat in a zigzag path so as to heat the entire surface of each of the cylinders and to pass through the interior of the uppermost cylinder, and suitable inlets and outlets for the peat, the various parts being constructed and arranged in detail as hereinafter more particularly described.

Figure 1 is an elevation of the drier, partly in section. Fig. 2 is an end view, partly in section. Fig. 3 is a plan view of the drier.

In the drawings like letters of reference indicate corresponding parts in each figure.

A A′ are the front and back walls of the structure.

A^3 A^3 are the side walls.

B is the fire-grate or other source of heat.

C C C C are four retorts or cylinders which are supported by the walls of the structure, their ends extending through the front and rear walls A A′. These cylinders are suitably connected together in series by the chutes or passages *c c c*, the inlet-passage to each of the cylinders being located at the opposite end to the outlet-passage, so that the peat must pass completely through the cylinder. The cylinders extend partially into the side walls of the structure, which serve as an additional support therefor. Flues *a a a* are formed in the side walls and are adapted to carry the heated gases of combustion from the space underneath to the space above the various cylinders and are so located as to direct the current of these gases in a zigzag path.

c′ is an opening located in the rear portion of the topmost cylinder of the series, this opening communicating with the space between the said cylinder and the cylinder next below, and thereby permitting the gases of combustion to pass into the top cylinder of the series. A partition c^2 extends up to about the upper cylinder in proximity to the inlet *c′* to prevent the peat falling therethrough.

An outlet D is provided at the opposite end of the top cylinder, through which the heated gases and the steam driven off from the peat in the top cylinder may escape. A suitable inlet peat-hopper E is located above an opening c^3 in the top cylinder and is fed by suitable means, such as the elevator F. Within each of the cylinders C is located a shaft G, journaled in bearings formed at the ends of the cylinders. By means of the spiders *g*, which are rigidly secured to this shaft, longitudinal blades *g′*, preferably formed of angle-iron, and spirally-disposed blades g^2 are carried by the shafts. These blades have their outer edges comparatively close to the inner surface of the cylinders for reasons to be hereinafter explained.

H represents outlet-pipes for taking off steam which is evolved from the peat as it passes through the cylinders. The steam passing through these pipes may be carried off by its own pressure, if sufficient, or by means of a fan or other suitable device; but it may also be used advantageously to assist in heating the top cylinder of the series by being passed into the space I between the jacket I′ and the outside surface of the top cylinder C through a suitable inlet *i*, the water of condensation and the steam itself being carried off through the outlet *i′*.

The shafts G may be driven by any suitable means; but the means which I prefer to employ consists of a plurality of sprockets g^3 and a sprocket-chain g^4.

The dry peat or other material is carried

off from the end of the last cylinder of the series by the passage c^4, which communicates with the exit-cylinder J, which is provided with any suitable rotating conveying means, which may be driven by the sprocket j. The outlet j' conveys the peat into a suitable conveyer K.

The operation of the device is as follows: The peat which is fed in through the hopper E is conveyed through the top cylinder by the rotating spiral blades g^2 and is at the same time continuously lifted up and dropped down in the interior of the cylinder by means of the longitudinal blades g', and, further, the spiral and longitudinal blades being set so as to have a very small distance between their outer edges and the inner surface of the cylinders will continuously press the peat against the hot inside surface of the cylinder, so that the moisture will be completely driven out of the same. The effect of the longitudinal blades will also increase the amount of the peat which is brought intimately in contact with the heat, as it continuously stirs it up in its passage through the cylinders, thereby exposing all the particles to the action of the heat. At the end of the first cylinder the peat falls through the opening c into the cylinder next below, where the same action continues, and in the succeeding cylinders till all the moisture or a very large proportion thereof has been removed from the peat, and the peat is then carried off through the exit-cylinder J. The course of the hot air and gases from the fireplace is indicated by arrows in Fig. 1, and an important point is to be noted—namely, that the heated air passes around the two lower series of the cylinders, but through the top cylinder, the reason for this being that it is desirable to take as much heat as possible from the heated air and gases before it is finally allowed to escape up the flue. By passing it through the top cylinder, therefore, the current of heated gases comes more intimately in contact with the particles of peat, and thereby gives up to them a greater quantity of its heat and also absorbs from the heat a very large quantity of the moisture contained therein. These heated gases could not be passed through the lower cylinders, however, as naturally by the time they reached the top cylinder in such a case the gases would be so thoroughly saturated with moisture that not only would they not tend to dry the peat in the top cylinder, but might even give up a certain amount of their moisture to the peat.

It will now be seen that I have invented a drier possessing a number of practical advantages in its construction. For example, the heat contained by the steam given off in the process of drying is not wasted, but is used in heating the top cylinder. The heated gases are directed so as to come in contact with the whole length of each of the cylinders and the contents of the top cylinder, so that practically all the heat contained by the said gases is utilized. The construction of the interior conveying apparatus is also one which tends to prevent any choking of the contents, so that a minimum amount of power is required to drive the conveyer-shafts.

It is to be understood that I do not wish to confine myself in using this device to the exact details of construction herein shown and described, as certain variations in the details of construction might be made without departing from the spirit of my invention. Of these I might mention that although four cylinders are herein shown I may provide a machine with more or less, if desirable. The steam might be taken off from the cylinders in other ways than by means of the exit-pipes, as shown. For example, it might be allowed to pass up through the passages c into the topmost cylinder and could be carried off from there, and other changes in detail might be made; but these need not be here referred to, as they would all come within the scope of mechanical skill.

What I claim as my invention is—

1. In a device of the class described the combination with the supporting structure and the plurality of cylinders located therein, the communicating passages between the cylinders and the peat and steam inlets and outlets, of the source of heat located in the lower portion of the structure, suitable flues for guiding the heated gases therefrom so as to bring them into intimate contact with the entire length of each of the cylinders, an opening being formed in the top cylinder through which said heated gases are adapted to pass into the said cylinder and an outlet-opening therefor as and for the purpose specified.

2. In a device of the class described the combination with the supporting structure of the cylinders supported thereby and having passages for connecting them together in series, the conveying means for conveying the peat through the cylinders and the inlets and outlets, of steam-outlets to carry off the steam evolved from the peat in the cylinders, an outside jacket around the top cylinder forming therewith an air-space and means for conveying the steam given off from the lower cylinders into said air-space thereby forming a heating-jacket for the top cylinder and means for drawing off the said steam and condensed water from the steam-jacket as and for the purpose specified.

3. In a device of the class described the combination with the supporting structure and the cylinder supported thereby, of a suitable source of heat, inlets and outlets for the cylinder and a conveying device comprising a longitudinal shaft rotatably mounted in the ends of the cylinder, longitudinal blades secured by arms or spiders to said

shaft and spirally-disposed blades secured to and extending between said longitudinal paddles, the outer edges of said spiral and longitudinal paddles or blades being in proximity to but not in contact with the inner surface of the cylinder as and for the purpose specified.

Signed at the city of Ottawa, in the Province of Ontario, this 18th day of December, 1903.

CARL ADOLPH SAHLSTRÖM.

Witnesses:
J. A. SYMES,
MAY LYON.