

No. 788,100.

PATENTED APR. 25, 1905.

W. T. GRIFFIN.
PROCESS OF TREATING PEAT.
APPLICATION FILED FEB. 25, 1903.

2 SHEETS--SHEET 1.

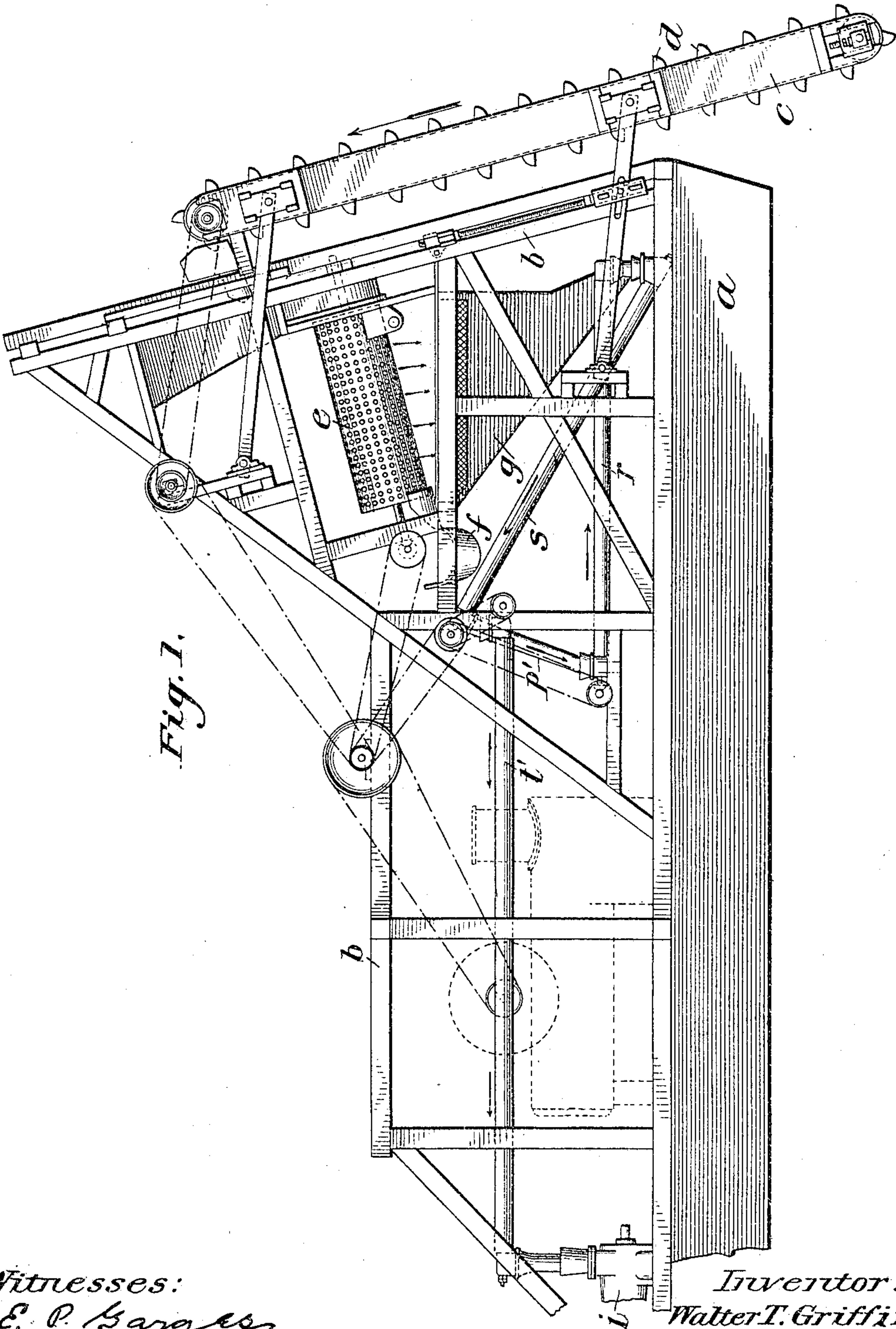


Fig. 1.

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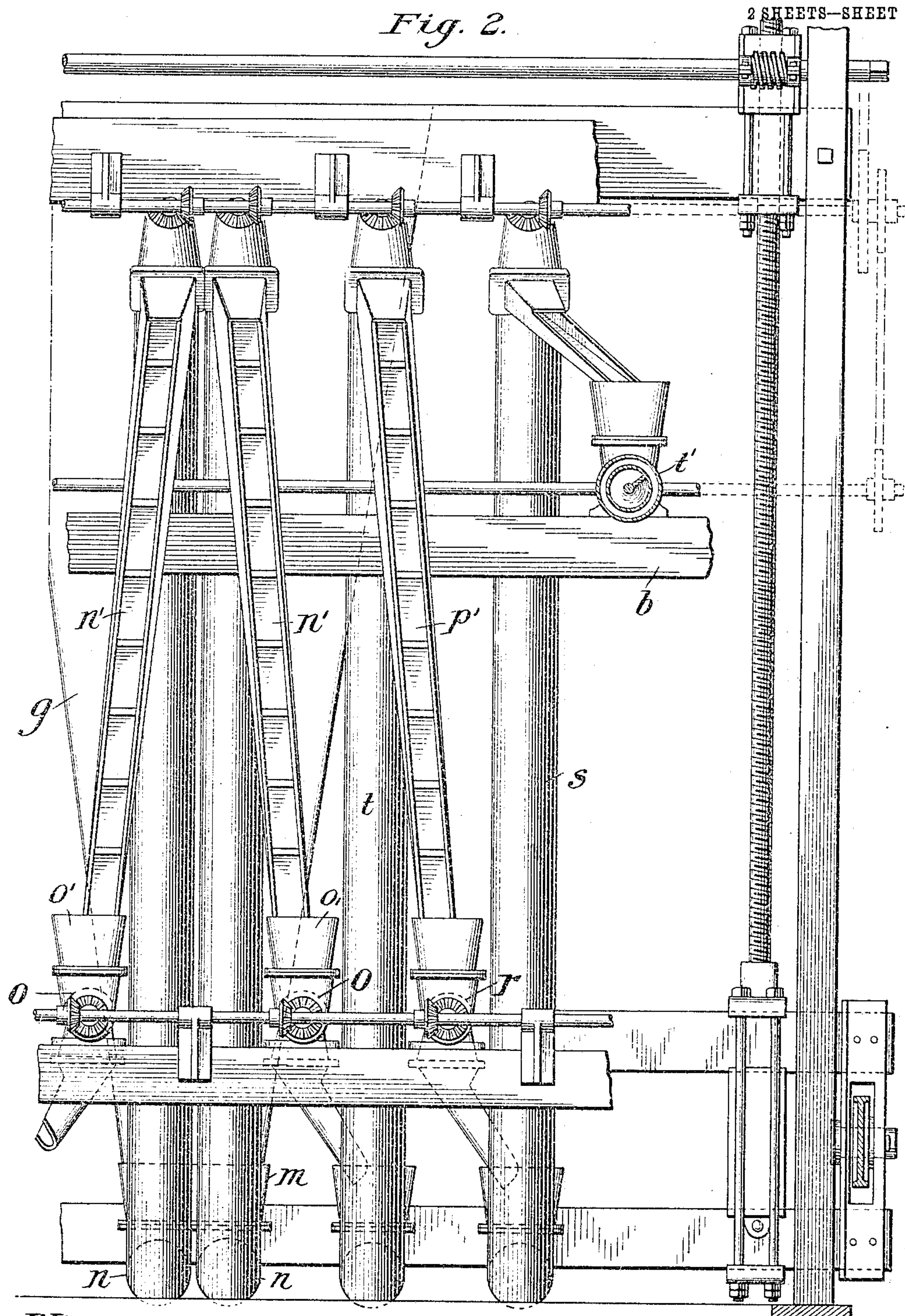
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Fig. 2.

2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

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PROCESS OF TREATING PEAT.

SPECIFICATION forming part of Letters Patent No. 788,100, dated April 25, 1905.

Application filed February 25, 1903. Serial No. 145,115.

To all whom it may concern:

Be it known that I, WALTER TIMOTHY GRIFFIN, a citizen of the United States, residing at Limoges, France, have invented certain new and useful Improvements in Processes of Treating Peat, of which the following is a specification.

My invention relates to a process or method for the excavation of crude peat, salt, &c., and the subsequent treatment thereof for commercial use; and the object of the same is to devise a continuous process by which the peat may be gathered and conveyed to a compressor designed to operate upon the material, the latter being treated in transit to extract a large percentage of the moisture therefrom without compressing the peat and without detracting or diminishing the calorific properties thereof.

To this end the process includes, primarily, passing the peat through a zone heated to such a degree that the cellular construction of the material will be expanded until it is broken, whereby the moisture or water contained therein will be freed, so that it may pass off, said peat, however, not being heated to such a degree as to release the volatile oils or gases contained therein, and it includes, further, the step of suddenly or abruptly subjecting the material treated immediately upon its exit from the heated zone to a relatively colder atmosphere and to a separating action whereby the oils or gases which may have passed into a semivolatile or nascent state are congealed therein.

The invention further includes the detailed steps of the method or process to be hereinafter described, and particularly pointed out in the claims.

As the process may be illustrated by a machine, I have shown in the accompanying drawings one construction of such for carrying the process into effect.

In the drawings, Figure 1 is a side elevation of a machine designed to carry out my process, and Fig. 2 is a transverse sectional view of a part of the same.

In carrying my process into effect the crude peat is excavated from the bog in thin slices

or cakes, preferably but a fraction of an inch in thickness, and conveyed, preferably by an endless elevator, to a screening-station, at which point, preferably an elevated one, all foreign matter—such as sticks, roots, sod, and the like—is separated therefrom. The screened material is then deposited at a draining-station, preferably by falling continuously through the meshes in the screen during the separating action directly into a hopper arranged beneath said screen. At the draining-station the greater specific gravity of the peat serves to separate the same from the free water discharged at said draining-station, and said water is drawn off from the peat at this point. From this station the peat is carried by a circuitous path to the compressor-station, where the treated material may be further operated upon. In transit from the draining-station to the compressor-station the material is passed through a heated zone to extract in part the moisture from the material and subjected to a cooling and separating action immediately upon its exit from said heated zone.

As is well known, peat is a fibrous cellular substance, the cells thereof containing a large percentage of free water.

It is my purpose in passing the material through the heated zone to expand the cells of the material to the point of bursting in order that the water contained in the same may be released and yet not to heat the material to such a degree that the valuable oils and gases contained therein will be volatilized.

In order that a strong or powerful heat may be applied to the material and yet the volatilization of the gases and oils arrested or prevented, as before premised, my process includes as a step thereof subjecting the material immediately upon its exit from the heated zone to a much lower temperature and at the same time separating or disintegrating the mass, so that not only will the colder atmosphere rapidly permeate the same and congeal any oils or gases in a partly-volatilized state, but the free water released from the broken cellular structure and steam generated therefrom will pass off and not be held in

check, as it otherwise might be by the crust which forms on the material during the passage of the same through the heated zone.

In the transit of the material from the draining-station to the compressor the same is preferably passed through a succession of heating, cooling, and separating operations, so as to extract the moisture and dry the material, while maintaining the same in such condition that the water released therefrom and steam generated from the same will not be arrested during the entire passage of the material, to permit of strong heat being applied to the peat in its passage through the heated zones, and to arrest or prevent the volatilization of the valuable oils and gases contained therein.

In the means illustrated in the accompanying drawings for carrying my process into effect a movable carrier *a* is shown, providing the base or support for the entire apparatus, this carrier being shown in the form of a scow or lighter adapted for flotation in the water of the bog; but, as will be understood, the apparatus may be carried by two or more scows, a scow and a contiguous vehicle, or in some instances entirely by a vehicle. The framework of the apparatus is designated by the letter *b*, supported from the front end of which and depending over the front of the scow is an adjustable elevator-leg and excavator *c*, provided with an endless band, cable, or chain carrying a series of scoops *d*, designed to cut or excavate the peat from the bog in thin layers or cakes and to elevate the same to the screening-station, at which point the material is dumped into a cylindrical revolving screen *e*, set at a suitable inclination so as to discharge the extraneous matter into a trough *f*, which conveys it to some place of deposit. The separated portions of the peat fall through the meshes of the screen *e* into a receiving-hopper *g*, located directly under said screen, having a foraminous upper portion and a contracted lower portion, with a spout leading from the end thereof to the mouth of the conveyer which carries the material to the compressor *i*. As the peat is excavated, elevated, and discharged into the screen a quantity of free water is carried with the same and passing through the meshes in the screen falls into the hopper *g*. As the peat is of greater specific gravity than the water, however, the former will gravitate to the contracted portion of the hopper, forcing the water toward the top of the same, where it will pass off through the openings therein.

The material discharged from the hopper *g* is preferably carried by a circuitous route to the compressor *i*, being alternately heated and cooled and separated a number of times in transit. To effect this purpose, the conduit before referred to is preferably circuitously arranged or coiled at its end communicating with the hopper *g*, one member of

each coil being arranged at an inclination and the other member being horizontally disposed and one of the ends of each coil being entirely open, the continuity of the conduit being preserved by open sluices or troughs having ripples arranged transversely of the same.

The entire closed portion of the conduit is heated, preferably by providing a steam-jacket for the same, although other arrangements may be employed for this purpose.

It will be apparent that the closed horizontally-arranged and inclined members of the coils before referred to provide heating zones and that the sluices or troughs arranged between said inclined and horizontal members provide means for cooling and separating the material immediately after it passes through the heated zones in its transit from the hopper to the compressing-machine. In the operation of this part of the process the material gravitating in the bottom of the hopper *g* is discharged therefrom into a hopper *m*, which in turn discharges the material into the lower open ends of the inclined members *n n* of the conduit. By means of rotating forwarding-worms working axially of the members *n n* the material deposited in the lower ends of the same is carried upwardly therethrough, is heated in its passage, and is discharged into the open atmosphere through the rear ends of said members. The discharged material falls into the open sluices or troughs *n' n'*, passes down through the same, and is discharged at the lower ends thereof into the hoppers *o'*, which in turn discharge the material into the open ends of each of the members *o* of the conduit, the material being both cooled and separated in its passage through said sluices. By means of worms working in the members *o* the material is carried through the latter, being heated in transit, and is discharged at the rear ends of said members into the inclined members *t*. By means of worms arranged in the latter the material is carried upwardly through the same and discharged through the upper open ends thereof into the sluice-boxes *p'*, corresponding to the troughs *n' n'*. The material passes down through said boxes *p'*, is separated and cooled in transit, and is discharged into the members *r*, corresponding to the members *o*. By means of forwarding-worms the material is carried to the rear of the members *r*, being heated in transit, discharged into the inclined members *s*, elevated through the latter by forwarding-worms, being heated in transit, and discharged at the upper ends of said members *s* into the major members *t'* of the conduit, which carry the material directly to the compressing-station, where a compressing-machine may be located.

As the two ends of the conduit adjacent to the front ends of the same are correspond-

ingly constructed or coiled, in the cross-sectional view Fig. 3 I have deemed it necessary to show but one end of said conduit complete or but one-half of the entire conduit at this end, as it will be understood that the part omitted is but a duplicate of that illustrated.

I have determined that the cells of the peat begin to burst at a temperature of approximately 190° Fahrenheit, the precise temperature depending somewhat upon the quality of peat under treatment, and complete expansion or bursting takes place at a temperature between 250° and 275° Fahrenheit.

When the temperature is carried to or above 300° Fahrenheit, it is found that the valuable oils and gases will be volatilized and burned.

From the foregoing my process will be fully understood, and it will be appreciated that the peat may be economically treated according thereto and that the product when produced will be highly efficient as a fuel.

Having thus described my invention, what is claimed as new, and desired to be secured by Letters Patent, is—

1. The herein-described process for treating peat, which consists in passing the material through a zone of sufficient length and high degree of temperature to heat the peat to a degree which will cause the cells thereof to burst, and relieving said material of the effects of said zone substantially at the moment of the bursting of the cells to arrest the tendency of the oils or hydrocarbons to volatilize, substantially as described.

2. The herein-described process for treating peat, which consists in passing the material through a zone of sufficient length and high degree of temperature to heat the peat to a degree which will cause the cells thereof to burst, and subjecting the material to a cooling and separating action before material volatilization of the oils in the peat ensues, substantially as described.

3. The herein-described process for the treatment of peat and the like, which consists in passing the material through a circuitous path, said path including substantially regularly-spaced heating zones and sta-

tions extending from the outlet end of one zone to the inlet end of the succeeding zone at which stations the material is subjected to a cooling and a positive separating action, substantially as described.

4. The herein-described process for the excavation and continuous treatment of peat, &c., which consists in excavating the material in thin layers, separating the extraneous matter from the peat, draining the free water from the material, subjecting the drained peat a plurality of times first to the action of heat, and then to cooling and separating actions, and finally compressing the material, substantially as described.

5. The herein-described process for treating peat, &c., which consists in excavating the peat in thin layers, conveying the latter to a screening-station, separating the extraneous matter from the peat, delivering the separated peat to a draining-station, separating the free water from the material by gravity, permitting the escape of said water, conveying the material from the latter station to a compressing-station and subjecting the peat in transit alternately and successively a plurality of times first to the action of heat by passing the same through heated zones arranged in a spiral path and then to cooling and separating actions, substantially as described.

6. The herein-described process for the treatment of peat, which consists of passing the material through a zone heated to a degree to raise the temperature of the peat to between 190° and 275° Fahrenheit and suddenly arresting the increase in temperature of the peat and rapidly cooling the same before the temperature of said material reaches 300° Fahrenheit, substantially as described.

In testimony whereof I have hereunto signed my name, in the presence of two attesting witnesses, at New York, in the county of New York and State of New York, this 29th day of January, 1903.

WALTER TIMOTHY GRIFFIN.

Witnesses:

O. H. GLENDINNING,
E. R. HUDDERS.