TO ALL WHOM IT MAY CONCERN:

BE IT KNOWN THAT WE, WILLIAM JAMES REGINALD SIMS, CONTRACTOR, OF THE VILLAGE OF KIRKFIELD, IN THE COUNTY OF VICTORIA, AND ALFRED LAWRENCE DAVIS, INSURANCE AGENT, OF THE TOWN OF PETERBOROUGH, IN THE COUNTY OF PETERBOROUGH, IN THE PROVINCE OF ONTARIO, CANADA, HAVE INVENTED CERTAIN NEW AND USEFUL IMPROVEMENTS IN PROCESSES OF TREATING AND DRYING PEAT, OF WHICH THE FOLLOWING IS A SPECIFICATION.

Our invention relates to improvements in processes or methods for treating and drying peat; and the object of the invention is to devise a continuous process by which the crude peat fed at the one end may be delivered at the opposite end in a properly-pulverized and sufficiently dry state for the compressing-machines to form a perfect block and so that the cost of manufacture may be reduced to a minimum without detracting from or diminishing the calorific properties of the product, and thereby enable an excellent fuel to be put on the market at a price well within the reach of the consumer. These objects we attain by the various steps in our method, as hereinafter described.

Figure 1 is a diagrammatic elevation showing the arrangement of the apparatus designed to carry our method into effect. Fig. 2 is a plan view of such apparatus.

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

It is well known in the treatment of peat heretofore that the great difficulty has been in producing peat at a price which will enable it to be put on the market with a reasonable amount of profit. It is also well known that in methods heretofore employed the great difficulty has been in eliminating the moisture from the peat to such an extent that the compressing-machines will turn out blocks which are perfect throughout—that is to say, without large cracks or openings in the block. Indeed, in most blocks of peat as at present produced the cracks predominate. These cracks and defects or openings are seriously detrimental to its utilization as fuel, for the reason that the combustion is facilitated to a much greater extent than if the block were solid, as the flames permeate through the

cracks to all portions of the peat. In fact, this has been one of the great sources which render this fuel defective. In order to produce a perfect block without cracks or indentures, it is necessary that the moisture in the powdered peat should be reduced in practice to about twelve per cent. and certainly not under ten or over fourteen. Peat when produced with too much moisture in it, even if the blocks do not crack when formed, may afterward by exposure to the air crumble or break, thus taking away from the effectiveness of such peat as a fuel. It will therefore readily be understood how important it is that the exact amount of moisture be retained in the peat in order to produce first-class fuel. On the other hand, if the pulverized peat is made too dry the blocks when made go to pieces in transhipment, which is also a serious matter. Another defect which may be mentioned is that when the peat is formed into blocks with cracks such blocks disintegrate in the fire and pass down through the grate-bars of a stove or furnace, so that the peat is wasted as well as the heat which ought to be produced. It will therefore be understood that it is with the object of producing the peat with a proper degree of moisture, which will avoid all these objections and which will render such pulverized peat suitable for compressing, that our invention is particularly designed.

We shall now describe the method for treating and drying the peat which we have found to be efficacious.

After the peat is brought in to the scow, dredge, or steam-shovel it is deposited in a hopper A, from which it descends into a cylinder B, made, preferably, of iron slats and arranged at a slight incline, but nearly horizontal. This cylinder is rotatable by any suitable mechanism and is for the purpose of disintegrating the peat and clearing it of all foreign matter, such as roots, sods, &c. At the bottom of the cylinder is a conveyor C, by which the peat in a disintegrated state is carried to another conveyor D, which in turn carries it to a hopper E, provided at the bottom with a suitable spreading device F, whereby the disintegrated peat is carried into a box or other suitable receptacle G in the
form of a layer or layers. From the receptacle G the peat is conveyed by a suitable truck g to a hydraulic press H, where the layer or sets of layers suitably placed one on top of the other are compressed. We find in practice that the layer or layers are relieved by such hydraulic presses of about fifty per cent. of moisture and are compressed into flat shallow cakes of peat. From the hydraulic press the peat is conveyed by another suitable truck g to another hopper I, provided with suitable agitators i, whereby the flat cakes are broken up. At the bottom of the hopper we provide the regulating-gates /, whereby the supply of peat to the conveyors J may be regulated to a nicety, this of course depending upon the amount of peat that can be conveyed at a given speed. The proper amount of course that should be deposited is the conveyer must be commensurate with the requirements of the drier into which the peat is afterward conveyed.

J is the screw conveyer, by which the peat is conveyed from the disintegrating-hopper to the chain conveyer K, by which it is carried to another disintegrator L, which is designed to remove all lumps. Underneath the chain conveyer is preferably arranged any suitable heating device, preferably steam-pipes k.

M is a chain conveyer, by which the disintegrated peat is conveyed to the drier n, and this conveyer is of course regulated at a proper relative speed to the other conveyers and to the capacity of the drier. The drier n may be of any approved form, but has preferably a rotating cylinder, to which the heat is applied as the peat is being carried through.

From the drier the peat passes by conveyers O to another disintegrator P, which we find in practice pulverizes all the remaining lumps in the mass. At this stage of the process the peat is in a hot state, having passed through the drier, which is kept at an exceptionally high temperature. From the disintegrator P the peat in this hot state is carried to a chain conveyer Q, which carries the peat upwardly at an incline and dump it from the end through a considerable space of air into a similarly constructed and arranged incline conveyer R, from which it is also dumped into a subsequent conveyer S, which carries and dumps it into a hopper T, from which the compressing-machine T are supplied. The compressing-machines T have conveyers U extending underneath them, from which the blocks as turned out are conveyed to a suitable bin or storehouse V. When the peat has passed through the drier and disintegrator, a certain amount of moisture still remains, which is too great for the proper formation of the block; but as the peat is precipitated from the end of each conveyer Q, R, and S through the air such peat, coming in contact with the colder air, causes a steam to form and pass off from the now pulverized peat, thereby removing so much of the remaining moisture as it is necessary to eliminate in order to produce the proper degree of moisture, which we have before intimated is about twelve per cent.

We attribute a great deal of importance to our dumping-conveyers Q, R, and S, as not only is the temperature reduced in the intensely-heated mass of the peat, but the moist- 75 ture is reduced, as hereinbefore described, and to the water to be fed directly to the compressing-machine without loss of time and at a proper degree of temperature as well as of moisture for the proper working of the dies.

It will be noticed that our process is a continuous process and that practically all the mass is exposed to the air before finally compressing. In practice we find that from the beginning of this process to the moment that the peat passes into the compressing-machine—occupies a period of little more than half an hour.

In this application we do not wish to lay claim to the device by which the crude peat is relieved of roots and foreign matter, nor to the hydraulic device by which the moisture is extracted from the peat, as these form the subject-matter of separate applications; but we may say that it is important that the peat is properly spread in layers separated by suitably-perforated racks to enable the moisture to be extracted when placed in the press. We may also mention that the whole of the 100 plant used in our method is preferably located in suitable buildings in order to enable us to utilize our method for turning out peat both in winter as well as in the summer.

In order to equalize the degree of moisture in the peat as it is being fed from the hopper T, we preferably provide a steam-pipe t', which is provided with suitable faucets, such pipe being also provided with branches leading into the spout t, whereby a jet of water or steam may be injected into such spouts when it is found that the pulvored peat is too dry for proper compression in the machine. It will also be understood that although we show the pulverized peat as being dumped through space from one conveyer to the other, such as shown and described in reference to the conveyers Q, R, and S, such pulverized peat might not be dumped as shown, but simply conveyed without dumping to the feed-hopper of the compressing-machine, or other means may be employed to relieve further moisture, such as a forced-draft conveyer.

What we claim as our invention is—

1. The method herein described of treating and drying crude peat consisting first in removing the roots and foreign matter from the peat and at the same time disintegrating such peat, then spreading the peat in its disintegrated state, then compressing such spread peat into a flat cake, so as to reduce the moisture, then breaking or disintegrating the peat, then carrying a regulated supply of such disintegrated peat in a stream through a
slightly-heated zone, so as to further reduce the moisture, then further disintegrating the peat to remove the lumps, then carrying such further-reduced peat in a stream into and through an intensely-heated zone, then running such disintegrated peat out in a stream, then disintegrating again so as to remove further lumps, then further conveying said peat in a stream and then causing the now completely pulverized and heated peat to fall through space whereby practically all the particles are exposed to the action of the air, so as to cause a steam to arise from the particles and the pulverized peat to be further reduced in temperature prior to compressing as and for the purpose specified.

2. The method herein described of treating and drying crude peat consisting first in removing the roots and foreign matter from the peat, then spreading it in a loose layer or layers, then compressing the layer or layers into a flat cake, then disintegrating said cakes, then carrying or conveying such disintegrated mass through a more or less heated zone, again disintegrating the mass to still further and more uniformly reduce the same, then conveying the mass through a highly-heated zone, then disintegrating the heated mass of peat by which the peat is further and more uniformly reduced, then conveying the peat to a sufficient height, then discharging it in its pulverized state, so that in passing through the air the temperature and moisture are reduced prior to compressing as and for the purpose specified.

3. In the process herein described spreading the peat after disintegration, then compressing it to remove the moisture and form flat cakes, then disintegrating the flat cakes and feeding a regulated supply for further treatment.

4. The method herein described of treating and drying crude peat consisting first in removing the roots and foreign matter from the peat and at the same time disintegrating such peat, then spreading the peat in its disintegrated state, then compressing such spread peat into a flat cake, so as to reduce the moisture, then breaking or disintegrating the peat again, then feeding a determinate amount through a slightly-heated zone, so as to further reduce the moisture, then dumping and further disintegrating the peat to remove the lumps, then carrying such further-reduced peat in a stream through an intensely-heated zone, then running such disintegrated peat out in a stream, then disintegrating again so as to remove further lumps, then further conveying said peat in a stream and then dropping the now completely pulverized and heated peat through space whereby practically all the particles are exposed to the action of the air, so as to cause a steam to arise from the particles and the pulverized peat to be further reduced in temperature, then finally subjecl the pulverized peat to a spray of steam and finally compressing the same.

5. The method herein described of treating and drying crude peat consisting first in removing the roots and foreign matter from the peat and at the same time disintegrating such peat, then spreading the peat in its disintegrated state, then compressing such spread peat into a flat cake so as to reduce the moisture, then breaking or disintegrating the peat again, then feeding the same in determinate quantities through a slightly-heated zone, then further disintegrating the peat to remove the lumps, then carrying such further-reduced peat in a stream into and through an intensely-heated zone, then running such disintegrated peat out in a stream, then disintegrating again so as to remove further lumps prior to compressing as set forth.

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Witnesses:
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