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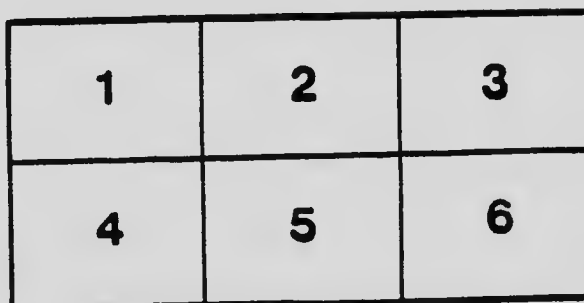
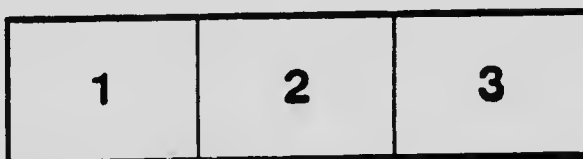
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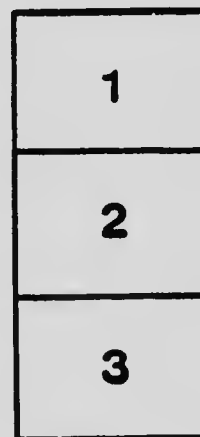
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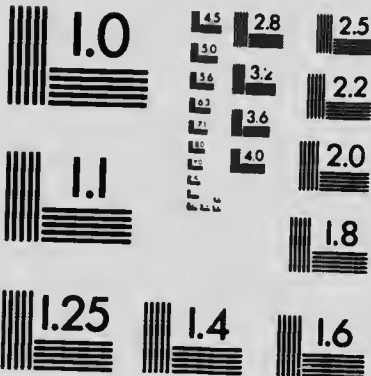
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THE PRODUCTION OF PEAT

BY THE
AUTOMATIC
MOVABLE PEAT PLANT

*Read by Ernest V. Moore, before the American
Peat Society, at Ottawa, July 26th, 1910.*

Price 50 cents.

WITH FIVE ILLUSTRATIONS

The International Peat Engineering Company, Limited,
Farnham, P.Q., Canada.

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Gentlemen:—

Owing to lack of time I have not been able to prepare such a paper as I would like to read at this meeting. I wrote Mr. Bordollo, that there was a question of my being able to prepare a paper at all. But, I see, he has taken much for granted, and as I do not wish to shoulder the responsibility for a blank in the very interesting programme that has been prepared, I shall say a few words.

On a previous occasion I made public some of my ideas with regard to peat fuel manufacture. That paper, possibly known to some of you, was written at a time when my experience was much more immature than it is at present. Since then I have profited much by association with such men as Messrs. Nyström and Anrep of our Government staff, with Mr. Carlsson, instructor at the Royal Swedish Peat College and Peat Expert of the Swedish Government and with Mr. Lincoln, General Manager of the Canada Fertilizer Co., one of the best read men on peat that I have ever had the pleasure of meeting, and from all of these men I have learned much.

Referring for a moment to my former statements, perhaps it is sufficient to say, that the only correction I have to make is in regard to my own plant at Victoria Road, the essential feature of which was an area constructed for artificial drying. After a thorough trial and in the light of the knowledge I have gained through my association, particularly with the gentlemen from Sweden, I frankly say that I was not on the most promising track in my efforts to facilitate drying by an especially prepared wooden drying area. I am still of the opinion that such a plant, if properly installed, would pay, and pay well; for I had some measure of success at Victoria Road that was not evident to anyone but myself and those working with me, which success would have appeared greater had I not been handicapped financially during the entire progress of my experiments.

However that may be, to-day, Gentlemen, we have a complete plant for the manufacture of peat fuel right here in Canada, which in

construction, in output, in economy of operation and in cost of permanent installation, so far supersedes my former efforts, that I need not take up any of your valuable time, discussing history, except in so far as that what follows may be "making history" for our successors.

The plant about which I propose to talk to you is based essentially on the wet machine process in its most advanced form. It is a plant which excavates **automatically** its own peat from the bog, puts it through a macerating machine and delivers this peat pulp on top of the bog in an even layer, cut in rows longitudinally and also across, making the wet process block, which before drying is usually about 5 x 5 x 10 inches. I propose to refer only to the manufacture of peat fuel up to and including the stage in which it is laid out upon the ground and dried. We shall have something unique to offer in regard to the collection of the dried material, but for the present we propose to adopt the methods so ably carried out by Mr. Anrep at Alfred.

Our plant is rather a new assemblage of proven parts, than an entirely new invention, although a number of new and useful devices are incorporated in the complete mill. It is no longer an experiment, but it is **a demonstrated success** and can now be seen in daily operation at the plant of the Canada Fertilizer Co., Limited, hardly 30 miles from Montreal, and as such, is worth your most careful investigation.

The design which made such a mill possible was suggested by two facts:

1. In every wet process peat plant is a lot of tracklaying and track shifting or its equivalent, to get the peat to its drying ground and to keep the plant up to a working face.

2. This could be entirely and successfully done away with by supporting the mill on what we will call travelling aprons, i.e. instead of wheels or broad rollers, a supporting device made up of wooden slats in the form of a continuous belt travelling around parallel axles on properly supporting wheels, the bottom side of which belt being kept rigid by proper guides.

With these two facts to work upon the first step was to construct a platform large enough to hold the motive power and a peat macerating



RIGHT SIDE VIEW OF MACHINE.

mill, and also strong enough to withstand the shocks of a mechanical excavator tearing up large imbedded roots, or logs, etc., to make provisions to give the supporting aprons any desired rate of travel and to make the steering of the device convenient. As it moved along, the next step naturally was to provide the peat, which was done by an entirely new bucket and chain excavator made of steel and sufficiently strong to withstand extra strain, when roots or logs are encountered in the peat.

The use of such an excavator has been made possible because the machine moves freely in any direction and thus can be kept up to a new working face continuously.

The transfer of the dug material from the excavator-discharge to the hopper of the peat mill necessitates a belt conveyor, and with this we

have a machine delivering continuously a mass of peat properly prepared for spreading out to dry.

You understand, the machine is in motion, therefore the suggestion for the next step was at hand. The machine could itself without introduction of hand labor spread this peat pulp directly behind itself and so entirely dispense with the so-called Drying Field, avoiding all apparatus and work necessary to spread at some distance from the machine. A new device has been designed for this purpose and also to cut the spread mass longitudinally; and another unique method was invented for the cutting crosswise. Now, Gentlemen, all that was left to be done was to house the whole suitably, and there is your New Portable Peat Mill.

The question naturally arises: "What advantages can we expect from such arrangement of the wet process?" They are too numerous to detail, but, chiefly, this mill, with an output up to 6 tons per hour, requires only **two men** to operate it; namely, an engineer who also steers the device and the man who makes the fuel, i.e. who controls the excavator, the peat mill and the spreading device. He can do that from a seat as all controls are by levers situated at one place. Besides these two men we have a boy, who drags away the larger roots brought up by the excavator, and which is only necessary on bogs containing many roots.

We dispense with all hand labor for the excavating of peat.

We need no men to attend to cars.

No men to lay or shift tracks.

Nor men to attend to the spreading.

Excepting the main ditch which drains the bog and which is economically and automatically done by our peat plant, no cross drains are necessary to prepare drying field, as the machine necessarily does its own draining and very efficiently at that.

The men are not exposed to the weather and can work continuously, except in such heavy rains which injure the peat. On such days when a heavy downpour makes work impossible only two men are idle, instead of well on to a score.



FRONT VIEW OF MACHINE IN OPERATION.

We have provided a very level spreading ground as the machine eliminates humps, hollows, etc., practically by its own weight, transferred to the bog surface through the flat bottoms of the supporting aprons.

Before taking up the machine part by part, there are 3 things which I wish to point out.

First: that I cannot include in a paper that will afterwards be printed and thus remain on record any of the dimensions in connection with the mill. They may be somewhat different for each individual bog.

Secondly: some dimensions of the first machine will be altered in the second, from which still better results are expected; and

Thirdly: the mill I am talking about has cost a great deal of sacrifice, time, thought and money, in the face of the contemptuous position of

capital, owing to the numberless failures in the Peat Industry. The Trying-Out of this mill has been a peat-education in itself, and while to those who are sufficiently interested to examine the mill, the fullest information is freely available, it is not my intention to go too closely into details, nor to exhibit the detail drawings of this mill.

The plant from the ground up is divided into 11 parts:

1. Supporting Aprons.
2. Platform and Transmission.
3. The Motive Power.
4. The Excavator.
5. The Cross Conveyor.
6. The Peat Mill.
7. The Spreading Box.
8. The Smoothing Device.
9. The Longitudinal Cutting Knives.
10. The Cross Cutting Knives.
11. The Housing.

1. Supporting Aprons The idea of supporting and moving a peat mill on the same sort of supports as are used in Caterpillar Traction-Engines and in ditching-and-tile-laying machines, designed to go over sand and soft ground, was first conceived by me in January 1909. Since then I have spent much time and work looking up the different designs of these caterpillar drives, choosing and altering not only to get a satisfactory design, as applied to an automatically moving self supported peat mill, but also to get a design which might be protected by letter patents. There are numbers of unique features in connection with these supports, one of which is an over-lapping steel plate arrangement on the slabs of the moving aprons, which makes the bottom smooth, continuous plain and prevents sinking even in the softest ground.

How efficient these aprons are was shown at our first trial when the total weight of our machine rested upon and travelled over not only the ordinary surface of the bog but also over a considerable strip which had been cleared of all surface covering, exposing the soft sticky peat mud. On the very softest places the mill did not sink over two inches.



MACHINE TRAVELLING AHEAD, SPREADING AND CROSS-CUTTING

2. Platform and Transmission The platform was built throughout of the best Carnegie structural steel, large enough to provide room for all machines, and strong enough to withstand the most severe strains, due to the excavator's catching up roots or logs. The driving mechanism includes 2 speeds forward; a working speed of about 30 inches per minute, and a speed of about two to three miles per hour to be used when turning the mill or travelling empty to or from any place on the working area. The front supporting apron can be turned to steer the machine in either direction. It will turn within a radius of about 30 to 40 feet. The steering is accomplished from a hand wheel conveniently situated. A rope spool has been provided by means of which stumps may be pulled. Each individual machine in the plant is controlled by its own friction clutch and, as I have remarked before, these are brought to central points to be operated conveniently. We have also provided a reverse mechanism.

- 3. The Motive Power** The motive power we are using at present is gasoline, but electricity shall be introduced on the next machine we will construct. We have a heavy duty slow moving, very reliable engine of 36 rated H.P. (Buffalo Gasoline Motor Co.), the best make known. We found the engine perfectly reliable and convenient. In fact it requires so little attention that the engineer has all the time to attend to the steering. For a single machine on a bog no other power seems so desirable; but for two or three more machines on one property electricity generated by peat from a Central Station would be preferable.
- 4. The Excavator** The unique feature of the excavator, which is of the "Chain and Bucket Type" supported on a structural steel skeleton, was invented by Mr. Lincoln. This refers particularly to the design of the buckets which are automatically self cleaning. The greatest obstacle to be overcome in an automatic excavator for peat is that difficulty encountered from roots and logs buried in the bog and the tendency of peat to adhere so tightly to any form of bucket, that it would not discharge. These two obstacles have been successfully done away with by the new features of the excavator. The excavator is conveniently adapted to make any depth of ditch, and so the quantity of peat necessary to keep the mill working harmoniously is easily kept adjusted.
- 5. The Conveyor** The Cross-Conveyor as its name indicates simply provides for carrying the excavated peat from the discharge of the excavator to the hopper of the peat mill.
- 6. The Peat Mill** The peat mill is the largest size of Anrep mill made, and this was chosen because experience has shown it to be the most economical and most efficient machine for the treatment of peat by the wet process. Only he who has operated some of the different styles of peat mill can appreciate how all the little troubles (and I assure you there are many) incidental to the very simple looking operation of macerating and pulping peat have been overcome. Besides, the Anrep machine is comparatively light and very strong.
- 7. The Spreading Box** From the discharge of this peat mill the pulp mass drops into a long narrow box about at the centre. This box is open at the top and has an opening



SPREAD PEAT.

along its rear side from which the peat is delivered in an even layer on the surface of the bog and directly behind the mill. The layer of peat in this box is kept uniform in thickness by right and left hand spiral conveyors which accomplish their work most satisfactorily.

8. The Smoothing Device The peat is now ready for the smoothing device, which, having a slight slope downwards and to the rear, presses the peat down to desired thickness and also smooths the surface of the peat mass already spread.

9. The Longitudinal Cutting Knives Just behind this smoothing device is a row of longitudinal cutting curves which cut the peat mass into parallel strips five inches wide, and immediately behind this is the cross cutting device. This is not a reciprocating machine.

10. The Cross-Cutting Device The knives are supported by a chain moving continuously across the spread area and so arranged as to make a clean cut every ten inches.

11. The Housing The whole machine is protected by a roof and by detachable sides. These sides are left off during the working season but can be quickly put in place, leaving the mill effectively housed and protected over winter.

The operation of the plant is as follows:

The bog is laid out, if possible, in a nearly rectangular area and divided by lines 100 feet apart. The peat mill moves down one of these lines, excavating a ditch along this line the required depth to fill the spreading box. The excavator is hung out over the side of the platform and therefore cuts its ditch parallel to the spread peat mass and a short distance away from it. When the ditch has been dug the full length of the first line the excavator, spreading box and cutting knives are completely lifted by a lever and the machine is quickly turned around under its own power, and it now returns making the ditch twice as wide and spreading the dug material on the other side. This ditch is then left until the peat spread has become fit for fuel. This fuel will be removed before the machine comes back to the point from which it started, when it increases the width of the ditch by a cut, down one side and up to the other, again spreading in the manner described.

While the peat is drying at the first ditch, a second and third ditch and so on are made until a working area has been provided so large that before the plant has reached the far side of the bog, the peat on the first ditch has been removed and the operation becomes continuous. When the bog is exhausted or when for any other reason it is desired to move the machine, all that is necessary is to raise the excavator, the spreading and cutting devices, close up the house and start out across the country to another property, over the softest ground if necessary, or on an inclined platform up to a car, on which the machine will be loaded in a very short time.

The plant is complete in itself and no other buildings or equipments are necessary.



"FULL STEAM — AHEAD".

Although I have spoken at some length there is much more that might be said as to the behavior of our pioneer machine, its further possibilities and of our plans regarding it. But I have not found time to get this information in shape. Points I have not made clear I will be pleased to take up with anyone interested during the course of our meeting, or I will refer you to Mr. Lincoln, who can speak authoritatively as he is in control of all patents in connection with this device, besides being Gen-

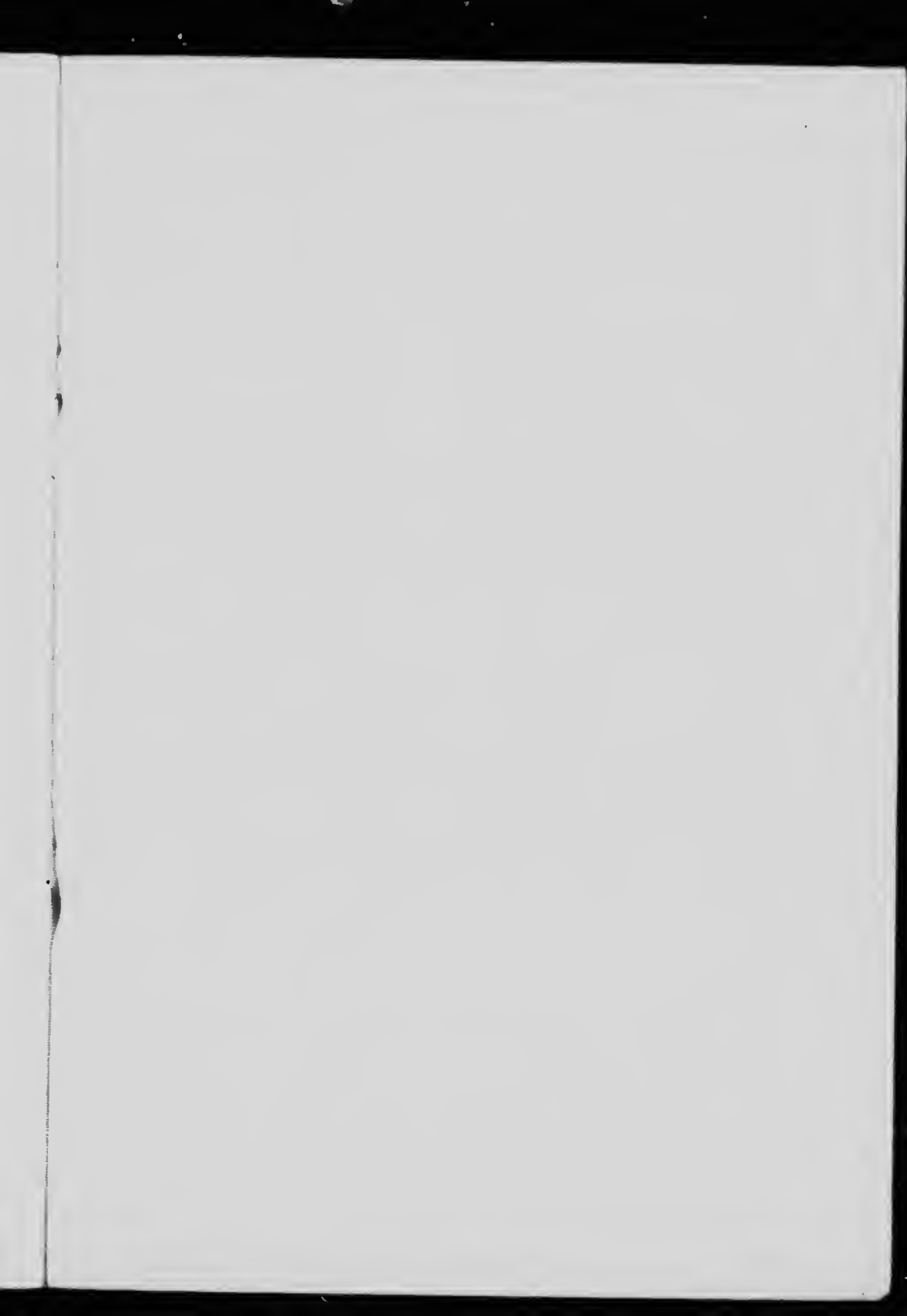
eral Manager for the Canada Fertilizer Co., on whose plant in Farnham, P.Q., this first machine now operates.

Before closing I desire to again express my appreciation of the knowledge of the manufacture of peat fuel, which I have obtained from Messrs. Anrep and Nyström, during the time they worked at my plant, and from Mr. Carlsson, late Swedish Government Peat Expert, with whom I have been constantly associated for a considerable time, and to the many other workers in Peat who have from time to time given me new ideas or valuable criticisms on my own work, and most particularly among them am I indebted to that gentleman, who by personal sacrifice has made it financially possible that my designs have become real facts, who from his extensive travel both in Europe and in America and his unusually keen powers of observation, his knowledge of new Peat-literature, not available to me, being in foreign languages, and from his phenomenal insight into things mechanical, has been able to give me much friendly advice and criticism besides providing the most successful automatic peat excavator which I believe exists.

Gentlemen, I desire to avoid the appearance of giving myself free advertisement, but I cannot help feeling proud that the experimental step of a new advance in peat fuel manufacturing is over. I have not spoken of a "proposed" machine existing only "on paper," nor have built air castles of what "**Would**" be possible if we had the money. I have told you of a living body of iron and steel which exists and which has done **all and more** than I have claimed.

Gentlemen, I thank you for your attention, and before taking my seat I avail myself of the privilege of being authorized to invite you one and all to inspect the machine now at work at the plant of the Canada Fertilizer Co., Ltd., near Farnham, Que., less than 30 miles East from Montreal.

THE INTERNATIONAL PEAT ENGINEERING COMPANY, LIMITED.
CHICAGO, 5049 WINTHROP AVE., FARNHAM, P.Q., BOX 299.
MONTREAL, CANADA, G. P. O. BOX 615.



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