E. V. MOORE.

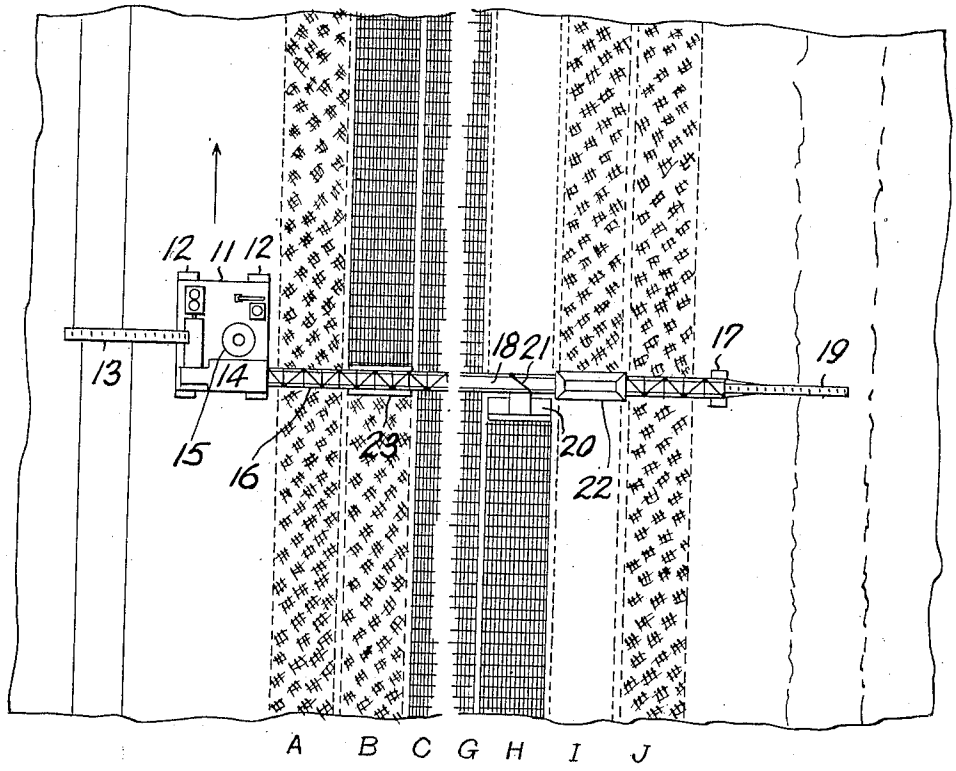
SYSTEM OF HANDLING PEAT.

APPLICATION FILED AUG. 29, 1918.

1,373,627.

Patented Apr. 5, 1921.

FIG. 1



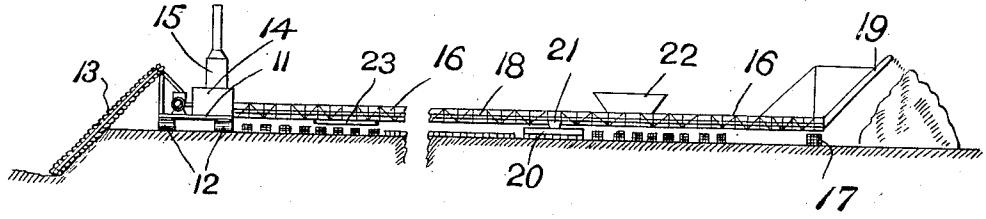


FIG. 2.

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SYSTEM OF HANDLING PEAT.

1,373,627. Specification of Letters Patent. Patented Apr. 5, 1921.

Application filed August 29, 1918. Serial No. 251,985.

To all whom it may concern:

Be it known that I, ERNEST V. MOORE, a subject of the King of Great Britain, and resident of the city of Montreal, in the Province of Quebec and Dominion of Canada, have invented certain new and useful Improvements in Systems of Handling Peat, of which the following is a full, clear, and exact description.

This invention relates to improvements in a system of handling peat, and the object of the invention is to provide a continuous system for economically cutting, spreading, piling or cubing, and stacking the peat in form convenient for loading into transport vehicles.

A further object is to provide a system which may be operated at a minimum of cost and with a minimum of labor.

A still further object is to provide a system which may be carried out with a minimum amount of simple and rugged machinery.

According to this invention, the working area is preferably laid out with a view to obtaining a maximum length, so that the apparatus may travel for long periods of time in one direction (a minimum of one day being preferred), without loss of time in reversing. The excavator and macerator are preferably located on a single platform which is mounted on caterpillars. This whole arrangement is provided with a reversible drive, so that it may travel up and down along a working face without any time being lost in turning the apparatus around. A bridgework extends from the platform at right angles to the direction of travel and is supported at its outer end on a caterpillar which is driven by a shaft extending through the bridge. This bridge supports an endless conveyer and draws at any point throughout its length a peat spreading apparatus. At the outer end of the conveyer is a dry peat stacking elevator.

In the drawings which illustrate the invention:—

Figure 1 is a plan view of the device, illustrating the system in operation.

Fig. 2 is a side elevation of the device.

Referring more particularly to the drawings, 11 designates a platform mounted on caterpillars 12 and provided with an excavating device 13 of any suitable type and with a macerator 14 into which the excavating device discharges peat. Under ordinary circumstances, the apparatus will be run by steam power, since fuel in the form of peat is always at hand. Where electric current at low cost is available, it may be used if desired, being conveyed to the various driving motors in any suitable manner. Where steam is used, the boiler 15 and the various engines necessary will be mounted on the platform 11. The caterpillars of the platforms preferably have independent drives and reversing gear, so that the platform may be maneuvered as desired.

A bridge 16 is provided hinged at one end to the platform and supported near the opposite end on a caterpillar 17. This caterpillar is preferably driven from the same source of energy as the caterpillars under the platform, but means are provided in the drive so that the end caterpillar may be operated independently of the platform caterpillar. The bridge carries an endless belt conveyer 18, which is preferably driven from the macerator.

At the outer end of the bridge, an elevator 19 is provided, preferably driven from the conveyer. A peat spreader 20 of any suitable type or design is releasably attached to any suitable part of the bridge in such a manner that it may be shifted along the bridge to other locations. Any suitable form of unloading device 21 is provided for the conveyer and is adjustably mounted on the bridge, so that it may be thrown into or out of operation or moved to a new location on the bridge when the spreader is moved. If desired, a hopper 22 may be movably mounted on the bridge, so that it may be located at any suitable point to discharge on to the conveyer.

The operation of the system is as follows:

The apparatus moves along under its own power and the excavator removes a predetermined number of cubic feet of peat per minute which it discharges into the macerator. The macerator works the peat into uniform consistency, water being added if necessary, and discharges the peat to the conveyer which transports it to the spreading device attached to the bridge. The unloader is set in operative position to remove peat from the conveyer and discharge it into the spreader. As the apparatus moves along, the spreader deposits the peat on the ground in a form closely resembling bricks arranged end to end in rows. For the purpose of further description, the word "row" will be used as

applied to the deposit of the spreader at each trip; thus a "row" will be many bricks in width and will extend the full travel of the apparatus. The apparatus continues moving over the ground, cutting and spreading continuously. When the end of the cut is reached, the spreader is shifted out along the bridge, so as to spread another row and the whole apparatus moved laterally the amount of the cut. When the peat laid in the first row is dry or nearly dry, it becomes available as fuel to generate power necessary to operate the apparatus. Assuming that the time required for the preliminary drying of the peat is thirty days and that the apparatus requires three days to travel the length of its cut, it will be seen that ten cuts will be made and ten rows of peat laid out for drying. As the peat in the various rows approaches a state of proper dryness, operators are positioned on the bridge and arrange the bricks of peat in small piles at suitable intervals on the ground. These operators lie prone on the bridge or on a platform suspended therebelow, where they can easily reach and pile the peat bricks. These operators, being carried on the bridge, pile or cube the peat at exactly the same rate it is spread. Working at an absolutely uniform rate controlled by the machine and working under comfortable conditions, these operators produce a maximum of result with a minimum of effort, so that great efficiency is obtained in this part of the work. Following the foregoing hypothesis, when the ninth row is spread, the unconsumed peat in the first row is dry and the cubers or pilers throw it over into the second row, thus leaving the first row clear. The spreader is now brought back to a position approximately over the first row and the spreading operation continued. While the first row is being re-spread the hopper 22 is positioned on the bridge above the second row, and operators working on the second row throw the cubes or piles of dry peat into the hopper. The peat falls from the hopper on to the conveyer, which transports it to the outer end of the bridge and delivers it to the elevator. The elevator at this stage is extended in an almost horizontal position, so as to stack the peat the maximum distance from the end of the bridge. When the first row has been re-spread, the second row is clear and the spreader and hopper are moved over so that spreading of the second row and harvesting of the third row are carried on simultaneously. This operation continues until the peat in the first row is dry enough for piling, whereupon the piling or cubing is carried on simultaneously with the spreading and harvesting. The system is now in full operation and will continue in this manner as long as weather conditions permit. When the entire drying area has been harvested once and is about to be respread, the whole apparatus will have been moved laterally on the drying area a distance equal to the surface width of all the cuts made. This movement at each cut enables the angle of the excavator to remain uniform. Each time the apparatus is thus moved laterally, the stacking elevator is slightly raised, so that its outer end will still be over the center of the peat stack.

In Fig. 1, the system as illustrated has been in operation for at least a sufficient time for the whole working surface comprising the rows A to J to have been spread once. The peat in row A is dry and has been cubed or piled in small piles for further drying. A certain amount of this peat is used as fuel for the machine. In row B the dry peat is being piled by operators carried along on the platform 23, the cubed peat being illustrated in rear of the platform and the uncubed but dry peat in advance of the platform. In rows C to H the peat is spread for drying and is in various stages of drying. In row C, which is next to row B, the peat is substantially dry, while in row G, which has been recently spread, the peat is still quite wet. Row H is being spread, the peat being transported on the conveyer 18 and discharged by the unloader 21 into the spreader 20 which is trailed behind the conveyer. The row H in advance of the spreader is empty as is also row I in rear of the conveyer. As the conveyer advances the dry and cubed peat in row I is thrown into the hopper 22, thus clearing the row in readiness to receive wet peat as soon as row I is completely laid. In row J the peat is completing its drying in cubed form but has not yet reached the same stage of dryness as that in row I which is being harvested. The dry peat which is loaded at row I onto the conveyer is carried to the elevator 19 which dumps it on the peat stack or into cars. On the next passage of the apparatus over the ground the cubing platform will be shifted to cover row C, the spreader will be operating on row I and the hopper 22 will be located over row J. There will be no operation on rows A, B, D, E, F, G and H on which the peat will be drying either in its cubed form or as spread. Obviously the peat will be drying on row J until gathered but this row is, for purposes of explanation, considered as completely dry. On the third passage of the apparatus over the ground the cubing will be on row D and the spreading on row J which has been previously cleared. On this circuit of the machine it is obviously impossible to load dry peat from row A onto the conveyer for transportation to the elevator as the entire length of the conveyer is used for the transportation of wet peat. It will be re-

membered, however, that the dry peat in row A has been used for fuel for the apparatus so that the greater portion of it has been consumed. Of the little that remains in row A enough is set aside at the edge of the row adjacent the excavator to provide fuel for the next passage of the apparatus and the remainder is thrown onto row B, thus clearing row A for the spreading on the next circuit. On the fourth circuit the spreader is shifted to row A, the hopper to row B and the cubing platform moved one row farther out. Wet peat is now laid in row A and the dry peat of row B, including what previously remained from row A, is thrown into the hopper and conveyed to the storage pile. As the apparatus advances the previously reserved peat on the edge of row A is used for fuel thus completely clearing the row as the machine advances.

The exact movement of the apparatus can best be understood when described in connection with a particular example of time and distance. It is therefore considered that the time of drying is thirty days (as before), the speed of the apparatus four feet per minute, or 5760 feet in twenty-four hours, which is a little over a mile. Assuming that the nature of the area operated upon permits the machine to operate continuously in one direction for three days, it will be seen that only ten rows of peat need be laid to dry at one time. When the tenth row is laid, the first row will be completely dry and the row may be cleared preparatory to re-laying. Assuming the width of the spreader to be 12′, this gives a drying area 120′ wide and approximately 3 miles long. Assuming the depth of peat in the bog to be such that each cut represents a horizontal distance of 9″ on the surface, the machine will have cut toward the dry peat stack ten cuts of 9″ each or 7½′. Before starting each new cut, the apparatus is maneuvered sidewise this distance of 9″ and thus encroaches to a certain extent on the adjacent edge of the drying area. Since, however, the entire bridge and the spreader, etc., move laterally with the excavator, the encroachment on one edge is made up by an equal extension of the drying area at the opposite edge. It is for this reason that the dry peat stack is made as far as possible from the end of the bridge. The operation now continues as previously described until the whole area has been respread for drying. This continues throughout the season, which in Canada is approximately four months. It will thus be seen that the cycle of operations occurs only four times in the season. It will also be seen that in the course of the season, the excavation is a strip 30′ wide and a little over 3 miles long. When the enormous areas occupied by peat bogs are considered, it will be seen that it is a comparatively easy matter to provide for a three mile travel, even in a straight line. An ordinary section of land (640 acres) has a perimenter of 4 miles, so that making allowance for loss in turning the apparatus through a large radius curve at the corners and also allowing for a gangway several hundred feet wide in the center of the section, it will be seen that a cut of over 3 miles can be obtained by working around such an area. It will also be seen that as the annual cut is only 30′ in width, a considerable number of years must elapse before even so small an area as 640 acres is exhausted. Obviously, the greatest efficiency of operation is obtained when working on a large site of somewhat elongated form, on which the apparatus would require five or six days to lay one row. This would mean only five or six rows during the time of drying and would mean a shorter, cheaper and more easily handled bridge. Under these conditions, the maximum area will be worked, for the reason that the area unworkable according to this system is a strip slightly wider than the whole apparatus. Thus, if the rows are extended in length, the bridge may be reduced in length and the unworkable area will be reduced accordingly. Moving at a speed of 4′ per minute and taking a 9″ cut off a cutting face 6′ to 8′ deep, the system will produce about 6 tons of fuel per hour, or in a working season of 100 days, approximately 14,400 tons. Since even as small an area as 640 acres may be worked for a number of years, it will be seen that the output from such an area is very large.

From the foregoing, it will be seen that the length of the cut expressed in days divided into the maximum time of drying determines the length of the bridge expressed in number of rows for any given locality. If in a locality, the weather conditions are exceptionally favorable and the peat is found to dry in say 20 days in place of 30 days, the spreading will be stopped as soon as the first row is found to be dry enough for harvesting and respreading of the drying area will commence without waiting to spread the whole area. If the time of drying in a locality is unusually great or if it is impossible to secure the desired length of cut, compensation will have to be made by way of increasing the length of the bridge. It may therefore be necessary to provide more than one supporting caterpillar for this bridge. As it obviously would not be practicable to have these intermediate caterpillars travel over the drying peat in the rows, it is necessary to provide unspread spaces for them to travel in. This is automatically done by the shifting of the whole apparatus between cuts. If the

spreading device is moved over exactly its own width at the end of a row, it will be obvious that when the whole apparatus is moved to take the fresh cut, the spreader will be moved this distance away from the last row spread. This also provides automatically for trackage for the wheels of the spreader. If, in addition to the movement of the whole apparatus, the spreader is moved slightly more than its width each time, there will obviously be a still greater space left vacant between the rows.

The apparatus preferably works back and forth, so that no time will be lost in turning it around. The apparatus runs to one end of its cut, is adjusted laterally for the fresh cut, the spreader and harvesting hopper 22 moved on the bridge as required, and the drive reversed.

While the peat has heretofore been spoken of as stacked in a row at one side of the drying area, it will be understood that this is not essential. The adjustable stacking elevator permits the delivery of a season's harvest along a given line and it will therefore be entirely practicable to lay tracks along this line and have the elevator discharged directly into them. By arranging for an adequate number of cars, the entire harvest of peat may be removed as it is gathered, so that there will be no accumulation. On the other hand, the peat may be stacked in the manner first described and loaded as desired into cars running on a track located on the remote side of the stack from the harvesting apparatus. In this connection, it is to be noted that the method of gathering the peat from all over the drying area by means of the same conveyer which is used to spread it enables this operation to be carried out very economically, both as regards capital investment and operation cost. As compared with the ordinary method of gathering peat from the drying areas by means of wagons, it shows a very great economy.

The cut has hitherto been spoken of as if it was in a straight line or following the perimeter of a rectangular area. This is not essential, as the apparatus being easily maneuvered may follow the contour of the land, that is to say, the apparatus may follow the line where the peat is of uniform depth, so that very little adjustment will be required.

Having thus described my invention, what I claim is:—

1. A method of handling peat which comprises simultaneously excavating peat, spreading the peat for drying, cubing the dry peat, and gathering and stacking the dry peat by means of a single apparatus advancing continuously over a working area.

2. A method of handling peat which comprises continuously and simultaneously excavating peat, spreading the peat for drying, and gathering the dry peat by means of a single apparatus.

3. A method of handling peat which comprises driving a conveyer repeatedly over a drying area and using said conveyer from one end to an intermediate point for the conveyance of wet peat, and using the remainder of the length of said conveyer for the conveyance of dry peat.

4. In a method of handling peat the steps of simultaneously conveying wet peat and dry peat in the same direction on a single conveyer, the wet peat being carried from one end of the conveyer to a movable unloading point intermediate the ends of the conveyer, and the dry peat being carried from adjacent the unloading point to the second end of the conveyer.

5. A method of handling peat which comprises repeatedly and simultaneously spreadpeat for drying, and gathering dry peat from a working area, and excavating peat on one edge of said area, and discharging dried peat adjacent the opposite edge of said area, simultaneously with the spreading and gathering, the excavating, spreading, gathering and discharging being carried out by means of a single apparatus advancing continuously and passing repeatedly over the area.

6. A method according to claim 5, in which the spreading and gathering steps are carried out on an area moved laterally on each repetition of the process a distance equal to the width of cut resulting from the step of excavating.

7. A method according to claim 5, in which the spreading and gathering steps are carried out on an area moved laterally on each repetition of the process a distance equal to the width of cut resulting from the step of excavating, and in which the dried peat is discharged along a fixed line until the area required for carrying out the steps of spreading and gathering the peat encroaches on the discharge line.

8. A method of handling peat, which comprises continuously excavating peat, spreading the peat to dry, and gathering the dry peat, the various stages of the process being carried out in rotation on parallel divisions of a drying area and simultaneously on the whole drying area.

In witness whereof, I have hereunto set my hand.

ERNEST V. MOORE.