

W. L. SHEPARD & H. J. WICKHAM.

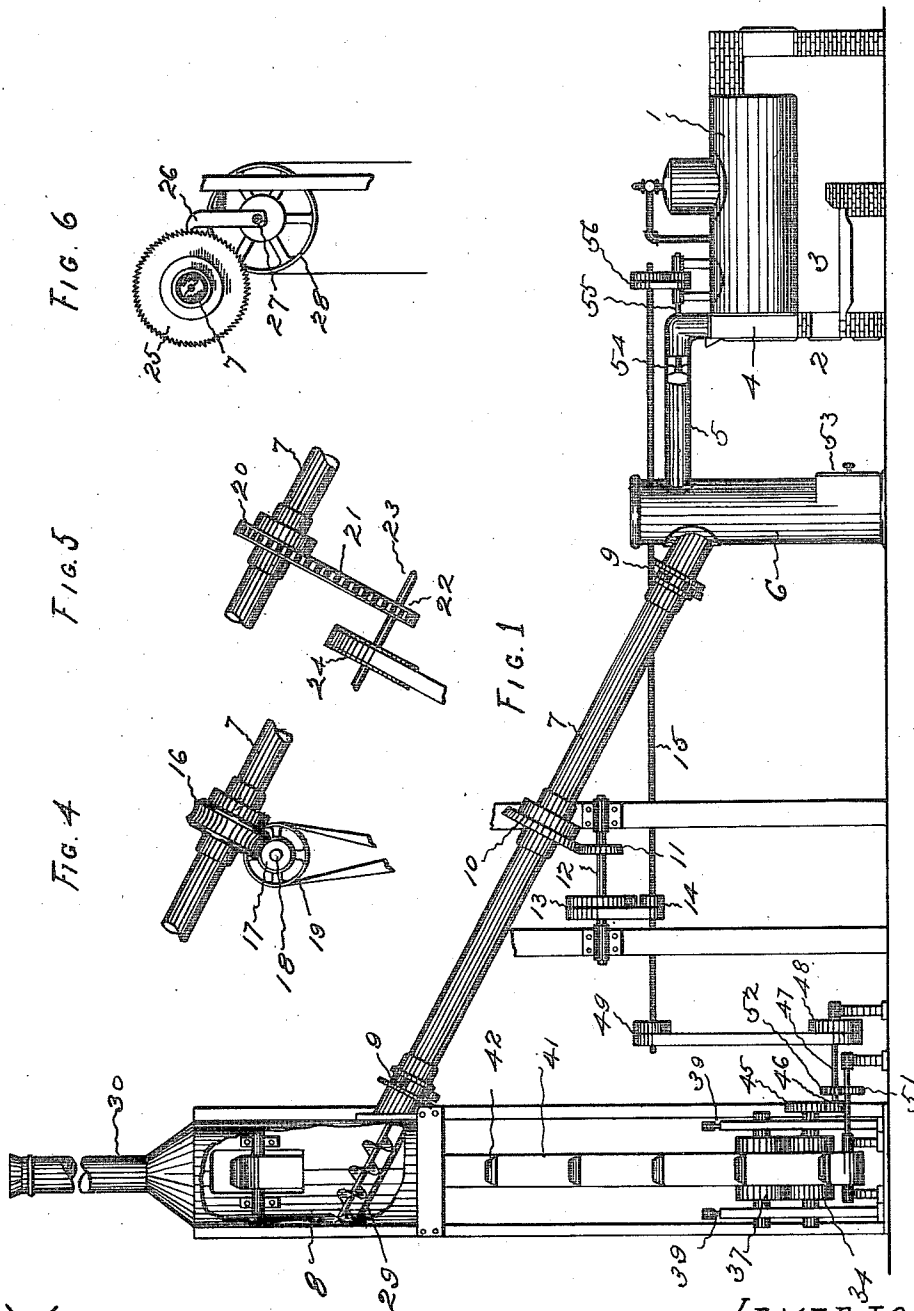
FUEL PRODUCER.

APPLICATION FILED SEPT. 8, 1909.

Patented Feb. 28, 1911.

3 SHEETS—SHEET 1.

985,462.



WITNESSES:

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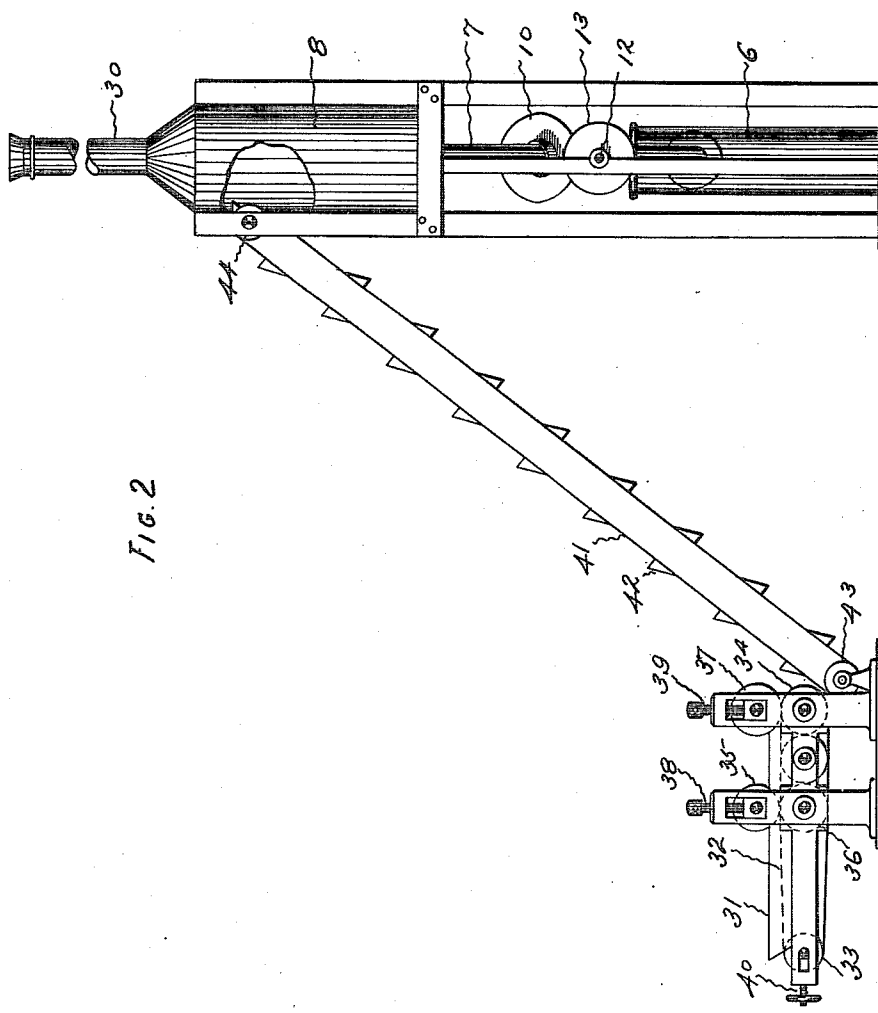


FIG. 2

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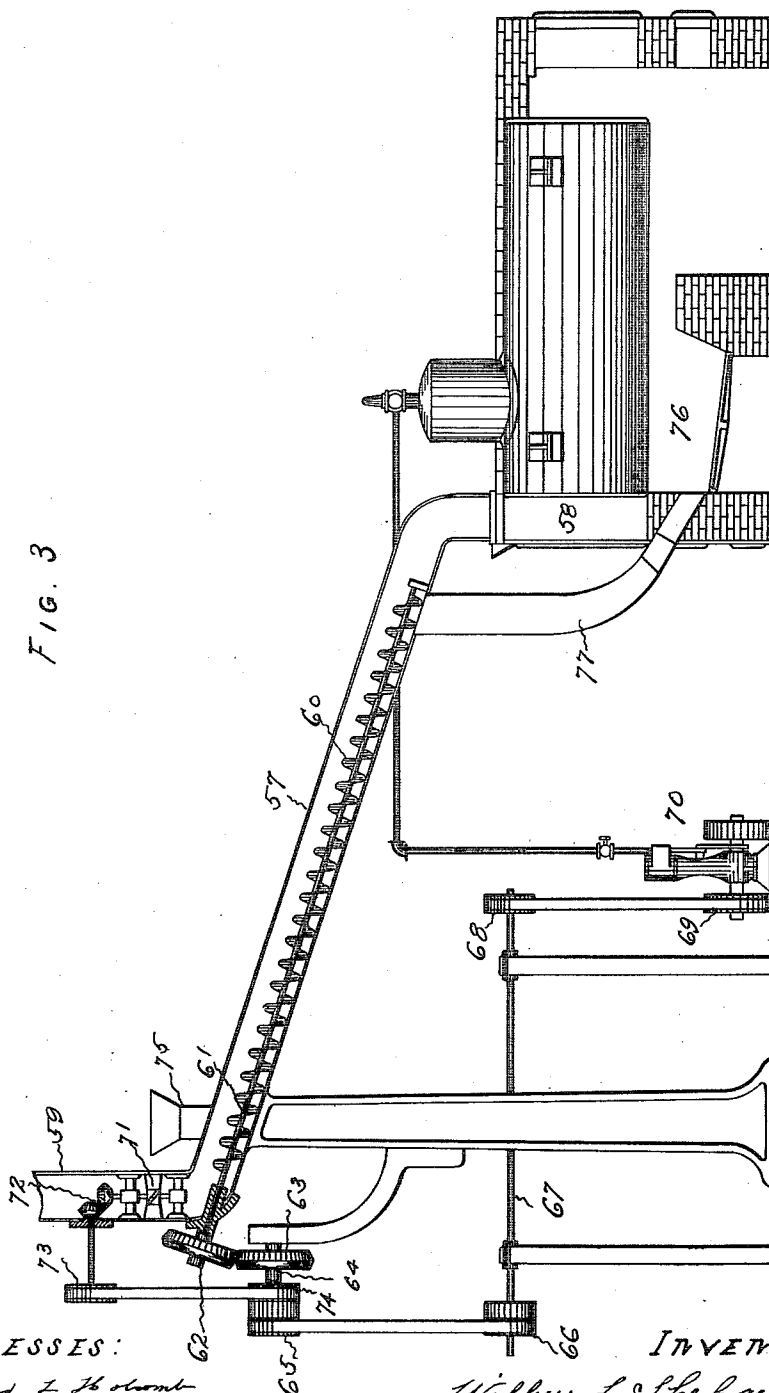
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3 SHEETS—SHEET 3.

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FIG. 3



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UNITED STATES PATENT OFFICE.

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FUEL-PRODUCER.

985,462.

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To all whom it may concern:

Be it known that we, WILBUR L. SHEPARD and HORACE J. WICKHAM, citizens of the United States, residing at Elmwood and Manchester, respectively, in the county of Hartford and State of Connecticut, have invented a new and useful Improvement in Fuel-Producers, of which the following is a specification.

10 This invention relates to apparatus for transforming peat from the condition it is in when it comes from the bog and carries considerable moisture, to a condition in which it may at once be used in a furnace
15 as fuel.

The object of the invention is to provide a simple apparatus which is continuous in operation and utilizes the waste heat which ordinarily escapes through the stack for drying
20 and hardening the peat.

Figure 1 of the accompanying drawings shows a front elevation, with parts broken away, of a furnace and horizontal boiler provided with one form of apparatus which
25 embodies this invention. Fig. 2 shows a side elevation of the same peat drying apparatus and a means for carrying the peat to this apparatus. Fig. 3 shows a front elevation, with parts in section, of a furnace and horizontal boiler, provided with a modified form
30 of apparatus for conveying peat through the smoke pipe for drying and to the furnace for burning. Fig. 4 is a detail of a modified form of mechanism which may be
35 employed for operating the feeding means shown in Fig. 1. Fig. 5 shows a different form of driving mechanism, and Fig. 6 shows a still different form of mechanism for driving the peat feeding means.

40 The apparatus is shown in Fig. 1 in connection with a common horizontal boiler 1 having an ordinary furnace 2 with the usual fire box 3 and smoke box 4. A pipe 5, in this form of apparatus, leads from the smoke
45 box to a receiver 6. The central section 7 of the smoke tube that extends on an incline from the receiver to the hopper 8, is mounted on bearings 9 at each end so that it may be rotated. Near the middle of the rotatable
50 section of the tube is a gear 10 which is driven by a gear 11 on a shaft 12 that is provided with a pulley 13. This pulley is belted to a pulley 14 on a driving shaft 15, which may be driven from any convenient source
55 of power. By this mechanism, the central

section of the tube may be rotated at the desired speed. The tube may be provided with a worm wheel 16, and this wheel driven by a worm 17 on a shaft 18 bearing a pulley 19 that is belted to any suitable source of power, as shown in Fig. 4. If desired, the tube may
60 be provided with a sprocket wheel 20 that may be connected by a chain 21 with a sprocket wheel 22 on a shaft 23 bearing a pulley 24 that may be belted to any source of
65 power, as shown in Fig. 5. Or a ratchet wheel 25 may be mounted on the tube, and this wheel may be intermittently rotated by a pawl 26 mounted on a crank 27 that may be rotated by a pulley 28 driven from any
70 source of power, as shown in Fig. 6. In the lower part of the hopper and desirably connected with the tube so as to rotate therewith, is a feed worm 29. The top of the hopper is connected with a stack 30, through
75 which the smoke and gases from the furnace pass to the outer atmosphere.

The peat to be treated by this apparatus may be deposited in a trough 31 and carried
80 by a belt 32 turning around rolls 33 and 34 between the rolls 35 and 36 and the rolls 34 and 37. The space between the rolls 35 and 36 and between the rolls 37 and 34 may be adjusted by means of the screws 38 and 39
85 so as to compress the peat which passes between them sufficiently to express the desired amount of moisture. The tension of the feed belt may be regulated by the screw 40. As the peat passes from between the
90 rollers 34 and 37, it is deposited upon the elevator belt 41, which is provided with common elevator buckets 42. This belt passes around a common drum 43 at the bottom, and a drum 44 at the top in such manner as
95 to elevate the peat from the presser rolls and deposit it in the hopper at the base of the stack, and into which opens the upper end of the inclined smoke tube. The shafts of the lower squeezing rolls may be geared together, and one of these gears 45 engaged
100 with a gear 46 on a shaft 47 bearing a pulley 48 that is belted to a pulley 49 on the driving shaft 15. The shaft of the lower elevator drum may be provided with a gear 51 that engages a gear 52 on the shaft 47,
105 for operating the elevator.

By means of this apparatus the peat may be first compressed to express all free moisture, and then elevated to the hopper from which it is fed by the spiral feed screw into
110

the inclined smoke tube. As the peat passes down this tube, it is rolled about by the rotation of the tube and subjected to the heat of the gases and products of combustion escaping from the fire in the furnace. All of the remaining moisture contained in the peat is carried away by the draft up the stack, and the dried peat allowed to flow from the lower end of the tube into the receiver 6, from which, when the door 53 is opened, it may be shoveled into the furnace and used as fuel. If desired, a fan 54 may be arranged in the pipe from the smoke box. The shaft 55 of this fan may be driven by a belt 56 from the shaft 15.

If desired, the tube may be fixed in position, as shown in Fig. 3. In this form of apparatus the tube 57 at its lower end communicates with the smoke box 58, and at its upper end with the base of the stack 59. In this tube is arranged a spiral conveyer 60. The shaft 61 of the conveyer may be provided with a gear 62 which meshes with a gear 63 on a shaft 64 bearing a pulley 65. This latter pulley may be belted to a pulley 66 on a shaft 67 provided with a pulley 68 that may be belted to a pulley 69 on the shaft of an engine 70 driven by steam from the boiler.

A fan 71 may be located at the base of the stack near the upper end of the tube, and this fan driven by gears 72 and a pulley 73 that is belted to a pulley 74 on the shaft 64. A hopper 75 is arranged at the upper end of the tube for the introduction of peat to the tube. In this case, the peat is fed down the inclined tube and is agitated by the spiral conveyer. While it is being conducted down the tube, and being agitated the peat is subjected to the heat of the escaping products of combustion. This peat may be admitted to the fire box 76 through a tube 77.

With the apparatus described herein, peat containing more or less moisture may be deposited in the inclined tube and while passing down through the tube and being turned over and agitated, either by the rotation of the tube or by the spiral conveyer in the tube, is subjected to the heat of the escaping products of combustion from the fire. The use of this apparatus is economical, for the reason that it is only waste heat which is utilized for transforming the peat into condition to be used as fuel.

The invention claimed is:

1. The combination with a boiler, of a furnace having a fire box beneath the boiler, a stack for said furnace, connections between the furnace and stack including an inclined tube located outside of the furnace and communicating with the furnace and the stack, said tube conducting all of the gases of combustion from the furnace to the stack, and means in connection with the tube whereby the peat is fed through said inclined tube and discharged at a point adjacent to the fire box, whereby the peat is dried and prepared for use in said fire box under the boiler by the waste heat escaping from the furnace after it has passed the boiler.

2. The combination with a boiler, of a furnace having a fire box beneath the boiler, a stack for said furnace, connections between the furnace and stack including an inclined tube located outside of the furnace and communicating with the furnace and the stack, said tube conducting all of the gases of combustion from the furnace to the stack, means for rotating said tube, means for admitting peat into said tube, and means for discharging peat from said tube adjacent to the fire box, whereby the peat is dried and prepared for use in said fire box under the boiler by the waste heat escaping from the furnace after it has passed the boiler.

3. The combination with a boiler, of a furnace having a fire box beneath the boiler, a stack for said furnace, an inclined tube located outside of the furnace and communicating with the furnace and the stack, said tube conducting all the gases of combustion from the furnace to the stack, means for admitting peat into the upper end of said tube, means in connection with the tube whereby the peat is fed through said inclined tube, and means at the lower end of said tube for receiving peat fed through the tube, whereby the peat thus admitted into, fed through and discharged from said tube is dried and prepared for use in said fire box under the boiler by the waste heat escaping from the furnace after it has passed the boiler.

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