Oct. 6, 1931. A. P. YOUNG 1,826,232

SOIL STERILIZING APPARATUS

Filed April 11, 1929

Fig. 1.

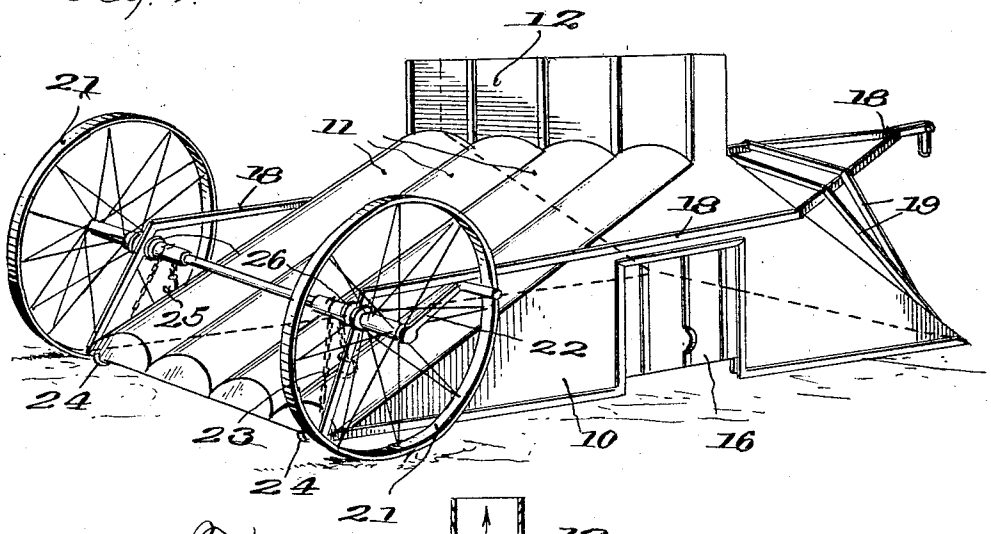


Fig. 2

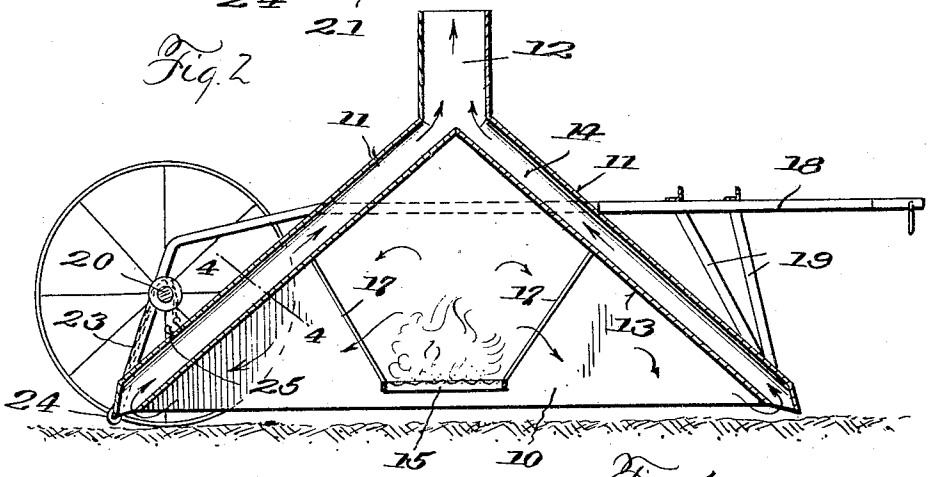
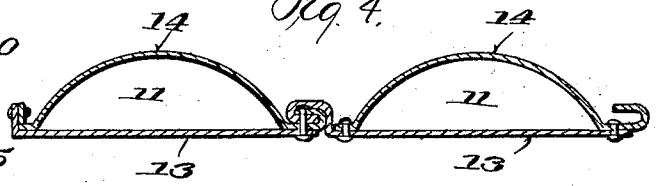


Fig. 4.



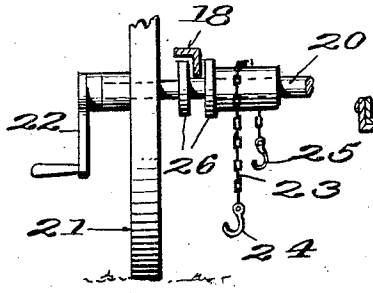


Fig. 3

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UNITED STATES PATENT OFFICE

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SOIL STERILIZING APPARATUS

Application filed April 11, 1929. Serial No. 354,311.

My invention has to do with the treatment of the soil by the application of heat to destroy or rid it of weeds or other life that is objectionable in the cultivation or use of the soil for beneficent purposes. My object stated generally is to provide a portable furnace of such construction that it will most efficiently subject the ground to the desired sterilizing heat, be capable of handling or manipulation with the minimum of effort or power, will be inexpensive of construction and economical in operation, and which will have with the minimum of material all necessary strength and rigidity to withstand the more or less hard treatment unavoidable with such an apparatus.

My invention consists in whatever is described by or is included within the terms or scope of the appended claims.

In the drawings:—

Fig. 1 is a perspective view of a portable furnace embodying my invention;

Fig. 2 is a vertical section from front to rear;

Fig. 3 is a detail view in rear elevation of one of the carrying wheels and associated parts;

Fig. 4 is a detail view in transverse section on the line 4—4 of Fig. 2.

Giving a brief or general description to facilitate the detail description which follows, my apparatus comprises a grate for fuel and a tent-like casing with downwardly inclined walls which meet in a ridge or apex above the grate which confine the products of combustion and cause them to descend to points in opposite directions close to the ground, and then pass upward and outward through flues which lead to a chimney or stack on the ridge or apex, the necessary draft to support combustion being thus provided and the products of combustion being kept for a prolonged period within the casing and thus most advantageously used for their heat-imparting effect upon the soil. The apparatus is readily portable so that it may be shifted from place to place in the treatment of the soil and for transportation generally and, to this end, it is provided with carrying wheels and means for connecting it to the back or tail of a wagon or other propelling means.

Describing now in detail what is shown in the drawings, the tent-like casing includes two triangular side walls, 10, between the upper edges of which extend the opposite downwardly and outwardly inclined top or roof members, each composed of a plurality of side by side flues, 11, open throughout their length from top to bottom and at their top joined to a vertical chimney or stack, 12.

The flues, 11, may be made in any desired way, but an advantageous construction is shown in the drawings in which each is a unit composed of a flat base or bottom plate, 13, and a partly cylindric top plate, 14, the two plates lapping at their edges and being riveted together and each plate at its edge having a fold to interlock and be joined with the corresponding formation of the adjoining flue, and the fold or overlaps riveted together. It will be evident that this makes an inexpensive and yet strong and rigid construction so that the roof members are of great strength and stiffness and yet are light in weight. At the bottom the top plate of each flue is bent downward to provide a guard or partial closure across the lower end of the flue to assure that there will be no substantial escape of gases or products of combustion at the bottom.

The fuel grate, 15, extends from one side wall inward from a door opening in that side wall which is closed by a door, 16, that may move outward and upward when necessary to open it, but which normally remains in a closed position. The grate is supported a a short distance above the ground by several rods or wires, 17, that are attached at their upper ends to the underside of the roof and incline inward and downward on both sides of the grate and are attached at their lower ends to the grate. The bottom of the door is spaced several inches above the bottom edge of the end wall in order to clear the ground and also to provide a draft opening.

The end walls, roof and chimney or stack are preferably made of sheet metal and, of course, at the edges and other points where

necessary stiffening or reinforcing bars are secured.

To the two side walls there are secured at a level at or just above the top of the door the two side bars, 18, of a light frame work, preferably made of angle iron. These side bars are extended forward and backward beyond the side walls and at what may be considered the front of the apparatus, they are brought together or converged and united at their front ends and provided with a clevis or hook or means for attachment to the rear end of a wagon or other transporting device, and said converged and united ends may serve as a handle for such pulling or other manipulation of the apparatus as may be necessary. Brace bars, 19, extend from the forward edge of the roof member upward to the horizontal bars, 18.

The bars, 18, where they extend rearward beyond the side walls are bent sharply downward in a straight line and pass over a horizontal axle, 20, upon which their forward downwardly and rearwardly inclined edges rest, said axle having at each end just rear of each side plate a transporting wheel, 21, which turns loosely on the axle, so that the axle will not turn as the wheels revolve and so that the axle may be revolved independently of the wheels to serve as a windlass. At one end (or both if desired), the axle beyond the wheel has a crank, 22, by which it may be revolved by hand for the winding on or unwinding therefrom of a length of chain, 23, so that when one end of the chain, as by means of a hook, 24, is engaged with the bottom edge of the roof, the bottom of the apparatus may be raised sufficiently high to wholly clear the ground at such times as the apparatus is to be transported from place to place, the apparatus at the front being raised sufficiently high by means of the joined forward ends of the horizontal frame bars, 18. The chain is secured to the axle between its ends so that both ends of the chain are free, one, however, being shorter than the other and provided also with a hook, 25, which when the longer length having the other hook is wound upon the axle to lift the apparatus from the ground, may be engaged with a convenient link of the chain and thereby the chain prevented from unwinding. As the shaft or axle is forward of the rear edge of the apparatus, the chains extend downward and rearward and they thus serve to hold the downwardly inclined portions of the horizontal frame bars, 18, and the axle together without the necessity of any other securing or attaching means. To prevent lateral displacement by longitudinal shifting of the axle, the axle has on opposite sides of said downwardly and rearwardly inclined part of the frame bars, 18, washers or collars 26.

Of course, the roof members may have the form of a curved arch in which case it might be advantageous to differently construct or form the flues. The flues, in effect, it will be seen, make a double-walled construction.

It will be seen that my construction is such that the heat generated by the burning fuel is conserved and utilized to the maximum. The interior of the flues, 11, is subject to heat by radiation from the inner walls and thereby it promotes the draft through the flues to the stack. And there is the minimum of loss of heat by convection. The particular structure shown secures to the utmost the most advantageous use of the heat, but variations therefrom may be resorted to which, while not so advantageous, will nevertheless embody the principles of my invention and to the extent of utilizing the heat generated advantageously. It will be seen that an important feature of my invention is utilizing the radiant heat to heat the air within the flues to promote a draft which will carry the heated products of combustion to the soil and, of course, by different flues or stack arrangements, this result can be achieved.

What I claim is:—

1. Soil sterilizing apparatus comprising means for holding fuel while burning and an enclosing casing for said means open at the bottom for the application of heat to the ground within the casing, the whole being portable, said casing including a roof with double walls providing a space that opens into and extends from the bottom of the casing upward and communicating with the external air at the top.

2. Soil sterilizing apparatus comprising means for holding fuel while burning and an enclosing casing for said means open at the bottom for the application of heat to the ground within the casing, the whole being portable, said casing including a roof portion composed of a plurality of connected lateral flues, that extend from the bottom upward and are open at bottom and top to the interior and exterior of the casing respectively.

3. Soil sterilizing apparatus comprising a casing within which is a fuel supporting means, said casing being open at the bottom to give access of heat generated to the ground, a supporting frame connected with said casing and including bars that project from the sides thereof, an axle extending crosswise of the casing and upon which said bars rest, and wheels loosely mounted upon said axle adapted to support one end of the casing.

4. Soil sterilizing apparatus comprising a casing within which is a fuel supporting means, said casing being open at the bottom to give access of heat generated to the ground, a supporting frame connected with said casing and including bars that project from the sides thereof, an axle extending crosswise of the casing and upon which said bars rest, and wheels upon said axle adapted

to support one end of the casing, means for rotating said axle and flexible means connected with the axle adapted to be wound and unwound thereon by the revolution of the axle and means for connecting said flexible means with said casing.

5. A soil sterilizing furnace having a casing composed of triangular sides and flue-form roof members arranged between said sides and extending from the bottom to the apex of the casing, the flues communicating with the interior of the casing at the bottom and with the exterior at the apex.

6. A soil sterilizing furnace having a casing composed of triangular sides and flue-form roof members arranged between said sides and extending from the bottom to the apex of the casing, the flues communicating with the interior of the casing at the bottom and with the exterior at the apex, and the flues consisting of similar units joined edge to edge.

7. Soil sterilizing apparatus comprising means for holding fuel while burning and an enclosing casing for said means open at the bottom for the application of heat to the ground within the casing, the whole being portable, and members within the casing defining a flue passage leading from the lower part of the interior upward and discharging at the uppermost part of said casing.

8. Soil sterilizing apparatus comprising means for holding fuel while burning and an enclosing casing for said means open at the bottom for the application of heat to the ground within the casing, the whole being portable, and members within the casing defining a flue passage leading from the lower part of the interior upward and discharging at the uppermost part of said casing, the flue wall within being exposed to radiant heat.

In testimony whereof I hereunto affix my signature.

AMPS P. YOUNG.