

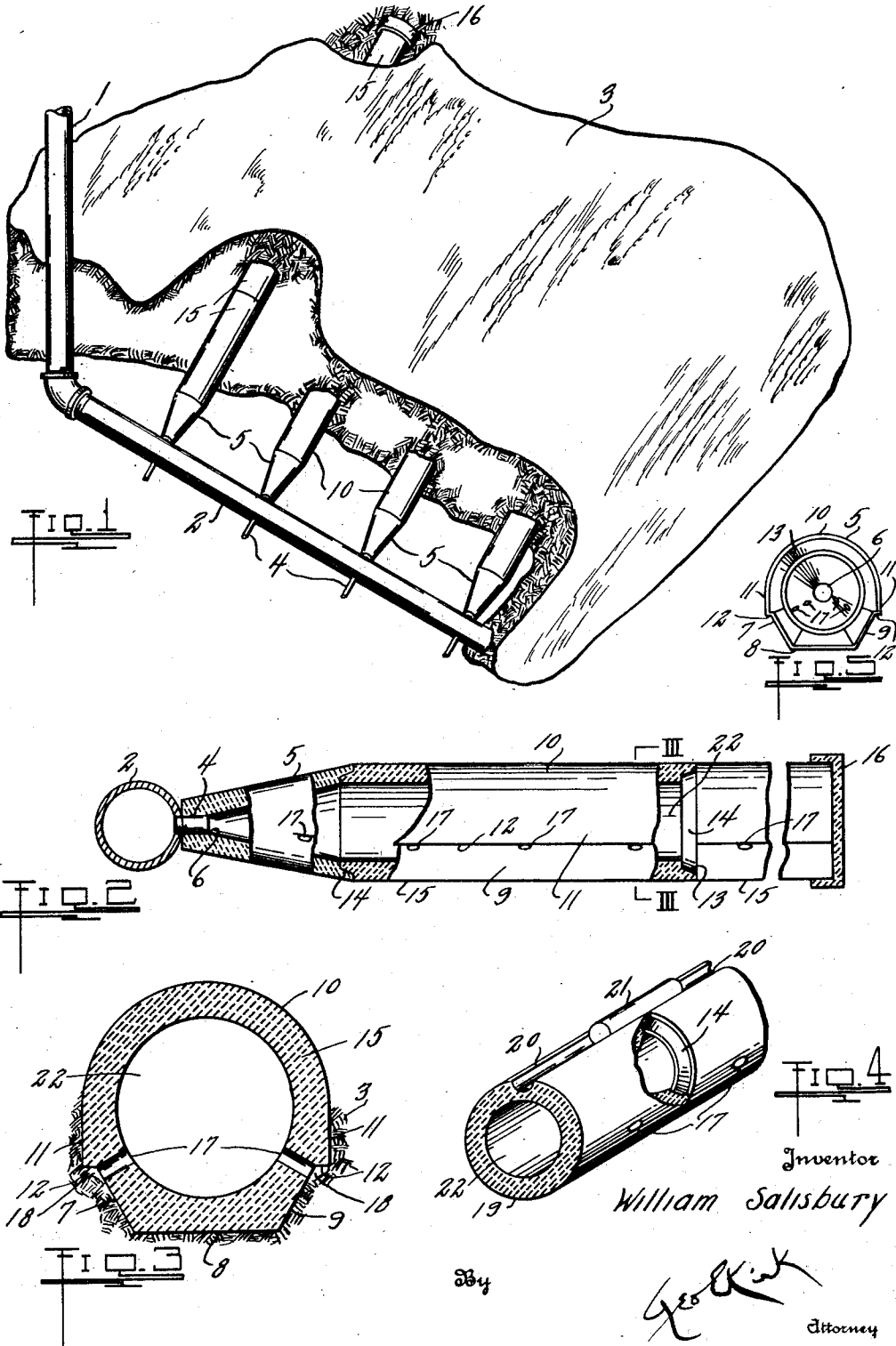
Sept. 6, 1932.

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1,875,504

METHOD AND APPARATUS FOR SOIL STERILIZATION

Original Filed July 17, 1930



UNITED STATES PATENT OFFICE

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METHOD AND APPARATUS FOR SOIL STERILIZATION

Original application filed July 17, 1930, Serial No. 468,612. Divided and this application filed April 25, 1931. Serial No. 532,804.

This invention relates to soil sterilization. This invention has utility when incorporated in a method of sterilizing soil, in systems for transmitting fluids for even distribution through soil and in the elements forming the system.

This application is a division of my co-pending application Ser. No. 468,612, filed July 17, 1930, for Soil Sterilization.

Referring to the drawing:—

Fig. 1 is a perspective view of an installation, parts being broken away;

Fig. 2 is a side elevation of a group of the elements of the invention herein, forming a sub-surface transmission line;

Fig. 3 is a view on the line III—III, Fig. 2;

Fig. 4 is a perspective view of a modified type of transmission element; and

Fig. 5 is an end elevation of a connecting element between a header and a distribution line.

Steam line or riser 1 is connected to header 2 disposed in soil 3 to have nipples 4 extend therefrom. Conical shaped plastic elements or tile 5 have their reduced ends circular and provided with openings there-through for slip fit connections with the nipples 4.

The remote or large end thereof has cross sectional form comprising straight sides, 7, 8, 9, forming a polygonal or semi-hexagonal portion. Circular side 10 thereof terminates in flat side extensions 11 which have connecting sides 12 therefrom to the polygonal portion.

This combination circular-polygonal shaped end is provided with chamfer 13 for receiving beveled end 14 of tile element 15 having the cross sectional form of the large end of the conical element 5. This particularly shaped tile has many advantages for sub-surface fluid transmission.

The elements 15 are laid in parallel rows extending from the header 2 any desired length, the last tile of each line being capped by saucer-shaped cover 16 of the same material as the tile.

The tile are preferably laid so that the side 8 forms a base therefor, the extensions 11

then form overhangs along the sides thereof. Openings 17 extend radially through the sides 7, 9, just under the overhangs adjacent the connecting faces 12.

Steam under pressure may be turned into the lines formed by these elements and such will be delivered in jets downwardly from the tile into the soil. All of the steam will be so delivered, the interfitting ends and closed line termini preventing other escape. This sub-surface delivery in downwardly directed jets insures a proper depth sterilization while preventing blow-outs or puddles. It has been found steam under 50 pound pressure in the header will sterilize an area approximately 140 by 50 feet in about 8 hours, the branch lines being from 12 to 18 inches apart. This kills all the undesirable bacteria without unnecessary flooding. Steam up to 150 pounds pressure has been used without line rupture or leaks at the tile element joints.

The overhangs prevent soil working into the openings 17 and also provide pockets 18 therebeneath which aid in initial distribution of the steam from the openings.

The interfitting joints may be round, the flat face 8 usually sufficient to maintain alignment of the tile and prevent rotation therebetween thus keeping proper opening alignment.

However the shape of the ends may conform to the semi-hexagonal portion and thus insure prevention of rotation between the elements 15.

In some instances circular tile 19 may be used and in order to maintain the openings properly aligned groove 20 is placed along the side thereof to facilitate laying, the workman placing the tile so that the groove is upward and continuous. To insure the alignment is maintained keys 21 may be dropped into the grooves over the joints.

The opening 22 through the tile is preferably circular and while the elements are designed primarily for sterilization, the transmission lines formed thereby may be used for irrigation or fertilizing.

By this construction, a sterilizing system may be built up to cover any shape or size plat. The interfitting joints prevent any es-

cape of fluid thereat even when such is under substantial pressure. All the steam being jetted downwardly allows it to thoroughly spread before reaching the surface.

What is claimed and it is desired to secure by United States Letters Patent is:—

1. The method of sterilizing soil comprising discharging steam directly thereinto from a sub-surface source, confining the steam to a downwardly directed discharge.

2. The method of sterilizing soil comprising discharging a series of steam jets directly thereinto from a sub-surface source, confining the steam from said jets to a downwardly directed discharge.

3. The method of sterilizing soil comprising discharging a jet of high pressure steam downwardly into the soil from a sub-surface source.

4. The method of sterilizing soil comprising discharging a definitely spaced series of jets of steam directly into the soil, confining the discharge to a downwardly distribution.

5. The method of sterilizing soil comprising discharging a definitely spaced series of steam jets downwardly directly into the soil from a sub-surface source, confining the steam to a downwardly discharge.

6. The method of sterilizing soil comprising discharging a definitely spaced series of steam jets of substantial pressure downwardly into the soil from a sub-surface source.

7. Apparatus for sterilizing soil comprising a sub-surface line composed of a series of tile elements having joints interfitting to prevent fluid escape therebetween, said tile provided with downwardly directed openings whereby the entire discharge from said apparatus is confined to a downwardly distribution therefrom.

8. Apparatus for sterilizing soil comprising a steam line, a header, and a series of branch lines from the header extending beneath the surface of the soil, said branch lines composed of tile elements having joints interfitting to prevent steam escape therebetween and provided with downwardly directed openings.

In witness whereof I affix my signature.

WILLIAM SALISBURY.