

April 10, 1951

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2,548,065

BURNING APPARATUS FOR PLANT BEDS

Filed May 18, 1948

4 Sheets-Sheet 1

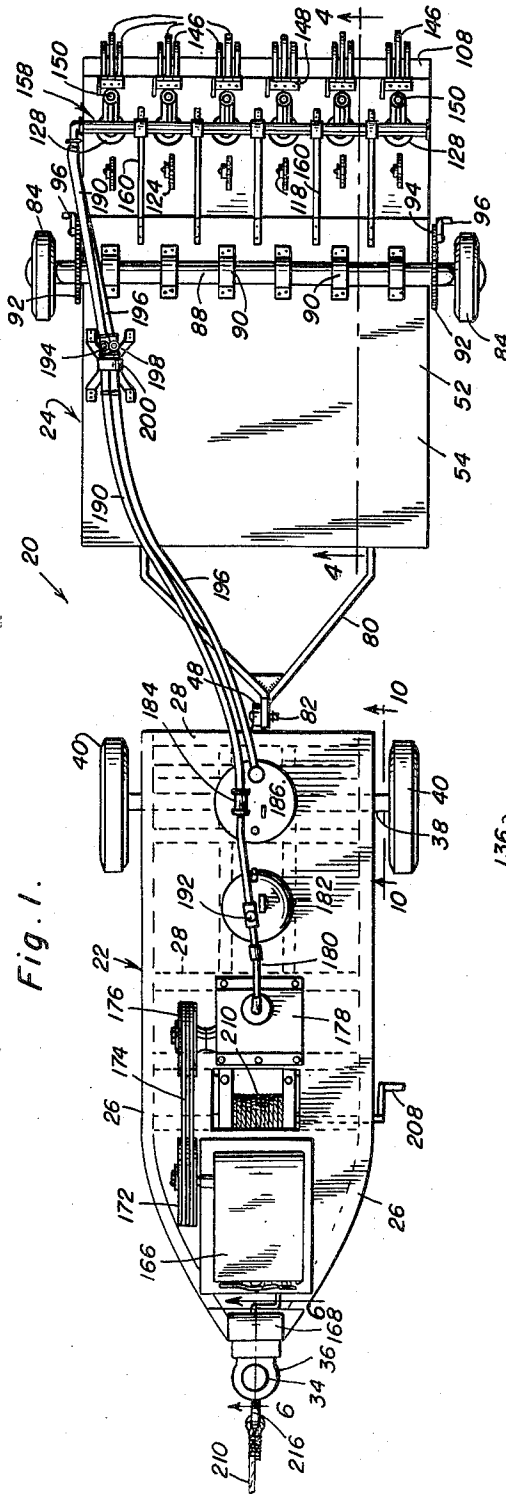


Fig. 1.

Fig. 8.

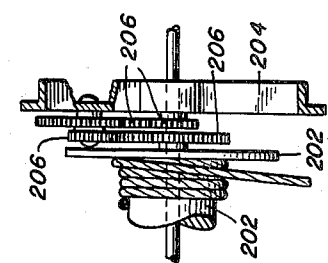


Fig. 13.

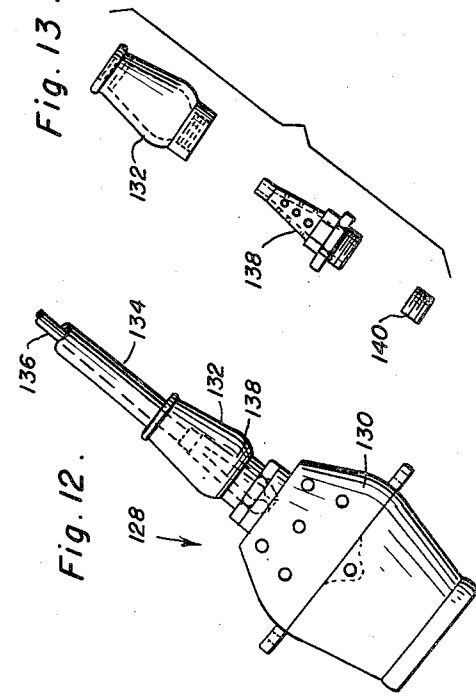


Fig. 12.

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4 Sheets-Sheet 2

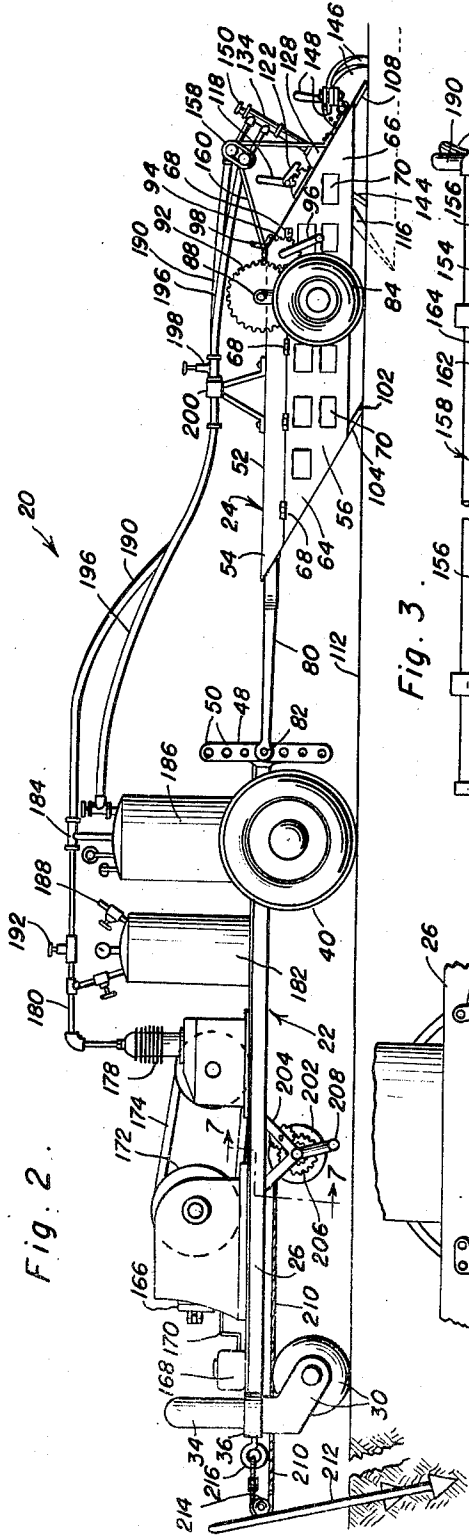


Fig. 2.

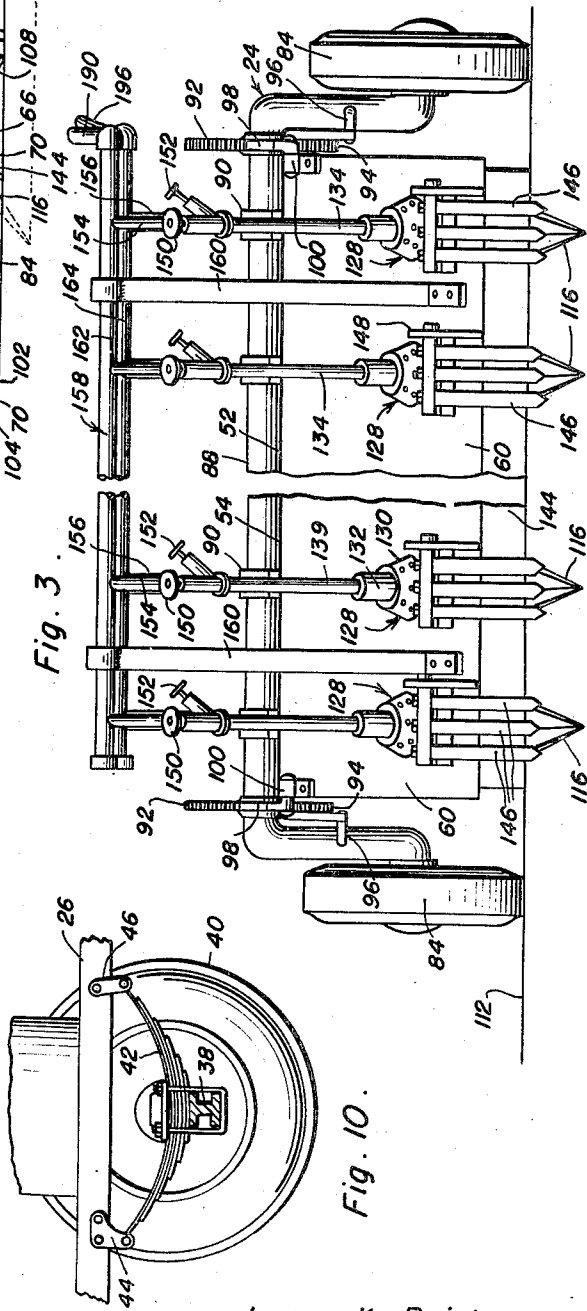


Fig. 3.

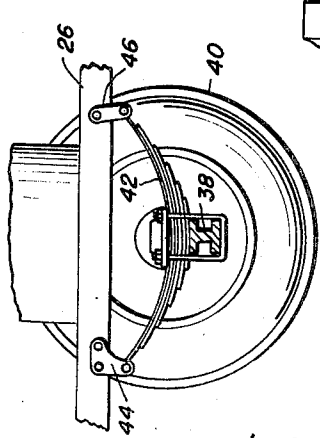


Fig. 10.

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4 Sheets-Sheet 3

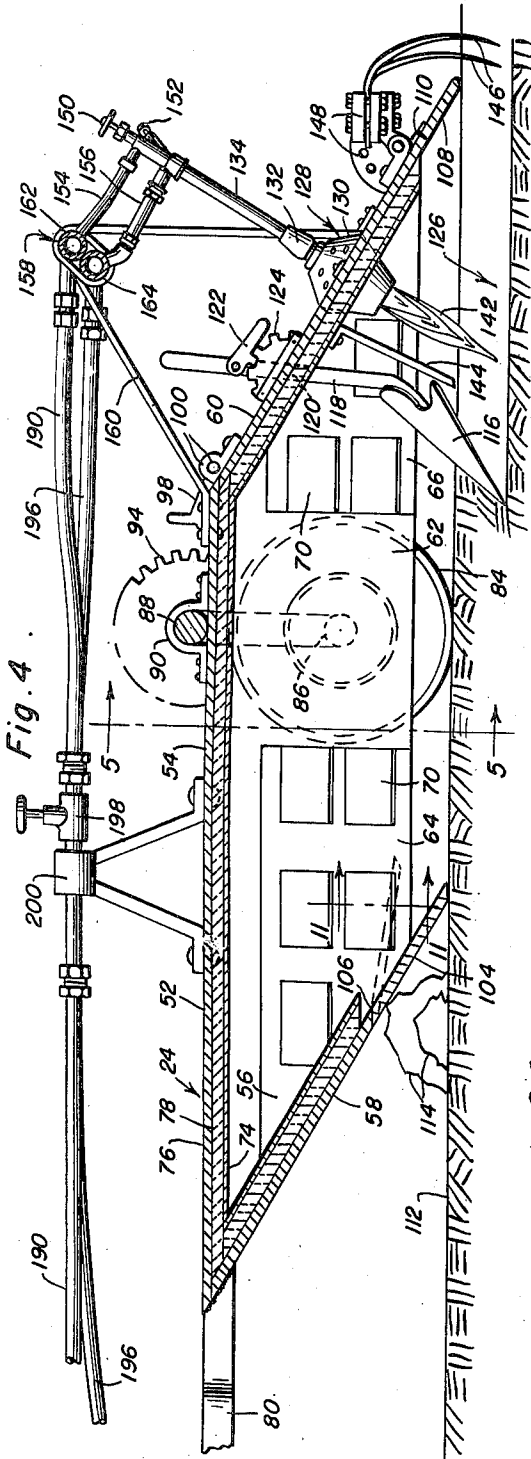


Fig. 4

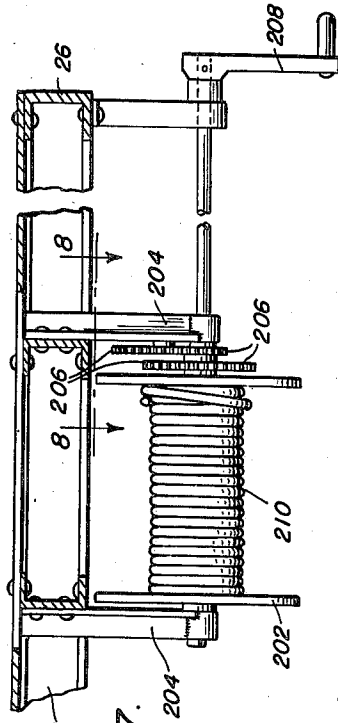


Fig. 7

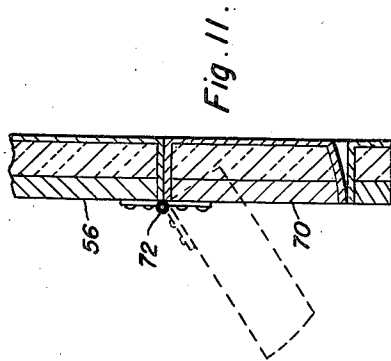


Fig. 11

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Fig. 9.

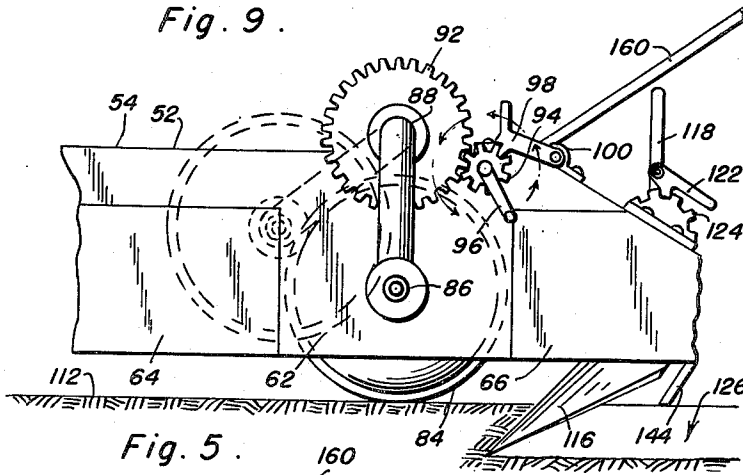


Fig. 5.

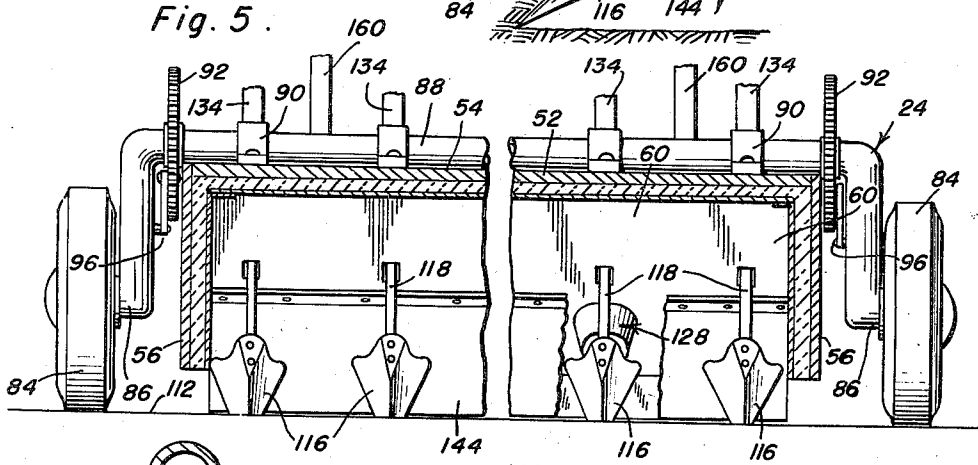
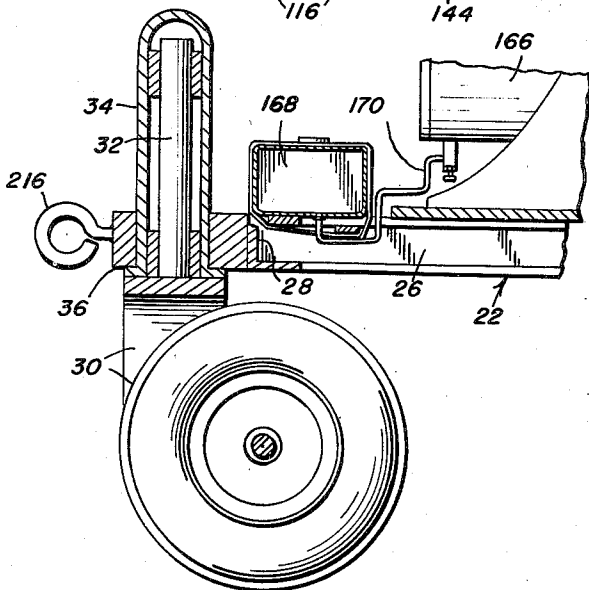


Fig. 6.



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# UNITED STATES PATENT OFFICE

2,548,065

## BURNING APPARATUS FOR PLANT BEDS

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Application May 18, 1948, Serial No. 27,622

5 Claims. (Cl. 111-7)

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This invention relates to new and useful improvements and structural refinements in apparatus for burning plant beds such as beds for tobacco plants, and the like, and the principal object of the invention is to thoroughly and effectively destroy weeds, underground roots, etc. such as would interfere with or otherwise hinder proper growth of the plants.

This object is achieved by the provision of the instant apparatus wherein a plow-shaped foot breaks the soil, a jet of flame is directed into the furrow broken by the foot and finally, an evener follows the nozzle from which the jet of flame is thrown and covers or levels off the furrow, thereby completing the operation.

An important advantage of the invention resides in the fact that the plant bed to be burnt is broken in the form of a furrow, thus enabling the jet of flame to reach and effectively destroy weeds, etc. disposed under the ground.

A primary feature of the invention resides in the provision of what may be referred to as a bottomless oven under which the ground breaking foot and the burner nozzle are located, which oven effectively prevents the heat from the flame from dissipating into the atmosphere and assures that weeds on the ground surface as well as below the ground surface are effectively destroyed.

An additional feature of the invention resides in its ability to employ a plurality of ground breaking feet, a plurality of burner nozzles and a plurality of ground eveners, all in association with a common oven, whereby the operating capacity of the invention is substantially enhanced.

A still further feature of the invention lies in the provision of self-contained means for generating a combustible fuel mixture and delivering the same to the various burner nozzles, said means constituting a component part of the apparatus itself.

An additional feature of the invention resides in its mobility, the entire apparatus assuming the form of a wagon associated with a trailer, matters being so arranged that the wagon as well as the trailer may readily travel along the plant bed as well as along a highway while being transported from one site of operation to another.

Another important advantage of the invention lies in its simplicity of construction and operation and its adaptability to economical manufacture.

With the above more important objects and

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features in view and such other objects and features as may become apparent as this specification proceeds, the invention consists essentially in the arrangement and construction of parts as illustrated in the accompanying drawings, in which:

Figure 1 is a top plan view of the invention.

Figure 2 is a side elevational view thereof.

Figure 3 is a rear elevational view of the trailer portion of the invention, showing the same partially broken away.

Figure 4 is a cross sectional view, taken substantially in the plane of the line 4-4 in Figure 1.

Figure 5 is a cross sectional view partially broken away, taken substantially in the plane of the line 5-5 in Figure 4.

Figure 6 is a cross sectional view, taken substantially in the plane of the line 6-6 in Figure 1.

Figure 7 is a cross sectional view partially broken away, taken substantially in the plane of the line 7-7 in Figure 2.

Figure 8 is a cross sectional view, taken substantially in the plane of the line 8-8 in Figure 7.

Figure 9 is a fragmentary side elevational view of the trailer used in the invention.

Figure 10 is a cross sectional view, taken substantially in the plane of the line 10-10 in Figure 1.

Figure 11 is a cross sectional view, taken substantially in the plane of the line 11-11 in Figure 4.

Figure 12 is an elevational view of a burner nozzle used in the invention, and

Figure 13 is an exploded perspective view of some of the components of the burner nozzle.

Like characters of reference are employed to designate like parts in the specification and throughout the several views.

Referring now to the accompanying drawings in detail, the invention consists of a burning apparatus for plant beds designated generally by the reference character 20, the same including in its construction two major units or sub-assemblies, namely, a wagon 22 and a trailer 24.

The wagon 22 is constructed from a pair of side members 26 and a plurality of suitable cross members 28, the side members 26 being arcuated at their forward end portions to terminate in a pointed nose, which, in turn, is equipped with a rubber-tired caster unit 30. This caster unit includes a substantially upright shaft 32 which is rotatable in a cylindrical standard 34, the latter being secured in a block 36 provided at the for-

ward end of the side members 26, as will be clearly understood.

A rigid axle 38, carrying a pair of rubber-tired wheels 40, is suspended by means of suitable leaf springs 42 and shackles 44, 46 from the rear end portions of the side members 26, and the wagon 22 is provided at the rear end thereof with a vertically extending tow bar 48 formed with a row of apertures 50.

The aforementioned trailer 24 assumes the form of what may be referred to as a bottomless oven 52, the same including in its construction a top wall 54, a pair of spaced parallel side walls 56, a downwardly and rearwardly extending front wall 58 and a downwardly and rearwardly extending rear wall 60. It is to be noted that intermediate portions 62 of the side walls 56 are rigidly secured by welding or in any other suitable manner to the top wall 54, but forward and rear portions 64, 66 respectively of the side walls are hingedly connected, as indicated at 68. By virtue of this hinged connection, the portions 64, 66 of the side walls 56 may be swung outwardly and upwardly for the purpose of cooling the interior of the oven. Moreover, ventilating doors 70, hinged as at 72, may be provided on the portions 64, 66 of the side walls 56, whereby opening of the doors will obviate the necessity of opening the entire portions 64, 66 when the oven is to be cooled.

It is to be noted that the top, side, front and rear walls of the oven are of insulated construction, each wall having inner and outer layers of metallic material indicated at 74, 76 respectively, together with a packing of insulating material such as asbestos 78, or the like, interposed between the layers 74, 76, as is exemplified in the upper left-hand corner of Figure 4. This form of insulated construction is, of course, typical to the wall structure of the oven as a whole.

The oven portion 52 of the trailer 24 is provided with a forwardly extending yoke 80 equipped at its forward end with a coupling pin 82, the latter being selectively receivable in the apertures 50 of the aforementioned bar 48 of the wagon 22.

It may be stated at this point that the trailer 24 is equipped with a pair of retractable wheels 84 which are rotatable on downwardly offset stub shafts 86 of a tubular axle 88, the latter being rotatable in a set of aligned bearings 90 provided on the top wall 54 of the oven 52. As is best shown in Figure 9, the axle 88 carries a pair of spur gears 92 meshing with relatively small pinions 94, the latter being rotatably mounted on the side walls 56 of the oven 52 and being equipped with suitable hand-cranks 96.

The pinions 94 actually assume the form of ratchets with which are engageable suitable pawls 98 pivoted as at 100 to the body of the oven 52. It will be apparent from the foregoing that by simply rotating the hand-cranks 96, the wheels 84 may be lowered or raised as desired, the arrangement of the pawls 98 and ratchets 94 being such that the pawls, while engaging the ratchets, will effectively retain the wheels either in the raised or lowered position.

The forward lower end portions or corners 102 of the side walls 56 of the oven are normally intended to ride along the ground, which is effected either by raising or lowering the wheels 84 as necessary, or by adjusting the position of the yoke 80 with respect to the bar 48, that is, by inserting the coupling pins 82 in the various apertures 50 of the bar 48, as will be clearly understood.

It is to be noted that an obliquely disposed extension plate 104 is hinged as at 106 to the lower edge of the front wall 58 of the oven, while a further extension plate 108 is hinged as at 110 to the lower edge of the oven rear wall 60. These plates 104, 108 normally engage the surface 112 of the ground, but are readily deflectable in an upward direction, upon coming in contact with an obstruction, such as indicated at 114.

The essence of novelty in the invention resides in the provision of a transversely extending row of soil breaking feet 116 in the oven 52, these feet being secured to suitable arms or limbs 118 which are pivoted as at 120 to the rear wall 60 of the oven. Moreover, the feet 116 are swingably adjustable, being retained in a predetermined position by means of pawls 122 engaging toothed quadrants 124, the former (pawls) being pivoted to the arms 118 and the latter (quadrants) being secured to the wall of the oven, as will be readily apparent. The feet 116, of course, are intended to penetrate into the ground so as to form a furrow 126 when the trailer 24 travels along the plant bed, the depth of the furrow being governed by the setting of the arms 118 with respect to the quadrants 124. It should be also noted that inasmuch as a plurality of the feet 116 are provided in a transversely extending row, a plurality of furrows will be formed in the ground while the apparatus travels along the plant bed.

A plurality of burner nozzles designated generally by the reference character 128 are mounted in a transverse row upon the rear wall 60 of the oven 52, these nozzles being of conventional construction and including a foraminous jacket 130 carrying an adapter 132 which, in turn, is mounted upon the end portion of a compressed air tube 134. (See Figures 4, 12 and 13.) The tubes 134 contain relatively small fuel tubes 136 which extend through the adapters 132 and are provided with fuel nozzles proper 138 equipped with tips 140. This form of nozzle construction is, as aforesaid, of conventional type, but it should be noted that the nozzles 128 are directed forwardly and downwardly, so that the jets of flame 142 (see Figure 4) are thrown into the furrows 126 broken by the feet 116. A transversely extending heat deflector plate 144 is provided between the nozzles 148 and the feet 116, thereby preventing the latter from sustaining damage from the heat of the flames.

A transversely extending row of ground eveners, assuming the form of sets of resilient fingers 146 are mounted on the lower edge portion of the oven wall 60, the purpose of these eveners being, of course, to level the soil after the furrows 126 have been formed by the feet 116 and burnt by the nozzles 128, the eveners 146 being adjustable as to depth by virtue of adjustable mountings 148 with which they are provided.

The flow of compressed air and fuel through the tubes 134, 135 respectively is regulated for each of the nozzles 128 by means of suitable valves 150, 152 respectively, the valves 150, 152 being, in turn, connected by suitable conduits 154, 156 respectively (see Figure 4) to a transversely extending manifold assembly 158 mounted by means of suitable brackets 160 upon the oven 52.

This manifold assembly includes a compressed air tube 162 and a fuel tube 164, the conduits or risers 154 being connected to the former and the conduits or risers 156 communicating with the latter, as will be clearly apparent.

The aforementioned wagon 22 carries self-contained means for generating a gaseous combusti-

ble fuel mixture for the burner nozzles 128, these means including a small internal combustion engine 166 which receives its supply of fuel from a fuel tank 168 through the medium of a fuel line 170, the engine 166 having a drive pulley 172 connected by a belt drive 174 to a flywheel 176 of an air compressor 178. The outlet of this air compressor is connected by a pipe 180 to a compressed air tank 182 and also by means of a connection 184 to a liquid fuel tank 186. The compressed air tank 182 is provided with an outlet connection 188 for general utilitarian purposes such as pumping tires, etc.

The connection 184 feeding a supply of compressed air is also in communication by means of a flexible conduit 190 with the compressed air tube 162 of the manifold 158, a shut-off valve 192 being provided between the compressor 178 and the tank 186, and a further valve 194 being provided between the tank 186 and the manifold tube 162, for obvious reasons.

Moreover, the fuel tank 186 is connected by means of a flexible conduit 198 to the fuel tube 164 of the manifold 158, a suitable shut-off valve 198 being provided on the conduit 196, adjacent the aforementioned valve 194. A convenient support 200 is mounted on the top wall 54 of the oven 52 for the purpose of supporting the flexible conduits 190, 196 as will be clearly apparent.

It will be apparent from the foregoing that by properly regulating the valves 194, 198, a combustible fuel mixture of correct proportions may be delivered through the medium of the manifold 158 to the various nozzles 128, so that the plant bed burning operation may be effected along the aforementioned lines.

Means are provided for moving the entire apparatus along the plant bed while the burning operation is in progress, said means assuming the form of a winch 202 rotatably mounted in suitable brackets 204 extending downwardly from the framework of the wagon 22. Rotation of this winch is effected through the medium of suitable reduction gearing 206 actuated by a hand-crank 208, the winch 202 being intended for winding of a cable 210 thereon, substantially as shown.

A suitable stake 212 is inserted in the ground at the end of the plant bed, the cable 210 being passed around a pulley 214 with which the stake 212 is provided, and the end of the cable being secured to an eye 216 provided on the aforementioned block 36 with which the front end of the wagon 22 is equipped. Accordingly, it will be found that by simply rotating the crank handle 208, the entire apparatus including the wagon 22 and the trailer 24 will be drawn along the plant bed at any suitable rate of speed, while the plant bed burning operation is being effected.

It is believed that the advantages and use of the invention will be clearly apparent from the foregoing disclosure and accordingly, further description thereof at this point is deemed unnecessary.

While in the foregoing there has been shown and described the preferred embodiment of this invention it is to be understood that minor changes in the details of construction and arrangement of parts may be resorted to without departing from the spirit and scope of the invention as claimed.

Having described the invention, what is claimed as new is:

1. A burning apparatus for plant beds, comprising a wagon, a wheel-supported bottomless oven drawn by said wagon, said oven including side walls and a downwardly and rearwardly extending rear wall, a transverse row of adjustable soil breaking feet provided in said oven, a transversely extending manifold mounted on said oven, a plurality of burner nozzles mounted on said rear wall and directed to throw jets of flame into furrows broken by the respective feet, tubes connecting said nozzles to said manifold, a transverse row of ground eveners carried by said rear wall, a motor-driven air compressor and a liquid fuel tank mounted on said wagon, and conduits connecting said tank to said manifold and said compressor to said manifold and to said tank.

2. A burning apparatus for plant beds, comprising a wagon, a bottomless oven drawn by said wagon, retractable wheels on said oven, said oven having heat insulated wall construction and including a pair of side walls, and downwardly and rearwardly extending front and rear walls. a transverse row of adjustable soil breaking feet provided in said oven, a plurality of burner nozzles mounted on said rear wall and directed to throw a jet of flame into a furrow broken by the respective feet, a transverse row of ground eveners carried by said rear wall, a transverse manifold mounted on said oven and including an air tube and fuel tube both separately connected to each of said nozzles, a motor-driven air compressor and a fuel tank carried by said wagon, and conduits connecting said tank to said fuel tube and said compressor to said air tube and to said tank.

3. The device as defined in claim 2 together with means including a manually rotatable winch on said wagon for propelling the same along the ground.

4. The device as defined in claim 2 together with ventilating doors provided on said oven.

5. The device as defined in claim 2 together with a transverse heat deflector provided in said oven between said nozzles and said feet.

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