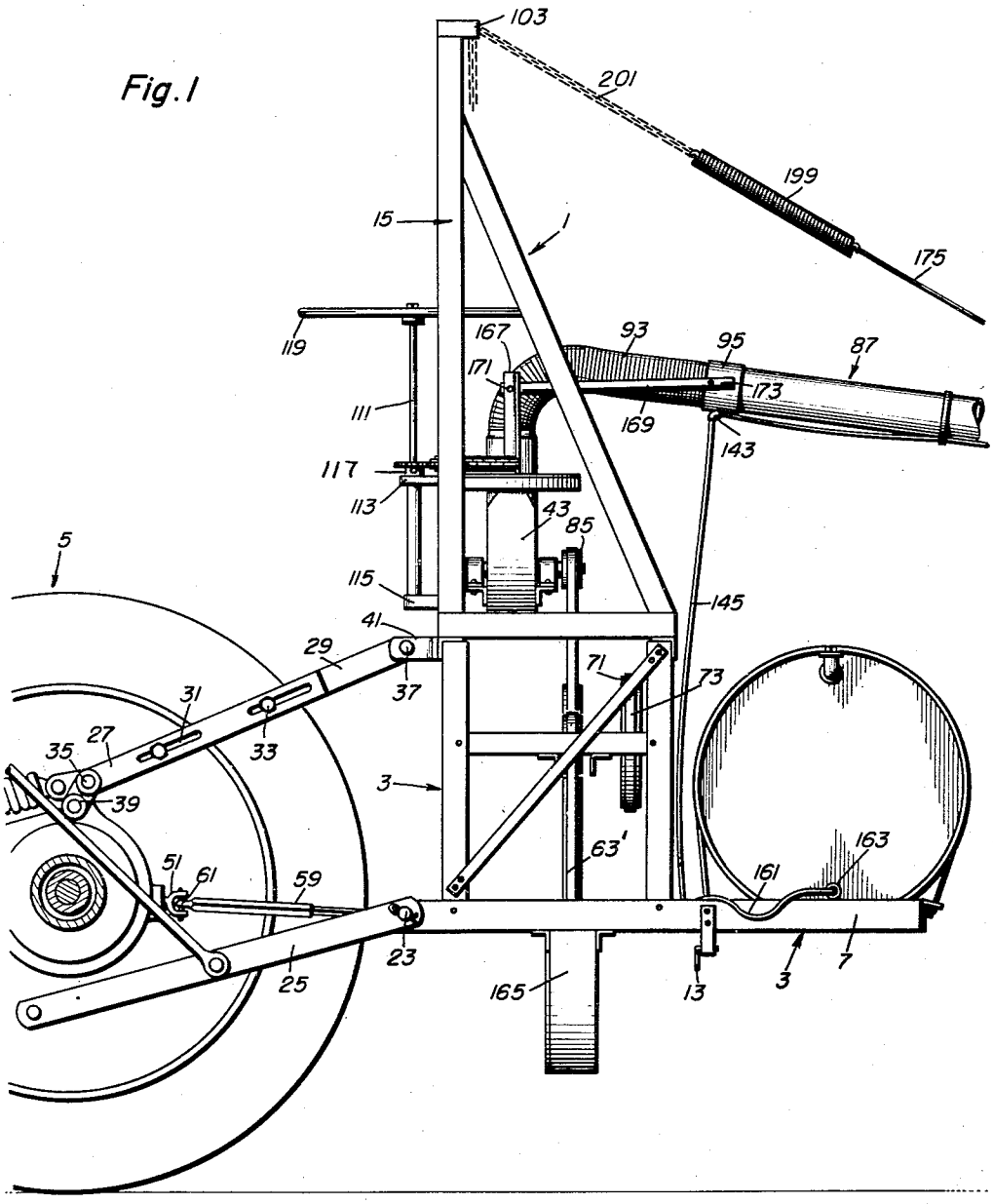
June 17, 1958 K. R. DAVISSON ET AL 2,839,047

WEED BURNER APPARATUS FOR TRACTORS

Filed March 11, 1955 4 Sheets-Sheet 1

Fig. 1



Kenneth R. Davisson
George R. Smith
INVENTORS.

BY Clarence A. O'Brien and Harvey B. Jacobson
Attorneys

June 17, 1958 K. R. DAVISSON ET AL 2,839,047

WEED BURNER APPARATUS FOR TRACTORS

Filed March 11, 1955 4 Sheets-Sheet 2

Fig. 8

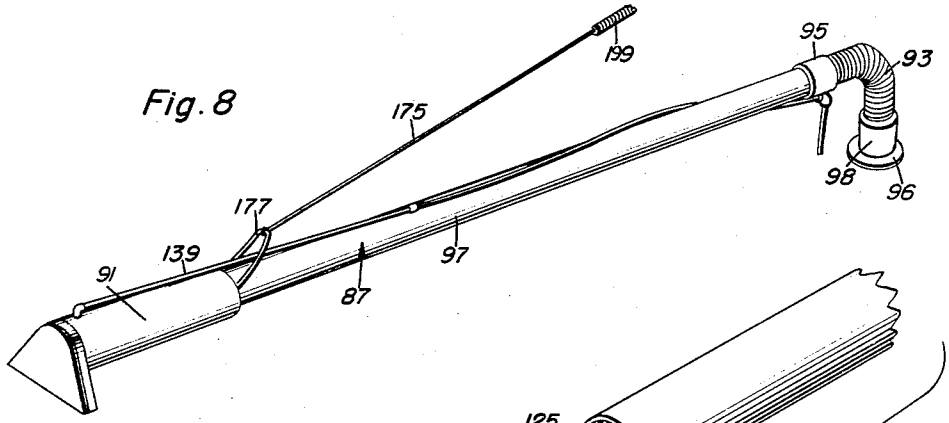


Fig. 9

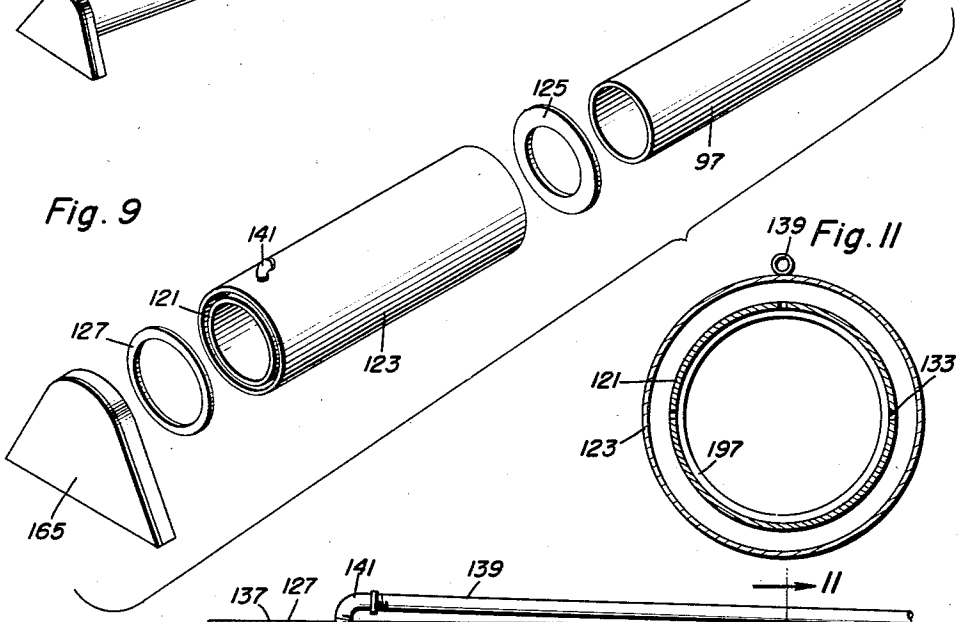
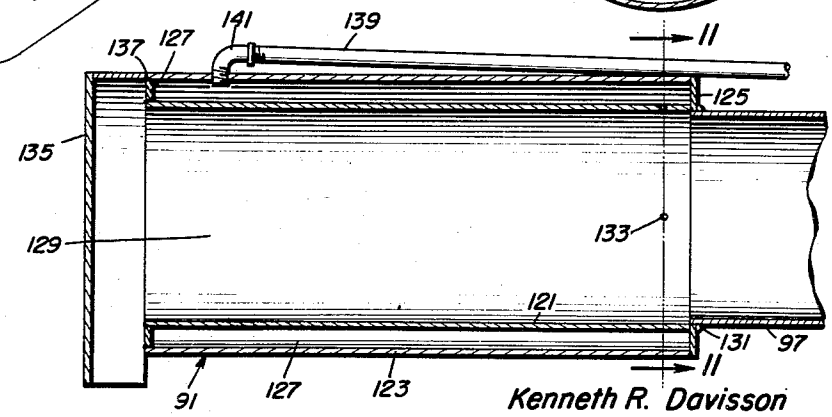


Fig. 11

Fig. 10



Kenneth R. Davisson
George R. Smith
INVENTORS.

BY Clarence A. O'Brien and Harvey B. Jacobson
Attorneys

June 17, 1958 K. R. DAVISSON ET AL 2,839,047

WEED BURNER APPARATUS FOR TRACTORS

Filed March 11, 1955 4 Sheets-Sheet 3

Fig. 4

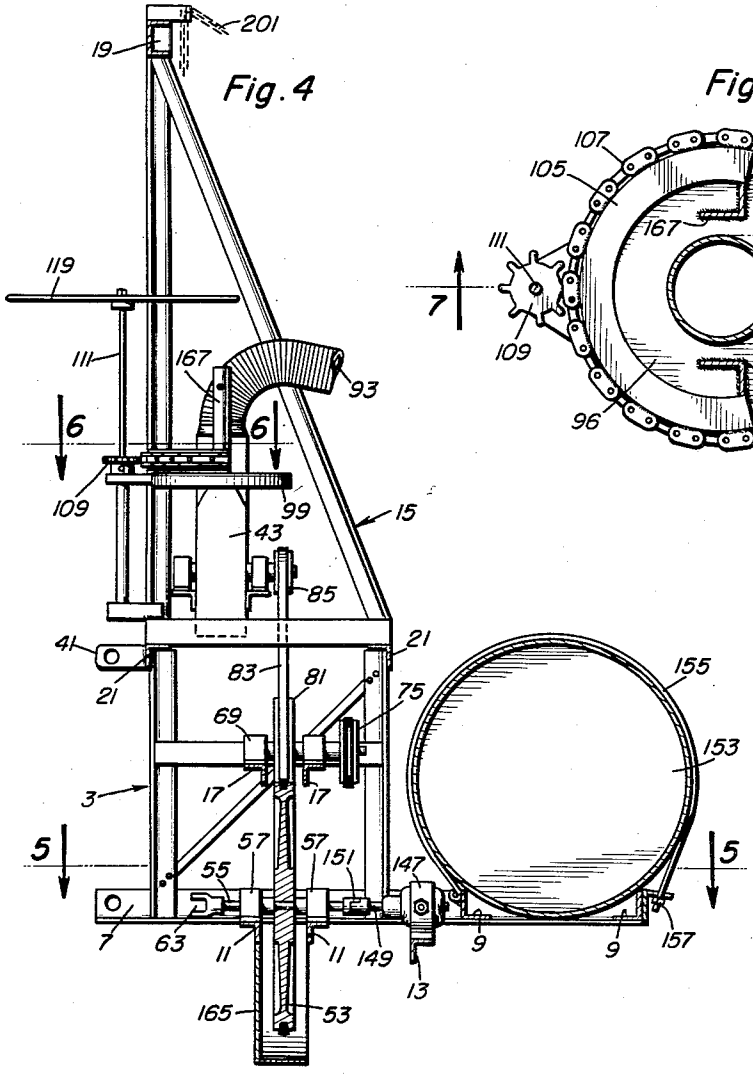
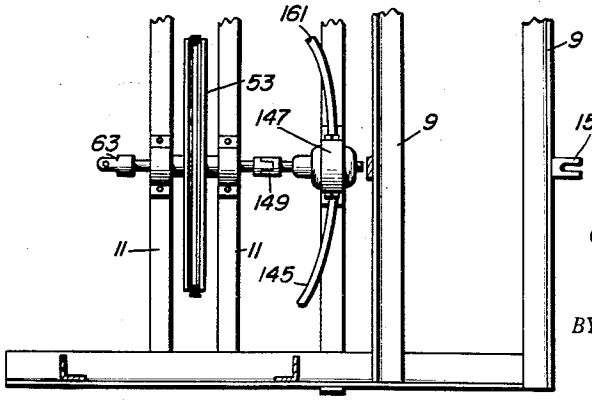


Fig. 6

Fig. 5



Kenneth R. Davisson
George R. Smith
INVENTORS.

BY Clarence A. O'Brien and Harvey B. Jacobson
Attorneys

June 17, 1958 K. R. DAVISSON ET AL 2,839,047

WEED BURNER APPARATUS FOR TRACTORS

Filed March 11, 1955 4 Sheets-Sheet 4

Fig. 2

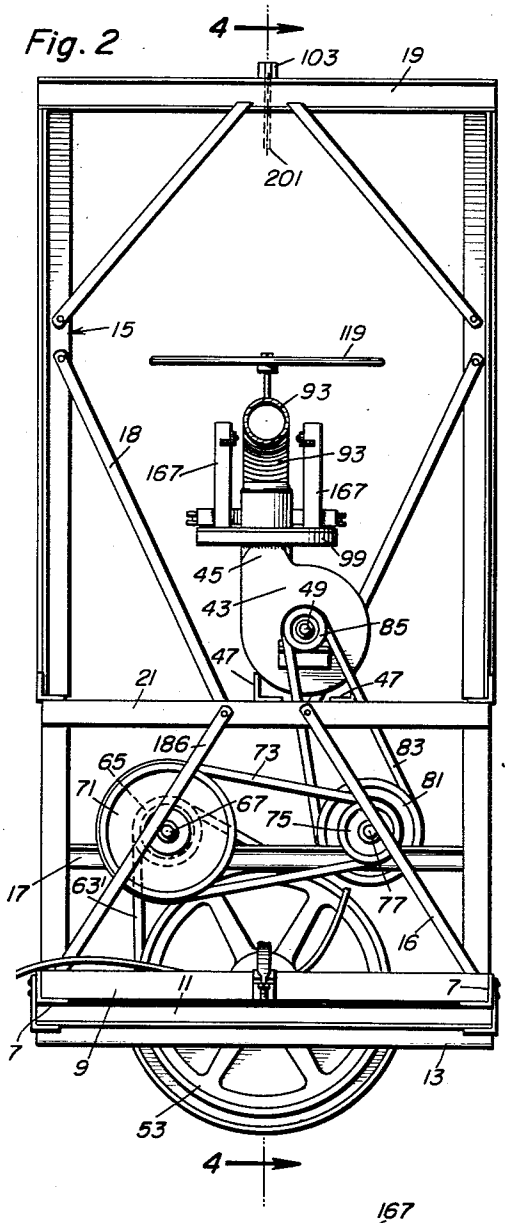


Fig. 3

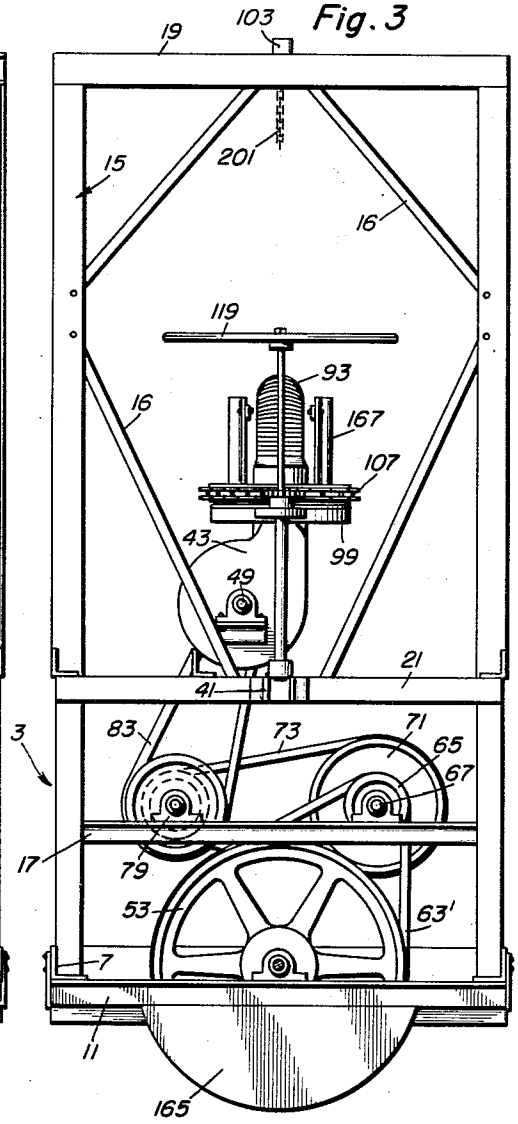
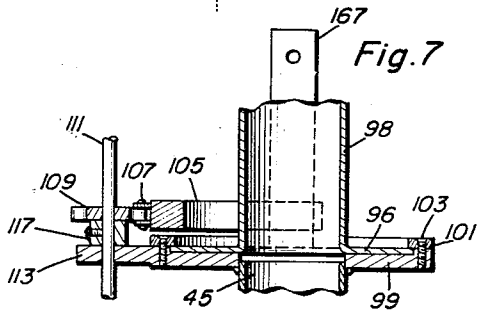


Fig. 7



Kenneth R. Davisson
George R. Smith
INVENTORS.

BY Clarence A. O'Brien and Harvey B. Jacobson
Attorneys

United States Patent Office

2,839,047

Patented June 17, 1958

2,839,047

WEED BURNER APPARATUS FOR TRACTORS

Kenneth R. Davisson, Severance, and George R. Smith, Greeley, Colo.; said Davisson assignor to said Smith

Application March 11, 1955, Serial No. 493,734

1 Claim. (Cl. 126—271.2)

Our invention relates to improvements in weed burner apparatus for attachment to and transporting by a tractor to destroy weeds in fields and the like.

The primary object of our invention is to provide an oil burning apparatus for the above purpose in which a hollow boom having a terminal burner head on one end, and being connected at its other end to a blower for feeding air to the burner head for combustion purposes and blowing flame out of said head is mounted at a high elevation on the power lift of a tractor for transportation over fields and for raising and lowering of the apparatus according to operating requirements, the boom being swingable laterally through a wide arc in burning weeds.

Another object is to provide, in such apparatus, for operating the blower and pumping liquid fuel to the burner head by operation of the rear power take-off of the tractor.

Still another object is to provide a highly effective, economical and safe burner head for vaporizing liquid fuel and directing a flame downwardly from the boom to facilitate destroying weeds.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

Figure 1 is a fragmentary view in side elevation of our improved apparatus attached to the power lift of a tractor;

Figure 2 is a view in rear elevation of the apparatus detached, parts being shown in section and the fuel drum and its attaching means eliminated;

Figure 3 is a view in front elevation also with the fuel drum and its attachment means eliminated.

Figure 4 is a view in vertical section taken on the line 4—4 of Figure 2;

Figure 5 is a fragmentary view in horizontal section taken on the line 5—5 of Figure 4;

Figure 6 is an enlarged fragmentary view in horizontal section taken on the line 6—6 of Figure 4;

Figure 7 is a view in vertical section taken on the line 7—7 of Figure 6;

Figure 8 is a view in perspective of the boom and burner head detached;

Figure 9 is a fragmentary enlarged, exploded view of the boom and parts of the burner head;

Figure 10 is an enlarged fragmentary view in vertical longitudinal section of the burner head and boom; and

Figure 11 is a view in transverse section taken on the line 11—11 of Figure 10.

Referring to the drawings by numerals, according to our invention the operating parts of the apparatus are mounted in a tower designated generally by the numeral 1 and which is formed preferably of welded together angle iron and other suitable bars.

The tower 1 comprises a generally rectangular base frame 3 adapted to extend rearwardly from the power

lift of a tractor 5 and comprising a pair of side bars 7 a pair of rear cross bars 9, a pair of forward cross bars 11 and a cross bar 13 intermediate the pairs of bars 9, 11. A pair of skeleton side frames 15 rising from the side bars 7 are connected together by a pair of lower front and rear cross bars 17, a top channel bar 19 and a pair of front and rear cross bars 21 intermediate the top bar 19 and pair of bars 17. The frames 15 are braced by suitable front and rear diagonal braces 16, 18.

The tower 1 is connected to the power lift of the tractor 5 for carrying thereby by the following means. The side bars 7 of the base frame 1 are pivoted at the front ends thereof as at 23 to the conventional side power lift arms 25 of the tractor to extend rearwardly therefrom. Bars 27, 29 connected by bolt and slot connections 31, 33 are pivoted at outer ends thereof, as at 35, 37 to the conventional power lift overload safety control 39 and between front lugs 41 on the front cross bar 21 of the frames 15. The bars 27, 29 being above the power lift arms 25 hold the tower 1 upright during raising and lowering thereof by the power lift arms 25.

A blower 43 of the type having a top vertical discharge tube 45 is suitably mounted in upright elevated position in the tower 1 midway between the side frame 15 on bars 47 cross connecting the pair of bars 21 and with its shaft 49 extending longitudinally of the path of travel of the tower 1.

A step up drive between the rear power take-off shaft 51 of the tractor 5 is provided comprising a large pulley wheel 53 running between the pair of cross bars 11 of the base frame 3 and fixed on a horizontal shaft 55 journaled in bearings 57 on said bars 11. A telescopic sectional shaft 59 universally jointed as at 63, 61 to the shaft 55 and to the rear power take-off shaft 61 of the tractor operatively connects said shaft 51 to the pulley 53. A belt 63' connects the pulley 53 to a higher substantially smaller pulley 65 on a shaft 67 having bearings 69 on the bars 17 and having a larger pulley 71 fast thereon connected by a belt 73 to a relatively smaller pulley 75 on a shaft 77 having bearings 79 on the bars 17. A pulley 81 relatively larger than the pulley 75 and on the shaft 77 is connected by a belt 83 to a smallest pulley 85 on the blower shaft 49. As will now be seen a triple step up drive is provided between the power take-off shaft 51 and the blower 43.

The boom 87 comprises a tube 97 extending rearwardly from the tower 1 above the blower 43, and having the burner head 91 presently described on its rear end. The front end of the tube 97 is flexibly and rotatably connected to the blower discharge tube 45 for vertical and lateral swinging by means of the following. A flexible elbow pipe section 93 is attached at one end by a collar 95 to the front end of said tube 97 and is provided with a collar 98 on its other end having a circumferential end flange 96 rotatably seating in a recessed circumferential flange 99 on the upper end of said discharge tube 45. A keeper ring 101 overlying the flange 96 is bolted, as at 103, to the flange 99 to retain said flange 96 in seated position. Means for rotating the collar 98 to swing the tube 97, or boom 87 laterally comprises a segmental circumferential front flange 105 on said collar 98 to which is suitably fixed a length of sprocket chain 107 meshing with a sprocket wheel 109 on a vertical boom rotating shaft 111. The shaft 111 is journaled at the front of the tower 1 in a lug 113 on the flange 99 and at its lower end in a lug 115 on one of the before mentioned bars 21. A set collar 117 on the shaft 111 seating on the lug 113 prevents downward sliding of the shaft 111 in the lugs. A hand wheel 119 is provided on the upper end of shaft 111 for rotating the same.

The burner head 91, best shown in Figures 8 to 11, comprises a pair of inner and outer cylindrical pipe sec-

tions 121, 123 of like length extending concentrically rearwardly from the rear end of the tube 97 and spaced apart with suitably attached front and rear sealing rings 125, 127 closing the space between said sections to form therebetween an annular vaporizing chamber 127. The inner pipe section 121 forms a combustion chamber 129 communicating with the tube 97 at and preferably of slightly larger diameter. The rear end of the burner head 91 is welded as at 131 on the tube 97. Gas discharge apertures 133 in the rear end portion of the inner pipe section 121 provide for gas passing from the vaporizing chamber 127 into the combustion chamber for mixing with air from the blower 43 and igniting in chamber 129 to discharge out of the rear end of the burner head 91. A dished deflector plate 135 downwardly flaring edgewise is suitably fixed, as by welding 137, to the rear end of said head 91 to direct flame downwardly as it is blown by the blower 43 out of the rear end of the combustion chamber 129.

A fuel delivery pipe 139 extends along the burner head 91 and tube 97 and communicates with the rear end of the vaporizing chamber 127 by a terminal elbow 141. Another terminal elbow 143 on pipe 139 is connected to a flexible pump discharge pipe 145 depending therefrom in the rear of the tower 1 and connected to the discharge side of a small pump 147 mounted on the before-mentioned cross bar 13 and to the shaft 149 of which the shaft 55 of the pulley 53 is operatively coupled as at 151 so that the pump 147 is driven by the power take-off shaft 51.

A source of liquid fuel supply such as oil is provided in the form of a drum 153 seating on the rear pair of cross bars 9 of the base frame 3 and which forms a rack for said drum on the rear of the side frames 15. Wire fasteners 155 are secured at one end to one bar 9 of the pair and trained around the drum 155 with the other ends retained by nuts 157 in notched lugs 159 on the other bar 9 of the pair securely anchoring said drum 153 in place. A fuel feed line 161 preferably flexible is suitably attached to a bottom bung 163 in said drum 153 and to the intake side of the pump 147.

A rearwardly opening dished guard plate 165 is suitably attached to the pair of cross bars 11 to surround the lower portion of the pulley 53 to prevent weeds from tangling with said pulley.

Means for preventing the flexible elbow pipe section 93 from buckling sidewise is provided comprising a pair of uprights 167 on the flange 96 on opposite sides of section 93, and a pair of bars 169 pivoted at one end, as at 171, on said uprights and extending along said section 93 on opposite sides thereof with their other ends riveted, as at 173, to opposite sides of the beforementioned collar 95.

The boom 87 is suspended in upswung or lowered position by a cable 175 having one end attached by a yoke 177 to the rear end portion of the tube 97 and its other end attached by a terminal coil spring 199 to a chain 201 adapted to be attached at different points in its length to a catch 103 on the upper cross bar 19.

In operating the described apparatus the boom 87 is lowered to lower the burner head 91 for heating as in a ground fire or the like. When said head 91 is properly heated and the pump 147 and blower 43 operating fuel pumped into the vaporizing a preheating chamber is vaporized therein and issues into the combustion chamber to mix with the air blown through the combustion chamber 129 by the blower 43 and be ignited by the fire so that flame is blown downwardly out of the baffle plate 135 for destroying weeds. With the burner head thus operating the boom may be swung upwardly into any desired

position and suspended in that position by the cable 175, spring 199 and chain 201 and in which it may be swung laterally in a wide arc to destroy tall weeds by rotating the collar 98 through manipulation of the hand wheel 119. By operation of the power lift of the tractor 5 the entire apparatus may be raised or lowered as may be found desirable according to operating requirements.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly all suitable modifications and equivalents may be resorted to, falling within the scope of the appended claim.

What is claimed as new is as follows:

A weed burning apparatus adapted to be supported from the power lift of a tractor having a power takeoff, said apparatus comprising a vertically disposed skeletonized supporting frame adapted to be supported from the power lift, a blower mounted on said frame, step-up drive means for said blower supported on said frame and adapted to be driven from the power take-off, an elongated tubular boom supported from said frame and communicating with the blower, said boom having a flexible portion therein adjacent the inner end thereof, swivel means connecting the boom to the frame for permitting swinging movement thereof about a vertical axis, lift means interconnecting the upper end of the frame with the boom for raising and lowering the boom, means associated with said swivel for rotating the boom about a vertical axis, stabilizing means mounted on said swivel means and extending upwardly alongside the flexible portion of the boom for preventing tilting movement of the boom about the longitudinal axis thereof and maintaining the boom in the same vertical plane as the swivel means, a burner head on the outer end of the boom for receiving combustion supporting air from the blower through the hollow boom, and fuel supply means mounted on said frame and boom for supporting fuel to the burner head, said fuel supply means including a pump adapted to be driven from the power take-off, said swivel means including a horizontal plate mounted on the inner end of the boom, a recessed circumferential flange on the discharge of the blower rotatably receiving said plate, said stabilizing means including a pair of uprights disposed on opposite sides of the flexible portion of the boom and being rigid with the plate for rotational movement therewith, and a pair of bars pivotally connected to the upper ends of the uprights and being connected to the boom outwardly of the flexible portion, said means for rotating the boom including a segment of an annular flange mounted horizontally on said uprights above the plate, a length of sprocket chain rigid with the periphery of the annular flange, a sprocket gear rotatably supported on said frame in meshing engagement with the chain, and handle means connected to said gear for rotation thereof, said handle means being disposed for access by the operator of the tractor.

References Cited in the file of this patent

UNITED STATES PATENTS

1,515,476	Greenfield	Nov. 11, 1924
1,925,164	Woolery	Sept. 5, 1933
2,531,884	McLemore	Nov. 28, 1950
2,561,264	Burgess	July 17, 1951
2,662,783	Sawyer	Dec. 15, 1953
2,685,453	Kuhary	Aug. 3, 1954
2,712,358	Kuhary	July 5, 1955