

No. 776,227.

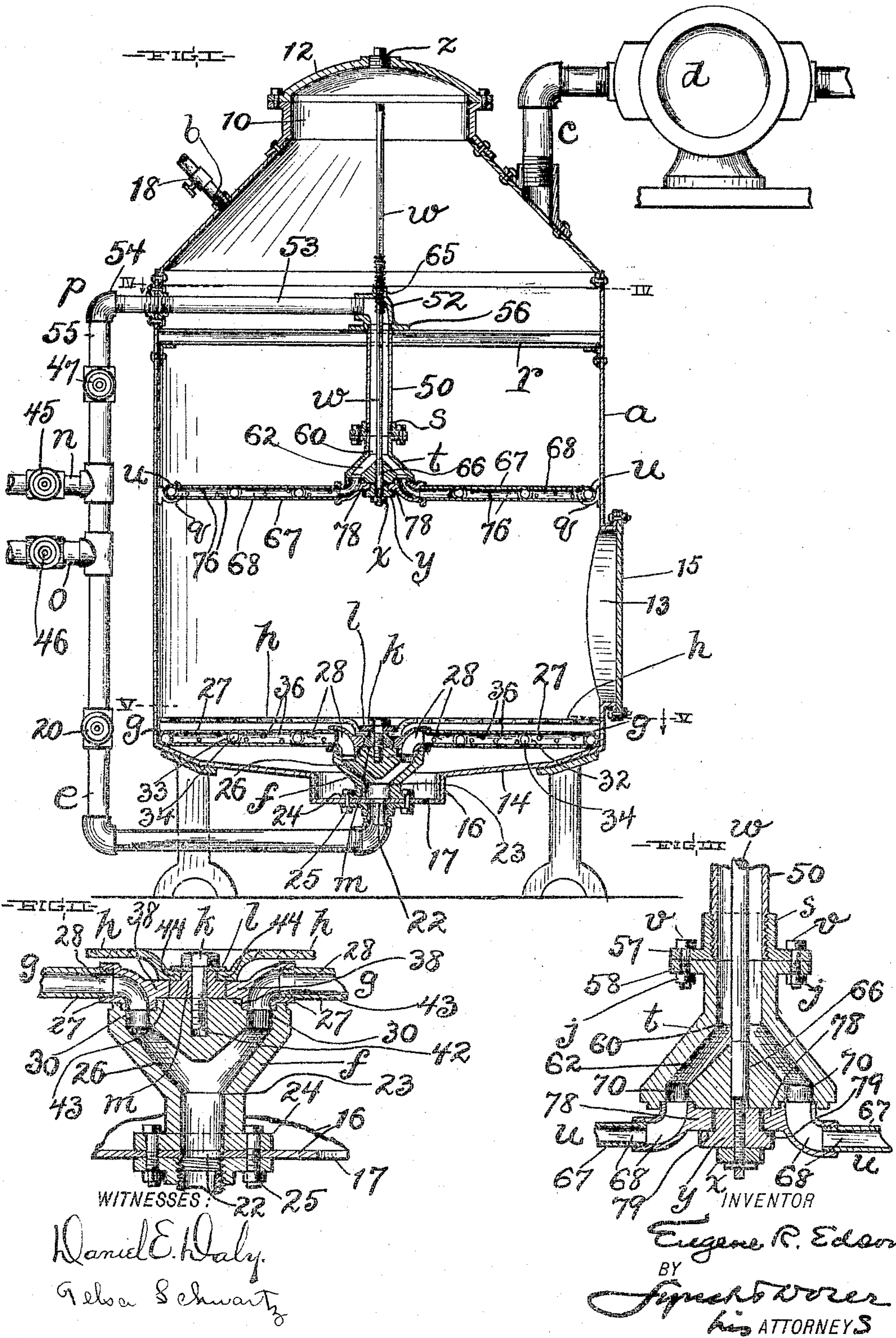
PATENTED NOV. 29, 1904.

E. R. EDSON.  
RENDERING OR REDUCING APPARATUS.

APPLICATION FILED MAY 2, 1902.

NO MODEL.

2 SHEETS—SHEET 1.





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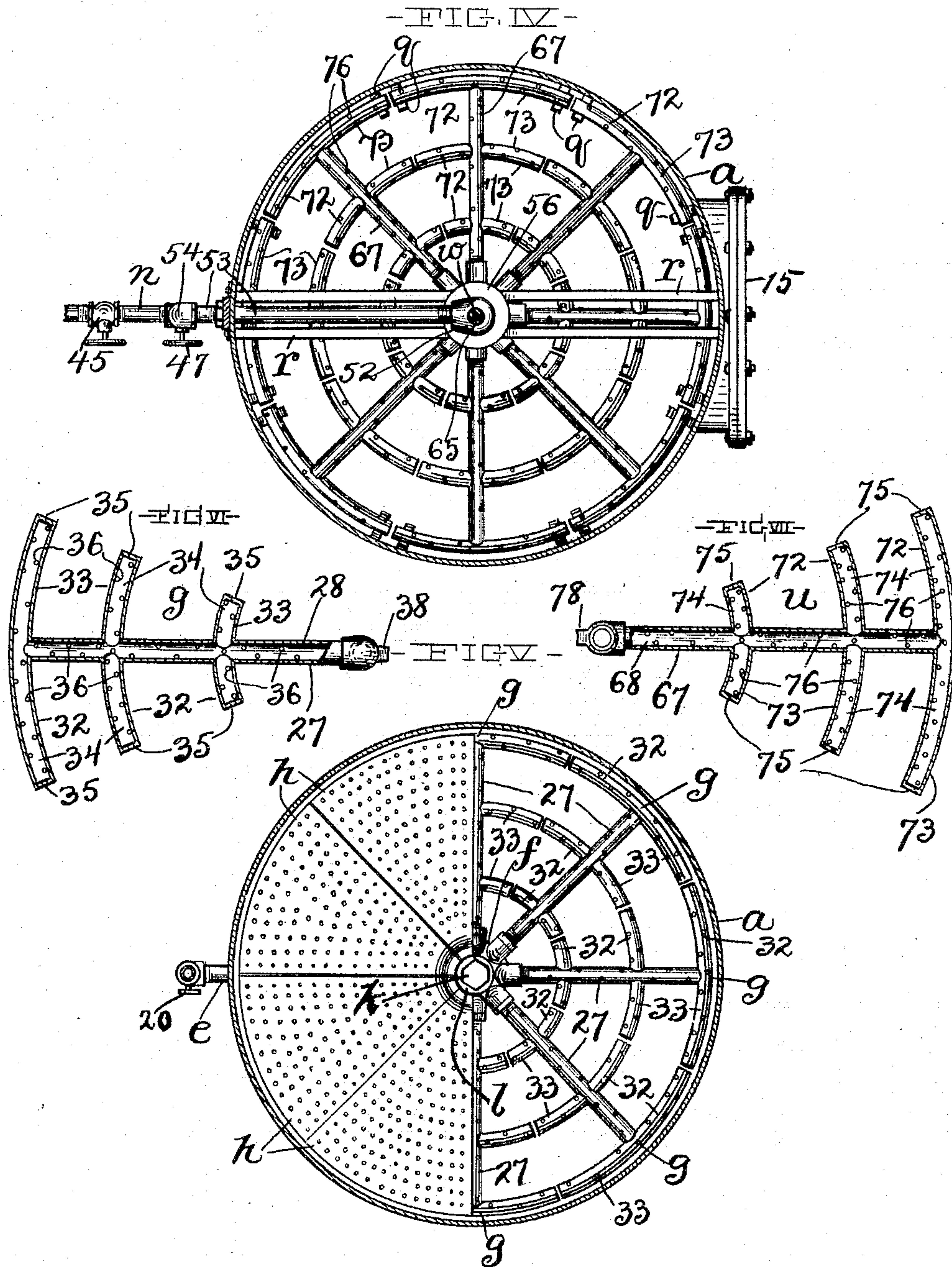
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# UNITED STATES PATENT OFFICE.

EUGENE R. EDSON, OF CLEVELAND, OHIO.

## RENDERING OR REDUCING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 776,227, dated November 29, 1904.

Application filed May 2, 1902. Serial No. 105,605. (No model.)

*To all whom it may concern:*

Be it known that I, EUGENE R. EDSON, a citizen of the United States of America, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Rendering or Reducing Apparatus; and I hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same.

This invention relates to improvements in rendering or reducing apparatus suitable for use in the production of oil and fertilizer from fish-waste, garbage, and other material, and pertains more especially to apparatus not only suitable for extracting oil from the said material by the treatment of the material with a volatile solvent—such, for instance, as naphtha—but well adapted for eliminating from the mass all traces of naphtha, gases, noxious odors, and moisture after draining or removing from the mass the extracted oil and the solvent mixed with the said oil, so as to render the residue suitable for use as a fertilizer.

The primary object of this invention is to provide simple and inexpensive apparatus capable of efficiently and speedily reducing material of the character indicated.

With this object in view and to realize other advantages hereinafter appearing, the invention consists in certain features of construction and combinations of parts, hereinafter described, and pointed out in the claims.

In the accompanying drawings, Figure I is a side elevation, largely in central vertical section, of apparatus employing my invention. Figs. II and III are vertical sections in detail, illustrating a portion of the means employed in distributing steam and air within the body of material undergoing treatment. Fig. IV is a top plan in section on line IV IV, Fig. I; but the perforated false bottom is omitted in Fig. IV. Fig. V is a top plan in section on line V V, Fig. I; but several of the sections of the perforated false bottom of the tank of the apparatus are omitted in Fig. V to show several of the perforated branching-out sections below the said bottom. Fig. VI is a top plan, largely in section, of one of the fluid-distrib-

uting sections *g*. Fig. VII is a top plan, largely in section, of one of the fluid-distributing sections *u*. Figs. II, III, VI, and VII are drawn on a larger scale than the remaining figures.

Referring to the drawings, *a* designates a normally closed tank which is cylindrical and provided at the top and centrally, as shown in Fig. I, with a charging-aperture 10, at which the material to be treated is introduced into the tank upon opening or removing the suitably-applied cover 12, which normally closes the said aperture.

The tank *a*, a short distance above its bottom 14 and at one side, is provided with a lateral aperture 13, which is closed by a suitably-applied door or cover 15, upon removing which access is had to the interior of the tank for repairs and cleaning and for removing from the tank any residue remaining therein after the treatment of material. The bottom 14 is depressed at its central portion, as at 16, to form a receptacle which has its bottom provided, at one side of its central portion, with a hole 17 extending vertically therethrough. The bottom 14 declines toward the receptacle 16, so as to facilitate the flow of oil extracted from material treated within the tank into the said receptacle, whence it flows through the hole 17, where it is received by a reservoir or pipe. (Not shown.) A valved pipe *b* for supplying naphtha or solvent to the chamber of the tank is arranged to discharge into the upper portion of the said chamber and has its valve 18 normally closed.

The tank *a* is provided, at its upper end, with a vapor-conducting pipe or flue *c*, which is connected with the receiving end or inlet of a suitably-operated pump or device *d*, adapted when operating to create suction within the vapor-outlet *c*, and consequently within the chamber of the tank *a*.

A pipe *e*, which has a normally closed valve 20, is employed to conduct steam or air into the lower portion of the chamber of the tank *a* and extends in under a centrally-depressed portion 16 of the bottom 14 and there discharges through a hole 22, with which the bottom of the said portion 16 is provided,



into the lower end of the chamber 23, formed by and within a vertically-arranged multiple-pipe coupling  $f$ , which, as shown very clearly in Fig. II, rests upon and centrally of the bottom of the receptacle 16, and the coupling  $f$  is provided, at its lower end, with an external annular flange 24, which is secured, preferably, removably by means of bolts and nuts, as at 25, to the said bottom. The upper portion of the chamber 23 is annular and flares upwardly, as at 26, and a group of branching-out perforated interchangeable pipe-sections  $g$  are arranged in a horizontal plane and radially of the bottom 14 at suitable intervals around the pipe-section  $f$ . The pipe-sections  $g$  rest, at their outer ends, upon the bottom 14 and communicate, at their inner ends, with the upper end of the upwardly-flaring portion 26 of the interior chamber 23 of the multiple-pipe coupling  $f$ . The extension of the pipe  $e$  to the bottom of the tank below the inner ends of the pipe-sections  $g$  and the discharge of the said pipe  $e$  into the said pipe-sections  $g$  through the multiple-pipe coupling  $f$  renders the construction simple and inexpensive and convenient in the assemblage and removal of parts.

Each pipe-section  $g$  comprises, preferably, a central member 27, arranged radially of the chamber of the tank  $a$  and extending from the coupling  $f$  outwardly into close proximity to the surrounding wall of the said chamber. The said member 27 is provided, internally, with a passage-way 28, which extends longitudinally of the said member. The said passage-way 28 communicates at the inner end of the said member 27 (see Fig. II) with a discharge-aperture 30, formed in the top wall of the chamber 23 of the coupling  $f$ —that is, the chamber 23 discharges through holes 30, formed in the top wall of the chamber, into the pipe-sections  $g$ , and as many apertures or holes 30 as there are pipe-sections  $g$  are provided.

A pipe-section is shown detached in Fig. VI, and it will be observed that the central member 27 of the said section has several concentrically-arranged hollow arms 32 extending from and laterally of the said member 27 in one direction and several concentrically-arranged hollow arms 33 extending from and laterally of the said member 27 in the opposite direction, that the passage-ways 34, formed within and extending longitudinally of the said arms, are closed at their outer ends, as at 35, and communicate, at their inner ends, with the passage-way 28 of the aforesaid central member 27, and that the said member 27 and its arms 32 and 33 have perforations or orifices 36 for discharging the fluid conducted to the said passage-ways from the coupling  $f$  into the chamber of the tank  $a$ . Each pipe-section  $g$  is provided externally at the inner end of its member 27 with a lug 38, (see Fig. II,) which rests upon the

upper end of the coupling  $f$ . Each section  $g$  is suitably supported, therefore, within the lower portion of the tank and is provided with numerous laterally-discharging orifices 36, arranged at suitable intervals along the passage-ways formed in the pipe-section  $g$ .

A perforated false bottom is arranged over and in close proximity to the perforated pipe-sections  $g$  and is composed of several generally triangular perforated sections  $h$ , which are arranged in a horizontal plane radially of the tank with their wider ends next to the surrounding wall of the chamber of the tank. The sections  $h$  are held downwardly at their inner ends over the coupling  $f$  by a bolt or screw  $k$ , a washer  $l$ , and collar  $m$ , as shown very clearly in Fig. II. The bolt or screw  $k$  is arranged vertically and engages a correspondingly screw-threaded hole 42, formed in and centrally of the upper end of the coupling  $f$ . The collar  $m$  embraces the shank of the bolt or screw  $k$  and rests upon the upper end of the coupling  $f$ , and the lower end of the said collar is enlarged diametrically to form an upwardly-facing annular shoulder 43, which constitutes a seat for the inner ends of the sections  $h$  of the false bottom. The sections  $h$  at the said ends have downwardly-projecting flanges 44, which rest upon the said seat or shoulder 43 and are overlapped on top by the washer  $l$ , interposed between the upper end of the collar  $m$  and head of the bolt or screw  $k$ . The flanges 44 of the sections  $h$  also engage the upper sides of the lugs 38 of the pipe-sections  $g$ .

By the construction hereinbefore described it will be observed that all of the sections  $g$  are held at their inner ends down upon the coupling  $f$  by the bolt or screw  $k$  through the medium of the flanges 44 of the sections  $h$  and the washer  $m$ , and that the removal or withdrawal of the bolt or screw  $k$  detaches the coupling  $f$  and false-bottom sections  $h$  for repairs or other purposes.

The material which is to be treated within the tank  $a$  rests upon the perforated false bottom, and the oil or liquid extracted or flowing from the said material passes through the perforations of the said bottom downwardly to and upon the tank-bottom 14 and thence gravitates down the latter to the discharge opening or outlet 17. A valved steam-supply pipe  $n$  and a valved air-supply pipe  $o$ , arranged externally of the tank  $a$ , are connected and communicate with the pipe  $e$ . The valve 45 of the pipe  $n$  and the valve 46 of the pipe  $o$  are normally close and obviously air or steam is conducted to the pipe  $e$ , and consequently to the pipe-sections  $g$ , within the tank  $a$  upon opening the valve 20, according as the valve 46 or the valve 45 is opened.

Obviously steam discharged from the pipe-sections  $g$  passes upwardly into any body of material undergoing treatment upon the false



bottom and is instrumental in heating the said material and assists in stirring the material and facilitates the passage of vapor and gases from the material to the vapor-outlet *c*.

Any air discharged from the pipe-sections *g* is instrumental in stirring or disintegrating the body of material undergoing treatment within the tank and participates in the elimination and passage of vapors and gases from the body of said material.

The perforated false bottom practically separates the body of material from the pipe-section *g*, and the liability of any clogging of the discharge orifices or perforations of the said pipe-sections *g* by the said material is reduced to a minimum. It will be observed also that the arrangement of the pipe-sections *g* insures a distribution of the fluid discharged therefrom through the entire mass of material.

A pipe *p*, which has a normally closed valve 47, is employed to conduct steam or air into the chamber of the tank *a* above the discharge-aperture 13 of the tank (see Fig. I) and comprises a vertical pipe-section 50, arranged within and centrally of the said chamber and connected, at its upper end, by an elbow 52 with a horizontally-arranged pipe-section 53, which extends to the outside of the tank and is there connected by an elbow 54 with a pipe-section 55, which is connected with the pipes *n* and *o* and has the valve 47.

The pipe *p* is adequately supported within the chamber of the tank *a* by a pair of beams or bars *r*, which are arranged horizontally within and extend transversely of the said chamber at opposite sides, respectively, of the upper end of the pipe-section 50 and are supported in any approved manner from the tank *a*, and the elbow 52 is provided with an external annular flange or member 56, which rests upon the said bars or beams.

An internally-screw-threaded sleeve *s*, as shown very clearly in Fig. III, engages corresponding screw-threads formed externally of and upon the lower end of the pipe-section 50. The sleeve *s* is provided, at its lower end, with an external annular flange 57, which is arranged over and corresponding annular flange 58, formed upon and externally of the upper end of a vertically-arranged multiple-pipe coupling *t*, which is suspended from the pipe-section 50 of the pipe *p*, centrally of the chamber of the tank and is secured to the sleeve *s* removably by bolts *v*, which extend through the flanges 57 and 58, and nuts *j* engaging the said bolts. The pipe-coupling *t* is therefore detachably secured to the pipe *p*, which discharges at the lower end of its pipe-section 50 into the upper end of the chamber 60, formed by and within the coupling *t*. The lower portion of the chamber 60 is annular and flares downwardly, as at 62, and a group of interchangeable branching-out perforated pipe-sections *u* are arranged in a

horizontal plane and radially of the chamber of the tank *a* at suitable intervals around the coupling *t*.

The pipe-sections *u* are supported at their outer ends, as will hereinafter appear, and communicate at their inner ends with the lower end of the downwardly-flaring portion 62 of the chamber 60 within the coupling *t*.

Each pipe-section *u* comprises, preferably, a central member 67, arranged radially of the chamber of the tank *a* and extending from the coupling *t* outwardly into close proximity to the surrounding wall of the said chamber. The said member 67 is provided internally with a passage-way 68, which extends longitudinally of the said member. The said passage-way 68 communicates at the inner end of the said member 67, as shown very clearly in Fig. III, with a discharge-port 70, formed in the bottom of the chamber 60 of the section *t*—that is, the chamber 60 discharges through holes 70, formed in the said bottom, into the pipe-sections *u*, and as many apertures or holes 70 as there are pipe-sections *u* are provided.

A pipe-section *u* is shown in Fig. VII, and it will be observed that the central member 67 of the said section has several concentrically-arranged hollow arms 72 extending from and laterally of the said member 67 in one direction and several concentrically-arranged hollow arms 73 extending from and laterally of the said member 67 in the opposite direction, that the passage-ways 74 formed within and extending longitudinally of the said arms are closed at their outer ends, as at 75, and communicate at their inner ends with the passage-way 68 of the aforesaid central member 67, and that the said member 67 and the said arms 72 and 73 have perforations or orifices 76 for discharging the fluid conducted to the said passage-ways from the coupling *t* into the chamber of the tank *a*. Each pipe-section *u* is provided externally at the inner end of its member 67 with a lug 78, (see Fig. III,) which bears against the lower end of the coupling *t*. A vertically-arranged rod *w* extends through the elbow 52 and centrally through the pipe-section 50 and through a suitable distance below the coupling *t*, which is suitably perforated centrally, as at 66, to accommodate the location and operation of the said rod. The rod *w* extends through an internally-screw-threaded flange or member 65, with which the elbow 52 is provided, and has correspondingscrew-threadsengagingthreads within the said member 65. The rod is directly supported, therefore, from the pipe *p* and indirectly from the beams or bars *r*. A nut *x* is arranged below the coupling *t* and engages corresponding screw-threads formed upon the lower end of the rod *w*, and a collar *y* is mounted upon the said rod between the said nut and the lower end of the said coupling *t*. The lower end of the collar *y* is en-



larged diametrically to form an upwardly-facing annular shoulder 79, which constitutes a seat for the inner ends of the pipe-sections *u*, being engaged by or extending in under the bottoms of the lugs 78 of the said pipe-sections *u*.

By the construction hereinbefore described it will be observed that all of the pipe-sections *u* are held at their inner ends up against the coupling *t* by the rod *w* and the nut *x* through the medium of the collar *y*, and that the turning of the rod *w* to the extent required in the required direction will result in lowering the said rod sufficiently to cause the collar *y* to release the pipe-sections *u*.

Two arms 72 and 73 of each pipe-section *u* are arranged at opposite sides, respectively, of the outer end of the said section, and are hung upon the surrounding wall of the chamber of the tank through the medium of hooks or hangers *q* attached to the said wall. The release, therefore, of the pipe-sections *u* by the collar *y* will permit the said sections to swing downwardly and outwardly toward the said wall, and the said pipe-sections *u* are readily removable.

It will be observed that the pipe-sections *u* do not interfere with the feeding of material to and upon the false bottom from the aperture 10 because the spaces between the arms of the pipe-sections *u* afford passage for the said material.

Air or steam is conducted to the pipe *p*, and consequently to the pipe-sections *u*, upon opening the valve 47, according as the valve 46 or the valve 45 is opened. The object of conveying steam through the pipe-sections *u* into the chamber of the tank *a* is to heat the body of material undergoing treatment, to participate in stirring the material, and to facilitate the passage of vapors and gases from the material. Air conducted through the said pipe-sections *u* into the said chamber stirs the material and operates to eliminate and carry vapors and gases from the material. It will be observed also that the arrangement and construction of the pipe-sections *u* insure a distribution of fluid discharged therefrom through the upper portion of the body of material.

The rod *w* extends upwardly into the aperture 10, where it is reachable by a wrench introduced through a screw-threaded hole which is formed in the cover 12 and normally closed by a correspondingly-threaded plug *z*.

What I claim is—

1. In rendering or reducing apparatus, a tank provided with a vapor-outlet; several perforated pipe-sections arranged in a horizontal plane within the chamber of the tank and comprising, respectively, a main hollow member which extends from the central portion of the said chamber laterally and outwardly and has laterally-projecting hollow perforated arms in open relation with the said

main member, and means for conducting fluid to the inner ends of the passage-ways formed by and within the laterally and outwardly extending main members of the said perforated pipe-sections.

2. In rendering or reducing apparatus, a tank provided with a vapor-outlet, several pipe-sections arranged in a horizontal plane within the chamber of the tank and comprising, respectively, a hollow member which is arranged radially of the said chamber and extends from the central portion of the said chamber laterally and outwardly and has laterally-projecting hollow perforated arms having the passage-ways formed therein extending from and communicating with the passage-way formed within and by said radial member, and means for conducting fluid to the inner ends of the passage-ways of the radial members of the said perforated pipe-sections.

3. In rendering or reducing apparatus, the combination, with a tank, of a perforated false bottom arranged within the chamber of the tank, a short distance above the imperforate bottom of the tank and composed of sections arranged radially of the said chamber; a support for the false-bottom sections, which support is interposed between the inner ends of the false-bottom sections, and the imperforate bottom, and provided in its upper end, with a vertically-arranged screw-threaded hole; a correspondingly-threaded bolt or screw engaging the said hole, a collar embracing the shank of the said bolt or screw and resting upon the said support and extending in under the inner ends of the false-bottom sections, and a washer interposed between the head of the bolt or screw and the upper side of the said ends of the false-bottom sections.

4. In rendering or reducing apparatus, the combination, with a tank having a perforated false bottom arranged horizontally therein and composed of sections, of a multiple-pipe coupling located within and centrally of the lower end of the tank and having an interior chamber whose top wall is provided with a series of apertures or holes, perforated pipe-sections extending from the said coupling outwardly and communicating with the aforesaid apertures or holes, and a pipe leading from the said coupling into the upper portion of the tank.

5. In rendering or reducing apparatus, the combination, with a tank, of an upright multiple-pipe coupling arranged centrally of the lower end of the chamber of the tank, and having an interior chamber whose upper portion flares upwardly and whose top wall is provided with apertures or holes, perforated pipe-sections extending from the said coupling outwardly and communicating with the aforesaid apertures or holes, and means for conducting fluid into the said coupling.

6. Rendering or reducing apparatus, comprising a tank provided with a vapor-outlet;



a multiple-pipe coupling arranged at the central portion of the bottom of the chamber of the tank, means for conducting fluid into the said coupling, a group of pipe-sections which  
 5 communicate with and extend laterally and outwardly from the aforesaid coupling and are supported at their inner ends from the said coupling; a perforated false bottom arranged over the said group of pipe-sections and com-  
 10 posed of sections extending from over the inner ends of the last-mentioned pipe-sections outwardly and bearing, at their said ends, downwardly upon the said pipe-sections.

7. Rendering or reducing apparatus, comprising a tank provided with a vapor-outlet and having its bottom provided centrally with a depressed receptacle-forming portion having an outlet, which bottom declines toward its said depressed portion, a multiple-pipe  
 15 coupling arranged within and extending above the said depressed portion of the bottom, means for conducting fluid into the lower end of the said coupling; pipe-sections communicating with and extending outwardly from  
 20 the aforesaid coupling and resting, at their inner ends, upon the said coupling; a perforated false bottom arranged over the said pipe-sections and composed of sections which bear, at their said ends, downwardly upon  
 25 the aforesaid pipe-sections, and means adapted to hold the false-bottom sections in place at their inner ends.

8. Rendering or reducing apparatus comprising a tank provided with a vapor-outlet  
 35 and having its bottom provided centrally with a depressed receptacle-forming portion having an outlet, which bottom declines toward its said depressed portion; a multiple-pipe coupling arranged within and extending above  
 40 the said depressed portion of the bottom; means for conducting fluid into the said coupling; pipe-sections arranged in a horizontal plane and communicating with and extending outwardly from the aforesaid coupling and  
 45 provided, at their inner ends and externally, with projections which rest upon the said coupling; a perforated false bottom arranged over the said pipe-sections and composed of sections extending from over the aforesaid pro-  
 50 jections, and means for holding the said false-bottom sections down upon the said projections.

9. Rendering or reducing apparatus, comprising a tank having a vapor-outlet, a multiple-pipe coupling arranged over and centrally of the bottom of the tank; means for  
 55 conducting fluid into the said coupling; a group of perforated pipe-sections communicating with and extending outwardly from the aforesaid coupling; which perforated sections have projecting members resting upon the  
 60 said coupling; a vertically-arranged bolt or screw extending into the upper end of the said coupling; a collar embracing the said bolt or screw above the said coupling; a false bottom

composed of sections resting upon the said collar and upon the aforesaid lugs or projecting members of the perforated pipe-sections, and a washer interposed between the upper  
 70 end of the said collar and the head of the bolt or screw and overlapping the adjacent portions of the said false-bottom sections.

10. In rendering or reducing apparatus, a tank provided, internally, a suitable distance  
 75 above the bottom of the chamber of the tank, with several downwardly-tiltable pipe-sections extending from the central portion of the said chamber laterally and outwardly, and hung, at their outer ends, to the surrounding  
 80 wall of the said chamber; means for detachably supporting the said pipe-sections at their inner ends, and means for conducting fluid into the said pipe-sections at the inner ends of the said pipe-sections.

11. In rendering or reducing apparatus, the  
 85 combination, with a tank, and a group of pipe-sections within the chamber of the tank, a suitable distance above the bottom of the tank, which pipe-sections extend laterally and outwardly from the central portion of the said  
 90 chamber and are removably supported, at their outer ends, from the surrounding wall of the said chamber, of a central pipe-section arranged at the inner ends of and communicating with the aforesaid pipe-sections; means  
 95 for conducting fluid into the said central pipe-section, and means for detachably holding the said group of pipe-sections to the central pipe-section.

12. In rendering or reducing apparatus, the  
 100 combination, with a tank, a multiple-pipe coupling arranged a suitable distance above the bottom of and centrally within the chamber of the tank, and means for conducting fluid into the said coupling; of a group of  
 105 pipe-sections communicating with the aforesaid coupling, and adjacent pipe-sections of the said group diverging laterally and outwardly from the said coupling, means for supporting the said group of pipe-sections at  
 110 their outer ends from the surrounding wall of the chamber of the tank, and means for detachably holding the said group of pipe-sections at their inner ends to the aforesaid coupling.

13. In rendering or reducing apparatus, the  
 115 combination, with a tank, a multiple-pipe coupling arranged a suitable distance above the bottom of and centrally within the chamber of the tank, and means for conducting fluid into the said coupling, of a series of perfo-  
 120 rated pipes arranged in a horizontal plane and communicating with the said coupling and extending from in under the said coupling into suitable proximity and hung to the surrounding wall of the said chamber, and means for  
 125 detachably holding the said series of perforated pipes against the lower end of the aforesaid coupling.

14. In rendering or reducing apparatus, the  
 130 combination, with a tank, of a multiple-pipe



coupling located a suitable distance above the bottom and centrally of the chamber of the tank and having an interior chamber whose bottom is provided with a series of apertures or holes, perforated pipe-sections extending from the said coupling outwardly and communicating with the aforesaid apertures or holes, and a pipe leading from said coupling outside the tank to a point above the pipe-sections and communicating with the interior of the tank at such point.

15. In rendering or reducing apparatus, the combination, with a tank, of a multiple-pipe coupling arranged a suitable distance above the bottom and centrally of the chamber of the tank, and having an interior chamber whose lower portion flares downwardly and has a bottom provided with apertures or holes, suitably-supported perforated pipe-sections extending from the said coupling outwardly and communicating with the aforesaid apertures or holes, and means for conducting fluid into the said perforated pipe-sections.

16. Rendering or reducing apparatus com-

prising a tank provided with a vapor-outlet; a pipe extending downwardly within and centrally of the tank; means for conducting fluid into the said pipe; a multiple-pipe coupling arranged at the lower end of and communicating with the aforesaid pipe, a group of pipe-sections arranged in a horizontal plane and communicating with the aforesaid coupling and provided at their inner ends and externally, with projections engaging the lower end of the said coupling, a rod extending through the said coupling, a collar upon the said rod and overlapping the under sides of the aforesaid projections, and means for supporting the aforesaid group of pipe-sections at their outer ends.

In testimony whereof I sign the foregoing specification, in the presence of two witnesses, this 15th day of March, 1902, at Cleveland, Ohio.

EUGENE R. EDSON.

Witnesses:

C. H. DORER,

TELSA SCHWARTZ.