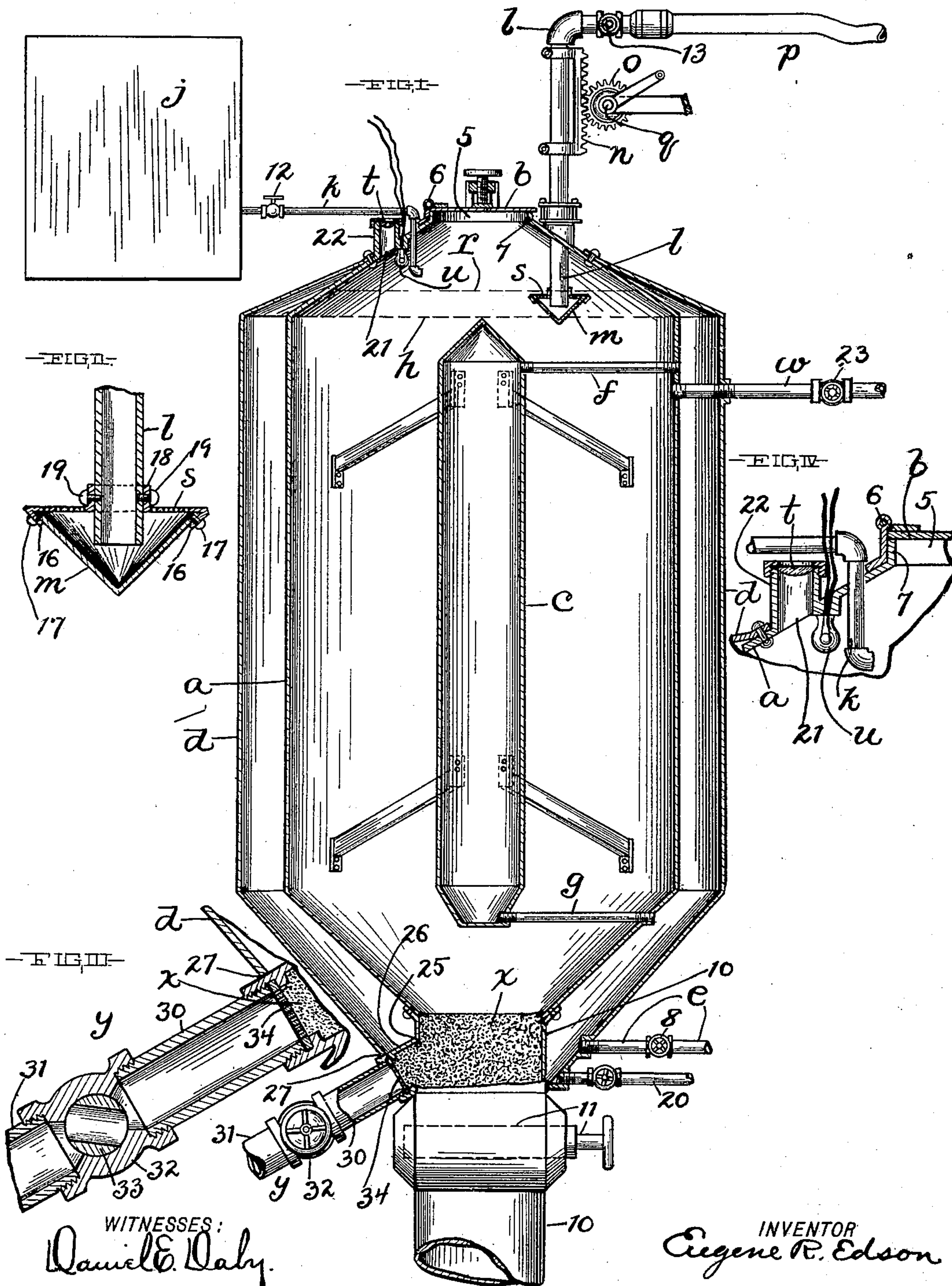


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**E. R. EDSON.**  
**RENDERING APPARATUS.**  
(Application filed May 10, 1901.)

(No Model.)



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# UNITED STATES PATENT OFFICE.

EUGENE R. EDSON, OF CLEVELAND, OHIO.

## RENDERING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 689,471, dated December 24, 1901.

Application filed May 10, 1901. Serial No. 89,695. (No model.)

*To all whom it may concern:*

Be it known that I, EUGENE R. EDSON, a resident of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain  
5 new and useful Improvements in Rendering Apparatus; and I do 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  
10 make and use the same.

This invention relates to improvements in rendering apparatus, and pertains more especially to apparatus designed for use in reducing fish or fish waste or other oil-yieldable  
15 and gelatin-yieldable material to obtain oil and glue or gelatin.

One object of this invention is to heat the material under an adequate pressure in a closed receptacle and avoid emulsification of  
20 the oil extracted from the material.

Another object is to filter the gelatin solution which is obtained from the material in the residue-discharge pipe of the receptacle and maintain the said pipe adequately heated  
25 during the filtering of the said solution to prevent fermentation.

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

In the accompanying drawings, Figure I is a side elevation, largely in section, of the apparatus which constitutes the subject-matter of this application. Fig. II is an enlarged  
35 elevation in section, showing the receiving end of the oil-conducting pipe of the apparatus and the vessel suspended or supported from the said end of the said pipe. Fig. III is an enlarged side elevation in section, illustrating the pipe-line for draining the gelatin solution from the apparatus. Fig. IV is an  
40 enlarged side elevation in section, illustrating the window of the upper portion of the material-receiving receptacle and the lamp within the said receptacle adjacent to the window.

Referring to the drawings, *a* designates a vertically-arranged or upright receptacle into  
50 which the oil-yieldable and gelatin-yieldable material—fish, fish waste, or other matter—is introduced for treatment to extract or flow

gelatin solution and oil from the material. The receptacle *a* is a closed container provided at its upper end and centrally with a  
55 manhole and charging aperture or inlet 5 and has a cover *b* arranged to close the said inlet and hinged at one side, as at 6, to the flange 7, which is formed upon the receptacle around the said inlet. The material requiring treat-  
60 ment is introduced into the receptacle at the inlet 5. The cover *b* is secured in its closed position in any approved manner.

The receptacle *a* is provided centrally with a core-forming closed heating-drum *c*, which  
65 is arranged vertically and extends from near the upper end to near the lower end of the receptacle. The drum *c* is supported in any approved manner from the receptacle *a*. A closed heating-jacket *d* surrounds the recep-  
70 tacle *a* and extends from the upper end to and below the lower end of the receptacle *a*. The jacket *d* comprises, preferably, a casing whose chamber surrounds the receptacle *a* and is in open relation at its lower end with  
75 a valved pipe *e* for supplying the heating agent—steam or whatever it may be—to the said chamber, and the chamber of the jacket *d* is connected by pipes *f* and *g* with the upper and lower ends of the chamber of the inner drum *c*. The connection of the chambers  
80 of the drum *c* and the jacket *d* by the pipes *f* and *g* establishes a circulation through the said drum and pipes, and consequently the fluid within the chamber of the drum is main-  
85 tained at a temperature uniform with the temperature of the fluid in the chamber of the jacket. The valve 8 of the pipe *e* is normally closed.

The receptacle *a* is provided at its lower  
90 end and centrally with a downwardly-extending valved pipe 10, at which is discharged the residue remaining after the removal of the oil and gelatin solution from the material treated within the said receptacle. The valve  
95 11 of the outlet 10 is preferably a slide valve and of course normally closed.

A valved pipe *k*, arranged to discharge into the upper portion of the receptacle *a*, leads from a compressed-fluid reservoir *j*, in which  
100 compressed air or other elastic fluid under pressure is stored. The valve 12 of the pipe *k* is normally closed.

A vertically-arranged valved oil-conduct-



ing pipe *l* extends into the upper portion of the receptacle *a* and has its lower and receiving end arranged within a cup or vessel *m*, which is secured to or suspended from the pipe in any approved manner. The pipe *l* is adjustable vertically and is provided outside of the receptacle *a* with a vertically-arranged rack *n*, which is rigidly secured to and arranged longitudinally of the pipe *l* and is in mesh with a pinion *o*, operatively mounted upon a suitably-supported and suitably-operated shaft *q*. The pipe *l* extends above the rack *n* and at its upper end connects with a flexible tube or hose *p*.

In operating the apparatus the cover *b* of the receptacle *a* is opened and material requiring treatment is introduced at the inlet 5 of the said receptacle. The receptacle *a* is filled with material from the inlet 5 to the upper end of the drum *c*, as indicated by the dotted line *h*. When the receptacle *a* has been supplied with the material requiring treatment, the cover *b* is closed and the valve 8 of the pipe *e* is opened, so as to supply steam or heating fluid to the chamber of the jacket *d* and by means of the pipes *f* and *g* to the chamber of the drum *c*. Steam is preferably employed, and a pressure of steam sufficient to heat the means within the receptacle *a* quickly and thoroughly—say a pressure of about fifteen pounds—is employed; but so high a pressure of steam would, unless the mass were kept quiet by some other agency, result in heating and agitating the mass to such an extent as to result in an emulsification of the oil extracted from the material, and consequently air or other elastic fluid under sufficient pressure is admitted to the receptacle *a*, preferably on top of the mass within the said receptacle, by the pipe *k* upon opening the valve 12 of the said pipe. An adequate pressure of air or other aeriform or gaseous body admitted upon top of the mass within the receptacle has been found necessary to prevent an ebullition or agitation of the mass by the heat or fermentation within the mass, and a pressure of twenty pounds per square inch on top of the mass has been found very efficient against fifteen pounds of steam-pressure employed in heating the mass. Fish or fish waste is more liquid than solid, and the oil contained in the said material becomes readily liberated during the treatment of the material within the receptacle *a* and rises and accumulates on top of the mass within the said receptacle, and the pipe *l* is lowered until the cup or vessel *m* is submerged in the risen layer of oil when oil flows into the vessel *m* and thence into the pipe *l* and is forced through the said pipe and the connected tube *p* by the pressure upon the mass. The valve 13 of the pipe *l* if not already open is, of course, opened preparatory to forcing oil from the receptacle *a*. The dotted line *r* indicates the top of a layer of oil formed at the top of the mass. The pipe *l* extends downwardly into the vessel *m* to near the lower end of the ves-

sel, so that the oil can flow into the pipe only from within the said vessel. The oil is therefore overflowed from the top of the mass into the vessel *m* and thence is conducted off by the pipe *l*. A strainer *s* extends over the top of the vessel *m* around the pipe *l* and prevents coarse foreign matter from entering the vessel with the oil. The strainer *s*, as shown in Fig. II, has ears or flanges 16 removably secured by means of screws 17 to the upper end of the vessel *m*. The said strainer has an inner annular flange 18 embracing and removably secured by means of screws 19 to the pipe *l*. The vessel *m* is therefore supported from the pipe *l* through the medium of the strainer *s*. The vessel is preferably an inverted conical shell to facilitate the lowering and entering of the vessel into the upper end of the mass within the receptacle *a*. It will be observed also that the material undergoing treatment within the receptacle *a* is heated by heat radiating outwardly through the mass from the drum *c* and by heat radiating inwardly through the mass from the jacket *d*, so that the mass is quickly and uniformly heated throughout. Of course the jacket *d* is provided at its lower end with a valved drain-pipe 20.

The receptacle *a* is provided at its upper end with an upwardly-flanged aperture 21, and the flange 22, surrounding the said aperture, forms a seat for a sight-glass *t*. The aperture 21, flange 22, and sight-glass *t* constitute, therefore, a window, at which the condition of the mass within the receptacle and the layer of oil accumulating on top of the mass can be readily inspected with the assistance of a lamp *u*, preferably an incandescent electric lamp, suspended or applied within the receptacle adjacent and in close proximity to the said window, as shown more clearly in Fig. III.

A valved water-supply pipe *w* extends through the jacket *d* and is arranged to discharge into the receptacle *a*. The valve 23 of the pipe *w* is normally closed. If the moisture contained within the material undergoing treatment is not sufficient in quantity to enable the extraction or flowing from the material undergoing treatment of the glue or gelatin contained in the material, additional moisture is supplied by opening the valve 23 of the pipe *w*, so as to permit water to flow from the said pipe into the receptacle *a*.

The slide-valve 11 of the pipe 10 is located a suitable distance below the upper end of the said pipe outside of and below the jacket *d*, and the said pipe is filled or supplied between the said valve and its upper extremity with filtering material *x*. The pipe 10 between its valve 11 and its upper extremity is provided with a lateral outwardly-flanged aperture 25. A flange 26 is formed around the said aperture 25. The jacket *d* is perforated, as at 27, to accommodate the connection of the drain-pipe line *y* with the flange 26. The pipe-line *y* comprises a short pipe-section 30,



which extends outwardly from the flanged aperture 25 and is screw-threaded externally at each end, as shown in Fig. IV. The threaded inner end of the pipe-section 30 engages corresponding threads formed internally of the flange 26. The pipe-line  $y$  comprises also a pipe-section 31, arranged in line with and at a short distance from the outer end of the pipe-section 30, and a valve-casing 32 connects the two pipe-sections 30 and 31 together, being internally screw-threaded at each end and engaging corresponding threads formed upon and externally of the adjacent ends of the pipe-sections 30 and 31. The valve 33 within the valve-casing establishes or interrupts continuity in the passage-way formed by the pipe-line  $y$  and is normally closed. This valve 33 is opened, however, preparatory to draining gelatin solution from the receptacle  $a$  and is left open somewhat during the operation of the apparatus, so as to result in a continuous flow of gelatin solution from the receptacle. Obviously by the construction hereinbefore described the gelatin solution is filtered before it reaches the pipe-line  $y$ , and a screen 34, suitably applied at the receiving end of the pipe-section 30 of the said pipe-line, prevents ingress of any large particles of filtering material from the pipe 10 into the said pipe-line.

A not unimportant feature of the apparatus consists in the extension of the heating-jacket downwardly to and around the filtering-material-containing portion of the discharge-pipe 10, so that the gelatin solution is maintained adequately heated until it is filtered, being exposed to a high enough heat to prevent fermentation until after the foreign matter has been removed from the said solution by the filtering material. Obviously the filtering material within the pipe 10 upon opening the valve 11 after the treatment of a body of material within the receptacle  $a$  is discharged with the residue from the said pipe. I would remark also that the pipe  $k$  has its discharging end arranged to discharge laterally into the chamber of the receptacle  $a$ , as indicated by the arrow, so as to avoid stirring the mass within the said receptacle during the supply of pressure to the receptacle. I would remark, furthermore, that any particular degree of heat or any artificial heat does not necessarily have to be employed in the treatment of the material within the closed receptacle. The heat employed might be considerably below 212° Fahrenheit, and some fish, as well as other material from which the oil is readily extracted, may be treated at an ordinary atmospheric temperature of from 60° to 100° Fahrenheit without the use of artificial heat, and yet the use of pneumatic pressure upon the material being treated would still be invaluable and indispensable to prevent agitation resulting from a tendency of the material to ferment within the receptacle, and the pneumatic pressure should be applied before any agitation of the material

being treated from fermentation or otherwise is possible. I would add, however, that the use of artificial heat will in any case expedite the extraction of the oil from the material undergoing treatment and is therefore not unimportant.

The processes adapted to be carried out by the apparatus which constitutes the subject-matter of this application are made the subject-matter of copending applications serially numbered 59,696 and 67,970, respectively.

What I claim is—

1. In apparatus of the character indicated, a closed receptacle provided with a suitably-closed inlet for receiving the material to be treated, and having a residue-outlet at its lower end, means for controlling continuity in the passage-way through the said outlet, means for conducting, from the receptacle, liquid extracted or liberated from the material undergoing treatment within the receptacle, means for heating the receptacle, a reservoir containing an aeriform or gaseous fluid under a pressure high enough to prevent ebullition or agitation of the material undergoing treatment upon placing the pneumatic pressure upon the mass, a pipe leading from the said reservoir and discharging into the chamber of the said receptacle, and means for controlling communication through the said pipe.

2. Apparatus of the character indicated, comprising an upright closed receptacle having a residue-outlet at its lower end and an inlet at its upper end, which receptacle has its upper end provided, also, with an oil-outlet; a cover for closing the inlet; means for controlling continuity in the passage-way through the residue-outlet; means for heating the receptacle; a compressed-air reservoir; a pipe or passage-way connecting the chamber of the said reservoir with the chamber of the first-mentioned receptacle, and a valve in the said pipe or passage-way, substantially as and for the purpose set forth.

3. Apparatus of the character indicated, comprising an upright closed receptacle having a suitably-closed inlet for receiving the material to be treated, an oil-conducting pipe extending from above the receptacle downwardly into the chamber of the receptacle, means for lowering and raising the said pipe, a vessel supported from and extending around the lower end of the said pipe, a reservoir for supplying a pneumatic pressure, and a valved pipe leading from the said reservoir and arranged to discharge into the upper end of the chamber of the first-mentioned receptacle, substantially as and for the purpose set forth.

4. Apparatus of the character indicated, comprising an upright closed receptacle provided with an inlet at its upper end and having a residue-discharge pipe extending downwardly from the lower end of the receptacle, a cover for closing the inlet, means for controlling continuity in the passage-way through the said discharge-pipe, means for heating



the receptacle, an oil-conducting pipe extending from above the receptacle downwardly into the chamber of the receptacle, an inverted-cone-shaped vessel-forming shell supported from and extending around the lower and receiving end of the said oil-conducting pipe, a reservoir for supplying a pneumatic pressure to the first-mentioned receptacle, and a valved pipe leading from the said reservoir to the chamber of the said receptacle, substantially as and for the purpose set forth.

5. Apparatus of the character indicated, comprising an upright closed receptacle provided with an inlet at its upper end and having a residue-discharge pipe extending downwardly from the lower end of the receptacle, a cover for closing the inlet, means for controlling continuity in the passage-way through the said discharge-pipe, means for heating the receptacle, an oil-conducting pipe extending from above the receptacle downwardly into the chamber of the receptacle, a vessel supported from and extending around the lower and receiving end of the said oil-conducting pipe, a strainer extending over the said vessel around the oil-conducting pipe, a reservoir for supplying a pneumatic pressure to the first-mentioned receptacle, and a valved pipe leading from the said reservoir to the chamber of the said receptacle, substantially as and for the purpose set forth.

6. Apparatus of the character indicated, comprising an upright closed receptacle provided with an inlet at its upper end and having a residue-discharge pipe extending downwardly from the lower end of the receptacle, a cover for closing the inlet, means for controlling continuity in the passage-way through the said discharge-pipe, means for heating the receptacle, an oil-conducting pipe extending from above the receptacle downwardly into the chamber of the receptacle, a vessel extending around the lower and receiving end of the said oil-conducting pipe, a strainer extending over and secured to the said vessel around and attached to the oil-conducting pipe, a reservoir for supplying a pneumatic pressure to the first-mentioned receptacle, and a valved pipe leading from the said reservoir to the chamber of the said receptacle, substantially as and for the purpose set forth.

7. Apparatus of the character indicated, comprising an upright closed receptacle having a residue-outlet at its lower end and an inlet at its upper end, a cover for closing the inlet, means for controlling continuity in the passage-way through the outlet, an oil-conducting pipe extending from above the receptacle downwardly into the chamber of the receptacle, means for lowering and raising the said pipe, a vessel supported from and extending around the lower end of the said oil-conducting pipe, a strainer extending over the said vessel around the oil-conducting pipe, a reservoir for supplying a pneumatic pressure, a valved pipe leading from the said reservoir into the upper end of the chamber of

the first-mentioned receptacle, a window in the upper end of the receptacle, and means for illuminating the interior of the receptacle adjacent the said window.

8. In apparatus of the character indicated, an upright receptacle provided with an inlet for receiving the material to be treated, a closed heating-drum arranged centrally of the receptacle and extending from within the upper end to within the lower end of the receptacle, a heating-jacket surrounding the receptacle and extending around the upper end of the aforesaid discharge-pipe, means for supplying the jacket with a hot fluid, a passage-way establishing open relation between the chamber of the jacket and the lower portion of the chamber of the drum and another passage-way establishing open relation between the upper portion of the drum-chamber and the chamber of the jacket, substantially as and for the purpose set forth.

9. In apparatus of the character indicated, a receptacle provided with an inlet for receiving the material to be treated and having a residue-discharge pipe extending downwardly from the lower end of the receptacle, means for controlling continuity in the passage-way through the said discharge-pipe, means for heating the receptacle and the upper portion of the discharge-pipe, filtering material occupying the discharge-pipe above the means for controlling communication through the said pipe, and a valved pipe-line leading from the residue-discharge pipe below the top of the filtering material and above the means for controlling communication through the said residue-discharge pipe, substantially as and for the purpose set forth.

10. In apparatus of the character indicated, a receptacle provided with an inlet for receiving the material to be treated and having a residue-discharge pipe extending downwardly from the lower end of the receptacle, means for controlling continuity in the passage-way through the discharge-pipe, a heating-jacket surrounding the receptacle and extending around the upper end of the discharge-pipe, means for supplying the heating agent to the said jacket, filtering material within the jacket-surrounded upper portion of the discharge-pipe above the means for controlling communication through the said pipe, and a valved pipe-line leading from the residue-discharge pipe below the top of the filtering material and above the means for controlling communication through the said residue-discharge pipe, substantially as and for the purpose set forth.

11. In apparatus of the character indicated, an upright closed receptacle provided with a suitably-closed inlet for receiving the material to be treated, and having a residue-discharge pipe extending downwardly from the lower end of the receptacle, means for controlling continuity in the passage-way through the said discharge-pipe, a valved pipe-line for draining gelatin solution from the recep-



5      tacle, means for heating the receptacle, a reservoir containing an aeriform or gaseous fluid under a pressure high enough to prevent ebullition or agitation of the material undergoing  
10      treatment upon placing the said pneumatic pressure upon the mass of material, a pipe leading from the said reservoir and discharging into the upper portion of the chamber of the said receptacle, and a valve in the said  
15      pipe, substantially as and for the purpose set forth.

12. In apparatus of the character indicated, an upright closed receptacle provided with an inlet at its upper end and having a residue-  
20      discharge pipe extending downwardly from the lower end of the receptacle, a cover for closing the inlet, means for controlling continuity in the passage-way through the said discharge-pipe, a heating drum arranged centrally of the receptacle and extending from  
25      within the upper end to within the lower end of the receptacle, a heating-jacket surrounding the receptacle and extending around the upper end of the aforesaid discharge-pipe, means for supplying the heating agent to the jacket and to the drum, filtering material within the aforesaid discharge-pipe above the means for controlling communication through the said pipe, a valved pipe-line leading from  
30      the residue-discharge pipe below the top of the means of filtering material within the said

residue-discharge pipe and above the means for controlling communication through the said pipe, a reservoir for supplying a pneumatic pressure to the receptacle, and a valved  
35      pipe leading from the said reservoir to the upper portion of the chamber of the said receptacle, substantially as and for the purpose set forth.

13. In apparatus of the character indicated, 40  
an upright closed receptacle provided with a suitably-closed inlet for receiving the material to be treated, a residue-discharge pipe extending downwardly from the lower end of the receptacle, means for controlling con- 45  
tinuity in the passage-way through the said discharge-pipe, means for heating the material introduced into the receptacle, an oil-conducting pipe extending into the upper portion of the receptacle, a pipe-line for conduct- 50  
ing gelatin solution from the receptacle, a reservoir for supplying a pneumatic pressure to the receptacle, and a valved pipe arranged to conduct fluid from the said reservoir onto the mass within the receptacle, substantially as 55  
and for the purpose set forth.

Signed by me at Cleveland, Ohio, this 2d day of May, 1901.

EUGENE R. EDSON.

Witnesses:

C. H. DORER,

A. H. PARRATT.