

No. 671,131.

Patented Apr. 2, 1901.

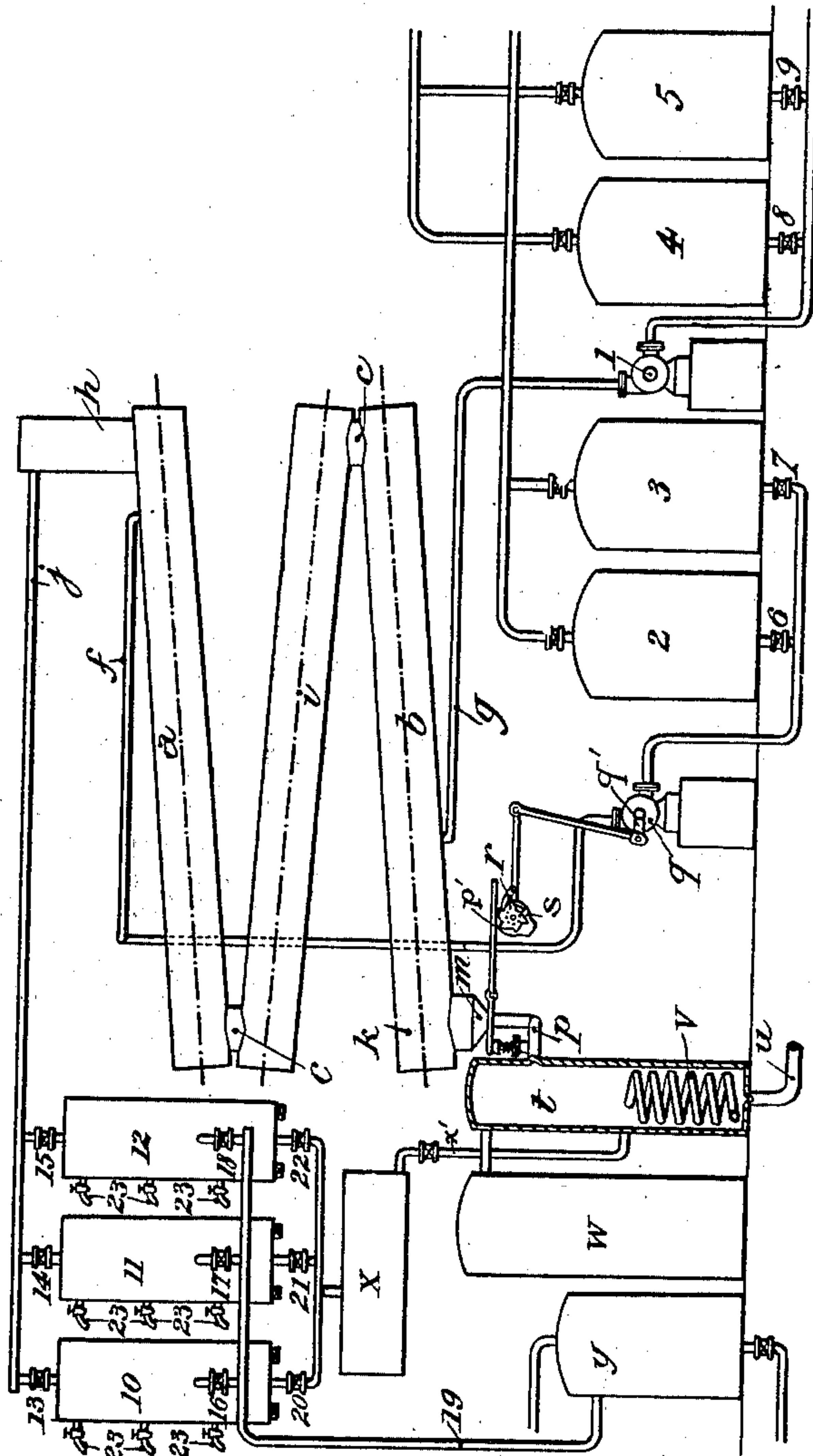
J. DELATTRE.
GREASE EXTRACTING APPARATUS.

(Application filed June 16, 1900.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1



Witnesses:-

Edward Kreser.

George Barry Jr.

Inventor.

Jules Delattre
by attorneys
Brown & Howard

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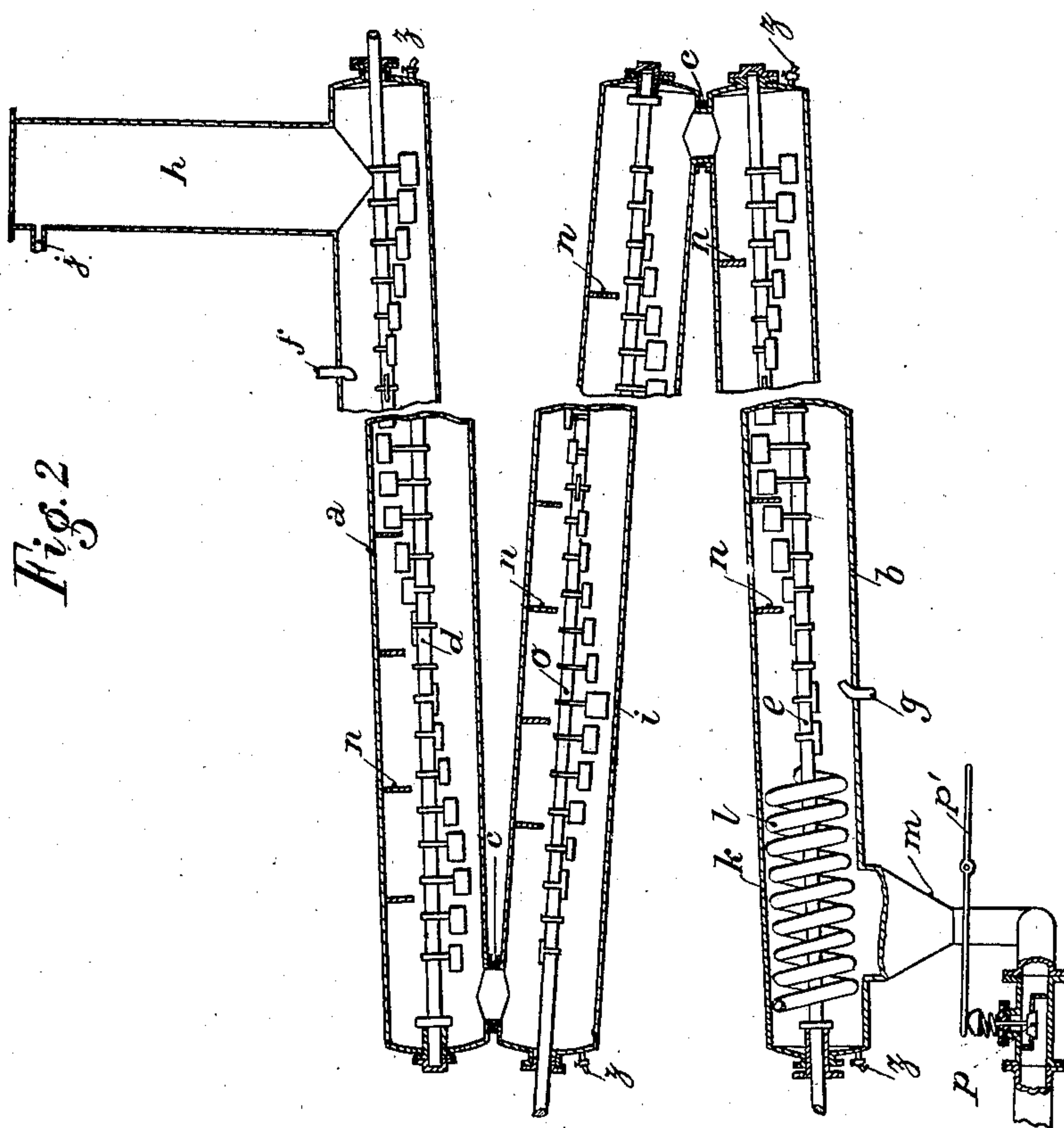
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Edward Kieser
George Barry Jr.

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Brown & Howard

UNITED STATES PATENT OFFICE.

JULES DELATTRE, OF DORIGNIES-FLERS, FRANCE.

GREASE-EXTRACTING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 671,131, dated April 2, 1901.

Application filed June 16, 1900. Serial No. 20,562. (No model.)

To all whom it may concern:

Be it known that I, JULES DELATTRE, a citizen of the Republic of France, and a resident of Dorignies-Flers, Nord, France, have invented a new and useful Improvement in Apparatus for Extracting Greasy Matters from Liquids and other Substances, of which the following is a specification.

My invention relates to an apparatus which may serve in a general way for the methodical extraction by means of liquid solvents of fatty substances contained in liquids, dirty waste, and other products containing such substances—for example, the waste waters from the washing of wool—but, in a word, all substances which, having undergone a manufacturing process, a crushing, stirring, or a previous division, may be introduced and run through the apparatus and therein undergo the efficacious treatment by the solvent.

The degreasing device which forms an essential part of my apparatus consists of a series of superposed inclined cylindrical vessels, hereinafter termed "cylinders," in which the matter to be cleansed has a descending circulation, while the solvent has an ascending circulation, the mixture of the two currents being assured by agitators and baffles. At its lower end, below the inlet for the solvent, the lowest cylinder is heated to a temperature sufficient to induce the distillation of any portion of the solvent that may be carried down along with the degreased fatty matter and the immediate reëtrance of such portion into the circulation. On the other hand, the uppermost cylinder is provided at its upper part above the inlet for the fatty matter with an upward extension in which the solvent charged with grease is decanted before issuing from the apparatus. This part is intended to prevent such undissolved particles as may be in the matter under treatment from passing off with the solvent to a distilling apparatus, where the solvent is separated from the grease which it contains.

Connected with the degreasing device proper are various accessory appliances, which are hereinafter described, to insure the regular action of the process.

The annexed drawings represent an apparatus embodying my invention.

Figure 1 represents an elevation of the ap-

paratus. Fig. 2 shows, on a larger scale, in a vertical longitudinal section the degreasing device proper.

a i b designate a series of three cylinders superposed in zigzag fashion, the lower ends of *a* and *i* being connected by couplings *c c* with the upper ends of *i* and *b*, so that they are equivalent to one long cylinder. In these cylinders are respectively rotary agitators *d e o*, having spoon-like blades, the shaft of each of said agitators projecting through one end of its respective cylinder to provide for rotary motion being given to it by any suitable means. Across the upper parts of the cylinders are placed stationary baffle-plates *n*. Near the upper end of the upper cylinder *a* there enters a pipe *f*, through which the substance in a liquid form from which the grease is to be extracted and which is supplied from any suitable source—for example, from one or other of vessels 2 and 3—by a rotary pump *q*. Near the lower end of the lowest cylinder *b* there enters a pipe *g*, through which the solvent, which is supplied from any suitable source—for example, from one or other of vessels 4 5—by a rotary pump 1. At the upper end of the upper cylinder there is an upward extension *h*, preferably vertical, from the upper part of which leads a pipe *j* for the exit of the solvent and the dissolved grease. The lower part of the lowest cylinder *b* extends, as shown at *k*, beyond the inlet-pipe *g* for the solvent, and in the so-extended part is a heating-coil *l*. At the bottom of the said extension *k* there is an outlet for degreased material, which outlet communicates through a valve *p* with an evaporator or still *t*, in which is a heating-coil *v* and at the bottom of which is the exit-pipe *u* for the degreased material, which may be termed the "sludge" and which consists of all insoluble impurities.

The pipe *j* for the exit of the grease and the solvent leads to a decanting apparatus, represented as consisting of three upright vessels 10 11 12, from the bottoms of which pipes fitted with stop-cocks 20 21 22 lead to a deposit-collector *x*, from the bottom of which a pipe *x'*, fitted with a stop-cock, leads to the evaporator *t*. The decanting vessels 10 11 12 are provided at some distance above their bottoms with communications through a pipe 19

with a still *y*, and the said communications are provided, respectively, with stop-cocks 16 17 18. Stop-cocks 13 14 15 are also provided to open and close the pipe *j* to the decanting vessels, which are also provided with overflow-cocks 23 for ascertaining the level of the substances therein.

The valve *p*, which may be termed the "automatic" valve and which is self-closing by a spring, is under the control of the rotary pump *q*—a centrifugal pump, for example—the main or driving shaft of which is represented (see Fig. 1) as furnished with crank *q'*, through which a pawl-and-ratchet-wheel connection *r* is made with a cam *s*, which acts through a lever *p'* to periodically open the valve *p*. By this means the entry of the material to be treated through the pipe *f* and the discharge of the matter treated at *m* are properly regulated.

The operation is as follows: The material to be treated and the solvent (the one tending to circulate upward and the other to circulate downward through the cylinders) become so thoroughly intermingled by the rotary agitators *d o e* and the baffle-plates *n* that the solvent takes up the grease from the said material. By reason of the lesser specific gravity of the grease and solvent as compared with the degreased material the latter material gradually descends to the extension *k* of the lower cylinder *e* and makes its exit therefrom through the outlet *m* and valve *p* to the evaporator *t*, while the solvent, with the extracted grease, gradually ascends to the upward extension *k* of the uppermost cylinder *a*. The degreased material arriving within the extension *k* of the cylinder *b* is heated by the coil *l* to a temperature higher than the boiling-point of the solvent, and the most part of any solvent which has remained inactive in the so-arriving material is liberated in globules of gas, which, passing upward, are broken up by the baffle-plates *n* and condensed and again rendered active. If any solvent yet remains in the degreased material, the last traces of it are evaporated in the still *t*, whence the disengaged vapors pass to an ordinary condenser *w* to be condensed and collected for future use. On the arrival of the solvent and the grease dissolved or taken up by it in the upward extension *k* of the upper cylinder any undissolved portions of the grease or matters taken up may fall back to the cylinders, while the solvent and the dissolved grease pass off by the pipe *j* to the decanting apparatus 10 11 12, which acts in the following manner: The vessels 10 11 12 are intended to operate alternately, one being filled while the precipitation of the heavy material—that is to say, the sludge and dirty refuse-matter—may be taking place in another and the third is being emptied. If, for instance, at a given moment the vessel 12 is being filled, the valves 18 and 22 are closed, while 15 is open. At the same time the three valves 14 17 21 of the vessel 11 are all closed

to permit the subsidence of the heavy matters therein while the vessel 10 is emptying, the valves 13 and 20 being for the latter purpose closed and the valve 16 open to empty into the still *y* the solvent charged with grease. When the emptying of the vessel of the solvent and grease to the still has been effected, the valve 20 is opened to send the sludge or dirty matter into the deposit-collector *x*. From there this sludge goes to the evaporator *t*, where any solvent which has been carried along is eliminated from it. So soon as the vessel 12 is full (which its overflow-cocks 23 allow of being readily ascertained) the valve 15 is closed, and 13 is opened after the valves 16 and 20 have been closed. The vessel 10 then fills, while the vessel 12 is stationary and 11 being emptied, and so on, as already described.

I have remarked that in order to obtain a satisfactory regularity in the degreasing of the material and the charging with grease of the solvent the quantity of material and of solvent introduced must be regulated in such a manner that they are always in the most suitable proportions. To obtain this result, the operation of the pump *q*, which carries the matter for degreasing into the apparatus, and the pump 1, which discharges the solvent into the same, have to be suitably regulated. For this purpose I let the pump *q* draw alternately from one or other of the vessels 2 and 3, of which one is emptying and the other filling, and in the same way I let the pump 1 draw alternately from one or other of the two vessels 4 5, of which one is emptying and one filling. Valves 6 7 and 8 9, turned by hand or by an automatic mechanism, enable a connection or interruption at any desired moment of the communication between each pump and one or other of the vessels which connect with the same. With this arrangement the vessels 2, 3, 4, and 5 constitute measuring-chambers, and it is sufficient to count the number of emptyings of each chamber in a given time in order to ascertain the quantity delivered by each of the pumps.

What I claim as my invention is—

1. In an apparatus for degreasing, the combination of several inclined superposed connected cylinders, agitators and baffles in said cylinders, means for introducing the material to be degreased to the uppermost cylinder, means for introducing a solvent to the lowest cylinder, an upward extension from the upper cylinder forming a decanter, and a heater in the lower part of the lower cylinder, substantially as herein described.

2. In an apparatus for degreasing, the combination of several inclined superposed connected cylinders, agitators and baffles in said cylinders, a pump for introducing the material to be degreased to the uppermost cylinder, means for introducing a solvent to the lower cylinder, an upward extension from the upper cylinder forming a decanter, a heater in the lower part of the lower cylinder, an

exit-valve for sludge at the bottom of the lower cylinder, and means for controlling the opening and closing of said valves by the said pump, substantially as herein described.

5 3. In an apparatus for degreasing, the combination of several inclined superposed connected cylinders, agitators and baffles in said cylinders, a pump for introducing the material to be degreased to the uppermost cylinder, means for introducing a solvent to the lower cylinder, an upward extension from the upper cylinder forming a decanter, a heater in the lower part of the lower cylinder, an exit-valve for sludge at the bottom of the lower cylinder, means for controlling the opening and closing of said valve by said pump and a still into which the lower cylinder discharges through said valve, substantially as herein described.

20 4. In an apparatus for degreasing, the combination of several inclined superposed connected cylinders, agitators and baffles in said cylinders, means for introducing the material to be degreased to the uppermost cylinder, means for introducing a solvent to the lowest cylinder, an upward extension from the upper cylinder forming a decanter, a heater in the lower part of the lower cylinder, an outlet for the grease and solvent from said upward extension of the uppermost cylinder, and a decanting apparatus into which said outlet discharges for the separation of the grease and solvent, substantially as herein described.

35 5. In an apparatus for degreasing, the combination of several inclined superposed connected cylinders, agitators and baffles in said cylinders, means for introducing the material to be degreased to the uppermost cylinder, means for introducing a solvent to the lowest cylinder, an upward extension from the upper cylinder forming a decanter, a heater in

the lower part of the lower cylinder, an outlet for the grease and solvent from said upward extension of the uppermost cylinder, and a decanting apparatus into which said outlet discharges, consisting of three separate vessels one of which may be filling while another is discharging and in the third of which the decanting of the grease from the solvent progresses, substantially as herein described.

6. In an apparatus for degreasing, the combination of several inclined superposed cylinders, agitators and baffles in said cylinders, a heater in the lower part of the lower cylinder, a pump for introducing into the upper cylinder the material to be degreased, a second pump for introducing a solvent into the lower cylinder, and means for measuring the delivery of each of the two pumps, substantially as herein described.

7. In an apparatus for degreasing, the combination of several inclined superposed cylinders, agitators and baffles in said cylinders, a heater in the lower part of the lower cylinder, a pump for introducing into the upper cylinder the material to be degreased, a second pump for introducing a solvent into the lower cylinder, two measuring-chambers for supplying material to the first-mentioned pump, two measuring-chambers for supplying solvent to the second pump and means for opening and closing the chambers of each two alternately to their respective pump, substantially as herein described.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of two witnesses, this 31st day of May, 1900.

JULES DELATTRE.

Witnesses:

ALFRED C. HARRISON,
B. DEMEUR.