

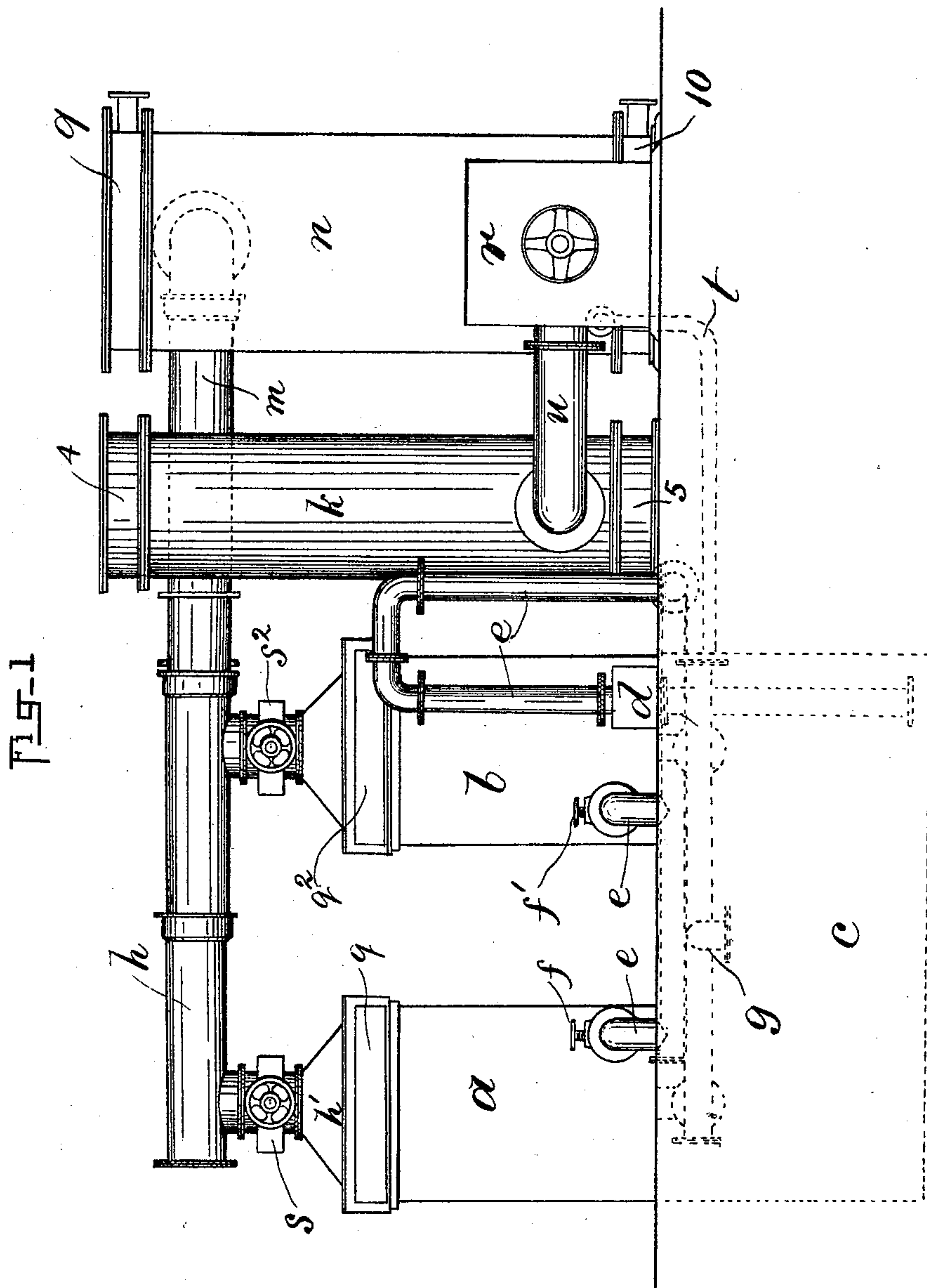
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4 Sheets—Sheet 1.

W. SAGAR, Sr., A. P. SAGAR & W. SAGAR, Jr.
APPARATUS FOR EXTRACTING OIL.

No. 587,139.

Patented July 27, 1897.



Witnesses

A. D. Harrison.

P. W. Pezzutti.



Inventors

William Sagar Senior

Alfred Parker Sagar

William Sagar Junior

Wight Brown Limby
Attorneys.

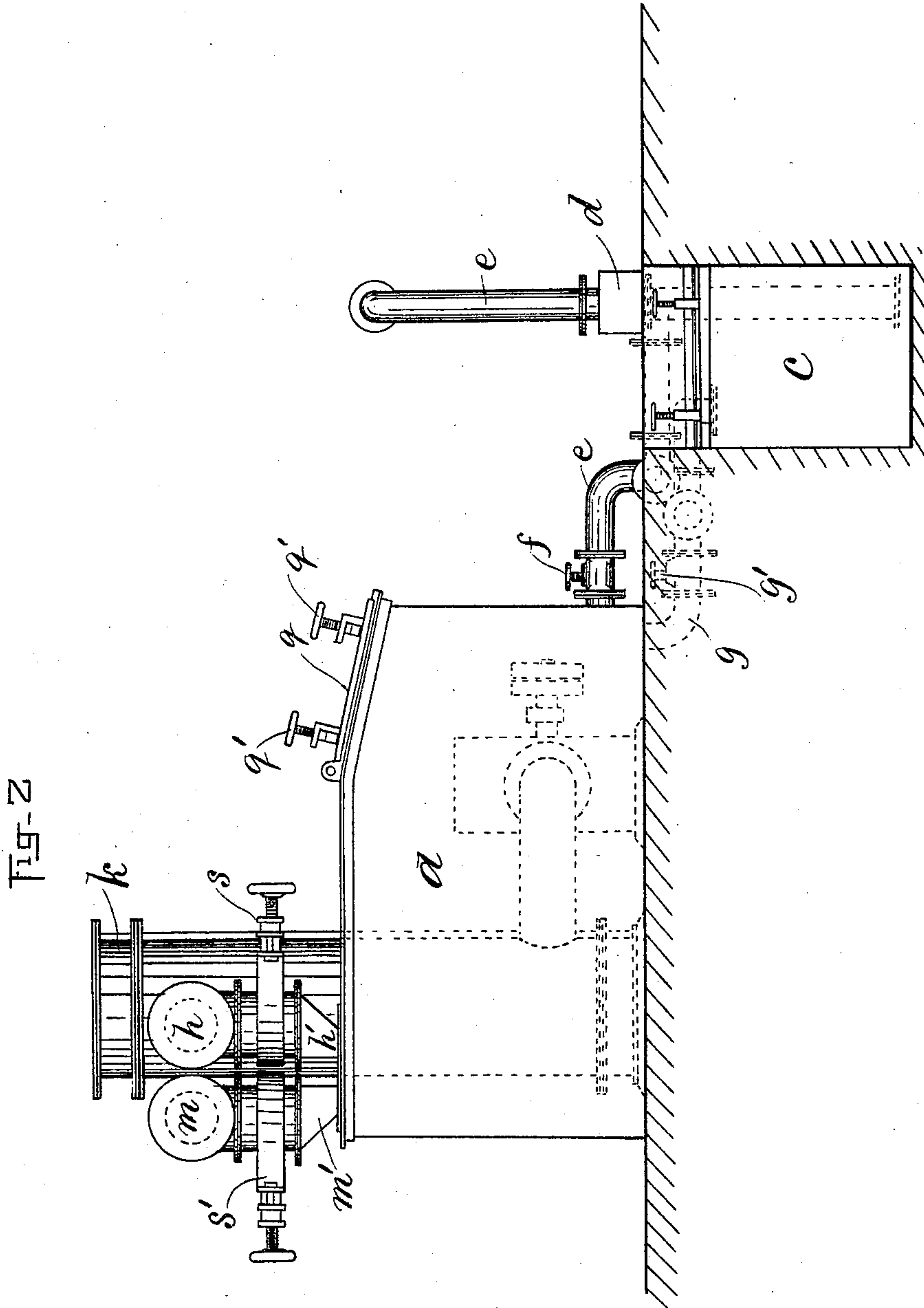
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Witnesses

A. S. Hanson.

P. W. Pryzeta.

Inventors

William Sagar Senior

Alfred Parker Sagar

William Sagar Junior

Wight Bunn & Quincy

Attorneys

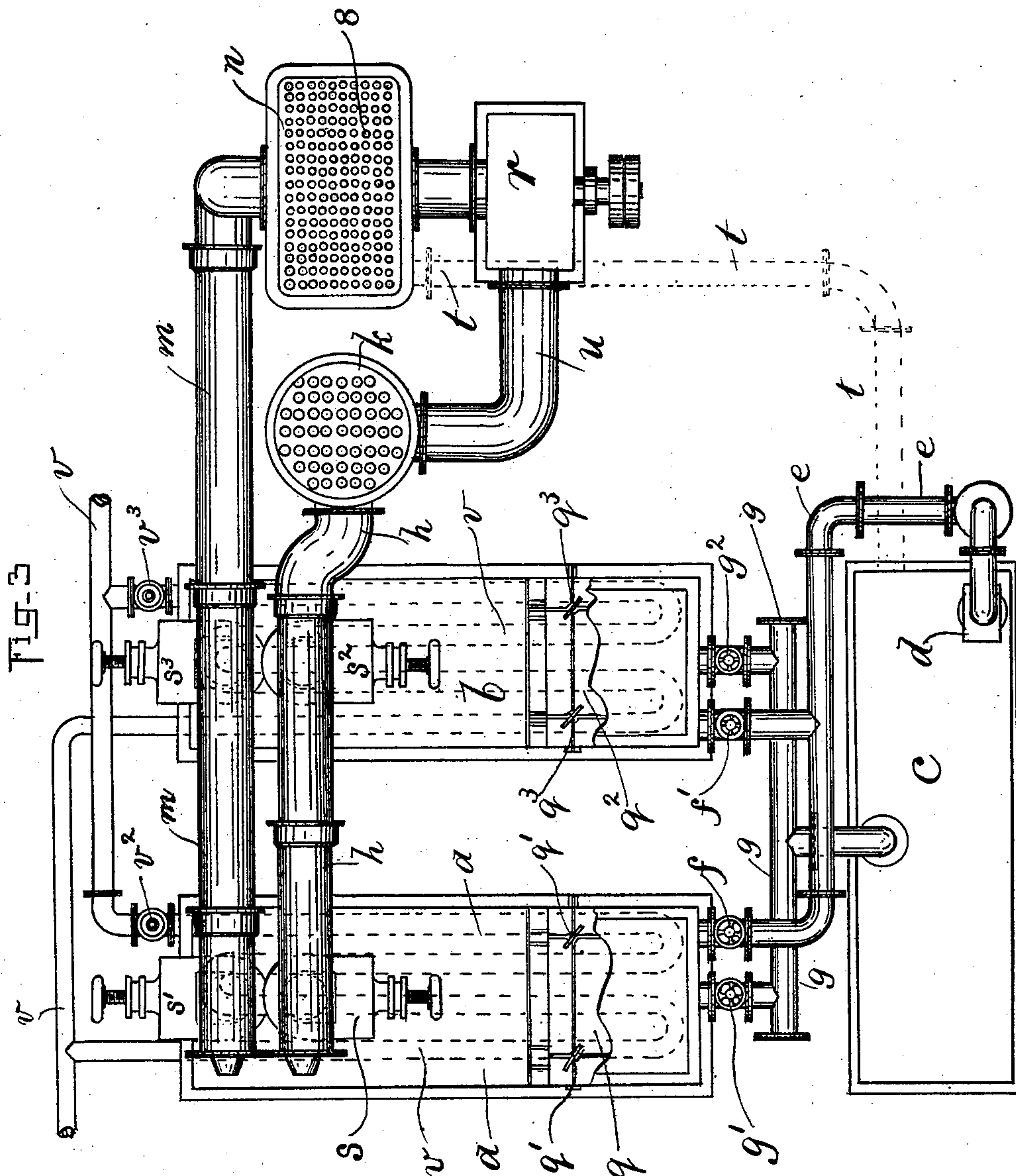
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Witnesses
A. D. Harrison.

Inventors
William Sagar Senior
Alfred Parker Sagar
William Sagar Junior
Knight, Brown & Lundy
Attorneys

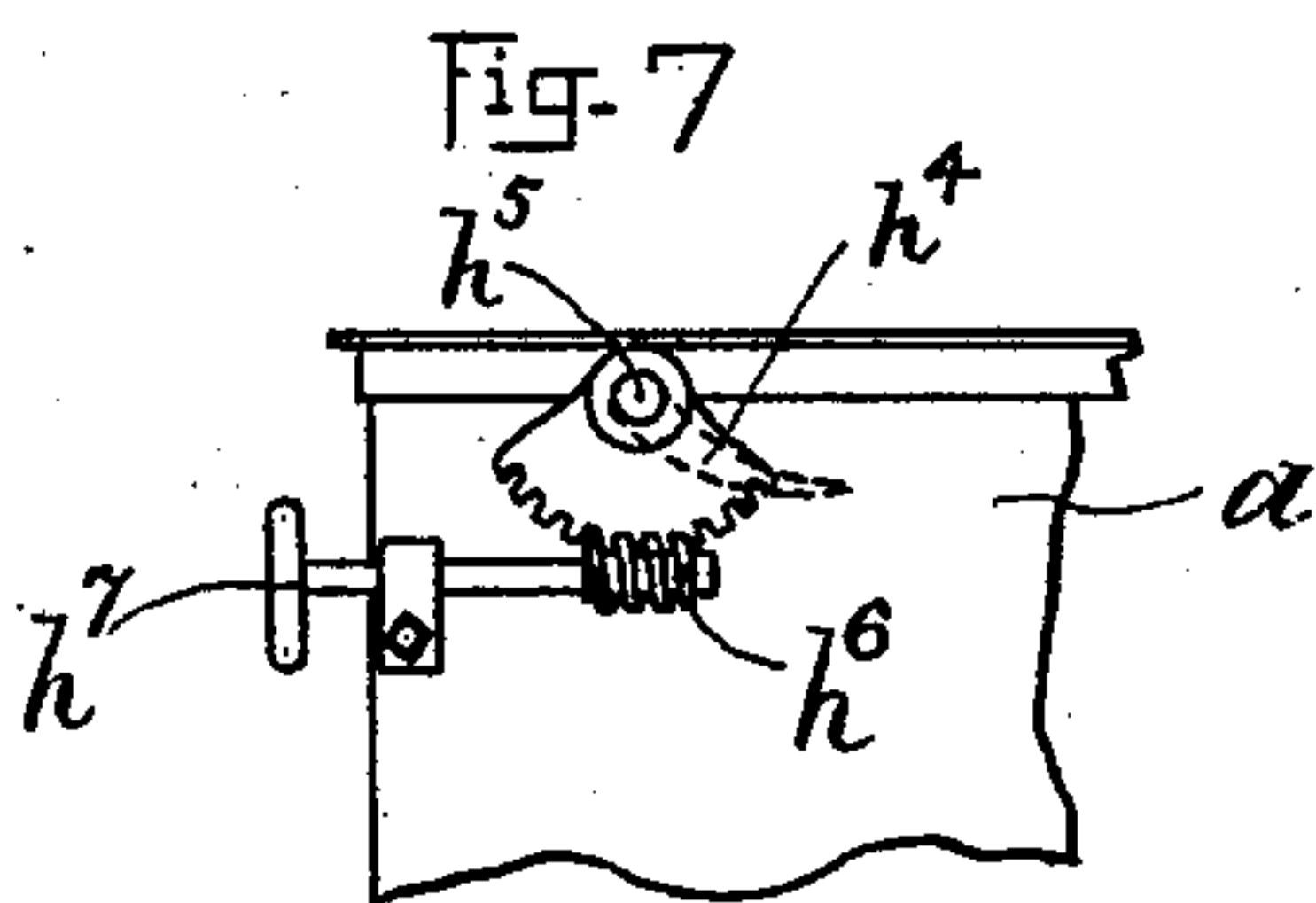
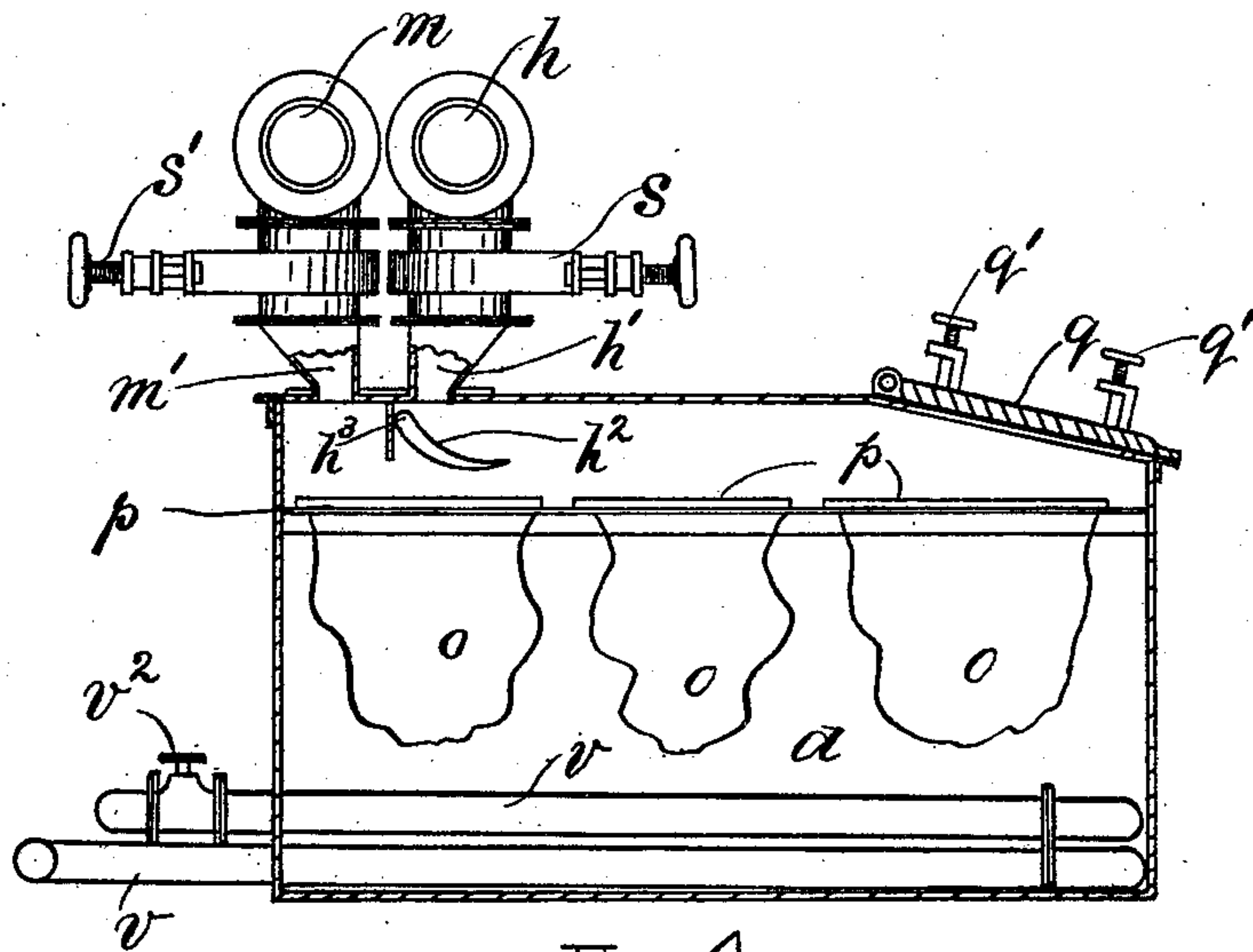
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A. D. Hanson.

Inventors
William Sagar Senior
Alfred Parker Sagar
William Sagar Junior
Knight Brown & Limby
Attorneys.

UNITED STATES PATENT OFFICE.

WILLIAM SAGAR, SR., ALFRED PARKER SAGAR, AND WILLIAM SAGAR, JR.,
OF COLNE, ENGLAND.

APPARATUS FOR EXTRACTING OIL.

SPECIFICATION forming part of Letters Patent No. 587,139, dated July 27, 1897.

Application filed November 4, 1896. Serial No. 611,053. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM SAGAR, Sr., ALFRED PARKER SAGAR, and WILLIAM SAGAR, Jr., subjects of the Queen of Great Britain, residing at Colne, in the county of Lancaster, England, have invented certain new and Improved Apparatus for Use in the Degreasing of Leather, of which the following is a specification.

10 In order to prepare sheepskins, hides, or leather to meet certain well-known requirements, as the even taking up of dye or other finish, it is necessary to free them or it of or from grease or fatty matter, and to do this re-
15 course has been had to the following of many methods and the employment of varied substances and devices, chief among which, perhaps, have been the employment of one or other of the many solvent substances which
20 are easily volatilized. In accordance with one of these methods the solvent is contained in a tank or vessel and the hides, skins, or leather are or is immersed therein, on which they are raised out of the tank, allowed to
25 drain, and then they are hung in the open air to dry. In this case, although the skins are properly and efficiently treated by the grease-removing solvent, yet great waste ensues by its evaporation. Consequently the
30 process is expensive. According to another method most elaborate buildings and apparatus, closed to prevent evaporation and loss into the atmosphere, with pipe connections for the supply and withdrawal of the solvent,
35 are employed and great expense or cost is entailed in their production, while the manner in which the solvent is brought into contact with the hides or leather (which is by being forced or blown as a spray into the room or
40 chamber in which they are placed) does not absolutely insure all the parts of them being treated or acted upon. Hence, in addition to being of great cost to install, it fails to act as efficiently as is desired.

45 As an alternative to spraying the solvent upon the skins or leather another method suggested is to immerse them in the solvent and agitate or move them quickly to and fro therein while the said solvent is heated to a
50 considerable degree above its normal temperature. In this case also the cost of the ap-

paratus is excessive, while the washing of the hides or leather in the heated solvent causes them to lose some of their natural constituent parts and so renders them hard and
55 harsh to the touch. Further, again, closed cylinders have been used, as in the last-preceding case, but they have been arranged so that after the treatment of the skins or leather by the solvent such solvent has been drained
60 off and water run in as part of the finishing process with equally detrimental results to those produced by the last-preceding case referred to. To avoid these losses, to produce
65 apparatus at comparatively little outlay, and to make same thoroughly efficient in its operations, so that the cost of carrying out the process is considerably reduced and the goods treated are rendered better and of
70 higher market value as compared with those treated by most of the processes hereinbefore referred to, is the object of this invention, and this object we attain by the employment
75 of means hereinafter described, and illustrated by the accompanying sheets of drawings, in which—

Figure 1 is an elevation showing end views of tanks and pipe connections thereto in conjunction with apparatus for condensing and heating, as hereinafter explained. Fig. 2 is
80 an elevation showing the parts illustrated by Fig. 1 and as seen in the direction indicated by the arrow *x*. Fig. 3 is a view of parts shown by Figs. 1 and 2 and as seen from
85 above and with the covers of the condensing and heating apparatus removed therefrom. Fig. 4 is a sectional side elevation showing the interior of one of the tanks hereinafter described. Fig. 5 is a view of the tank shown
90 by Fig. 4 and as seen from above, the exhaust and feed pipes hereinafter explained being shown in section at a part near their orifices in the tanks. Figs. 6 and 7 are drawings in detail hereinafter described.

Similar letters and figures of reference indicate similar parts throughout the several views.

In carrying our invention into effect we make use of closed tanks *a*, *b*, and *c*, arranged in suitable proximity with each other, as
100 shown; the tank *a* being used for carrying one part of the process into effect during the

time that the other tank, *b*, is being used for effecting the other part of the process, as hereinafter explained, while the tank *c* acts as a receptacle for the solvent, so that sufficient of this solvent may at any time be supplied to the tanks *a b* from said tank *c*, whence it is raised by a pump at *d*, which causes it to flow through the pipe *e*, its entrance or admission to the tanks *a b* being controlled or regulated by the valves *f f'*, respectively.

The discharging of the liquid or solvent from the tanks *a b* into the tank *c* is effected through the pipe *g*, the flow of said liquid or solvent being controlled or regulated in this direction by the valves *g' g²*.

Each of the tanks *a* and *b* has an appropriately-formed air-pipe *h* leading into the upper part of it from suitably-constructed heating apparatus *k*, (constructed as hereinafter described,) while leading also from the upper part of each of said tanks *a* and *b* is a pipe *m*, that conducts the air and its accompanying gases out of the said tanks *a b* into apparatus *n* for cooling same and which acts as a condenser, (its construction being hereinafter explained.) The air-pipes *h* are made to terminate with the elongated orifice, as shown at *h'*, so that the currents of air and gases which pass into the tanks *a b* through these pipes *h* are spread over the entire width of their said respective tanks, while by the deflectors *h²* (see Fig. 4) these currents of air and gases are caused to travel horizontally, as the positions of the skins *o* within the tanks may necessitate, in order that such said currents of air may be split up and caused to impinge on all the skins to an equal extent or degree, the said deflector *h²* being pivoted at its edge *h³* and arranged so that the toothed quadrant *h⁴*, secured to its pivotal shaft *h⁵*, may be caused by the worm *h⁶*, through the medium of the hand-wheel *h⁷*, (see Fig. 7,) to be adjusted and held as desired to direct the currents of air and gases as described.

The lids *q q²* and upper covering of the tanks *a b* are arranged at an angle to the horizontal plane in order that the currents of air and gases may be thereby constrained to gradually descend to pass more evenly into contact with all the skins in said tanks *a b*.

The orifices of the pipes *m* are also of the elongated shape *m'*, as shown, in order that the currents of air and gases may maintain their full width until their final exit from the tanks *a b*. Thus the skins *o* in all parts of the tanks are properly desiccated thereby.

To carry out the process, the skins or leather, arranged on frames *p*, are placed in suitable positions in the tank—say the tank *a*—on which the solvent, which may be petroleum, benzene, &c., is raised by the pump *d* from the tank *c* and caused to flow through the pipe *e* and valve *f* (the valve *f'* being closed at this time) into the said tank *a*, entering said tank *a* and rising slowly therein, with as little agitation as it is possible to impart to it during its said flow, until the said

skins *o* are completely immersed in it, on which the valve *f* is closed, and under these conditions they, said skins, are allowed to remain the desired length of time for the degreasing action or operation to be completed, during all this time the lid *q* being closed and held down by the screws *q'*, so that it is perfectly air-tight. On the completion of this action the valve *g'* in the pipe *g* is opened and the liquid solvent is allowed to flow from the tank *a* back into the tank *c*.

During the actions of the solvent on the skins *o* in the tank *a*, as above described, the lid *q²* of the tank *b* might have been opened or raised and a full complement of skins placed in said tank *b*, in order to be ready, by its said lid being closed down and held by its screws *q³*, to receive the solvent as it is now sent by the pump *d* through the pipe *e* and valve *f'*, the valve *f* on this occasion being closed to fill said tank *b*, as it had previously filled the tank *a*.

On all the liquid being withdrawn from the tank *a*, as above described, and while this latter is still closed up, (the valve *g'* being now closed,) the exhausting-fan or other appropriate exhausting apparatus *r* is put into action, so as to withdraw by evaporation all the solvent that remains in the skins or leather, this solvent being thus caused to pass through the pipes *m* (the valves *s* and *s'* being at this time opened, while the valves *s² s³* are closed) to the condenser *n*, where it is cooled down to again assume its liquid form, whence it flows through the pipe *t* back into the tank *c*, to be there stored, as will now be understood, while such of the gases that remain after passing through the condenser *n* are carried by the exhauster *r* forward by the pipe *u* into the heating apparatus *k* to be reheated prior to their reintroduction through the pipe *h* into the tank *a*, where again they may impinge upon the skins or leather, all these actions being thus performed without the solvent at any time being exposed to the atmosphere, by which means its escape and loss in this direction are prevented.

During the process of extracting the solvent from the skins in the tank *a*, referred to, the skins in the other tank *b* will have been treated by the solvent, which is again withdrawn through the pipe *g* by the valve *g²* being opened (at which time the valve *g'* will be closed) and passed into the tank *c*, on which the valve *g²* is again closed. So, also, are the valves *s s'*, while the valves *s² s³* are now opened for the actions to be carried out in the tank *b* as they had been in the tank *a*, and so the process may be continually repeated without loss of time by the operatives and without loss of the solvent by evaporating into the atmosphere.

After the solvent has become saturated with the grease or fatty matter that it has extracted or dissolved from the skins it is conducted away to distilling apparatus of

any well-known description, arranged in suitable proximity with the condenser *n*, or other condensing apparatus of any suitable construction, from which it may flow back to the tank *c*.

By arranging the apparatus as hereinbefore described the solvent can be kept at a low temperature throughout the entire process, since the heated or evaporated portion of it is condensed prior to its being remixed with the other in the tank *c*, and this we find in practice to be of especial benefit, since when the solvent becomes heated other constituent parts of the skins in addition to the fatty matter are dissolved out of them, and so they are considerably reduced in value. Still further, however, in order to prevent the possibility of the solvent becoming heated to too high a temperature, we arrange a coil of pipes *v v* within the tanks *a b*, respectively, through which we can cause cold water to flow, its admission into the respective tanks *a b* being controlled by the valves *v²* *v³*, or instead of the pipes *v v* being arranged in the tanks *a b* they may be placed within the tank *c*, in which latter they would be enabled to act upon the solvent prior to its admission to said tanks *a* and *b*. On the other hand, we find that the air and gases that are caused to impinge upon the skins to cause the solvent to evaporate has a better and more beneficial effect on such skins by being heated to a fair degree prior to being introduced. Hence we have arranged our apparatus, as before described, to attain this result.

The heating apparatus *k*, as shown in section by Fig. 6, consists of the chamber 2, through which pass the pipes 3, connecting the cavity 4 with the cavity 5. The gases and air circulate within the chamber 2, entering same by the pipe *w* and leaving by the pipe *h*, and so impinge in their passage upon the pipes 3, which are kept hot by the circulation of steam through them from the cavity 4, which it enters by the pipe 6, to the cavity 5, from which it escapes by the pipe 7.

The condensing apparatus *n* is of similar construction to the heating apparatus *k*, the sizes and external shapes alone varying. However, instead of steam being used cold water is circulated through the pipes 8 from the cavity 9 to the cavity 10, and the air and gases pass through and impinge upon said pipes 8 within the chamber *n*.

Such being the nature and object of our said invention, what we claim is—

1. In apparatus for degreasing leather, hides, or skins, the combination of tanks which, in operation, are closed against the escape of liquid or vapor, and are provided with valved outlets for permitting the solvent to accumulate and be drawn off, means for supporting the leather, hides, or skins within these tanks, means for supplying a liquid solvent to said tanks to immerse the said arti-

cles without agitating or disturbing them, and means for desiccating the contents of the closed tanks, substantially as herein specified.

2. In apparatus for degreasing leather, hides, or skins, the combination of tanks which, in operation, are closed against the escape of liquid or vapor, and are provided with valved outlets for permitting the solvent to accumulate and to be drawn off, means for supplying a liquid solvent to said tanks to immerse the leather, hides, or skins, means for heating and cooling air and gases used to desiccate the contents of the closed tanks, and exhausting or propelling apparatus for causing air or other gases to circulate within said tanks, substantially as herein specified.

3. In apparatus for degreasing leather, hides or skins, the combination of closed tanks, means for supplying liquid solvent to said tanks, coiled or a series of pipes within said tanks arranged to allow the circulation of cold water for maintaining the solvent at a normally low temperature, means for condensing the solvent out of the air and gases circulating in the closed tanks, apparatus for reheating said air or gases and means for propelling the same substantially as herein set forth.

4. In apparatus for degreasing leather, hides or skins, tanks having their lids or upper surfaces at an angle to the horizontal plane, air delivery and exhaust pipes with elongated orifices leading into said tanks and means for deflecting the currents of said air and gases, in combination substantially as specified.

5. In apparatus for degreasing leather, hides or skins, the combination of tanks formed and arranged as described, air-conducting pipes with elongated orifices leading into said tanks, deflectors arranged beneath certain of said orifices regulating-valves in connection with said pipes and means for heating and condensing the air and gases charged with the solvent substantially as herein specified.

6. In apparatus for degreasing leather, hides or skins the combination of tanks formed as described, air-conducting pipes with elongated orifices, leading into said tanks, valves in connection with said pipes, means for deflecting the currents of air and gases within the tanks and means for propelling said air and gases to cause same to circulate substantially as herein specified.

7. In apparatus for degreasing leather, hides or skins, the combination of tanks, formed as described, air-conducting pipes with elongated orifices leading into said tanks, valves in connection with said pipes, means for deflecting the currents of air and gases within the tanks, worm and wheel gear for regulating and holding said deflector, and fan or like propelling apparatus to cause the air and gases to circulate substantially as herein specified.

8. In apparatus for degreasing leather, hides or skins, the combination of tanks formed and arranged as described, a coil or series of pipes within said tanks to enable the employment of cold water to cool the solvent, air-conducting pipes with elongated orifices leading into said tanks, means of deflecting the currents of air circulating therein, propelling means for causing said air to circulate and heating and condensing devices for acting thereon substantially as herein specified.

WILLIAM SAGAR, SR.
ALFRED PARKER SAGAR.
WILLIAM SAGAR, JUNR.

Witnesses:
SAMUEL HEY,
HARRY ELLISON.