

(No Model.)

3 Sheets—Sheet 1.

C. WEBER.  
APPARATUS FOR TREATING COPS, &c.

No. 436,070.

Patented Sept. 9, 1890.

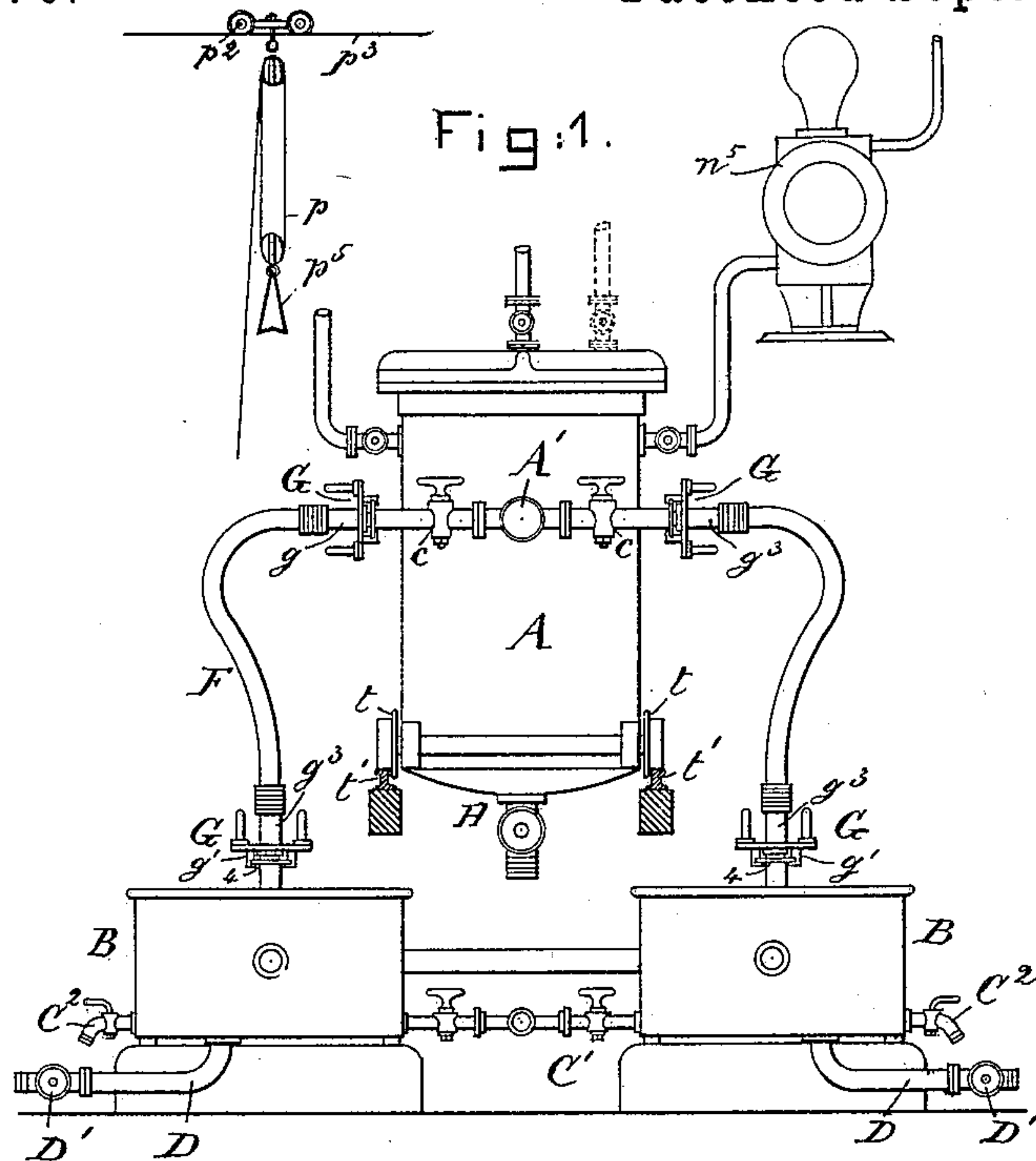
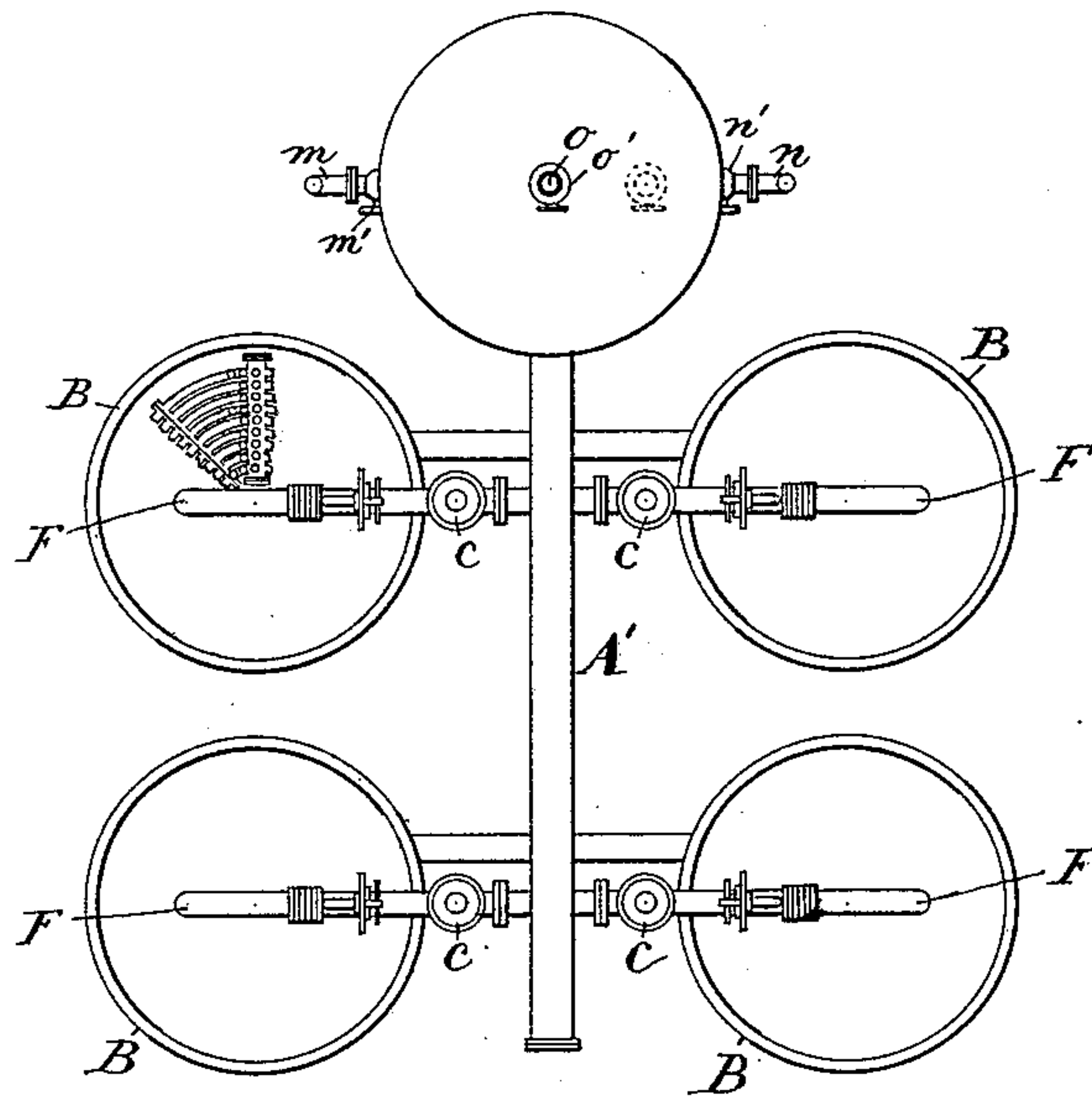


Fig. 2.



Witnesses.

Howard F. Eaton.  
Maurice L. Emery-

Inventor.

Charles Weber.  
by Lemley & Gregory  
attys.

(No Model.)

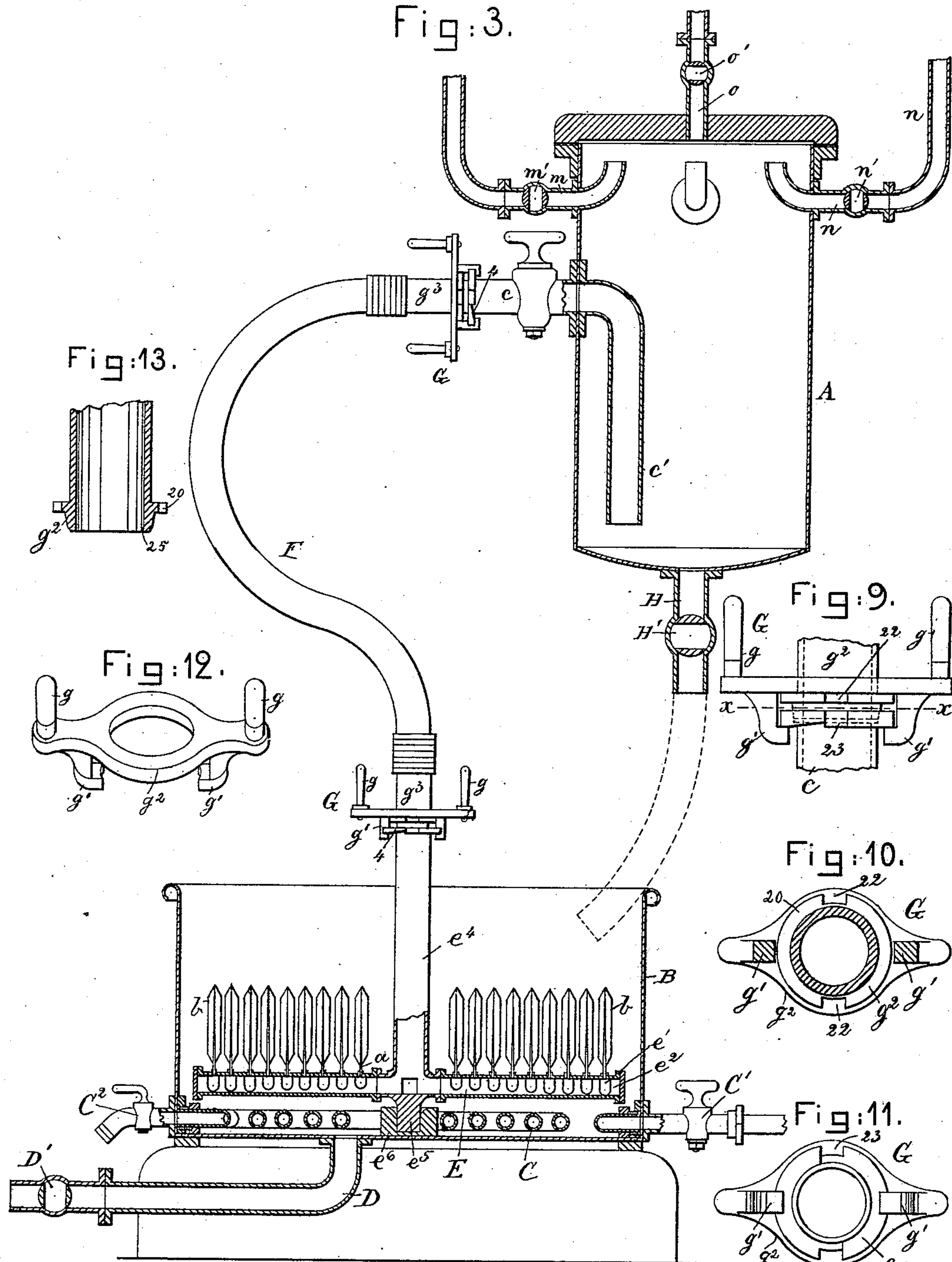
3 Sheets—Sheet 2.

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Fig: 3.



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Fig: 4.

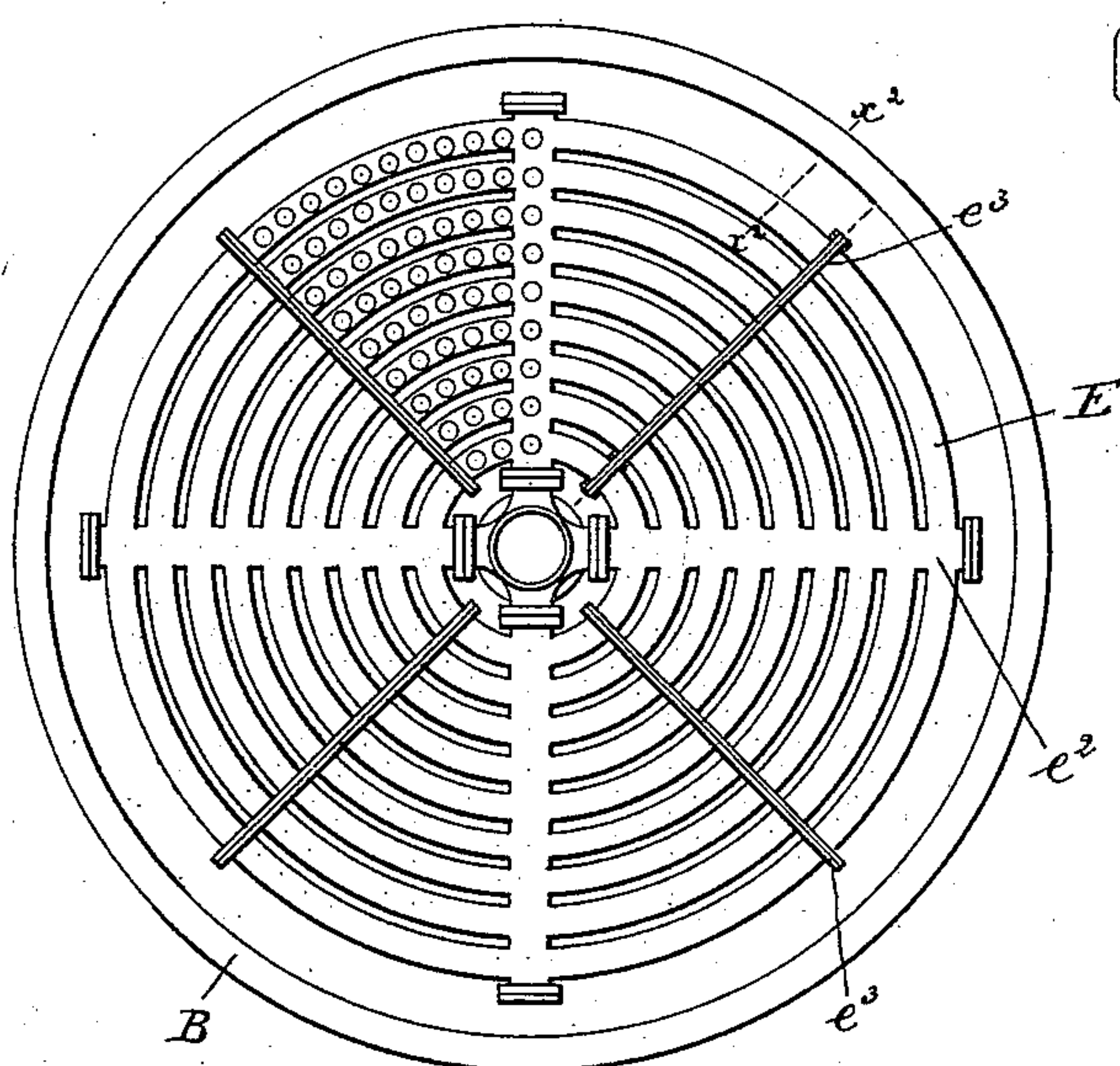


Fig: 5.

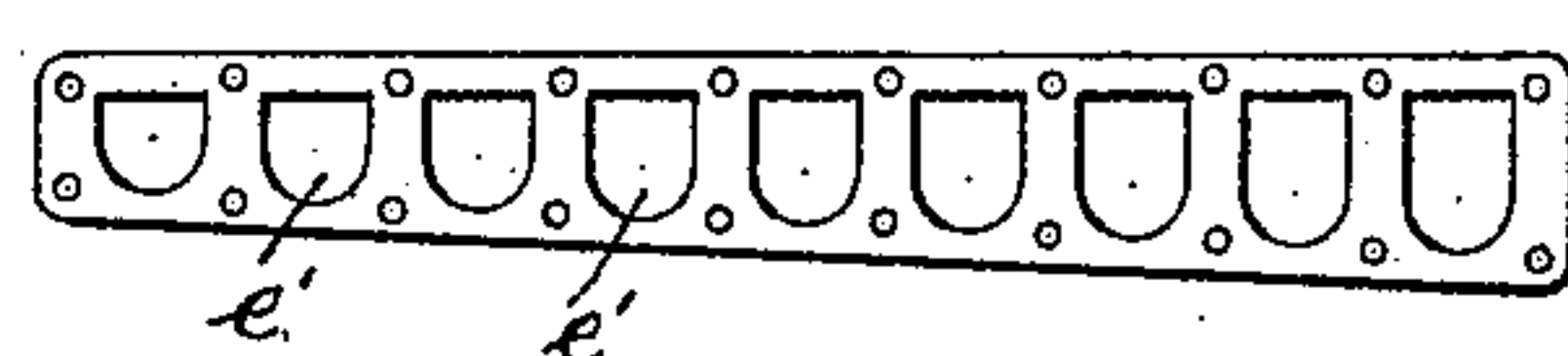


Fig: 6.

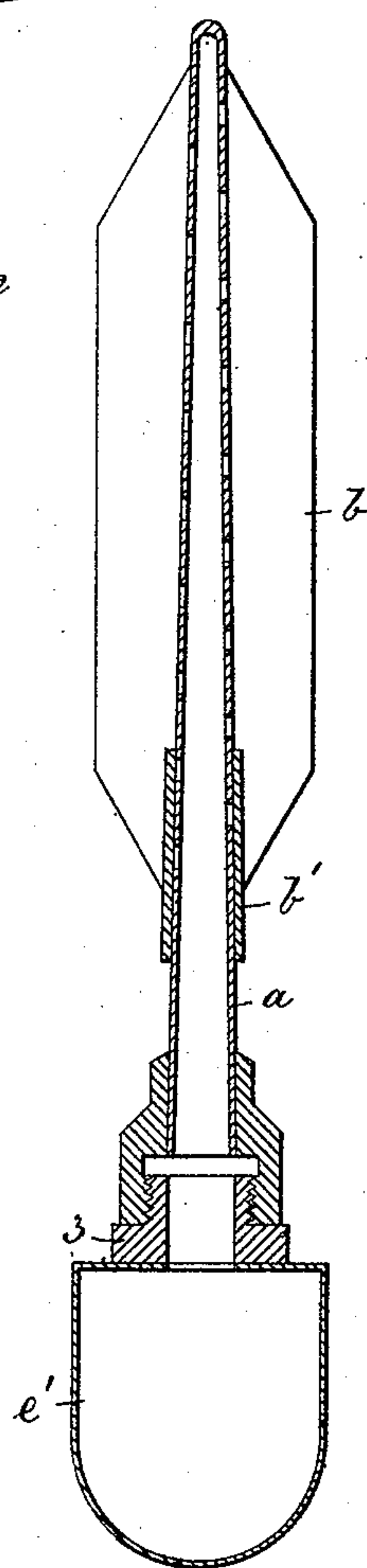


Fig: 7.

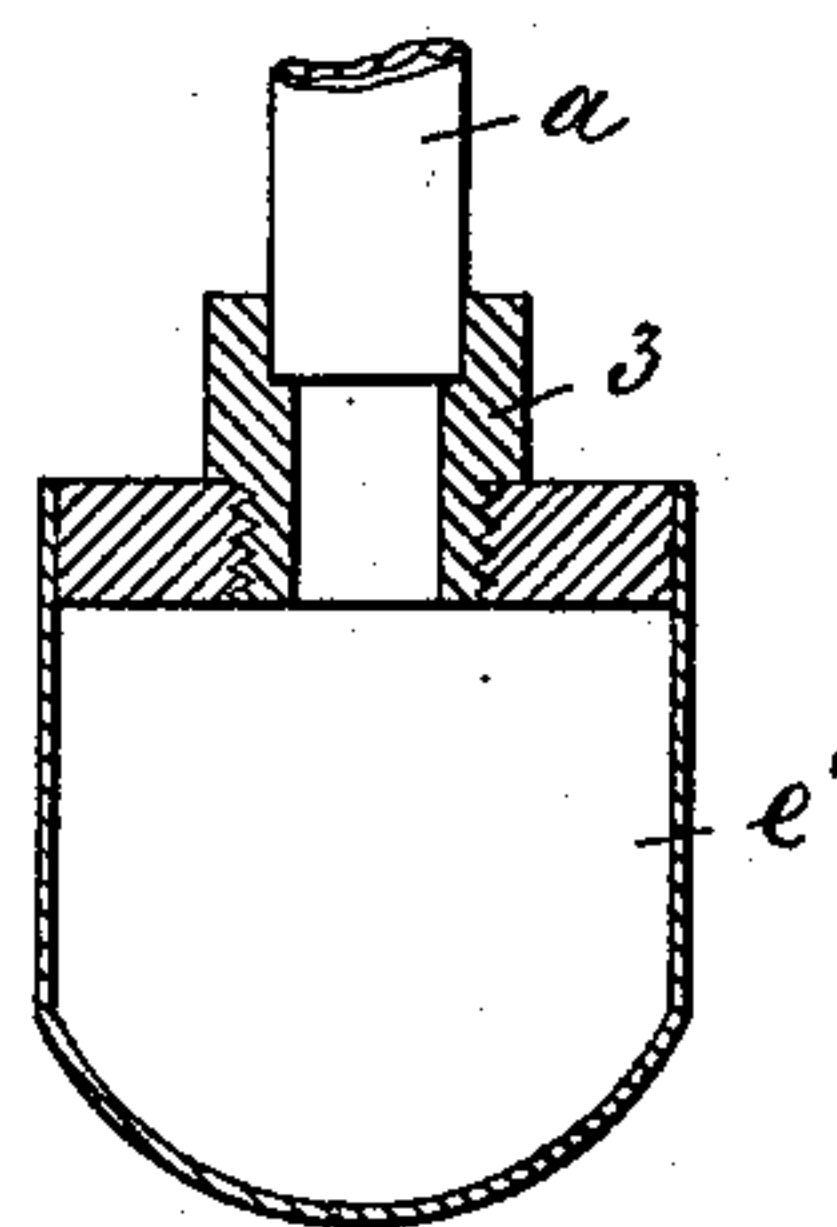
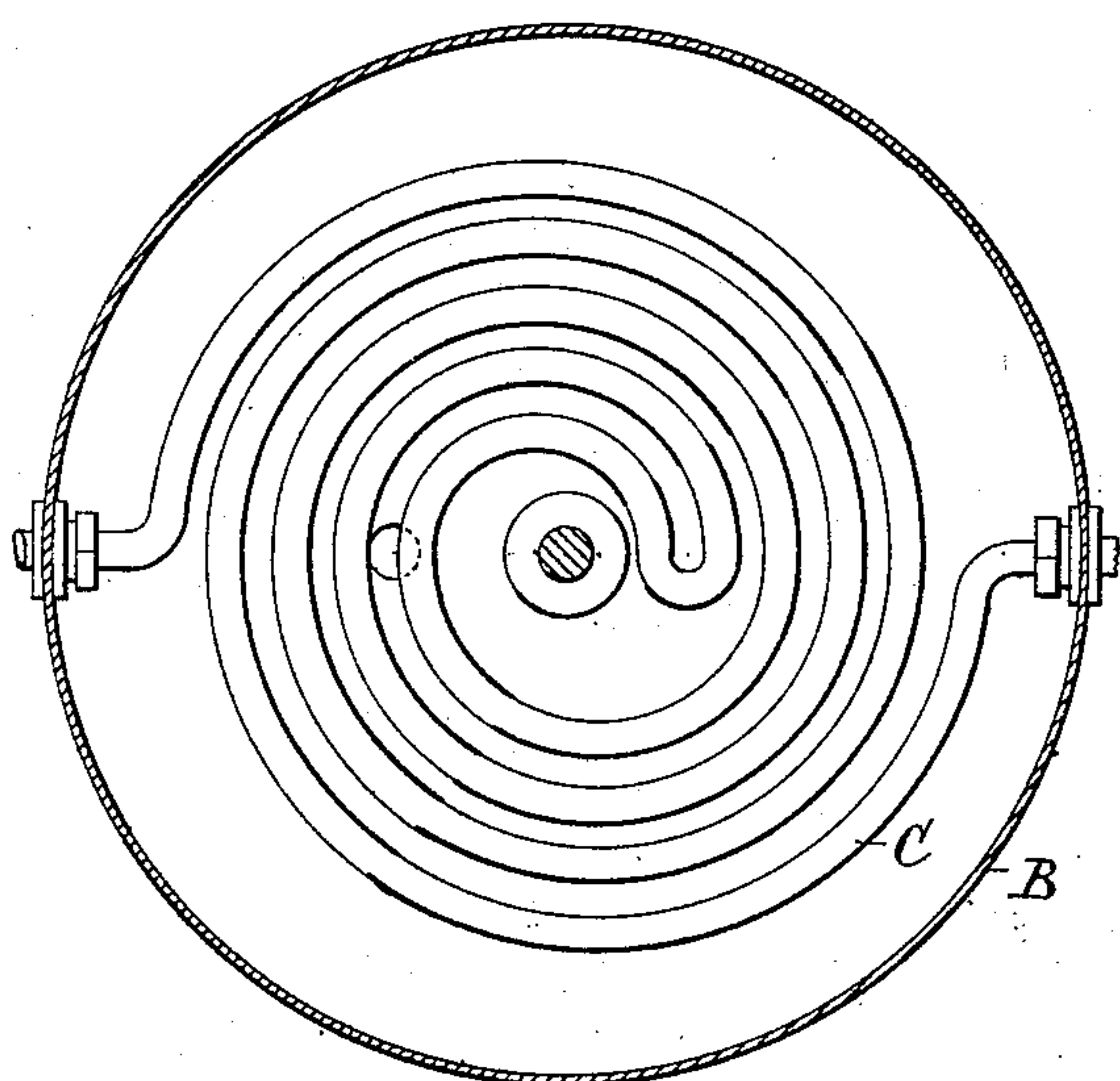


Fig: 8.



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# UNITED STATES PATENT OFFICE.

CHARLES WEBER, OF THANN, GERMANY.

## APPARATUS FOR TREATING COPS, &c.

SPECIFICATION forming part of Letters Patent No. 436,070, dated September 9, 1890.

Application filed May 28, 1889. Serial No. 312,437. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES WEBER, of Thann, Province of Alsace, Empire of Germany, have invented an Improvement in Apparatus for Treating Cops and other Textile Material, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

10 This invention has for its object the production of an improved apparatus by which to dye, cleanse, bleach, and otherwise treat, by a novel method, textile material in all stages of development, more especially yarn  
15 in cop form, irrespective of the reagent employed, which may be a liquid or gas.

My invention consists, essentially, of a vat or tank to hold a dye-liquor or other reagent, a hollow frame therein through which the  
20 reagent is made to flow, a reservoir or vacuum-chamber with which the said frame is connected, an exhaust apparatus in communication with the said reservoir to form a vacuum therein and to compel the reagent to be drawn  
25 from the tank or vat containing the same, the dye-liquor or other reagent drawn by the vacuum from the vat or tank into the reservoir being returned from the reservoir back to the vat or tank preferably through the hol-  
30 low frame.

Other features in which my invention consists will be hereinafter described, and pointed out in the claims at the end of this specification.

35 Figure 1 in side elevation represents one form of apparatus embodying my invention. Fig. 2 is a top or plan view of the apparatus represented in Fig. 1, the hollow frame for holding the cops or material to be treated  
40 being but partially shown in one of the vats or tanks, such full illustration being unnecessary in said figure because the said hollow frame is well shown in Fig. 3. Fig. 3 is an enlarged sectional detail showing one vat or  
45 tank, the hollow frame therein through which passes the liquor or other reagent used, and a heat-radiator, the pipe from the hollow frame being represented as connected directly with the reservoir instead of to a branch pipe run-  
50 ning to the reservoir and common to several vats or tanks, as in Figs. 1 and 2. Fig. 4 is a top or plan view of a form of hollow frame

which I prefer to use, especially when cops are to be dyed or treated, the said frame in practice having a series of nipples or other  
55 suitable devices to insure the connection with the frame of the perforated tubes, spindles, or yarn-holders upon which the cops or other material to be treated are placed. Fig. 5 is an edge view of one of the sections of the  
60 hollow frame. Fig. 6 is an enlarged detail in the section-line  $x^2$ , Fig. 4, it showing one of the hollow arms of the hollow frame with a tube or spindle thereon provided with a cop. Fig. 7 is a modification. Fig. 8 shows  
65 the radiator or heating-coil in the vapor tank. Fig. 9, on an enlarged scale, shows the coupling as holding two flanged collars in place. Fig. 10 is a section of Fig. 9 in the line  $x$ . Fig. 11 is an under side view of Fig. 9. Fig.  
70 12 is a top view of the coupling alone, and Fig. 13 shows one of the flanged unions detached.

Referring to the drawings, A is a closed reservoir or vacuum-chamber, while B repre-  
75 sents one or a series of vats or tanks, which may either be left open at the top, as represented in Fig. 3, or the vat or tank may be covered in any usual manner, hermetically or  
80 otherwise.

Each vat or tank B may, if desired, be provided with a radiator C, (best shown in Figs. 3 and 8,) through which may be passed steam or other usual heating medium by which to  
85 keep the dye-liquor or reagent in the vat or tank at the proper temperature. The pipes connected with the radiator will have suitable valves, as  $C'$   $C^2$ , to let on or cut off the steam or other heating medium, as may be desired,  
90 to thus render the radiator effective or inoperative, as desired.

Each vat or tank B has an outlet-pipe D, provided with a suitable valve  $D'$ , to enable the vat or tank to be emptied when desired.

Each vat or tank receives in it a hollow  
95 frame, as E, the said frame as herein represented being especially adapted to receive the tubes, spindles, or yarn-holders  $a$ .

The hollow frame E (represented in Figs. 3 and 4) is supposed to be composed of metal  
100 sections, having passages  $e'$   $e^2$  and provided with flanges  $e^3$ , which are bolted together, as best shown in part of Fig. 4. The metal sections abut and the passage-ways  $e'$  of each



section register with corresponding passage-ways of contiguous sections and form a series of circular channels, which are intersected by the radial passage-ways  $e^2$ . The sections of the hollow frame, as herein shown, have other flanges at the inner ends of the passage-ways  $e^2$ , which in practice are suitably bolted to flanges at the lower end of a hollow conductor or pipe  $e^4$ , forming, as represented, the central part of the said frame, the said conductor having, as shown, a foot  $e^5$ , which enters a suitable step or bearing  $e^6$ .

The hollow concentric arms or passage-ways of each section may be provided with suitable nipples 3, as in Fig. 6, to which are applied the lower ends of the hollow perforated or reticulated tubes, spindles, or holders  $a$ , preferably of metal and closed at their upper ends. If desired, however, the lower ends of the tubes or spindles  $a$  may have a suitable base, which may be fitted in any suitable manner directly to the arms of the section, as, for instance, as shown in Fig. 7.

The cops  $b$ , preferably containing a perforated cop-tube  $b'$  of usual construction, will be placed upon the tubes or spindles  $a$ , as represented in the drawings.

I do not desire to limit my invention to making the frame E in sections, as it may be made by coiling a pipe or conductor into a flat coil, substantially as represented by the radiator C, and the pipe in cross-sections may be of any usual shape.

Each hollow conductor or pipe  $e^4$  has connected or coupled to it in suitable manner a pipe F, the opposite end of which is connected to a portion of a cock, as  $c$ , in communication with the reservoir A through a pipe A', (represented in Figs. 1 and 2,) as when several vats or tanks are employed and located near one reservoir, or the said cock  $c$  may be attached directly to the reservoir, as shown in Fig. 3.

I have shown the lower part of the reservoir in Fig. 1 as provided with wheels  $t$ , which stand upon a track  $t'$ , whereby, when desired, the relative positions of the reservoir or tanks or vats may be changed, as in practice it sometimes happens that it is desired to use the same reservoir with different tanks or vats more or less separated from each other, and in such case the reservoir may be moved readily on the track to place it in desired position; but it will be obvious that the same result might be accomplished by mounting the vats or tanks on wheels in a similar manner to run on a track. (Not here shown.)

Each hollow conductor or pipe  $e^4$  has connected or coupled to it a pipe F, preferably flexible, it having secured to its two ends suitable flanged unions  $g^3$ .

The cops will preferably be applied to and taken from the hollow tubes or spindles while the hollow frame is outside of the vat or tank, and the hollow frame having been properly supplied with cops will be lowered into the dye-liquor or other reagent in the vat or tank

B, I having shown in Fig. 1 one form of hoisting device for such purpose.

In practice the hoisting apparatus, which may be of any usual kind, will preferably have wheels, as at  $p^2$ , to run on a track  $p^3$ , part of which is represented in Fig. 1.

I prefer to return the reagent from the reservoir A back through the hollow frame, especially when the material is to be dyed, as in that manner a more uniform dyeing of the material is effected; but for other purposes—such, for instance, as bleaching, scouring, &c.—the waste or discharge pipe H of the reservoir may be connected with the tank B, as indicated by dotted lines in Fig. 3, so as to discharge therein, in which case the reagent will be circulated through the tank and reservoir in one direction.

The tubes or spindles  $a$  herein represented are of suitable shape to receive a cop taken from a spinning-machine; but I do not desire to limit my invention to the exact form of tube or spindle  $a$  shown, as the same may be varied in shape externally, according to the shape of the mass of yarn or material to be treated, and through which the reagent is to be passed in one and then in an opposite direction. The reagent used will vary according to the process or treatment to which the material is subjected—as, for instance, it may be a gas for bleaching purposes, or it may be any kind of a liquid, and when a gas is employed, the vat B will be hermetically closed in any well-known manner.

I prefer to employ air by which to force the reagent from the reservoir into the tank; but other gases might be used.

The connection of the flexible pipe F with the hollow conductor and with the pipe or cock referred to as being in communication with the reservoir may be made by any suitable coupling; but I prefer to use the coupling G.

The coupling G hererein represented, (see Figs. 9 to 12,) is composed, essentially, of a plate  $g^2$ , having a central opening and provided with lips  $g'$  and handles  $g$ .

The plate  $g^2$  of the coupling receives through it the tubular or sleeve-like end of a flanged union, (shown separately in Fig. 13,) its flange 20 being notched, as at 22, so that the flange may pass the lips  $g' g'$ , and enable the flange to be seated on the plate  $g^2$ .

The union is preferably extended below its flange 20 to form an annular lip 25, (see Fig. 13,) to enter an annular recess at the upper end of the hollow conductor  $e^4$ , or at the outer end of a continuation or connection with the cock  $c$ , the said conductor and the said continuation each having a like flange 4 notched at 23, and preferably inclined or beveled at its under side.

To connect the pipe F with the cock  $c$ , the lips  $g'$  have to be passed through the notches 23 of the flanges 4, and then the ends of the flanged union and the flanged end of the cock continuation being in contact, the plate  $g^2$



will be moved and partially rotated by the handles, causing the intumed ends of the lips  $g'$  to engage the inclined rear sides of the flanges 4 and form fluid-tight joint.

5 As represented in Fig. 3, the reservoir at a point inside and opposite the connection with it of the cock or valve  $c$ , or of the pipe  $A'$ , has a siphon pipe or leg  $c'$ , which is extended nearly to the bottom of the reservoir  
10 A. The reservoir A is further provided with a waste or discharge pipe H, having a suitable cock or valve  $H'$ .

The reservoir A is represented as having connected to it at or near its upper end a pipe  
15  $n$ , communicating with and forming the inlet of a vacuum-forming apparatus, preferably a vacuum-pump  $n^5$ , (shown only in Fig. 1,) which may be of any usual construction, and by which, when the valve  $n'$  is open, a vacuum  
20 will be formed in the reservoir A to cause the dye or other reagent placed in the tank or vat B to be drawn or sucked through the cops  $b$  or other material into the perforated tubes, spindles, or holders  $a$ , and thence through the  
25 hollow frame E and pipe F into the reservoir. The vacuum will be continued until the reservoir is more or less filled, when the valve  $n'$  will be closed. The dye or other reagent in the reservoir may now be made to return  
30 from the reservoir or vacuum-chamber through the pipe and hollow frame and through the cop or material to be dyed or treated in the opposite direction, either by a force-pump or apparatus in communication  
35 with the pipe  $m$ , having a valve  $m'$ , the latter being open, or by atmospheric pressure, which may be admitted through a pipe  $o$ , having a valve  $o'$ . When the vacuum is destroyed and  
40 air is permitted to enter the reservoir, the reagent contained in the flexible pipe will descend through the hollow conductor  $e^4$  and hollow frame by gravity alone, and the siphon-leg will compel the reagent in the reservoir, if a liquid, to follow down to the lower end of  
45 the leg.

By elevating the reservoir A, as shown in the drawings, the force employed to return the reagent to the tank through the hollow frame is assisted by gravity.

50 I do not desire to limit my invention to making the communication between the reservoir and pipe F at any particular point of the reservoir.

In practice each hollow conductor may have  
55 a suitable bail or hook, which may be engaged by any suitable hook, as  $p^5$ , of the hoisting apparatus used.

I claim—

60 1. In an apparatus for treating textile material, the combination, with a tank or vat to contain the reagent and to receive the material to be treated and an independent hollow frame located in the tank, of a closed reservoir or vacuum-chamber independent of the  
65 said tank and communicating with said hollow frame, an exhaust apparatus, and a pipe-connection between the said reservoir or vac-

uum-chamber and exhaust apparatus, to operate substantially as described.

2. In an apparatus for treating textile material, the combination, with a tank or vat to  
70 contain the reagent and to receive the material to be treated, and a hollow frame located in the tank, of an elevated reservoir or vacuum-chamber independent of the said tank  
75 and connected to the said hollow frame, an exhaust apparatus, and a pipe-connection between the said reservoir and exhaust apparatus, to operate substantially as described.

3. In an apparatus for treating textile material, a tank or vat to contain the reagent  
80 and to receive the material to be treated, an independent hollow frame located in the tank, and a reservoir or vacuum-chamber communicating with said hollow frame, combined with  
85 an exhaust apparatus, and a pipe-connection between the said reservoir and exhaust apparatus, and with a second pipe connected with the said reservoir for the admission of  
90 air or other medium to aid in the return of the said reagent from the reservoir back to the said hollow frame and into the tank, substantially as described.

4. In an apparatus for treating textile material, the combination, with a tank or vat to  
95 contain the reagent, and a radiator in the said tank to heat the said reagent, of an independent hollow frame located in the tank, a reservoir or vacuum-chamber communicating with  
100 said hollow frame, an exhaust apparatus and a pipe-connection between the said reservoir and exhaust apparatus, substantially as described.

5. In an apparatus for treating textile material, a vat or tank to contain the reagent,  
105 and an independent hollow frame connected by a pipe, with a reservoir or vacuum-chamber elevated above the tank or frame, combined with an exhaust apparatus, and a pipe,  
110 as  $n$ , in communication with the said exhaust apparatus to form a vacuum in the reservoir, and having a valve or cock  $n'$ , and with a  
115 cock to admit air to the said reservoir when the cock  $n'$  is closed, substantially as described.

6. In an apparatus for treating textile material, a vat or tank to contain the reagent, a  
120 reservoir or vacuum-chamber elevated above the said tank or vat and having a siphon-leg, combined with an independent hollow frame located in said vat, an exhaust apparatus and a pipe-connection between the hollow frame  
125 and the said siphon-leg, and a cock or valve to shut off communication between the said hollow frame and reservoir, substantially as described.

7. In an apparatus for treating textile material, a series of vats or tanks, a reservoir or  
130 vacuum-chamber common to the said vats or tanks, and a series of hollow frames in said tanks, combined with a series of pipes to connect the said frames with the said reservoir or vacuum-chamber, and a valve to open communication between any one or more of the



said hollow frames and the said reservoir, substantially as described.

8. In an apparatus for treating textile material, the combination, with the vat or tank, 5 of the hollow frame composed of sections having passage-ways  $e'$  and  $e^2$ , and the hollow conductor or pipe communicating with the said passages, substantially as described.

9. The combination, with a series of tanks 10 or vats and a series of hollow frames located in said tanks or vats, of a reservoir or vacuum-chamber independent of the said tanks and communicating with said hollow frames, and a pipe-connection between the said reservoir 15 and in communication with an exhaust apparatus, to operate substantially as described.

10. In an apparatus for treating textile ma-

terial, the combination, with a tank or vat to contain the reagent and to receive the material to be treated, and an independent removable hollow frame located in the tank, of a 20 reservoir independent of the said tank and connected to said hollow frame, an exhaust apparatus, and a pipe-connection between the said reservoir and exhaust apparatus, to operate substantially as described. 25

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CHARLES WEBER.

Witnesses:

WILLIAM W. RICKARD,  
CHAS. R. ENGLISH.