

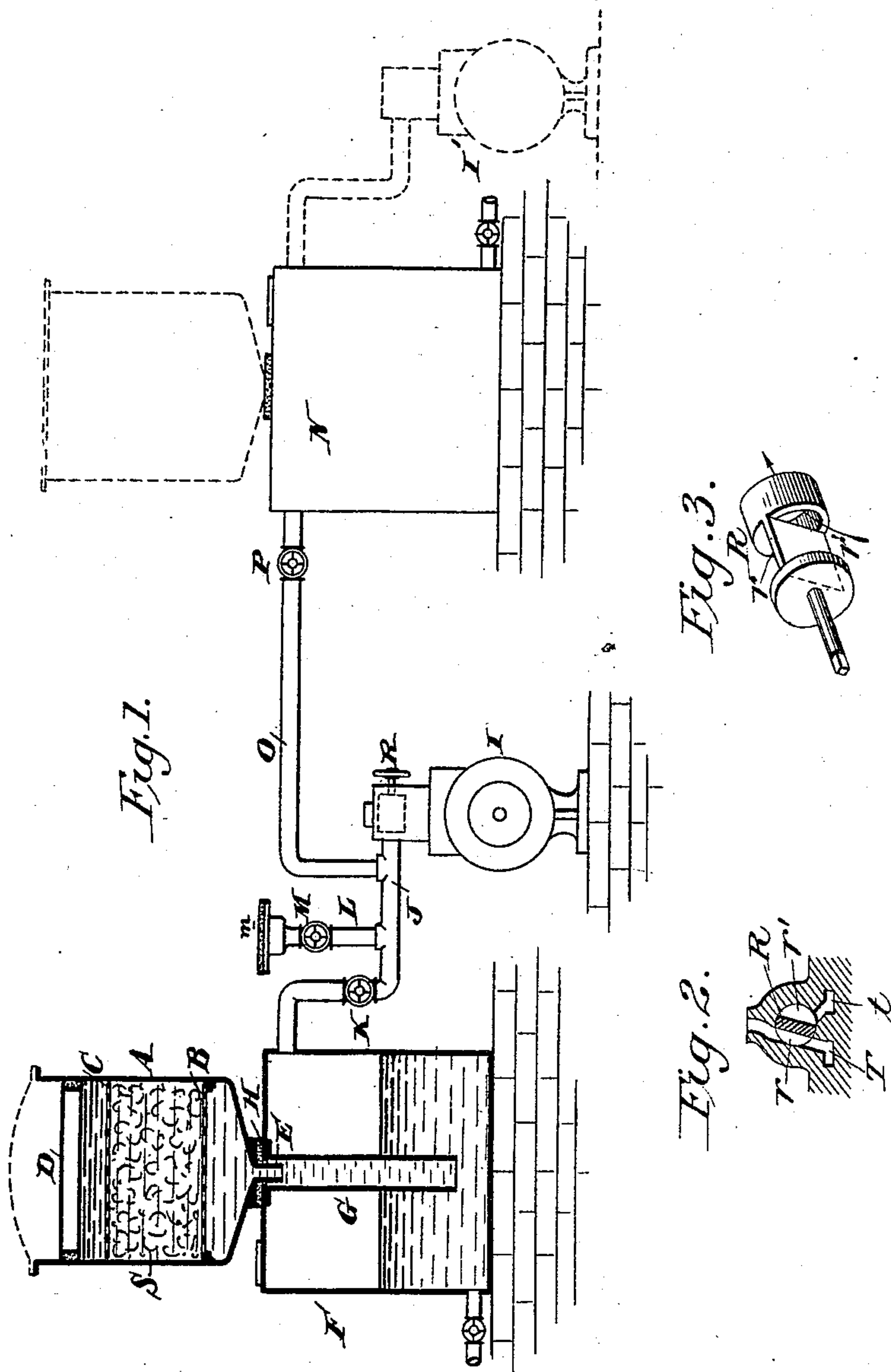
(No Model.)

J. H. LORIMER.

MACHINE FOR TREATING TEXTILE OR OTHER FIBERS.

No. 426,828.

Patented Apr. 29, 1890.



WITNESSES:

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UNITED STATES PATENT OFFICE.

JOHN H. LORIMER, OF PHILADELPHIA, PENNSYLVANIA.

MACHINE FOR TREATING TEXTILE OR OTHER FIBERS.

SPECIFICATION forming part of Letters Patent No. 426,828, dated April 29, 1890.

Application filed December 5, 1888. Serial No. 292,708. (No model.)

To all whom it may concern:

Be it known that I, JOHN H. LORIMER, of the city and county of Philadelphia, and State of Pennsylvania, have invented an Improvement in Machines for Treating Textile or other Fiber to Liquids and Gases, of which the following is a specification.

My invention has reference to machines for treating textile and other fibers to liquids and gases; and it consists of certain improvements, all of which are fully set forth in the following specification and shown in the accompanying drawings, which form a part thereof.

In carrying out my invention I place the material to be treated in a vessel resting upon a perforated bottom or support and held in place from above, preferably by a movable piston or diaphragm, and, if desired, this piston may be arranged above another perforated diaphragm which rests upon the material being treated. This vessel has an outlet at the bottom, which may be connected by an air-tight joint with a pipe extending to or near the bottom of another vessel or reservoir containing liquid dye or other substance with which the material in the first-mentioned vessel is to be treated. Connecting with this liquid-reservoir above the liquid-level is a pipe leading to a pump or pumps adapted to either create a vacuum or force air or gas into the vessel under pressure. The liquid in the reservoir or vessel never enters the pump, and hence this piece of mechanism is not subjected to corrosive action of acids or other injurious liquids to which the fiber must be subjected. The wool, cotton, yarn, or fibers of all sorts, rags, roots, woods, leaves, or such other material to be treated is placed in the vessel between the two perforated diaphragms and the top of the vessel sealed with a cover or a solid movable piston or diaphragm. The pump is put in operation as an exhaustor to exhaust the air from the material so confined, and then by a suitable valve this pump may be made to force air into the reservoir, whereby the liquid in the reservoir is forced up into the vessel and through the material to be treated, the pressure on the liquid to make it rise being caused by the action of the pump which forces air or a gas into the reservoir above the liquid. By then operating the pump

as an exhaustor or vacuum-pump the liquid may be caused to return to the reservoir and leave the material being treated. This operation may be repeated as often as desired. The material in the vessel may then be subjected to air or gas to dry or otherwise treat it, the said air or gas being circulated through it by the pump. In carrying out this step the vessel may be placed upon an auxiliary pipe connecting with the pump, and through which air or gas may be circulated. It is also evident that there may be two or more reservoirs containing different liquids, and in connection with the vessel containing the material to be treated may be placed in succession.

Referring to the drawings, Figure 1 is an elevation of apparatus (with part in section) embodying my invention. Fig. 2 is a section through the valve of the pump of Fig. 1, and Fig. 3 is a perspective view of the valve removed.

A is the vessel in which the material S to be treated is placed between two perforated diaphragms B and C to hold it in place, and yet allow of the passage of liquid and air or gas. This vessel A is provided with a movable air-tight diaphragm or piston D above the material S and its upper perforated diaphragm, and this piston D is preferably made buoyant, so as to float on the liquid. If desired, a closed cover may be used in place of the piston D, as indicated in dotted lines.

The lower part of the vessel A terminates in a nozzle E. This vessel fits upon a reservoir F, having the tube G extending down from the top to near the bottom, and having the tube open at the top to receive the nozzle E of the vessel A. A rubber packing H may be used between the vessel A and top of the reservoir F to make an air-tight joint.

I is the air or gas pump, which connects by a pipe J with the upper part of reservoir F and is provided with a valve K. A valve R may be employed to reverse the suction and discharge ports of the pump, so that by moving this valve the pump may create a suction through or put a pressure on the pipe J. This valve R has two ports r and r' , the former leading to the atmosphere and the latter to the pipe J. The valve is fitted in the chest at top of the pump, and the ports of the valve may com-

municate with either the suction-port T or discharge-port *t* of the pump. (See Fig. 2.) As shown in Fig. 2 the air enters through port *r* into the suction-port T of the pump and is discharged through ports *t* and *r'* into the pipe J. By rotating the valve R the port T may be connected with pipe J by port *r'* of the valve to reverse the action of the pump.

L is an air-pipe opening from pipe J and having a valve M and a socket *m* for the nozzle E of the vessel A.

N is a second liquid-reservoir similar to F, and connects with the pipe J by a pipe O, having a valve P.

The operation will now be understood. The material S being placed in the vessel A, said vessel is placed upon the reservoir F, as shown. The pump I is then operated to suck air through the pipe J from F, valves M and P being closed. This extracts the air from vessel A and creates a partial vacuum therein. The valve R is then turned and the pump I now forces air through pipe J into the reservoir F above the liquid, which liquid is forced up the pipe G through nozzle E and through the material S in the vessel A, causing the movable piston-diaphragm D to rise. By this operation the liquid is caused to permeate every portion of the material S. The operation may be repeated as often as desired. If now it is desired to treat the material to air or gas alone, the vessel A is placed upon the socket *m* of pipe L, and the valve K is closed and M opened. The pump I may now be operated as before, only now with the effect of circulating air or a gas and not liquid. By this means the material may be dried or subjected to the influence of gases.

When it is desired to treat the material in the vessel A to two or more liquids, the vessel A is removed from the reservoir F and arranged in connection with the reservoir N, containing the other liquid, and in this case the valve P is opened and the valves K and M are closed. Any number of such reservoirs may be employed.

The movable piston D is not necessary, though it is desirable. When the pump is to make a vacuum in the vessel A, then the piston D or a closed top must be used; but when the liquid is allowed to fall from the vessel A by gravity and the air circulated is permitted to exist at atmospheric pressure and also allowed to go to waste, then the piston D and closed top may be dispensed with. It is clear that instead of one pump I and a valve R a second pump I' may be used, thus employing two pumps, as indicated, in connection with reservoir N, one of which may be used to create a vacuum and the other a pressure in said reservoir. There may be two or more of the vessels A and the materials in such vessels may be simultaneously treated by being respectively connected with different reservoirs. It often happens that after the material has been treated with one liquid it is

necessary to treat it with another, and this can readily be done by placing the vessel in connection with different reservoirs.

I do not limit myself to the specific details shown, as they may be modified in various ways without departing from my invention.

Having now described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A closed reservoir containing liquor, in combination with a vessel to contain the material to be treated, having its interior connected with said liquor-reservoir below the liquor-level, and air-circulating devices connecting with the upper part of said liquor-reservoir to force air therein, and a connecting-pipe or air-tight passage-way between the reservoir and vessel to cause the liquor to rise in a solid column into said vessel containing the material by the increased pressure upon the surface of the liquor.

2. A closed reservoir containing liquor, in combination with a vessel to contain the material to be treated, having its interior detachably connected with said liquor-reservoir by a liquid-tight joint below the liquor-level, and air-circulating devices connecting with the upper part of said liquor-reservoir to force air therein, and a connecting-pipe or air-tight passage-way between the reservoir and vessel to cause the liquor to rise in a solid column into said vessel containing material by the increased pressure upon the surface of the liquor.

3. A closed reservoir containing liquor, in combination with a vessel to contain the material to be treated, having perforated diaphragms, between which the material to be treated is contained, having its interior connected with said liquor-reservoir below the liquor-level, and air-circulating devices connecting with the upper part of said liquor-reservoir to force air therein, and a connecting-pipe or air-tight passage-way between the reservoir and vessel to cause the liquor to rise in a solid column into said vessel containing the material by the increased pressure upon the surface of the liquor.

4. The combination of a vessel to contain material to be treated, a reservoir to contain the treating-liquid, having its interior below the liquid-level connected with the vessel on one side or surface of the material contained therein, air-circulating devices to create a vacuum or pressure, pipes leading from the air-circulating devices to the upper part of the reservoir, and a movable air-tight piston in the vessel above the material being treated.

5. The combination of a vessel to contain material to be treated, a reservoir to contain the treating-liquid, having its interior below the liquid-level detachably connected with the vessel on one side or surface of the material contained therein, air-circulating devices to create a vacuum or pressure, pipes leading from the air-circulating devices to the upper

part of the reservoir, a tubular socket for the vessel opening from the pipe leading from the air-circulating devices, and valves in said pipe to shut off the socket or the reservoir.

5 6. The combination of a reservoir for containing liquid, a vessel for containing material to be treated, a pipe or air-tight passage-way connecting the interior of the vessel with the bottom part of the reservoir, a pump, a
10 pipe leading from the pump to the top of the reservoir, and a valve device to cause the pump to suck or force air from or into the pipe.

15 7. The combination of two reservoirs for containing liquid, an air-circulating pump for forcing air into or sucking air from the said reservoirs, valves to control the air with respect to each of said reservoirs, and removable vessels for containing the material to be treated, having provision for connection of

the interior of the vessel with the lower part 20 of said reservoirs below the liquid-level.

8. A liquid-reservoir containing liquid, having a pipe G extending from its top to a point below the liquid, in combination with a vessel containing the material to be treated, having its interior connected with the pipe G by an air-tight joint, whereby through the said pipe G it communicates with the reservoir below the liquid-level, a pump, and a connecting-pipe from the pump to the reservoir above 30 the liquid-level.

In testimony of which invention I hereunto set my hand.

JOHN H. LORIMER.

Witnesses:

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