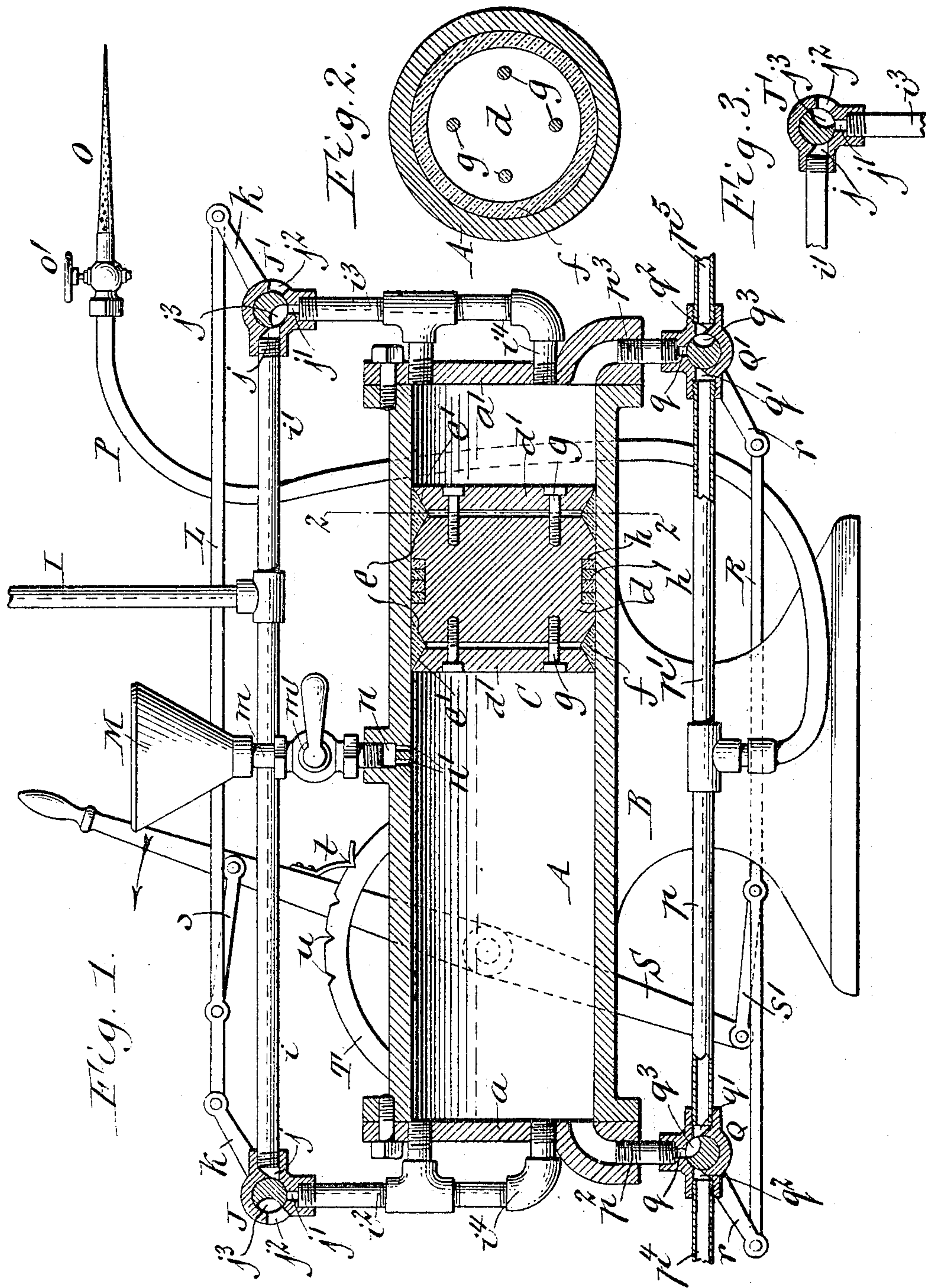


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W. SCHRAMM.
APPARATUS FOR IMPREGNATING MEAT.

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UNITED STATES PATENT OFFICE.

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APPARATUS FOR IMPREGNATING MEAT.

No. 801,612.

Specification of Letters Patent.

Patented Oct. 10, 1905.

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To all whom it may concern:

Be it known that I, WILHELM SCHRAMM, a subject of the Emperor of Germany, residing at New York, in the county and State of New York, have invented new and useful Improve-
5 ments in Apparatus for Impregnating Meat, &c., of which the following is a specification.

This invention relates to an apparatus which is more particularly designed for impregnating meat with a liquid solution which pre-
10 serves, cures, or pickles the same; but the apparatus may also be used for impregnating other material.

The object of this invention is to provide a
15 simple and efficient apparatus of this character whereby the operation of impregnating meat or other material may be effected continuously and expeditiously.

In the accompanying drawings, Figure 1 is
20 a vertical longitudinal section of my improved impregnating apparatus. Fig. 2 is a cross-section of the same in line 2 2, Fig. 1. Fig. 3 is a fragmentary section showing one of the pressure and vent valves in a position
25 different from that shown in Fig. 1.

Similar letters of reference indicate corresponding parts in these views.

A represents the working cylinder of the apparatus, which is preferably arranged in a
30 horizontal position and closed at opposite ends by imperforate heads *a a'*. This cylinder may be supported on a base B or in any other suitable manner. Within this cylinder is a reciprocating piston C, which fits the bore
35 thereof and is not connected with any other part of the apparatus.

Although various forms of pistons may be used, that shown in the drawings is preferred and is constructed as follows: *d* represents a
40 central section, and *d' d'* two end sections, which together constitute the body of the piston. The central section has its opposite ends beveled, and the inner edges of the end sections are also beveled, as shown at *e e'*, forming annular packing channels or grooves of
45 V-shaped cross-section between adjacent sections.

f represents endless or continuous packing-rings of lead or other comparatively soft metal
50 or material which are arranged in the end packing-grooves and are of corresponding cross-section.

g represents clamping bolts or screws which adjustably connect the central section with
55 the end sections of the piston. Upon tightening the clamping-screws the wedge action

of the coöperating beveled faces on the piston-sections causes the packing-rings *f* to be spread and bear snugly against the bore of the cylinder to prevent leakage past the piston. 60
As the packing-rings become worn the same can be taken up by further tightening the clamping-bolts.

For the purpose of further guarding against leakage past the piston the central section 65 thereof is provided with a peripheral groove *h*, in which are placed a plurality of packing-rings *h'*, preferably of fibrous material. This construction of piston produces a tight joint between the same and the cylinder which ef- 70 fectually prevents leakage and also enables any wear to be easily taken up.

The piston is moved alternately in opposite directions by a pressure medium, and during this movement an impregnating fluid is ex- 75 pelled from the cylinder into the article to be preserved. The pressure for thus moving the piston may be derived from water under pressure, compressed air, or steam, which is preferably supplied by a main pressure pipe 80 or conduit I, having branch pipes *i i'*.

i² i³ represent terminal pipes or conduits, which are connected with opposite ends of the cylinder at the top thereof. The branch pipes and terminal pipes are connected by 85 valves J J', preferably of the type having a rotary plug. The casing of each valve is provided with ports *j j' j²*, which open into the branch pipe, the terminal pipe, and the atmosphere, respectively. The plug of each 90 valve J J' is provided with a port *j³*, which is so constructed and arranged that upon rotating the plug the port can connect its terminal pipe either with the respective branch pressure-pipe or with the atmosphere, or com- 95 munication between any two of the ports in its valve-casing may be interrupted altogether. The plug of each valve is turned by an arm *k*, applied to the outer end thereof, and the plugs of both valves are operated simultane- 100 ously by connecting their arms by a horizontal bar L.

The impregnating or preserving fluid may be introduced into the cylinder in various ways, but preferably by means of a funnel M, 105 having an outlet-pipe *m*, which connects with the upper central part of the working cylinder and contains a valve *m'*. The pipe *m* preferably screws into a socket or chamber *n* in the outer part of the cylinder, the bottom 110 of which contains a plurality of smaller openings or perforations *n'*, leading to the bore of

the cylinder. The chamber n and perforations n' together form the inlet-conduit for the impregnating fluid. By this means a very large single inlet for the impregnating fluid is avoided, thereby preventing the packing-rings of the piston from catching in the same while reciprocating in the cylinder.

O represents the hollow needle or nozzle, which is adapted to be stuck into the meat or other material to be preserved for injecting the preserving or impregnating fluid into the same. This needle is provided with a hand-valve o' for controlling the discharge of the fluid. The impregnating fluid is supplied to the needle by a main delivery conduit, tube, or hose P, which is connected at one end with the needle, while its opposite end is connected with branch pipes $p p'$. The branch pipes $p p'$ are rigid; but the main pipe P is flexible for convenience in manipulating the needle.

$p^2 p^3$ represent terminal discharge or delivery pipes connecting with opposite ends of the cylinder at the bottom thereof, and $p^4 p^5$ are waste-pipes arranged adjacent to the branch and terminal pipes $p p' p^2 p^3$.

Q Q' represent two valves which control the discharge of fluid from opposite ends of the cylinder. Each of these valves has its casing provided with ports $q q' q^2$, which connect with the lower terminal pipe, branch pipe, and waste-pipe at one end of the cylinder. The rotary plug of each lower valve is provided with a port q^3 , which upon turning the plug can connect its lower terminal pipe with the respective branch delivery-pipe or with the waste, or communication between any of the ports of the valve-casing may be shut off. These valve-plugs are operated simultaneously by connecting the rock-arms r at the outer ends thereof by means of a bar or rod R. The upper and lower valves are operated simultaneously by means of an upright rocking hand-lever S, pivoted on the cylinder and having its upper and lower arms connected, respectively, by links $s s'$ with the upper and lower valve-bars L R.

In the position of the parts shown in Fig. 1 the piston is in the right end of the cylinder, and the valves J J' Q Q' are so shifted that the right end of the cylinder is connected with the main pressure-supply and the left end of the same is connected with the needle. Assuming that a charge of impregnating fluid has been previously introduced into the cylinder, the piston moving from right to left under the action of the pressure medium will expel the impregnating fluid from the left end of the cylinder and cause the same to pass successively through the pipe p^2 , ports $q q^3 q'$ of the valve Q, pipe p , and hose P to the needle O. While the valves are in this position the hand-lever S is at one extreme of its movement. When the piston reaches the left end of the cylinder and has discharged all the impregnating fluid therefrom, the hand-

lever is moved one step of its stroke toward the opposite extreme, as indicated by the arrow. By this movement of the lever the plug of valve Q closes the port q' of its casing, the plug of valve Q' connects the ports $q q^2$ of its casing, and the plug of valve J' connects the ports $j' j^2$ of its casing. When the valves are in this position, communication between the left end of the cylinder and the needle is cut off, the water or other pressure medium is permitted to escape from the right end of the cylinder through the waste-pipe p^5 , and at the same time air is admitted into the top of the cylinder through the port j^2 of the valve J', thus venting the cylinder and preventing the formation of a vacuum, which would interfere with the free discharge of the pressure medium. After the right end of the cylinder has been emptied of the pressure medium the hand-lever is moved another step of its stroke in the direction of the arrow, whereby the plug of valve Q' is so turned as to cut off connection between the right end of the cylinder and the waste p^5 ; but the plug of the valve J' still connects this end of the cylinder with the atmosphere, this position of the last-mentioned valve being indicated in Fig. 3. The funnel-valve m' is now opened and impregnating fluid is supplied through the same until the cylinder is entirely filled. While the cylinder is being thus charged with impregnating fluid the air in the cylinder is permitted to escape from the same through the vent-port j^2 of the valve J', which is open at this time. After the cylinder has been thus filled with a charge of impregnating fluid the hand-lever is moved another step to the end of its stroke in the direction of the arrow, whereby the plugs of the valves J J' are turned so as to close the air-vent at the right end of the cylinder and place the left end thereof in connection with the pressure-supply. Although the plugs of valves Q Q' also partake of this last-mentioned movement of the hand-lever, the same does not change the effect of these valves from their previous position. The piston is now propelled from left to right, causing the charge of impregnating fluid in front of the same to be delivered to the needle through the ports $q q'$ of valve Q'. At the end of the piston movement in this direction the hand-lever is moved one step toward the position shown in Fig. 1, whereby the valves are shifted reversely to that before described and cut off the left end of the cylinder from the pressure-supply, but place the same in communication with the waste and the vent at the left end of the cylinder, thus permitting the spent pressure medium to escape. Upon now moving the hand-lever another step in the same direction the waste connection with the left end of the cylinder is closed; but the left vent still remains open, permitting a charge of impregnating fluid to be placed through the funnel into the cylinder. The

movement of the hand-lever in this direction is now completed, causing the right end of the cylinder to be connected with the live pressure medium, while the left end of the cylinder is connected with the needle and the vent at the last-mentioned end of the cylinder is closed, as indicated in Fig. 1. This operation is continued in the manner described, the same being repeated for each reciprocation of the piston. It is of course understood that the funnel-valve m' is closed after each operation of filling the cylinder with a charge of impregnating fluid.

For the purpose of enabling the operator to readily shift the hand-lever accurately at each step, so that the valves assume their proper relative position, a segment T is arranged on the cylinder adjacent to the lever, and the latter is provided with a spring catch or indicator t , which engages with one or another of a series of notches u in the segment, said notches corresponding to the different required positions of the lever and valves and serving as a scale for the guidance of the attendant.

For the purpose of causing the pressure medium to be distributed more uniformly over the piston the terminal pipes $i^2 i^3$ are provided with extensions i^4 , which open in the lower end of the cylinder at opposite ends, as shown in Fig. 1. By this means the pressure medium acts against the piston on opposite sides of the same, thereby preventing tilting or binding of the same and also exposing a larger part of its area to the pressure medium at the beginning of its movement from either end of the cylinder.

My improved impregnating apparatus is simple in construction, easily operated, not liable to get out of order, and has a large capacity, due to the fact that the same can be operated with no interruption except that required to charge the cylinder with impregnating fluid.

I claim as my invention—

1. An impregnating apparatus comprising a cylinder, an impregnating-fluid-supply pipe connected only with the central part of said cylinder, a valve arranged in said impregnating-fluid-supply pipe, pressure-medium-supply pipes connected with opposite ends of the cylinder, air-conduits connected with opposite ends of the cylinder, valves arranged in said pressure-medium-supply pipes and said air-conduits, pressure-medium waste-pipes connected with opposite ends of the cylinder, impregnating-fluid-discharge pipes connected with opposite ends of said cylinder and valves arranged in said impregnating-fluid-discharge pipes and said pressure-medium waste-pipes, substantially as set forth.

2. An impregnating apparatus comprising a cylinder, an impregnating-fluid-supply pipe connected only with the central part of said cylinder, a valve arranged in said impregnating-fluid-supply pipe, pressure-medium-supply pipes connected with opposite ends of the cylinder, air-conduits connected with opposite ends of the cylinder, valves arranged in said pressure-medium-supply pipes and said air-conduits, pressure-medium waste-pipes connected with opposite ends of the cylinder, impregnating-fluid-discharge pipes connected with opposite ends of said cylinder, valves arranged in said impregnating-fluid-discharge pipes and said pressure-medium waste-pipes, the impregnating-fluid-discharge pipes and the air-conduits, substantially as set forth.

3. An impregnating apparatus comprising a cylinder, a piston arranged in the cylinder, means for connecting opposite ends of the cylinder alternately with an impregnating-fluid-supply pipe and a pressure-medium-supply pipe, means for delivering said impregnating fluid and pressure medium alternately from opposite ends of said cylinder, a delivery-needle connected with said cylinder to receive the impregnating fluid therefrom, and a valve mechanism constructed and operating to connect the ends of said cylinder alternately with said pressure-supply pipe and with the atmosphere, substantially as set forth.

4. An impregnating apparatus comprising a cylinder, a piston arranged in the cylinder, means for supplying the cylinder alternately with a pressure medium and an impregnating medium, a delivery-conduit and a waste-conduit for the cylinder, a valve constructed and operating to connect the cylinder either with said delivery-conduit or said waste-conduit, and a delivery-needle connected with said delivery-conduit, substantially as set forth.

5. An impregnating apparatus comprising a cylinder, a piston arranged in the cylinder, means for supplying an impregnating fluid to the cylinder, pressure-conduits for opposite ends of the cylinder, valves for connecting each end of the cylinder respectively with its pressure-conduit or with the atmosphere, delivery-conduits and waste-conduits for opposite ends of the cylinder, valves for connecting each end of the cylinder respectively with its delivery-conduit or its waste-conduit and a needle connected with said delivery-conduits, substantially as set forth.

6. An impregnating apparatus comprising a cylinder, a piston arranged in the cylinder, means for supplying an impregnating fluid to the cylinder, pressure-conduits for opposite ends of the cylinder, valves for connecting each end of the cylinder respectively with its pressure-conduit or with the atmosphere, delivery-conduits and waste-conduits for opposite ends of the cylinder, valves for connecting each end of the cylinder respectively with its delivery-conduit or its waste-conduit, means for operating said valves in unison and

a delivery-needle connected with said delivery-conduits, substantially as set forth.

7. An impregnating apparatus comprising a horizontal cylinder, a piston arranged in said cylinder, means connected with the central part of the cylinder for filling the same with an impregnating fluid; upper terminal conduits connected with opposite ends of the cylinder at the top thereof, upper valves for connecting each of said upper terminal conduits either with a pressure-supply or with the atmosphere, an upper bar connecting the movable members of said upper valves, lower terminal conduits connected with opposite ends of the cylinder at the bottom thereof,

lower valves for connecting each lower terminal conduit with a delivery-conduit or with a waste-conduit, a lower bar connecting the movable members of said lower valves, a hand-lever connected on opposite sides of its pivot with said bars and a delivery-needle connected with said delivery-conduits, substantially as set forth.

Witness my hand this 18th day of February, 1905.

WILHELM SCHRAMM.

Witnesses:

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