

No. 662,104.

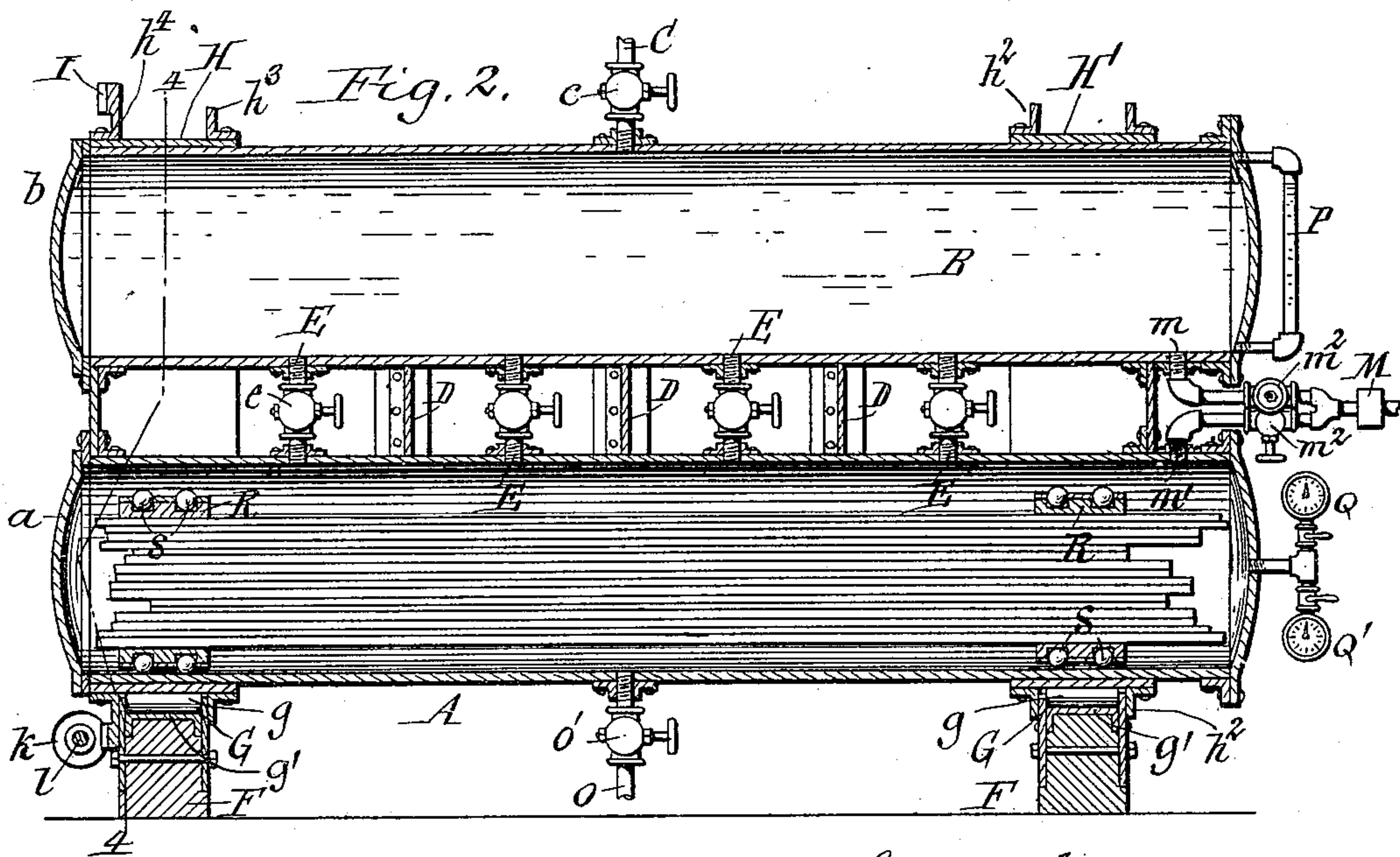
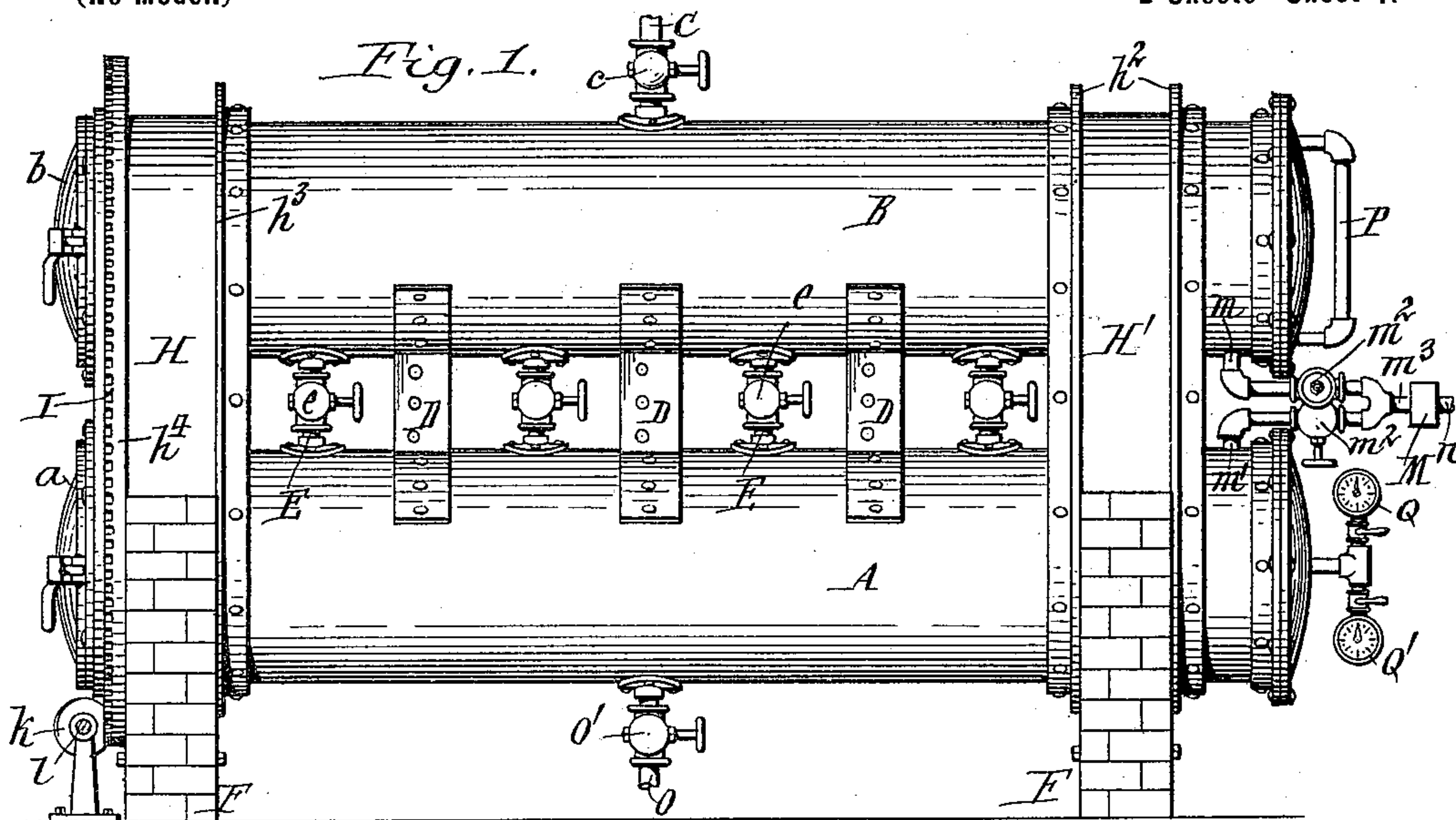
Patented Nov. 20, 1900.

L. M. STERN & E. M. KEMPNER.
APPARATUS FOR IMPREGNATING WOOD.

(Application filed Aug. 11, 1900.)

(No Model.)

2 Sheets—Sheet 1.



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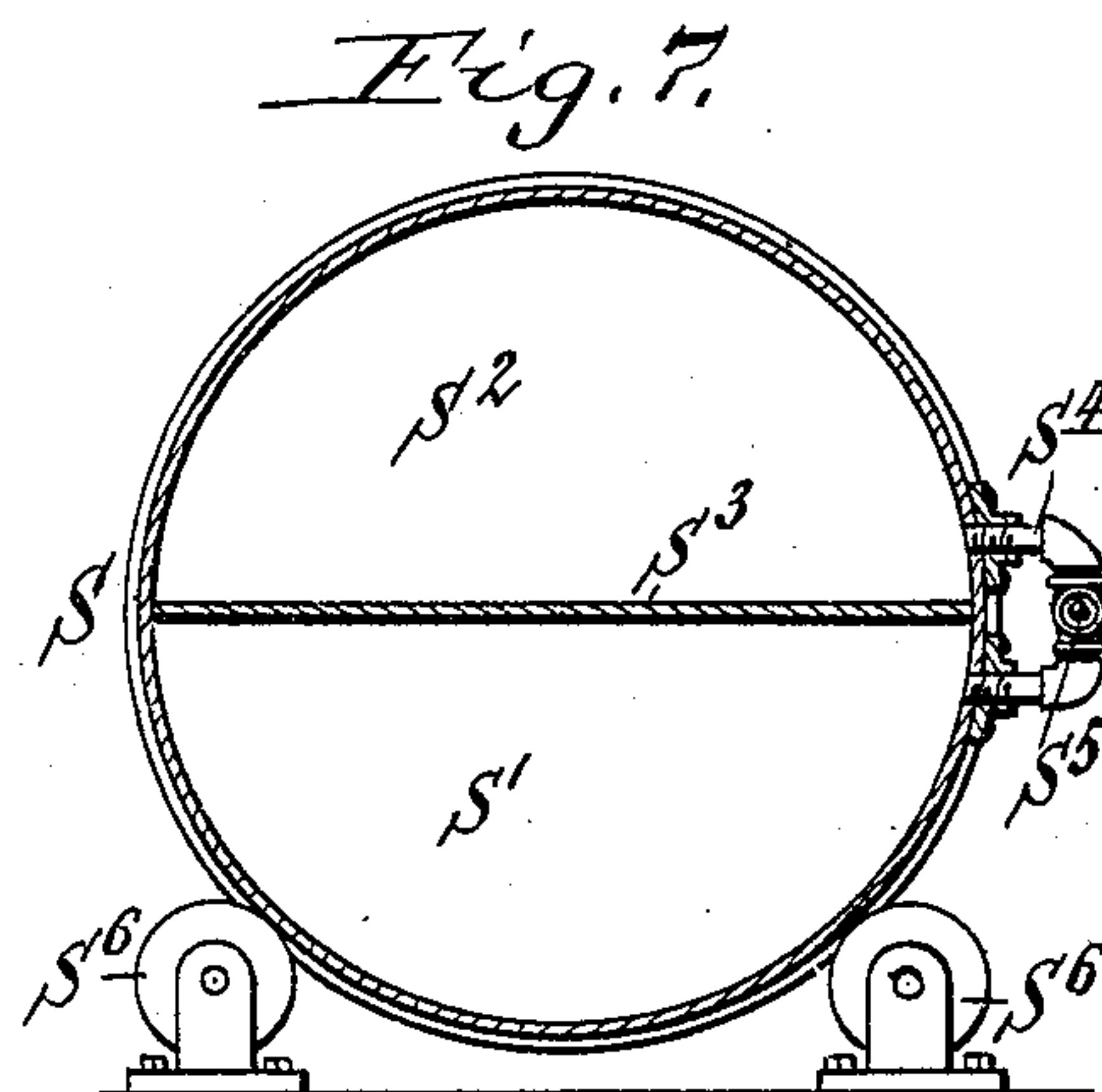
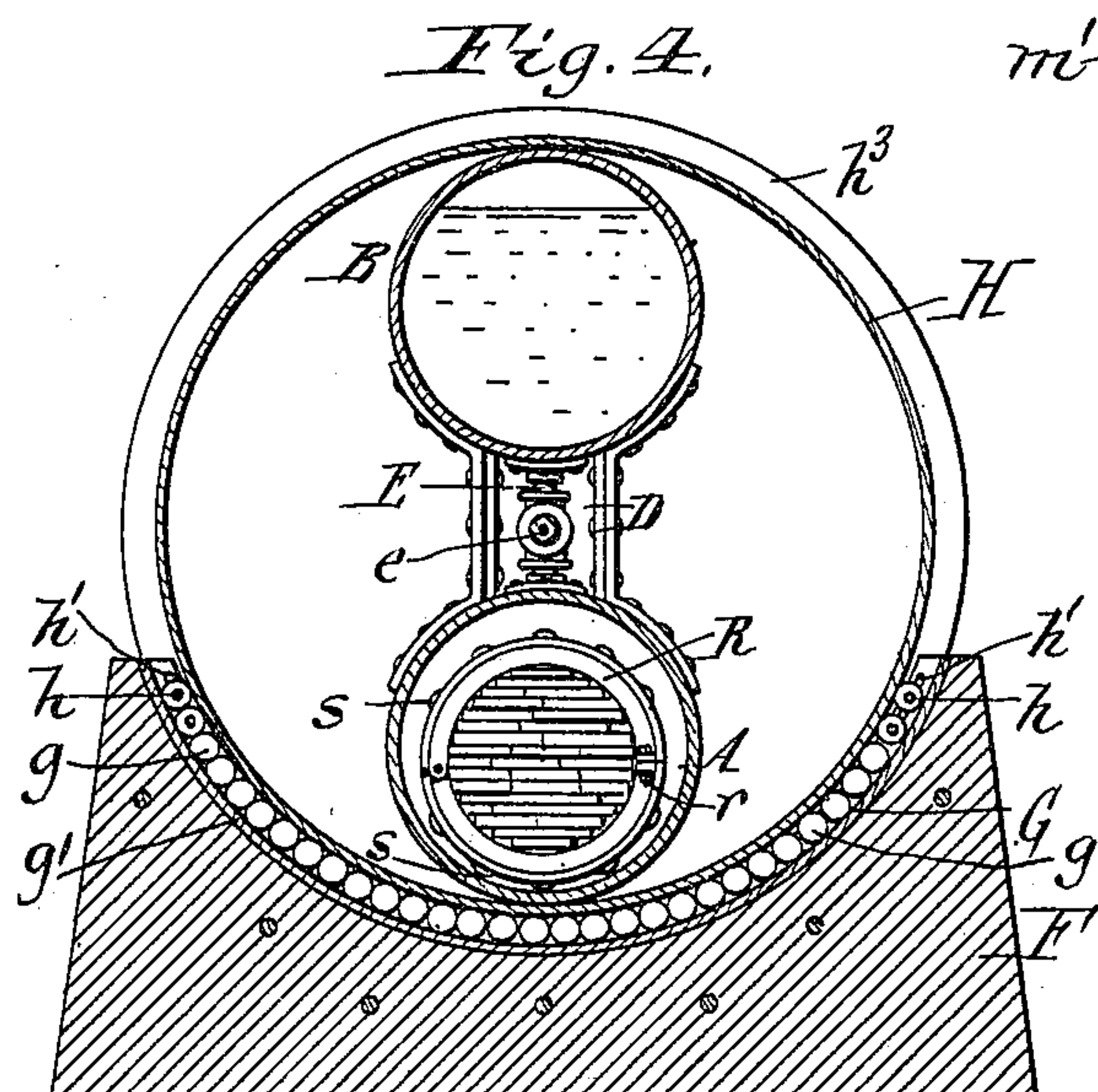
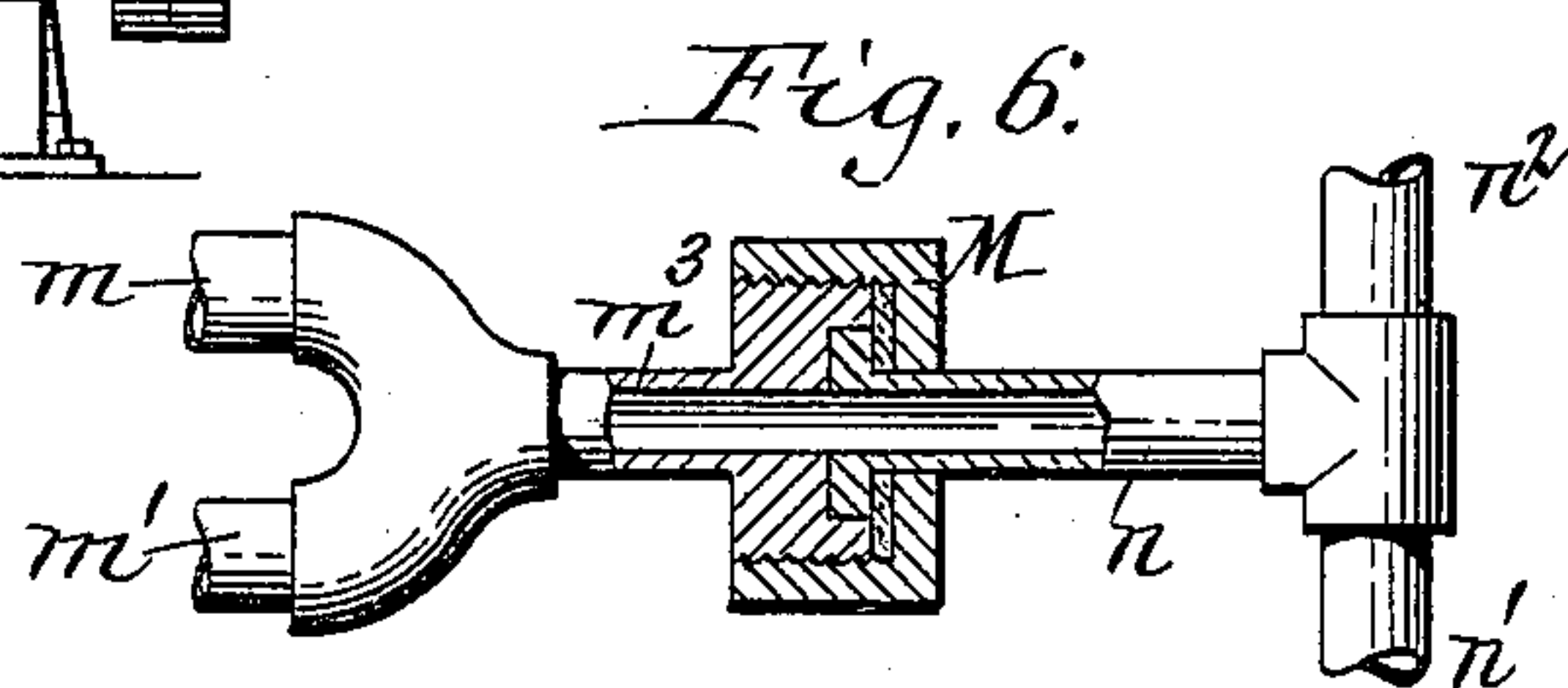
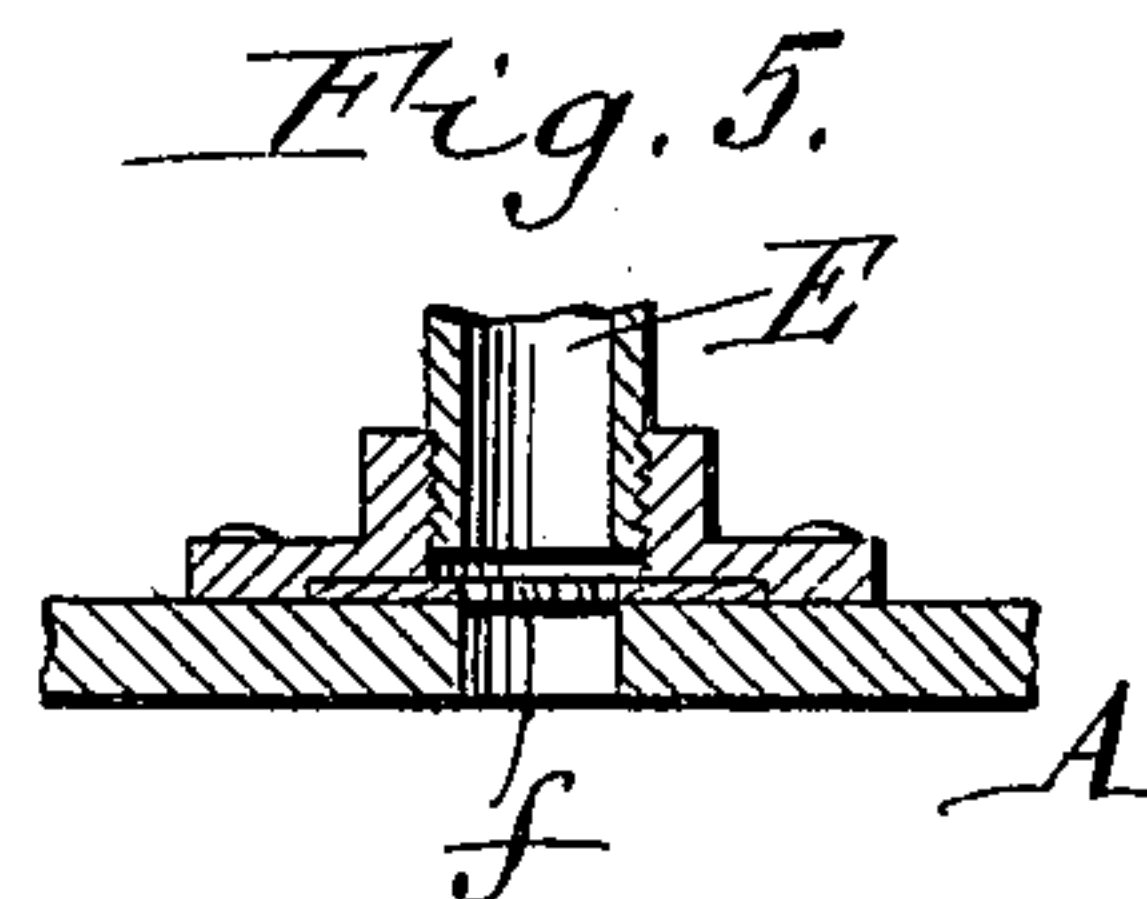
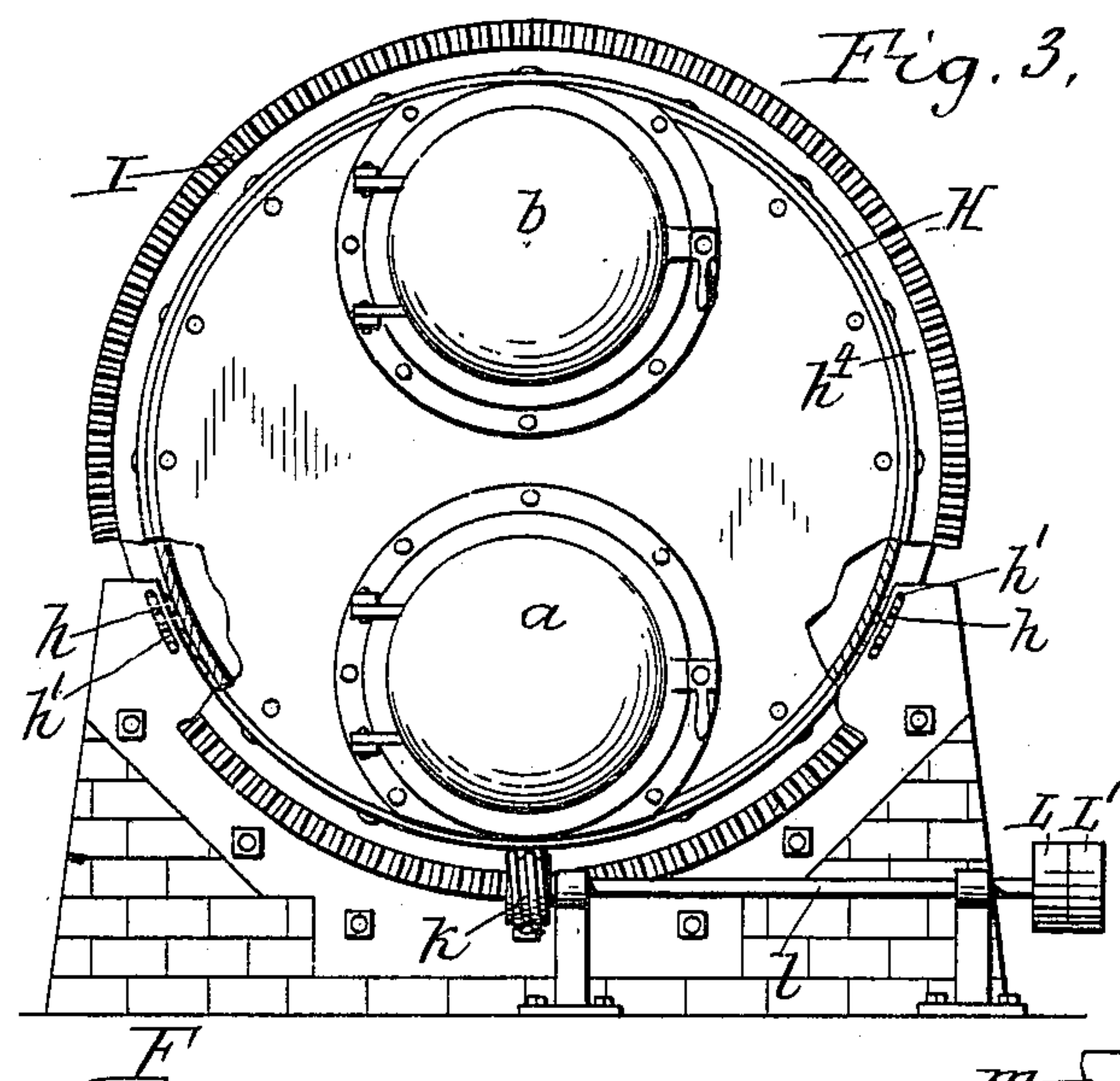
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2 Sheets—Sheet 2.



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UNITED STATES PATENT OFFICE.

LIONEL M. STERN AND EDWARD M. KEMPNER, OF BUFFALO, NEW YORK.

APPARATUS FOR IMPREGNATING WOOD.

SPECIFICATION forming part of Letters Patent No. 662,104, dated November 20, 1900.

Application filed August 11, 1900. Serial No. 26,614. (No model.)

To all whom it may concern:

Be it known that we, LIONEL M. STERN and EDWARD M. KEMPNER, citizens of the United States, and residents of Buffalo, in the county of Erie and State of New York, have invented new and useful Improvements in Apparatus for Impregnating Wood or other Substances, of which the following is a specification.

This invention relates to an apparatus for treating or impregnating wood or other substances with a liquid for the purpose of rendering the wood or other substance fireproof or waterproof, or for dyeing the wood or other substance, or for any other desired purpose.

The apparatus to which this invention relates contains two chambers, tanks, or compartments, one being the treating tank or chamber into which the wood or other substance is placed for treatment and the other the storage tank or chamber which contains the liquid with which the wood or other substance is impregnated or treated, the two chambers being so connected and mounted that they can be rotated together and either can be placed above the other, so that when the storage-tank is above the treating-tank the liquid will flow from the storage-tank to the treating-tank, while when the arrangement is reversed and the treating-tank is above the storage-tank the surplus liquid will flow from the treating-tank to the storage-tank.

The object of our invention is to produce an apparatus of this kind in which the communication between the two chambers or tanks can be established or interrupted at will, so that the treating-chamber can be exhausted without exhausting the storage-chamber, and the apparatus is rendered more satisfactory and effective in its operation.

In the accompanying drawings, consisting of two sheets, Figure 1 is a longitudinal elevation of our improved impregnating apparatus, showing the storage-chamber above the treating-chamber. Fig. 2 is a longitudinal vertical section showing the parts in the same position. Fig. 3 is a front elevation of the apparatus, partly in section. Fig. 4 is a vertical cross-section on line 4-4, Fig. 2. Fig. 5 is a detached sectional view, on an enlarged scale, of the end of one of the pipes which connect the two chambers. Fig. 6 is a de-

tached sectional view, on an enlarged scale, of the trunnion-coupling by which the stationary portion of the exhaust and pressure pipe is connected with that portion of the pipe which is secured to and rotatable with the apparatus. Fig. 7 is a vertical cross-section showing a modified construction of the apparatus.

Like letters of reference refer to like parts in the several figures.

A represents the treating-chamber, and B the storage-chamber, each of which is represented in Figs. 1 to 4 as being formed by a horizontal cylindrical tank. In the normal position of these chambers, which is shown in Figs. 1 to 4, the storage-chamber B is arranged above the treating-chamber A. The treating-chamber A is provided at its front end with a movable head or door *a* for the introduction and removal of the wood or other substance to be treated. The storage-chamber B is provided at its front end with a similar movable head or door *b*, through which access can be had to the storage-tank for cleaning or repairing. The storage-chamber B is provided at its top with an inlet-pipe C, provided with a hand-valve *c*. When the storage-chamber is required to be supplied with liquid, the pipe C is connected with a pipe (not shown) through which the liquid is supplied from a reservoir. The two chambers or tanks are arranged at a short distance from each other and are rigidly secured together by upright braces D, which may be formed of plates riveted to the tanks, as shown, or in any other suitable manner. The two chambers or tanks are placed in communication by flow-pipes E, provided with hand-valves *e*. These flow pipes or passages are made of such size and number that they will permit the liquid to pass rapidly from one chamber or tank to the other. In order to prevent the valves in these pipes from becoming clogged by chips of the treated material, the ends of these pipes adjacent to the treating-chamber are protected by strainers *f*, as indicated in Fig. 5. The two tanks or chambers are so supported or mounted that they can be rotated together about a horizontal longitudinal axis, whereby the relative position of the tanks can be changed in such manner so that either can be placed up-

permost for the time being. Any suitable support which permits of this rotary movement of the two tanks or chambers can be employed. The devices for this purpose, which are shown in the drawings, are constructed as follows:

F represents two transverse supporting piers or walls, which are arranged near the ends of the tanks and formed of masonry or in any other suitable way. G is a semicircular roller-bearing which is secured to the top of each of these walls.

H H' represent supporting-rings which encircle both chambers or tanks above these roller-bearings and are firmly secured to the lower portion of the treating-tank and the upper portion of the storage-tank. The rollers g of each bearing G rest in a semicircular channel g' , which is secured to the supporting-pier F, and the rollers at the ends of the channel are preferably provided with journals h , which project into elongated openings h' in the sides of the channel, Fig. 3, whereby the rollers are confined in the channel and at the same time allowed sufficient play to prevent binding. The rear ring H' is provided on opposite sides with flanges h^2 , which are arranged outside of the roller-channel g' and hold the tanks against longitudinal movement. The front ring H is provided on its rear side with a similar flange h^3 and on its front side with a flange h^4 , which carries a gear-rim I. The latter is in mesh with a worm k , which is mounted on a horizontal shaft l , having tight and loose pulleys L L' for driving the shaft and rotating the tanks. Any other suitable means for turning the tanks may, however, be employed.

m represents a pressure-pipe which is connected with the lower portion of the storage-tank, and m' an exhaust-pipe which is connected with the upper portion of the treating-tank. Each of these pipes is provided with a hand-valve m^2 and the two pipes are united to a trunnion m^3 , which is arranged in line with the axis about which the tanks can be rotated. This trunnion is connected by a stuffing-box or packed joint M with a stationary pipe n , which has two branches n' n^2 , one leading to an exhaust-pump and the other to a pressure-pump.

When the apparatus is used for treating material by the vacuum process, the pressure-pipe m is closed and the exhaust-pipe m' is opened and connected with the exhaust-pump, whereby the treating-tank is exhausted. When the apparatus is used for treating material by the pressure process, the exhaust-pipe m' is closed and the pressure-pipe m is opened and connected with the pressure-pump, whereby the pressure is applied to the surface of the liquid in the storage-tank.

O represents a drain-pipe provided with a hand-valve O' and connected with the bottom of the treating-tank. The valves c and O' can also be used for admitting air to the

chambers when necessary to relieve a partial vacuum in the same.

P represents a glass gage arranged in the rear head of the storage-tank B, so that the level of the liquid in the same can be observed.

Q represents a vacuum-gage, and Q' a pressure-gage, arranged in the rear head of the treating-tank.

R, Figs. 2 and 4, represents tying-rings which are employed for tying lumber or similar long material in such a way that the material can be conveniently introduced into and removed from the treating-tank. Each of these rings is divided diametrically into two parts which are connected by bolts r or other detachable fastenings, permitting the rings to be applied around a quantity of lumber or other material. These rings form projecting bearing-surfaces around the bundle of lumber or other material, and in order to reduce the friction their peripheral faces are provided with projecting antifriction-balls s , which are seated in sockets in the rings. These balls enable the bundled or tied charge of lumber or other material to be readily pushed into the treating-tank or to be withdrawn therefrom.

For charging the treating-tank the two tanks are placed in the position represented in Figs. 1 to 4, in which the storage-tank is above the treating-tank. The valves in the connecting-pipes are closed, the head or door at the front end of the treating-tank is opened, and the lumber or other material to be treated is introduced into the treating-tank. The latter is now closed, and the valves in the connecting-pipes are opened, thereby causing the liquid to flow from the storage-tank into the treating-tank and fill the same. When the treatment is finished, the tanks are rotated, so as to bring the treating-tank above the storage-tank, whereby the surplus liquid is caused to flow back into the storage-tank. When the treating-tank has been so freed from liquid, it is opened and the treated lumber or other material is removed either in the elevated position of the treating-tank, or if it is more convenient to discharge the lumber or other material from the treating-tank in the lowermost position of the latter the valves in the flow-pipes are closed when the liquid has been drained from the treating-tank and the latter is returned to its lowermost position.

In the modified construction of the apparatus represented in Fig. 7 a cylindrical tank S is divided into two compartments S' S² by a diametrical partition S³. The two compartments are connected by one or more flow-pipes S⁴, each having a hand-valve S⁵. The tank is rotatably mounted by resting upon rollers S⁶ or in any other suitable manner.

We claim as our invention—

1. The combination of a horizontal impregnating-chamber having a releasable head for

the introduction and removal of the material to be treated, a horizontal storage-chamber for the impregnating liquid arranged normally above said impregnating - chamber, means whereby said chambers are secured together, a support on which said chambers are rotatably mounted, whereby the impregnating-chamber can be brought above the storage-chamber, a flow-pipe connecting said chambers, and an adjustable valve arranged in said pipe, substantially as set forth.

2. The combination of a horizontal impregnating-chamber having a releasable head for the introduction and removal of the material to be treated, a horizontal storage-chamber for the impregnating liquid arranged normally above said impregnating - chamber, means whereby said chambers are secured together, a support on which said chambers are rotatably mounted and which has its axis arranged lengthwise of said chambers, a flow-pipe connecting said chambers, and an adjustable valve arranged in said pipe, substantially as set forth.

3. The combination of a horizontal impregnating-chamber, a horizontal storage-chamber for the impregnating liquid arranged nor-

mally above said impregnating - chamber, means whereby said chambers are secured together, a flow-pipe connecting said chambers, a hand-valve arranged in said pipe, vertical rings arranged transversely to the longitudinal dimension of said chambers and encircling the same, and bearings on which said rings are rotatably supported, substantially as set forth.

4. The combination with a storage-chamber for the treating liquid and a treating-chamber for the substance to be treated, which chambers are secured together and connected by a flow-pipe provided with a hand-valve, of a support on which said chambers are rotatably mounted, a trunnion, and valve-controlled branch pipes, one leading from said trunnion to said storage-chamber and the other to said treating-chamber, substantially as set forth.

Witness our hands this 6th day of August, 1900.

LIONEL M. STERN.

EDWARD M. KEMPNER.

Witnesses:

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