(No Model.) 2 Sheets—Sheet 1.

L. TOBEY.

METHOD OF AND APPARATUS FOR MAKING FIBROUS VESSELS SUCH AS PAILS, TUBS, &c.

No. 368,794. Patented Aug. 23, 1887.

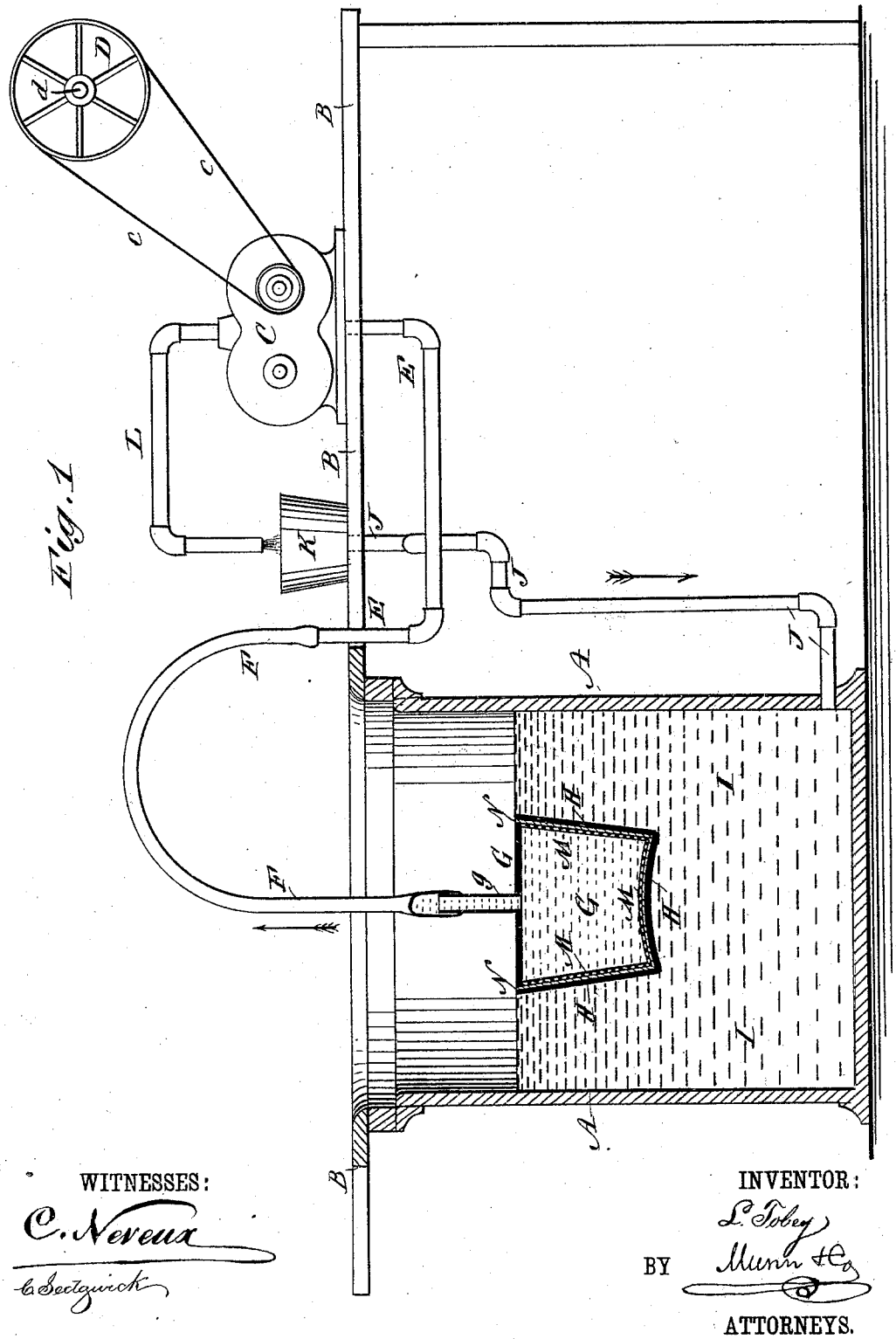


Fig. 1.

WITNESSES:

C. Neveux

E. Sedgwick

INVENTOR:

L. Tobey

BY Munn & Co

ATTORNEYS.

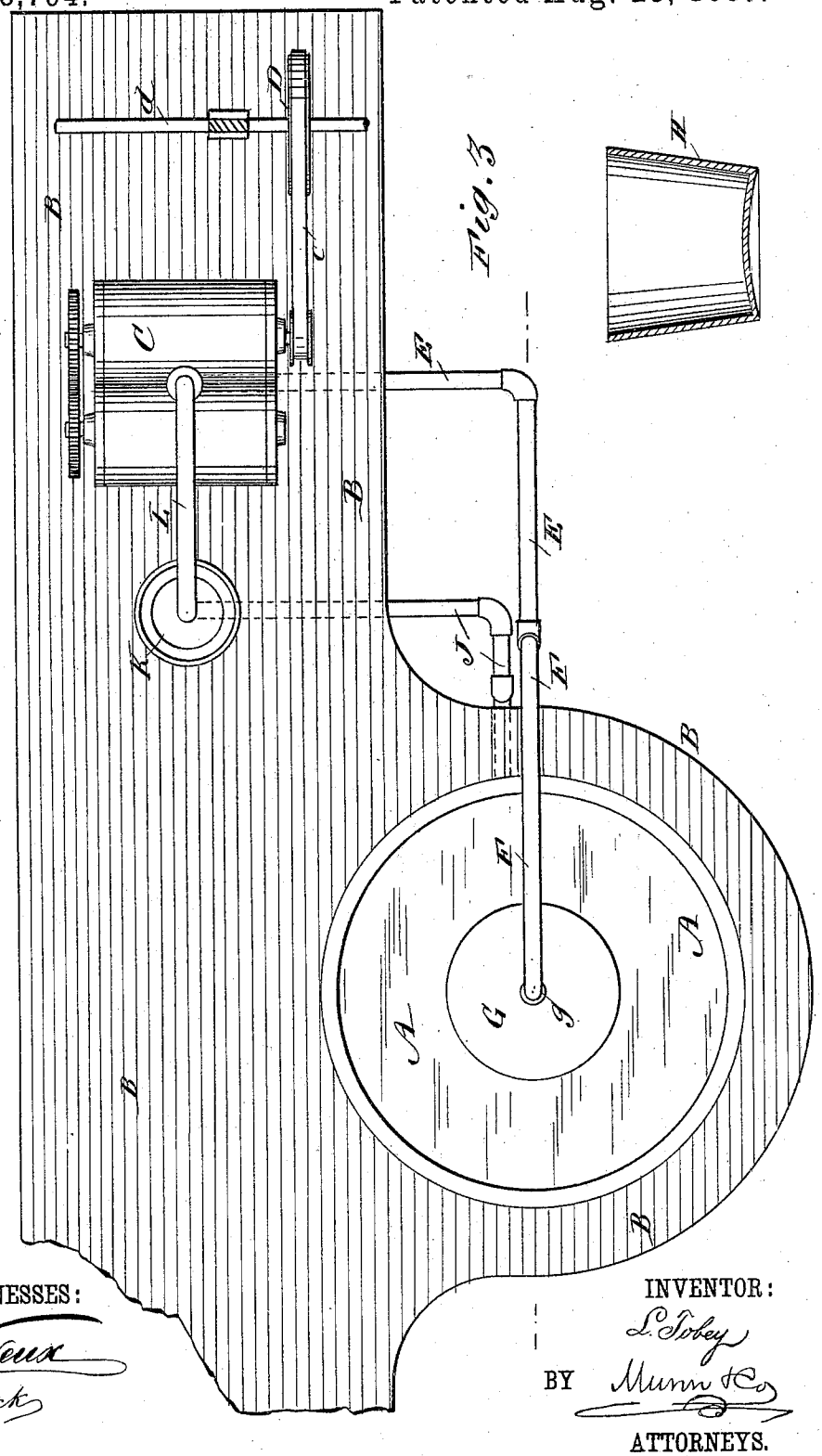
N. PETERS, Photo-Lithographer, Washington, D. C.

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UNITED STATES PATENT OFFICE.

LEROY TOBEY, OF PENN YAN, NEW YORK.

METHOD OF AND APPARATUS FOR MAKING FIBROUS VESSELS, SUCH AS PAILS, TUBS, &c.

SPECIFICATION forming part of Letters Patent No. 368,794, dated August 23, 1887.

Application filed December 7, 1886. Serial No. 220,966. (No model.)

To all whom it may concern:

Be it known that I, LEROY TOBEY, of Penn Yan, in the county of Yates and State of New York, have invented a new and Improved Method of and Apparatus for Making Fibrous Vessels, such as Pails, Tubs, &c., of which the following is a full, clear, and exact description.

My invention relates to the manufacture of vessels—such as pails, tubs, boats, &c.—from fibrous material—such as paper or rag pulp; and the object of the invention is to provide for the production of vessels of this class in a superior and inexpensive manner.

The invention will first be particularly described, and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a vertical sectional elevation of an apparatus embodying my invention and illustrating the process involved in the manufacture of a pail of ordinary form. Fig. 2 is a plan view thereof with the operator's table partly broken away, and Fig. 3 is a vertical sectional elevation of a pail-body made in accordance with my invention.

I will first describe the apparatus and then the manner of using it in accordance with my method or system of manufacturing fibrous ware, and, as a convenient illustration, I will explain in detail the manufacture of a pail from woody fibers or pulp; but it will be understood that many other forms of vessels may be produced—such as tubs, boats, and other articles—and any suitable fibrous material may be used in the manufacture of the goods—such as rag pulp or other substance.

A vat or tub, A, of suitable form and size to accommodate within it the pail or other article to be produced, is arranged, preferably, beneath an operator's table or frame, B, on which is set up a pump, C, which may have any preferred form and size, and may be driven by a belt, *c*, from a pulley, D, on a shaft, *d*, to be driven by any convenient motor.

To the suction-opening of the pump a pipe, E, is connected, and this pipe is connected at its outer end with a flexible pipe, F, which in turn is connected with the interior of a hollow form, G, which has an exterior shape or contour corresponding with the desired shape of the article to be produced—in the instance shown with the interior of the finished body H of a pail. I show the connection of the pipe F with the form G by the entrance of a tubular neck, *g*, on the form into the mouth of the pipe; but any other practicable attachment of these parts F G may be made as may be preferred or necessary. The flexible pipe F allows the form G to be placed or immersed in and lifted from a liquid, I, preferably water, in the vat A, and into which the fibrous material will be placed or fed in proper quantity from time to time during the manufacture of the pail or vessel.

A pipe, J, communicating with the interior of the vat A, at or near the bottom of the vat, extends to a funnel or receiver, K, into which the water or liquid I, after passing through the pump C, is discharged through a pipe, L, connected with the discharge-orifice of the pump. If desired, the pipes L G may be connected as one continuous pipe leading from the pump-discharge directly to the bottom of the vat, and the receiver K then would be dispensed with; but the construction shown is at present preferred in practice.

The entire body of the pail form G (its top alone excepted) is provided with a series of perforations, M, indicated by the white dots or marks in Fig. 1 of the drawings, and over the perforated portion of the form there is placed a closely-fitting covering or jacket, N, which may be made of felt, flannel, or any other suitable material, through which the water or liquid I may be drawn by the action of the pump C, and which will at the same time hold back the paper or other pulp fed into the liquid. This jacket N is shown in section between the perforated form G and the pail-body H in Fig. 1 of the drawings.

Any preferred agitating devices may be used to evenly distribute or hold in suspension the fibrous material fed into the vat A, and the fibrous material may be fed to the vat in any suitable manner.

The operation is as follows: After the jacket N is drawn over the perforated portion of the form G and the fibrous material has been supplied to the liquid I in the vat A, the pump C will be started and the jacketed form G N will be lowered into the pulp-charged liquid, and the suction induced by the pump will cause a deposit of the fibers onto the jacket N, through which the liquid will be drawn to the interior of the form, and thence out through the pipes F E to the pump, and thence, through the pipes L J, the liquid will be returned to the

vat A. It is obvious that the thickness of the body H of the pail formed on the jacket N will depend on the length of time the jacketed form is immersed in the vat-liquid while the pump is in operation; hence a body, H, for a pail or other vessel having any desired thickness may be produced by "timing" the immersion of the jacketed form, and the pail or vessel body will have practically a uniform thickness. When the pulp has accumulated on the form G N to the desired thickness, the form with the pail-body on it will be lifted from the liquid I, and the action of the pump C will be continued to first draw the water or liquid entirely from the form, and then draw atmospheric air through the pail-body, the jacket, and the form G until the pulp or fibrous body H is quite dry, whereupon the pail-body, with the jacket N inside of it, will together be shaken from the form G, leaving it in condition to receive another jacket, or the same jacket, N, after it shall have been stripped or removed from the interior of the nearly dry and quite hard form H; and the operation of producing the next pail may be carried on by again immersing the jacketed form, as above described. After the pail-body H or other vessel is quite dry it will be soaked in a hardening compound, and then will be pressed and finished with handles and ornamentation by paints or lacquer or otherwise to fit it for market.

I find in practice that pails or other articles produced by the herein-described apparatus and method are seamless and water-proof, and are almost as strong as wood, and can be made as light as tinware, and are more durable than either wooden or tin ware, and are very cheaply manufactured.

The return of the liquid I to the vat A by the pump through the pipes L J serves not only to prevent waste of the liquid, but also agitates the contents of the vat to facilitate a practically uniform distribution of the pulp onto the jacketed form, and the agitation so produced may suffice at times without the use of mechanical agitators; but the latter will be serviceable in making articles of various forms.

Should the fibrous material be of a nature not allowing it to be drawn through a fine sieve-cloth, and should the size of the vessel to be produced admit of it, the form may consist of wire-cloth of fine mesh, which may be sufficiently strong to withstand the suction of the pump without collapsing, and the jacket N then may be dispensed with and the pulp or fibrous material would be drawn directly onto the wire-cloth, as will readily be understood.

Having thus fully described my invention, I claim as new and desire to secure by Letters Patent—

1. The herein-described method of producing fibrous vessels, which consists in drawing fibrous material held in suspension in a liquid onto a perforated form immersed for a time in the liquid, then lifting the form and fibrous material deposited thereon from the liquid and continuing the suction through the fiber-coated form to withdraw the liquid from the form, and subsequently draw air through the deposited fibers to dry the vessel produced on the form, substantially as herein set forth.

2. The herein-described method of producing fibrous vessels, which consists in drawing fibrous material held in suspension in a liquid onto a perforated form immersed for a time in the liquid, then lifting the form and fibrous material deposited thereon from the liquid and continuing the suction through the fiber-coated form to withdraw the liquid from the form, and subsequently draw air through the deposited fibers to dry the vessel produced on the form, then removing the shaped and dried vessel from the form and removing the form-jacket therefrom, when said jacket is used, and then treating the vessel to a hardening solution, and finally pressing the vessel to a finish, substantially as herein set forth.

3. In an apparatus for the manufacture of fibrous vessels, the following elements in combination: a tank, as A, to receive liquid holding fibrous substances in suspension, a pump, as C, a pipe, as E F, leading from the suction-opening of the pump, and a perforated form, as G, connected to the suction-pipe and adapted for immersion in the vat-liquid, substantially as described, for the purposes set forth.

4. In an apparatus for the manufacture of fibrous vessels, the following elements in combination: a tank, as A, to contain liquid holding fibrous substances in suspension, a pump, as C, a pipe, as E F, leading from the suction-opening of the pump, a hollow perforated form, as G, connected to the suction-pipe and adapted for immersion in the vat-liquid, and a jacket, N, applied over the perforated portions of the form, substantially as described, for the purposes set forth.

5. In an apparatus for the manufacture of fibrous vessels, the following elements in combination: a tank, as A, to contain liquid holding fibrous substances in suspension, a pump, as C, a pipe, as E F, leading from the suction-opening of the pump, a hollow perforated form, as G, connected to the suction-pipe and adapted for immersion in the vat-liquid, and a pipe, as L J, connecting the discharge-opening of the pump with the interior of the vat, substantially as described, for the purposes set forth.

6. In an apparatus for the manufacture of fibrous vessels, a hollow perforated form, as G, having an exterior shape corresponding to the interior form of the vessel to be produced and adapted for connection to a suction-pipe, in combination with a jacket, N, applied over the perforated portions of the form G, substantially as shown and described.

LEROY TOBEY.

Witnesses:
W. DELAFIELD DWELLE,
FRED. B. LEFFERTS.