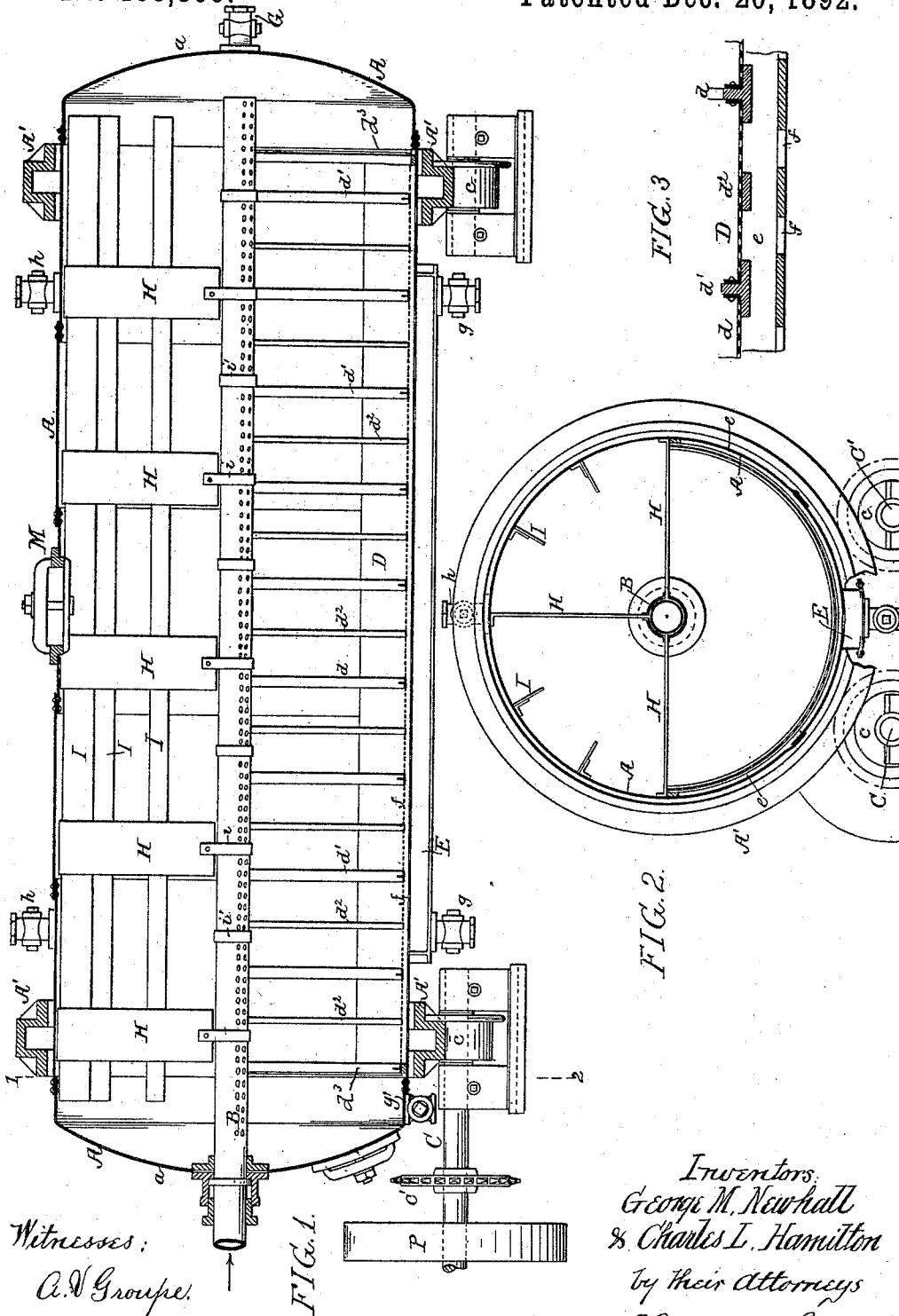


(No Model.)

G. M. NEWHALL & C. L. HAMILTON.
WOOD PULP DRAINER.

No. 488,399.

Patented Dec. 20, 1892.



Witnesses:
A. V. Groupe.
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UNITED STATES PATENT OFFICE.

GEORGE M. NEWHALL AND CHARLES L. HAMILTON, OF PHILADELPHIA,
PENNSYLVANIA.

WOOD-PULP DRAINER.

SPECIFICATION forming part of Letters Patent No. 488,399, dated December 20, 1892.

Application filed January 21, 1890. Serial No. 337,637. (No model.)

To all whom it may concern:

Be it known that we, GEORGE M. NEWHALL and CHARLES L. HAMILTON, both citizens of the United States, and residents of Philadelphia, Pennsylvania, have invented certain improvements in Wood-Pulp Drainers, of which the following is a specification.

Our invention relates to certain improvements in the construction of revolving drainer filters used in the treatment of wood pulp for the manufacture of paper, the paper pulp being received by this filter from the digester.

The object of our invention is to construct a filter so that it acts as a revolving drainer and washer as more fully described herein-after.

In the accompanying drawings:—Figure 1, is a longitudinal section of our improved filter; Fig. 2, is a transverse section of the same on the line 1—2, Fig. 1; and Fig. 3, is an enlarged sectional view of a detail of construction.

A is a closed cylindrical casing made of sheet metal or wood, having heads *a a*, and secured to the periphery of the casing are annular rails *A'*, adapted to travel on revolving wheels *c c*, mounted on shafts *C'*, the shaft *C'* being driven in any suitable manner, in the present instance through the medium of the pulley *P* or by a link belt passing over a sprocket wheel *c'*; belts or gearing may be used according to circumstances.

B is a water inlet pipe extending nearly the full length of the cylinder *A*, being open at its inner end and being suitably perforated on one half of its circumference as shown, the perforations being made sufficiently large to permit the passage of water. On one half of the cylinder is a semi-cylindrical screen *D*, shown clearly in Fig. 3, made up in the present instance of a series of sections *d* secured together by T-beams *d'* and intermediate strips *d''* tending to stiffen and support the screen section, the opposite ends of which are closed by semi-circular filling strips *d'''* near the ends of the cylinder, and the opposite edges of the screen are secured to longitudinal filling strips, as shown in Fig. 2, in order to form a closed chamber between the screen and the casing. These screen sections are finely perforated for the purpose of sepa-

rating the pulp from the liquor, the liquor passing through the perforations into a chamber *e* (Fig. 2) between the screen and the casing, and from this chamber passing through openings *f* into the longitudinal receiving box *E* below the casing.

The receiving box *E* is provided with suitable valves *g, g*, by which the liquid may be drawn from the filter. Diametrically opposite the box *E* are one or more pressure valves *h* to which may be coupled air or steam pressure pipe to force or accelerate the filtration when necessary.

The material to be treated is supplied to the cylinder through the inlet pipe *G*.

H H are blades secured at the center of the machine to straps *i* passing around the pipe *B* and extending to the casing to which they are secured. These blades serve to hold the pipe *B* in position and also act as stirring or cutting blades to agitate the material under treatment.

I I are radial lifting and mixing blades running longitudinally in the cylinder, and serve to make a uniform mixture of solutions and pulp after each drainage.

The operation of the machine is as follows:—The pulp to be treated is directed through the inlet opening *G* into the machine, standing still with the collecting box *E* down and while the black liquor is draining off. The wash water is then passed in through the perforated pipe *B* distributing itself throughout the entire length of the pipe and passing through the perforations therein. The cylinder is revolved through the medium of the driven shaft *C'* and the blades *H* and *I* thoroughly agitating the material. After a sufficient length of time, the machine is stopped with the screen portion lowermost and the drain water drains off from the pulp, passing through the screen into the box *E* and from there being drawn from the machine. Air or steam under pressure may be supplied through one of the pipes *h* to aid in the filtration, and after complete drainage fresh water can be turned into the cylinder, the cylinder is again revolved and the filtering process again repeated, until the pulp is in condition to be further treated in a subsequent machine, or air may be admitted through the pipe *G*,

which, in such case, would be provided with a stuffing box, fittings and valve, to accommodate two separate supply pipes. The blades H being secured at their inner ends to the pipe B by straps or rings *i*, tend to support the pipe B in the cylinder and keep it central therein. The fully washed pulp, after being diluted for the purpose, is withdrawn by a cock or valve *g'* from the cylinder. Should it be desirable to remove the pulp in a semi-dry state, the same may be removed through the man hole M.

We claim as our invention:—

1. A filter comprising a closed cylindrical chamber, a semi-cylindrical screen therein, and forming between the casing and the screen a closed chamber *e*, a receiving box E, below said chamber *e* and communicating therewith, outlet pipes leading from said receiving

box, a perforated pipe extending from one end of the cylinder to or nearly to the opposite end thereof, blades H extending from said perforated pipe to the casing and inlet and outlet for the material to be treated, substantially as specified.

2. The combination of the screen sections *d*, the bars *d'* connecting said sections and intermediate strengthening bars *d²* between said connecting bars, substantially as specified.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

GEORGE M. NEWHALL.
CHARLES L. HAMILTON.

Witnesses:

H. F. REARDON,
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