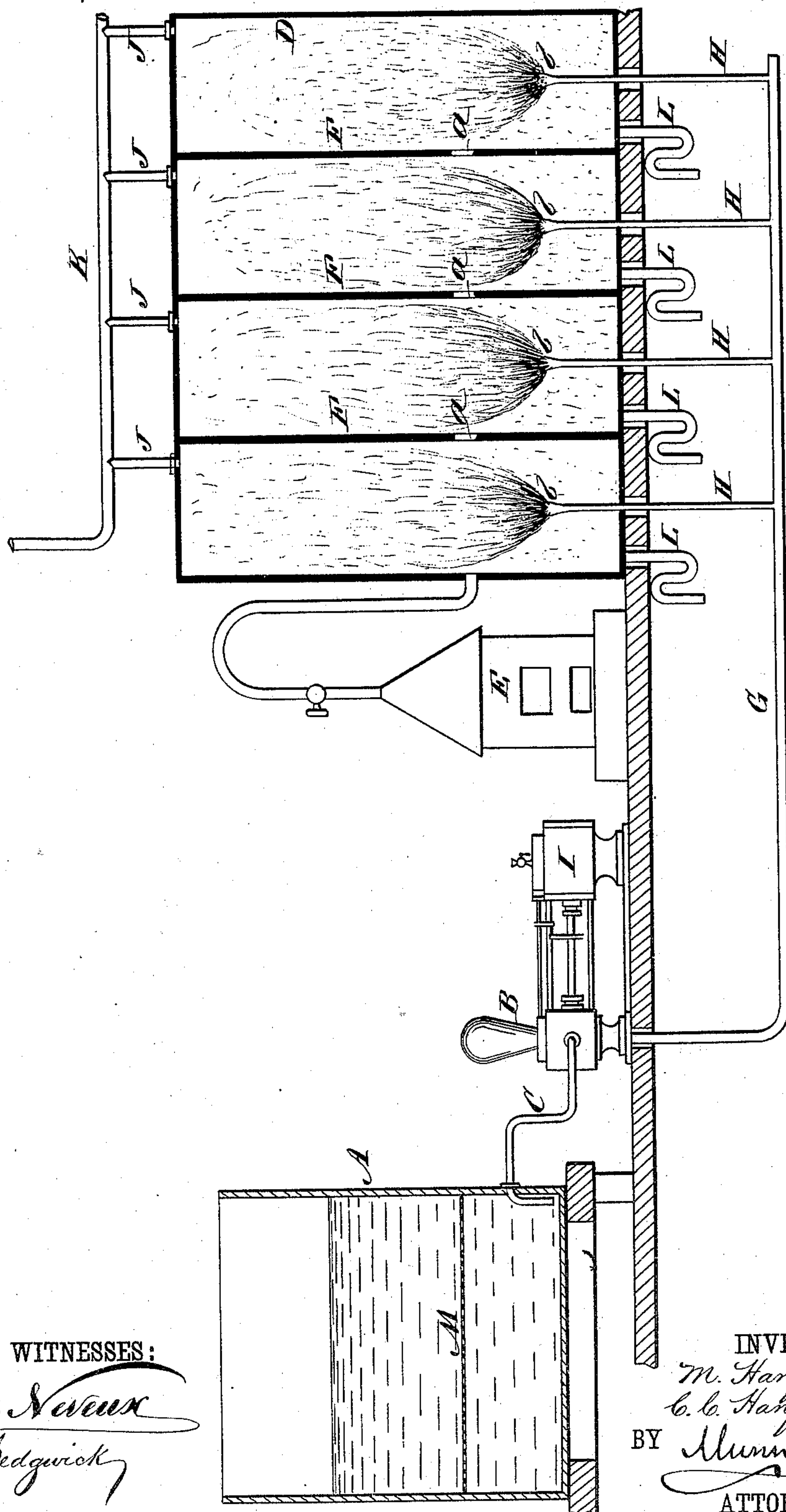


(No Model.)

M. & C. C. HANFORD.
APPARATUS FOR BLEACHING LIQUIDS.

No. 319,409.

Patented June 2, 1885.



WITNESSES:

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MELANCTHON HANFORD AND CLARENCE C. HANFORD, OF BOSTON, MASS.

APPARATUS FOR BLEACHING LIQUIDS.

SPECIFICATION forming part of Letters Patent No. 319,409, dated June 2, 1885.

Application filed June 20, 1884. (No model.)

To all whom it may concern:

Be it known that we, MELANCTHON HANFORD and CLARENCE C. HANFORD, of Boston, in the county of Suffolk and State of Massachusetts, have invented a new and Improved Apparatus for Bleaching Liquids, of which the following is a full, clear, and exact description.

The invention consists in the peculiar construction and arrangement of parts, as herein-after fully described, and pointed out in the claims.

Reference is to be had to the accompanying drawing, forming a part of this specification, in which the figure is a sectional elevation of the preferred form of apparatus for carrying out our new method.

The liquid to be bleached, if cane-juice, will first be passed through a suitable filter to clear it of all coarse impurities. It will then be placed in the tank A or other receptacle, to which the force-pump B is connected by the pipe C.

D is the bleaching-chamber, to which the bleaching-gas is supplied—in this instance from the sulphur-stove E. The chamber D is by preference divided into compartments by the partitions F, which have the openings *a* formed in them for the passage of the gas from one compartment to the other. The liquid to be bleached is forced by the pump B, operated by engine I, into the compartments of chamber D, through the pipe G and branch pipes H, which enter the chamber, and which are provided within the compartments each with an atomizer or perforated head or rose, *b*, which cause the liquid to be divided into spray, or atomized, as illustrated in the drawing.

To prevent back-pressure in the chamber D, we provide it with the pipes J, which connect with the leader K, for conducting away any gas that may be forced out of the chamber D by overproduction in the stove E.

The bleached liquid passes out of the chamber D through the outlet-pipes L, which are bent S-shaped, as shown, to make them self-seating, to prevent escape of gas from the chamber D.

By spraying or atomizing the liquid to be bleached in the bleaching agent every particle of the liquid is subjected to the action of the gas, and thus a very thorough and perfect bleaching of the liquid is effected.

The perforated diaphragm M may be placed in the tank A, if desired, to prevent all danger of any foreign substance entering the pump or pipes of the apparatus.

We are aware that it is not broadly new to force liquids into a vessel by means of a steam-pump through a pipe, sulphurous acid being introduced into the said vessel for bleaching the liquid, and we therefore do not claim such invention. The pipe through which the liquid is forced had but a single aperture, like an ordinary spigot, the liquid being broken in its descent. In our apparatus the liquid is forced through an atomizing-nozzle, which separates the particles of liquid into a very fine spray, thus allowing the acid-gas to more thoroughly intermix with the liquid than where the liquid fell in large bodies, as in the case referred to.

Having thus described our invention, we claim as new and desire to secure by Letters Patent—

1. The chamber D, to which the bleaching-gas is supplied, divided into compartments communicating with each other, and combined with the pump B, pipe G, and branches H, which enter the chamber D, and which are provided within the chamber with atomizing-heads *b*, substantially as set forth.

2. The chamber D, divided into compartments communicating with each other, and provided with the pipes J and bent outlet-pipes L, combined with the gas-generator E, tank A, pump B, and connecting-pipes C G and branch pipes H, entering the compartments of the chamber, and provided with perforated or atomizing heads *b*, as and for the purposes set forth.

MELANCTHON HANFORD.
CLARENCE C. HANFORD.

Witnesses:

JOSEPH CUTLER,
ASA COTTRELL.