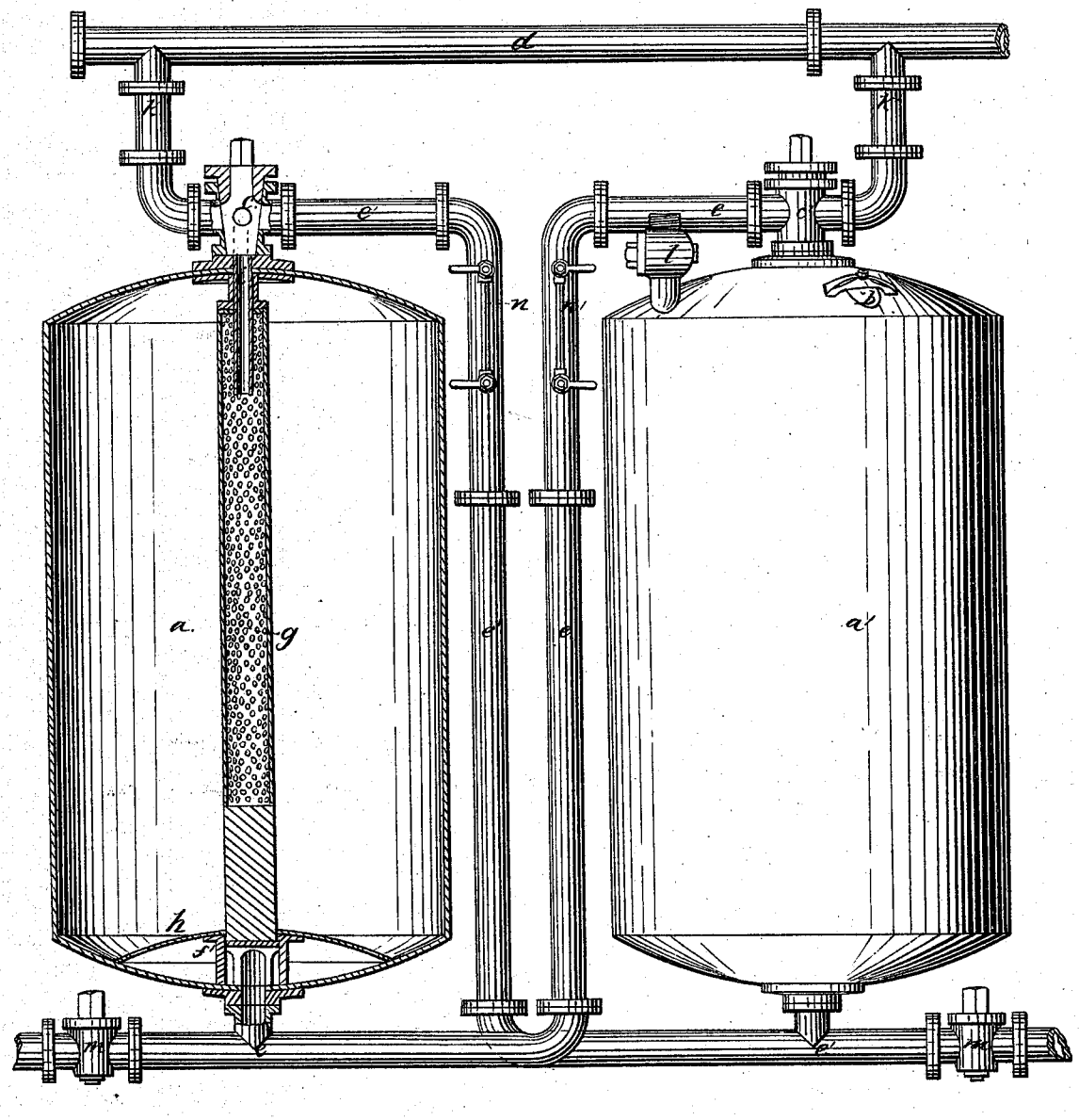
S. BARLOW.

Bleaching Apparatus.

No. 35,357. Patented May 27. 1862.



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SAMUEL BARLOW, OF STAKEHILL, MIDDLETON, COUNTY OF LANCASTER, ENGLAND.

IMPROVEMENT IN APPARATUS FOR BLEACHING AND CLEANSING TEXTILE FABRICS.

Specification forming part of Letters Patent No. **35,357**, dated May 27, 1862.

To all whom it may concern:

Be it known that I, SAMUEL BARLOW, of Stakehill, Middleton, in the county of Lancaster, in England, have invented certain Improvements in Apparatus for Bleaching and Cleansing Textile Fabrics; and I do hereby declare that the following, taken in connection with the drawings which accompany and form part of this specification, is a description of my invention sufficient to enable those skilled in the art to practice it.

The object of my invention is to improve and expedite the process of bleaching and cleansing textile fabrics and materials by passing often and rapidly through and among them warm or hot bleaching and cleansing liquids, thereby more effectually and rapidly extracting and removing discoloring matter, dirt, or impurities than can be done by percolation of said liquids through said textile matter or by other means employed prior to my invention.

My invention consists in an improved arrangement and construction of apparatus for bleaching and cleansing textile fabrics and material, substantially such as is herein described, and it is embodied in an apparatus consisting of two closed metallic vessels, termed "keirs," which are so connected each with the other by pipes forming communication from the top of each to the bottom of the other, and with provision by which steam of considerable pressure can be admitted alternately to the top of either keir, that fluid admitted into the top of one keir can be expelled therefrom by steam-pressure forcing the fluid through the material contained in this keir into the top of the other, and by stopping the supply of steam to the keir in which it was first admitted for the purpose above named, and by admitting it to the other keir, which contains the fluid, this may be forced back through the material contained in said keir to the top of that one into which the fluid was first admitted, and this operation may be repeated indefinitely as often as is necessary or desirable. Each of the keirs is provided with a man-hole and its appendages, through which the textile matter is introduced and removed, which holes can be closed so as to be steam-tight under pressure.

Within and at the bottom of each keir is a plate (made by preference of iron and solid, except around the edge, which is perforated) so shaped as to leave space between it and the keir bottom, from which plate, extending upward, is a pipe or pipes perforated with small holes placed closely together from the top nearly to the bottom, which is best made solid, so that no liquid can remain in said pipe or pipes at the bottom, and so that the liquid introduced into said pipe or pipes shall not be discharged therefrom so near the inclosed plate before referred to as to pass directly through the apparatus with but little contact with the matter with which it is packed or charged. Each of the said pipes or distributers in both keirs receives an inlet-pipe through the top of each keir, through which the bleaching or cleansing fluid is alternately forced from one keir to the other, and through which inlet-pipes steam is introduced first into one keir and then into the other.

Beneath the plate before referred to as within each keir means are provided for discharging or blowing off the liquid of each keir and for blowing steam through each keir, and one keir is provided with a suitable inlet for charging it with bleaching or cleansing liquid.

Referring to the drawings, *a a'* are the keirs, which I prefer to have made of boiler-plate and which must be strong enough to withstand the load of textile and fluid matter and the steam-pressure with which they are charged. Where joints are needed in construction, they are best made flush on the inside—butted joints battened on the outside are preferable—and the rivet-heads should be countersunk on the inside, so that no asperities are left to injure the goods.

b (seen in keir *a'*) is the man-hole with usual appendages, which man-hole is used for packing and unpacking the goods and for entrance into the keir for repairs and for convenience in constructing it. Both keirs are provided with similar man-holes; but, keir *a* being shown in longitudinal vertical section to exhibit parts in the interior of the keir embodying my invention, the man-hole in said keir is not therein shown. The top of both keirs is surmounted with "two-way valves" *c c'*, commanding the communication with the keirs from the pipe *d*, conveying steam from

the boiler, and also with the pipes *e e'*, which connect the bottom of *a* with top of *a'* and the bottom of *a'* with top of *a*. These valves can also be used to shut off all communication with the keirs from either the steam-pipe *d* or the pipes *e e'*. An aperture in the bottom of each keir communicates with the pipes *e e'* and is surmounted, as shown in keir *a*, by a piece, *f*, shaped as shown in the drawings, which upholds the perforated pipe *g* and the center of the plate *h*. This plate, which is of less diameter than the cross-section of the keir, is placed in the keir with its convex surface uppermost and with its perimeter supported by the concave surface of the base of the keir, leaving the space shown in keir *a*, into which fluids can escape through perforations around *h* into the pipe beneath.

The vertical perforated pipe *g* (shown in *a*) I term the "distributer." It is made solid or is filled for a short distance from the bottom to the commencement of the perforations, so that all fluids entering therein may escape therefrom by the perforations. A pipe, *i*, leading from the valve *c* through the top of the keir, is introduced into the upper end of *g*, which end is secured to the top of the keir in some convenient way, as shown in the sectional part of the drawings.

Check-valves *k k'*, opening downward and closing upward, are placed in the steam-pipe between the valves *c c'* and the boiler, as shown in the drawings, to prevent the fluid contents of the keirs from passing from them into the boiler consequent upon a sudden fall of pressure in the boiler or the formation therein of a partial vacuum. One of the keirs, *a'*, is provided with a valve, *l*, through which the liquid to be used for bleaching or cleansing is introduced. The pipes *e e'* are supplied with valves *m m'*, through which the fluid contents of the keirs can be discharged and steam blown through the kiers from the boiler.

n n' are glass gages, by which can be seen whether or not liquid is passing through pipes *e e'*.

The operation of my invention is as follows: Both keirs, which are alike in all particulars, except that *a'* has the valve *l*, which is not needed on the other keir, are filled with the goods to be operated on, they being packed on the convex plates and around the distributers and kept highest at the center of the keirs. The man-holes being closed, steam is admitted into both keirs through the valves *c c'*, being admitted by the perforated pipe to the interior of the "pack" of goods, as well as to the upper surface. This forces all the cold air and water out of the goods, through the perforated convex plates, into the pipes *e e'*, out through the blow-off valves *m m'*, these being opened for that purpose, and leaves the goods warm or hot and nearly dry. When the air and water are thus forced out, the valves *m m'* are closed and the valves *c c'* are so turned as to shut off the steam without opening communication with *e e'*, and the bleaching or cleansing liquid, first properly heated, is run or pumped into *a'* through valve *l*. This valve is then closed and valve *c'* so turned as to let steam into *a'*, and valve *c* is so turned as to open communication through *e'* from the bottom of *a'* to the top of *a*. This forces the bleaching or cleansing liquid through all the goods in *a'*, through the apertures in the convex plate therein, and through pipe *e'* into the distributer and upon the top of the goods in *a*. By turning the valve *c* so as to let the steam flow into *a*, and by turning valve *c'* so as to shut off steam from *a'* and open communication with pipe *e*, the bleaching or cleansing liquid is forced from *a* back into *a'*. This process is repeated till the goods are sufficiently worked.

My invention may be modified by making one of the keirs smaller than the other and using it only to contain the operating-liquid, which would first be forced from the small vessel into the large one containing the goods, and would next be forced through the goods in this vessel back into the small one, which process would be repeated till the goods reached the desired condition. A further modification which will incorporate one part of my invention to advantage in certain cases is to employ but one keir, closed or open, as may be desired. In such cases a puffer-pipe, which is an ordinary pipe of small diameter and of sufficient length to be secured to the perforated plate and to extend above the top of the goods in the keir, may be fixed within the distributer, if there is but one, or centrally among them if there is a number, and if the keir is an open one a deflector is to be secured at a little distance over the upper open end of said pipe, the lower open end of which communicates with the space beneath the perforated plate. Into this space and from the bottom of the keir and in the axial line of said pipe extends the open end of the short arm of a siphon-shaped pipe and considerably above the bottom of the keir, so as to allow the working-liquid to accumulate beneath the perforated plate without flowing into the steam-pipe. Now, if the goods are placed in the keir and the working-liquid is poured upon them and into the distributer, it is evident that it will percolate through them into the space left below the perforated plate. If, then, steam is let on through the steam-pipe referred to, the liquid will be forced up by it, and, striking against the deflector or the top of the keir, according as the keir may be open or closed, falls back again upon the top of the goods and into the distributer and again works through, as before described. A convenient steam-valve is of course to be connected with the steam-pipe and a suitable discharge-valve with the bottom of the keir.

I claim—

1. The combination of closed keirs so arranged that by direct pressure of steam within

said keirs bleaching or cleansing liquid can be forced interchangeably from one to the other and through the textile material contained in one or both keirs, substantially as described, by which the goods or materials are subjected to the action of bleaching-liquid and of steam alternately, for the purpose specified.

2. The combination of a perforated pipe or pipes, or distributer or distributers, with a plate perforated at its outer edge, when arranged within a keir so as to admit bleaching or cleansing liquid through the said perforated pipe or pipes within the bulk of the pack of goods and to discharge said liquid from said goods through said plate.

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Witnesses:

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