

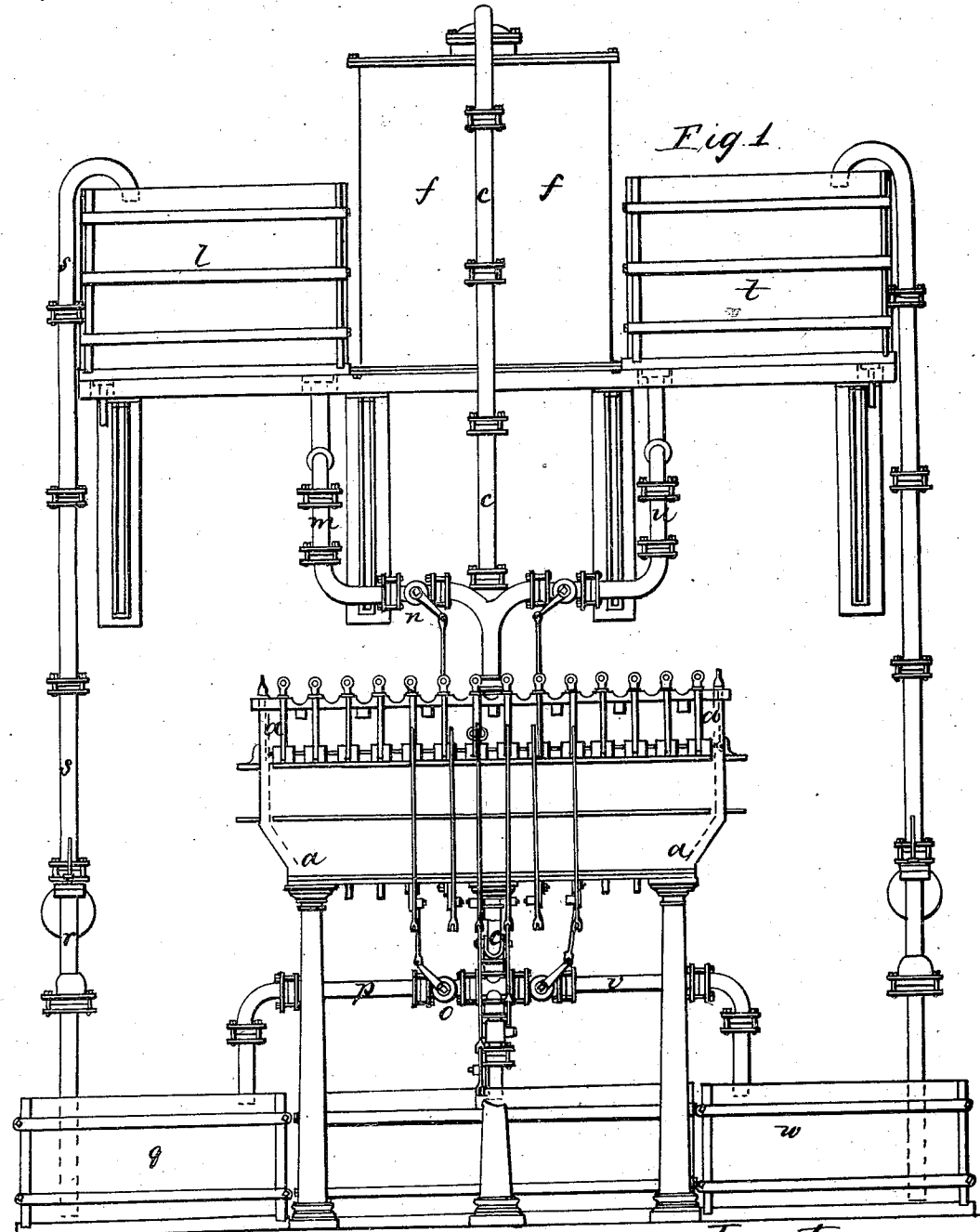
Sheet 1, 4 Sheets.

L. W. Wright.

Bleaching Apparatus.

N^o 622.

Patented Mar. 3, 1838.



Witnesses
Frat B. Ogden

Inventor
L. W. Wright

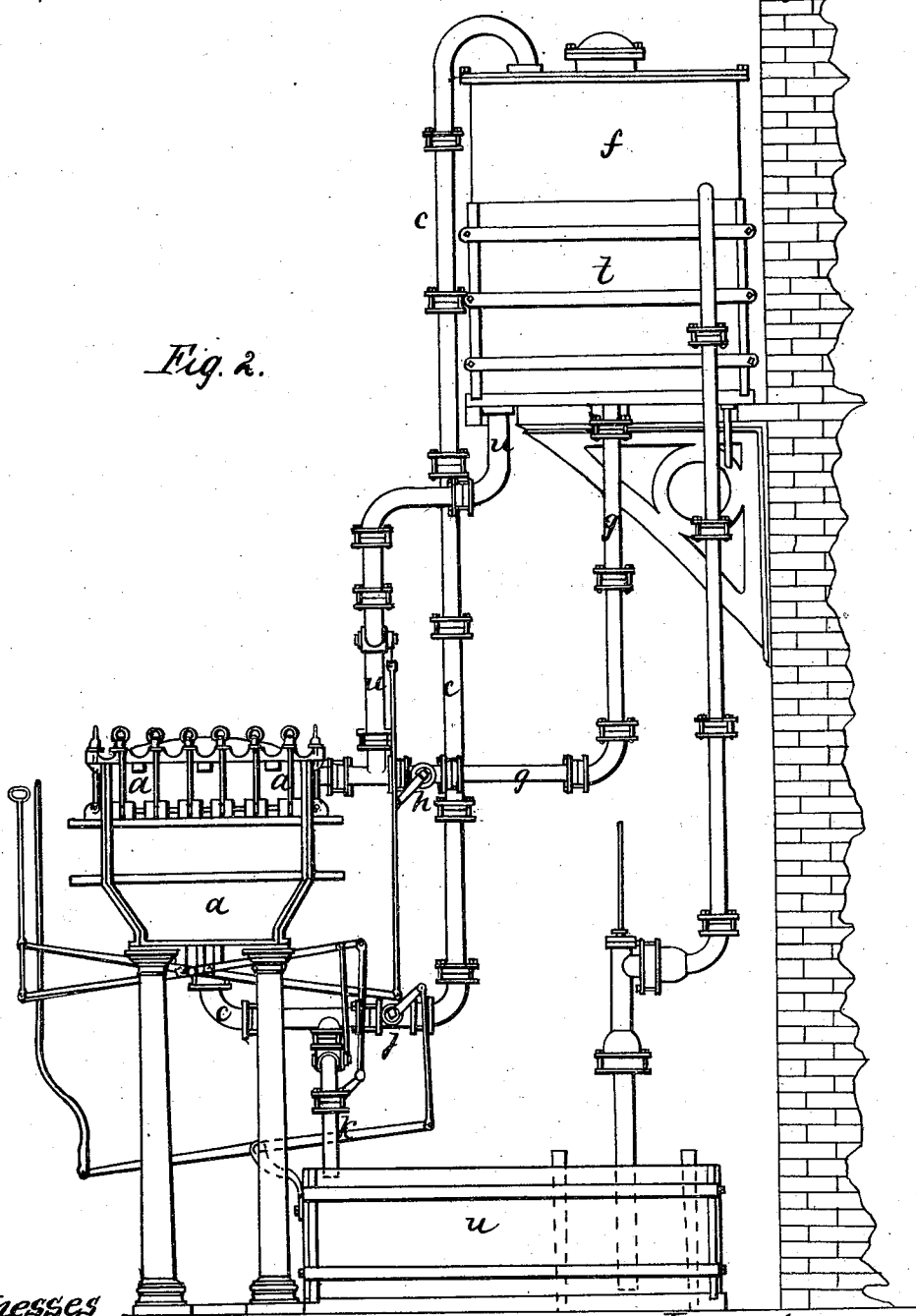
L. W. Wright.

Bleaching Apparatus

N^o 621.

Patented Mar. 3, 1838.

Fig. 2.



Witnesses

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Sheet 3, 4 Sheets

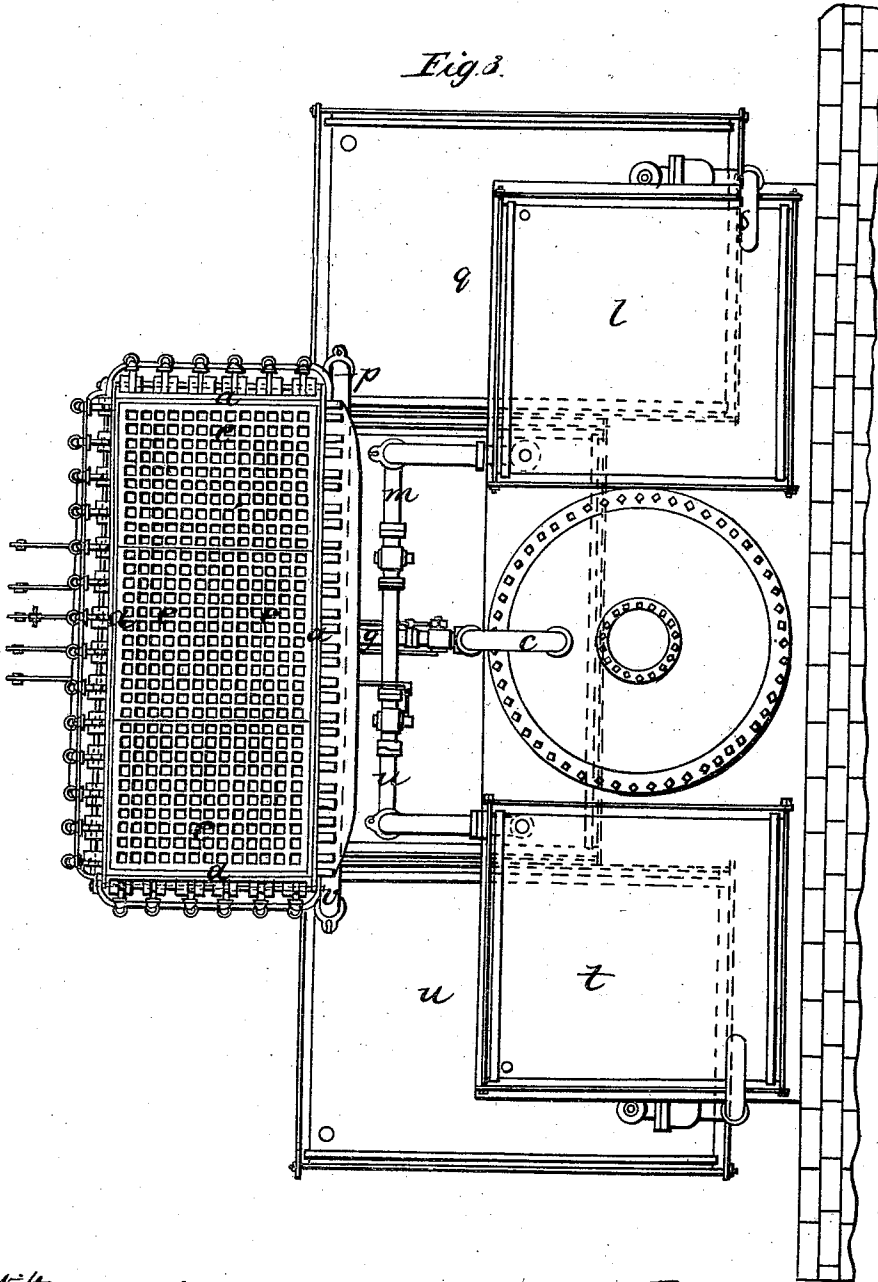
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Fig. 3.



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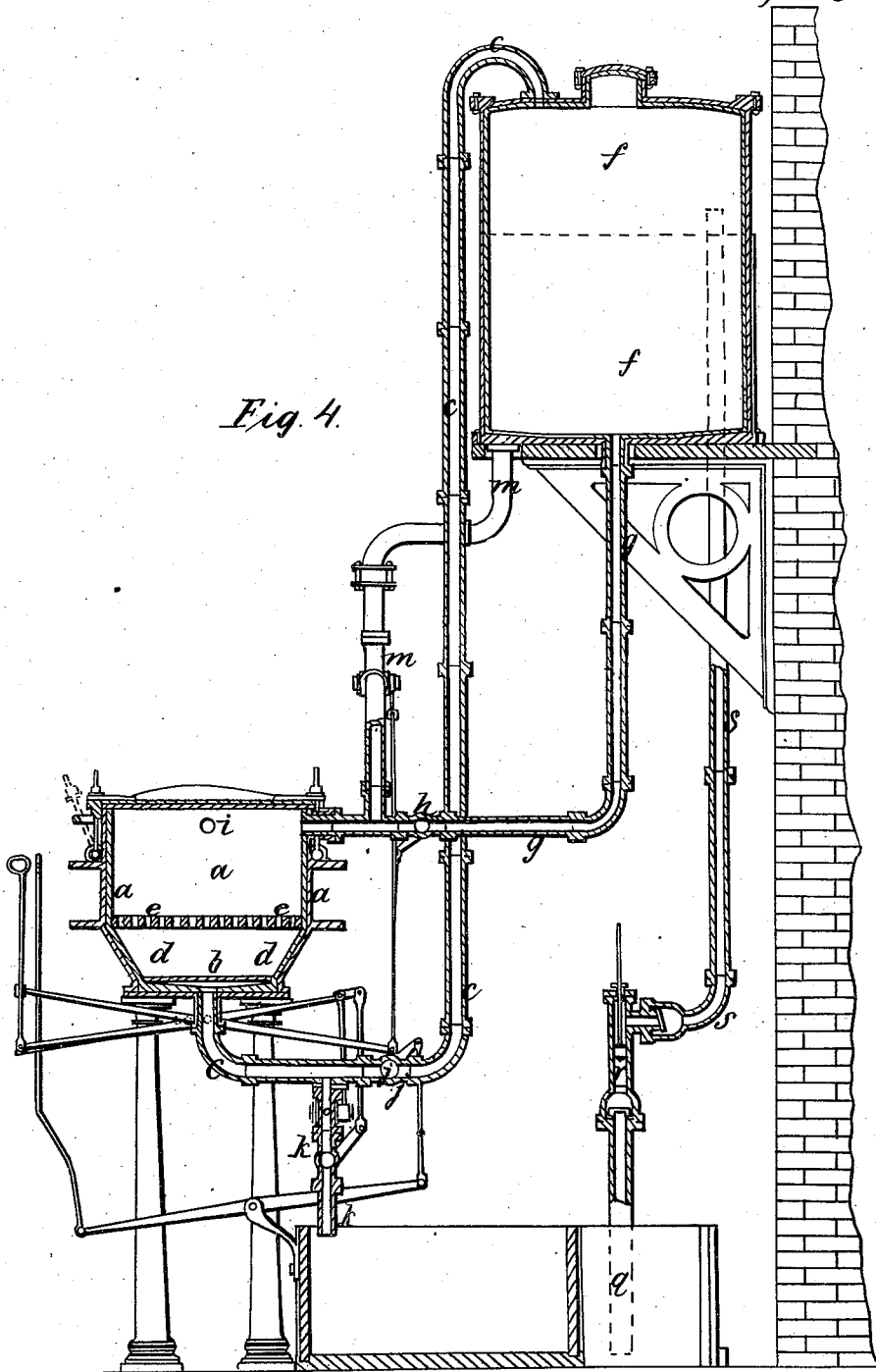
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Patented Mar. 3, 1838.

Fig. 4.



Witnesses,
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Inventor,
Lemuel Wright

UNITED STATES PATENT OFFICE.

LEMUEL W. WRIGHT, OF MANCHESTER, ENGLAND.

APPARATUS FOR BLEACHING LINENS, COTTONS, &c.

Specification of Letters Patent No. 622, dated March 3, 1838.

To all whom it may concern:

Be it known that I, LEMUEL WELLMAN WRIGHT, a citizen of the United States of America, now residing in Manchester, England, have invented certain new Improvements in Machinery or Apparatus for Bleaching or Cleansing Linens, Cottons or other Fabrics, Goods or other Fibrous Substances, and that the following is a full and exact description of the same, together with the machinery and apparatus for effecting it as invented by me.

My improvements in bleaching or cleansing linens cottons or other fibrous substances and in the machinery or apparatus for effecting the same consist, firstly, in the peculiar construction of an air-tight vessel in which the goods or fibrous materials intended to be bleached are to be packed in close contact; secondly, in the manner of passing the alkaline solutions through the compact mass of goods or fibrous materials by the agency of steam at a high pressure which has the effect of opening the fibers of the material under operation; thirdly, in the mode of rinsing or washing out the alkali or other chemical matters used in the process of bleaching by means of high pressure steam; fourthly, in the manner of forcing the solutions of chlorid of lime and sulfuric acid through the goods in the bleaching vessel by hydraulic and pneumatic pressure and fifthly, in the mode of washing cleansing or rinsing the chemical matters from the goods after the bleaching operation has been completed, and, sixthly, in the mode or manner of drying the fibrous goods or other substances by passing high pressure steam through them in a compact state before removing them from the bleaching vessel or keir.

In the accompanying drawings Figure 1 represents the complete apparatus as seen in front elevation with the pipes employed for conducting the fluids into and out of the several vessels. Fig. 2. is a side or end elevation of the same in which the positions and forms of some of the pipes are more evidently seen than in the former figure. Fig. 3, is a plan or horizontal representation of the same apparatus as it would appear if seen from above and Fig. 4 is a sectional elevation of the complete apparatus taken through the vessel in which the packed goods are to undergo the bleaching and

cleansing process, through the vessel intended to contain the alkaline solution, and through some of the pipes or tubes communicating with the several vessels, the similar letters of reference pointing out the same parts of the apparatus in the several figures.

The keir or bleaching vessel *a. a. a.* is of a rectangular form made of cast iron and tapering downward at the sides and ends near the bottom. This vessel I propose to line with slabs of slate or any other material that will not be subject to be acted upon by the chemical matters which have to pass through the vessel. A lid or cover of the same material is made to fit airtight and is held down by swivel bolts and screw caps. A false bottom *b.* of slate with ribs on its underside fits into the lower part of the vessel and is perforated with small holes for the purpose of allowing the liquors to flow through into the pipe *c.* below. The goods (say raw flax or linen) being packed in the vessel *a.* as at *d. d.* to the height of the beveled part and resting upon the false bottom are to be pressed down by a grating *e. e.* made of large slabs of slate or other suitable material which grating may be weighted by blocks of stone if necessary. A vessel *f.* contains the alkaline liquor which is admitted into the keir *a.* through the pipe *g.* and when the keir *a.* is nearly full that is up to the height of the pipe *g.* the stop-cock *h.* is then to be closed.

Steam at a high pressure (say from 30 to 100 lbs. upon the square inch according to the nature of the materials to be operated upon) is now to be admitted into the keir *a.* by a pipe *i.* leading from a steam boiler situated in any convenient place nearly contiguous. The steam thus introduced being allowed to continue acting upon the alkaline liquor in the close vessel *a.* for a considerable time it will cause the liquor to boil and the ebullition thus produced under the great pressure of the steam will force the alkaline liquor through the substance of the compact goods and in so doing open and separate fibers of the material and soften the gummy and coloring matters.

When the liquor has completely penetrated through the entire mass of the material intended to be bleached the stop-cock *j.* in the pipe *c.* is to be opened which will allow the whole of the liquor in the vessel *a.* by the force of the steam to be drawn

through the goods or materials under operation and to rise through the pipe *c. c. c.* into the vessel *f*. This operation must be repeated according to the nature of the articles operated upon (that is to say) the alkaline liquor from the vessel *f*. must be passed through the pipe *g*. into the keir *a*. and then by letting on the steam as before the alkaline liquor must be forced through the material again and again until the gummy or coloring matter is sufficiently removed. The alkaline liquor must now be discharged from the vessel *a*. which is done by closing the cock *j*. and opening the cock in the descending pipe *k*. when by the pressure of the steam the liquor will be forced through the goods and through the pipe *k*. into a stone cistern below.

In order to remove the remaining alkali from the goods, the vessel *f* must be filled with clean water and this water be passed through the goods several times in the same way and by the same means as the operations of the alkaline solution were performed, occasionally withdrawing the foul water and supplying clean water as may be required for rinsing the alkali out of the goods.

The goods in the vessel *a* should now be cooled down to about 100 Fahrenheit by passing cold water through them merely by hydraulic pressure unassisted by the force of steam, which is done by the attitude of the water flowing from the vessel *f* or by the pressure of air forced into the vessel *a* by an air pump the stop-cocks in the several connecting pipes being closed. Having thus reduced the temperature of the goods or fibrous materials, a solution of chlorid of lime or bleaching powder with the ordinary proportions of water such as bleachers use is now to be passed through them from the stone cistern *l*, by the pipe *m*, and cock *n* and this pipe *m* communicating with the induction pipe *g*, of the vessel *a* the liquor is made to percolate through the goods by hydraulic or pneumatic pressure and flow away by the eduction pipe *c* and through the cock *o* and branch pipe *p*, into a cistern *g*, below. From this cistern the chlorid liquor is to be raised by a pump *r* through the pipe *s*, again into the vessel *l*, and the operation upon the material may be repeated according to the judgment of the operator, and having passed the bleaching liquor through

the goods as many times as may be required it is left in the cistern *g*, below.

In order to wash the chlorid from the goods or fibrous materials clean water from the vessel *f* must be forced through by steam pressure as before described taking care to close all the cocks except those which pass the water from the vessel *f* through the keir.

The operation called souring is performed by conducting a weak solution of sulfuric acid and water (such as is commonly used by bleachers) through the goods or fibrous materials in the keir *a* from the vessel *t*, by the pipes *u*, in the same manner as the chlorid liquor was conducted; and after this sour liquor has passed through the goods in the keir it is discharged by the pipe *v*, into the cistern *u* and the operation repeated if required.

In order to remove all the acid from the fibers of the goods, (first reducing the temperature of the goods as before described) rinsing water must be forced by high pressure steam through the keir *a*, in the manner before described, and when the rinsing has been completed high pressure steam alone is allowed to pass through the goods or fibrous materials which will remove the moisture and leave the goods nearly dry.

I propose performing the chlorid and scouring operation by having a separate keir or vessel which may be made of stone or wood lined with lead of the same dimensions and shape as the keir *a*, into which the goods or fibrous substance may be packed and chlorid and souring process to be performed as before described. It is obvious that the machinery or apparatus as above described, may be varied in its form and construction, I do not therefore intend to claim as my invention any of the separate parts thereof as applicable to other purposes; but I do claim as my invention—

The application of high pressure steam to be used with the improved combination and arrangement of the several parts as applicable to bleaching or cleansing linens, cottons or other fabrics goods or other fibrous substances as before described.

LEMUEL W. WRIGHT.

Witnesses:

SAM. PEARCE,
WM. P. MEEKER.