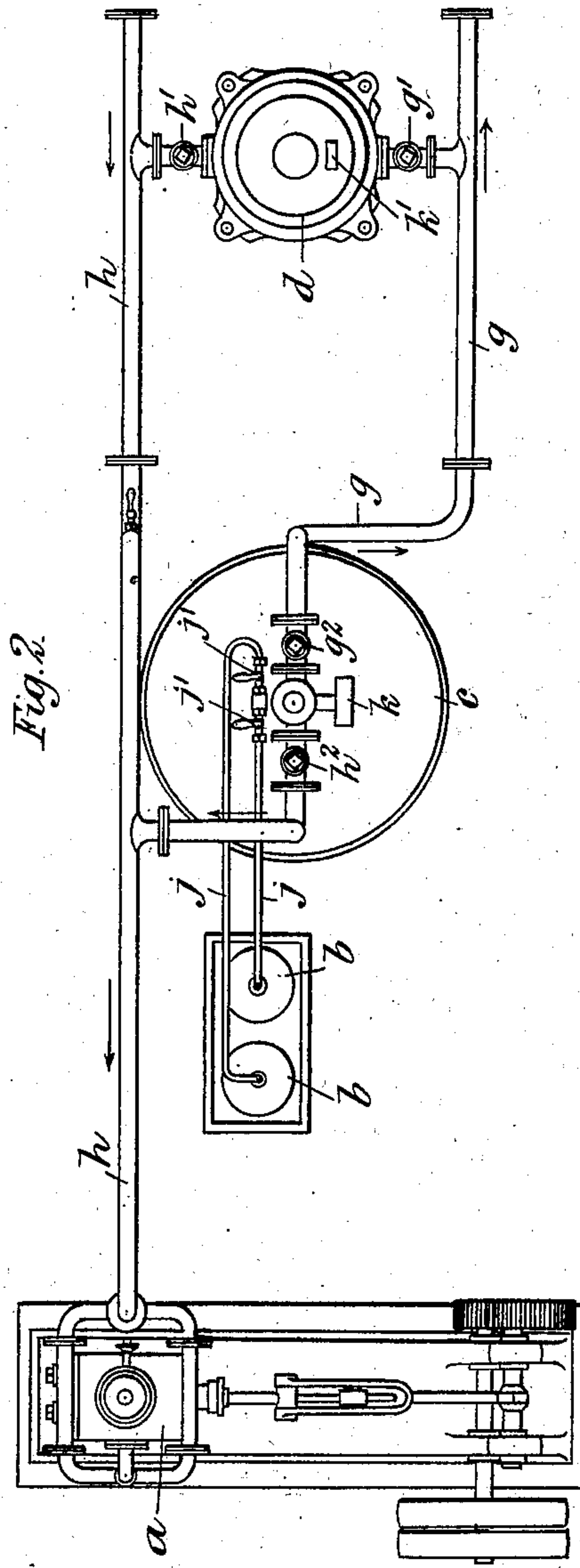
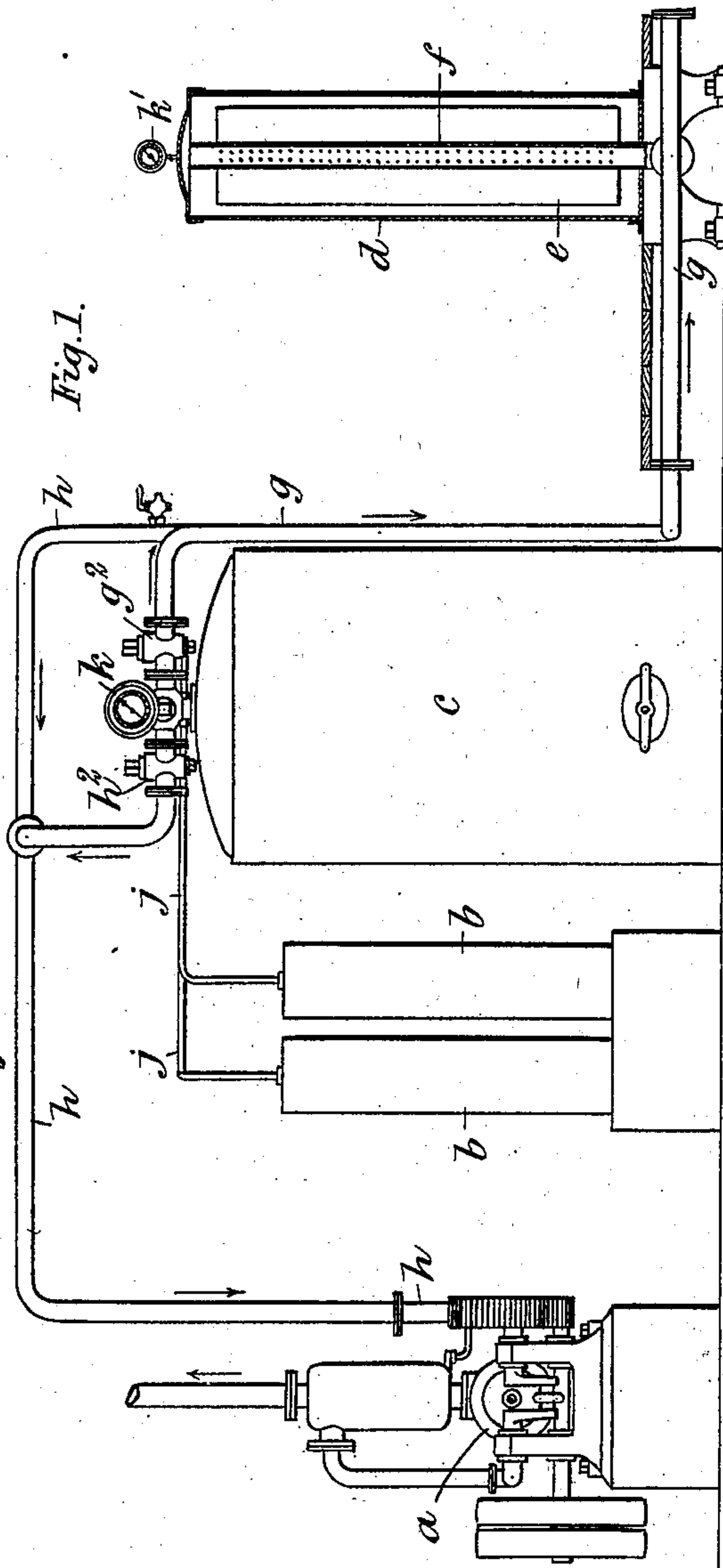


No. 721,436.

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V. FLOQUET & L. BONNET.
APPARATUS FOR BLEACHING FABRICS.
APPLICATION FILED JULY 7, 1902.

NO MODEL.



Witnesses

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UNITED STATES PATENT OFFICE.

VICTOR FLOQUET AND LÉONCE BONNET, OF REIMS, FRANCE, ASSIGNORS
TO JOHN WILLIAM WILLANS SHAW, OF ROCHDALE, ENGLAND.

APPARATUS FOR BLEACHING FABRICS.

SPECIFICATION forming part of Letters Patent No. 721,436, dated February 24, 1903.

Application filed July 7, 1902. Serial No. 114,552. (No model.)

To all whom it may concern:

Be it known that we, VICTOR FLOQUET, residing at Rue des Capucins 56, and LÉONCE BONNET, residing at Rue Jeanne d'Arc 27, Reims, France, citizens of the French Republic, have invented a certain new and useful Improvement in Apparatus for Bleaching Fabrics, of which the following is a specification.

It has before been proposed to employ sulfurous-acid gas for bleaching fabrics by admitting it to a closed vessel containing the fabric and from which the air has been exhausted; but from various causes the results have not been wholly satisfactory. We have discovered that one of the principal reasons for this is that the gas has been admitted at too great a pressure and not sufficiently gradually. According to this invention the gas instead of being allowed to expand into the vacuum-chamber direct from a high-pressure reservoir or other source is first allowed to expand to about atmospheric pressure into an intermediate vessel, which also serves as a measure, and is then again allowed to expand into the exhausted vessel containing the fabric, so that the pressure in the latter vessel is less than that of the atmosphere.

Figure 1 is a side elevation, partly in section, of the apparatus employed; and Fig. 2 is a plan.

a is a pump for producing a vacuum.

b b are tubes containing sulfurous acid under pressure.

c is the intermediate vessel.

d is a vessel containing the roll of cloth *e*, wound upon the perforated spindle *f*, which is connected by a pipe *g* and cocks *g' g'* to the vessel *c*. The vessels *c* and *d* are connected to the pump *a* by the pipe *h* and cocks *h' h'*. The vessels *b* and *c* are connected by pipes *j* and cocks *j'*. *k k'* are pressure-gages on the vessels *c* and *d*.

The cloth is partially wound on the hollow spindle *f*, which is perforated to within a distance from the edge of the fabric equal to the total thickness of the layers of cloth on it. The spindles are placed in the vessel *d*, which is then closed. The pump *a* is started, the cock *h'* being open and the cocks *g' g' h'*

closed. When the pressure-gage *k'* shows that a good vacuum has been obtained in the vessel *d*, the cock *h'* is closed. While a vacuum is being formed in *d* one of the cocks *j'* is opened to fill the vessel *c* with gas from one of the tubes *b*. When the gage *k* shows atmospheric pressure in the vessel *c*, the cock *j'* is closed. The cocks *g'* and *g'* are next opened, and the gas at a low pressure passes from the vessel *c* to the vessel *d* through the fabric. The cock *h'* is only used for forming a vacuum in *c* at the commencement—i. e., just before gas is first admitted. After that the vessel *c* will contain gas at all times.

The most important feature of our invention resides in providing means for causing the sulfurous-acid gas to enter the fabric-containing vessel without pressure, and it is for this reason that we employ the intermediate vessel *c*, where the gas under pressure from the tubes *b* expands and is reduced to the ordinary atmospheric pressure. We have demonstrated that if the fabric is placed in the vessel *c* and a vacuum is produced there and afterward the gas is admitted direct from the gas-tubes *b* with a pressure of from three to four atmospheres bad results are obtained, white spots, blotches, and inequalities of bleaching are present on the fabric, and some places are not bleached at all; but when the gas is drawn slowly and naturally through the fabric it spreads evenly and is absorbed uniformly throughout the entire fabric. To illustrate the operation of the apparatus, we will suppose that communication between the intermediate vessel and the fabric-containing vessel is cut off and that vacuums are formed in both vessels. When the pressure in the vessel *c* is at the desired degree, gas is allowed to pass to the fabric-containing vessel *d*. The manometer on the fabric-containing vessel will descend a few degrees, (usually from 70° to 50°.) Then the valve *g'* is closed, and if the fabric remains two or three minutes in the cylinder the indicator will advance again to about 60° to 65°, showing that the gas is being absorbed in the fabric still in the vacuum. Too much gas will make the fabric yellow in shade. When the indicator remounts as the gas is being absorbed, it shows

that the fabric has received enough gas in order to be bleached, and the operation is completed.

What we claim is—

5 1. An apparatus for bleaching comprising a vessel containing sulfurous-acid gas under pressure, an intermediate vessel connected therewith in which the gas expands, a closed fabric-containing vessel connected with the
10 intermediate vessel and receiving gas at a low pressure therefrom, and means for producing a vacuum in the fabric-containing vessel.

2. An apparatus for bleaching comprising a vessel containing sulfurous-acid gas under
15 pressure, an intermediate vessel connected therewith in which the gas expands, a closed fabric-containing vessel connected with the intermediate vessel and receiving gas at a low pressure therefrom, and means for produc-
20 ing a vacuum in the fabric-containing vessel and in the intermediate vessel.

3. An apparatus for bleaching comprising a vessel containing sulfurous-acid gas under pressure, an intermediate vessel connected therewith in which the gas expands, means 25 for regulating the flow of gas to the intermediate vessel, a closed fabric-containing vessel, connected with the intermediate vessel and receiving gas at low pressure therefrom, means for regulating the flow of gas from the 30 intermediate vessel to the fabric-containing vessel, exhaust apparatus connected with the fabric-containing vessel and with the intermediate vessel, and means for opening and closing communication between the exhaust 35 apparatus and the fabric-containing and intermediate vessels.

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Witnesses:

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