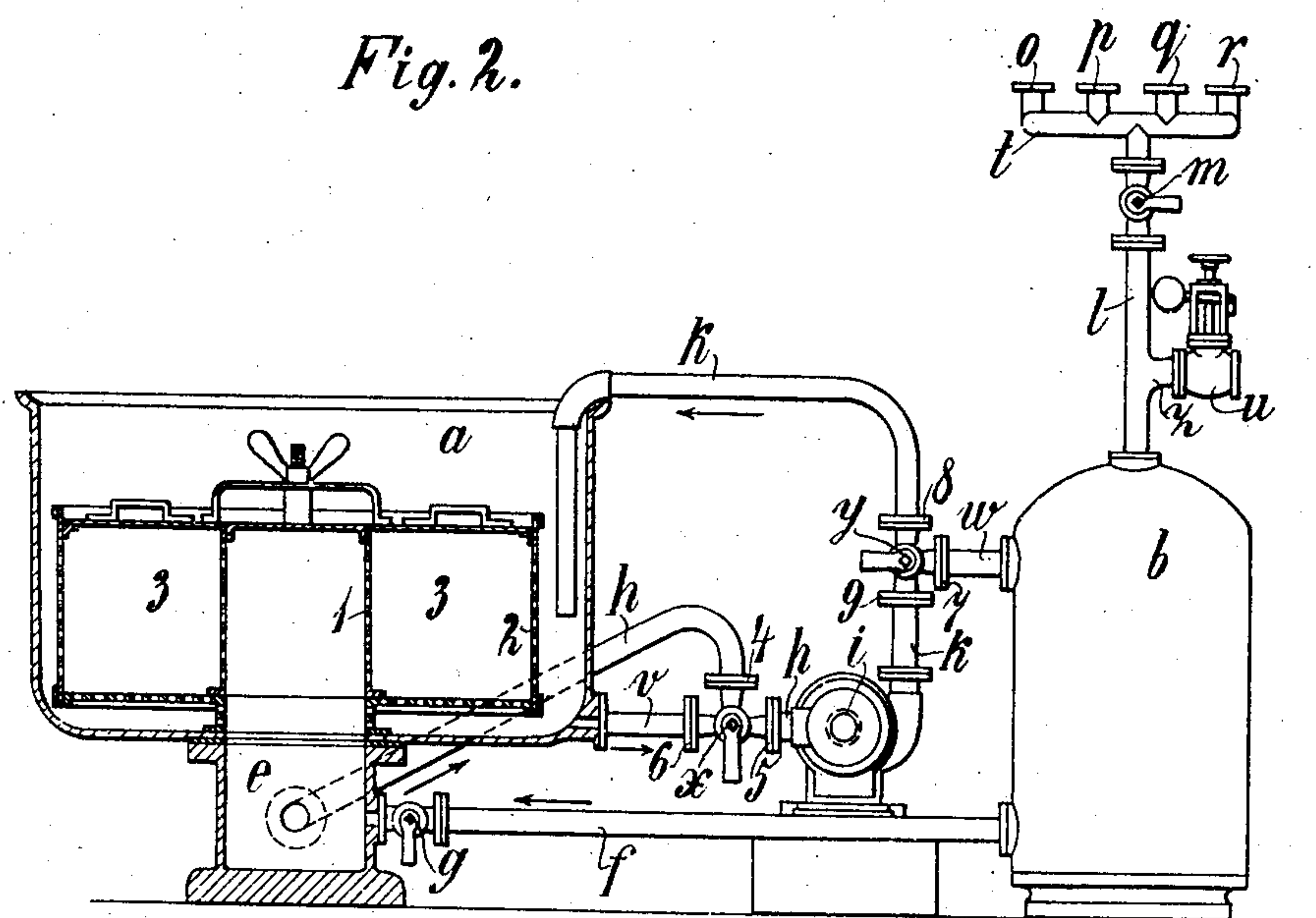
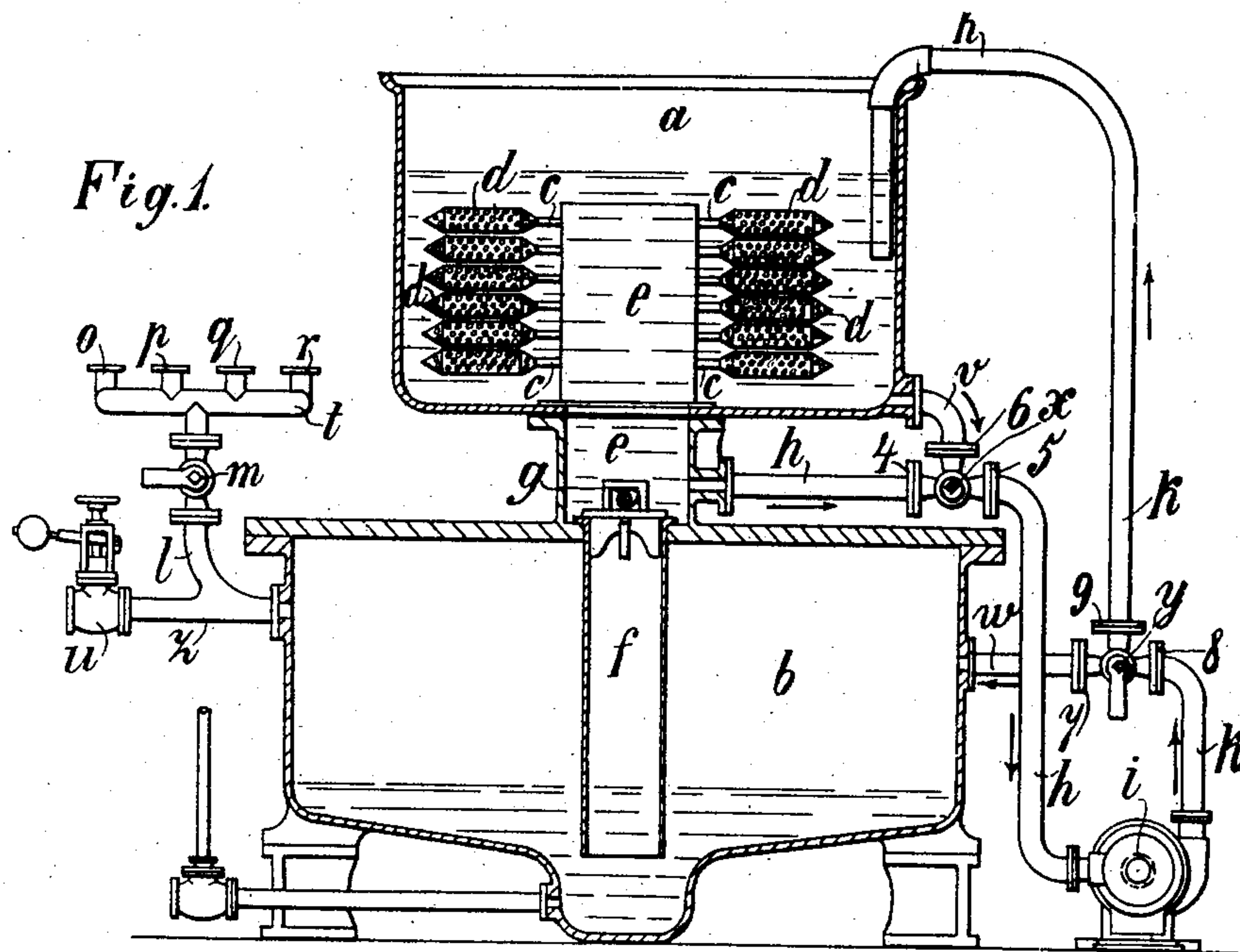


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PATENTED JULY 12, 1904.

O. VENTER.  
APPARATUS FOR DYEING.  
APPLICATION FILED JULY 11, 1902.

NO MODEL.



Witnesses  
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## UNITED STATES PATENT OFFICE.

OTTO VENTER, OF CHEMNITZ, GERMANY.

## APPARATUS FOR DYEING.

SPECIFICATION forming part of Letters Patent No. 764,966, dated July 12, 1904.

Application filed July 11, 1902. Serial No. 115,201. (No model.)

*To all whom it may concern:*

Be it known that I, OTTO VENTER, a subject of the German Emperor, residing and having my post-office address at 18 Helenenstrasse, Chemnitz, in the Kingdom of Saxony, Germany, have invented certain new and useful Improvements in Apparatus for Dyeing Loose Material, Fabrics, Hosiery, and the Like or for Corroding, Bleaching, &c., the Same, of which the following is a specification.

The present invention relates to an apparatus for dyeing loose material, fabrics, hosiery, and the like or for corroding, bleaching, &c., the same which renders it possible to use the expensive means—compressed air and vacuum—only at the commencement of the dyeing process—*i. e.*, for the preliminary dyeing—while the material to be dyed may be observed in an open dye-vat. During the further process, however, the bath is driven through the material by means of a pump with optional speed to alternately opposite directions. By the action of two three-way cocks a further advantage is gained, as it is only necessary to set the pump, in the present case a rotary pump, running in one direction only for the purpose of attaining an alternate circulation of the bath. The dye-vat, which is open at its top side, may naturally have any optional position in regard to the dyeing-bath reservoir. It may, for example, be arranged above or below it or in a line with it. For the purpose of disclosing this feature two different arrangements of the apparatus are represented in the annexed drawings, which differ inasmuch from each other that in Figure 1 the dye-vat *a* is situated above the dyeing-bath reservoir *b* and in Fig. 2 beside the latter.

As disclosed in Fig. 1, the apparatus consists of the open dye-bath *a*, dyeing-bath reservoir *b*, unions or connections *o p q r* for steam, vacuum, compressed air, and water, the rotary pump *i*, and the necessary pipes or conduits *l z h k* and stop-cocks or valves *m x g y*. The chamber or tube *e* of the dyeing-bath reservoir *b* can be closed or connected with the pipe *f*, extending into the bath-reservoir, by means of the valve *g* and is connected above with the short pipes *c* in the

usual manner. These short pipes *c* are connected with the perforated hollow bodies *d*, serving for reception of the material to be dyed, which is placed within them.

The second arrangement, as shown in Fig. 2, differs, as above stated, from that of Fig. 1 only in the arrangement of the dyeing-bath reservoir, which is not situated below the dye-vat, but beside the latter, whereby nothing is changed in the operation of the apparatus. It may be noted that the short pipe *f*, extending into the dye-vat *a* of the first arrangement, is constructed as a pipe *f* and the valve *g*, Fig. 1, which closes or opens the pipe *f*, as a cock *g*.

The principal new features of the arrangements in Figs. 1, 2 are the three-way cocks *x* and *y* in the pipes or unions *h* and *k*. Three-way cock *x* is connected with the dye-vat *a* by means of pipe *v*, while three-way cock *y* communicates with the dyeing-bath reservoir by means of pipe *w*. These three-way cocks *x* and *y* can both in Figs. 1 and 2 be adjusted in such a manner that it is possible to attain the communication *e h x h i k y k a* for the circulation of the dye-bath, while another time the way *a v x h i k y w b* can be taken for this purpose. An overpressure is preserved in the dyeing-bath reservoir *b* by means of steam or compressed air. The height of this overpressure can be adjusted according to the material to be dyed and be kept at a constant height during the dyeing process. This is attained by means of the reduction-valve *u* communicating with the reservoir *b* through pipe *z* or by any other suitable means.

The operation of both apparatus shown in Figs. 1 and 2 is in every respect the same and may therefore be explained in the following for both arrangements together. When the textile fibers have been brought onto the hollow bodies *d*, Fig. 1, or filled into the baskets 3 and the reservoir *b* has been filled with a solution of coloring-matter, the valve *g* is opened and the three-way cocks *x*, *y*, and *m* are so adjusted that the connection between the pipes 4 5 and 4 6 and between 7 8 and 7 9 is interrupted, while that between pipes *l t* is effected. Then by the alternate connection of the short pipe *t* with the pressure air or vacuum-con-



duit the solution of coloring-matter contained in the reservoir *b* in Fig. 1 is forced from within outward by way of the short tubes *c*, hollow bodies *d*, and through the material arranged on the latter or, as in Fig. 2, through the material between the two perforated cases 1 2 or drawn back in the opposite direction from without inward, thus removing the air contained in the chamber or pipe *e* and the textile fibers during the so-called "preliminary" dyeing. When by means of alternate pressing and sucking the preliminary dyeing is finished, valve *g* is closed and the rotary pump *i* started. By alternate adjustment of the three-way cocks *x* and *y*, so that now the connection *e h x h i k y k a*, then the connection *a v x h i k y w b*, is effected or the valve *g* closed, it is possible to force the dye-bath contained in the dye-vat *a* with optional speed sometimes through the material to be dyed from without inward and sometimes from within outward. In the first case—i. e., with closed valve *g*—the dye-bath is sucked from the reservoir *a* through the material into the chamber or pipe *e* and gets back into the vat *a* by way of *e h x h i k y k*. In the second instance—i. e., with the valve *g* open—the dye-bath is sucked up from the vat *a* by means of the rotary pump and forwarded by way of *k y w* to the reservoir *b*, from where it passes through pipes *f* and *e* by means of the constant counter-pressure to the material, which it passes in opposite direction than before.

Having now fully described my invention, I declare that what I claim is—

1. In an apparatus for dyeing loose material, fabrics, hosiery, and the like or for corroding, bleaching, &c., the same, the combination of a dyeing-bath reservoir *b*, of a dye-vat *a* open at its top, a hollow body *d* provided in said dye-vat forming a support for the reception of the material to be treated, a chamber *e* in communication with the hollow space of said support, a pipe *f* connecting the lower part of said chamber *e* to the lower part of the dyeing-bath reservoir, pipes for applying vacuum or compressed air, a rotary pump *i*, a pipe *k* leading from the rotary pump to the upper part of said dye-vat and a second pipe *h* leading from the rotary pump to the chamber *e* substantially as and for the purpose set forth.

2. In an apparatus for dyeing loose material, fabrics, hosiery, and the like, or for corroding, bleaching, &c., the same, the combination of a dyeing-bath reservoir *b*, a dye-vat *a* open at its top, a hollow body *d* provided in said dye-vat forming a support for the reception of the material to be treated, a chamber *e* in communication with the hollow space of said support, a pipe *f* connecting the lower part of said chamber *e* to the lower part of the dyeing-bath reservoir, pipes for applying vacuum or compressed air, a rotary pump *i*, a pipe *k* leading from the rotary pump to the upper part of said dye-vat and a second pipe leading from the rotary pump to the chamber *e*, of a pipe *w* discharging into the dyeing-bath reservoir, a three-way cock *y* connecting said latter pipe *w* to said pipe *k*, a pipe *v* leading to the lower part of the dye-vat and a second three-way cock connecting said pipe *y* to said pipe *h*, substantially as and for the purpose set forth.

3. In an apparatus for dyeing loose material, fabrics hosiery, and the like, for corroding, bleaching, &c., the same, the combination of a dyeing-bath reservoir *b*, a dye-vat *a* open at its top, a hollow body *d* provided in said dye-vat forming a support for the reception of the material to be treated, a chamber *e* in communication with the hollow space of said support, a pipe *f* connecting the lower part of said chamber *e* to the lower part of the dyeing-bath reservoir, pipes for applying vacuum or compressed air, a rotary pump *i*, a pipe *k* leading from the rotary pump to the upper part of said dye-vat and a second pipe *h* leading from the rotary pump to the chamber *e* of a pipe *w* discharging into the dyeing-bath reservoir, a three-way cock *y* connecting said latter pipe *w* to said pipe *k*, a pipe *v* leading into the lower part of the dye-vat and a second three-way cock connecting said pipe *v* to said pipe *k*, a reduction-valve *u* and a pipe connecting said dyeing-bath reservoir to said reduction-valve, substantially as and for the purpose set forth.

In witness whereof I have signed this specification in the presence of two witnesses.

OTTO VENTER.

Witnesses:

MORRIS LIPMAN,  
FREDERICK J. SIETZMAN.