

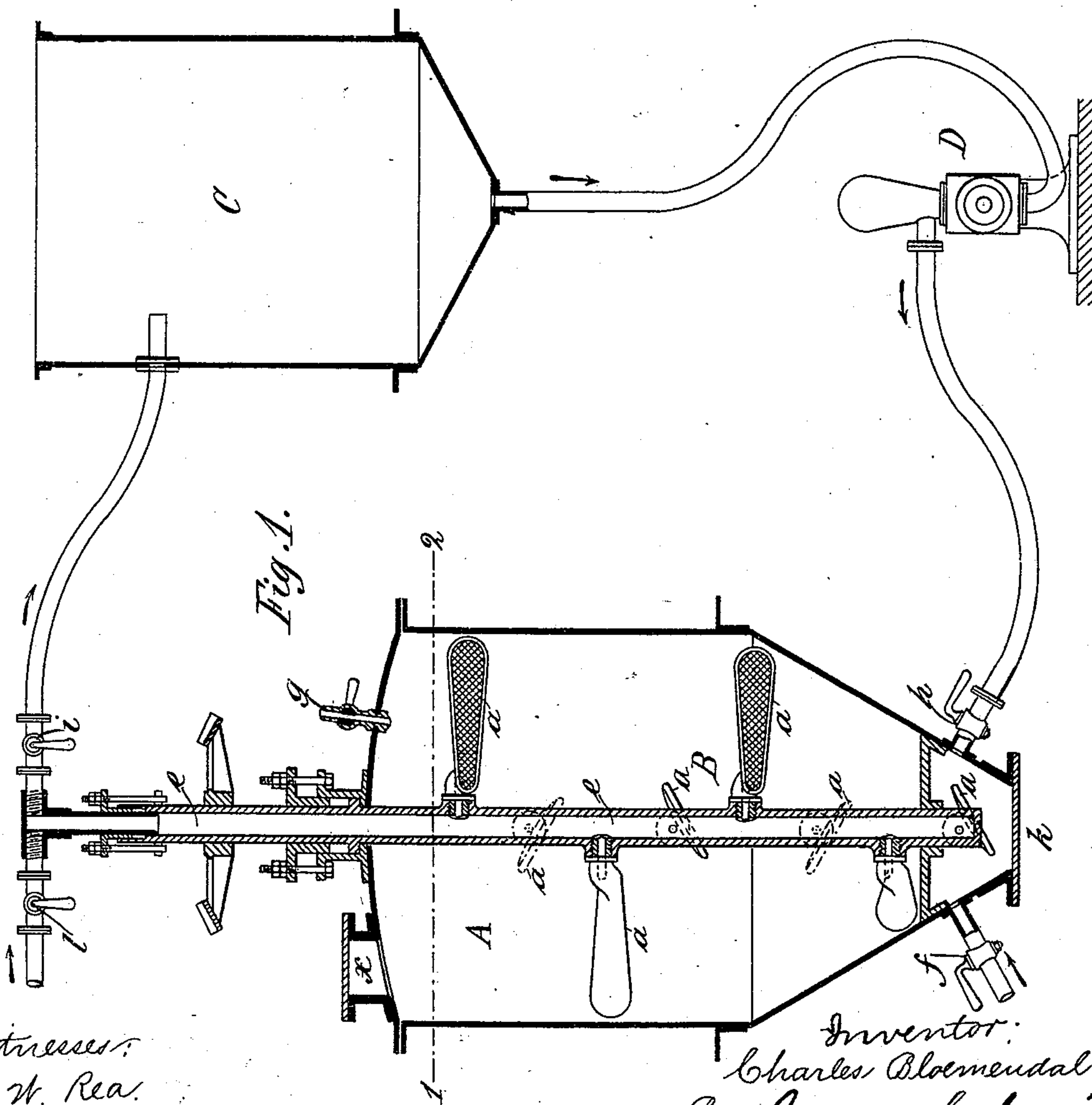
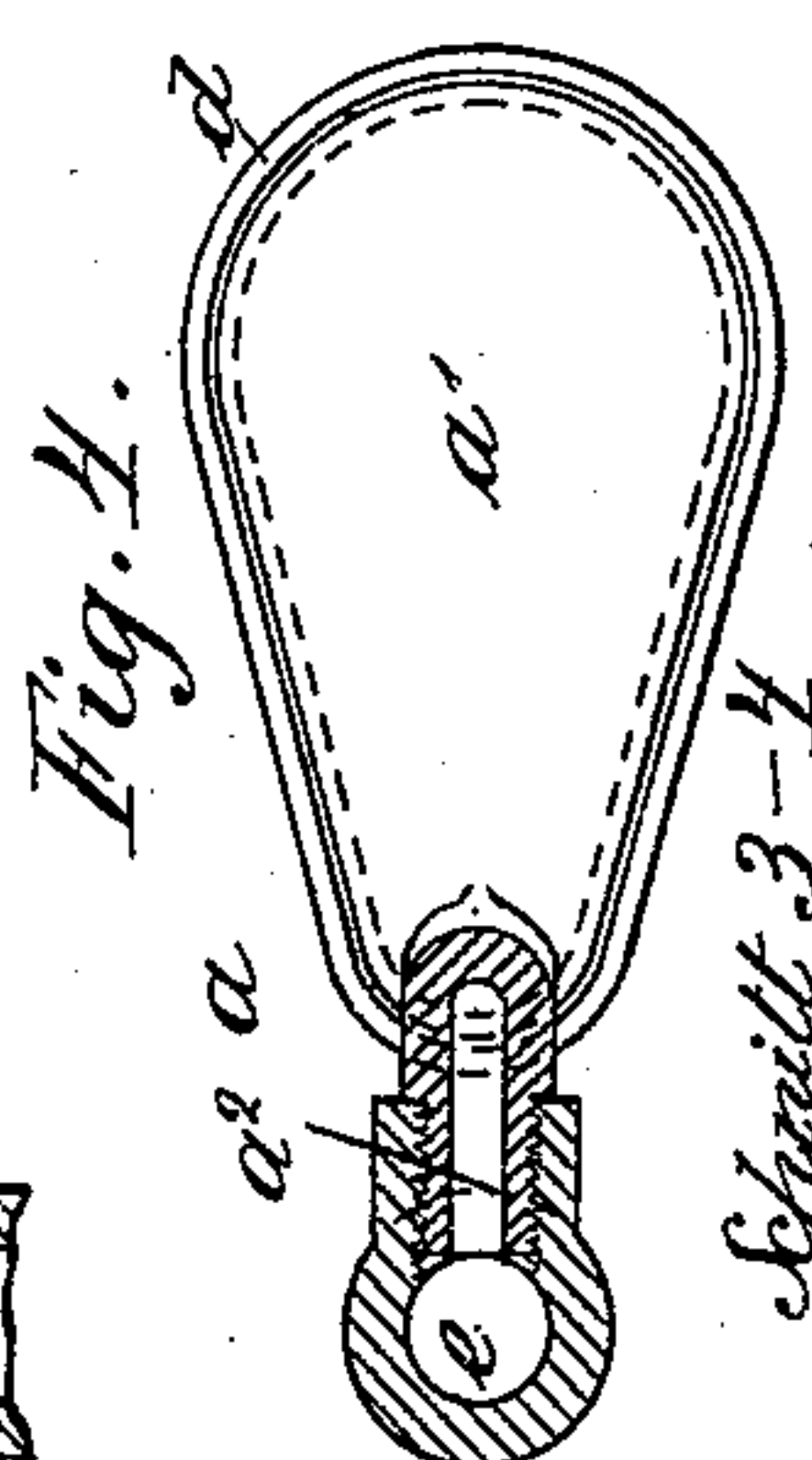
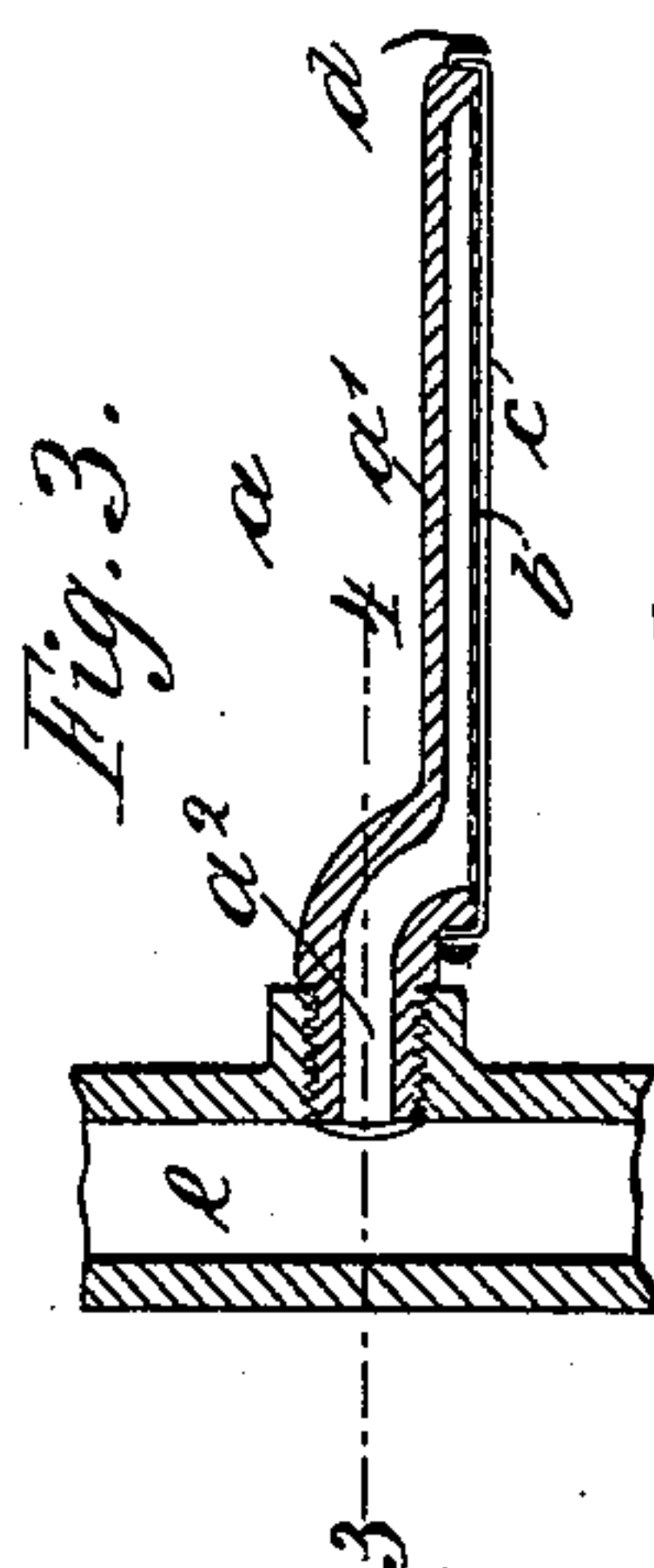
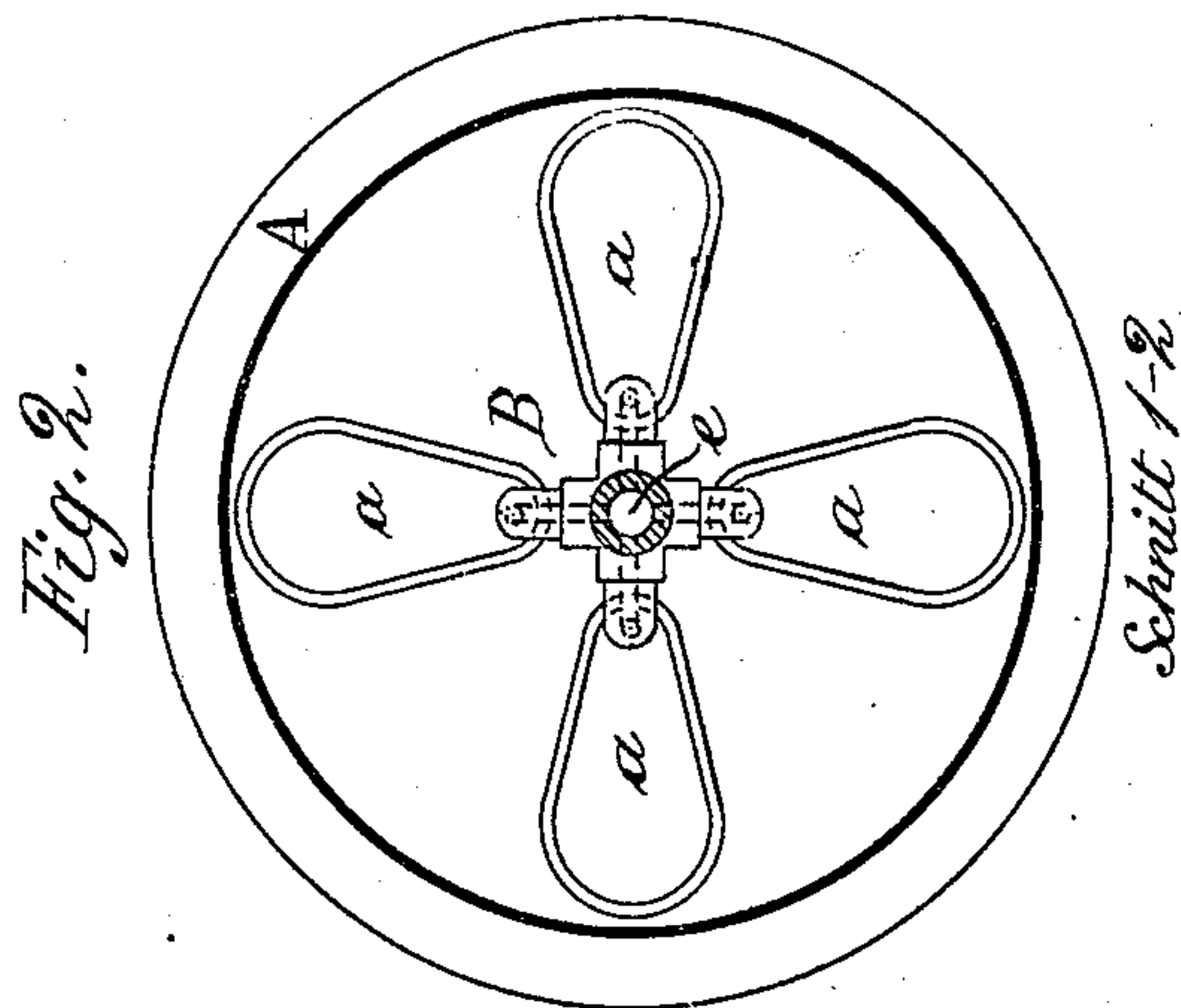
(No Model.)

C. BLOEMENDAL.

## PROCESS OF PRODUCING HYDRAULIC MORTAR.

No. 519,599.

Patented May 8, 1894.



Witnesses:  
G. W. Rea.  
J. A. Saul

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By James L. Norris  
Atty.



# UNITED STATES PATENT OFFICE.

CHARLES BLOEMENDAL, OF BERLIN, GERMANY.

## PROCESS OF PRODUCING HYDRAULIC MORTAR.

SPECIFICATION forming part of Letters Patent No. 519,599, dated May 8, 1894.

Application filed June 15, 1893. Serial No. 477,683. (No specimens.) Patented in Germany November 9, 1890, No. 58,461, and in England August 12, 1891, No. 13,616.

*To all whom it may concern:*

Be it known that I, CHARLES BLOEMENDAL, a subject of the Queen of the Netherlands, and a resident of Berlin, Germany, have invented certain new and useful Improved Processes of Producing Hydraulic Mortar, (for which Letters Patent have been obtained in Great Britain, No. 13,616, dated August 12, 1891, and in Germany, dated November 9, 1890, No. 58,461,) of which the following is a specification, reference being had to the accompanying drawings.

My invention relates to a process of and apparatus for producing hydraulic mortar from which the air is expelled. The interior air is withdrawn from the material (non-hydraulic cement and sand) for making the mortar by rinsing the same with water which does not contain air in order to effect a thorough adhesion of the minuted particles.

In the accompanying drawings I have shown how my said invention may be conveniently and advantageously carried into practice.

Figure 1 represents a sectional view of the entire apparatus. Fig. 2, is a plan view, taken on the line 1—2, Fig. 1, and Figs. 3 and 4 show details drawn to an enlarged scale of the vanes of the stirrer.

I employ an apparatus which comprises a mixing cylinder A provided with a stirrer B a water receptacle C and a pump D. The stirrer B is provided with vanes *a* each of which consists of a trough-shaped or hollow part *a'* over which is stretched a perforated plate *b* and a filter cloth *c* secured to the edge of the vane by means of a frame *d*. Each of the said vanes *a* is provided with a short tubular piece which is screwed into a boss formed on a hollow shaft *e* by which communication is established between said vanes and the hollow shaft *e*. The vanes are inclined in such a manner that they will exert a pressure on the forward movement upon the material, and thus more easily receive the air contained in the latter.

My process is carried out as follows, that is to say, the cylinder A is filled through a feed opening or manhole *x* with the dry material (cement and sand) to about three quarters of its capacity; it is then hermetically closed and water very slowly admitted from below

through a pipe *f* provided with a cock. This water partially displaces the air contained in the material, which escapes through an air-cock *g* provided at the top of the cylinder. When the cylinder A is full the two cocks *f* and *g* are closed and a third cock *h* is opened; the stirrer B and the pump D being set in action at the same time. The pump forces the water, which is preferably boiled in order to free it as much as possible from air, from the receptacle C into the cylinder A. After a certain pressure has been produced in the cylinder another cock *i* included in an upper pipe connecting the hollow shaft with the water receptacle is opened, the pumping and stirring being continued. The water is saturated in the cylinder with air and passes through the filter cloths into the vanes *a*. By reason of the pressure exerted in the stirring by the vanes upon the material, the air passes rapidly into the vanes and with the water through the above mentioned tubular piece *a'* into the hollow shaft *e*, from which both pass through the upper pipe and cock *i* into the receptacle C. On leaving the upper pipe *i* part of the air taken up from the material escapes. The circulation is continued until the material is thoroughly mixed and has given off its air to a sufficient extent, then the material is removed from the cylinder through a lower opening *k*. The material washed away through the filter cloth passes from the receptacle C through the pump into the mixing cylinder; for this reason it is expedient to employ a membrane pump. A lixiviation of the material cannot take place, as the water in the said receptacle C is used again and again. If the filters of the vanes are to be cleaned, water is let in through one of the lower pipes hereinbefore referred to.

What I claim is—

1. The herein described process for producing hydraulic mortar, which consists in slowly saturating the material in a closed receptacle with water, maintaining a circulation of water, substantially free from air, through the material, whereby the air contained in said material is taken up, and conducting said air outside the receptacle, substantially as described.

2. The herein described process for produc-



ing hydraulic mortar, which consists in slowly saturating the material, in a closed receptacle, with water introduced from below, discharging the air thereby expelled, simultaneously stirring said material and maintaining a circulation of water, substantially free from air, therethrough, whereby the air contained in said material is taken up, and conducting said air outside the receptacle, substantially as described.

3. In apparatus for making hydraulic mortar, the combination of a cylinder A, a hollow

shaft *e* therein, trough-shaped vanes *a*, provided with filter cloths *c*, and communicating with the hollow shaft *e*, and a pump D for forcing water into the cylinder A, substantially as described.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

CHARLES BLOEMENDAL.

Witnesses:

J. LEMAN,  
A. SIEBER.