

No. 702,590.

Patented June 17, 1902.

J. W. REYNOLDS.  
PUMP.

(Application filed Mar. 21, 1901.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 2.

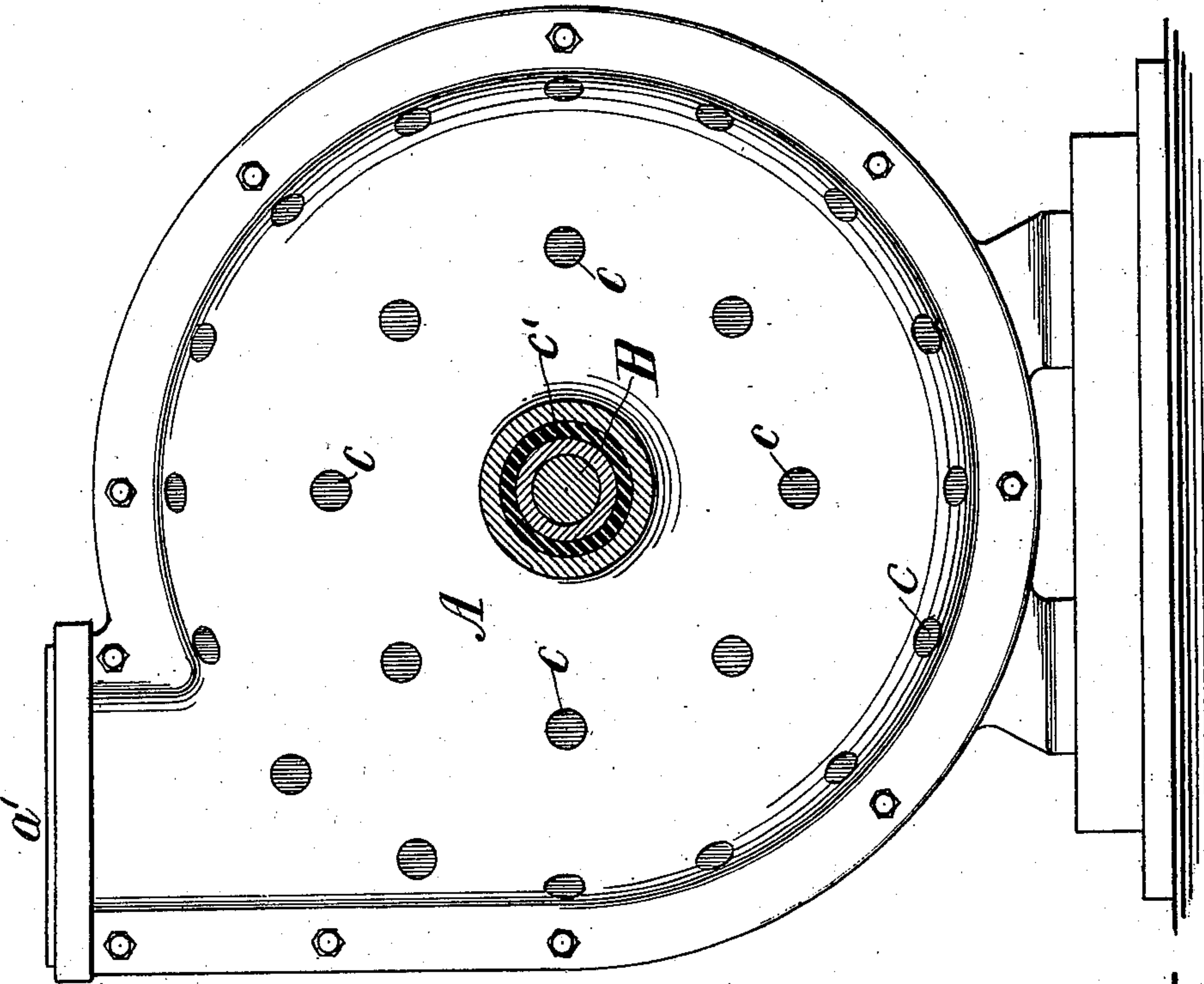
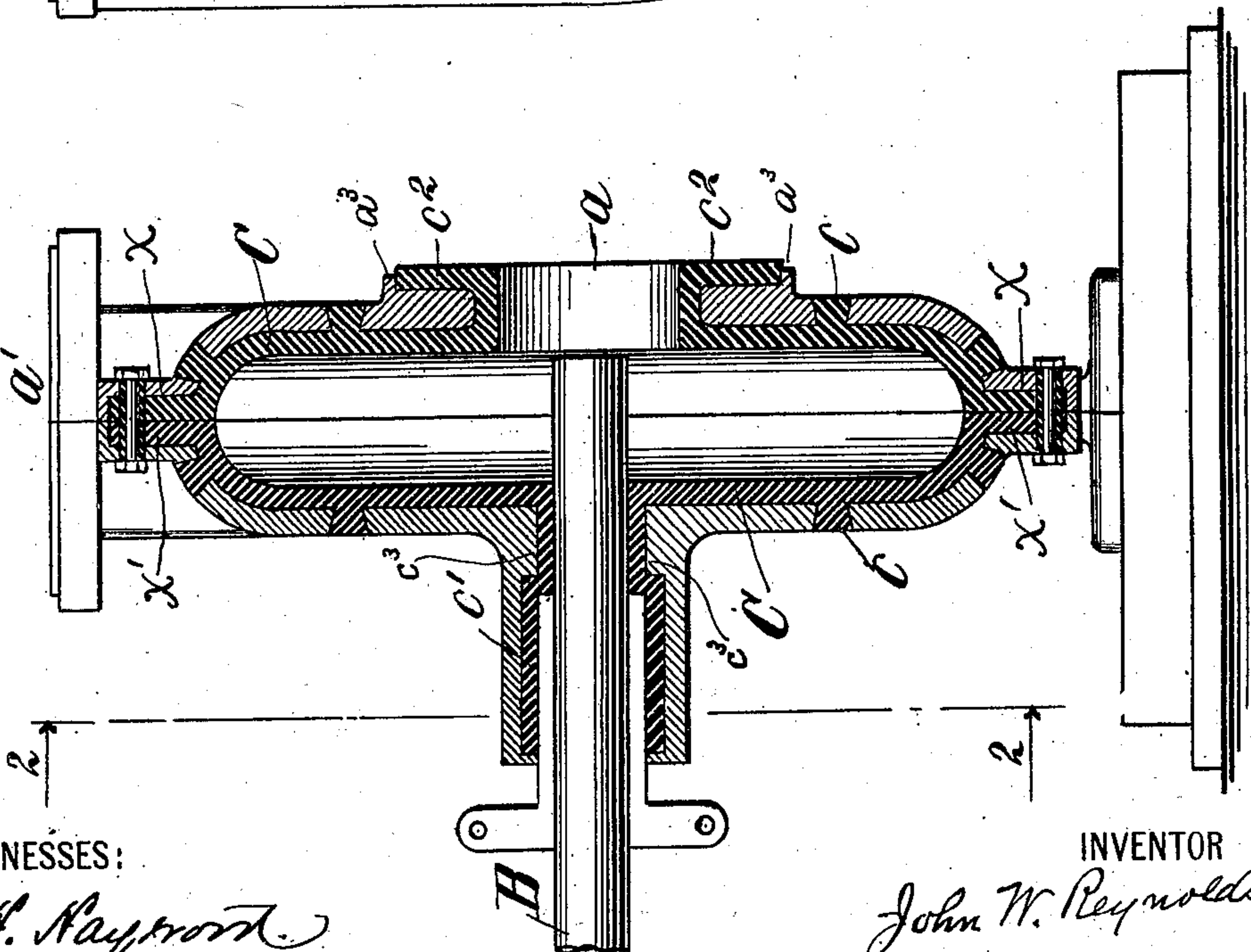


Fig. 1.



WITNESSES:

*D. H. Raymont*  
*C. F. Carrington*

INVENTOR

*John W. Reynolds*  
BY  
*James C. Chapin*  
His ATTORNEY

No. 702,590.

J. W. REYNOLDS.  
PUMP.

Patented June 17, 1902.

(Application filed Mar. 21, 1901.)

(No Model.)

2 Sheets—Sheet 2.

Fig. 5,

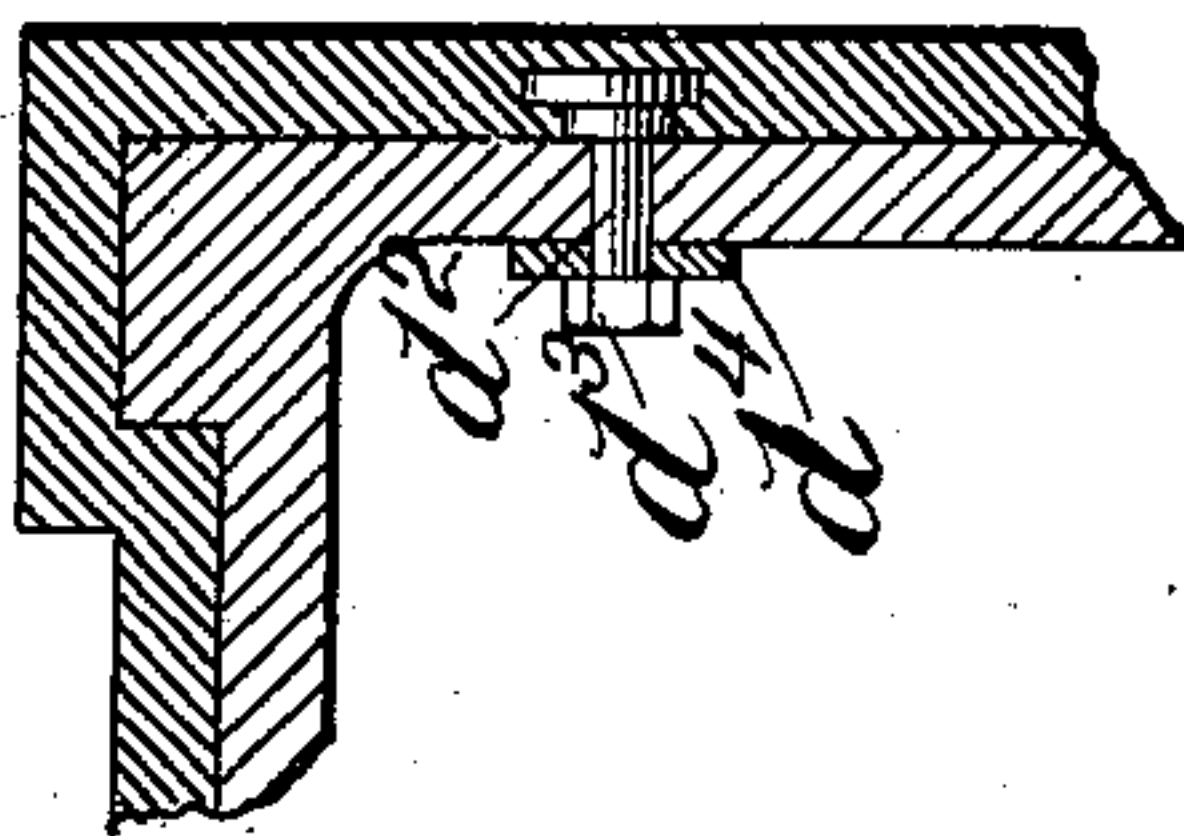


Fig. 4,

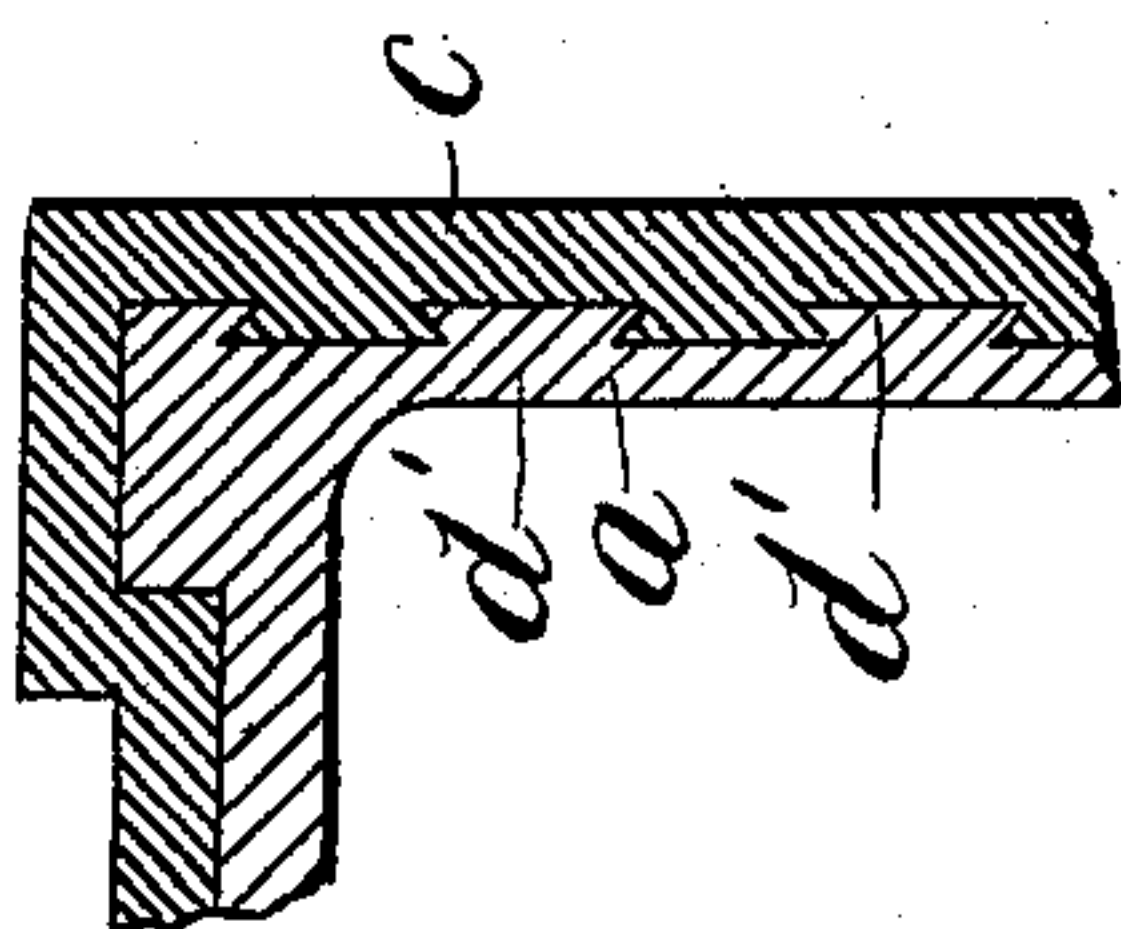
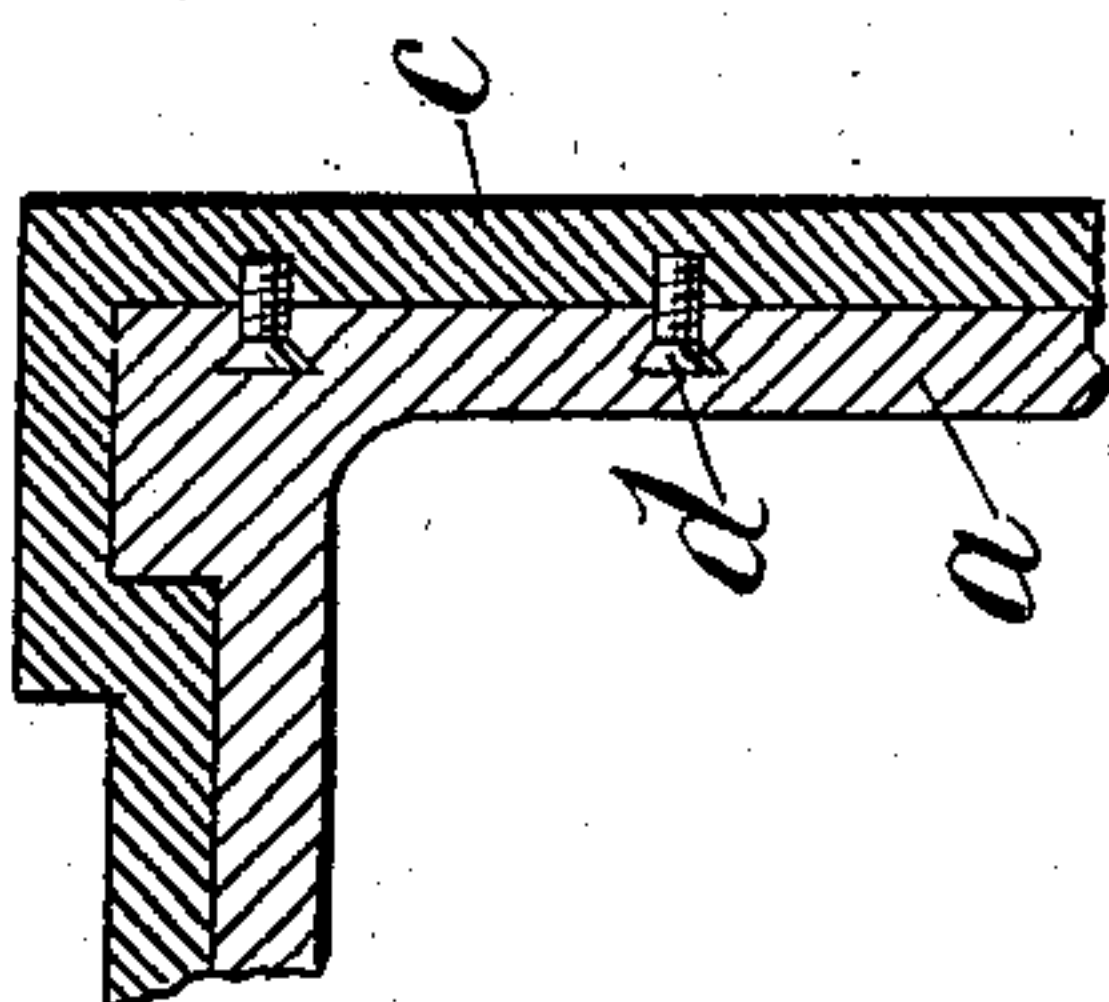


Fig. 3.



WITNESSES:

*D. H. Hayport*  
*C. F. Carrington*

INVENTOR

*John W. Reynolds*  
BY  
*J. C. Chapin*  
His ATTORNEY



# UNITED STATES PATENT OFFICE.

JOHN W. REYNOLDS, OF BALLSTON SPA, NEW YORK.

## PUMP.

SPECIFICATION forming part of Letters Patent No. 702,590, dated June 17, 1902.

Application filed March 21, 1901. Serial No. 52,180. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN W. REYNOLDS, a citizen of the United States of America, and a resident of Ballston Spa, Saratoga county, New York, have invented certain new and useful Improvements in Pumps, of which the following is a specification.

My invention is an improved casing for a centrifugal pump which is especially designed for pumping sulfurous acids.

It consists in the peculiar construction and arrangement of devices hereinafter fully described and claimed.

In the accompanying drawings, Figure 1 is a cross-sectional view of a centrifugal pump embodying one form of my invention. Fig. 2 is a side elevation of the pump shown in Fig. 1 and partly in section, the section being taken on the line 2 2. Figs. 3, 4, and 5 are detail sections illustrating modifications of my invention.

A represents the casing of a centrifugal pump which is made in sections, the sections being bolted and having an annular radial groove X formed between them. The casing is of the kind usually employed in this class of pumps, and it has the usual inlet-opening  $\alpha$  and in the centers of its respective sections the outlet-opening  $\alpha'$  and the stuffing-box  $c'$ , the latter being formed integrally with one of the sections and disposed opposite the opening. The stuffing-box  $c'$  is shouldered with an annular shoulder, as at  $c^3$ , and an annular shoulder  $\alpha^3$  is formed around the opening  $\alpha$ . B represents a shaft which has its bearing in said stuffing-box and on which is mounted the usual piston or fan. (Not shown.)

C represents a lining for the pump. This lining is of lead and is formed by casting it within the sections of the pump, as hereinafter described. In the preferred form of my invention the lining is held in place within the casing by means of projections  $c$ , which fit in openings formed in the casing. The projections  $c$  serve as anchors for the lining. The projections  $c$  are here shown as being tapered, as are also the openings in the casing. Preferably the projections are circular, and their greatest diameters are adjacent the outer surface of the casing. In other words, each projection and the opening in the casing constitute a dovetail mortise. The lining C

is continued into the stuffing-box  $c'$ , where it engages the shoulder  $c^3$ , and about the flange of the inlet  $\alpha$ , as indicated at  $C^2$ , where it engages the shoulder  $\alpha^3$ . The openings through which the connection-bolts for the sections pass are also lined.

The lining C is formed within the casing by the process of casting. The sections, with their openings, constitute a part of the mold and act as chills. Any desired metal core may be used in connection with the casing-section to obtain the requisite thickness for the lining. The material of the lining in its molten state is then poured into the mold in the usual manner. It will be observed that at this time the securing projections  $c$  will be formed in the openings of the sections. After one section has been supplied with the lining it is used as a part of the mold, in which an adjacent casing-section is embodied. The purpose of this is that when the molten metal is poured into the second mold it will run to the section already lined at that annular flanged portion X' in the groove X, where a joint of the lining is to be made. Thus perfect joints for the lining can be made between adjacent sections. By thus forming the lining by casting the same in the sections of the pump, using said sections as chills, and forming the projections  $c$  integrally with the lining the latter is so firmly secured in place as to effectually prevent the same from bulging or creeping, which is a matter of importance, owing to the fact that sulfurous acids are pumped at different temperatures, and hence there is a tendency of the lead lining to contract and expand. The shouldered openings in the centers of the casing-sections being engaged by the lining, as hereinbefore stated, it will be understood that the central portions of the lining are immovably secured to the casing.

Having thus described my invention, I claim—

1. A pump-casing comprising a pair of hard-metal sections bolted together, an opening  $\alpha'$  being formed in one side of the meeting portions of said sections, one of the latter having a central inlet shouldered opening  $\alpha$  in one side of the casing and the other having the centrally-disposed stuffing-box  $c'$  having an annular shoulder therein in the opposite

side of the casing, said sections being further provided with outwardly-flared openings, said casing having a lead lining fast therein and formed integrally with tapered projections  
5 in said flared openings, said lining being continued into the said stuffing-box and through the said inlet-opening and engaged with the shoulder of the stuffing-box and inlet-opening, substantially as described.  
10 2. A centrifugal-pump casing, of hard material having a shouldered inlet-opening in one side, a shouldered stuffing-box in the

other, and a lining of soft material, said lining having integral portions extending into and through said opening and stuffing-box 15 and engaged with the shoulders thereof, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOHN W. REYNOLDS.

Witnesses:

FRANK WHALEN,  
WM. A. MEHAN.