

(No Model.)

C. CURTIS & N. M. JONES.  
BLOW-OFF PIPE FOR PULP DIGESTERS.

No. 513,892.

Patented Jan. 30, 1894.

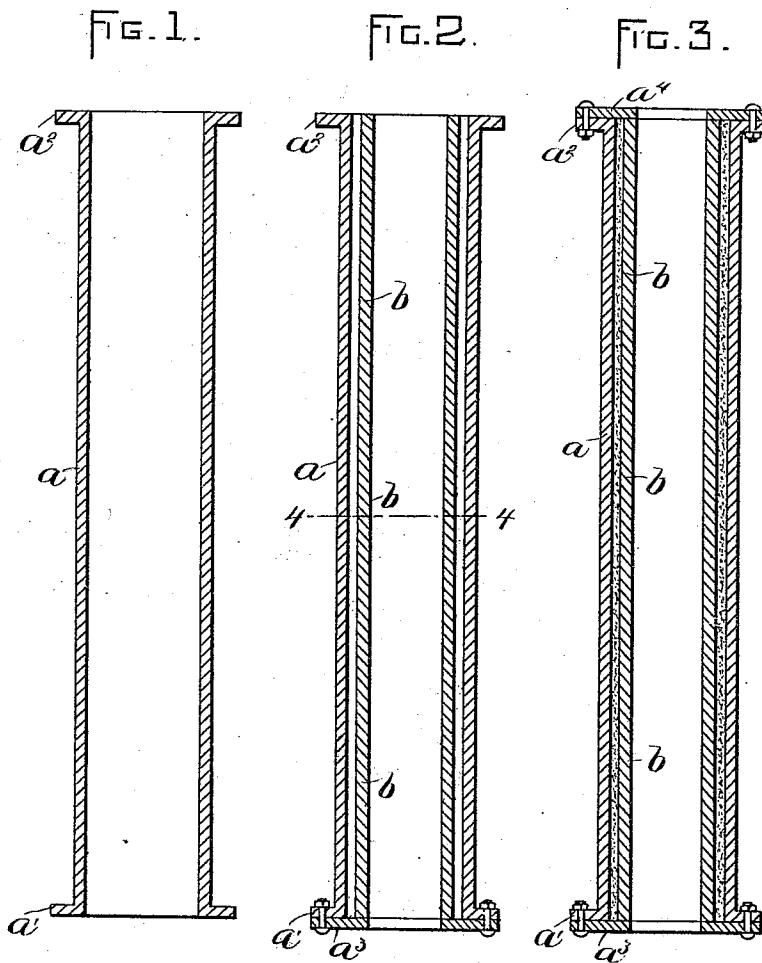
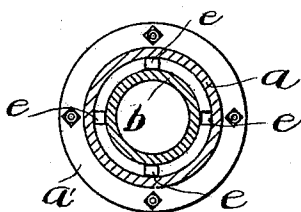


FIG. 4.



WITNESSES:

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# UNITED STATES PATENT OFFICE.

CHARLES CURTIS, OF NEWTON, MASSACHUSETTS, AND NATHANIEL M. JONES, OF BANGOR, MAINE.

## BLOW-OFF PIPE FOR PULP-DIGESTERS.

SPECIFICATION forming part of Letters Patent No. 513,892, dated January 30, 1894.

Application filed November 19, 1892. Serial No. 452,535. (No model.)

*To all whom it may concern:*

Be it known that we, CHARLES CURTIS, of Newton, in the county of Middlesex and State of Massachusetts, and NATHANIEL M. JONES, of Bangor, in the county of Penobscot and State of Maine, have invented certain new and useful Improvements in Blow-Off Pipes for Pulp-Digesters, of which the following is a specification.

This invention relates to pipes which are used to remove from pulp digesters the charge of cooked pulp and the acid solution used to cook or disintegrate the pulp; and it has for its object to provide an improved construction, whereby a blow-off pipe may be produced at a reasonable expense, which shall be strong and durable and free from liability to be injuriously affected by the acid solution.

To these ends, the invention consists in the improvements which we will now proceed to describe and claim.

Of the accompanying drawings, forming part of this specification: Figure 1 represents a longitudinal section of the external portion of our improved blow-off pipe. Fig. 2 represents a longitudinal section, showing our improved pipe partly completed. Fig. 3 represents a longitudinal section of the completed pipe. Fig. 4 represents a section on line 4—4, Fig. 2.

The same letters of reference indicate the same parts in all the figures.

In carrying out our invention, we employ an external shell or casing, consisting preferably of a length of cast or wrought iron pipe  $a$ , having at its ends flanges  $a^2$ . To one of said flanges we attach, by bolts or rivets, a non-corrosive metallic ring  $a^3$ , which is formed to project inwardly from the inner surface of the pipe, and constitutes a flange. The pipe being placed in a vertical position, with the end having the ring  $a^3$  at the bottom, we insert in the pipe a lining composed of any suitable number of lengths  $b$  of cement pipe, the cement being preferably composed of a mixture of Portland cement, quartz and silicate of soda, although we do not limit ourselves to this composition. We prefer, also, to compress the cement while it is being formed into the tubular lengths  $b$ , as we find that by com-

pression we make the material uniformly dense and prevent the liability of the passage of the acid solution through it. The cement sections are made of smaller diameter than the inner surface of the pipe  $a$ , and they are placed in said pipe in such manner as to leave an annular space between the cement sections and the pipe  $a$ . We prefer to insert wooden strips  $e$  between the pipe  $a$  and the cement sections, to make said sections concentric with the inner surface of the pipe. The joints between the cement sections are preferably cemented while the lining is being built up. After a sufficient number of the cement sections has been inserted, we prefer to pour a filling of liquid cement into the annular space between the cement sections and the pipe, the strips  $e$  being removed during the operation of pouring in the said filling. After this, we attach to the flange  $a^2$  another non-corrosive metallic ring  $a^4$ , which is similar to the ring  $a^3$  and forms a flange bearing upon the opposite end of the cement lining, as shown in Fig. 3. This completes the construction of the pipe, which is ready for use as soon as the cement filling has suitably hardened.

When the pipe is to be used in connection with a pulp digester, we make the rings  $a^3$   $a^4$  of lead, phosphor-bronze, or other suitable non-corrosive metal, and may secure the pipe to such digester by having the fastening bolts or rivets extend through the flanges and rings and a suitable corresponding flange or seat on the digester.

We do not limit ourselves to making the cement lining in a plurality of sections, as, in some cases, one section or length  $b$  of cement pipe will be sufficient.

We do not limit ourselves to the use of the described improvement in blow-off pipes, as the same may be applied to steam pipes, and particularly the large-sized pipes used for conducting steam considerable distances in large volumes. A steam pipe thus constructed will prevent condensation of steam in the pipe or radiation of the heat from the pipe to a very great extent.

We claim—

A pipe consisting of an external metal shell,

a lining composed of molded cement pipe inserted in said casing and separated therefrom, a continuous filling of cement interposed between said lining and casing, and rings of non-corrosive metal extending across the ends of the space between the metal shell and pipe lining for retaining the lining and filling within the shell, substantially as described.

In testimony whereof we have signed our

names to this specification, in the presence of two subscribing witnesses, this 11th day of November, A. D. 1892.

CHARLES CURTIS.  
NATHANIEL M. JONES.

Witnesses:

C. F. BROWN,  
A. D. HARRISON.