

(No Model.)

C. CURTIS & N. M. JONES.  
PAPER PULP DIGESTER.

No. 485,808.

Patented Nov. 8, 1892.

FIG. 2.

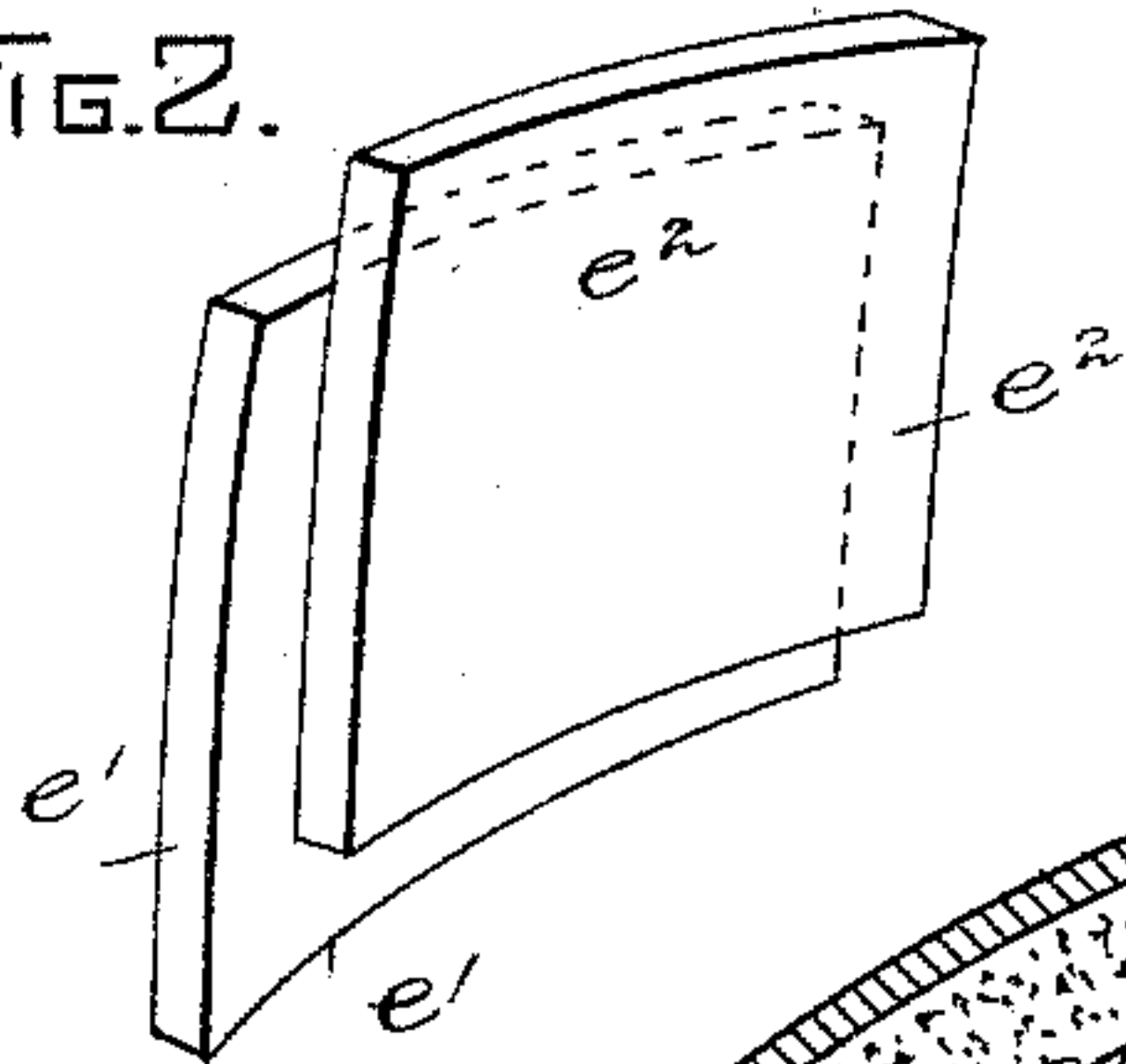
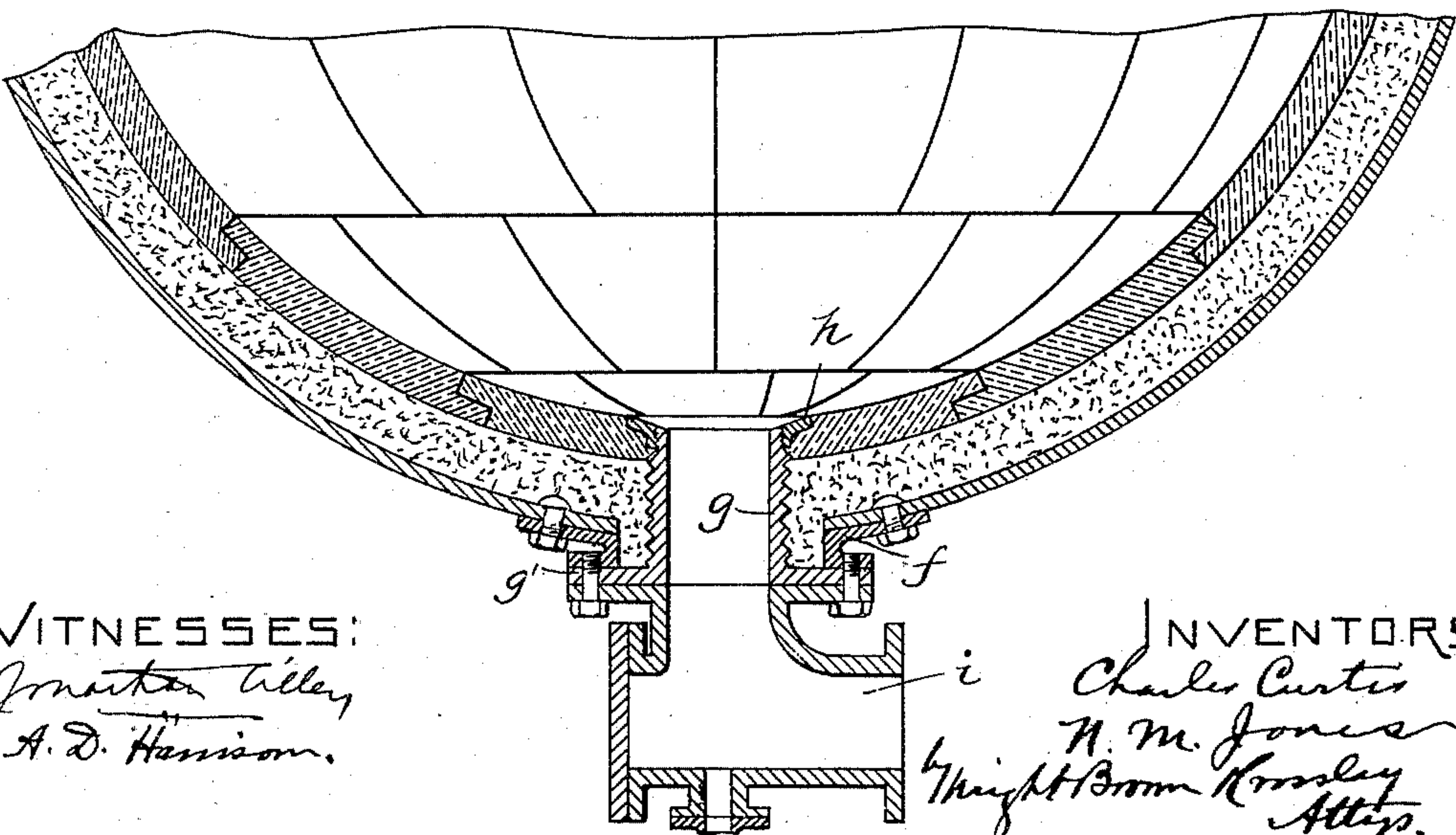
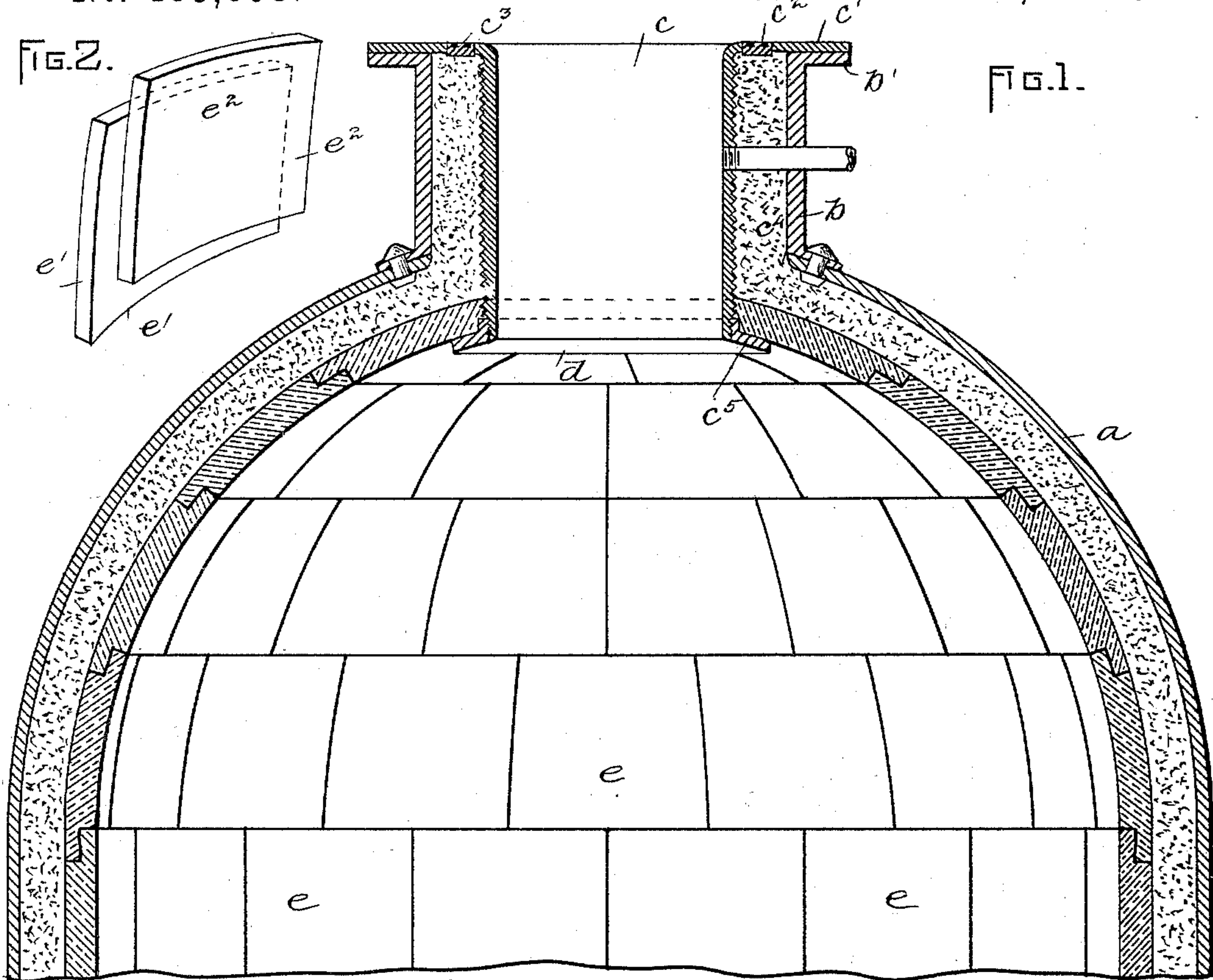


FIG. 1.



WITNESSES:  
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# UNITED STATES PATENT OFFICE.

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

## PAPER-PULP DIGESTER.

SPECIFICATION forming part of Letters Patent No. 485,808, dated November 8, 1892.

Application filed April 2, 1892. Serial No. 427,471. (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 Paper-Pulp Digesters, of which the following is a specification.

This invention has reference to digesters in which wood chips are cooked in the manufacture of paper-pulp, and particularly to digesters composed of a metal shell lined with cement.

The invention consists in certain improvements, hereinafter described and claimed, relating to the construction of the digester at the ends of manholes.

Our improved digester comprises an outer shell or casing of suitable material which is provided on its interior surface with an acid-resisting composition, to which is applied another lining of any desirable cement, preferably in slabs or blocks, and having tongues and recesses. The top of the shell or casing is provided with an upwardly-extended collar having a flange thereon, which is adapted to serve as a support or bearing for a downwardly-extended cylinder or manhole, having a circular shoulder or flange on the top thereof, which is adapted to rest upon the flange of the upwardly-extending collar of the shell and act as a support for the cylinder or manhole. This cylinder is considerably smaller in diameter than the collar and is provided on its outer periphery with corrugations, except at its lower portion, which is screw-threaded to receive another flange for a purpose presently to be explained. The lower portion of the shell or casing is provided with similar fittings, although of much smaller dimensions, through which suitable connection is made to a blow-off valve for the discharge of the cooked pulp.

In the drawings forming part of this specification, Figure 1 is a central vertical section of our improved digester. Fig. 2 is a detail in perspective of one of the slabs or blocks constituting the inner lining before mentioned.

The shell *a* is composed of any suitable

composition to give the requisite durability and rigidity to the structure. On the upper portion thereof collar *b* is riveted or otherwise secured, and has flange *b'*, serving as a support for cylinder *c*. Cylinder *c*, smaller in diameter than collar *b*, has also a radiating flange *c'*, adapted to rest upon flange *b'*, and extends downwardly through collar *b* and into the shell *a* for a short distance. This cylinder *c* may be of any suitable acid-resisting material—such as aluminum, phosphor-bronze, &c.—and may be secured in any suitable manner to flange *b*, the flange *c'* having a desired number of perforations, as *c<sup>2</sup> c<sup>3</sup>*, in which plugs may be inserted, said plugs being provided with stops to serve as grips for a wrench or appliance used to insert and remove the plugs, the removal of the plugs enabling the cement to be poured in through the openings *c<sup>2</sup> c<sup>3</sup>*. The outer periphery of cylinder *c* has corrugations *c<sup>4</sup>* upon the greater portion of its surface, and upon the lower end thereof screw-threads *c<sup>5</sup>*. Another flange *d*, internally screw-threaded, is inserted upon this lower end and adapted to make a tight joint with the top overhanging blocks composing the inner lining.

The lower portion of the shell *a* is provided with fittings somewhat similar to the above. Flange *f* is detachably secured to the shell against which rests flange *g'* of tube *g*, also of acid-resisting material, and provided with corrugations and with screw-threads to accommodate flange *h*. Suitable connections are made, as at *i*, with a blow-off valve to free the digester of cooked pulp. The inner lining is composed of a series of four-sided slabs or blocks *e*, two adjacent sides of the same having a portion of the edges recessed on one surface and the other two adjacent edges similarly recessed on the opposite side, thus forming on the four sides tongues *e' e'* and recesses *e<sup>2</sup> e<sup>2</sup>*. Between these tongues and recesses when the blocks are in place is a packing of any suitable acid-resisting material. These blocks *e* are composed of any suitable acid-resisting material which will not be affected by the action of the chemicals used. The blocks are built up in the shell *a*, as shown in Fig. 1, closely around cylinder *c* and tube *g*, the outer lining being filled in and



built up as the blocks *e* are put in place. The top block is supported in its place by flange *d*, after which the cement of the outer lining is poured in through perforations *c*<sup>2</sup> *c*<sup>3</sup> to fill the annular space between collar *b* and cylinder *c*, and so protect the outer shell from any acid that might leak through the joints made by blocks *e* and flange *d*. It will of course be understood that flange *h* of tube *g* serves a similar purpose. A further advantage of this construction is that the cylinder *c* protects the edges of the lining *e* from injury from the falling of chips as the digester is filled. The plugs may then be placed in the perforations and secured in place.

We claim—

1. In a digester, the combination of an outer shell, an outwardly-extended collar thereon having a flange, an inwardly-extended cylinder in said collar concentric with and of a smaller diameter than said collar, a cement lining between the shell and cylinder, said cylinder being provided with corrugations to engage the said cement lining, an inner lining composed of molded blocks, and a flange

screwed upon the inner end of said cylinder and bearing on the inner surface of the inner lining, substantially as described.

2. In a digester, an outer shell *a*, an outwardly-extended collar *b*, having flanges *b'*, an inwardly-extended externally-corrugated cylinder *c*, having flange *c'*, provided with openings for the insertion of the cement lining between said cylinder and collar, an inner lining composed of molded blocks, a flange secured to the inner end of the cylinder and bearing on the said inner lining, and an outer cement lining interposed between the shell and cylinder and engaged with the corrugations of the cylinder.

In testimony whereof we have signed our names to this specification, in the presence of two subscribing witnesses, this 28th day of March, A. D. 1892.

CHARLES CURTIS.  
NATHANIEL M. JONES.

Witnesses:

JONATHAN WILEY,  
C. F. BROWN.