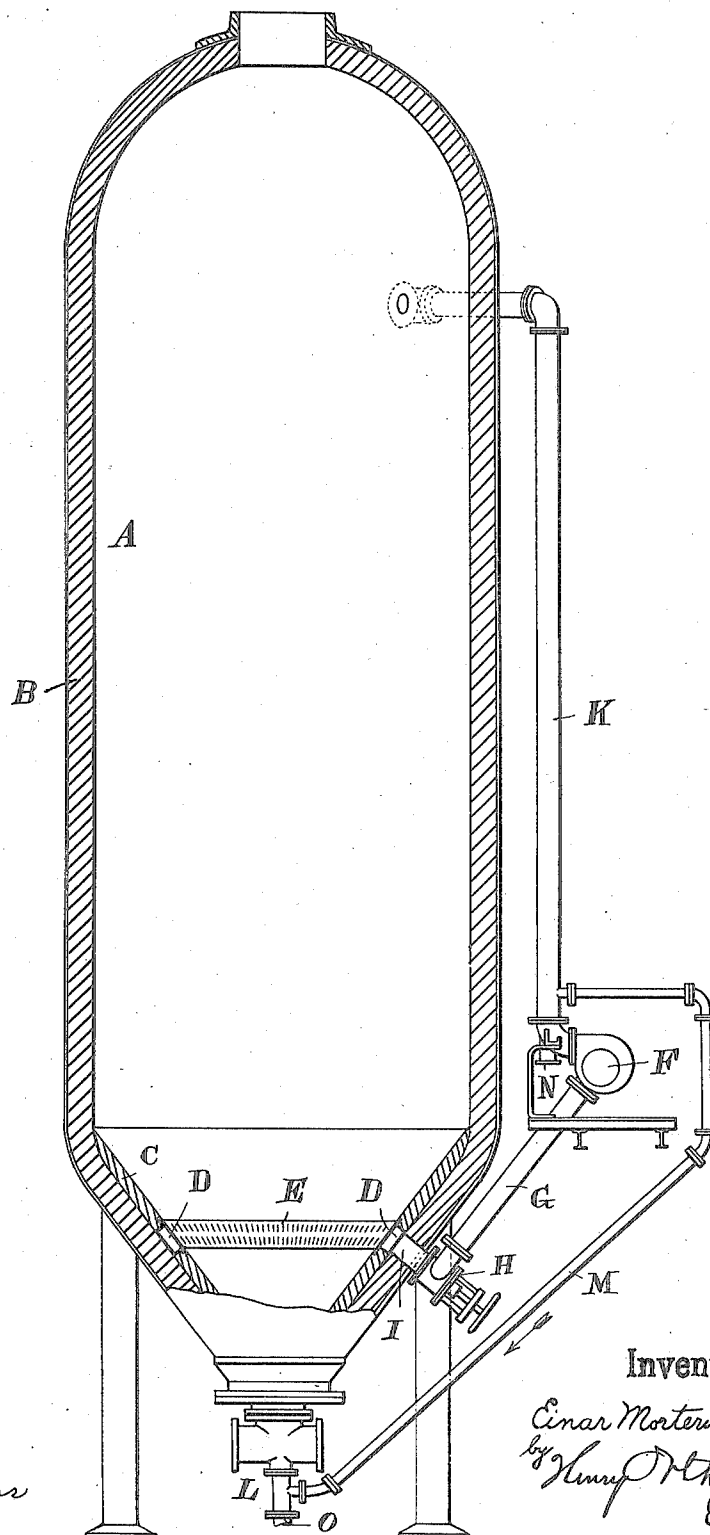


E. MORTERUD.  
MANUFACTURE OF CELLULOSE.  
APPLICATION FILED JUNE 28, 1909.

947,974.

Patented Feb. 1, 1910.



Witnesses.  
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# UNITED STATES PATENT OFFICE.

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## MANUFACTURE OF CELLULOSE.

947,974.

Specification of Letters Patent.

Patented Feb. 1, 1910.

Application filed June 28, 1909. Serial No. 504,848.

*To all whom it may concern:*

Be it known that I, EINAR MORTERUD, a subject of the King of Norway, residing at Torderød, near Moss, Norway, have invented certain new and useful Improvements in the Manufacture of Cellulose; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

My invention relates to the manufacture of cellulose and has for its object improvements in the method and means for carrying out the process.

It has been proposed to cause a circulation of the liquid in the digester by artificial means, that is to say, by way of a pump or the like.

My invention consists in improvements, whereby such circulation may be made use of in an effective, economical and in every respect satisfactory manner.

The annexed drawing shows one embodiment of my invention being a vertical section through a digester.

I shall first describe the drawing,—it being understood that my invention is not limited to the constructional features shown in the drawing,—and thereupon explain the chief features of invention particularly specified in the claims.

A is the digester and B the usual lining; b is an extra lining in the conical bottom part of the digester. D is an annular chamber or channel embedded in this extra lining the conical or otherwise formed inner face of the same being formed by a grating E serving as strainer.

F is a pump, the same being connected by means of the pipe G, the valve H and the short tube I to the chamber D. Another pipe K is carried up to the top part of the digester.

L is the blow off fitting at the bottom of the boiler and M is an auxiliary circulating pipe branching from the pipe K to the said piece L.

N and O are flanges for the connection of steam pipes.

The prior attempts of carrying out the digesting process with forced circulation have failed from several reasons. To obtain

a good result I have found that the circulation should be very lively; the pump as well as the pipes and the strainer should be made of not too small dimensions. The circulation has to be regulated according to the length of the digesting period; that is to say the quantity of steam led into the digester, the heat of which is taken up by the liquid, must have a certain relation to the circulation, as only in that manner it is possible to obtain the wholly uniform temperature through the whole contents of the digester. If steam is let in at the bottom of the digester, this must be in very limited quantity, otherwise a countercirculation may be caused disturbing the uniform downflow of the liquid. The steam should therefore mainly be admitted at N. Another point is that the liquid brought to circulation must move uniformly through the whole contents of the digester as it sinks down through the same from the top to the strainer. To secure this, it is necessary that the inlet at the top is arranged above the contents of the digester and that the strainer forming the outlet at the bottom has a large area and is arranged in a symmetrical position to the axis of the digester. On the other hand the strainer must be so arranged, that the digester may be emptied of its contents of pulp without any obstruction by any part of the strainer. To fill these several conditions, I have made the strainer in the form of an annular grating embedded in a lining in the bottom of the digester. The face of the strainer is in line with the inner surface of the extra lining C.

If the space below the strainer is of any considerable volume, that is to say, if the strainer is placed somewhat high above the outlet opening, an auxiliary circulation of liquid through this space should be provided for and to this end I have provided the pipe M.

### Claims.

1. In a cellulose digester the combination with the digester of a circulating pipe connecting the bottom part with the top part of the digester, a pump in the pipe, means to strain the solid contents from the liquid at the bottom connection of the pipe and means for introducing steam into the liquid in the pipe at the point between the pump and the top connection.

2. In a cellulose digester the combination with the digester of a circulating pipe, an

annular channel in the lining of the digester and a strainer forming the inner side of the channel.

3. In a cellulose digester a strainer adapted to be embedded in the lining of the digester and having an annular form corresponding with the inner surface of the bottom part of the boiler.

4. In a cellulose digester a strainer of annular form placed at some distance from the bottom of the digester, a chamber behind the strainer, a pump and a connection be-

tween the chamber and the pump, a pipe connection between the pump and the top part of the boiler and a pipe connection of less area between the pump and the lowest point of the boiler.

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

EINAR MORTERUD.

Witnesses:

HENRY BORDEWICH,  
MICHAEL ALGER.