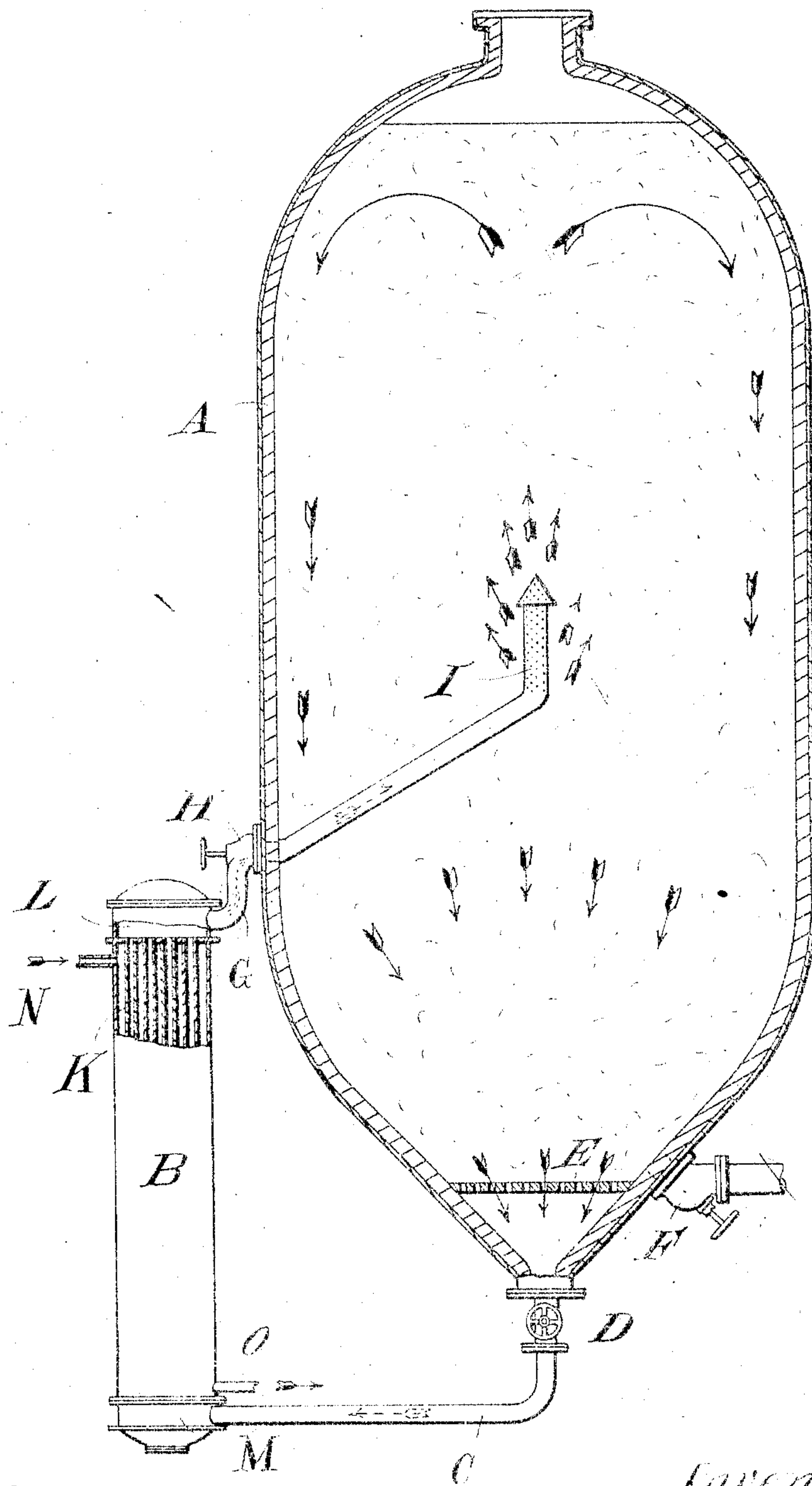


No. 883,328.

PATENTED MAR. 31, 1908.

E. MORTERUD.
MANUFACTURE OF CELLULOSE.
APPLICATION FILED APR. 11, 1906.



Witnesses.

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UNITED STATES PATENT OFFICE.

EINAR MORTERUD, OF CHRISTIANIA, NORWAY.

MANUFACTURE OF CELLULOSE.

No. 885,328.

Specification of Letters Patent.

Patented March 31, 1908.

Application filed April 11, 1903. Serial No. 311,192.

To all whom it may concern:

Be it known that I, EINAR MORTERUD, a subject of the King of Norway, and residing at Christiania, 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 or figures of reference marked thereon, which form a part of this specification.

My invention relates to the manufacture of cellulose and more especially to an improved method of carrying out the digesting operation by way of indirect heating.

Indirect heating of the cellulose digesters has hitherto been carried out either by way of steam coils inside the digester or by way of steam jacketed digesters. Neither of these methods are satisfactory and the present invention has for its object to provide a method of indirect heating, whereby the digesting process may be carried out in an efficient way with relatively small costs and without inconveniences of the kind connected with the indirect methods of heating hitherto used.

My invention consists in providing means whereby the liquid contents of the digester may be kept in circulation through the digester and a heating apparatus, by means of which the liquid is kept at a suitable temperature. In this way the contents of the digester is heated very rapidly and very evenly and the difficulties and inconveniences connected with the old systems of indirect heated digesters are avoided.

By having the heating devices altogether separated from the digester very obvious advantages are obtained; for instance, the heating devices may be repaired without causing any stopping of the constituted use of the digester, because it is an easy thing to replace the heating apparatus with an auxiliary one, or the heating apparatus may be made up of several independent sections, which may be so connected with each other that one section may be repaired while the other ones are in use. Generally of course the whole system of heating elements may be in use in starting the digesting operation, so that the temperature may be brought up to

the necessary height quickly, whereupon one or more elements may be cut out of the circulating system for being repaired or cleaned, whereupon the temperature is kept up by the rest of the elements. By heating the digester in this manner the circulation will be uniform and quick and therefore the digesting process will be finished in shorter time and no material will be overheated as is often the case, when steam coils are placed inside the digester. In this way it is also possible to use steam of a higher temperature.

The annexed drawing shows a digester system embodying the present invention.

A is the digester (shown in section) and B the heater, C is the connecting pipe between the lowermost point of the digester and the heating apparatus, D is a valve interposed in said connecting pipe and E is a strainer bottom, located inside of the digester, close beneath the discharge valve F.

G is a tube through which the top of the heating apparatus communicates with the interior of the boiler. This tube is also provided with a valve H and preferably with a perforated nozzle, which may be situated below and more or less distant from the top of the boiler, whereby the circulation of the liquid within the digester may be regulated and a suitable temperature attained throughout the contents of the digester.

In this constructional form of the system the heating apparatus is composed of an aggregation of tubes K inclosed in a cylindrical box and opening into chambers L, M respectively at the top and bottom of said box. The liquid passes through these tubes, and is heated by the steam entering at N and passing along between and around the tubes.

O is the discharge opening for the condensed water.

If a more rapid circulation is desired than that produced by the difference of temperature only, suitable mechanical means may be employed to attain this end.

Claims.

The combination with a pulp digester for the sulfite process, of a heating device outside of the digester, said heating device connected at its lower end to the lower end of the digester, and a discharge pipe from the upper end of the device into the digester above its bottom and sufficiently below the surface of the contents of the digester to pro-

duce an upwardly directed current of solution through the central part of the digester, maintaining the circulation through the heater and digester and thereby maintaining substantially a constant temperature throughout the contents of the digester, substantially as described.

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.