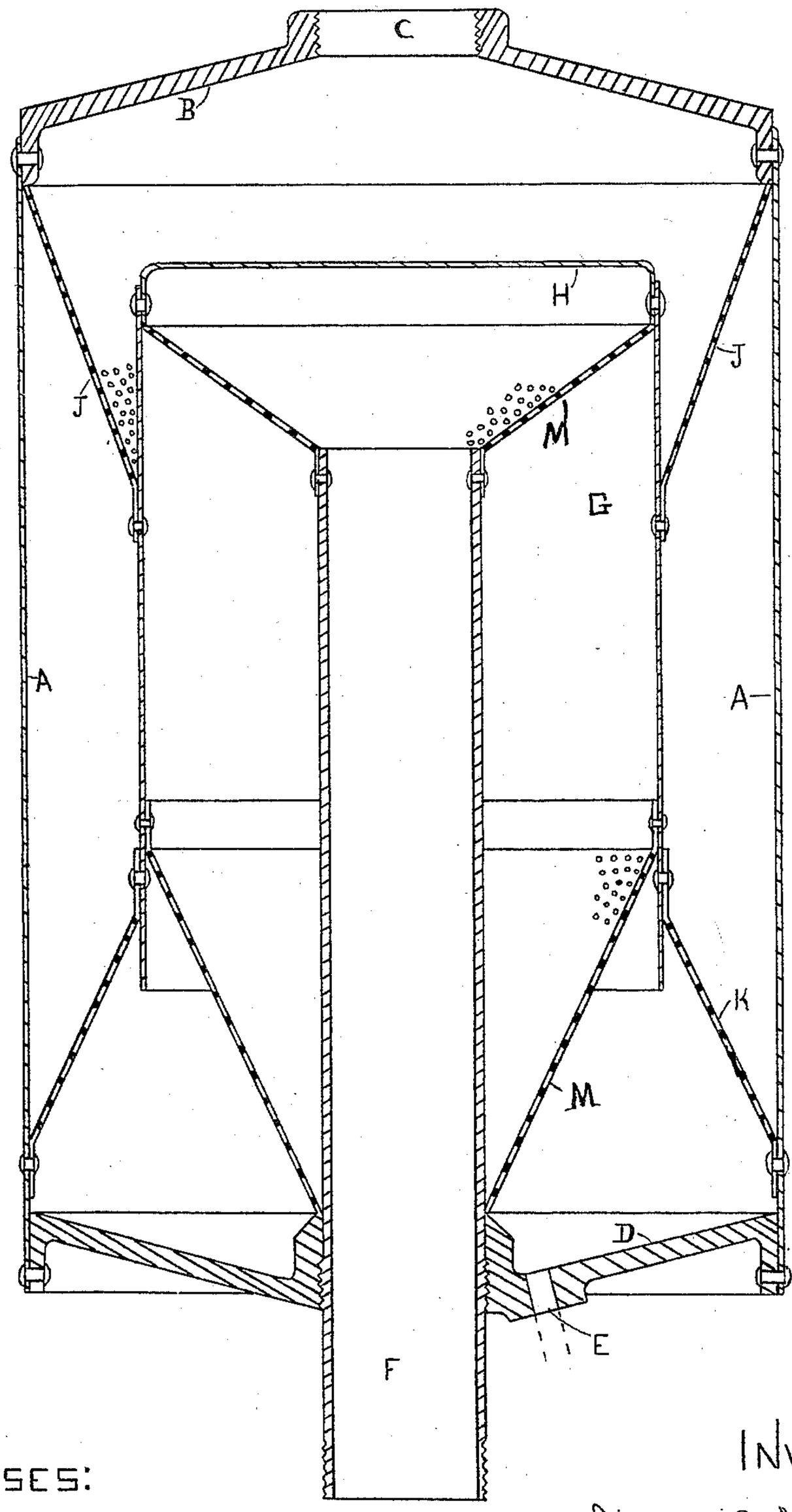
(No Model.)

C. A. MacDONALD.

PRECIPITATOR FOR IMPURITIES IN EXHAUST STEAM.

No. 440,715. Patented Nov. 18, 1890.



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PRECIPITATOR FOR IMPURITIES IN EXHAUST-STEAM.

SPECIFICATION forming part of Letters Patent No. 440,715, dated November 18, 1890.

Application filed February 17, 1890. Serial No. 340,719. (No model.)

To all whom it may concern:

Be it known that I, CHARLES A. MACDONALD, a subject of the Queen of England, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Precipitators for Impurities in Exhaust-Steam, of which the following is a full, clear, and exact specification.

My invention relates to devices for precipitating and thus collecting or extracting the oil and other impurities from exhaust-steam, so that the same can then be subsequently used for the manufacture of ice in the ordinary manner of ice-machines, and has for its object to provide a simple, cheap, and effective device for this purpose.

It is illustrated in the accompanying drawing by a single cross-section view.

A is an exterior or inclosing chamber of any desired shape, preferably cylindrical, having the upper end B, with the screw-threaded aperture C therein, and the lower end D, with a similar screw-threaded aperture, also a draw-off aperture E.

F is a pipe which enters through the screw-threaded aperture in the bottom D and proceeds preferably to a point about two-thirds above the bottom of the cylinder.

G is an inner inverted cup supported within the cylinder, its top H a short distance above the top of the pipe F. This cylinder is supported in this position by means of the funnel-shaped perforated diaphragms J, K, L, and M. These diaphragms are shown perforated in cross-section and certain other perforations shown on diaphragm J. They should be perforated throughout, it not being necessary to show this in the drawing. More or less of such diaphragms might be employed, and they are preferably placed, as shown in the drawing, diagonal to the course of the steam as it passes through them.

The device could be greatly changed in its structure without materially departing from the spirit of the invention.

The use and operation of my invention are as follows: The steam-pipe which conducts the exhaust or other steam which is subsequently to be condensed for the manufacture of ice is attached, for example, to the aperture C, and in that case from the pipe F leads another pipe to the point of condensation of the steam, or the supply-pipe could be attached to the pipe F and the pipe leading to the point of condensation be attached to the aperture C. If the steam is supplied from the aperture C the operation is as follows: It first strikes upon the top H of the cup G, and is thence diverted so as to descend through the perforated funnel-shaped diaphragm J, thence through the annular passage-way between the walls of the cylinder A and cup G, through the perforated diaphragm K, thence upward through the perforated diaphragm L within the cup G, against the top thereof, and thence down through the pipe F and away to the place of condensation. As the steam impinges against the head H it will deposit a certain portion of its oil and other impurities, they being gradually driven toward the edge of such top and thence passing down along the side of the cup G. As it passes through each of the perforated diaphragms the steam also deposits upon such diaphragms large portions of its impurities, and such impurities so deposited ultimately find their way down along the side of the cylinder A, cup G, and pipe F, and along the various diaphragms until such impurities are ultimately collected in the lower portion of the bottom D, whence they may be drawn off through the aperture E. If the steam is supplied through the pipe F the operation is substantially the same, the first deposit being made on the top H of the cup G and then on the diaphragm M, bottom D, diaphragm K, diaphragm J, and inner side of the top B, whence it flows back upon the top of the cup G. Other diaphragms may be used, or some of these may be dispensed with, according to the extent and character of the impurities in the steam which it is sought to cleanse, and it will be obvious that the arrangement of these diaphragms could be greatly changed.

I claim as new and desire to secure by Letters Patent—

1. In a precipitator, the combination of a closed case, preferably cylindrical and having an aperture at one end, with a pipe extending therein from the other end, a cup-shaped portion over the inner end of such pipe, and a

series of diaphragms inclined to the axis of the case and placed between the adjacent walls of the pipe and the cup and the cup and the case, so that the current of fluid will pursue a circuitous path through such case and through a series of diaphragms arranged at angles to the line of motion of such current.

2. In a precipitator, the combination of a closed case, preferably cylindrical and having an aperture at one end with a pipe extending therein from the other end, a cup-shaped portion over the inner end of such pipe, and a series of diaphragms placed between the adjacent walls of the pipe and the cup and the cup and the case, so that the current of fluid will pursue a circuitous path through such case and through a series of diaphragms.

Signed at Chicago this 12th day of February, 1890.

CHARLES A. MACDONALD.

In presence of—
FRANCIS W. PARKER,
CELESTE P. CHAPMAN.