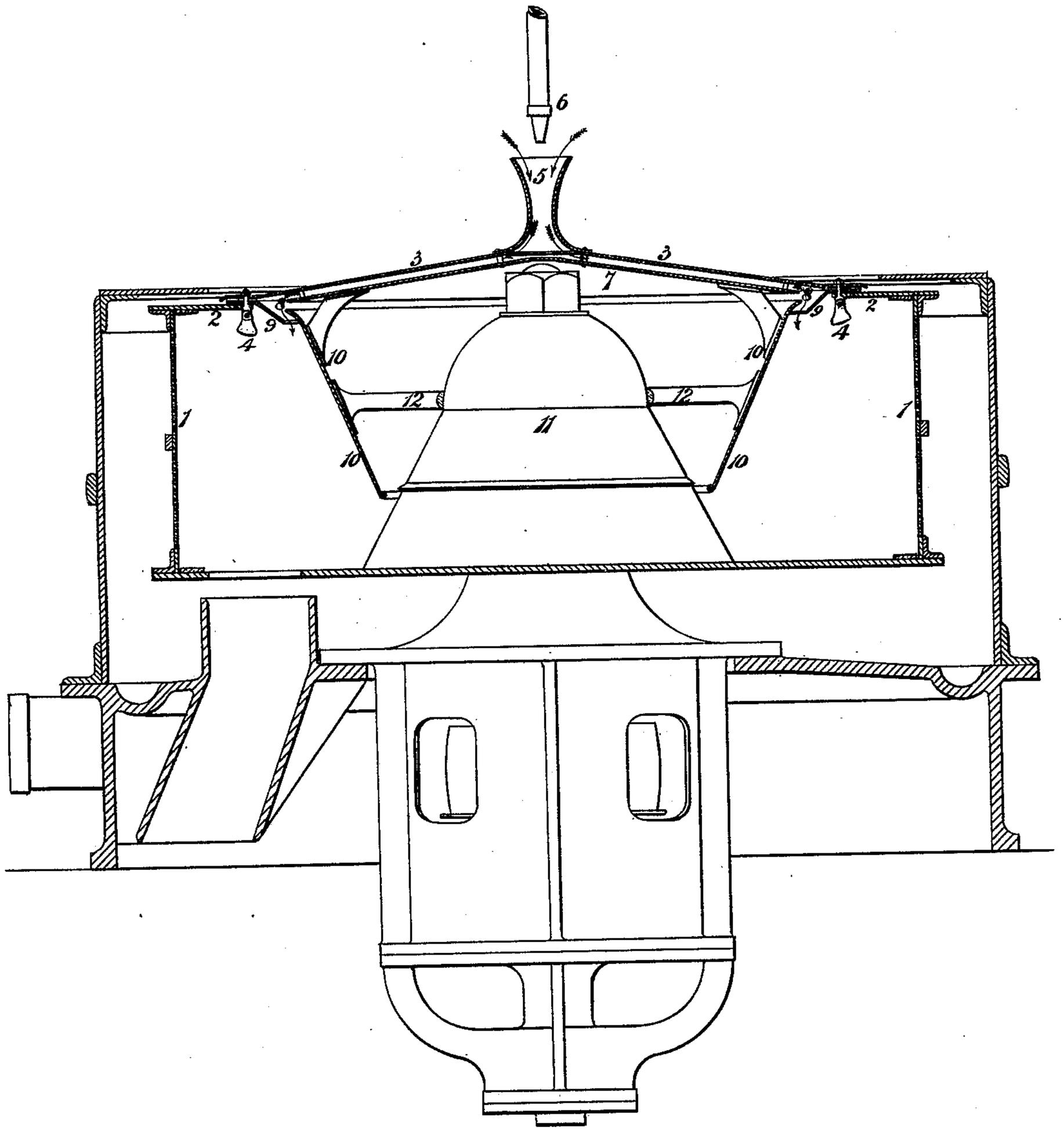
H. W. WALKER & T. L. PATTERSON.

Centrifugal Machine.

No. 214,267. Patented April 15, 1879.



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UNITED STATES PATENT OFFICE.

HUGH W. WALKER AND THOMAS L. PATTERSON, OF GREENOCK, NORTH BRITAIN.

IMPROVEMENT IN CENTRIFUGAL MACHINES.

Specification forming part of Letters Patent No. **214,267**, dated April 15, 1879; application filed January 27, 1879; patented in England, July 31, 1877.

To all whom it may concern:

Be it known that we, HUGH WILLIAM WALKER and THOMAS LAW PATTERSON, both of Greenock, in the county of Renfrew, North Britain, have invented certain new and useful Improvements in Centrifugal Machines for Purifying or Refining Sugar, for which we have obtained British Letters Patent dated July 31, 1877, (No. 2,924 of 1877, and sealed January 22, 1878;) and we do hereby declare that the following is a full, clear, and exact description of the invention, which 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 reference-numerals marked thereon, which form a part of this specification.

Our invention has for its object to improve the construction and action of centrifugal apparatus used for carrying out the known process of treating sugar with a mixture of steam and air for the purpose of purifying or refining the same.

We have already obtained Letters Patent of the United States No. 209,309, dated October 22, 1878, for a modification of our invention, designed for and applicable to centrifugal machines of the kind known as "suspended and over-driven;" and what we now desire to secure by Letters Patent is a modification designed for and applicable to centrifugal machines of the kind known as "under-driven." In this case, instead of introducing the mixed steam and air through the shaft, we do so at the center of the cover, which we construct with a central inlet having a trumpet-like mouth. Above the inlet we place the nozzle of a branch steam-pipe, so that a jet of steam may be directed into the inlet, and may carry air in with it. The cover is made with an inner shell, and the mixture of air and steam first passes between the cover and this shell, and proceeds downward from all parts of the outer edge of the shell into the interior of the basket. Below the cover, and for convenience attached thereto, there is a conical shell, which is wider at its upper part, and any water due to condensation of the steam and deposited on its surface is, by the centrifugal action, made to run up the conical shell, and be thrown from its upper edge into an annular channel formed under the cover, near its outer edge, by the attachment to the cover of a narrow conical ring. Water due to condensation, and deposited on the cover and its shell, also reaches the annular channel, and all the water reaching that channel is, by the centrifugal action, made to issue by openings provided for the purpose at the edge of the cover, and is thrown off above the top annular plate of the basket.

The accompanying drawing is a vertical section of an under-driven centrifugal machine as fitted with our improved apparatus.

The top edge of the basket 1 is constructed, in the usual manner, with a flat annular rim or plate, 2, projecting inward a short distance from the sides of the basket. For the space within the rim 2 there is provided, according to our invention, a cover, 3, of sheet metal, which rotates with the basket, and after a charge of magma is put into the basket this cover 3 (with parts hereinafter described attached to it) is placed in position, resting on the inner edge of the annular rim 2, the joint being made sufficiently tight by a lining of rubber, which is fixed on the under side of the edge of the cover.

Any convenient form of sub-fastening or holder may be used to secure the cover in its place; but we prefer to employ small weighted holders 4, hinged loosely to the under side of the cover, which holders, when the basket is rotating, are, by the centrifugal force, made to turn outward and upward against the under side of the basket-rim 2, and thereby bind the cover firmly down to that rim. These holders 4 (which are described and claimed in the specification of our hereinbefore-mentioned Patent No. 209,309, dated October 22, 1878) have the advantage of requiring no manipulation, as when the basket is not rotating they hang downward clearly within the rim 2, and do not interfere with the placing or removal of the cover 3.

A mouth-piece, 5, which may be of the form shown, or cylindrical, or of any other suitable form, is fixed on the center of the cover 3, and a nozzle, 6, fixed to a steam-pipe, and, by pref-

erence, adjustable in position, is placed so as to direct a jet of steam downward into the mouth-piece 5 in a manner to cause a quantity of air to enter along with the steam-jet.

At a very short distance under the cover 3 a sheet-metal disk, 7, is fixed to the cover, and causes the mixed steam and air to diverge in a disk-like form and spread outward under the cover. This disk 7 also receives any drops due to condensation, and such drops are, by the centrifugal action of the rotation, also carried outward, being thrown from the edge of the disk 7 into an annular pocket, 8, formed by the attachment to the under side of the edge of the cover 3 of an annular, conical, or curved sheet-metal ring, 9, having its inner edge below the edge of the disk 7. The water thrown into the annular pocket 8 escapes by openings to the outside of the cover 3, and over the rim 2 of the basket, and is thus prevented from reaching the sugar in the basket.

A convenient way of forming the openings is by inserting radial strips of metal between the edge of the cover 3 and the ring 9, so as to leave small passages when attaching the latter to the former by riveting or otherwise.

The mixture of steam and air passes down round the edge of the disk 7, and between the ring 9 and the upper edge of a conical shell, 10, and so has access to the sugar, while some of it may proceed down within the conical shell 10, and through a narrow annular opening between the bottom of that shell 10 and the usual central cone, 11. The conical shell 10 serves to collect any drops due to condensation on the central cone, 11, and, with the aid of the centrifugal force, to lead them up into the annular pocket 8. This conical shell 10 is fixed to arms 12, radiating from a ring which rests on the central cone, 11. It is also, by preference, attached to the cover 3, to be lifted out therewith when charging the machine, although, if preferred, it may be arranged to be lifted out separately.

What we claim as our invention is—

In an under-driven centrifugal machine, the cover made with a central inlet mouth-piece, 5, for the introduction of a jet of steam and air taken in by the steam at the mouth-piece, and fitted with an inner shell, 7, between which and the cover the mixture of air and steam passes, and from the outer edge of which it descends into the basket, in combination with the conical shell 10, which is wider at its top and leads deposited moisture to top outlets, through which also the moisture from the cover passes, all substantially as and for the purposes hereinbefore described.

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