

DEVICE FOR AUTOMATICALLY REGULATING THE FLOW OF THE HEAD PRODUCTS OR OTHER
CONDENSATION PRODUCTS PROCEEDING FROM DISTILLING AND RECTIFYING APPARATUS.

994,672.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, EMILE GUILLAUME, a citizen of France, residing at Paris, France, have invented new and useful improvements in devices for automatically regulating the flow of the head products or other condensation products proceeding from distilling and rectifying apparatuses; and I do hereby declare the following to be a full, clear, and exact description of the same.

The present application is a division of an application, Serial No. 367,697 filed April 11, 1907, for Letters Patent of the United States.

This invention relates to a device for controlling the delivery of the products condensed in distilling apparatus, and in rectifying liquids, and especially the controlling of the delivery of the head products of alcoholic liquids, an operation in which the vapors of the head products are first led into a condenser and then into a supplementary condenser, or refrigerator, for the purpose of condensing the portion still condensable which has been carried over with the gases, and of discharging these gases into the atmosphere.

The device in question is devised to admit of the removal or the separation of the liquid condensed in the condenser and in the refrigerator in invariable quantity for a control predetermined at will, and this moreover in such a manner that the condensed product proceeding from the supplementary condenser, or refrigerator, will be always completed automatically by the product proceeding from the condenser. The lower part of the refrigerator is placed at a certain height above the lower part of the condenser in such a manner that the product resulting from the preliminary condensation effected in the condenser can never under any circumstances return to the refrigerator. The product condensed in the condenser is led to the outlet pipe which proceeds from the refrigerator to the control cock of the exit pipe placed at the testing point by a branch pipe so arranged that it can be placed sufficiently below the exit of the liquid condensed in the supplementary condenser or refrigerator that the two following conditions may be fulfilled: First in the case in which the quan-

tity of the product condensed in the refrigerator, is insufficient to correspond completely to the extraction effected by the opening of the control cock of the delivery pipe, the missing quantity will be automatically supplied by a delivery from the condensed product proceeding from the condenser. Second, inversely if the quantity of the product condensed in the refrigerator is greater than the flow which has to be effected according to the predetermined control of the exit cock, the excess of the product condensed in the refrigerator will combine with the product condensed in the condenser. In consequence of this arrangement, the cock which regulates the outlet and the delivery at the testing point is set for a predetermined supply which can be selected at will, this delivery and this supply remaining invariable even in the case when the passage of an excess of water to the condenser takes place, that is to say, when practically even all the condensation or nearly all the condensation takes place in the condenser, and this in a manner entirely independent of the condensation taking place in the supplementary condenser, or refrigerator, which is necessary for the exhaustion of the gases.

The accompanying drawing illustrates by way of example a construction which can serve for the arrangement of the new device.

The vapors which come from the upper part of the distillation or rectification column 1 proceed to the lower part of the condenser 2. The vapors which are not condensed during their passage through this condenser 2 pass by the pipe 16 to the upper part of the supplementary condenser or refrigerator 3, in which the particles which are still condensable are condensed, and the gases escape freely to the outer air through the exhaust pipe 15. The condensation and cooling water is supplied through the cock 11 into the little auxiliary cooler 8, flows through the pipe 12 into the supplementary condenser 3, and then through the pipe 13 into the condenser 2, and finally escapes from this latter through the pipe 14. The cock 7 serves to control the outlet of the condensed product which is delivered to the testing point 9.

The discharge pipe 4-6 of the supplementary condenser 3 possesses a tubular

connection 5 which is connected to the lower part of the condenser 2 in such a manner that the connection of this branch pipe with the pipe 4—6 is effected at a point 17 located low enough in order that the branch 5 may satisfy automatically the following two conditions: Firstly it supplies to the junction 5 of the tubular conduit 6 the totality of the excess of liquid which is necessary to correspond completely to the outflow controlled by the cock 7, in the case in which the quantity of liquid flowing through the tube 4 becomes insufficient, or even also in the case when there is no liquid at all passing through this pipe 4; and consequently it serves as an overflow for the pipe 5 in the case when too much liquid flows through the pipe 4, that is to say in the case in which the condensation in the supplementary condenser 3 exceeds the outflow which is predetermined by the extent to which the cock 7 is opened. In this manner on the one hand there is obtained the free exit of the cold gases from the refrigerator 3, and on the other hand a constant flow at the exit testing point, to an extent predetermined by the opening of the cock 7 even in the event of a great excess of water passing into the condenser 2. This construction forms the essential novelty of the new process in question, which moreover may easily be applied in all other modifications which may be devised by those skilled in the art.

The outlet 15, which serves for the free escape of the cooled gases, is placed in the present instance at a point at one side of the pipe 4, and in practice is of course a little above the connection of this pipe 4 with the supplementary condenser 3. This arrangement has for its object to condense, before reaching the part 15, any remaining vapors even in very small quantity which might escape from the alcohol already condensed, but notwithstanding not completely cooled, which alcohol vapors would arrive through the branch pipe 5 from the condenser 2. Finally in the case in which the connection 5 is independent of the retrogression effected

by the pipe 10 in the column, as is the case in the construction illustrated in the drawing, the retrogression pipe 10 is placed a little above the engagement of the branch pipe into the condenser 2, so as to insure with absolute security the supply of the pipe 6 by means of the branch pipe 5 in a constant manner, and to insure that it is only the overflow which returns into the column 1. This arrangement possesses in this case the advantage that the condensed product collected in the condenser 2 is more or less cooled before being introduced into the pipe 6 through the branch pipe 5.

What I claim is:

An improved device for automatically regulating the flow of the head products, or other condensation products, proceeding from distilling and rectifying apparatus, said device comprising a condenser (2) connected to the top of the distilling or rectifying apparatus (1); a refrigerator (3), the lower part of which is placed above the lower part of the said condenser; an exit pipe (4—6) for the products proceeding from the said refrigerator; a regulating cock (7) fitted upon said exit pipe; a branch-pipe (5) connecting said exit pipe, at a point above said regulating cock, to the condenser, at a point below the connecting point of said branch-pipe to the refrigerator; a retrogression pipe (10) connecting the upper part of the column of said rectifying apparatus (1) to the condenser (2); and an outlet pipe (15) for the free escape of the incompressible gases, said pipe connecting the bottom of the refrigerator (3) at a point a little above the connecting point of the exit pipe (4) to the said condenser.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

EMILE GUILLAUME.

Witnesses:

JULES DAYOLLET,
EUGÈNE PICHON.