

(No Model.)

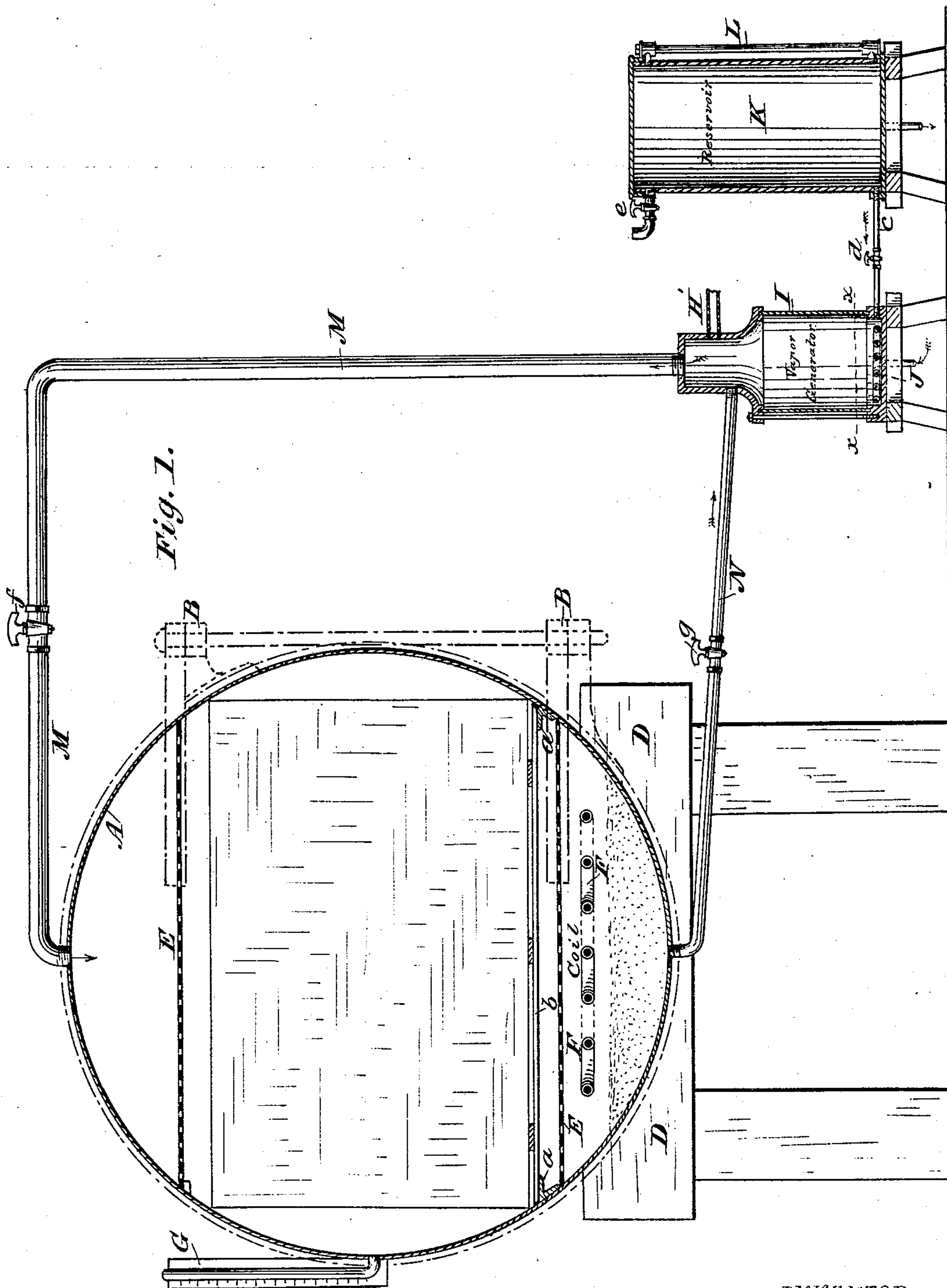
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G. CLARK.

METHOD OF AND APPARATUS FOR TREATING TOBACCO.

No. 253,584.

Patented Feb. 14, 1882.



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John Syler

INVENTOR

George Clark

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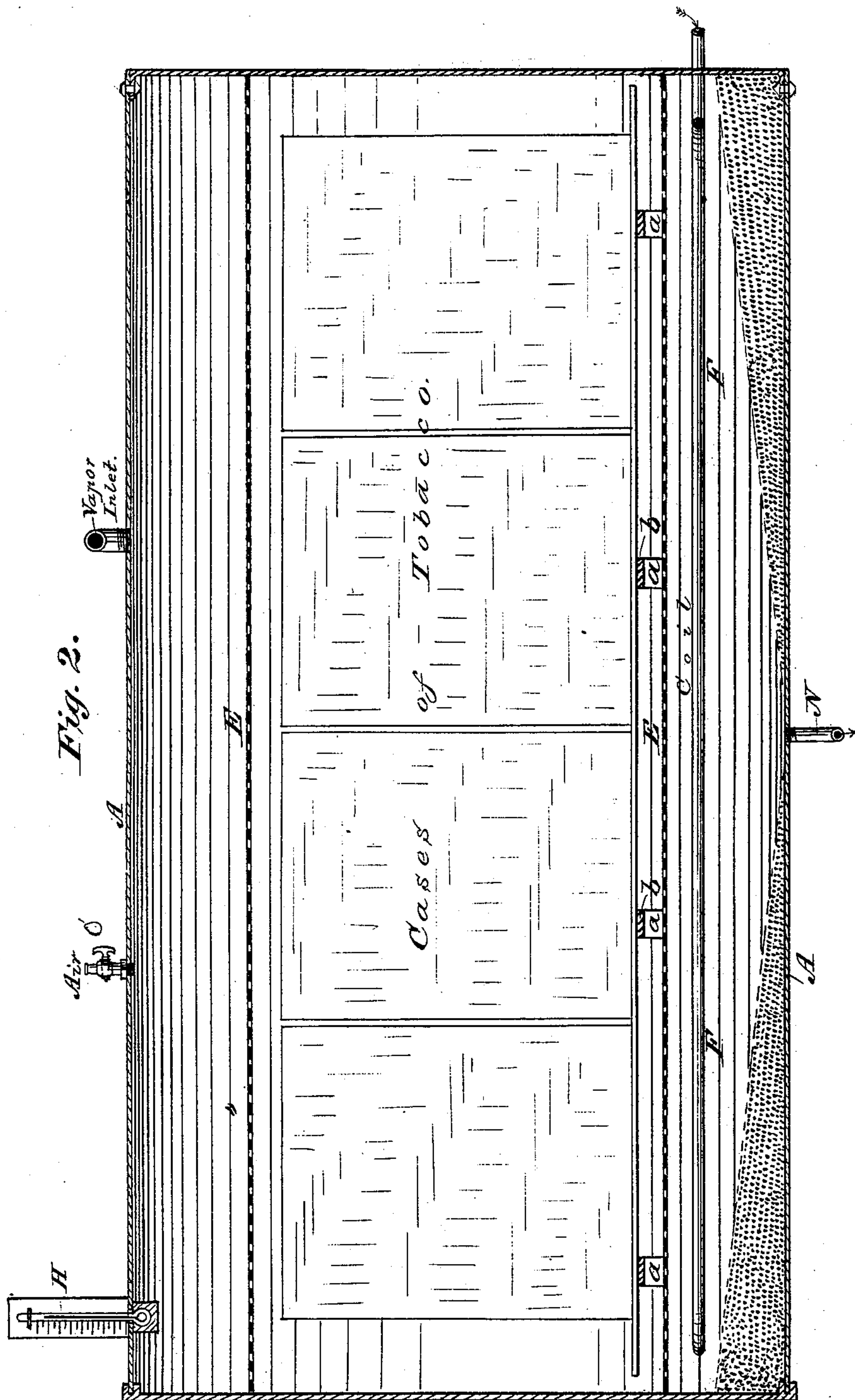
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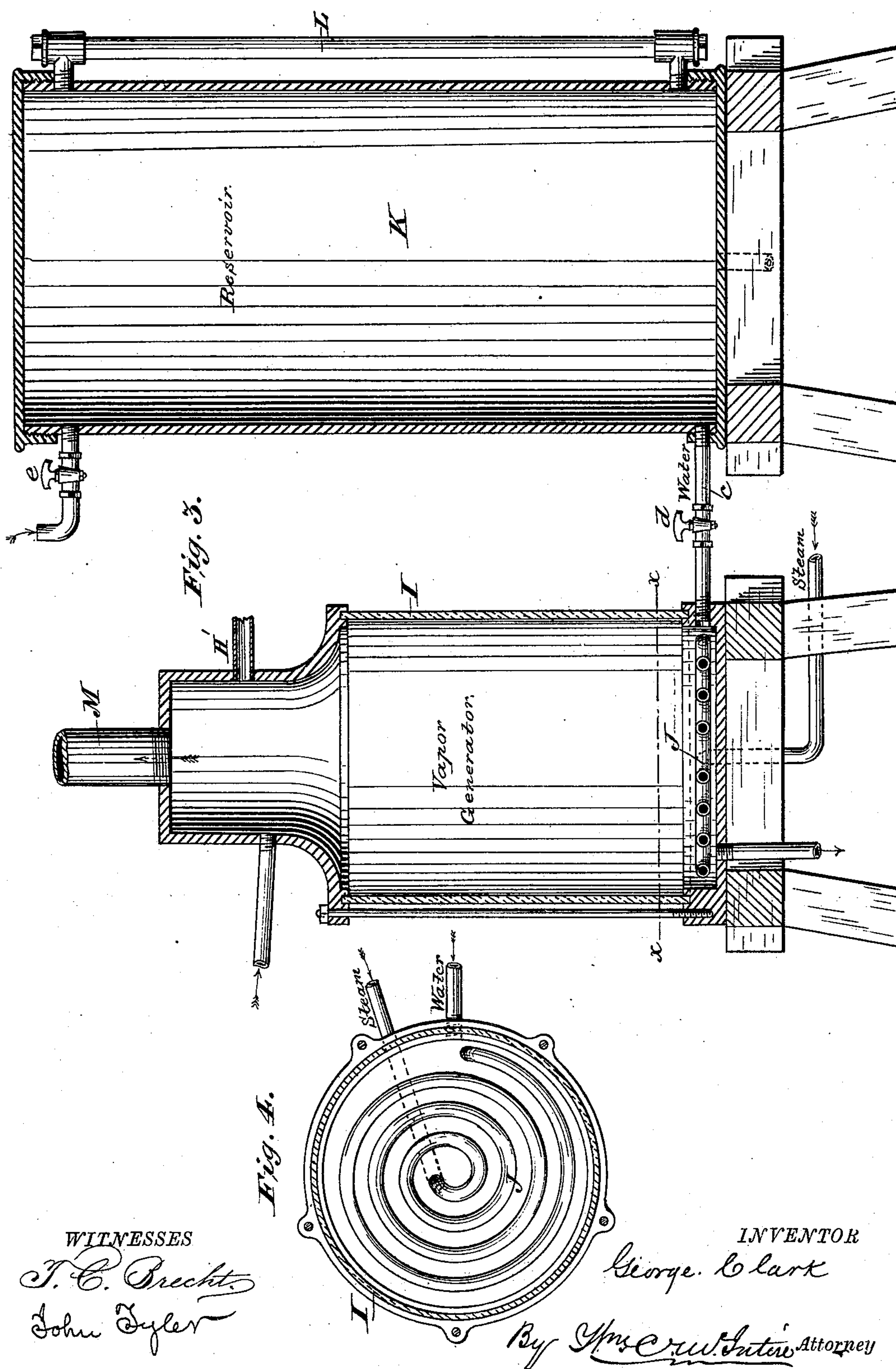
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UNITED STATES PATENT OFFICE.

GEORGE CLARK, OF NEW YORK, N. Y.

METHOD OF AND APPARATUS FOR TREATING TOBACCO.

SPECIFICATION forming part of Letters Patent No. 253,584, dated February 14, 1882.

Application filed October 11, 1881. (No model.)

To all whom it may concern:

Be it known that I, GEORGE CLARK, a citizen of the United States, residing at New York city, New York, have invented new and useful Improvements in Methods of and Apparatus for Treating Tobacco, of which the following is a specification.

My invention relates to certain new and useful improvements in the method of and apparatus for treating tobacco in bulk or loose.

It is well known by those familiar with the handling of tobacco after it leaves the producer that it is important and necessary to sweat or ferment it, or, as it may also be called, to "ripen" or "cure" it before manufacturing the same into cigars or chewing-tobacco. The primitive mode of accomplishing this end has been to dip or sprinkle the bunches or leaves of tobacco and lay the same in heaps or piles in an ordinary room, and then, by the use of a stove or other heating apparatus, to raise the temperature of the room until fermentation ensues. Following this method in the order of progress in the treatment of tobacco, the leaves, bunches, or packages have been placed in a room, the interior surface of which is lined with tin or other suitable sheet metal, and water in a vaporized condition injected into said room, the moisture taken up by the tobacco depending upon the absorbent nature of the plant, and when sufficiently dampened the temperature of the room raised to produce the necessary fermentation. In the first-named of these methods the moisture is very unevenly distributed, and the handling of the tobacco involves great labor and loss of time, and at the same time tends to the constant comminution or breaking of the leaves, making a large percentage of waste. In the second method the moisture taken up depending upon absorption renders it necessary that the spraying or injection of the water should be continued for a long time, and as the outside of the piles or packages is continually subjected to moisture it follows that that portion is more thoroughly saturated, and when the temperature of the curing-room is raised to produce fermentation the resultant effect of such fermentation is unequal throughout the entire mass, frequently entirely destroying the outside portion or seriously affecting the same.

It is also impossible by either of the methods described to obtain a uniform color in the tobacco treated.

Still more modern suggestions in the curing of tobacco involve the treatment in bulk—*i. e.*, in the original shipping-packages—to avoid the breakage of the leaves in rehandling, and involve air-tight apartments with water-vaporization underneath the packages of tobacco, such vaporization being accomplished by the discharge and subsequent reheating of water traveling through a circulating-pipe coiled around a fire-chamber to produce sufficient heat to make steam, so that the vapor emitted into the chamber is in the form of steam at about 212° Fahrenheit, or under, according to the condition of the fire.

I have discovered, after long experiment and thought, that none of the conditions of treatment involved in the methods described are favorable to the best results, and that the only desirable manner of moistening the tobacco previous to the necessary heating for fermentation is to bring the water vapor in contact with the tobacco *in vacuo*, and at a comparatively low degree of temperature. The objects of my invention are, therefore, to accomplish this result; and it consists in first producing a vacuum in the chamber occupied by the tobacco for treatment; then injecting water in the form of vapor or mist at a low degree of temperature until the entire mass of tobacco to be treated has been thoroughly and evenly moistened; and, finally, to raise the temperature of the chamber and its contents, and maintain it at an even and proper degree until the sweating or fermentation has been thoroughly accomplished. In order to accomplish these results it has been necessary for me to devise special apparatus, which I will describe in connection with the following detailed description of the process.

In the accompanying drawings, Figure 1 is a vertical section of the moistening chamber or cylinder, the vapor-generator, and water-reservoir with the necessary connections shown in elevation. Fig. 2 is a longitudinal vertical section of the moistening-chamber, with a series or number of cases of tobacco arranged therein ready for treatment. Fig. 3 is a vertical section, on an enlarged scale, of the reser-

voir and vapor-generator shown at Fig. 1; and Fig. 4 is a horizontal section of the vapor-generator, taken at the line *xx* of Fig. 3.

Similar letters denote like parts in the several figures of the drawings.

A is a cylinder of boiler-iron or other suitable material and practically air-tight, and having one or both of its heads adapted to be opened or closed upon hinges B. Within the cylinder are arranged longitudinally angle-irons *a*, upon which the cases C of tobacco may rest directly, or upon which may be arranged cross-bars *b*, adapted to support large or small sized packages. This chamber or cylinder A is, of course, erected or mounted upon a suitable foundation, D, to get the altitude necessary for the return by gravity of any excess of moisture, as will be hereinafter explained.

E E are longitudinal shelves or partitions of perforated metal or wire-gauze. Under the lower partition E is arranged a steam-coil, F, to which steam may be admitted through suitable connections when desired to raise the temperature of the chamber A. A barometer, G, is connected with the interior of the chamber A at any suitable locality, and H, Fig. 2, is a thermometer, also connected with the interior of said chamber H', being a connection with any suitable vacuum-producing pump.

I is a vapor-generator, consisting of a vertical cylinder or crown-shaped chamber arranged below and off to one side of the moistening-chamber A. This vapor-chamber has arranged in its bottom a flat coil of steam-pipe, J, (seen more clearly at Fig. 4,) and adapted by suitable connections to furnish a circulation of steam to produce the simmering or evaporation of water discharged upon said coil through the water-pipe *c*, leading from a reservoir, K, the supply from said reservoir being governed by a suitable cock, *d*, in the pipe *c*, and an air-cock, *e*, arranged above the water-level. The quantity of water being delivered is at all times ascertained by observing a gage, L, arranged upon one side of the reservoir.

The reservoir and vapor-generator may be each provided with a suitable cock for drawing off their contents when desired.

The crown or dome of the vapor-chamber is connected with the upper portion of the cylinder A by a vapor-conduit pipe, M, provided at some suitable point with a cock, *f*, for controlling the discharge of vapor to the curing-chamber A. The lower portion of the chamber A is furnished with a return-pipe, N, inclined downwardly and connected with the vapor-generator, so that any waters of condensation may be by gravity returned to the vapor-generator. This pipe N is also provided with a regulating-cock, *g*.

In order to facilitate the flow of any waters of condensation, the lower portion of cylinder or chamber A may be laid in cement, as shown more particularly at Fig. 2.

Now, having described the construction and arrangement of the several parts of the appa-

ratus, I will proceed to describe the method of treatment involving their use, desiring to have it kept in mind that my purpose is to introduce the vapors from water at a low degree of temperature compared with the heat of steam.

I simply remove the top and bottom from the cases containing the tobacco to be treated and place them within the cylinder A, closing the heads or doors. I then, by means of a vacuum-pump connected at H', thoroughly exhaust the air from the said chamber, and I then preferably slightly raise the temperature therein by the steam-coil F, to avoid any hasty condensation of the vapor introduced. When the barometer G indicates 28° I am then informed that I have a pressure equal to fourteen pounds to the square inch. I now open the cocks *f* and *e*, and subsequently the cock *d* in the water-connection *c*, steam in the meantime having been admitted to the flat coil J in the bottom of the vapor-generator I. The water flowing through pipe *c* into generator I, and coming in contact with the heated coil therein, simmers or is formed into a mist, which rises through pipe M and is discharged into the upper portion of cylinder A and evenly distributed throughout the same by the perforated partitions E E. The tobacco in the cases being *in vacuo*, the moisture is injected under a pressure of about fourteen pounds to the square inch at the start, and is directed toward the center of the several packages, the pressure decreasing as the tobacco becomes moistened. I keep a watchful eye upon the barometer G to see that it does not fall too rapidly, which is avoided by regulating the supply of water admitted through the pipe *c* from the reservoir, which is intelligently done by observing the gage L. This gage indicates at all times the amount of water used and injected in vapor form to the tobacco. Hence I am enabled at all times to determine when complete saturation has been reached, as experience will demonstrate the number of gallons necessary to a given quantity of tobacco. It is all important to observe these conditions, for the sudden and continuous discharge of too large a supply of vapor would cause the barometer to fall to the minimum before complete saturation of the tobacco, and the vacuum being destroyed it could only be re-established by the use of the pump, which would of course extract all the moisture—or, in other words, undo what had been done—or else the temperature within the chamber A would have to be raised to such a degree as to injuriously affect the tobacco. I have discovered from experience that the fiber of tobacco is injuriously affected when subjected (especially for any considerable length of time) to a temperature above 140°.

It will therefore be apparent that the gist of novelty in my method of treating tobacco rests in the idea of bringing the moist vapor in contact with the tobacco at a low degree of temperature while *in vacuo*, so that it is forced into the packages, instead of being taken up

solely by absorption, as heretofore. I am enabled by my improved method and apparatus to thoroughly moisten tobacco in bulk within ten hours, or less, while by the ordinary absorbing process, under the most favorable conditions, it requires from one to two weeks. When, under the conditions explained, the barometer G approaches its minimum the injection of vapor may be suspended by closing the cocks which were opened to produce its formation, and any products of condensation which may have accumulated in the curing-chamber A are discharged into the generator by gravity through the pipe N. Without removing the packages or cases within the curing-chamber the fermentation may be precipitated by heating to a suitable degree the coil F in the bottom of said chamber, and when this process is completed the cylinder is opened and the cases removed in condition for use; and it will be apparent that by the treatment described I am enabled to produce a uniform color of tobacco, which may be readily duplicated.

I may also employ the apparatus for removing the moisture from the cases when they are to be stored or shipped away for use in the future, as the contained moisture might, under such circumstances, produce mold or otherwise spoil the tobacco. To accomplish the removal of the moisture I open the connections between the cylinder and the vapor apparatus, apply the vacuum-pump and open an air-inlet, (seen at O, Fig. 2,) while at the same time, if deemed necessary, the temperature within the chamber is raised by means of steam within the coil F. By this means all the moisture is drawn back into the generator. The water thus removed may be measured, so as to accurately determine that the tobacco is absolutely dry.

I am aware that it is not new to extract unpleasant odors and infuse flavoring or sweetening substances in tobacco *in vacuo*, or to sweat tobacco in a sweat-house provided with a steam-coil in a water-tray, and do not claim any such thing; but

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

1. The method of treating tobacco, consisting essentially of establishing a vacuum within the containing-chamber and admitting vapor thereto in limited and regulated quantities at a comparatively low degree of temperature, whereby the moisture of the vapor is forced into the tobacco, in contradistinction to the process of absorption, as hereinbefore fully explained.

2. In an apparatus for treating tobacco, the cylinder A, adapted to have the air exhausted therefrom, whereby a vacuum is produced therein, in combination with a vapor-generator and water-reservoir arranged at one side, and connected by pipes M N c, substantially as and for the purpose described.

3. The vapor-generator I, provided with the coil J, and the curing-chamber A, connected by the vapor-pipe M at the top of each, and a return water-pipe, g, inclined as described, in combination with suitable means for supplying water to the vapor-generator, substantially as and for the purpose set forth.

4. The curing-chamber A, connected with the vapor-generating apparatus, and provided with a steam-coil, F, to produce fermentation, substantially as hereinbefore set forth.

5. The curing-chamber A, adapted to be connected with suitable vacuum-producing apparatus, and provided with the barometer G, in combination with the vapor-generator and reservoir, the latter being provided with the water-gage L, whereby the pressure in the chamber A and amount of water vaporized are determined, substantially as hereinbefore set forth.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

GEORGE CLARK.

Witnesses:

WM. C. McINTIRE,
D. P. COWL.