

No. 616,294.

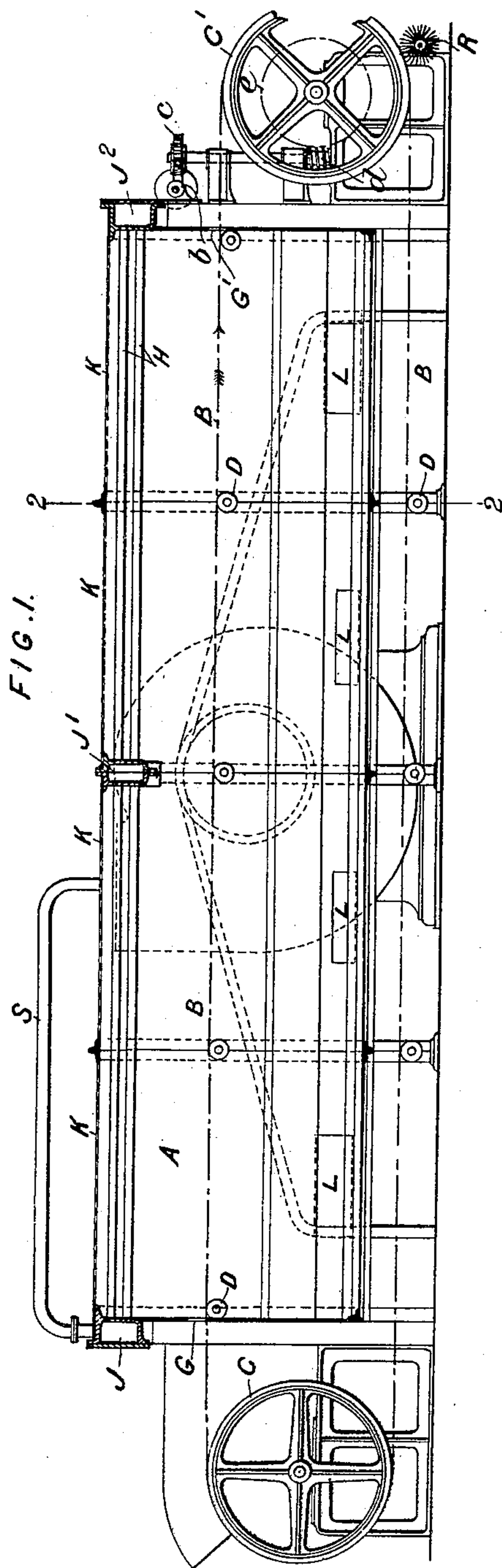
Patented Dec. 20, 1898.

S. C. DAVIDSON.
APPARATUS FOR DRYING TOBACCO, &c.

(Application filed July 24, 1897.)

(No Model.)

3 Sheets—Sheet 1.



WITNESSES:

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Thomas F. Wallad

INVENTOR:

Samuel Cleland Davidson,

By his Attorneys:

Allen C. Fraser & Co

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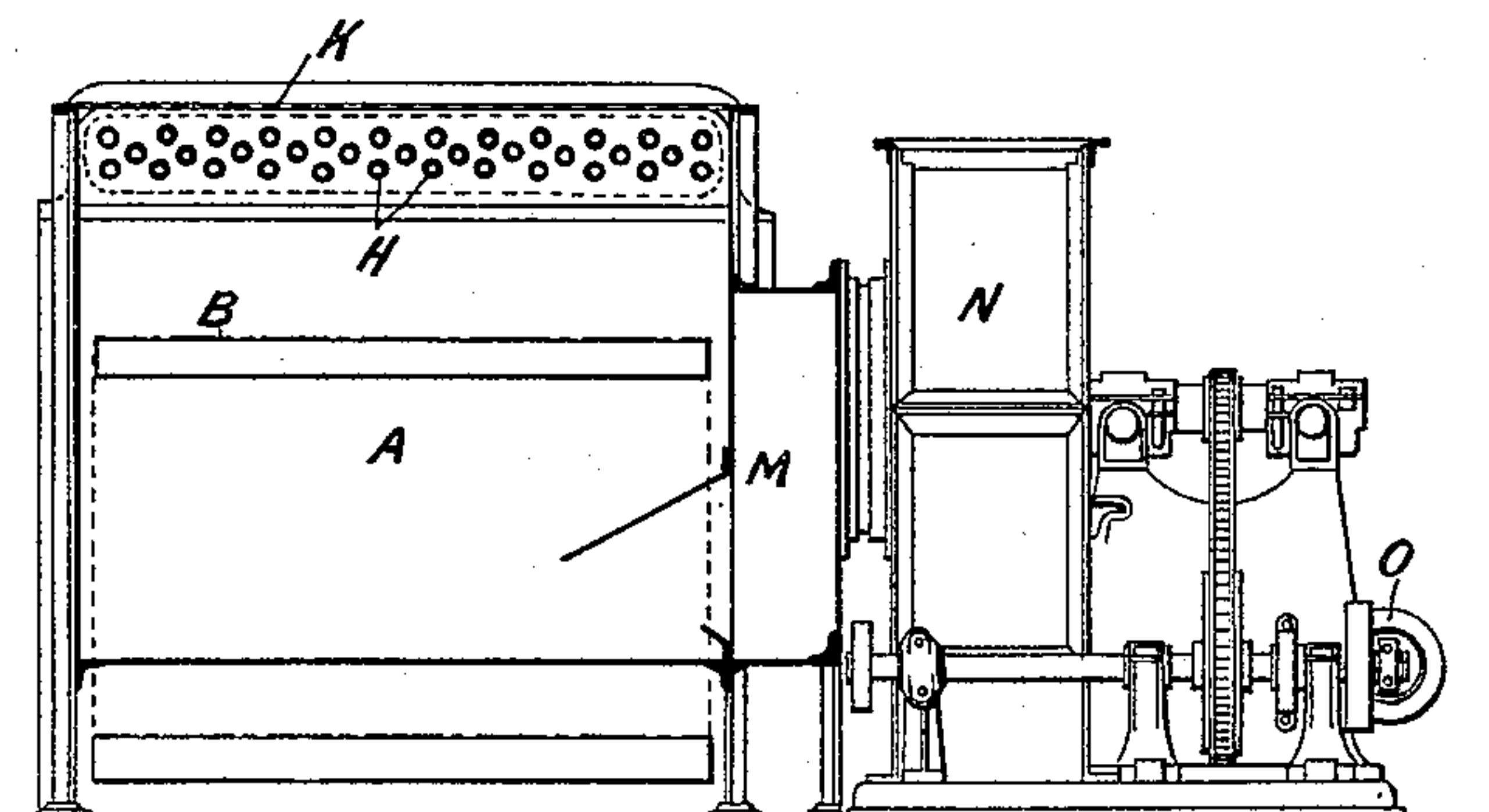
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3 Sheets—Sheet 2.

FIG. 2.



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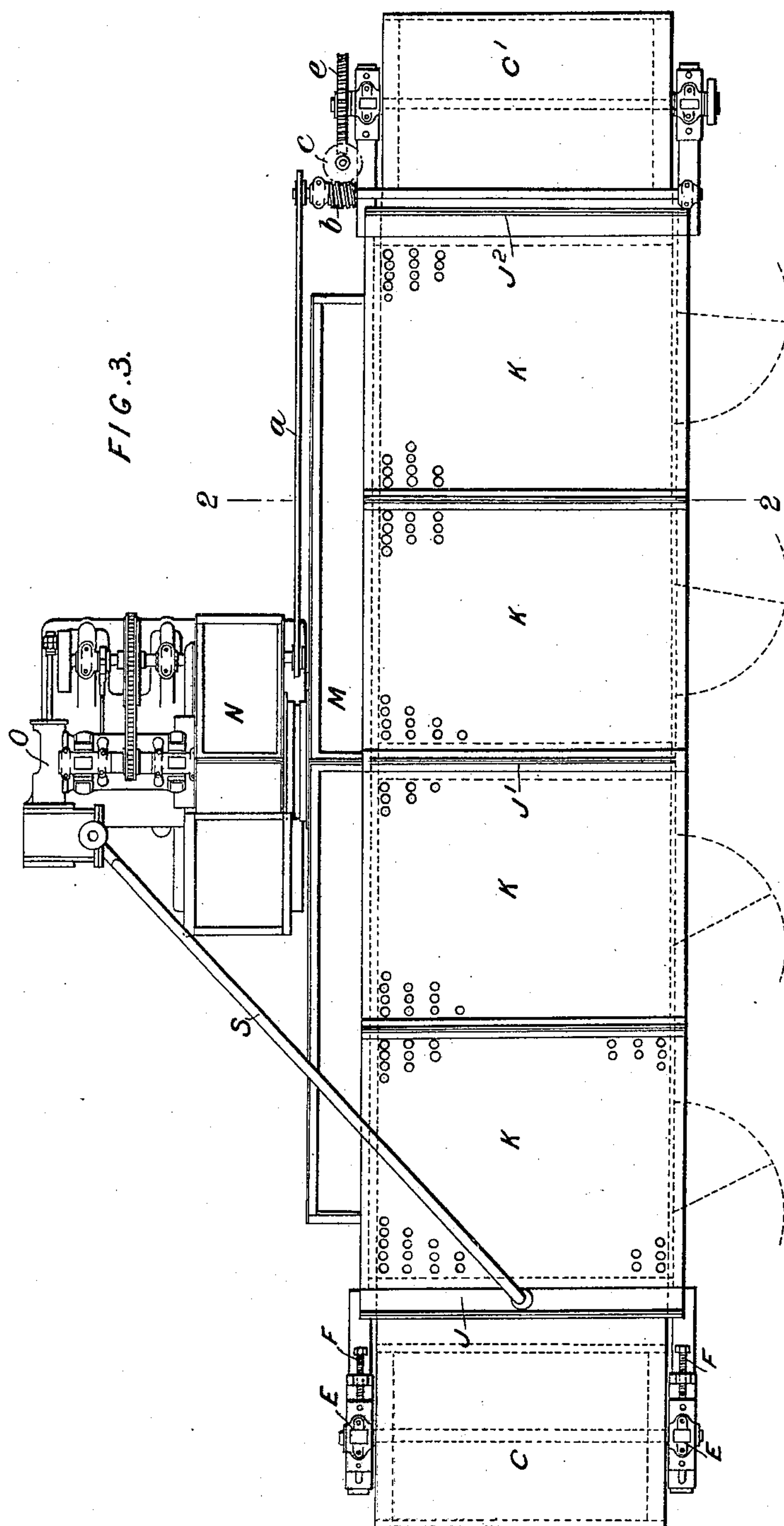
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UNITED STATES PATENT OFFICE.

SAMUEL CLELAND DAVIDSON, OF BELFAST, IRELAND.

APPARATUS FOR DRYING TOBACCO, &c.

SPECIFICATION forming part of Letters Patent No. 616,294, dated December 20, 1898.

Application filed July 24, 1897. Serial No. 645,826. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL CLELAND DAVIDSON, merchant, of Sirocco Engineering Works, Belfast, Ireland, have invented certain new and useful improvements in apparatus for drying or partially drying or otherwise treating tobacco-leaf, grain, malt, wool, or other substances, (which invention is the subject of Letters Patent in Great Britain, No. 15,105, dated June 23, 1897; in India, No. 307 of 1897, dated February 9, 1898, and in Ceylon, No. 562, dated January 18, 1898,) of which the following is a specification.

This invention has reference to apparatus for drying or partially drying or otherwise treating tobacco-leaf, grain, malt, wool, or other substances; and the invention mainly consists of a special construction or arrangement of apparatus, substantially as hereinafter described, whereby the tobacco-leaf or other substance to be operated on is caused to travel on a web of foraminous material through a box, chamber, or compartment (hereinafter called the "drying-chamber") and during its travel through the said chamber is submitted to the action of an artificial current of air, which enters through the top of the drying-chamber, (perforated for the purpose,) then comes in contact with an air-heater consisting of a range of longitudinal steam-pipes, and then passes through the web and the substance thereon.

In the accompanying drawings, Figure 1 is a central longitudinal section of an apparatus constructed according to my invention. Fig. 2 is a cross-section on the line 2 2 of Figs. 1 and 3. Fig. 3 is a plan.

A is the body of the apparatus, consisting of a box, chamber, or compartment, which I call the "drying-chamber" and which may be mounted, as shown, on a suitable stand or legs. Through this chamber A a web B, of any suitable foraminous material, such as wire web, passes horizontally from end to end, about midway between top and bottom, and forming the top stretch of an endless web, the under stretch of which returns, as shown, under the bottom of and outside the drying-chamber A. The web B is mounted on two revolving drums C C', arranged, respectively, outside of the drying-chamber A, at the inlet and delivery ends, respectively, of the appa-

ratus, and is supported between the same by rollers D. The bearings E E of the shaft carrying the drum C at the feed end of the apparatus are fitted with adjusting-screws F, so that the web may be kept sufficiently strained for satisfactory working. Openings or ports G G' are formed in the ends of the drying-chamber A for the entrance and exit, respectively, of the wire web B.

In the upper part of the drying-chamber A, above the web B, is placed an air-heater H, consisting of a range of steam-pipes extending from end to end of the drying-chamber and suitably mounted and expanded or otherwise secured into steam-chambers J J², (hereinafter referred to as the "steam-chests,") arranged, respectively, at the inlet and delivery ends of the drying-chamber A, or, if the drying-chamber A is so long that the steam-pipes, if employed in single lengths from end to end, would be liable to sag, one or more intermediate steam-chests, such as J', may be used, so that when live steam from a boiler or exhaust-steam from an engine is admitted to the steam-chest at one end of the drying-chamber it will traverse through the whole range of the pipes and the condensed water therefrom will be delivered into and drained off from the intermediate or exhaust-end steam-chests, from which latter any remaining uncondensed steam escapes. The range of steam-pipes preferably consists, as shown, of several horizontal rows, the pipes in each row being in different vertical planes to those of the pipes in the next adjoining row or rows, so that the air passing down between shall follow a serpentine or zigzag course.

The top of the drying-chamber, which is constructed directly over the steam-pipes, consists of a series of perforated plates K for the admission of air, the perforations being preferably so arranged that the air passing through same immediately strikes against the nearest steam-pipe thereto and is deflected therefrom over and among the other steam-pipes, so that the air is thus brought into efficient contact therewith and becomes equivalently heated thereby.

Exhaust openings or ports L are provided in the lower portion of the drying-chamber A below the web. They lead to an air-duct

M, through which the air passes to a fan or other air-exhausting appliance N, so that a current of air may be drawn down through the perforated plates K and steam-pipes H and through the material on the web B.

The fan N may be fitted with an engine O, which may also drive one of the web-drums C C' at the proper speed of travel and the exhaust-steam from which may be led through the pipe S to the steam-pipes H of the drying-chamber. In the drawings the engine is shown as driving the drum C' by means of the belt *a* and the worm-gearing *b c d e*.

A revolving brush R, applied to the under side of the web B at the delivery end of the machine, serves to brush the web clear of any adhering leaf.

In working the machine the material is spread on the web B, preferably at the same end of the machine as the steam is admitted to the heater H, so that the machine being in motion the wet or moist material immediately on entering the drying-chamber A comes in contact with the hottest part of the air-current passing down through same.

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

1. In drying and similar apparatus for treating tobacco-leaf and other substances, the combination of the treating-chamber A, the carrying-web B of foraminous material traveling horizontally from end to end of said chamber approximately midway between the top and bottom of same, said chamber having openings G G' at opposite ends respectively for the entrance and exit of said web and the substance it carries, perforated plates K K constituting the top of said chamber and allowing of inlet of air thereto, a range of steam-pipes H within said chamber below said perforated plates and between the latter and said web for heating the incoming air before it comes in contact with the substance on said web, outlets L L from said chamber below said web, an air-duct M communicating with said outlets, and an exhaust apparatus N in communication with said air-

duct, said exhaust apparatus drawing air by a suction-current downward through said perforated plates, past said heating-pipes H, through the web B and the substance thereon, and, from below the latter, through the outlets L L and air-duct M, substantially as hereinbefore described and shown.

2. In drying and similar apparatus for treating tobacco-leaf and other substances, the combination of the treating-chamber A, the carrying-web B of foraminous material traveling horizontally from end to end of said chamber approximately midway between the top and bottom of same, said chamber having openings G G' at opposite ends respectively for the entrance and exit of said web and the substance it carries, perforated plates K K constituting the top of said chamber and allowing of inlet of air thereto, a range of steam-pipes H extending from end to end of said chamber below said perforated plates and between the latter and said web for heating the incoming air before it comes in contact with the substance on said web, steam-chests J J' respectively at the inlet and delivery ends of said chamber, the respective ends of said steam-pipes being connected to said steam-chests, a steam-engine O, a pipe S connecting the exhaust of said engine with the steam-chest J and supplying said steam-chest with exhaust-steam, outlets L L from said chamber below said web, an air-duct M communicating with said outlets, and a fan driven by said engine and drawing air by a suction-current downward through said perforated plates, past said heating-pipes H, through the web B and the substance thereon, and, from below the latter, through the outlets L L and air-duct M, substantially as hereinbefore described and shown.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

SAMUEL CLELAND DAVIDSON.

Witnesses:

JOHN BROWN SHAW,
ARCHIBALD H. R. CARR.