

No. 839,868.

PATENTED JAN. 1, 1907.

F. N. MOREY.

MACHINE FOR DRYING AND STRAIGHTENING VENEER.

APPLICATION FILED MAR. 23, 1906.

4 SHEETS—SHEET 1.

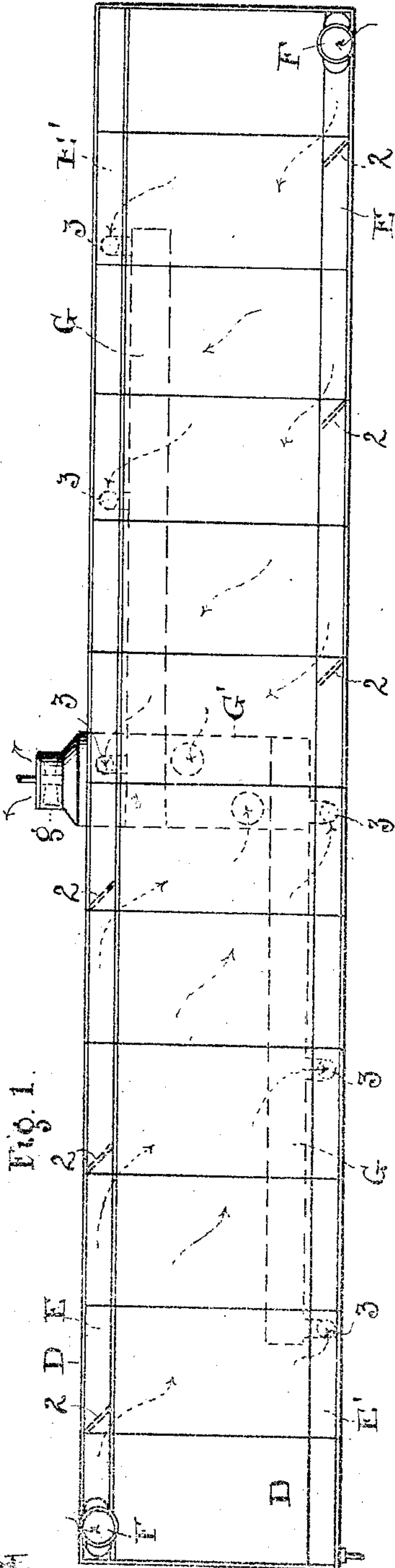


Fig. 1.

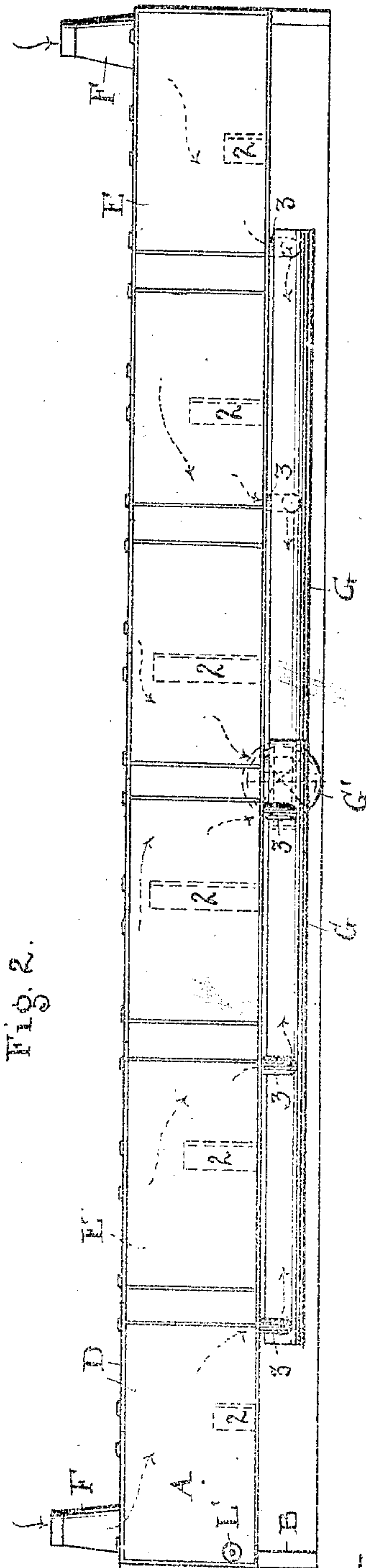


Fig. 2.

ATTEST.  
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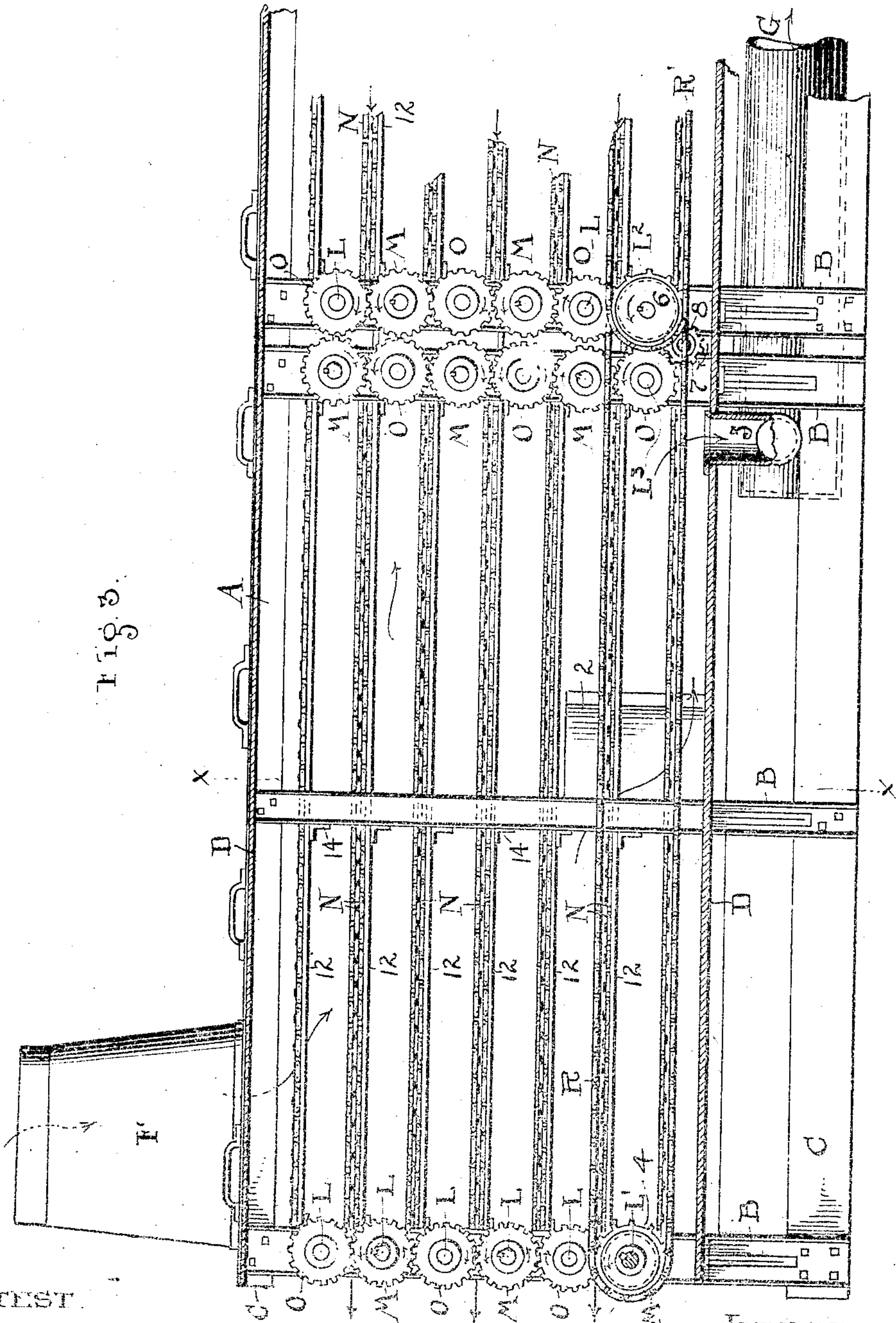
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4 SHEETS—SHEET 2.



ATTEST.

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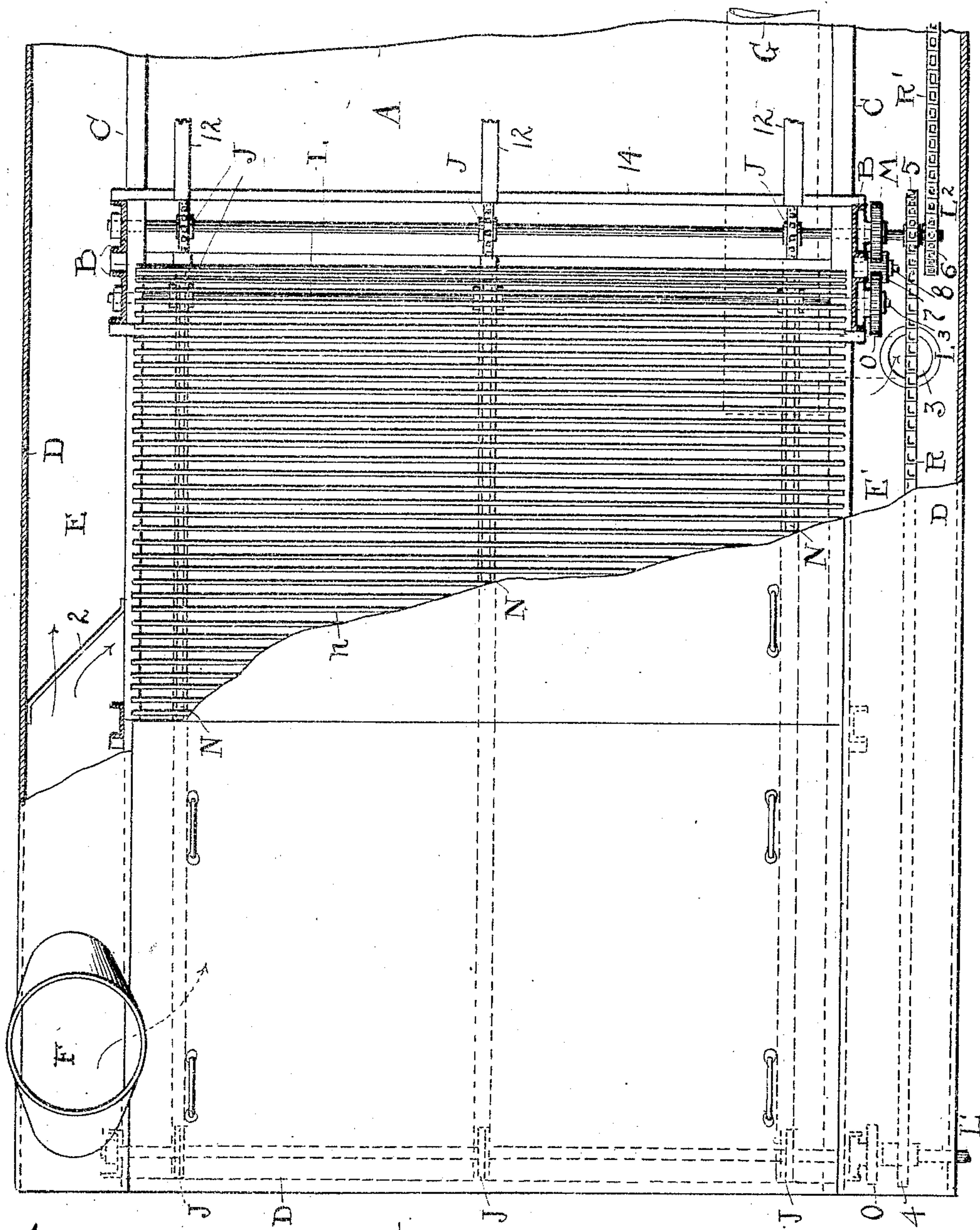
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4 SHL S-SHEET 3.



ATTEST.

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Fig. 4.

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4 SHEETS—SHEET 4.

Fig. 5.

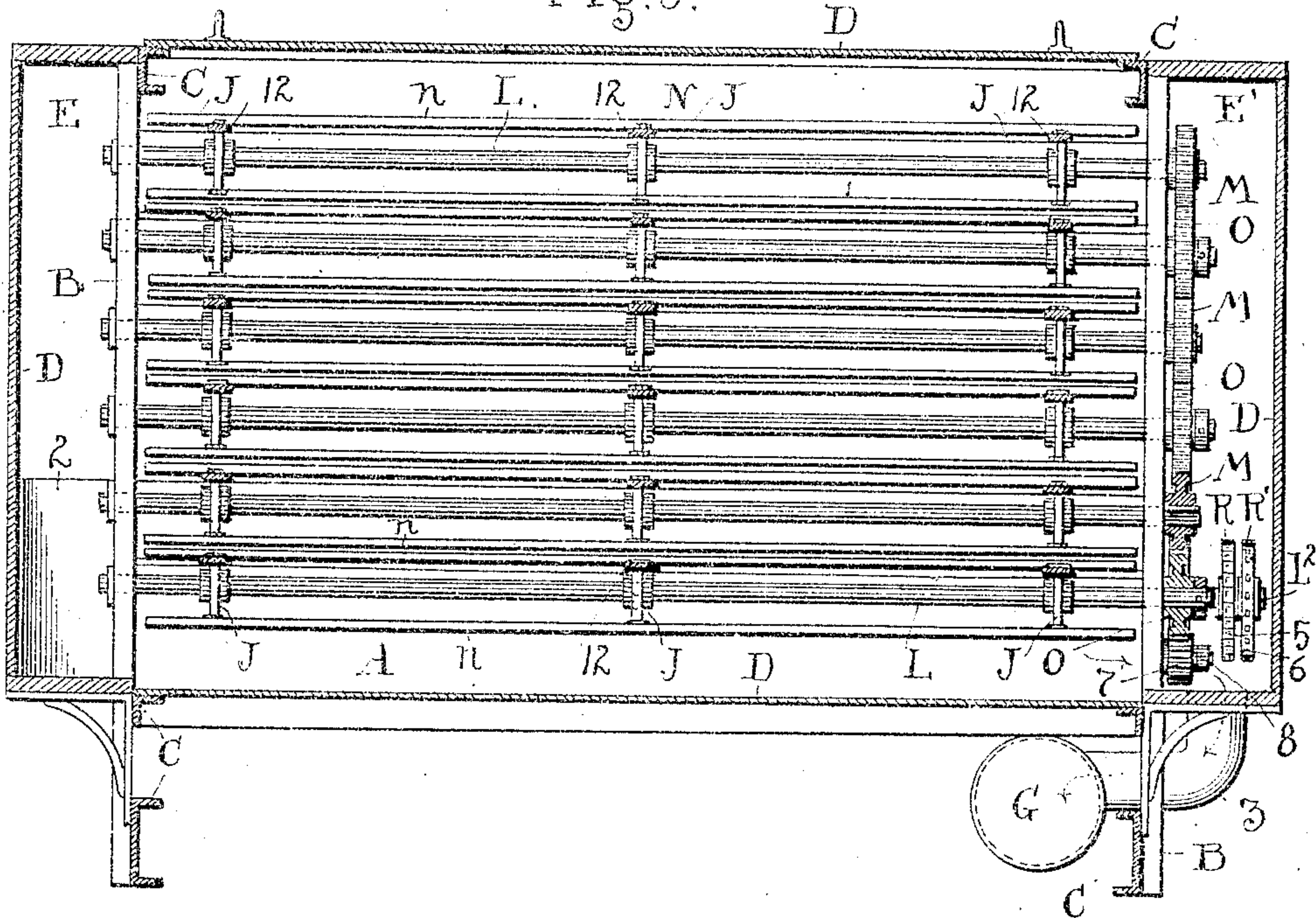
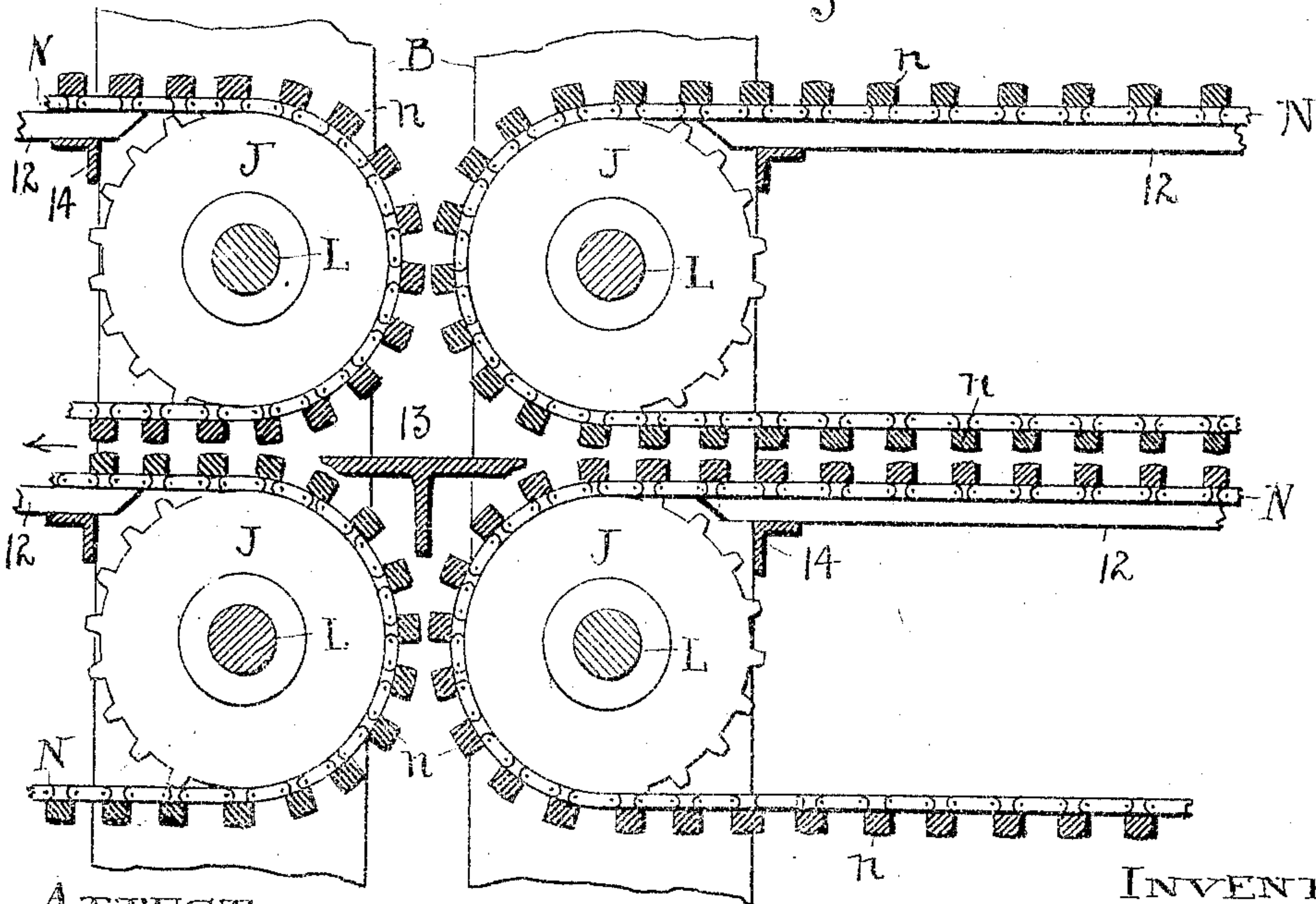


Fig. 6.



ATTEST

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# UNITED STATES PATENT OFFICE.

FRANK N. MOREY, OF PAINESVILLE, OHIO.

## MACHINE FOR DRYING AND STRAIGHTENING VENEER.

No. 839,868.

Specification of Letters Patent.

Patented Jan. 1, 1907.

Application filed March 23, 1906. Serial No. 307,621.

*To all whom it may concern:*

Be it known that I, FRANK N. MOREY, a citizen of the United States, residing at Painesville, in the county of Lake and State of Ohio, have invented certain new and useful Improvements in Machines for Drying and Straightening Veneer; and I do 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.

My invention relates to a machine for drying and straightening veneer, all substantially as shown and described, and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a plan view of my machine, and Fig. 2 is a side elevation thereof. Fig. 3 is a vertical longitudinal sectional elevation of an end portion of the machine considerably enlarged over Figs. 1 and 2, and Fig. 4 is a plan view of Fig. 3. Fig. 5 is a cross-section on a line corresponding substantially to line  $x x$ , Fig. 3, excepting that certain gears off that line are cross-sectioned to show their relation to the shafts on which they are mounted; and Fig. 6 is a materially-enlarged cross-section of two adjacent sprocket-wheels in each of the two adjacent sets of wheels for the veneer-carriers and showing carriers and other parts in that connection, all substantially as shown and described, and particularly pointed out in the claims.

Inasmuch as veneer is cut circularly from the log, its natural tendency is to curl, and inasmuch as the log necessarily is steamed, so as to soften the wood for cutting, the thin sheet removed therefrom is completely saturated with moisture and requires drying as well as permanent straightening before it can be used. The drying must take place concurrently with the straightening, and the two results necessarily are obtained in the same operation. Hence the object of the present machine is to both dry and straighten veneer at the same time. To this end the veneer or sheet of whatever size is passed between upper and lower endless carriers through a drying-chamber provided with means for heating the same to a suitable drying temperature by the introduction of volumes of heated atmosphere as well as with means for removing the moisture-laden atmosphere arising from the drying process in the manner best suited to this kind of work

and as will more fully appear hereinafter in the description.

Now, having reference again to the drawings, the drying-chamber A may be built up in any suitable way and of any suitable material and, as shown in this instance, comprises a series of posts or standards B at suitable intervals and places at each side and ends and longitudinal bars or beams C of channel-iron, angle-iron, or the like, forming a framework with said posts and inclosing walls D, preferably of sheet-iron, but not necessarily, and any other suitable material for inclosure may be used. The wall D runs along both sides and top and bottom of the chamber, and the entire chamber has usual dimensions of about one hundred feet length and eight feet width and stands bodily above the floor about as shown, the bottom channel-irons C forming the immediate base-support for the machine and the standards or posts B. One of the novel features of this chamber is the side ventilating-spaces (indicated by E and E', respectively) along both sides thereof its full length and outside of the working part of the chamber. The air-inlet and distributing spaces E run from the air-inlets F oppositely at each end to the middle of the chamber, and the air-exhaust spaces E' also run oppositely as to sides and ends to the middle of the chamber and serve to draw off the used air, which is drawn across the drier-carriers and conveyed to the suction outlet-tube G.

The hot-air-supply spaces E at opposite sides and ends of the drier-chamber have vertically-arranged air deflectors or plates 2 here and there adapted to divert the inflowing air between successive carriers bottom to top, and the opposite exhaust-spaces E' have elbow-shaped exhaust or suction flues 3, opening into the bottom thereof from exhaust-tubes G.

An important result of the foregoing construction is the carrying of the drying atmosphere transversely of the machine. In all veneer-driers wherein the air is carried lengthwise of the machine the air becomes so excessively laden with moisture that it could not possibly do its work either effectually or speedily, as must be obvious; but by a cross-draft and exposing the veneer to dry air only no portion of the dry air is required to handle more moisture than can readily absorb by a substantially transverse movement



through the machine, which greatly facilitates the drying operation and thoroughly dries the stock in the shortest time possible. This also largely increases the possible output

5 of a machine or plant otherwise limited in its capacities and works a great saving over the old method of handling the drying element.

The several air-diverting plates or vanes 2 inside the air-distributing spaces E run at successive elevations from low to high as they leave the blower-inlet F, Fig. 2, and the several elbow-flues 3 for carrying off the moisture-laden air discharge into a common tube G at their bottom, whence the air is drawn by the exhaust-fan *g* through cross-tube G' at the middle and bottom of the drier-chamber. This cross-tube also may have exhaust-openings from the drier-chamber, as well as tubes G at intervals, if preferred, independent of flues 3. Sometimes it is objected that the introduction of heated air at both ends of a drier of this kind or for this purpose may produce checking in the stock; but my experience has demonstrated that there is no danger of this result in a machine which handles its drying-air as in this case, while it does very materially facilitate turning out thoroughly and uniformly dried stock from all elevations in the machine and the doing of which has been one of the common difficulties encountered before my invention and which is perfectly overcome in this instance. Now, having a machine possessing these several features of construction and operation, a further element of novelty is the construction and arrangement of the carrier mechanism for the veneer. This includes successive series of carrier-aprons or endless carriers arranged in sets or series of six carriers in each set, one above the other horizontally and one set following the other in order from the beginning to the end of the machine. In the present machine there are ten such sets of carriers ten feet in length between sprocket or carrier wheels J, over which the carriers travel.

Each set of carriers has its own sprocket-chains N on shafts L, which run from side to side of the machine and have their bearings in posts B, and three sprocket-wheels are used on each shaft—one at each end and another at the center. There are also three sprocket-chains N for each individual carrier, and said chains and the cross slats or pieces *n* constitute the carrier as such. The slats *n* may be of wood or metal or even metallic tubing and are close enough together to form both a carrying-surface for the veneer and a straightening medium therefor in conjunction with the next carrier above, which rests thereon, as will presently appear.

Fig. 3 illustrates the relations of the carriers one to the other horizontally, as also seen in Fig. 6, and the actuating gear-wheels M and O, respectively, on the outer ends of

shafts L are splined and loose alternately in the series from bottom to top. Thus having shaft L' at one end and bottom of the machine under suitable power connections, so as to impart motion from it by appropriate connections to all the carriers in the machine, the power is transmitted along the line to the next adjacent series or set of carriers by means of a sprocket-chain R, running from a wheel 4 on the extremity of shaft L' to a sprocket-wheel 5 on the next or driven shaft L<sup>2</sup>, and a sprocket-chain R on a wheel 6 on this shaft imparts motion to the next series of carriers, and so on to the end of the several series—ten all told in this instance. An intermediate pinion 7, mounted on stud 8, is in mesh with gears M and O on the lower shafts L<sup>2</sup> and L<sup>3</sup>, respectively, and imparts motion to the series of gears and shafts splined thereto in the set above shaft L<sup>3</sup>, thereby providing a positive pull upon alternate carrier-chains N and which may be termed the "retreating" or "idle" chains of each set of chains. This constitutes a construction and arrangement of parts which imparts exactly the same rate of travel to all the carriers in a single set or series and to all the series alike. It should have been noted that this construction and arrangement of parts is simply repeated from set to set of carriers throughout the machine. Each shaft L at each end of each carrier, therefore, is equipped with its three several sprocket-wheels J and its end gear M or O, according as the wheel is splined or free on the shaft, and the splined gears are at the point of pull for each carrier. Thus in Fig. 3 at the left and top the second gear from the top is shown as splined, because the veneer is borne along on the top of that carrier, and the top of said carrier is therefore drawn or pulled along from the discharge end. On the other hand, the two next adjoining carrier-surfaces between the second and third wheels M travel back idle. Then the fourth shaft from the top becomes active, and the veneer in this line is borne along on the top of the carrier, as in the first instance. Thus there are three active and three idle lines of travel shown, the idle ones retreating and the active ones advancing continually. At the opposite ends of the same carriers the idle gears of each carrier are offset by a positive or splined gear M, and the sag or bottom of each carrier rests down uniformly on the veneer on the top of the carrier immediately beneath and serves to press thereon and straighten the same and hold it straight while drying. As seen in Fig. 3, the free gear on one shaft is set opposite a splined gear on the next succeeding shaft in the other series, and so on back and forth to the top in order to get the corresponding carriers to travel in the same direction. The foregoing or any equivalent arrangement of gear and drive mechanism



may be employed. Another feature in this connection is the longitudinal bars 12, which run parallel to each other between sprocket-wheels in the same section and support the upper portion of each carrier-chain between the corresponding sprocket-wheels. These bars have flat top surfaces over which the carriers or carrier-chains slide, so that all the carrying portions of the carriers are kept perfectly flat and even throughout their length, and flat-surfaced bridges 13, Fig. 6, intervene between successive carriers in the same line of transit to span the space between carriers on the same plane. The space between said carriers in any event is so small that before the engagement of the advancing carrier is released the next succeeding one will grip it. The bars 12 rest in transverse angle-irons or cross-pieces 14 at their middle and ends.

So far the machine has been referred to as only a "veneer-machine;" but it may be used for other purposes, as shall be found desirable or convenient. Obviously also the machine is of the knockdown kind for convenience in shipping.

Usually hatches are provided here and there to enter the drier-chamber. By dividing up the carrying and drying area for the veneer between the ends of the machine into subdivisions, sections, or sets not exceeding ten feet in length or between the sprocket-carrying wheels I get many advantages over a full-length carrier, as is obvious, both for convenience in shipping and setting up, but especially in obtaining a carrier that can be put into the machine with the requisite working stretch and not have it sag excessively nor run loose to an objectionable extent when expanded by heat. It will be observed that there is no wall between either the air-inlet distributing-space and the air-exhaust space and the endless carriers, and this leaves the air free to flow across between the carriers without interruption, whence it is drawn off by suction.

What I claim is—

1. A drying-chamber provided with opposite air distributing and exhaust spaces along its sides open their entire length and depth to the inside of the machine, and a series of endless carriers between said spaces, and an inlet for air to one space and an exhaust for the air open to the other space, whereby the drying-air is moved across the carriers from side to side.

2. A drying-chamber having endless drying-carriers adapted to travel lengthwise therein and provided with opposite air distributing and exhaust spaces, respectively, along its sides outside of said carriers, said spaces open to said carriers from top to bottom, and deflectors of varying elevation in the said air-distributing space.

3. A drying-chamber having a space along one side thereof and open from top to bottom on its inside for the distribution of drying-air to said chamber, and a full-depth space on its opposite side open from top to bottom to exhaust the air from said chamber, an inlet to said distributing-space and means in said space to deflect the air inward, and exhaust-flues at the bottom of said exhaust-space, whereby the drying-air is caused to travel transversely of said chamber.

4. A drying-chamber provided with a hot-air-distributing space along one side and an air-exhaust space along the other side and exhaust-flues opening into said exhaust-space to draw off the moisture-laden air, in combination with carriers exposed along their edges to both said spaces.

5. A veneer-drying chamber, in combination with sets of endless veneer-carriers arranged successively one to another and each set of carriers provided with its own carrying mechanism, said carriers in the same horizontal plane being arranged to travel in the same direction and means to bridge over from one carrier to the other, whereby veneer fed in at the head of the machine traverses a series of successive carriers to the tail of the machine.

6. A veneer-drying chamber having a succession of endless carriers one following the other in the same horizontal plane, said carriers comprising sprocket-chains and cross-slats at intervals thereon and sprocket-wheels carrying said chains, bridges for the veneer between the sprocket-wheels and carriers in adjacent sets and horizontal supports for said chains between the ends thereof.

7. In a veneer-drying machine, a series of endless carriers in a succession of sets following one another from one end to the other in the machine, and actuating and supporting mechanism for said carriers comprising a positively-engaged gear-wheel at one end and a loosely-mounted gear-wheel at the other end, and said positive and loose gears alternating in each series.

8. In a veneer-drier, a drying-chamber, in combination with a succession of separate sets of carriers arranged end to end and adapted to receive the veneer from set to set, bridges between carriers in the same plane and said carriers comprising endless chains and cross-slats, shafts and sprocket-wheels fixed thereon carrying said chains and alternate loose and fixed gears on said shafts from bottom to top in each set of carriers.

In testimony whereof I sign this specification in the presence of two witnesses.

FRANK N. MOREY.

Witnesses:

R. B. MOSER,  
C. A. SELL.