

No. 764,561.

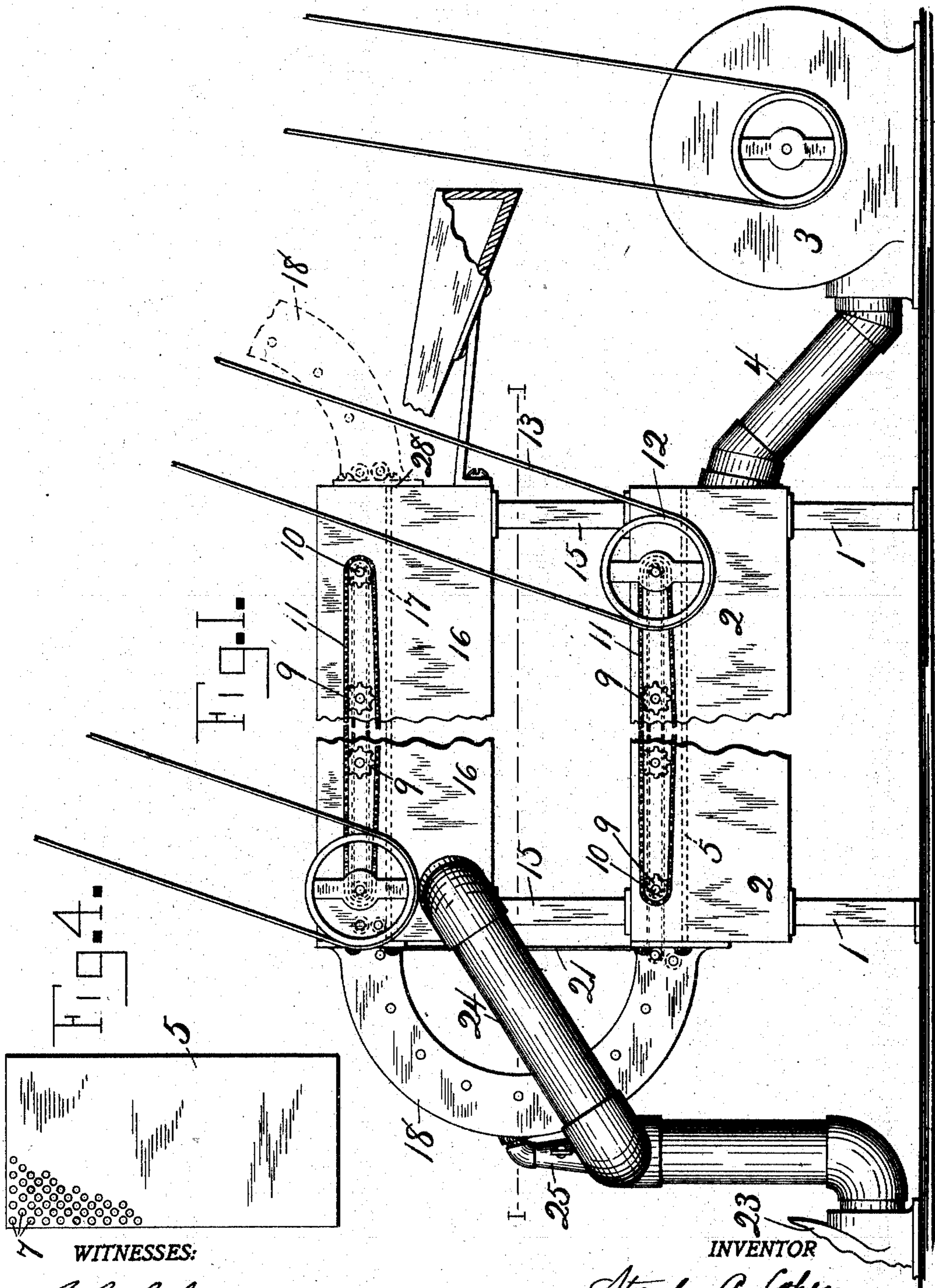
PATENTED JULY 12, 1904.

S. A. COHEN.
DRYING MACHINE.

APPLICATION FILED DEC. 18, 1903.

NO MODEL.

3 SHEETS—SHEET 1.



WITNESSES:

W. Schoeneck
Witness S. Schoeneck

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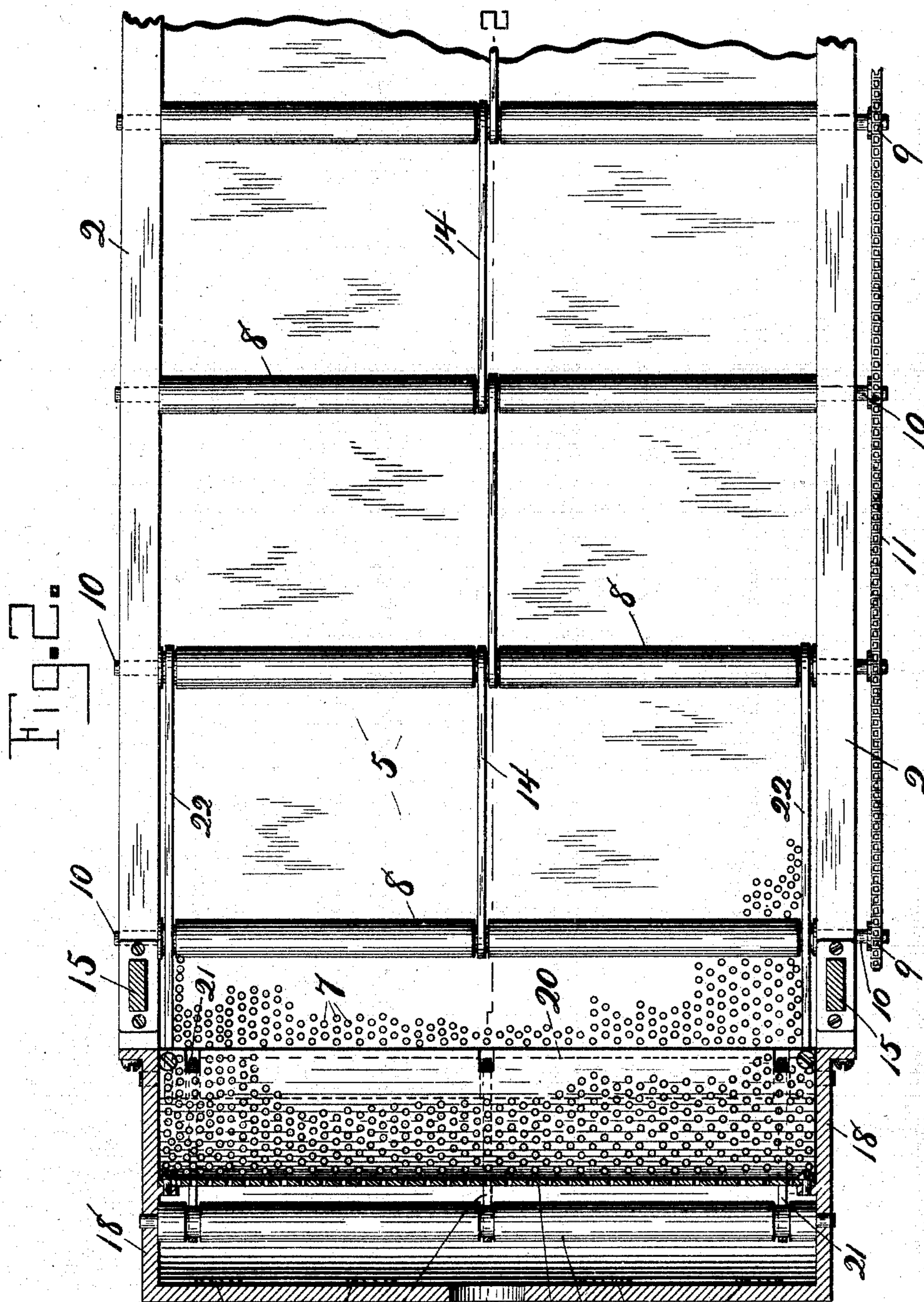
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3 SHEETS—SHEET 2.



WITNESSES:
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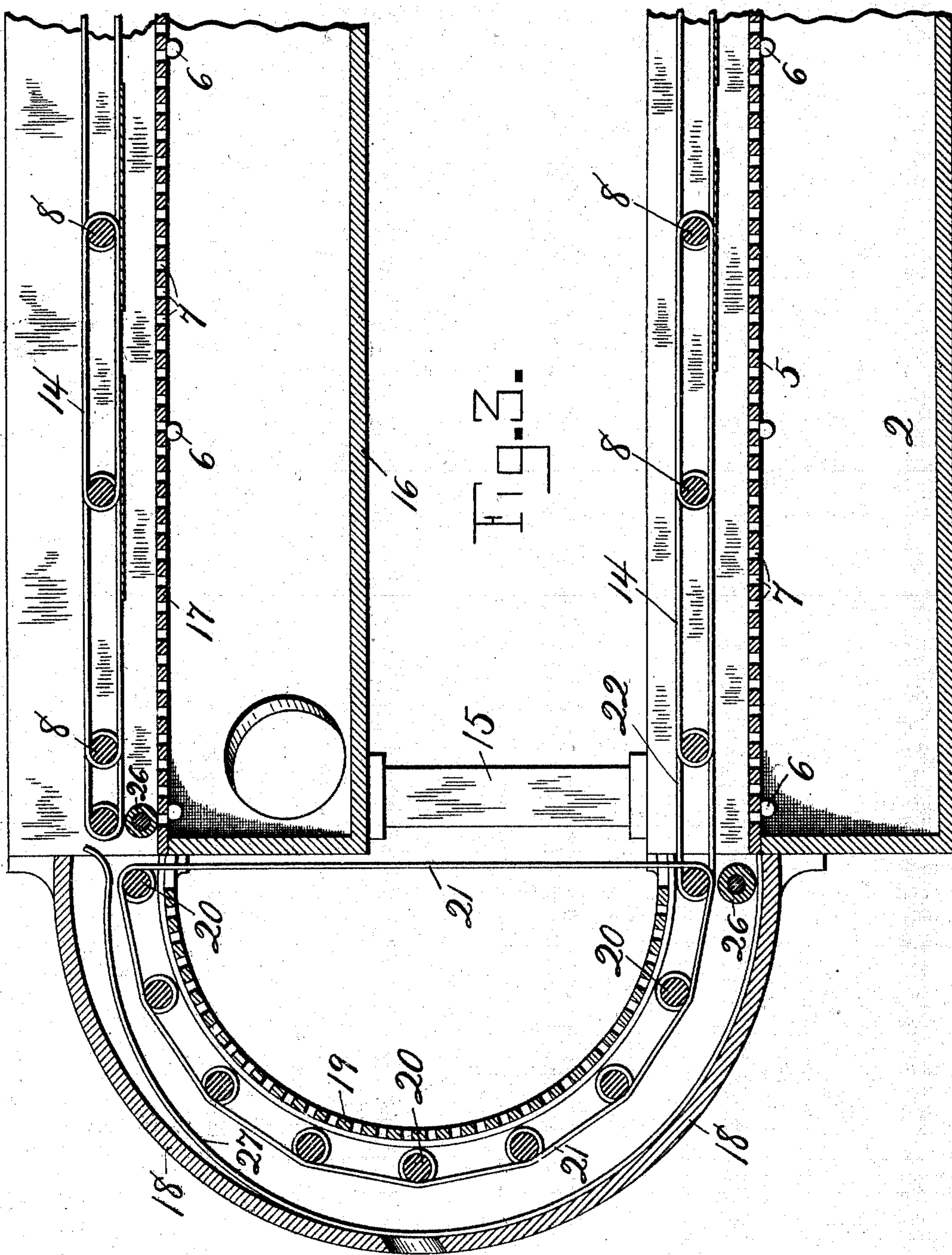
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3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

STANLEY A. COHEN, OF NEW YORK, N. Y.

DRYING-MACHINE.

SPECIFICATION forming part of Letters Patent No 764,561, dated July 12, 1904.

Application filed December 18, 1903. Serial No. 185,621. (No model.)

To all whom it may concern:

Be it known that I, STANLEY A. COHEN, a citizen of the United States, and a resident of New York city, in the county of New York and State of New York, have invented certain new and useful Improvements in Drying-Machines, of which the following is a specification.

My invention consists in improvements in machines for drying paper and the like, and is especially adapted to the drying of ink or other coloring-matter, paste, enamel, or gum upon paper or fabric in sheets or in the web.

The object of my invention is to provide a compact device simple and easily constructed and requiring little skill to operate. It is especially adapted to drying printed paper, but may also be used for drying substantially any fabric.

My device is adapted to feed the material to be dried in sheets or in the web from the supply to the delivery end thereof without clogging and with little attention from the operator.

In the drawings, Figure 1 is a side elevation of the machine. Fig. 2 is a longitudinal section on the line 1 1 of Fig. 1. Fig. 3 is a vertical section on the line 2 2 of Fig. 2. Fig. 4 is a view illustrating the perforations through which the air-blast is forced.

Referring to the drawings, in which like numerals refer to corresponding parts, 1 is the frame of the machine, supporting the air-box 2.

3 is a blower by means of which air is forced into the box 2 through the pipe 4. The metal plate 5 is secured within the box 2, as indicated in Figs. 1 and 3, by means of screws or bolts 6. The plate 5 is provided with perforations 7 throughout its entire surface. Above the plate 5 the rollers 8 are journaled in the sides of the box 2. Outside the box 2 the gear-wheels 9 are carried on the shafts 10 of rollers 8 and are adapted to be engaged by the endless chain 11. One of the shafts 9 also carries a pulley 12, engaged by power-belt 13. Each roller 8 is slightly cut away in its center an amount corresponding to the thickness of the tapes 14, which encircle each pair of rollers 8, according to the arrangement shown

in Fig. 2. Above the box 2 the posts 15 support the upper box 16, within which are arranged a perforated metal plate 17 and rollers, tapes, &c., corresponding to and geared together the same as those just described. To the end of box 2 is secured the rounded shell 18, the upper end of which is fitted to the box 16, as shown in Figs. 1 and 3. At the inner side of shell 18 is secured the curved perforated plate 19. The several rollers 20 are journaled in the ends of shell 18 and arranged as indicated in Figs. 2 and 3. Around the rollers 20 and engaging the same extend the three tapes 21, the rollers 20 being slightly cut away, so that the tapes will not project beyond their surface. The tape or belt 22 extends from one of the rollers 8 to the nearest roller 20, and so connects the system of rollers 8 with rollers 20 that they revolve in unison. The fan or blower 23 is arranged with the branch pipes 24 discharging through the sides of box 16 below perforated plate 17, the extension 25 leading into the shell 18, as shown. The rollers in the upper box 16 are revolved by power applied to one of their shafts, as indicated in Fig. 1. The rollers 26 are idle or guide rollers. Within shell 18 are placed the guides 27.

The operation of the machine is as follows: The air-blast from fans 3 and 23 is forced into the machine through the pipes indicated in Fig. 1, the blast being preferably heated for the purpose of drying the material more rapidly and effectively. The material to be dried is then inserted beneath the outer roller 8, driven, as indicated, from the power-belt 13. The moist surface on the lower face of the material at once is met by the hot air escaping under pressure through the perforations in plate 5, and the material is held up against the rollers 8 and tapes 14 by the blast while it is carried along its course by said revolving rollers and tapes. When the material reaches the farther end of box 2, it is delivered within the shell 18 and carried by rollers 20 and tapes 21 in a curved course until ejected into the box 16, where it is met by the blast from pipes 24 escaping through the perforations in plate 17, which holds it against the rollers and tapes

while it is being dried on the reverse side and carried along to the delivery end 28 of the machine. While the material is traveling from the lower to the upper box through the conduit or shell 18 it is held against the rollers 20 and tapes 21 by the blast from pipe 25.

When the material is in sheets, the operator may feed them into the machine as rapidly as desired, having care, however, that no sheet overlaps the moist surface of the preceding sheet.

It will be seen that my machine affords a positive feed, which acts in conjunction with the hot-air blast while holding the material against the feed tapes and rollers and at the same time keeps the moist surface out of contact with any part of the machine. By employing the device to carry the material from one drying-box up to another drying-box floor-space is saved. As many drying-boxes as desired, one above the other, may be employed to complete the drying. The perforated plates which I employ are inexpensive as compared with nozzles for delivering the blast. They may readily be cleaned and kept in order. In turning the material from one drying-box to another drying-box through the shell or conduit 18 the position of the perforated plate is reversed—that is to say, the air-blast escapes from the conduit to the atmosphere through the perforations; but the path of the material is between the blast and the perforated plate 19, whereas in the boxes the path of the material is outside the perforated plates. In each arrangement, however, the blast serves to retain the material against the feed-rollers while drying.

When the material has been carried through the first box, the ink, paste, enamel, or gum on its lower surface will have become sufficiently dry to receive without injury the contact of the feed rollers and tapes of the second box, in which the material is subjected to the supplemental drying by the hot air directed against its reverse surface. From the second box the material may be delivered to a frame or table, or if it be in the web it may be rolled up. If the drying in the machine shown be not sufficient, either because the course of the material has not been long enough or for any other reason, the number of drying-boxes may be increased indefinitely in series and the material led from the second to a third, and so on, as indicated by dotted lines in Fig. 1. It is of course immaterial whether the first box is arranged below, as shown, or above the supplemental boxes.

In case the effect of the first box is not sufficient to so dry the lower surface of the material that it may contact with the feeding devices of the second box the apparatus may be arranged with the second box inverted. The

same surface of the material will then be subjected to the blast as in the first box.

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

1. In a drying-machine, a set of feed-rollers adapted to propel the material in a straight path, a second set of feed-rollers adapted to propel the material in another straight path, and means for carrying the paper from the first set of rollers to the second set of rollers while under the influence of the drying means, and without permitting any contact except that of an air-blast with the moist surface of the paper, substantially as described.

2. In a drying-machine, feed-rollers, tapes connecting said feed-rollers and moving therewith, adapted to propel the material without allowing it to enter between the feed-rollers, a perforated plate parallel to the feeding means, and means whereby an air-blast is forced through the perforations of the plate to dry the material and maintain it in contact with the feeding means while moving through the machine.

3. In a drying-machine, a perforated plate, feed-rollers adapted to move the material in a straight path while its moist surface is subjected to an air-blast escaping to it through perforations in said plate, a second set of feed-rollers located in another plane and adapted to like purposes, and means whereby the material is transferred from the first feed-rollers to the second set of feed-rollers while being constantly subjected to a drying-blast and one surface maintained away from contacting points.

4. In a drying-machine, means for producing an air-blast, a shell for receiving the air-blast having perforations in its side opposite the air-blast, and feeding means adapted to carry the material through the shell between the blast and the perforations and to maintain one surface so exposed to the air-blast as to dry the same and to hold the opposite surface constantly in contact with the feeding means.

5. In a drying-machine, means for producing an air-blast, feeding means adapted to propel the material in a straight path, a perforated plate located between the air-supply and the straight path of the material, a second perforated plate, and additional feeding means adapted to propel the material in a curved path between the air-supply and said second perforated plate through which the air escapes to the atmosphere.

Signed at New York, in the county of New York and State of New York, this 15th day of December, A. D. 1903.

STANLEY A. COHEN.

Witnesses:

AUGUSTUS MAYERS,
WALTER D. APPLEYARD.