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FIG. 1

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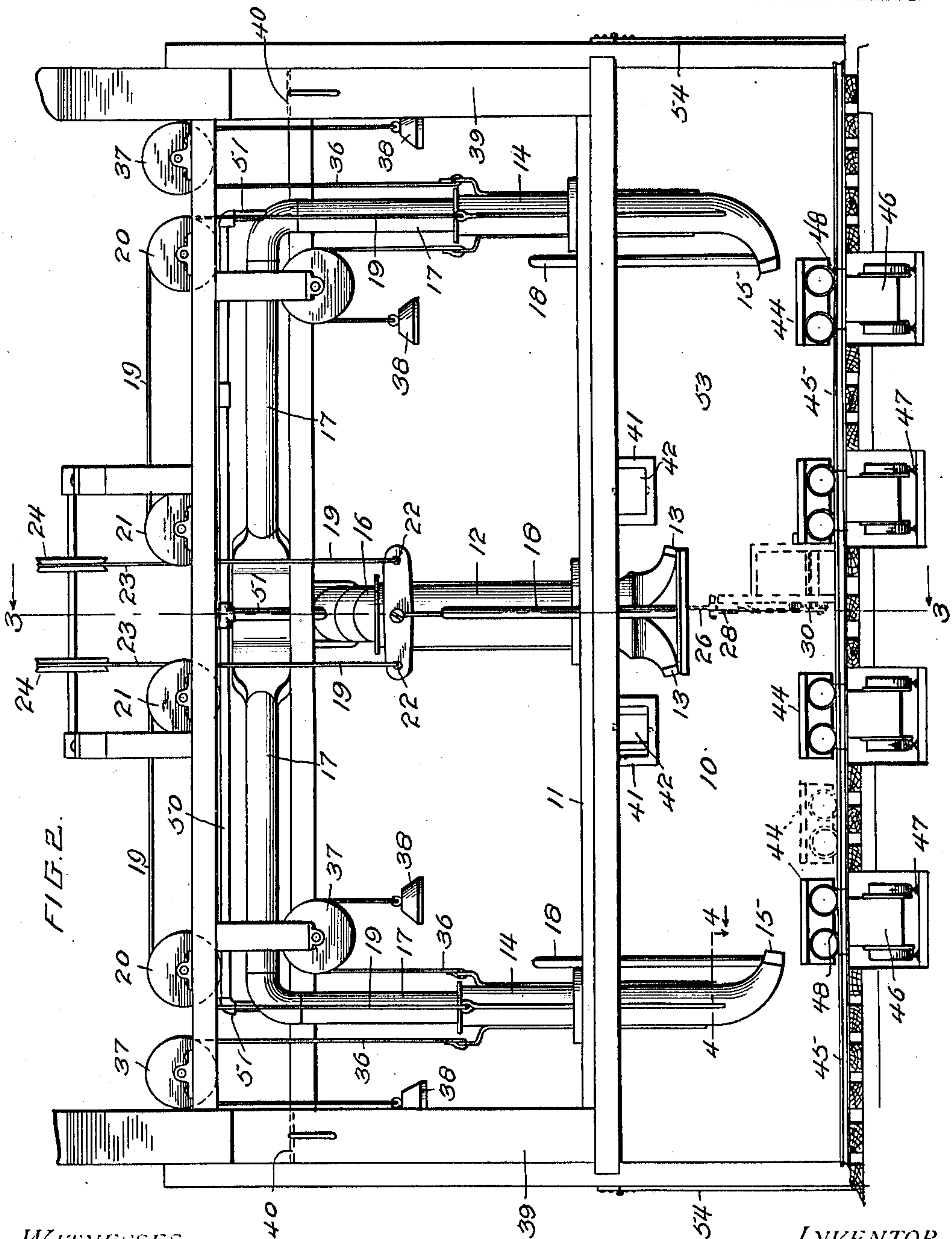
DRY KILN.

APPLICATION FILED JULY 21, 1910.

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3 SHEETS—SHEET 2.

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WITNESSES:

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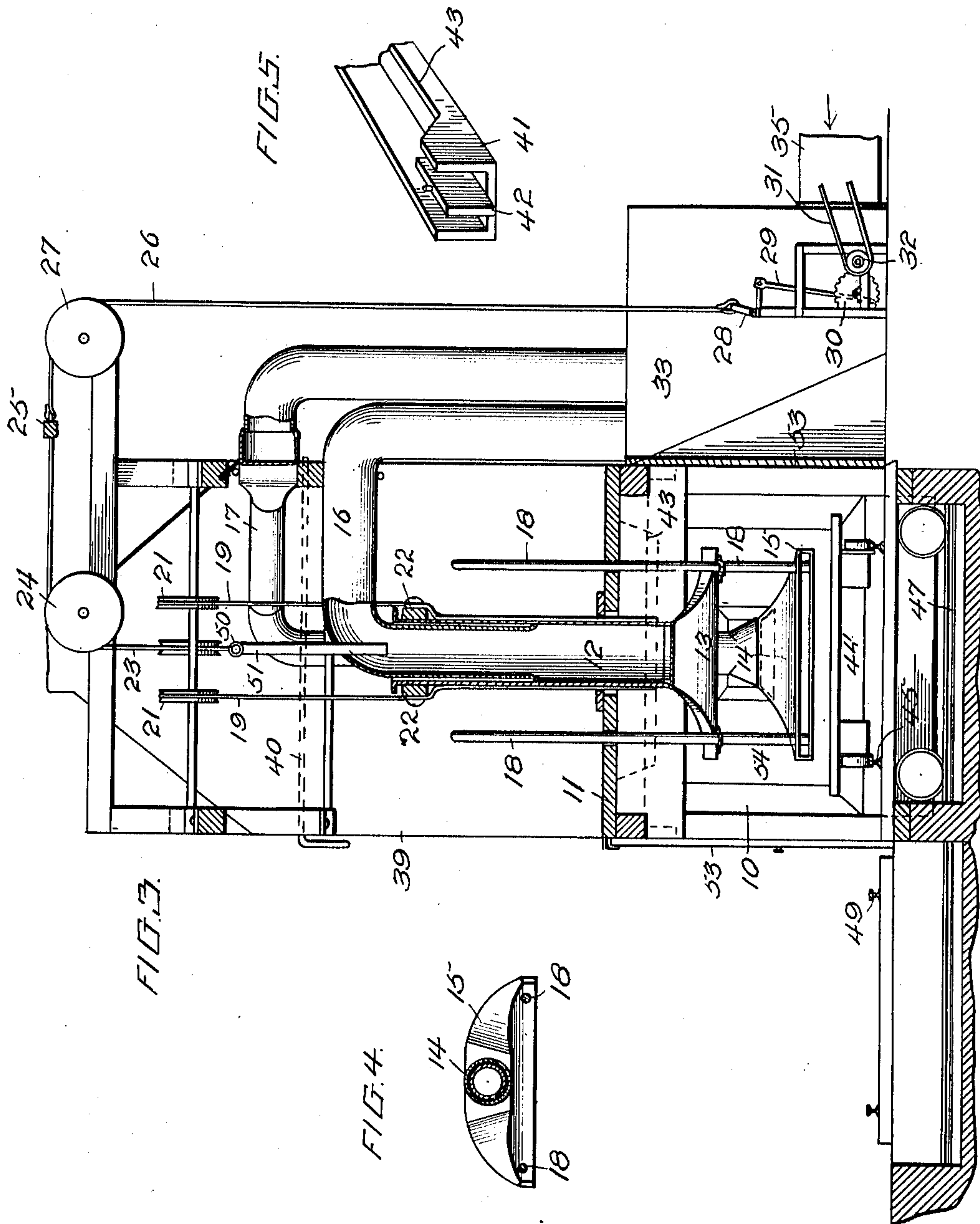
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UNITED STATES PATENT OFFICE.

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DRY-KILN.

978,209.

Specification of Letters Patent.

Patented Dec. 13, 1910.

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To all whom it may concern:

Be it known that I, JAMES R. RIPLEY, a citizen of the United States, residing at Memphis, county of Shelby, State of Tennessee, have invented certain new and useful Improvements in Dry-Kilns, of which the following is a specification, reference being had therein to the accompanying drawing.

10 This invention relates to a dry kiln and particularly to improvements upon the construction shown in my Patent #877,736, dated January 28, 1908.

15 The invention has for an object to provide a novel and improved construction wherein the air conducting pipes are oppositely disposed and alternately moved to effect a thorough distribution of the heated air upon the material to be dried which is disposed 20 intermediate of the air conducting pipes.

A further object of the invention is to provide a novel and improved arrangement of draft flues adapted to cooperate with the alternately disposed air conducting pipes.

25 Other and further objects and advantages of the invention will be hereinafter set forth and the novel features thereof defined by the appended claims.

30 In the drawings—Figure 1 is a top plan of the kiln; Fig. 2 is a side elevation thereof with the side walls removed; Fig. 3 is a vertical section on line 3—3 of Fig. 2; Fig. 4 is a detail section on line 4—4 of Fig. 2; and Fig. 5 is a detail of one of the draft flues.

35 Like numerals of reference refer to like parts in the several figures of the drawings.

40 The numeral 10 designates the drying chamber of the kiln which may be of any desired construction or configuration and disposed with its cooperating parts within a suitable building for that purpose. Extending through the roof 11 of this chamber is a centrally disposed air conducting pipe 12 having discharge nozzles 13 disposed in opposite directions and preferably elongated 45 to distribute the air for the width of the kiln.

50 At the opposite ends of the kiln, air conducting pipes 14 extend through the roof thereof and are provided with similar discharge nozzles 15, each directed toward the longitudinal center of the kiln. The pipes

12 and 14 are mounted to reciprocate upon fixed air conducting pipes 16 and 17, respectively, and the nozzles of these pipes are 55 each provided with guide rods 18 extending upward through the roof of the drying chamber to guide the movement of the pipes and nozzles and to prevent lateral movement thereof. This arrangement of nozzles 60 comprises oppositely disposed air distributing means and these are adapted to be raised and lowered in alternation by any means desired. A desirable form of such means is the lifting cables 19 which extend from the 65 pipes 14 upward over sheaves or pulleys 20 and 21 and thence downward into connection with the central distributing pipe 12 at 22. By this means, when either the central or end pipes are raised, the other is lowered, 70 thus producing an alternation of the blast upon the material. For the purpose of applying power for the raising of the pipes, cables 23 extend from the pipe 12 over bearing pulleys 24 to a suitable source of power. 75 These cables may be connected by a cross-bar 25 from which the power cable 26 extends over a bearing pulley 27 to a pivotally mounted crank arm 28. This arm is connected by a pitman 29 carried by a driving 80 gear 30 which receives power from any suitable source, for instance a belt 31 geared thereto through the shaft 32. The air conducting pipes 16 and 17 communicate with any desired source of heated air under pressure, for instance the heating chamber 33 85 which may be provided with a heating coil 34 and communicates at 35 with a blower or other device for producing air under pressure. The air distributing pipes are restored to their lowermost position by their 90 weight when the cable connection permits of such movement and for the purpose of counterbalancing this weight, cables 36 extend upward from the pipes 14, thence over guide 95 pulleys 37 and are provided at their lower ends with weights 38.

For the purpose of producing a draft through the drying chamber and of removing the moisture laden air, flues 39 are disposed at each end of the kiln and communicate with the upper portion thereof. These flues cooperate with the blast from the nozzles 13 and the discharge or blast therefrom 100

may be controlled by the dampers 40 which also regulate the air pressure within the drying chamber. For the purpose of cooperating with the nozzles 15, lateral draft flues 41 are disposed within the roof of the chamber and are provided at each end with dampers 42. These flues are open at the sides opposite the nozzles 15 as shown at 43 in Fig. 5.

The material to be dried may be introduced into the kiln in any desired manner, for instance by means of trucks 44 adapted to travel upon tracks 45 mounted within the chamber 10. These tracks are formed in sections and cooperate with carriers 46 mounted upon rails 47 and carrying cooperating track sections 48, as shown in Figs. 2 and 3. The trucks 46, when withdrawn from the kiln, bring the track sections 48 thereon into alinement with cooperating sections 49 disposed outside of the kiln and in a loading and unloading structure of any desired character. Under some conditions, it is desirable to introduce steam or moisture to the material being dried and for that purpose, a pipe 50 is provided which has communicating branches 51 extending into each of the pipes 16 and 17. Such connection can also be used for introducing steam in case of fire within the drying chamber. The kiln may also be provided with side walls or doors 53 which are movable for the purpose of introducing or removing material from the kiln. The ends of the drying chamber are also provided with doors or closures 54 adapted to be opened for access thereto.

The kiln is adapted for drying any character of material by the passage of a draft of air thereover which is distributed so as to contact with all portions of the material to produce an even drying and is therefore particularly desirable for drying lumber, wooden articles, soap, or laundried goods. The material to be dried is placed upon the trucks in the loading compartment and is then moved upon the carriers and by them transferred to the tracks within the drying chamber. When in alinement with these tracks, the trucks may be moved on to the tracks of the chamber and thus utilize the full capacity thereof. When thus disposed, the doors or other closures are placed in closed position and the draft of heated air introduced through the oppositely disposed distributing pipes whose elongated nozzles distribute the air in a horizontal plane extending across the chamber. These pipes and nozzles are continuously raised and lowered in alternation so that a draft through the material is produced, first in one direction and then in the opposite direction. This alternation of draft is assisted by the flues adjacent the center and ends of the chamber which cooperate with the nozzles, directing a blast toward them and these flues

may be controlled by dampers to secure the desired action of the air upon the material. After the drying is effected, the trucks may be removed from the chamber in any desired manner, such as shifting them to one end thereof upon the tracks within the chamber while freshly loaded trucks are introduced at the opposite end. This can be effected when the central distributing pipe is in raised position, as shown in Fig. 2. The construction is particularly adapted for use in a long kiln where the moisture laden air collects at the point farthest removed from the blast and the material would be less quickly and unevenly dried. The arrangement of nozzles and draft flues permits a thorough circulation and distribution of air to the material and removes all moisture laden air. The arrangement also permits the introduction of moisture to the material to prevent the too rapid drying of the portion thereof directly exposed to the air blast before the remainder has properly dried and permits the use of a low degree of heat which prevents injurious effects in lumber and other material dried.

The number and arrangement of nozzles may be varied in accordance with the capacity of the kiln or the material to be treated and the operating mechanism may be mounted and inclosed in any suitable manner.

Having described my invention and set forth its merits, what I claim and desire to secure by Letters Patent is—

1. In a dry kiln, a casing, air conducting pipes, oppositely disposed distributing devices carried by said pipes and movable vertically within said casing, and means for alternately moving said devices.

2. In a dry kiln, a casing, air conducting pipes, oppositely disposed distributing devices carried by said pipes and movable vertically within said casing, and means for automatically and alternately moving said devices.

3. In a dry kiln, a casing, air conducting pipes, oppositely disposed distributing devices carried by said pipes and movable vertically within said casing, and means for simultaneously and alternately moving said devices.

4. In a dry kiln, a casing, air conducting pipes, oppositely disposed distributing devices carried by said pipes and movable vertically within said casing, means for alternately moving said devices, a track disposed intermediate of said devices, a carrier movable laterally of said tracks, and a truck adapted to be shifted by said carrier.

5. In a dry kiln, a casing, air conducting pipes, oppositely disposed distributing devices carried by said pipes and movable vertically within said casing, means for alternately moving said devices, a track disposed

intermediate of said devices, a carrier movable laterally of said tracks, a truck adapted to be shifted by said carrier, and a loading and unloading track outside of said casing and adapted to cooperate with said carrier.

6. In a dry kiln, a casing, air conducting pipes, oppositely disposed distributing devices carried by said pipes and movable vertically with said casing, means for alternately moving said devices, and draft flues disposed opposite the discharge from said devices.

7. In a dry kiln, a casing, fixed air conducting pipes, movable air pipes mounted upon said fixed pipes and provided with distributing nozzles, and a connection between said movable pipes to effect an alternating movement thereof.

8. In a dry kiln, a casing, fixed air conducting pipes, movable air pipes mounted upon said fixed pipes and provided with distributing nozzles, a connection between said movable pipes to effect an alternating movement thereof, and means for counterbalancing one of said movable pipes.

9. In a dry kiln, a casing, fixed air conducting pipes, movable air pipes mounted upon said fixed pipes and provided with distributing nozzles, a connection between said movable pipes to effect an alternating movement thereof, means for counterbalancing one of said movable pipes, and means for guiding the reciprocation of said movable pipes.

10. In a dry kiln, a casing, fixed air conducting pipes, movable air pipes mounted upon said fixed pipes and provided with distributing nozzles, and a cable connection extending from one of said movable pipes to the other.

11. In a dry kiln, a casing, fixed air conducting pipes, movable air pipes mounted upon said fixed pipes and provided with distributing nozzles, a connection between said movable pipes to effect an alternating movement thereof, a draft flue at the upper portion of said casing having an opening opposite one of said nozzles, and a draft flue at the upper portion of said casing cooperating with the other nozzle.

12. In a dry kiln, a drying chamber, fixed air conducting pipes communicating therewith, sliding conducting pipes mounted upon said fixed pipes, and oppositely disposed elongated distributing nozzles upon said sliding pipes disposed within said chamber and movable relative to each other.

13. In a dry kiln, a drying chamber, a fixed air conducting pipe communicating therewith, a sliding conducting pipe mounted upon said fixed pipe, a distributing nozzle carried by said sliding pipe within said chamber, a cable extending from said sliding

pipe, a counterbalancing weight carried by said cable, and means for reciprocating said sliding pipe.

14. In a dry kiln, a drying chamber, a fixed air conducting pipe communicating therewith, a sliding conducting pipe mounted upon said fixed pipe, a distributing nozzle carried by said sliding pipe within said chamber, and a draft flue extending across the upper portion of said chamber and provided with an opening in its side wall in a parallel plane to said nozzle.

15. In a dry kiln, a drying chamber, air distributing nozzles mounted to reciprocate in a vertical plane centrally of said chamber and disposed in opposite directions, air distributing nozzles disposed at the opposite ends of said chamber for reciprocation in a vertical plane and disposed toward said central nozzles, and means for reciprocating said nozzles in alternation.

16. In a dry kiln, a drying chamber, air distributing nozzles mounted to reciprocate in a vertical plane centrally of said chamber and disposed in opposite directions, air distributing nozzles disposed at the opposite ends of said chamber for reciprocation in a vertical plane and disposed toward said central nozzles, means for reciprocating said nozzles in alternation, draft flues disposed at opposite sides of said central nozzles and provided with an inlet opening opposite the end nozzles, and draft flues disposed at the opposite ends of said casing and beyond said end nozzles.

17. In a dry kiln, a drying chamber, air distributing nozzles mounted to reciprocate in a vertical plane centrally of said chamber and disposed in opposite directions, air distributing nozzles disposed at the opposite ends of said chamber for reciprocation in a vertical plane and disposed toward said central nozzles, cable connections between said end nozzles and central nozzles for reciprocating them in alternation, and a cable connection from said central nozzles to a source of power.

18. In a dry kiln, a drying chamber, air distributing nozzles mounted to reciprocate in a vertical plane centrally of said chamber and disposed in opposite directions, air distributing nozzles disposed at the opposite ends of said chamber for reciprocation in a vertical plane and disposed toward said central nozzles, cable connections between said end nozzles and central nozzles for reciprocating them in alternation, a cable connection from said central nozzles to a source of power, and counterbalancing weights having cable connections to the end nozzles.

19. In a dry kiln, a drying chamber, air distributing nozzles mounted to reciprocate in a vertical plane centrally of said chamber and disposed in opposite directions, air dis-

tributing nozzles disposed at the opposite
ends of said chamber for reciprocation in a
vertical plane and disposed toward said cen-
tral nozzles, cable connections between said
5 end nozzles and central nozzles for recipro-
cating them in alternation, a cable connec-
tion from said central nozzles to a source of
power, a track extending longitudinally of
said chamber, a truck adapted to travel upon

said track, and a carrier for said track 10
mounted for movement laterally of said
track.

In testimony whereof I affix my signature
in presence of two witnesses.

JAMES R. RIPLEY.

Witnesses:

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DONALD CAMPBELL.