No. 761,088. PATENTED MAY 31, 1904.

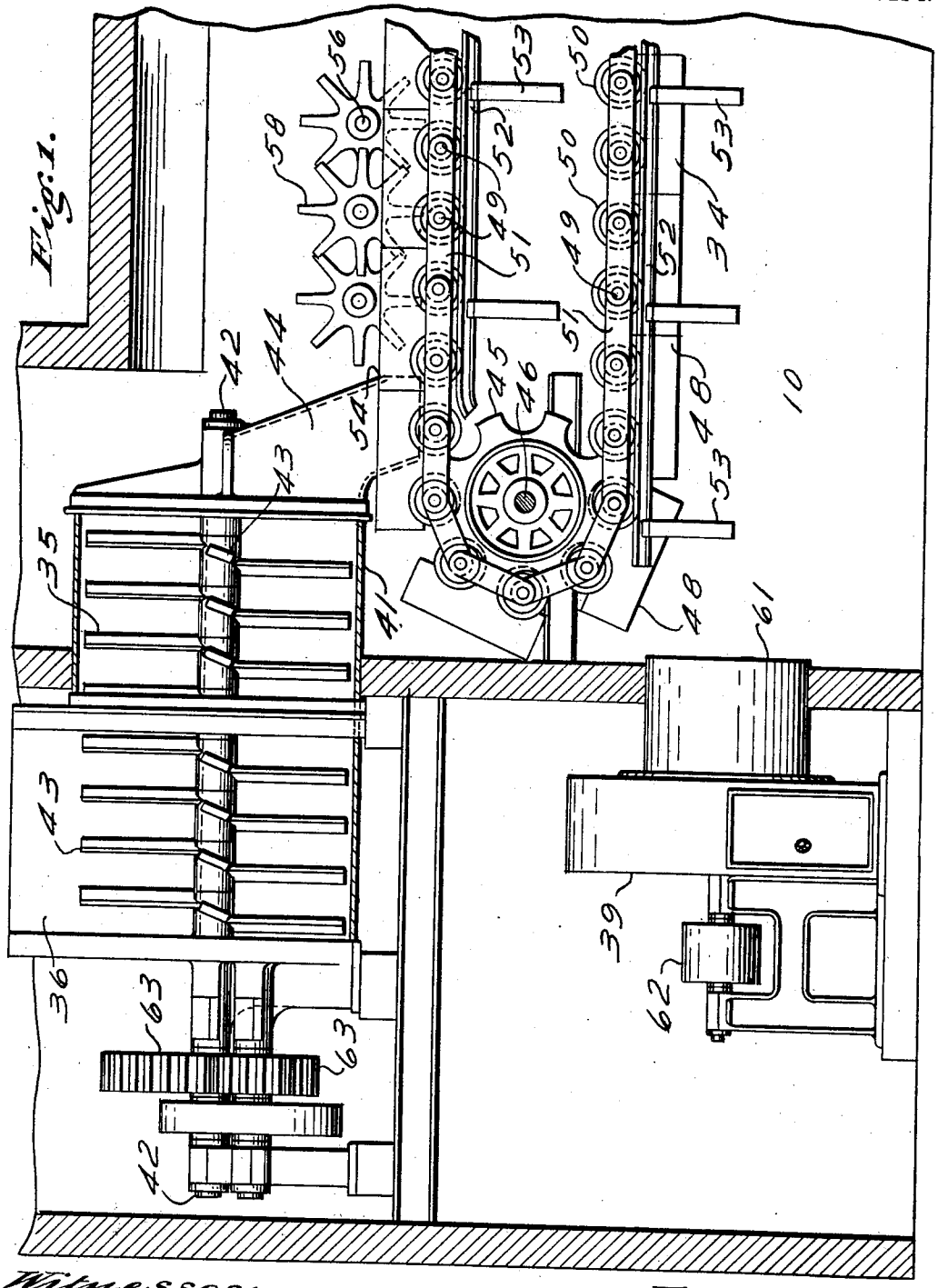
F. MEYER.

DRYING KILN.

APPLICATION FILED JULY 20, 1903.

NO MODEL. 6 SHEETS—SHEET 1.

Fig. 1.



Witnesses:
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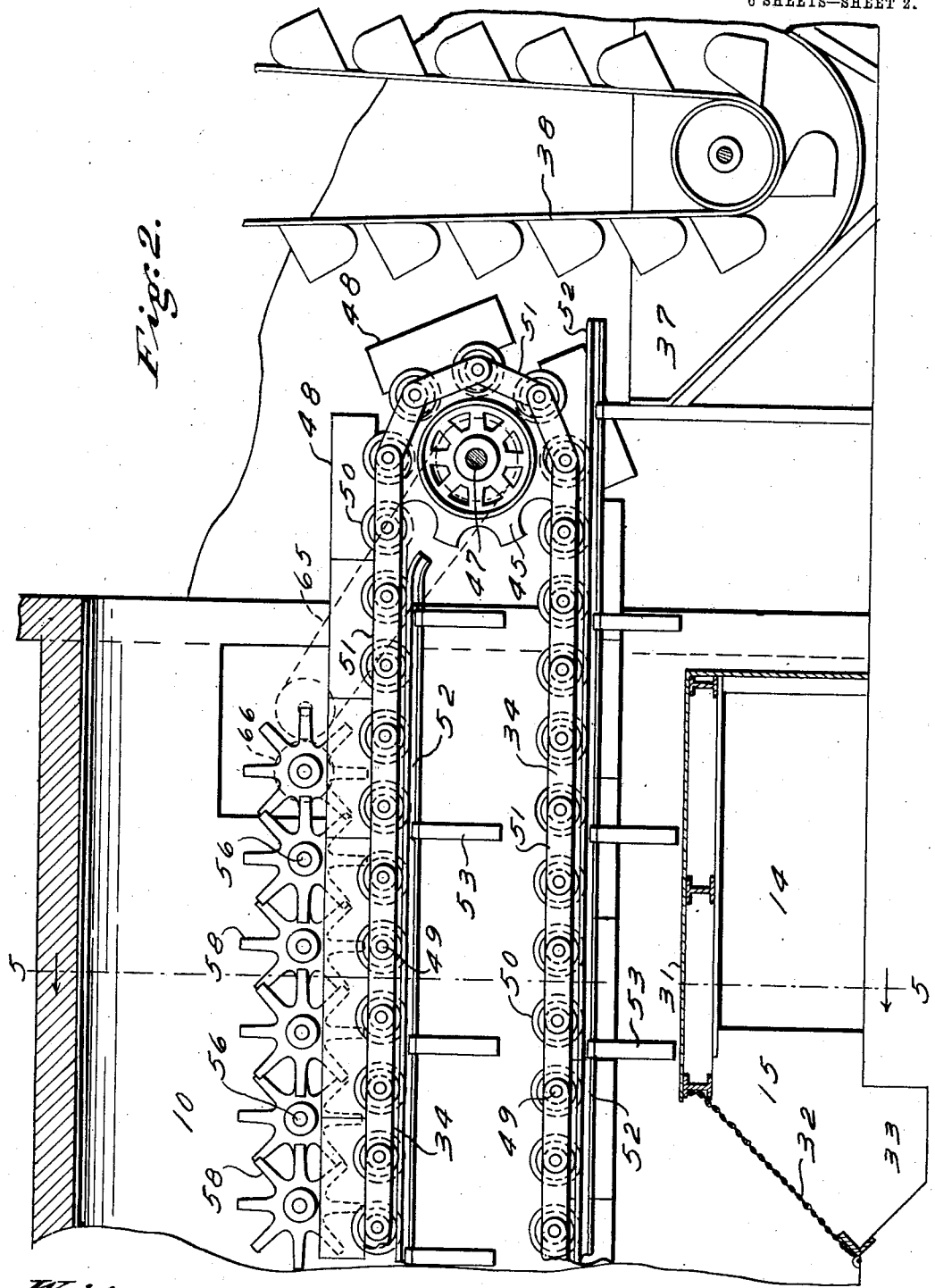
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APPLICATION FILED JULY 20, 1903.

NO MODEL. 6 SHEETS—SHEET 2.

Fig. 2.



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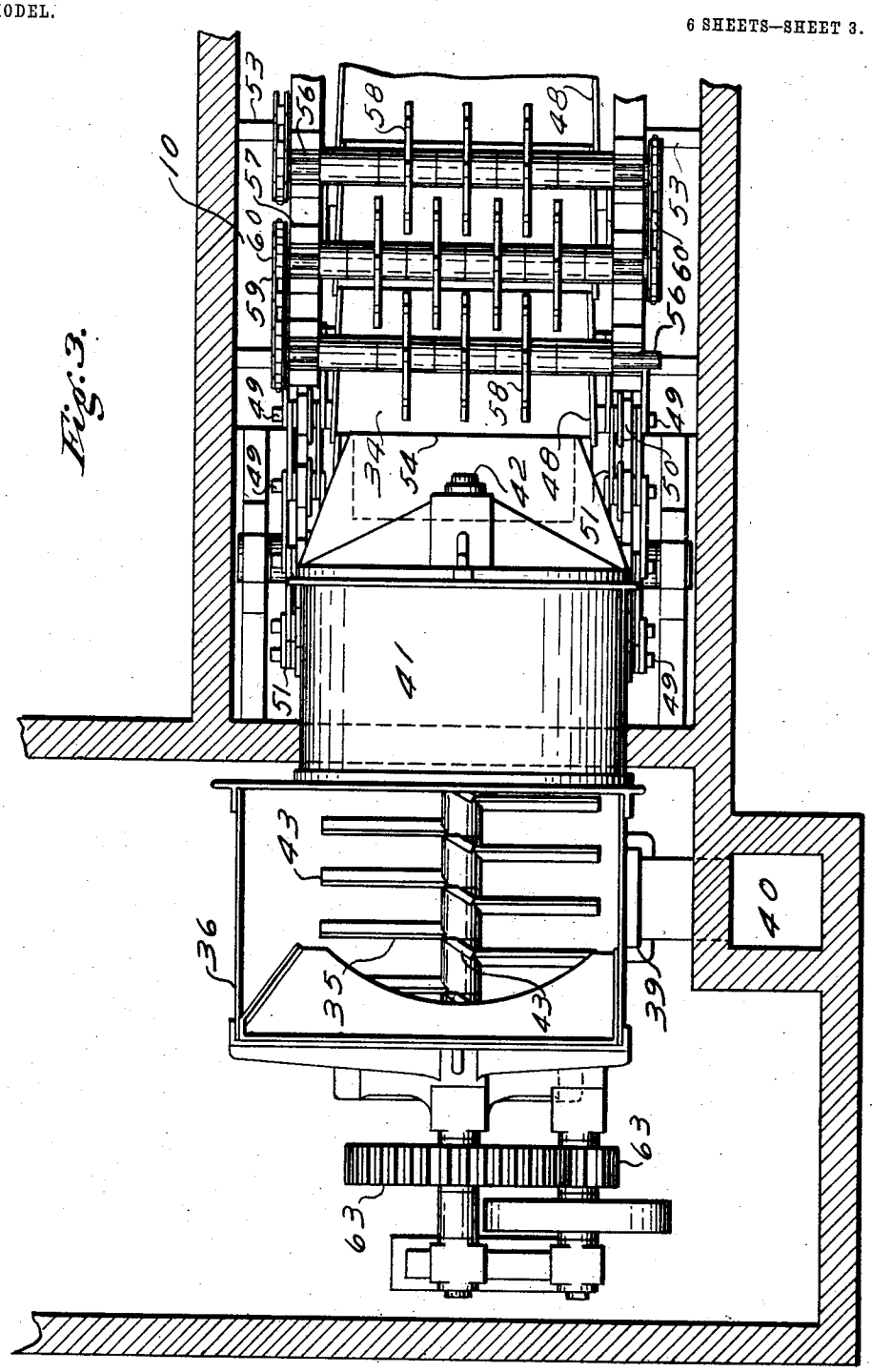
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APPLICATION FILED JULY 20, 1903.

NO MODEL. 6 SHEETS—SHEET 3.

Fig. 3.



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NO MODEL. 6 SHEETS—SHEET 4.

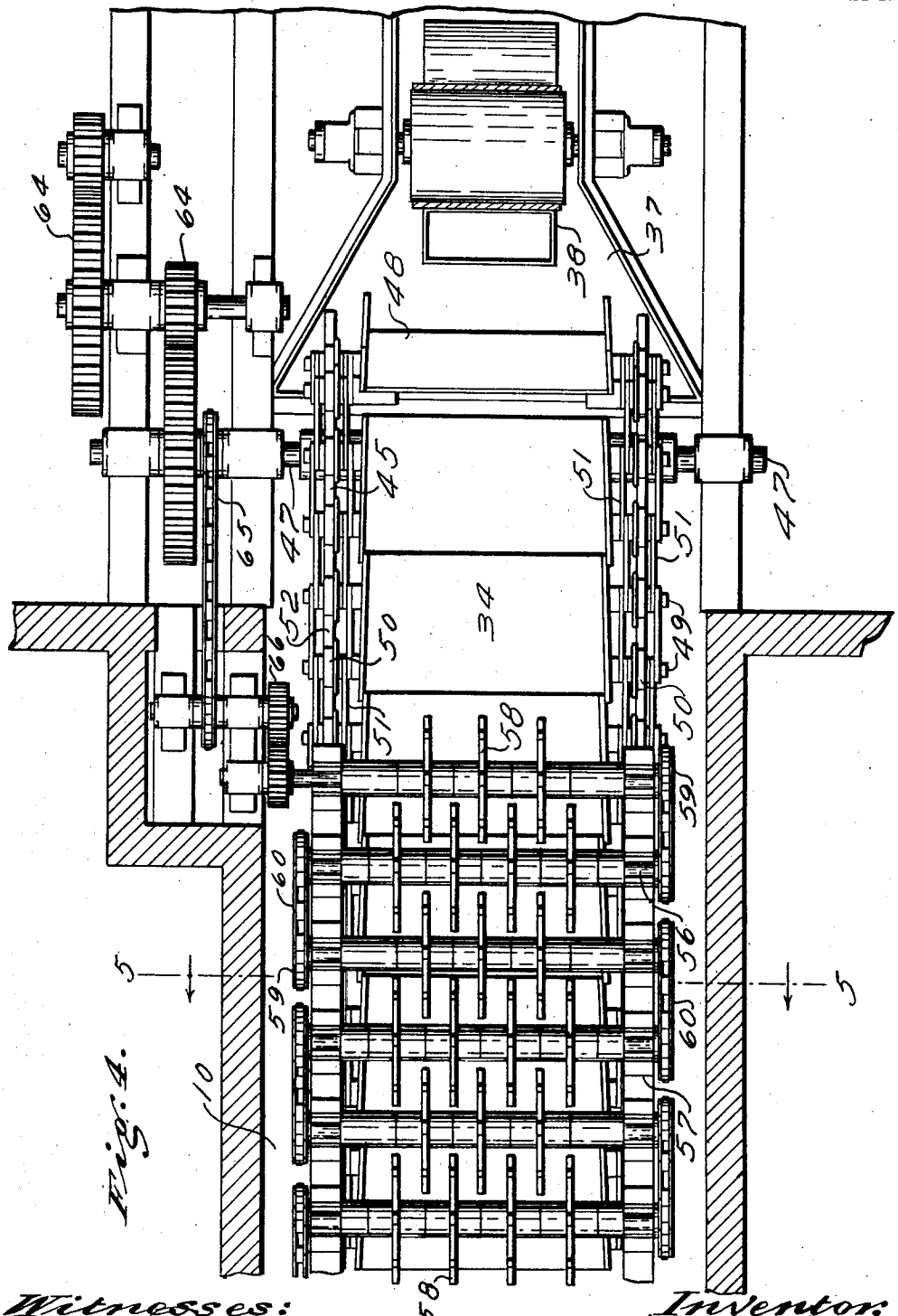


Fig. 4.

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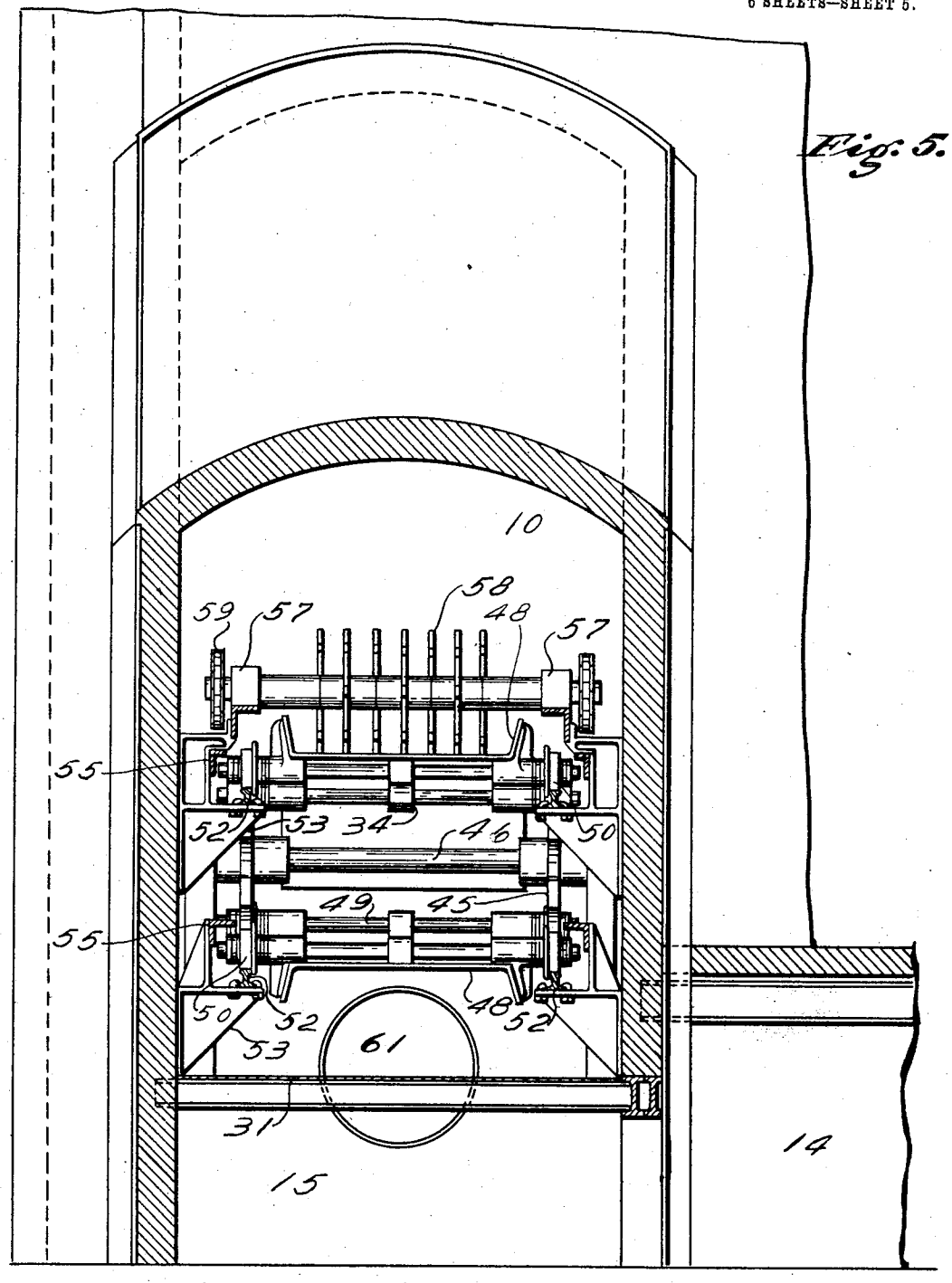
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DRYING KILN.

APPLICATION FILED JULY 20, 1903.

NO MODEL. 6 SHEETS—SHEET 5.

Fig. 5.



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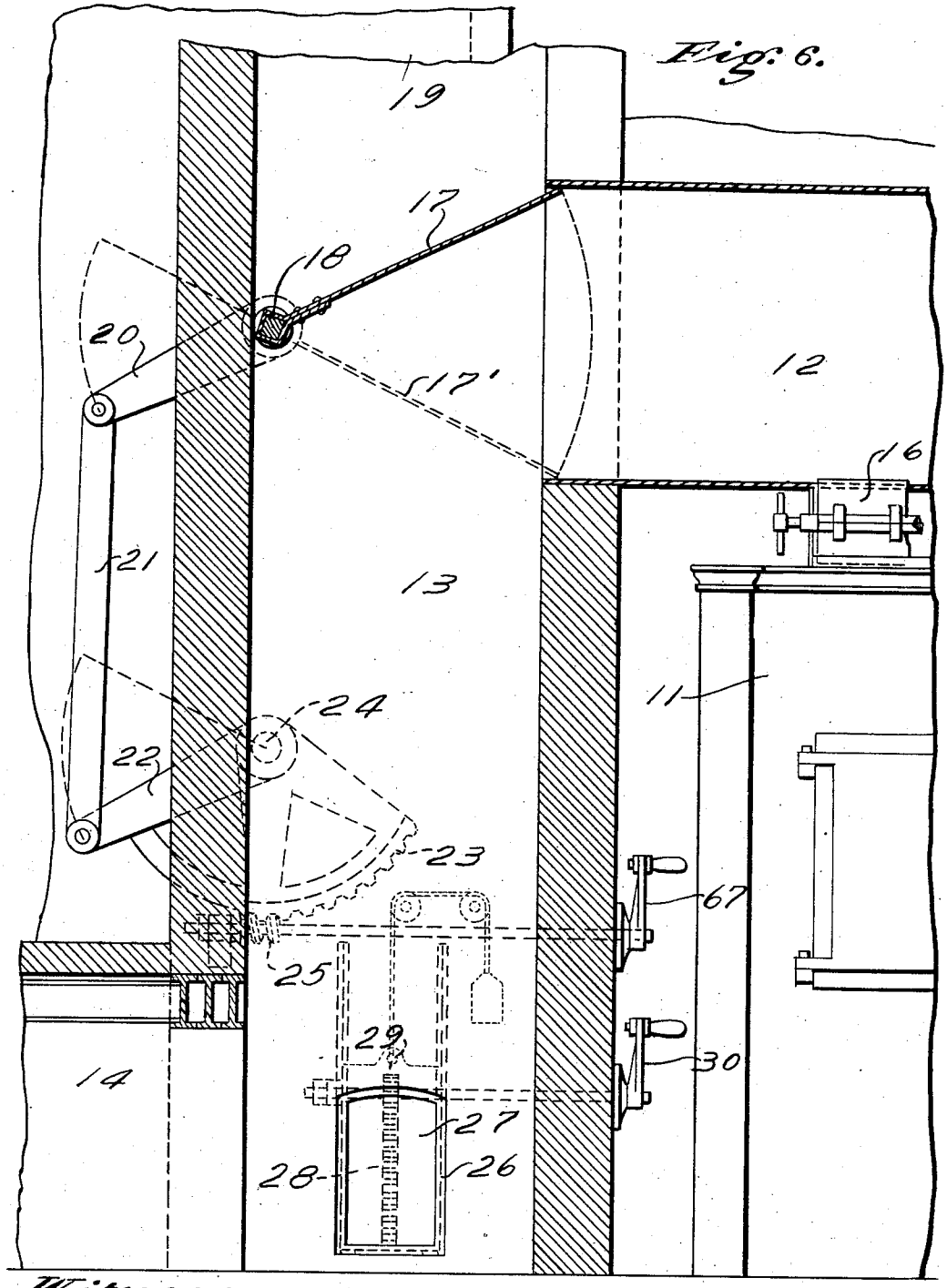
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APPLICATION FILED JULY 20, 1903.

NO MODEL. 6 SHEETS—SHEET 6.

Fig. 6.



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No. 761,088. Patented May 31, 1904.

UNITED STATES PATENT OFFICE.

FREDERICK MEYER, OF CHICAGO, ILLINOIS, ASSIGNOR OF FIVE-SIXTHS TO EUGENE J. KIRBY, OF CHICAGO, ILLINOIS, AND THE CHICAGO AMERICAN FUEL BRIQUETTING COMPANY, OF CHICAGO, ILLINOIS.

DRYING-KILN.

SPECIFICATION forming part of Letters Patent No. 761,088, dated May 31, 1904.

Application filed July 20, 1903. Serial No. 166,303. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK MEYER, a citizen of the United States of America, and a resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Drying-Kilns, of which the following is a specification.

My invention is particularly applicable for drying peat preparatory to compressing same into the form of briquets.

The main objects of my invention are to provide improved means for keeping the peat agitated during the drying process, so as to properly dry same throughout its mass.

A further object is to provide an improved arrangement of conveying mechanism particularly adapted for carrying the peat during the process of drying and agitation.

Other objects of different features of my invention will be understood from the following description with reference to the accompanying drawings, in which—

Figures 1 and 2 together form a side elevation, partly in section, of a drying-kiln constructed according to my invention. Figs. 3 and 4 together form plans of same, partly in section. Fig. 5 is a transverse sectional view of the machine on the line 5 5 of Figs. 2 and 4. Fig. 6 is a section of parts adjoining those shown in Fig. 5 and located behind the parts shown in Fig. 2.

In the construction shown the drying-chamber 10 is connected with the air-heater 11 by means of the air-passages 12, 13, 14, and 15. Communication between the heater 11 and the passage 12 is controlled by means of a damper 16. The deflector 17 is mounted on the shaft 18 in the passage 13 and is movable to the positions shown by dotted lines 17′, so as to deflect the heated air from the passage 12 upwardly into the chamber 19. An arm 20, rigidly secured to the shaft 18, connected by means of the link 21 and the arm 22 to the toothed sector 23, controls the position of the deflector 17. The sector 23 is rotatable on its pivot 24 and is operated by a worm 25, connected with the crank 67. This device is self-locking and permits of adjusting the deflector 17, so as to control the amount of heated air entering the passage 13. Cold air may be admitted into the passage 13 through a sluice-valve 26. The valve-plate 27 is provided with a rack 28, which meshes with a pinion 29, driven by the crank 30, the weight of the valve-plate 27 being counterbalanced by a suitable counterweight. (Indicated by dotted lines in Fig. 6.)

The air-passage 15 extends along the bottom of the compartment 10 and is separatd from the compartment 10 by a sheet-metal floor 31. The inner end of the passage 15 has an inclined screen 32 extending entirely across same for the purpose of arresting sparks which may have been carried into the passage 15 by the current of heated air, and the bottom of the passage 15 is provided with a pit 33 for gathering cinders which are arrested by the screen 32, thus preventing such cinders from piling against the screen and obstructing the passage 15.

Disposed above the floor 31 and extending through the entire length of the drying-chamber 10 is a horizontally-disposed conveyer 34, which will be hereinafter described. The conveyer 34 is supplied with material by a pug-mill 35, which is fed by a hopper 36, communicating with suitable conveying mechanism. (Not shown.) A hopper 37, located at the delivery end of the conveyer 34, receives the material from said conveyer, and such material is then conveyed away to suitable storage-bins by a system of conveyers, one of which is shown partly broken away at 38.

A fan 39 at the end of the drying-chamber 10, which is farthest from the heater 11, draws air and moisture from the chamber 10 and discharges it into the chimney 40.

The pug-mill 35 consists of a cylindrical receptacle 41, having an axial shaft 42 extending longitudinally through same. A plurality of vanes 43 are rigidly secured to the shaft 42 and revoluble therewith. The vanes 42 are disposed radially and with their broader faces at an angle to the axis of the shaft 42,

thus serving to keep the material in the pug-mill broken up and at the same time to force same through the chute 44 into the conveyer 34.

The conveyer 34 consists of an endless chain of buckets 48, mounted upon suitable sprocket-wheels 45, secured to the shafts 46 and 47. Each of the buckets 48 consists of a plate bent to form the bottom and sides of the bucket. The buckets are open at their ends and together form a continuous trough along the top of the conveyer 34. Each of the buckets is mounted upon two axles 49, each provided with a pair of rollers 50. The sprocket-wheels 45 are suitably arranged on their shafts to receive the rollers 50. The axles 49 are connected by links 51 to form a continuous belt. Suitable tracks 52, supported by brackets 53, extend between the sprocket-wheels 45 and in alinement with same in suitable position to carry the rollers 50 while same are passing between the said sprocket-wheels. The chute 44 extends downwardly into the trough formed by the buckets at the top of the conveyer, and the edge 54 forms a scraper, which prevents the material from piling into the buckets 48 to a greater height than that of the side walls of same. The angle-bars 55 extend along above the tracks 52 and prevent the rollers 50 from being displaced upwardly or sidewise, so as to leave the tracks 52.

A plurality of shafts 56, disposed transversely of the conveyer 48, are journaled in suitable bearings 57 above the conveyers 48. Each of the shafts 56 has radially secured thereon a plurality of star-wheels 58, each provided with a plurality of radially-disposed arms. The shafts 56 are spaced at equal distances from each other, and the arms of the stars are of greater length than one-half the distance between centers of the shaft and are so disposed as to overlap those on the next adjacent shafts. The shafts 56 are provided with sprocket-wheels 59, which are connected together by suitable link belts, so that all of the star-wheels 58 will rotate in the same direction. The arms of the star-wheels 58 are of sufficient length to dip into the trough of the conveyer 48 and agitate the material contained therein, the link belts 60 being driven in such direction that the arms below the shafts move in the same direction as the conveyer 34.

The fan 39 communicates with the compartment 10 by the passage 61 and is driven by the pulley 62, which may be connected through a belt with suitable power. The pug-mill 35 is driven by the train of gears 63, which is operated by suitable power mechanism. (Not shown.) The conveyer 34 is driven by a train of gears 64, which connects with the shaft 47, carrying the sprocket-wheels 45 at the delivery end of the conveyer 34. The agitator-stars 58 are geared to the shaft 47 by means of the chain belt 65 and the gears 66, together with the link belts 60.

The walls of the buildings are so arranged that little or no air enters the drying-compartment except through the air-passage 15. The air is exhausted at 61 by the fan 39.

The operation of the device shown is as follows: The peat or other material which is to be dried is delivered to the hopper 36 and is broken up and carried along by the blades 43. The speed of rotation of the shaft 42 is regulated to suit the carrying capacity of the conveyer 34. The material is delivered through the chute 44 into the buckets 48 and is thereby carried along the compartment 10 and delivered into the hopper 37. Since the material is quite wet when delivered through the chute 44, it has a tendency to settle and pack into a solid mass in the conveyer-buckets 48. If permitted to pack in such manner, this would greatly retard the drying effect of the heated air in the compartment 10. The rotation of the agitator-stars 58 continually stirs and loosens the material during its entire passage along the conveyer 34, and since the stars 58 revolve in the same direction as the motion of the conveyer 34 such agitation is accomplished with little additional power. The stars 58 are overlapped, so that material which is lifted by the rising arms of one set of stars will be drawn back into the conveyer by the descending arms of the next succeeding series of stars. The conveyer 34 is made of sufficient length, so that the peat is properly dried in its passage along same. After delivery to the hopper 37 the material is raised by the conveyer 38 and is then carried by suitable conveying mechanism (not shown in the drawings) to suitable storage-bins. (Not shown.)

It will be seen that numerous details of the construction shown may be altered without departing from the spirit of my invention. I therefore do not confine myself to such details except as hereinafter limited in the claims.

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

1. In a drying-kiln, the combination of a drying-compartment; an air-heater communicating with said compartment; a horizontally-disposed conveyer comprising a plurality of buckets open at their ends and abutting in suitable manner to form a continuous trough; means for supplying material to said conveyer; a plurality of parallel horizontally-disposed shafts extending transversely of said conveyer; a plurality of radially-disposed arms rigidly secured to each of said shafts, the arms on each shaft being disposed along such shaft so as to alternate with the arms on each of the shafts next adjacent and the distance between said shafts being less than twice the length of such arms; and means for rotating said shafts and thereby causing said arms to agitate the material during its passage along the conveyer, substantially as described.

2. In a drying-kiln, the combination of a drying-compartment; a horizontally-disposed

conveyer mounted in said compartment and comprising a plurality of buckets open at their ends and abutting in suitable manner to form a continuous trough; an air-heater communicating with said compartment at the delivery-end of said conveyer; means for exhausting air at the receiving end of said conveyer; a plurality of transverse shafts disposed above the conveyer and each having thereon a plurality of arms disposed transversely of the shafts, the arms on one shaft overlapping those of the next adjacent shafts in suitable manner to impart an alternating vertical movement to the material passing along said conveyer, substantially as described.

3. In a drying-kiln, the combination of a drying-compartment; an air-heater communicating with said compartment; a horizontally-disposed conveyer comprising a plurality of buckets open at their ends and abutting in suitable manner to form a continuous trough; means for supplying material to said conveyer; a plurality of parallel horizontally-disposed shafts extending transversely of said conveyer; a plurality of radially-disposed arms rigidly secured to each of said shafts, the arms on each shaft being disposed along such shaft so as to alternate with the arms on each of the shafts next adjacent and the distance between said shafts being less than twice the length of such arms; and means for rotating said shafts and thereby causing said arms to agitate the material during its passage along the conveyer, said shafts being driven in a suitable direction for causing said arms to pass through the material in a direction corresponding with the motion of said conveyer, substantially as described.

Signed at Chicago this 29th day of June, 1903.

FREDERICK MEYER.

Witnesses:
E. J. KIRBY,
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