

F. A. HETHERINGTON.
DRIER.
APPLICATION FILED NOV. 7, 1907.

913,497.

Patented Feb. 23, 1909.
2 SHEETS—SHEET 1.

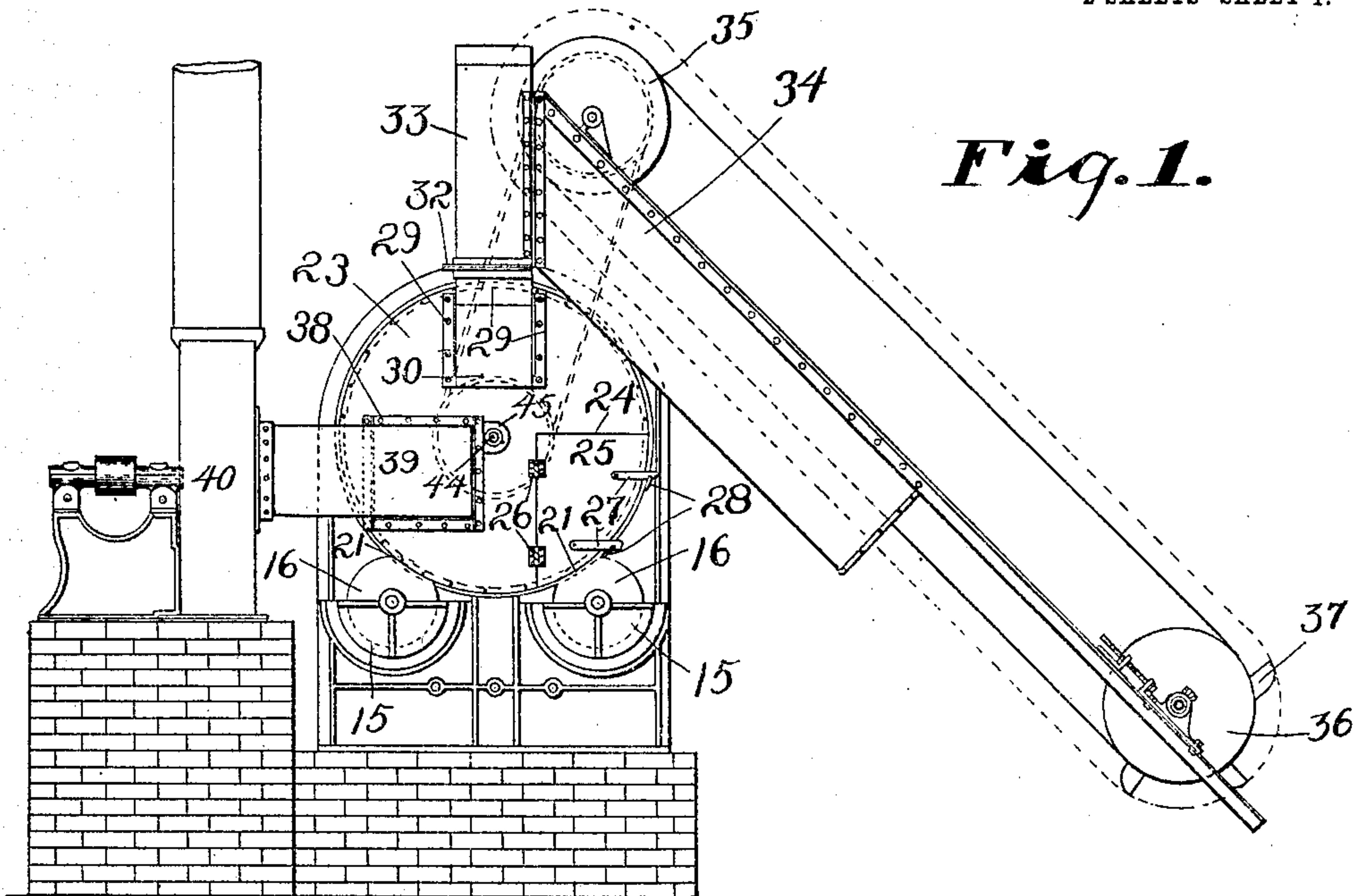


Fig. 1.

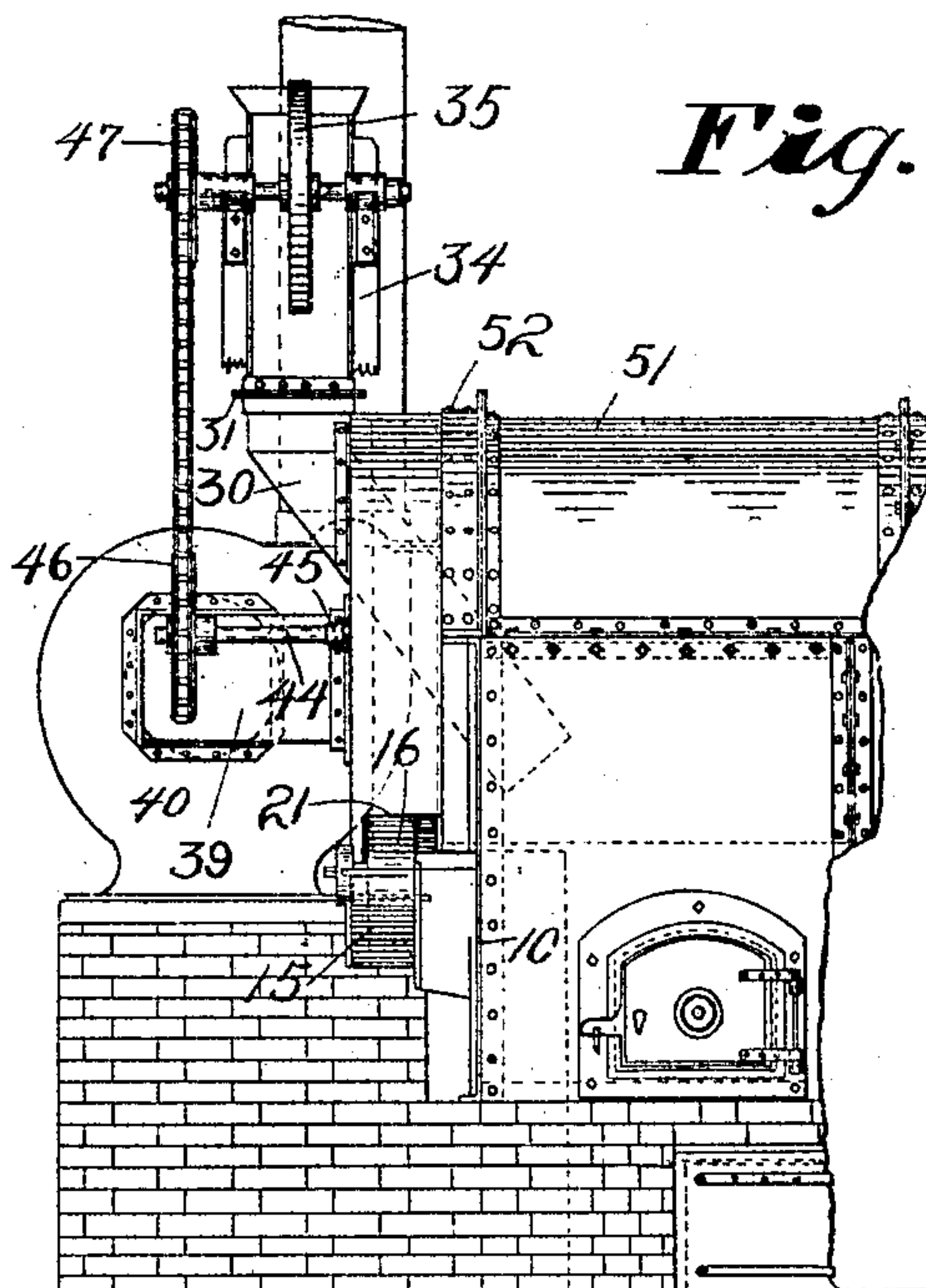


Fig. 2.

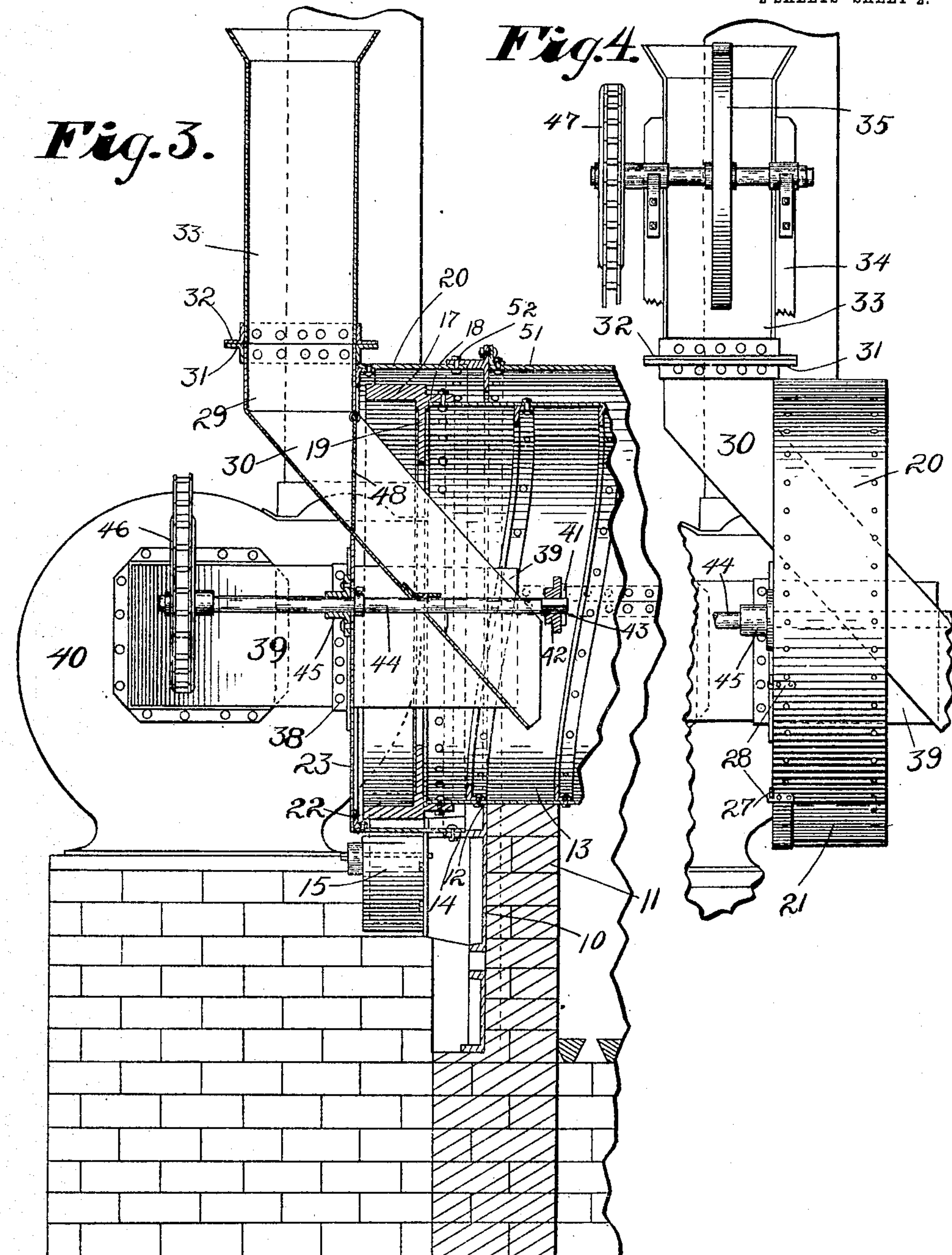
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DRIER.

913,497.

2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

FREDERICK A. HETHERINGTON, OF INDIANAPOLIS, INDIANA.

DRIER.

No. 913,497.

Specification of Letters Patent.

Patented Feb. 23, 1909.

Application filed November 7, 1907. Serial No. 401,059.

To all whom it may concern:

Be it known that I, FREDERICK A. HETHERINGTON, a citizen of the United States, residing at Indianapolis, in the county of Marion and State of Indiana, have invented certain new and useful Improvements in Driers, of which the following is a specification.

The object of my invention is to provide improved details of construction of the receiving end of a rotary drier in order to facilitate the introduction of material thereinto and the ready removal of the receiving head and readjustment of the delivery elevator, also self-contained construction for driving the elevator.

The accompanying drawings illustrate my invention.

Figure 1 shows an end elevation with the delivery elevator in position; Fig. 2 a side elevation with a portion of the delivery elevator omitted; Fig. 3 a vertical section on an enlarged scale, and Fig. 4 a side elevation with the lower end of the delivery elevator broken away.

In the drawings, 10 indicates an end plate of the housing 11 of the furnace setting. The plate 10 is provided with an opening 12 through which the drier drum 13 is projected, and surrounding said opening 12 is a circular flange 14. Carried by the plate 10 are a pair of roller-housings 15 in each of which is journaled a roller 16 to support the weight of and form a bearing for the drier drum 13. Secured to the receiving end of the drum 13 is a bearing head comprising a main cylindrical flange or ring 17 provided at its rear end with a cylindrical flange 18 adapted to be bolted, or otherwise secured to the drier drum 13, and also provided in its interior with an annular flange 19 which projects partially across the open receiving end of the drum 13 and thus forms a retainer to prevent freshly received material from dropping out. The ring 17 rests and rolls upon the rollers 16. The open end of the drier drum is closed and protected by a breaching ring 20 which fits in and is secured to the flange 14 of the face plate 10, said breaching ring 20 being cut away at two points 21, 21 to admit the rollers 16 there-through. Secured within the outer end of the breaching ring 20 is a ring 22 of angle iron and to the inwardly projecting flange of this angle iron I secure the major portion 21 of an end plate 23. The plate 23 is cut away at 24 in order to form an opening for

convenient access to the interior of the drier and this opening is closed by a swinging door 25 hinged at 26 to the plate 23 and provided with latches 27 adapted to engage catches 28 carried by the breaching ring. Formed through plate 23 at its upper side is an opening covered by a pipe section 29 and a trough section 30 which extends downwardly and inwardly therethrough into the interior of drum 13. The upper end of pipe section 29 carries a flanged ring or head 31 adapted to receive and form a support for a similar ring 32 carried at the lower end of a tubular head or pipe section 33, to one side of which is secured an elevator frame 34 carrying a driving wheel 35, an idler 36 and an endless elevator chain 37. Plate 23 is also provided in its lower part with an opening surrounded by a ring or flange 38 carrying a suction pipe 39, the inner end of which extends into the interior of the drum 13 any desired distance and the outer end of which connects with a suitable suction fan 40.

In order to provide a convenient means for driving the elevator chain I provide, inside of the drum 13, a pair of inwardly projecting diametrically opposed ears 41 (only one being shown), and secured to these ears is a cross arm 42 provided in its center with a squared hole adapted to receive the square inner end 43 of the shaft 44 which passes through the bottom of trough 30 and thence through a bearing 45 secured to the outer face of plate 23. Shaft 44 carries a sprocket wheel 46 near its outer end and this sprocket wheel is arranged in alinement with the sprocket wheel 47 carried by the shaft of the driving wheel 35, a chain passing over the two sprocket wheels.

In order to prevent a direct draft being established through the feed chute into the suction pipe 39 I mount in feed chute 30 a flat valve 48 which is pivotally mounted at its upper end so as to yield readily to the weight of sand above it but of sufficient weight in itself not to yield much to the suction produced by the suction pipe.

In operation, sand or other material to be dried is delivered by the elevator chain 37 into the head 33 and passes thence down through pipe 39 into trough 30 into the interior of the drum 13 which, upon being rotated, drives the material to the right in Fig. 3 through the drum, hot gases in the meantime being drawn in the opposite direction through the drum and through pipe 39. Ring or

flange 19 prevents the material discharged into drum 13 from trough 30 from spilling from the receiving end of the drum and easy access may be had into the interior of the drum 5 through door 25.

The furnace setting 11 has housing members 51 which extend over the drier drum 13 in the usual well known manner. It has heretofore been difficult to get into the interior 10 of a drier for repair, etc., but with the present construction it is merely necessary to remove the fastening bolts 52, whereupon the breaching ring 20, together with the feed spout and draft tube which are fastened thereto, may 15 be readily withdrawn as a complete structure without dismantling, and consequently it may be as readily replaced after repairs or inspection of the interior of the drier has been made. It will also be noticed that when the 20 breaching ring is removed shaft 44, as well as the elevating mechanism, is carried with it so that there is no need of disconnecting any of these parts.

I claim as my invention:

25 1. In a drier, the combination with a setting, an open ended drum rotatably mounted within said setting, and supporting rollers for the receiving end of said drum, of an inclosing breaching for the open end of said 30 drum, said breaching having openings for the passage of the supporting rollers, means for readily attaching and detaching said breaching to and from the setting, a driving shaft journaled in suitable bearings carried by the 35 breaching, and means carried by the drum for receiving the inner end of said driving shaft.

2. In a drier, the combination with a setting, an open ended drum rotatably mounted 40 within said setting, and supporting rollers for the receiving end of said drum, of an inclosing breaching for the open end of said drum, said breaching having openings for the passage of the supporting rollers, means for 45 readily attaching and detaching said breaching to and from the setting, a driving shaft journaled in suitable bearings carried by the

breaching, means carried by the drum for receiving the inner end of said driving shaft, and a feed chute carried by said breaching 50 and projected into the receiving end of the drum.

3. In a drier, the combination with a setting, an open-ended drum rotatably mounted 55 within said setting, and supporting rollers for the receiving end of said drum, of an inclosing breaching for the open end of said drum, said breaching being adapted for attachment to the setting and having openings 60 in its side for the passage of the supporting rollers, a feed chute carried by said breaching and projecting into the drum, and an elevator structure connected to said feed chute.

4. In a drier, the combination with a setting, an open-ended drum rotatably mounted 65 within said setting, and supporting rollers for the receiving end of said drum, of an inclosing breaching for the open end of said drum, said breaching being adapted for attachment to the setting and having openings 70 in its side for the passage of the supporting rollers, a feed chute carried by said breaching and projecting into the drum, an elevator structure connected to said feed chute, and 75 a suction pipe also carried by said breaching and projecting through the end of the drum.

5. In a drier, the combination, with a rotary drum, of a housing inclosing the same, said housing comprising a detachable breaching inclosing the receiving end of the drum, 80 said breaching carrying a feed spout, elevator mechanism discharging into said feed spout, a shaft journaled in said breaching, driving connections between said shaft and the elevator, and means carried by the drum for engaging the inner end of said shaft.

In witness whereof, I, have hereunto set my hand and seal at Indianapolis, Indiana, this first day of November, A. D. one thousand nine hundred and seven.

FREDERICK A. HETHERINGTON. [L. s.]

Witnesses:

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