

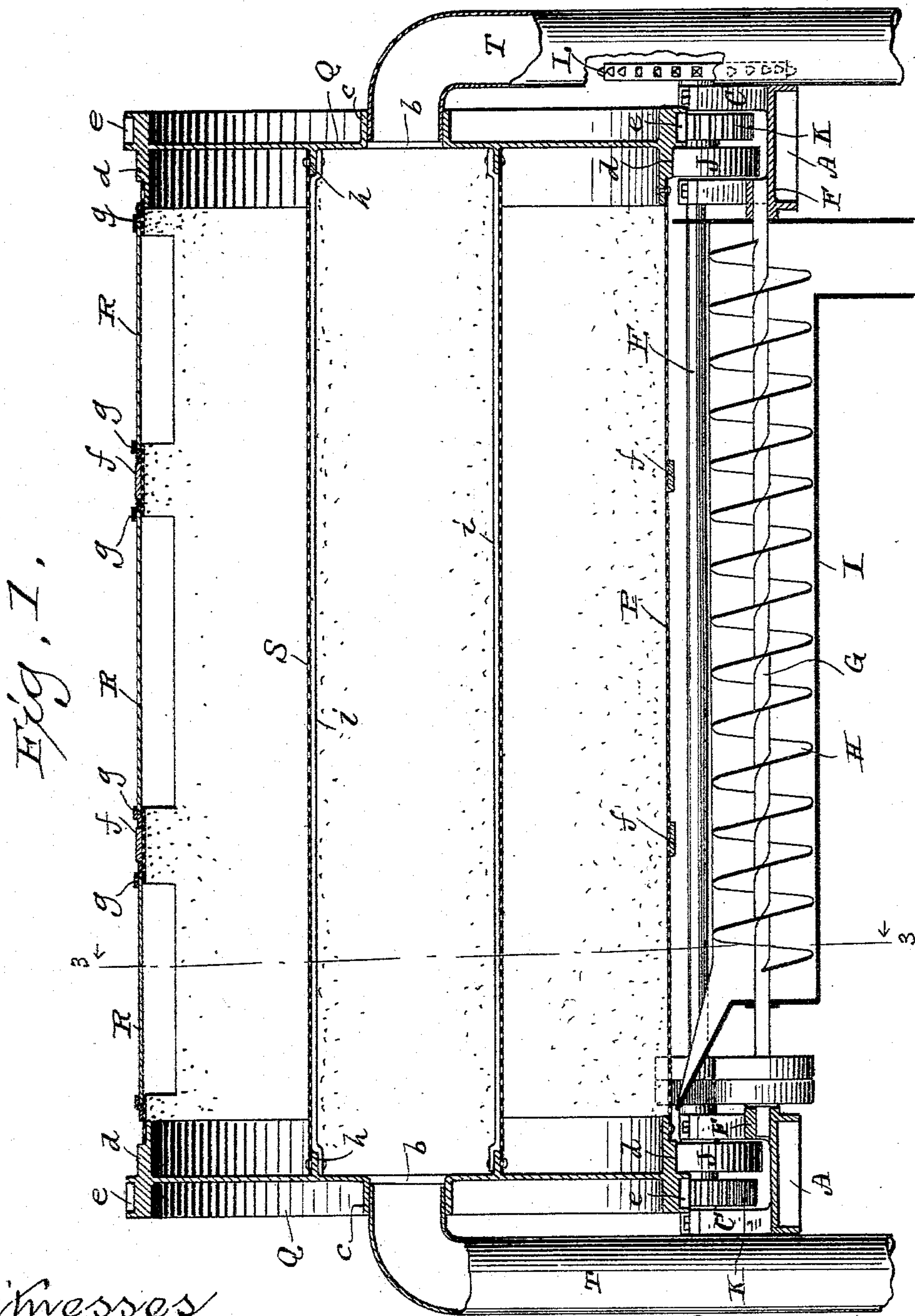
(No Model.)

3 Sheets—Sheet 1.

G. PORTZ.  
APPARATUS FOR DRYING MALT.

No. 494,937.

Patented Apr. 4, 1893.



Witnesses  
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Attorneys

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Fig. 3.

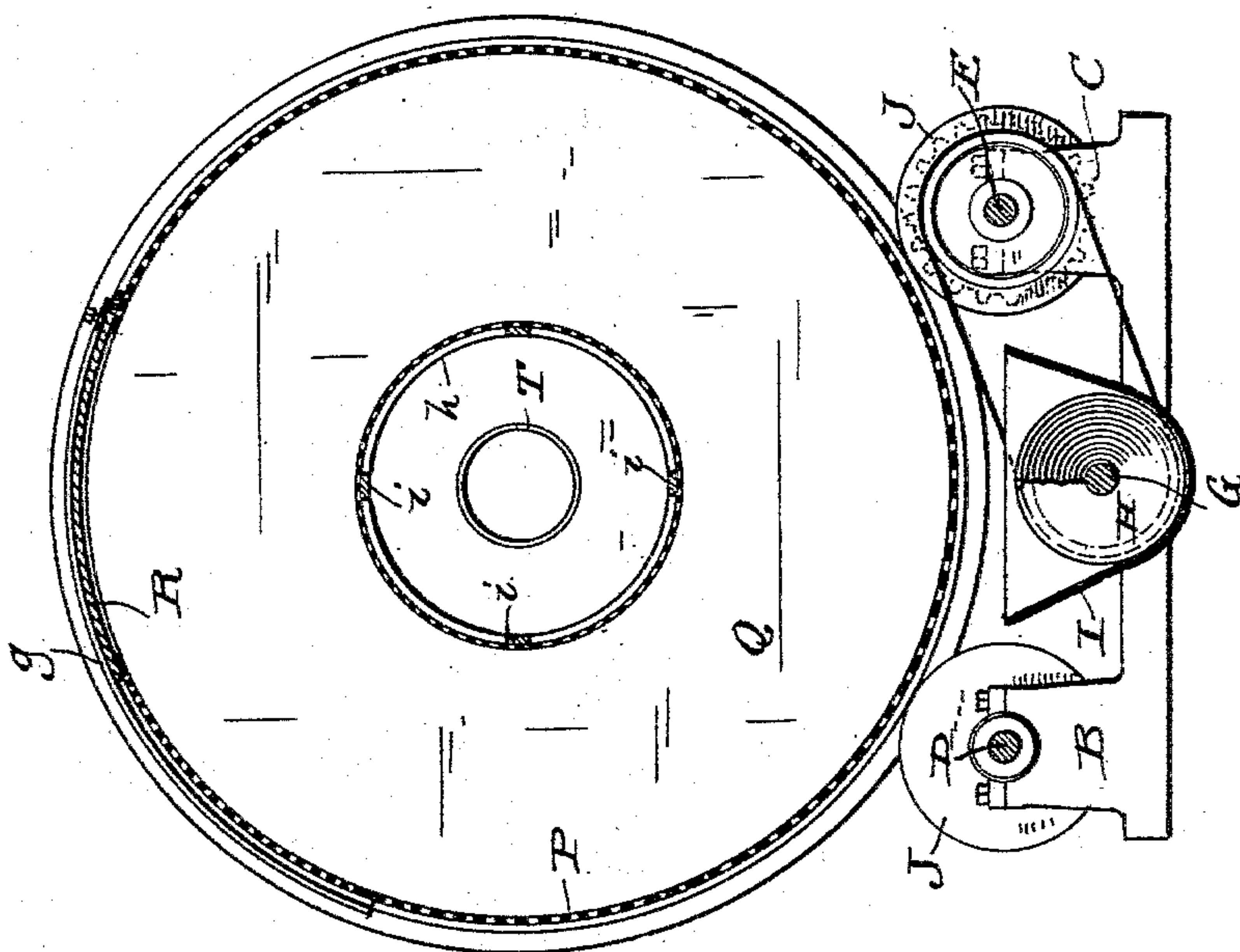
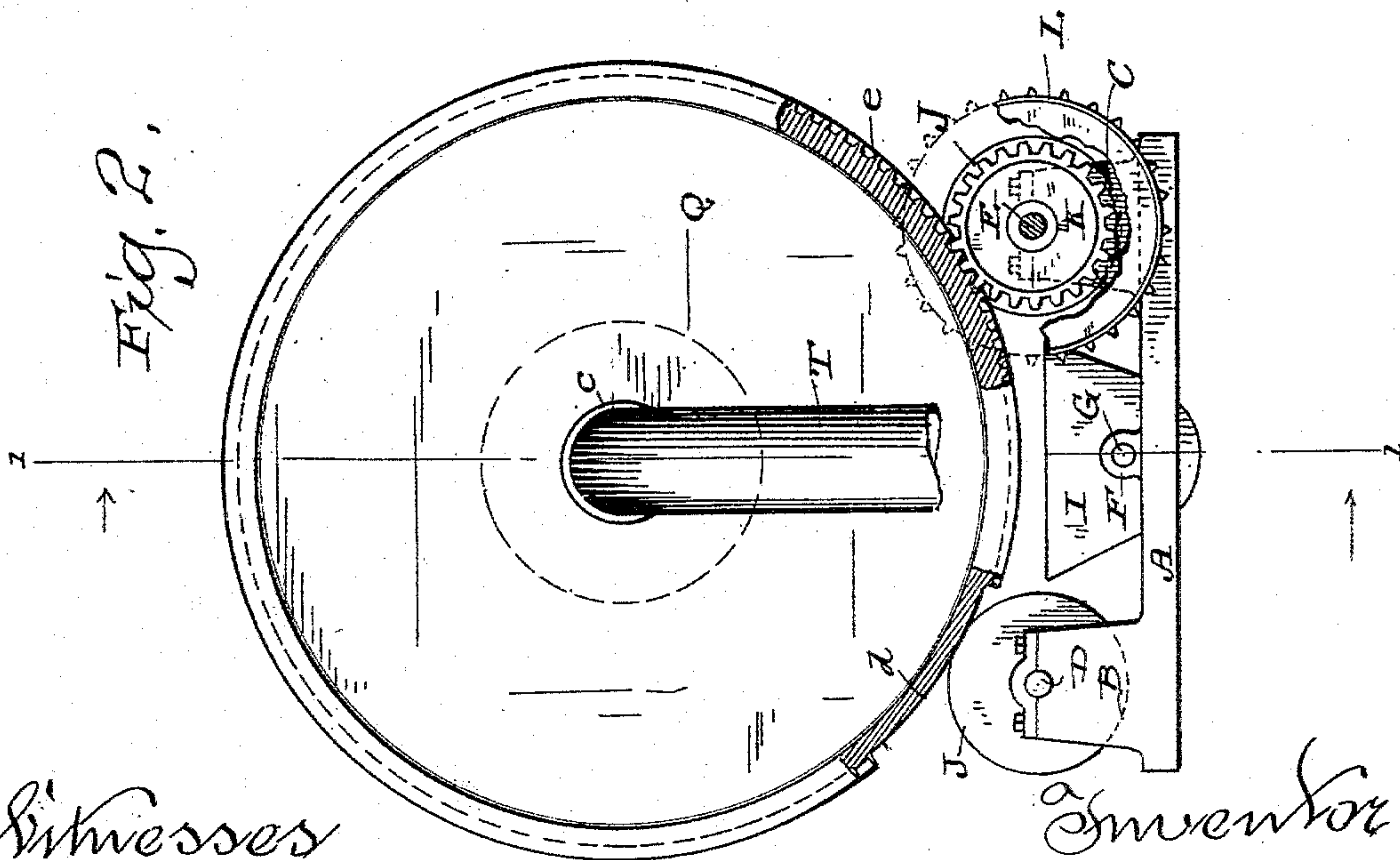


Fig. 2.



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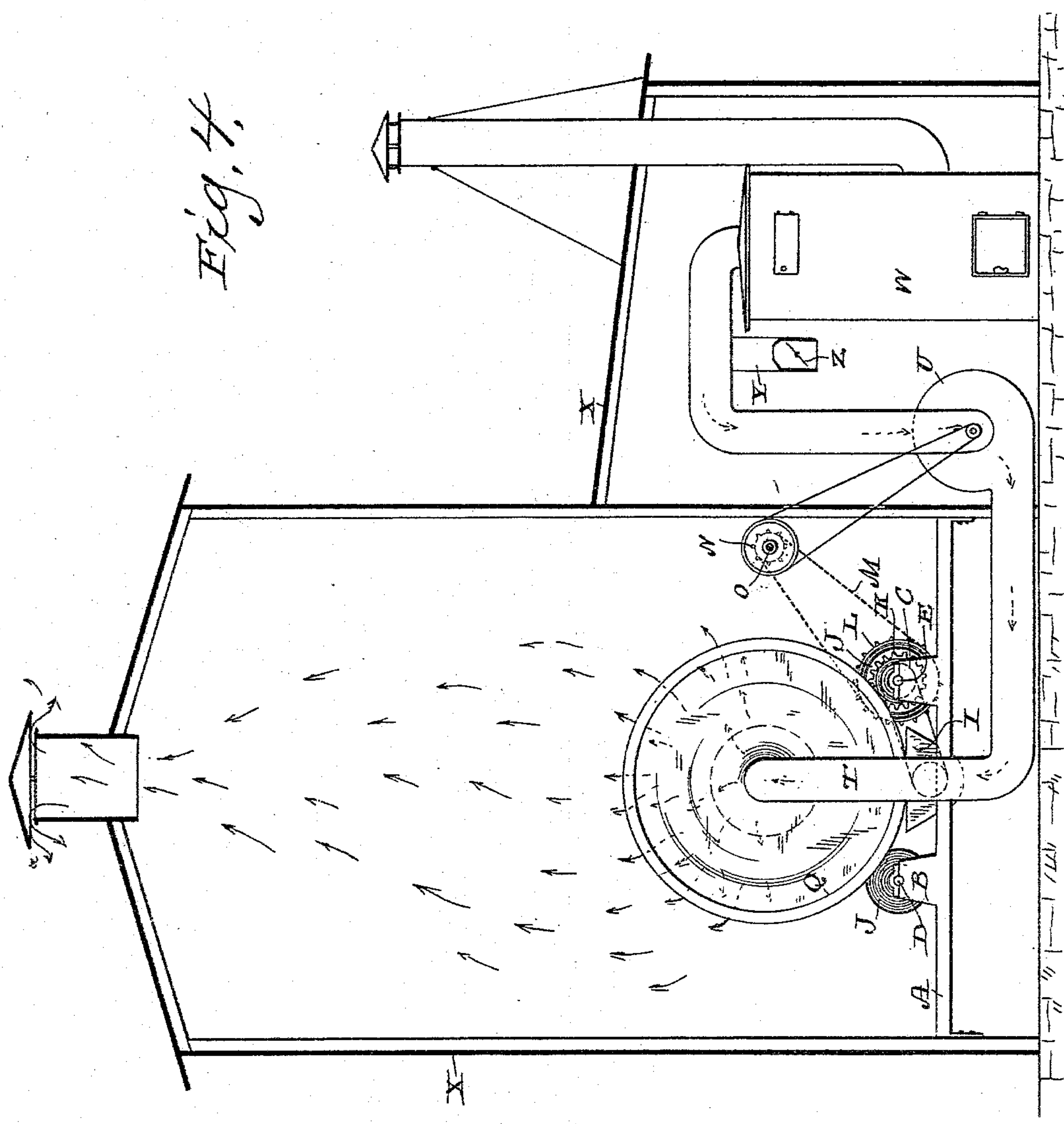
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# UNITED STATES PATENT OFFICE.

GEORGE PORTZ, OF HARTFORD, WISCONSIN.

## APPARATUS FOR DRYING MALT.

SPECIFICATION forming part of Letters Patent No. 494,937, dated April 4, 1893.

Application filed April 5, 1892. Serial No. 427,800. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE PORTZ, a citizen of the United States, and a resident of Hartford, in the county of Washington, and in the State of Wisconsin, have invented certain new and useful Improvements in Drying Malt; and I do hereby declare that the following is a full, clear, and exact description thereof.

My invention has for its object to provide an economical means for drying malt more rapidly than is possible with kilns in common use, as well as to effect a saving in the matter of space and labor necessary to the operation.

To this end the said invention consists in a certain apparatus to be hereinafter described with reference to the accompanying drawings and subsequently claimed.

In the drawings: Figure 1 represents a vertical longitudinal section taken on line 1—1 of the succeeding figure and illustrates a portion of an apparatus constructed according to my invention for the purpose of carrying out my improved method of drying malt; Fig. 2, an end view of the same partly broken away; Fig. 3, a transverse section on line 3—3 of Fig. 1, and Fig. 4, an elevation of my drying apparatus in position for use, the building containing said apparatus being shown in transverse section.

Referring by letter to the drawings, A represents transverse supports provided with bearings B, C, for parallel shafts D, E, as well as bearings F for the shaft G of a screw-conveyer H, the latter being arranged within a suitable casing or trough I, as best illustrated in Fig. 1. Each of the shafts D, E, carry rollers J that serve as supports for a drying drum, that is hereinafter described, and pinions K are also arranged on the latter one of said shafts.

Fast on the shaft that carries the pinions is a sprocket wheel L designed for connection, by a chain M, with another sprocket-wheel N on a suitably located driving shaft O, as shown in Fig. 4, and as best illustrated in Fig. 1, a belt-and-pulley mechanism connects the former shaft with the shaft G of the conveyer, above described.

The drying drum comprises a cylindrical shell P of perforated metal joined at its ends to heads Q having central apertures b sur-

rounded by annular flanges c and the peripheries of these heads are in the form of tracks d for the rollers J, and gear-teeth e that mesh with the pinions K on the shaft E, as above described. At intervals of its length the shell P of the drum is provided with stay-bands f and adjacent to these stay-bands or forming part of the same are guides g for sliding covers R for openings in said shell.

Secured to annular flanges h on the inner sides of the heads Q of the drying drum are longitudinal braces i and inclosing these braces and said flanges is a shell S of perforated metal, this construction being best illustrated in Fig. 1. The flanges c on the drum-heads Q rotate freely on the ends of stationary flues T leading from fan-casings U, the shafts of the fans within these casings being driven by belt-and-pulley connections with the drive shaft O above described, and flues V connect said fan-casings with a furnace W, this construction and arrangement of parts being clearly illustrated in Fig. 4, wherein is also shown a building X having one compartment for the furnace and another for the drying drum.

In practice germinated malt is let into the shell P of the drying drum through any one or all of the openings therein, after which the openings are all closed by their covers R and rotation imparted to said drum through the medium of the pinions K in mesh with the gear-teeth e above described. During the rotation of the drum, the fan-mechanism draws hot-air from the furnace and forces the same into the shell S, the perforations in the latter permitting said hot-air to act upon the malt confined within the perforated drum, pass from this drum into the adjacent compartment and from thence to the outside of the building X through a suitable flue in the roof of the same. When necessary, cold air may be mingled with the hot in order to reduce the temperature to a suitable degree, (which degree may be determined by a suitably arranged thermometer) any desirable means being employed for regulating the admission of said cold-air.

In Fig. 4 I have shown a cold-air pipe Y provided with a damper Z and intercepting the hot-air flue V, as a means to provide for tempering the air taken from the furnace.



Inasmuch as the drum is in rotation the malt confined therein is constantly agitated during the time it is subjected to the blast of hot or warm air, and consequently the drying is  
5 more rapid without danger of scorching, than by the usual means, and no labor is required to turn said malt. The malt having been dried, the openings in the drum are brought over the conveyer H and the covers for said  
10 openings drawn back in their guides to permit said malt to discharge into the conveyer trough I from whence it is run off by suitable means to a point of delivery.

While I have shown a tooth-gear for driving the drying drum, I may employ a friction, sprocket or belt-gearing for the same purpose, and as the rollers J are merely anti-friction supports for said drum they may be arranged on studs instead of the shafts herein described,  
20 these details of construction being mere matters of mechanical expediency in the carrying out of my invention, so long as the several parts named are so geared or connected together as to operate simultaneously in producing the required result, it being essential  
25 that the relative motions of the various parts be so timed that the drum shall be slowly revolved by the described gear to turn the malt while the blast is passing through the same,

and that the conveyer shall be timed to carry 30 off the malt just as it falls from the drum.

Having now fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

A malt-drier comprising a perforated shell, 35 a malt-receptacle in the form of a perforated drum inclosing the shell and having its heads provided with peripheral gear-teeth and tracks, parallel shafts arranged under the drum and provided with anti-friction rollers 40 in contact with the tracks, pinions on one of the shafts in mesh with the drum-head gear-teeth, a drive-shaft geared to the pinion-shaft, a furnace, incased fans arranged intermediate of the furnace and drum and geared to said 45 drive-shaft, flues connecting the fan-casings with the furnace and aforesaid drum-inclosed shell, and a conveyer-mechanism arranged to receive material discharged from said drum, substantially as set forth. 50

In testimony that I claim the foregoing I have hereunto set my hand, at Milwaukee, in the county of Milwaukee and State of Wisconsin, in the presence of two witnesses.

GEORGE PORTZ.

Witnesses:

N. E. OLIPHANT,  
JOHN E. WILES.