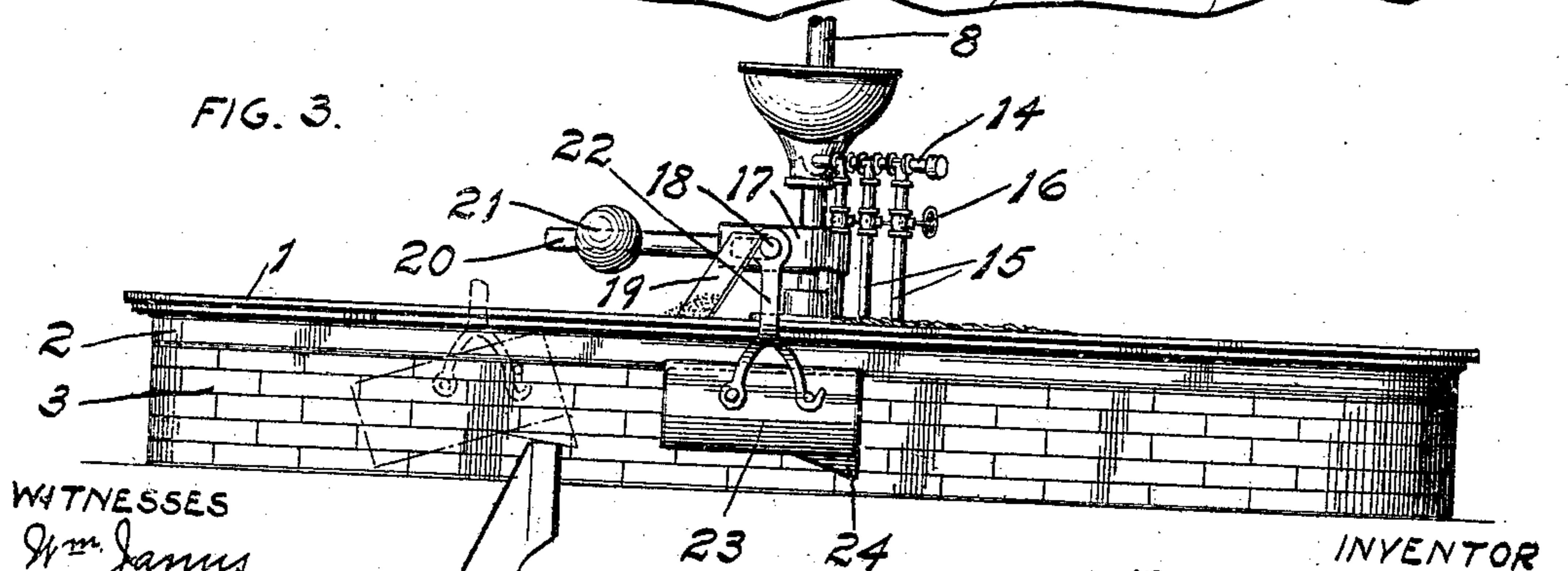
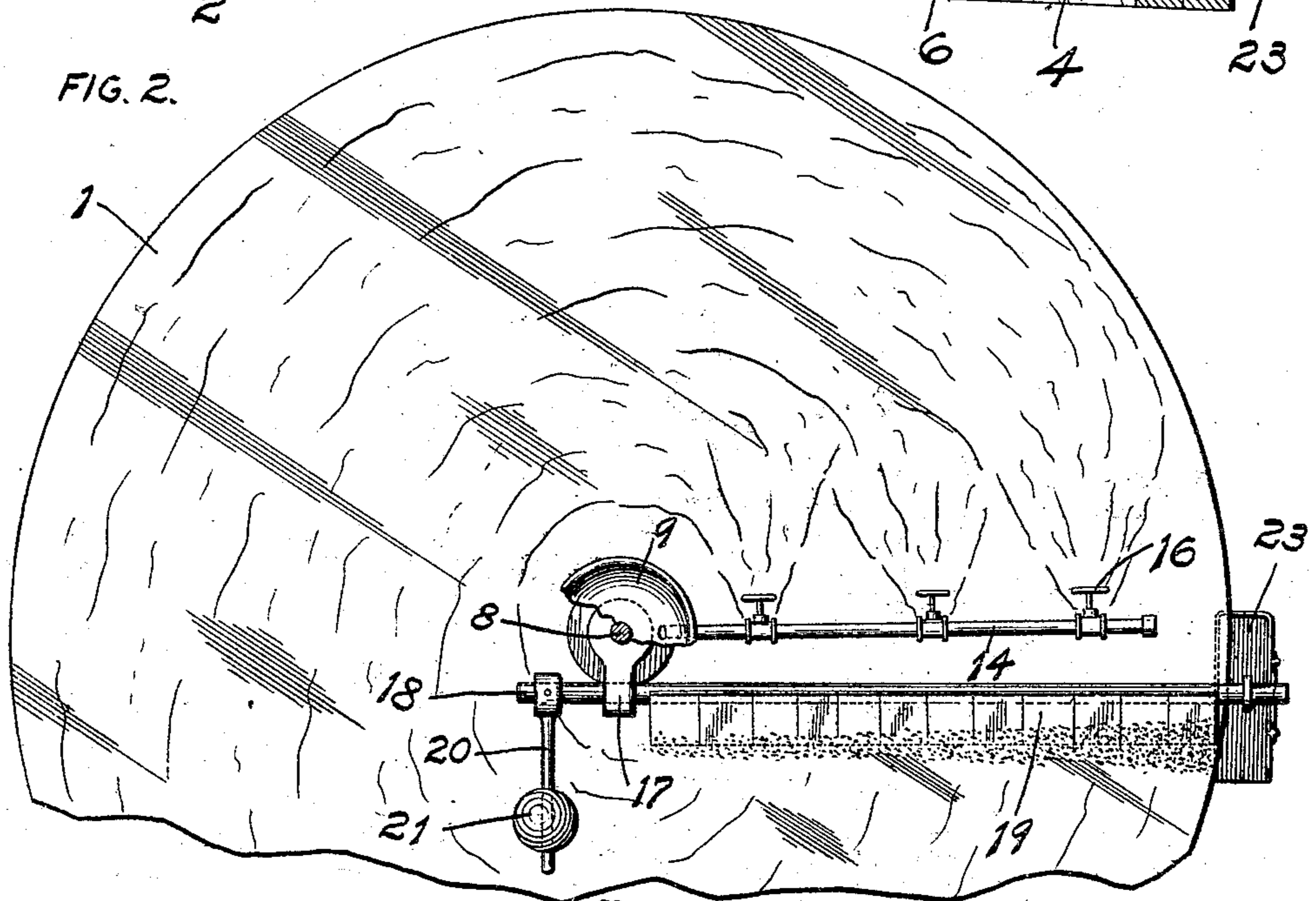
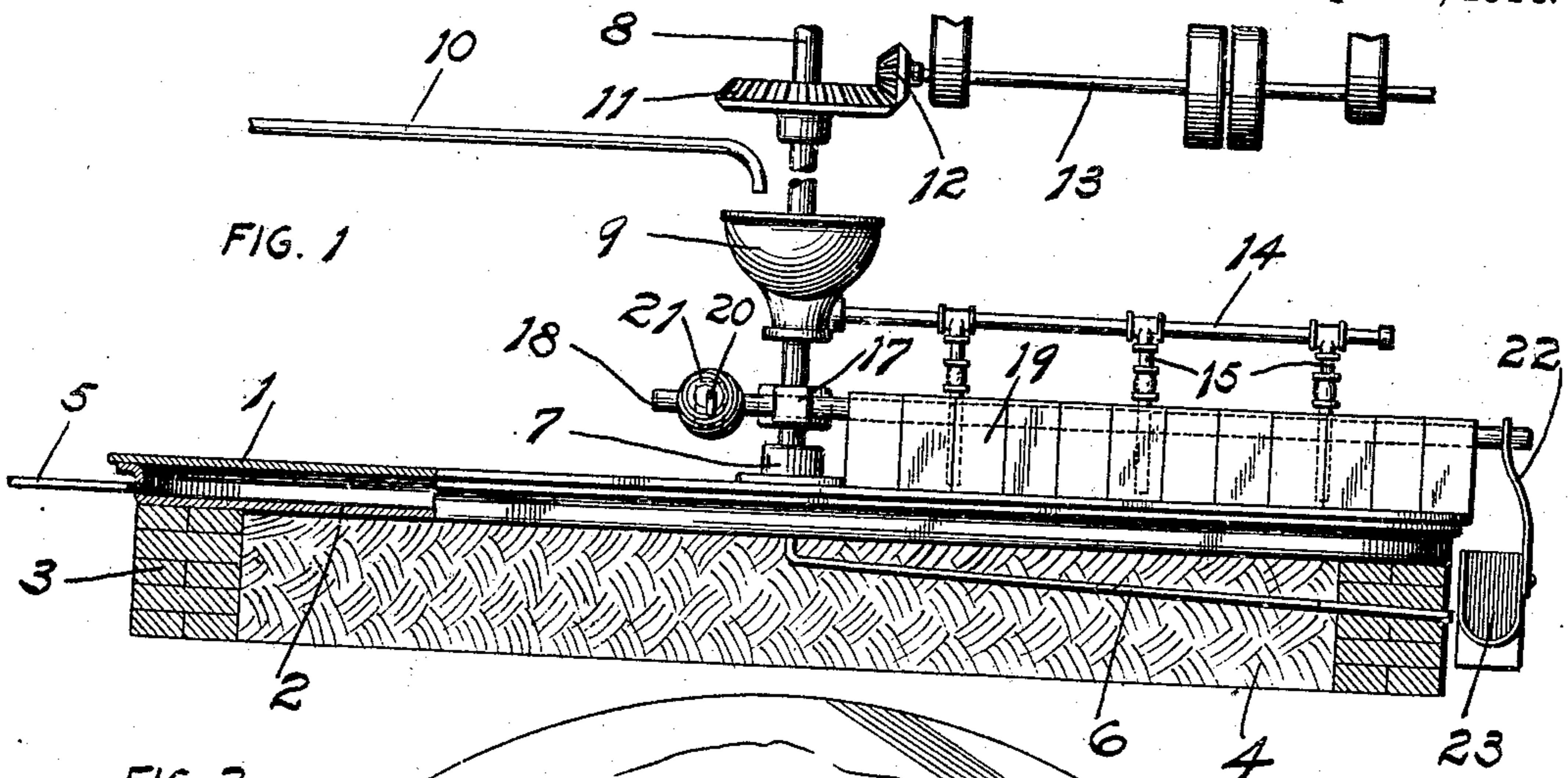


J. P. MARSHALL.  
 DRYING MACHINE.  
 APPLICATION FILED OCT. 19, 1909.

956,122.

Patented Apr. 26, 1910.



WITNESSES

Wm. Janus  
 W. P. Smith

INVENTOR  
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 ATT'Y.

# UNITED STATES PATENT OFFICE.

JOHN P. MARSHALL, OF ST. LOUIS, MISSOURI, ASSIGNOR OF ONE-HALF TO F. H. LUDINGTON, OF ST. LOUIS, MISSOURI.

## DRYING-MACHINE.

956,122.

Specification of Letters Patent.

Patented Apr. 26, 1910.

Application filed October 19, 1909. Serial No. 523,510.

*To all whom it may concern:*

Be it known that I, JOHN P. MARSHALL, a citizen of the United States, residing at St. Louis, Missouri, have invented a certain new and useful Improvement in Drying-Machines, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a side elevation of a drying machine of my improved construction with parts thereof shown in section. Fig. 2 is a plan view of the machine. Fig. 3 is an elevation of my improved drying machine.

My invention relates to a machine for drying various materials which are mixed with water or other liquid, and the machine as shown and hereinafter described is particularly intended for use in drying white lead, barytes, whiting, clay and the like.

My invention consists of a large hollow disk, which is fixed on a suitable base and occupies a horizontal plane and arranged to travel over the top surface of said disk is a feeding and spreading device and a scraper.

My invention further consists in means for heating the disk, means for conserving the heat applied to said disk, means for maintaining the edge of the scraper in contact with the surface of the disk, means for controlling and regulating the feed of material onto the disk, and means for causing the feeding apparatus and the scraper to move continuously at a fixed rate of speed over the surface of the drying disk.

To the above purposes my invention consists in certain novel features of construction and arrangement of parts hereinafter more fully described and claimed.

Referring by numerals to the accompanying drawings, 1 and 2 indicate, respectively, the top and bottom plates of the disks, which plates are preferably formed of heavy sheet metal with their edges united in such a manner as to form a practically air and water tight joint, thus preventing leakage of the fluid used as a heating medium. This disk is preferably arranged on a base 3 of brick or concrete in the center of which is located a body 4 of asbestos or similar material, which is intended to conserve the heat delivered to

the disk. A pipe 5 leads to the disk and is for the purpose of supplying steam, hot water or air utilized in heating said disk and leading from said disk is a discharge pipe 6. Fixed on top of the disk and at the center thereof is a bearing and journaled therein is the lower end of a vertically disposed shaft 8. Fixed on the shaft 8 is a bowl or hopper 9 and arranged to discharge thereonto is one end of a pipe 10, which leads from the tank containing the liquid white lead or other material to be dried.

Fixed on the shaft 8 above the bowl 9 is a bevel gear wheel 11 and meshing therewith is a pinion 12 carried by a shaft 13, which latter is mounted in suitable bearings and driven in a suitable manner. Leading from the lower portion of the bowl or hopper 9 is a horizontally disposed pipe 14 and leading therefrom downward is a series of feed pipes 15 provided with ordinary cut-off valves 16 and the lower ends of these feed pipes terminate just above the surface of the top plate 1 of the disk.

Fixed on the shaft 8 immediately above the bearing 7 is an arm 17, which projects horizontally a short distance approximately at right angles to the pipe 14 and journaled in the outer end of this arm is a rod 18. Fixed on said rod are the upper ends of a series of inclined plates which are arranged side by side and form a continuous scraper 19 extending from the center of the disk to the edge thereof, and the lower edges of all these plates are adapted to ride directly upon the top surface of the plate 1.

Fixed on the end of the rod 18 adjacent the arm 17 is one end of a forwardly projecting arm 20, and mounted on its arm is a weight 21, the tendency of which is to rock the rod 18 in such a manner as to maintain the lower ends of the plates forming the scraper in close engagement with the surface of the plate 1.

Depending from the outer end of the rod 18 is a hanger 22 and pivotally mounted on the lower end of said hanger is a hopper 23 provided on its under side with a lug 24. This hopper travels immediately beneath the edge of the disk and at a point immediately adjacent the outer end of the scraper 19.

While my improved drier is in operation,

hot water, air or steam is delivered to the hollow disk through the pipe 5 and thus the entire disk becomes thoroughly heated. Power is imparted to the shaft 13 and said shaft drives the vertical shaft 8 owing to the engagement of the pinion 12 with the gear wheel 11. Thus the pipe 14 and feed pipes 15 are caused to revolve around the shaft 8 and likewise the scraper, which is immediately in front of the pipe 14, revolves around the shaft 8. The liquid material to be dried discharges from the pipe 10 into the bowl or hopper 9 and passes from thence through the pipe 14, discharges from thence through the feed pipes 15 onto the surface of the heated disk. The flow of the material through the pipe 15 and consequently the feed of the material onto the disk, is regulated by a proper manipulation of the valves 16. The liquid material discharging from the pipes 15 spreads over the surface of the disk as the feeding apparatus and the scraper move slowly over said disk, and by the time the moving parts have made a complete revolution the material discharged onto the disk will have become dried and said material will be engaged by the scraper 19, and as said scraper continues in movement, said material will gradually work its way toward the edge of the disk and will discharge into the hopper 23. This feeding, drying and removing of the dried material is continuous as long as the shaft 8 is rotated, and by properly regulating the speed of rotation and regulating the flow of material onto the heated disk, said material can be very thoroughly dried and in such condition removed from the disk and discharged into the hopper 23. This hopper 23 automatically discharges once during every revolution by reason of the lug 24 striking a post A or the like located in the path of travel of said lug, and this action causes the hopper 23 to tilt as shown by dotted lines in Fig. 3, thus discharging the contents of said hopper into a suitable container.

It will be noted that in my improved drier I employ a fixed heating disk and for this reason I am enabled to use a much larger disk than is possible where a rotating disk is employed, for the reason that a large rotating disk consumes too much power in operation.

The revolving parts of my improved drier can be operated at various speeds depending upon the degree of heat maintained within the disk and according to the kind of material being dried.

I prefer to heat the disk by means of steam or hot water although it will be readily understood that the heating medium may be hot air.

A drier of my improved construction is comparatively simple, can be easily and

cheaply heated and the operating parts of the drier can be driven with comparatively little power.

I claim:

1. In a drying machine a fixed disk adapted to be heated, a radially arranged feeder arranged above the disk and adapted to feed the material to be dried onto said disk, a scraper arranged immediately in front of the feeder, and means carried by the outer ends of the scraper for receiving the material removed by said scraper.

2. In a drying machine, a disk adapted to be heated, a feeder arranged for operation above the disk, a scraper arranged for operation on the disk in front of the feeder and a hopper arranged to travel beneath the edge of the disk at the outer end of the scraper.

3. In a drying machine, a fixed disk adapted to be heated, means operating above the disk for feeding the material to be dried onto the surface of the disk, a scraper arranged to move over the surface of the disk in front of the feeder, gravity means arranged to maintain the lower edge of the scraper in engagement with the surface of the disk, and means carried by the scraper for receiving the material removed from the disk.

4. In a drying machine, the combination with a fixed disk adapted to be heated, a rotary feeder arranged to move over the surface of the disk for distributing material thereon, a radially disposed scraper arranged to travel immediately in front of the feeder, gravity means arranged to maintain the lower edge of the scraper in engagement with the surface of the disk, a hopper carried by the outer end of the scraper for receiving the dried material removed from the disk and a body of heat-conserving material located beneath the disk.

5. In a drying machine, the combination with a fixed disk of a radially disposed feeder arranged to move over the surface of the disk, means whereby the discharge of material from said feeder is regulated, a radially disposed scraper arranged to travel immediately in front of the feeder, and means carried by the outer end of the scraper for receiving the material removed from the disk by said scraper.

6. In a drying machine, the combination with a fixed disk of a radially disposed feeder arranged to move over the surface of the disk, means whereby the discharge of material from said feeder is regulated, a radially disposed scraper arranged to travel immediately in front of the feeder, a hopper carried by the outer end of the scraper for receiving the material removed from the disk, and gravity means arranged to maintain the lower edge of the scraper in engagement with the surface of the disk.

7. In a drying machine, a disk adapted to be heated, a feeder arranged for rotation above the disk, a scraper arranged to travel over the disk immediately in front of the feeder, a hopper carried by the outer end of the scraper immediately beneath the edge of the disk, and means whereby said hopper is tilted to discharge its contents.

8. In a drying machine, a fixed hollow disk adapted to receive and contain a fluid heating medium, a vertically disposed shaft journaled above the center of said disk, a hopper carried by said shaft and adapted to receive the material to be dried, a radially arranged feeder pipe leading from said hopper, a series of discharge pipes leading from said feeder pipe and feeder control valves located in said discharge pipe.

9. In a drying machine, a fixed disk adapted to be heated, a vertically disposed shaft journaled above the center of said disk, a hopper carried by said shaft and adapted to receive the material to be dried, a radially arranged feeder pipe leading from said hopper, a series of discharge pipes leading from said feeder pipe, means whereby the discharge from the feeder pipe is

controlled, a scraper carried by the shaft and arranged immediately in front of the feeder pipe, and a hopper carried by the outer end of said scraper.

10. In a drying machine, a fixed disk adapted to be heated, a vertically disposed shaft arranged for rotation above the center of the disk, a hopper carried by the shaft and adapted to hold the material to be dried, a radially disposed feeding apparatus carried by said hopper, means whereby the discharge of material from the feeding apparatus is controlled, a radially disposed scraper carried by the shaft immediately in front of the feeder, a hopper carried by the outer end of the scraper for receiving the dried material removed from the disk and means whereby the lower edge of the scraper is maintained in contact with the surface of the disk.

In testimony whereof I hereunto affix my signature in the presence of two witnesses, this 16th day of October, 1909.

JOHN P. MARSHALL.

Witnesses:

M. P. SMITH,  
ALMA GEBHART.