

F. OGDEN.
LUBRICATING SYSTEM FOR ROTARY MILLS.
APPLICATION FILED FEB. 2, 1914.

1,107,830.

Patented Aug. 18, 1914.

3 SHEETS—SHEET 1.

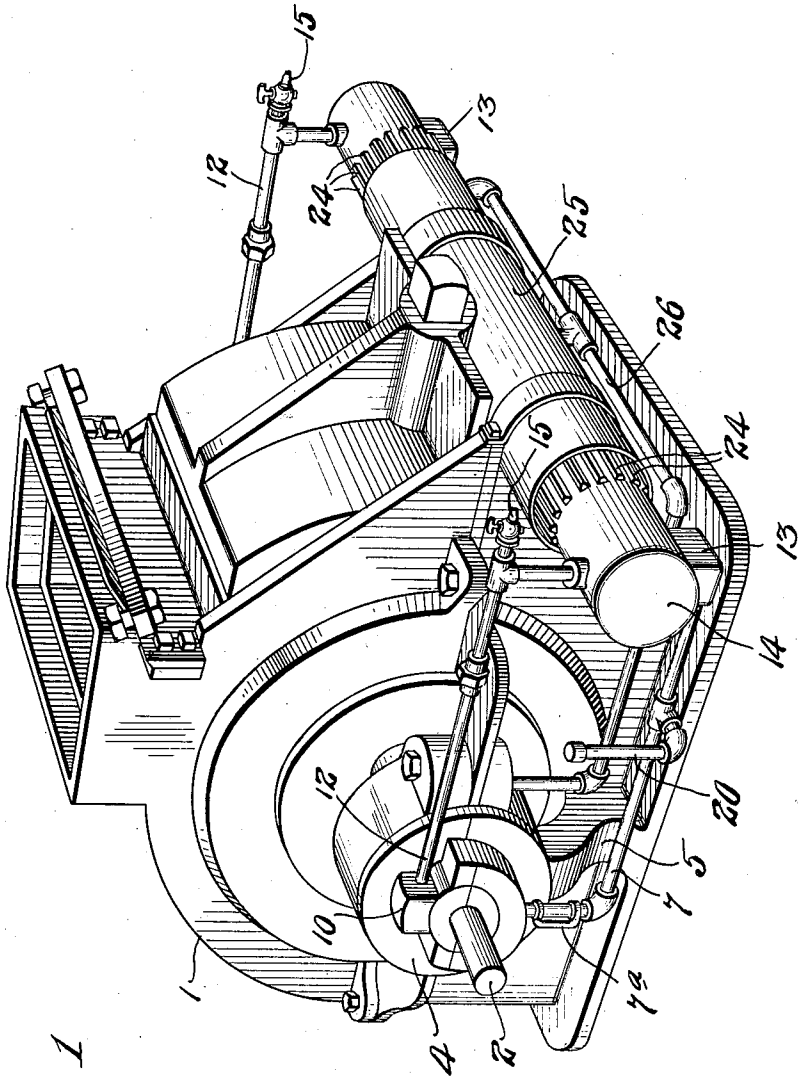


Fig. 1

Witnesses
Wm. Janus
C. Butler

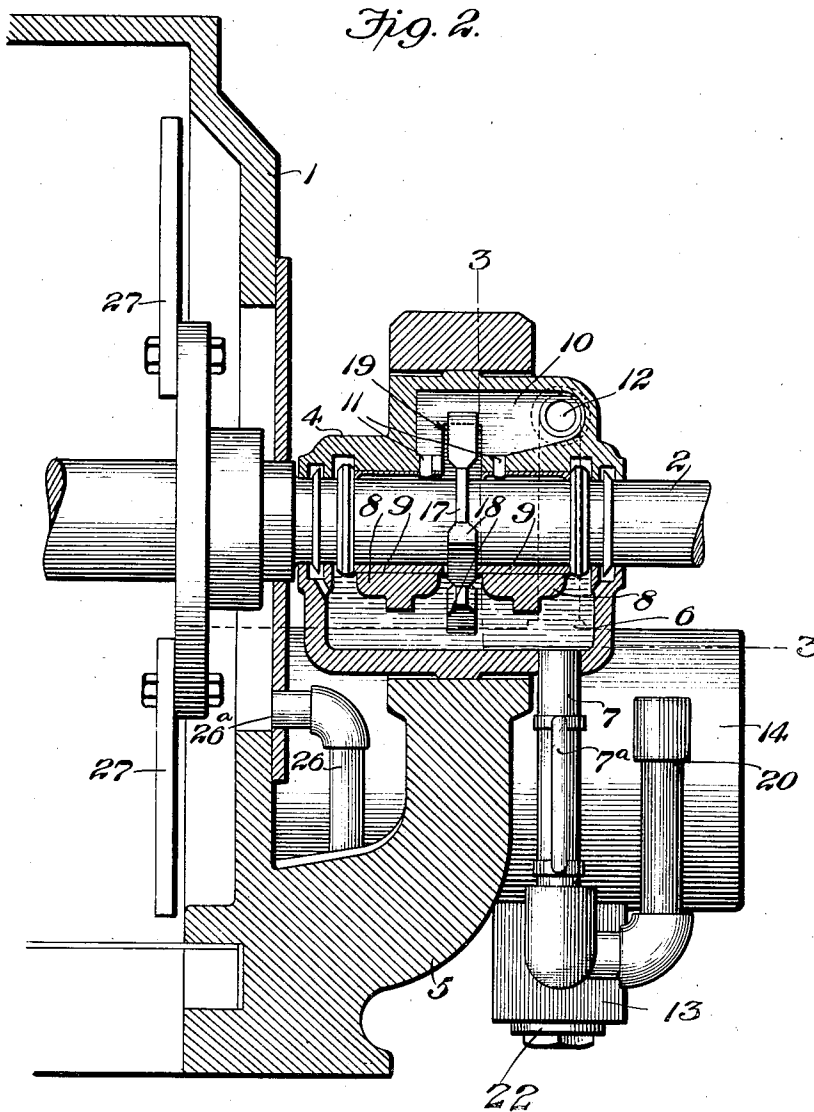
Inventor,
Ferris Ogden,
By J. R. Omead, atty.

F. OGDEN.
LUBRICATING SYSTEM FOR ROTARY MILLS.
APPLICATION FILED FEB. 2, 1914.

1,107,830.

Patented Aug. 18, 1914.

3 SHEETS—SHEET 2.



Witnesses,
J. Adolph Bishop.
O. S. Buttery

Inventor,
Ferris Ogden,
By J. Cornwall,
Atty.

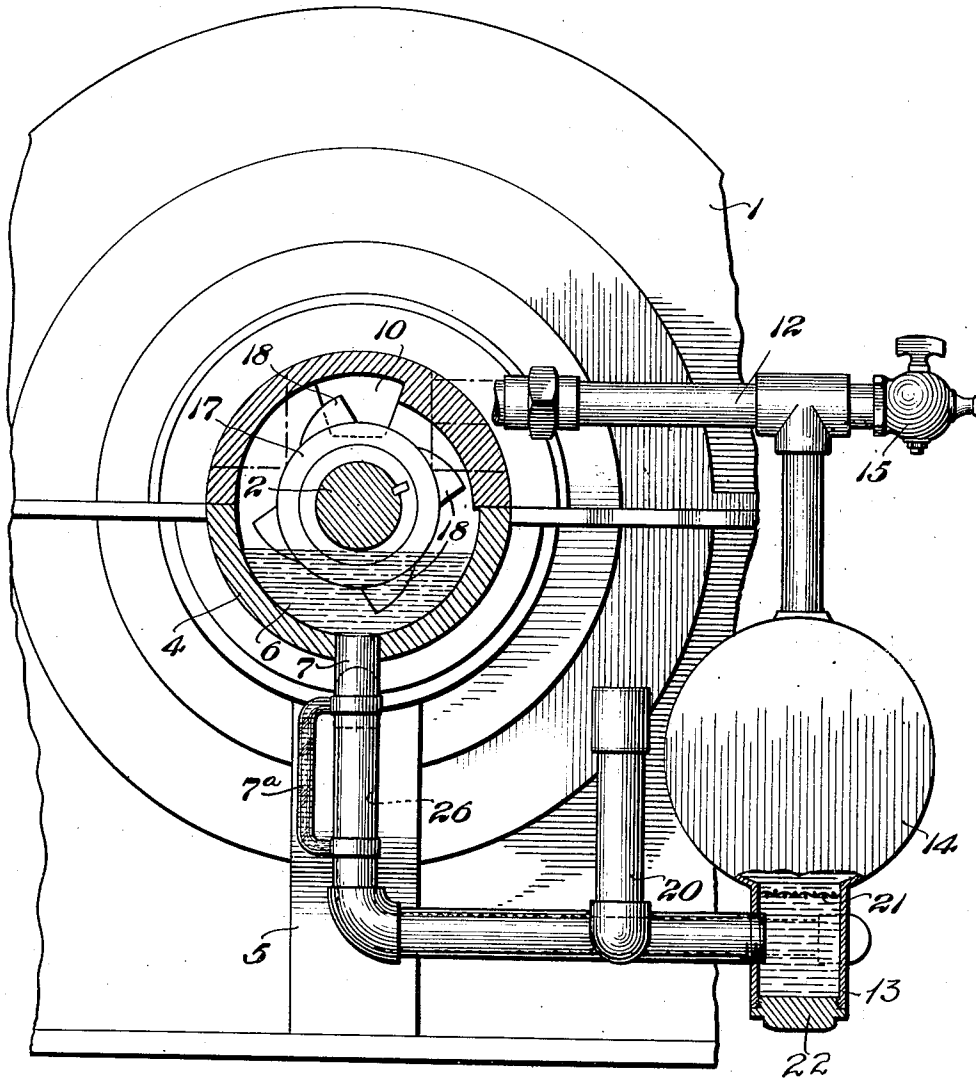
F. OGDEN.
LUBRICATING SYSTEM FOR ROTARY MILLS.
APPLICATION FILED FEB. 2, 1914.

1,107,830.

Patented Aug. 18, 1914.

3 SHEETS-SHEET 3.

Fig. 3.



Witnesses,

J. Adolph Bishop
C. S. Butler

Inventor,

Ferris Ogden,

By *J. Cornwall*
Atty.

UNITED STATES PATENT OFFICE.

FERRIS OGDEN, OF ST. LOUIS, MISSOURI, ASSIGNOR TO WILLIAMS PATENT CRUSHER AND PULVERIZER COMPANY, OF ST. LOUIS, MISSOURI, A CORPORATION OF MISSOURI.

LUBRICATING SYSTEM FOR ROTARY MILLS.

1,107,830.

Specification of Letters Patent.

Patented Aug. 18, 1914.

Application filed February 2, 1914. Serial No. 815,979.

To all whom it may concern:

Be it known that I, FERRIS OGDEN, a citizen of the United States, residing at the city of St. Louis, State of Missouri, have invented a certain new and useful Improvement in Lubricating Systems for Rotary Mills, 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 perspective view of a pulverizer equipped with my improved lubricating system. Fig. 2 is a vertical section taken longitudinally of the shaft. Fig. 3 is an elevation partly in section taken transversely of the shaft substantially on line 3—3 of Fig. 2.

My invention relates broadly to lubricating, and specifically to a special form of lubricating system for a rotary mill employing beaters or hammers which are pivoted upon a shaft and rapidly rotated, cooperating in their action with a concave or grinding cage to reduce material fed to their action. The proper lubrication of such mills is a very important consideration and is attended with considerable difficulty because of the large amount of dust produced by the operation of such mills, and the resulting necessity of keeping the bearings completely inclosed. Unless constantly and freely lubricated, the bearings on such mills are liable to become heated quickly, due to the very high rate at which the shaft is turned.

The principal object of my invention, therefore, is to produce a simple and efficient system of lubrication which will constantly feed oil to the bearings, and at the same time cool the circulating lubricant.

A further object of my invention is to provide a special form of lubricating journal which is completely closed yet capable of permitting ready access to the bearings.

Other and further objects of my invention will be obvious or hereinafter pointed out.

By reference to the accompanying drawings, it will be understood that 1 represents the casing of the rotary mill or pulverizer through which extends the shaft 2. The

journal boxes 4 are supported on suitable brackets 5 formed on the casing 1. The journal boxes are made in two sections, upper and lower, the upper sections being removable for the purpose of permitting access to the bearings. The lower sections of the journal boxes are formed to provide oil wells 6 which are fed by a pipe 7, leading from the lower portion of a tank 14. Formed on the lower sections of the journal boxes are the bearing supports 8 which support the Babbitt bearings 9. The upper sections of each of the journal boxes are formed with a distributing chamber 10 from which access to the bearings is given by small passages 11. Chamber 10 communicates with a circulating pipe 12 leading to the tank 14. The circulating pipes 12 may be supplied with test cocks 15. Each of pipes 7 may be supplied with an inspection glass 7^a, and are in two parts joined by couplings 16. The journal box also forms a casing for a rotary pump, the wheel 17 of which is keyed to the shaft 2 and provided with the buckets 18 operating in a suitable channel 19 in the journal box. A suitable filling pipe 20 is provided above the level of circulating pipes 12.

The operation of the device is as follows: The tank 14 and the pipes having been filled with lubricant by means of the filling pipe 20, upon operation of the mill, which is accomplished by the rotation of shaft 2, the pump will carry lubricant from the oil well 6 to the distributing chamber 10. The necessary amount of lubricant for the lubrication of the bearings will be supplied therefrom chamber 10 by the channels 11. The lubricant in the chamber 10 is kept under constant pressure by the operation of the pump, and hence it will be forced through the circulating pipes 12 back to the tank. The pressure thus produced on tank 14 will cause the lubricant to flow therefrom back to the oil well 6 through pipe 7. Thus constant circulation is maintained through pipes 7 and 12 and tank 14, and a constant supply of oil delivered to the bearings. Not only does this circulation insure a constant supply of oil, but it also affords opportunity for cooling of the oil, and for the extrication of foreign matter therefrom. The latter

may be accomplished by strainers 21 which strain the oil returning from the bearings before it passes into the supply pipes. Inasmuch as the pipes 7, which supply oil to the bearings, lead from the lower portion of the tank, they will draw the cooler oil, as the cooler oil settles to the bottom of the tank. The headers 13 are provided with suitable clean-outs 22 in their bottoms so that the sediment may be removed.

The cooling of the oil is accomplished while it is in the tank 14. As illustrated in Fig. 1, the tank may be provided with suitable fins 24 which act as heat radiating members, and partially covered by a casing 25. A pipe 26 communicates with the casing 25 and leads around to the axial portion of the mill casing, opening thereinto at 26^a. When the mill is in operation, the beaters 27, carried on the shaft 2, by their rotation create a suction at the axial portion of the machine after the fashion of a centrifugal fan. This suction draws air through the pipe 26 and through the casing 25 over the tank 14. This circulation of air over the tank 14 operates to cool the tank, and hence keeps the lubricant cooled. In case the mill is equipped with a fan blower, this pipe 26 need not be introduced at the axial portion of the machine casing, but may be introduced into the discharge hopper, the suction being created by the fan which operates to draw off the material reduced by the mill.

From the foregoing, it will be obvious that my invention affords a constant supply and the circulation of fresh oil to the bearings, the circulation being accomplished by the operation of the mill. Furthermore, it is obvious that the system provides an efficient means of cleaning the oil and of cooling it by the circulation of air induced by the operation of the mill.

What I claim is:

1. In a rotary mill having a shaft, a lubricating system comprising the combination of a journal box provided with an oil well and a distributing chamber, a tank for the reception of lubricant, a supply pipe leading from the lower portion of said tank to said oil well, a circulating pipe leading from said distributing chamber to the upper portion of said tank, a pump actuated from said shaft and operable to convey lubricant from said oil well to said circulating chamber and circulate it through said pipe and said tank, and means for causing a circulation of air about said tank upon the actuation of said shaft.

2. In a pulverizer the combination of a rotary shaft, a journal box providing bearings therefor and provided with an oil chamber and a circulating chamber, a tank, a supply pipe leading from the lower portion of said tank to said oil well, a circulat-

ing pipe leading from said distributing chamber to the upper portion of said tank, purifying means located in the tank, a pump actuated by said shaft and adapted to convey lubricant from said oil well to said distributing chamber whereby to cause a circulation of lubricant through said tank in said pipes, and means for abstracting heat from said tank, said means including an air circulating member operated by said shaft.

3. In a device of the class described, the combination with a rotary shaft, of a journal box provided with an oil well and a distributing chamber, said journal box providing a bearing for said shaft, an oil tank, a pipe for supplying oil to said oil well from said tank, a circulating pipe for conveying oil from said distributing chamber to said tank, a circulating device operating to convey oil from said oil well to said distributing chamber, means providing access for oil from said distributing chamber to said bearings, and means for purifying oil conveyed to said tank by said circulating pipe.

4. A lubricating system comprising the combination of a journal box providing a bearing for a shaft and being provided with an oil well and a distributing chamber, means for providing access for oil from said distributing chamber to the bearing, a tank, pipes connecting said oil well and said distributing chamber with said tank, means for causing the circulation of oil through said pipes and said tank, air circulating pipes arranged to cause a circulation of air about said tank, and means for causing a circulation of air through said pipes.

5. In a device having an operating shaft, a lubricating system comprising the combination of a journal box providing a bearing for the shaft, said journal box being provided with oil chambers, said journal box affording access for oil from said chambers to the bearing, an oil tank, a closed system of pipes connecting said tank with said chambers, and means operable by said shaft for causing a circulation of oil through said pipes and of air about said tank.

6. In a pulverizer the combination of a shaft, a journal box providing bearings therefor, an oil tank, a closed system of pipes connecting said oil tank with said journal box, means carried by said shaft for producing a circulation of oil through said tank, said journal box and said pipes, and means carried by said shaft for producing a circulation of air about said tank.

7. In a device having a rotary shaft, a tank for containing lubricant, said tank being partially inclosed by a casing, and means carried by said shaft for drawing air through said casing.

8. In a pulverizer having a rotary shaft, an oil tank, said oil tank being provided

with oil purifying means, bearings for said shaft, means carried by said shaft for causing a circulation of oil to said bearings and through said purifying means, and means
5 carried by said shaft for producing a circulation of air about said tank.

In testimony whereof I hereunto affix my

signature in the presence of two witnesses,
this nineteenth day of January, 1914.

FERRIS OGDEN.

Witnesses:

ERNEST T. ROEBKE,
GEO. H. BLANKMANN.