No. 650,767. Patented May 29, 1900.

A. ARNAUD.

GRINDING APPARATUS FOR GRAIN, &c.

(Application filed May 9, 1899.)

(No Model.)

Fig. 1

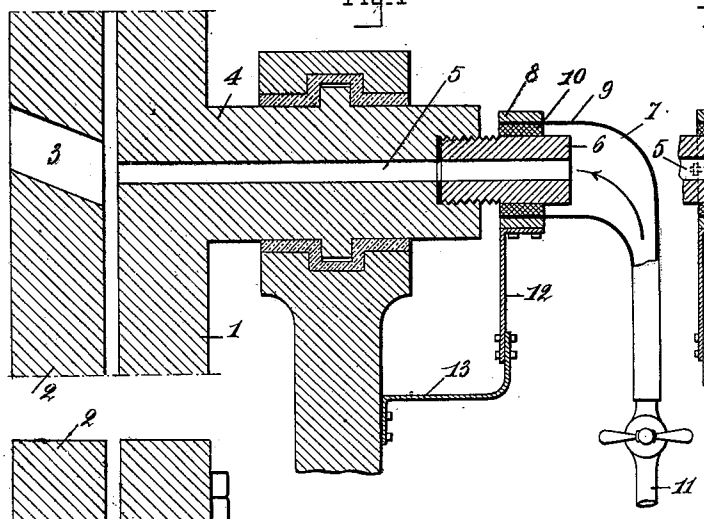


Fig. 3

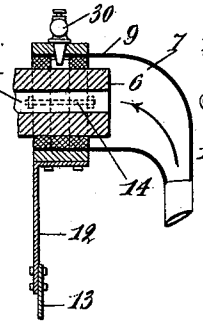
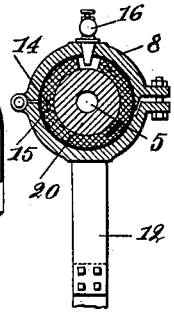


Fig. 4



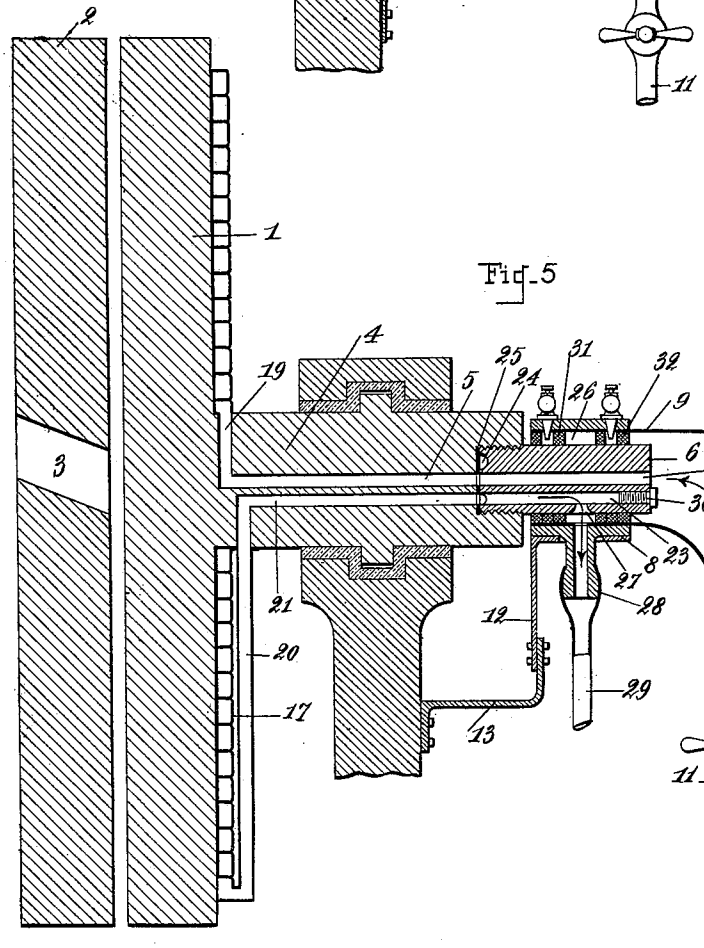


Fig. 2

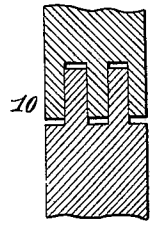
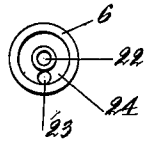


Fig. 5

Fig. 6



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UNITED STATES PATENT OFFICE.

ALBERT ARNAUD, OF PARIS, FRANCE.

GRINDING APPARATUS FOR GRAIN, &c.

SPECIFICATION forming part of Letters Patent No. 650,767, dated May 29, 1900.

Application filed May 9, 1899. Serial No. 716,141. (No model.)

To all whom it may concern:

Be it known that I, ALBERT ARNAUD, a citizen of the French Republic, residing at Paris, in the department of the Seine, France, have invented Improvements in Grinding Apparatus for Grain, &c., of which the following is a specification.

My invention relates to an improvement in grinding apparatus for grain, &c.; and the purpose thereof is to provide cooling means to prevent heat rising in the grinding operation. To obviate this objection, various means have been employed, one method in particular being by conducting a current of cold air into the working mass or by passing a current of a cold liquid through the apparatus intended to do the work or to direct the same against one or several of the outer walls.

My invention is designed to provide means for feeding cold currents, either gaseous or liquid, without fear of any loss or escape to the outside, which could not be realized hitherto.

In illustration of the invention I shall refer to the accompanying drawings, in which—

Figure 1 is a sectional view of a device to throw air or cold or cooled gas on the working surface of the plates or disks. Fig. 2 is a detail of the above arrangement. Figs. 3 and 4 are detail views of the feed-pipe coupling. Fig. 5 is a sectional view of an apparatus arranged so as to bring about cooling by means of serpentine coils through which a cold liquid circulates. Fig. 6 is a sectional detail view of a part of the device represented in Fig. 5.

In the arrangement of Figs. 1, 2, 3, and 4, intended to send directly a gaseous or cooled fluid upon the working parts of the apparatus, 3 is the admission-port for the material, and 1 the movable plate. I arrange in the axle of the movable plate 1 and its shaft 4 a conduit 5, which extends through a threaded thimble or neck 6, which runs into a chamber 7, which serves for the admission of the gaseous cold fluid. This chamber is stationary with regard to the movable axle and comprises a hinged collar 8, having the free ends secured together by a screw. The mouth 9 of this chamber, which is of rubber, incloses the neck 6, on which it is secured by the collar 8, a tight joint being made by interposing a leather washer 10, the ends of which are tongued and grooved.

As represented in Fig. 1, the collar 8 is held in place by means of a flexible rod 12 and a support 13.

An arrangement similar to the former device, but providing for oiling, is represented in Figs. 3 and 4. Here the single leather washer 10 is substituted by three or more washers placed alongside of each other and secured together by a threaded rod 14. The middle washer is recessed and an oil-cup discharged thereinto, so that the parts may be lubricated.

The cooling by circulation of the fluid near the working surface can be effected in the manner illustrated in Fig. 5. I provide in the shaft 4, on which the disk 1 is mounted, two channels or conduits, the one, 5, along the axis of the shaft and the other, 21, running parallel at a little distance. These two conduits open into two transversal openings 19 and 20 in the extremities of the branches of the serpentine coil 17 at the exterior surface of the disk 1. In order to facilitate the junction of the feed or inlet and outlet pipes of the cold liquid with the conduits 5 and 21, I attach at the extremity of the shaft 4 a threaded neck 6, which has two conduits or channels 22 and 23. The conduit 22 communicates directly with the conduit 51; but the lateral channel 23 of the neck communicates with the lateral conduit 21 of the shaft by means of the circular groove 24. (See Figs. 5 and 6.) A rubber washer 25 packs or keeps tight the junction of the neck 6 and the axle 4. The communications between the conduits 22 and 23 and the inlet and outlet pipes of the liquid are arranged as follows: The joint, with the inlet-pipe for the liquid, is absolutely like the one previously described in the arrangement shown in Figs. 1, 3, and 4; but in this instance I arrange two leather washers 31 and 32, as shown in Figs. 3 and 4, so as to leave an annular space 26 between the rubber neck 9 and the metallic neck 6. This annular space communicates on the one hand by an opening 27, left in the wall of the neck 6 with the conduit 23, said channel being closed at its extremity by a plug 30 and, on the other hand, by a neck 28, carried by the bearing or

collar 8 with the outlet-pipe for the fluid. The rubber washer 9 is perforated in the direction of the opening of the neck 28.

I claim as my invention—

1. A cooling apparatus for grinding-surfaces comprising the grinding-disks, a shaft having a passage leading therethrough, a thimble screwed in said shaft, a feed-pipe, a neck forming an enlargement of the same fitted over said thimble, a washer interposed between the thimble and neck and a clamping-collar, substantially as described.

2. In combination, the grinding-surfaces, the shaft, the thimble, the feed-pipe, the neck inclosing the thimble, a clamping-collar, a plurality of washers interposed between the neck and collar, a rod for clamping the same together, one of said collars having an opening therein and a lubricating device communicating therewith.

In witness whereof I have hereunto set my hand in presence of two witnesses.

ALBERT ARNAUD.

Witnesses:

EDWARD P. MACLEAN,

JABT DAYOLLET.