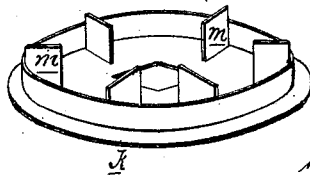
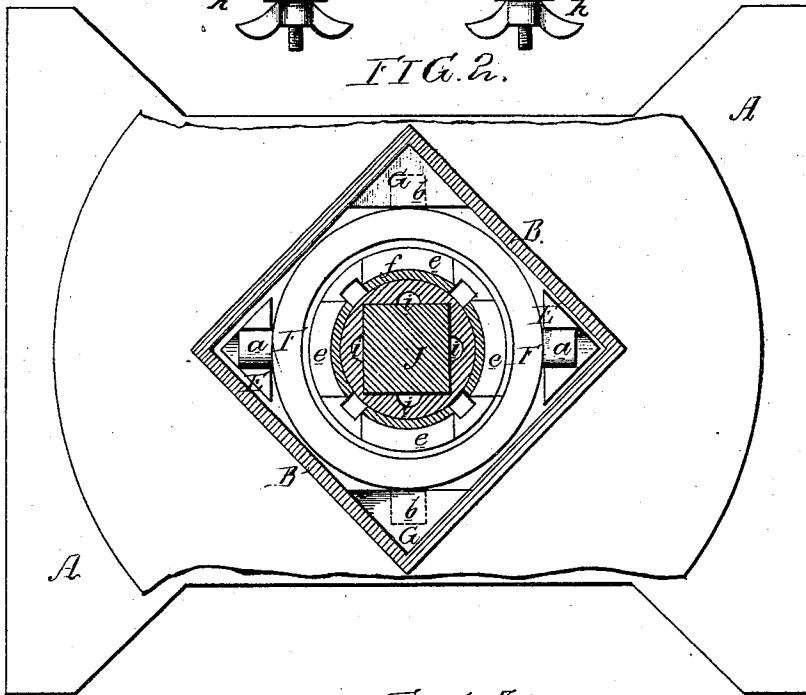
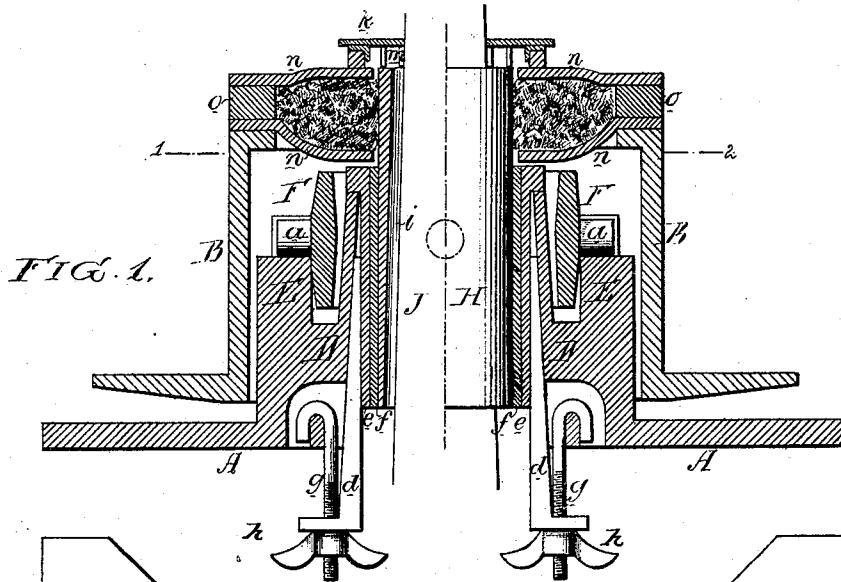


C. CUSTER.
BEARINGS FOR MILLSTONES.

No. 170,346.

Patented Nov. 23, 1875.



Witnesses,
Harry H. Henson Jr.
Harry Smith

Christian Custer
by his Attorneys,
Henson and Son

UNITED STATES PATENT OFFICE.

CHRISTIAN CUSTER, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR OF
ONE-HALF HIS RIGHT TO CHARLES K. BULLOCK, OF SAME PLACE.

IMPROVEMENT IN BEARINGS FOR MILLSTONES.

Specification forming part of Letters Patent No. **170,346**, dated November 23, 1875; application filed
October 20, 1875.

To all whom it may concern:

Be it known that I, CHRISTIAN CUSTER, of Philadelphia, Pennsylvania, have invented certain Improvements in Bearings for Millstones, of which the following is a specification:

The main object of my invention is to so suspend the lower non-revolving stone of a mill that, while it can easily accommodate itself to the movement of the upper stone, the lateral movement of the eye of the stone will be but slight. Further objects of my invention are to prevent the access of dust and dirt to the bearing, and to keep the spindle cool. These objects I attain in the manner which I will now proceed to describe, reference being had to the accompanying drawing, in which—

Figure 1 is a vertical section of my improved bearing for lower millstones; and Fig. 2, a sectional plan on the line 1 2, Fig. 1.

Mills in which an upper balanced stone is combined with a lower fixed stone are objectionable, because the rigid surface presented by the latter generally prevents a proper contact of the two stones, and results in a product of inferior quality. To overcome this objection the balancing of both stones has been resorted to; but all devices for effecting this object have heretofore been applied beneath the lower stone—a plan which frequently results in such an extended vibration of the upper face of the stone, owing to the distance of the center of vibration from the same, that the spindle is apt to bind in the eye of the said stone, while the maintenance of a close joint around the neck of the spindle, as well as at the curb, is prevented.

I overcome these objections by the use of the devices illustrated in the drawing, in which—

A represents the foundation or bed plate of the mill, and B the bush, which fits in the eye of the lower stone, and into the central opening of which projects the central tubular stem D, forming part of the foundation-plate A. This stem D has at opposite sides lugs E E, on the upper edges of which are formed bearings for two trunnions, *a a*, projecting from opposite sides of a ring, F, which is also pro-

vided with another pair of trunnions, *b b*, arranged at right angles to the said trunnions *a a*. The trunnions *b b* are adapted to bearings formed in the lower edges of blocks G G, Fig. 2, attached to or forming part of the bush B, as seen in Fig. 2. Through the central opening of the stem D extends a tubular sleeve or collar, H, which is arranged to turn in a journal-box formed by means of sectional strips *e* and packing-strips *f*. The pressure of the packing-strips against the sleeve H is regulated by means of wedges *d*, provided at their lower ends with lugs adapted to threaded stems *g*, secured to the foundation-plate, and provided with thumb-nuts *h*. To the interior of the sleeve H is snugly fitted the squared spindle J, the upper end of which carries the bearing of the upper revolving millstone, power being applied to the lower end in order to rotate the spindle. Besides the central opening for the reception of the spindle, the sleeve H has, in the present instance, four grooves, *i*, arranged at the sides of the central opening, so that, when the spindle is fitted in its place, these grooves form channels for the passage of air, said channels extending from top to bottom of the sleeve. Immediately above the sleeve H, and attached to and revolving with the spindle J, is arranged a ring, *k*, which is in line with the space between the upper and lower stones, and is provided with a number of downwardly-projecting radial plates, *m*, Fig. 3, which, as the ring revolves, act in the same manner as the blades of a rotary fan, inducing air to pass up through the grooves *i* of the sleeve H, and forcing it out into the space between the upper and lower stones, thus serving not only to prevent the spindle and sleeve from becoming heated, but also to maintain the grinding-surfaces cool and dry, and to prevent the falling of dust and dirt down upon the upper edge of the sleeve H and the packing. This packing consists of sponge or other elastic material, and is contained within a receptacle, L, formed by two dished rings, *n* and *n'*, which are united at their outer edges to a ring, *o*, secured to a flange on the upper edge of the bush B. The packing material presses against

the sleeve H with sufficient force to prevent the downward passage of any dirt which may accidentally find its way to the upper surface of the packing, thus forming a dust-tight joint, while the elasticity of the packing readily permits a slight lateral motion to be imparted to the receptacle L.

It will be observed, more particularly, on reference to Fig. 2, that the bush B is hung on the trunnions *b b* of the ring F, and that the ring itself is suspended by means of its trunnions *a a* from the lugs E E of the foundation-plate, so that the bush B, and consequently the lower stone, has two centers of vibration at right angles to each other, thus forming a universal joint, and permitting the stone to readily adapt itself to the requirements of the work to be performed.

The main feature of my invention, however, consists in arranging the universal joint or bearing in the eye of the stone, the centers of vibration being midway, or thereabout, between the upper and lower faces of the same.

By this arrangement not only is the lateral vibration of the stone at its upper face reduced to a minimum, but the accumulation of complicated balancing devices beneath the stone is prevented, and the latter can be brought near to the foundation-plate, thereby insuring increased steadiness.

I claim as my invention—

1. The combination described of the lower non-revolving stone of a mill with a universal bearing arranged within the eye of the stone, substantially as and for the purpose set forth.

2. The combination of the foundation-plate A and its lugs E E, and the bush B and its blocks G G, with the ring F and its trunnions *a a* and *b b*.

3. The sleeve or collar H, having grooves *i* extending throughout its entire length, as and for the purpose set forth.

4. The revolving ring *k*, provided with radial plates *m*, and arranged in line with the space between the upper and lower stones, as and for the purpose described.

5. The receptacle L, attached to and moving with the bush B, and filled with elastic packing material, in combination with the fixed sleeve H, as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CHRISTIAN CUSTER.

Witnesses:

HARRY HOWSON, Jr.,
HARRY SMITH.