

No. 692,243.

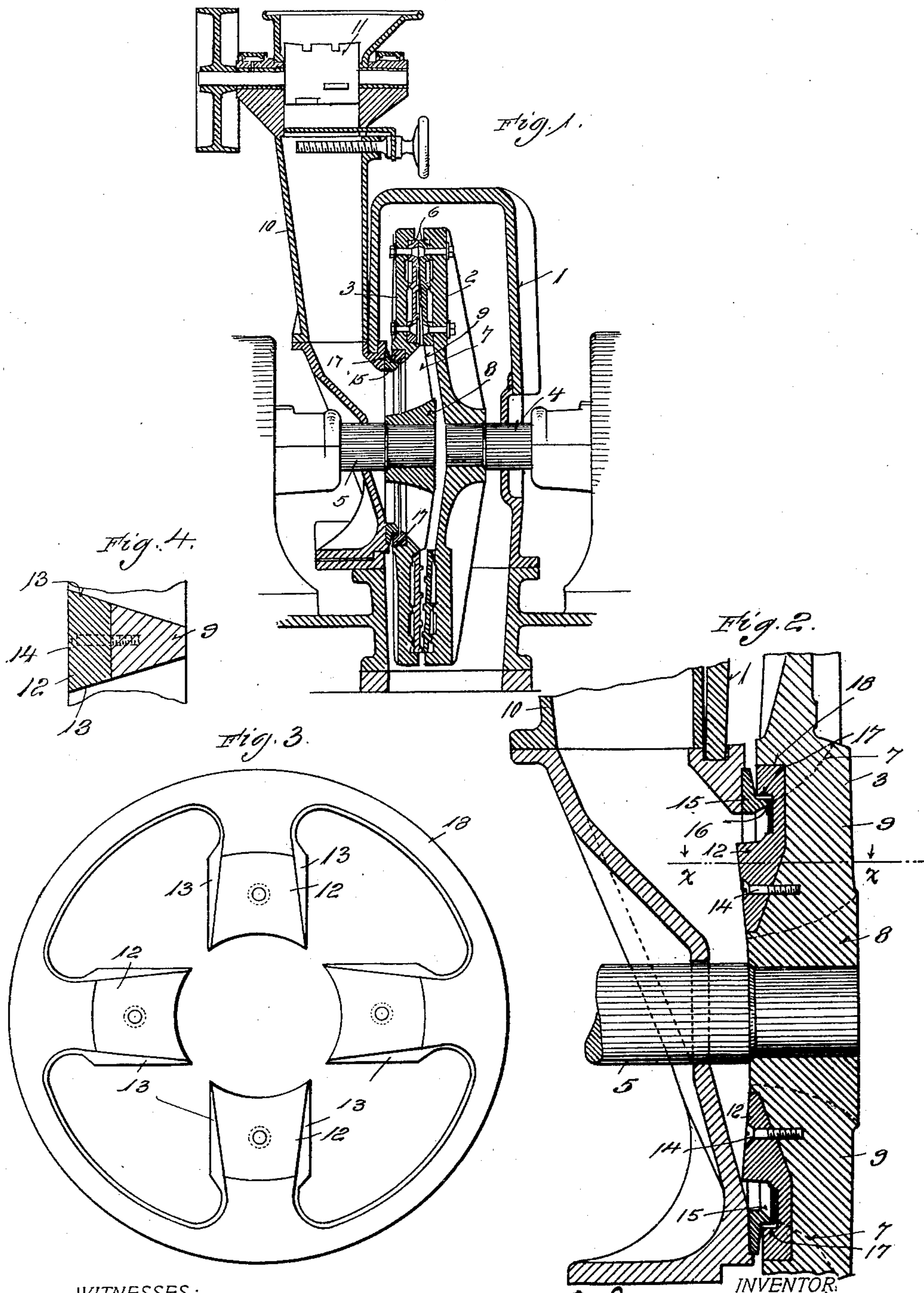
Patented Feb. 4, 1902.

W. E. COPENHAVER.

MILL.

(Application filed Sept. 16, 1901.)

(No Model.)



WITNESSES:
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UNITED STATES PATENT OFFICE.

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MILL.

SPECIFICATION forming part of Letters Patent No. 692,243, dated February 4, 1902.

Application filed September 16, 1901. Serial No. 75,464. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM E. COPENHAVER, a citizen of the United States, residing at Springfield, in the county of Clark and State of Ohio, have invented certain new and useful Improvements in Mills, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to mills, and more particularly to that class of grinding-mills known as "attrition-mills," in which two heads provided with grinding-plates are employed, arranged opposite each other and rotating in opposite directions, the material to be acted upon being fed through an eye or central opening in one of the heads.

The object of my present invention is to increase the efficiency and durability of the mill and at the same time provide for the ready renewal of certain portions thereof which are exposed to wear.

To these ends my invention consists in certain novel features, which I will now proceed to describe and will then particularly point out in the claims.

In the accompanying drawings, Figure 1 is a vertical sectional view, partly in elevation, of a mill embodying my improvements. Fig. 2 is an enlarged view similar to Fig. 1, only a portion of the structure being shown, however, and the section being through a different portion of the head. Fig. 3 is a view of the inner or back face of the removable wearing-plate, and Fig. 4 is a detail sectional view taken on the line *xx* of Fig. 2.

In the said drawings, 1 indicates the casing, 2 the solid head, and 3 the open head, said heads being mounted, respectively, on shafts 4 and 5, rotating in opposite directions, and said heads being provided with suitable grinding-plates 6. As usual in mills of this type, the head 3 is provided with an annular opening 7 around its center, through which the material is fed, the hub portion 8 of the head being connected with the annular body portion by spokes or arms 9. The material to be operated upon is fed to this eye or opening through a feed-spout 10 by any suitable means—such as, for instance, the feeding mechanism 11 shown. The spokes or arms 9 in mills of this type are beveled or inclined,

as shown in Fig. 4, their widest portion being on the outer or receiving side, so that after the material has passed the outer edge of the spokes or arms these latter will act to feed it onward into the space between the two heads. In practice, however, it has been found that these spokes or arms rapidly become worn, and thus not only weaken the head, but the character of the wear is such that their outer sides become beveled or inclined in a direction the reverse of that originally given them. This tends to force the material operated upon away from the eye instead of aiding in the feeding forward thereof. To overcome this difficulty, I propose to attach to the outer face of each arm 9 a wearing-plate 12, having beveled sides 13, corresponding to the bevel of the arm and secured in position by a screw-bolt 14 or in any other suitable manner. By reason of this construction the wear will fall upon the plates 12, which may readily be removed and replaced by other plates at a comparatively small cost, thereby maintaining the efficiency of the device and rendering it renewable at a small cost.

In mills of this class there is employed on the casing a seal-ring 15, surrounding the eye of the open head and having a projecting flange 16, which coöperates with a shoulder 17 on the head to prevent the material operated upon from leaking out between the head and casing at this point. In practice it is found that wear occurs at this point also, and while the seal-ring, being a separate part, may be readily removed and replaced by a new one the wear on the head requires a renewal of the entire head. In order to overcome this difficulty, I provide a ring 18, on which the shoulder 17 is formed, and I connect the wearing-plates 12 with this ring, preferably by forming them integral therewith, so that the entire wearing device in its preferred form comprises an annular portion 18, having a shoulder coöperating with the seal-ring 15, and radial plates 12, integrally connected therewith and forming wearing-plates for the spokes or arms. By reason of this construction the parts may be readily applied and removed and accurately centered and those portions of the outer face of the head which are

exposed to wear may be readily renewed, thus increasing the life of the head proper.

I do not wish to be understood as limiting myself to the particular details of construction hereinbefore described, and shown in the accompanying drawings, as they may obviously be varied without departing from the principle of my invention.

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

1. In a mill of the character described, the combination, with an open head having an eye and spokes connecting the hub and annular body of the head, of wearing-plates secured to the outer or receiving faces of the spokes, substantially as described.

2. In a mill of the character described, the combination, with an open head provided with a feeding-eye and spokes or arms connecting the hub and annular body of said head, said

spokes or arms being beveled, as described, of correspondingly-beveled wearing-plates secured on the outer or wider faces of the spokes or arms, substantially as described.

3. In a mill of the character described, the combination, with a casing, of an open head provided with an eye and spokes or arms connecting the hub of said head with its annular body, a seal-ring secured to the casing, and a wearing member detachably secured to the open head and comprising an annular portion, cooperating with the seal-ring, and radial plates fitting the outer or receiving faces of the spokes or arms, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM E. COPENHAVER.

Witnesses:

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IRVINE MILLER.