(No Model.)

P. W. GATES.

ECCENTRIC BEARING BOX.

No. 246,608. Patented Sept. 6, 1881.

Fig 1.

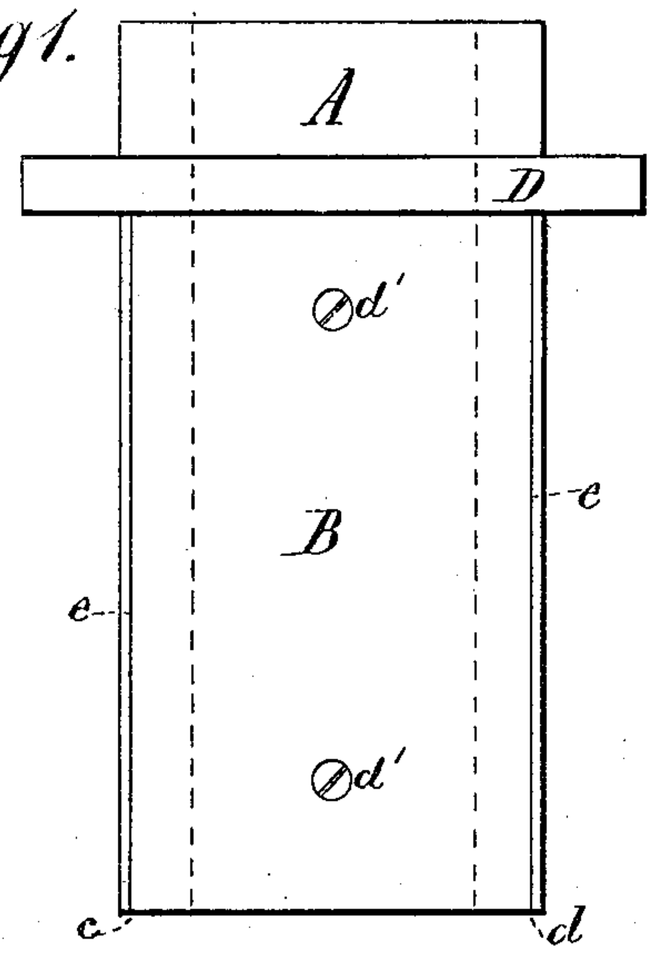


Fig 3.

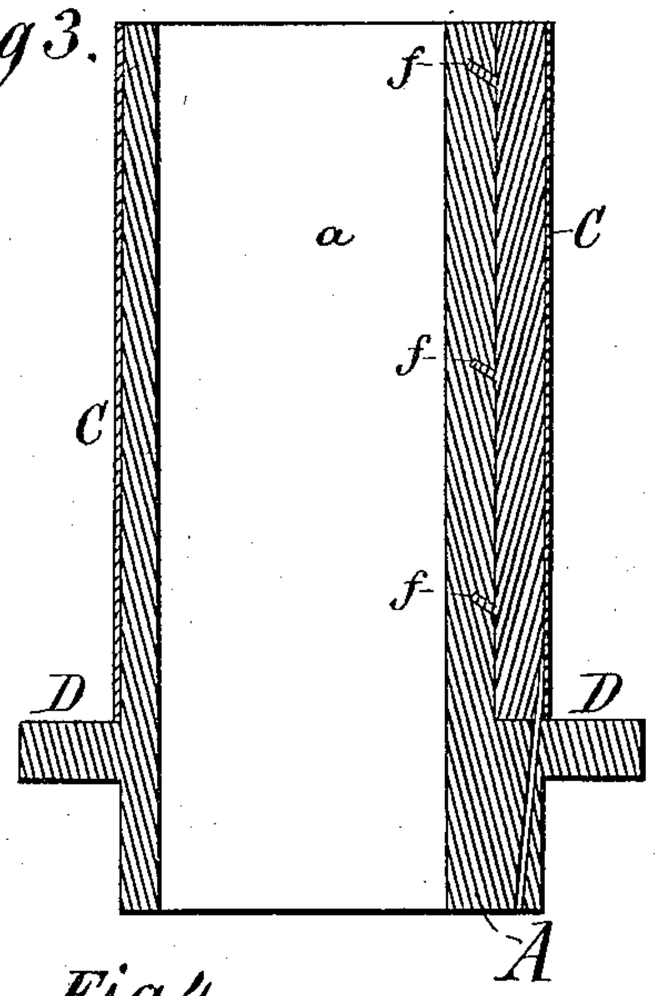


Fig 2

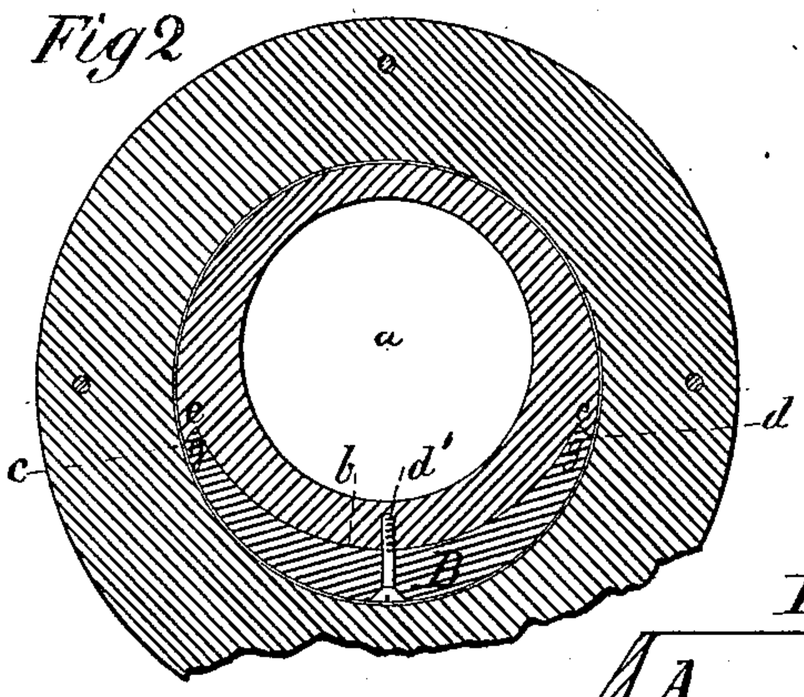


Fig 4.

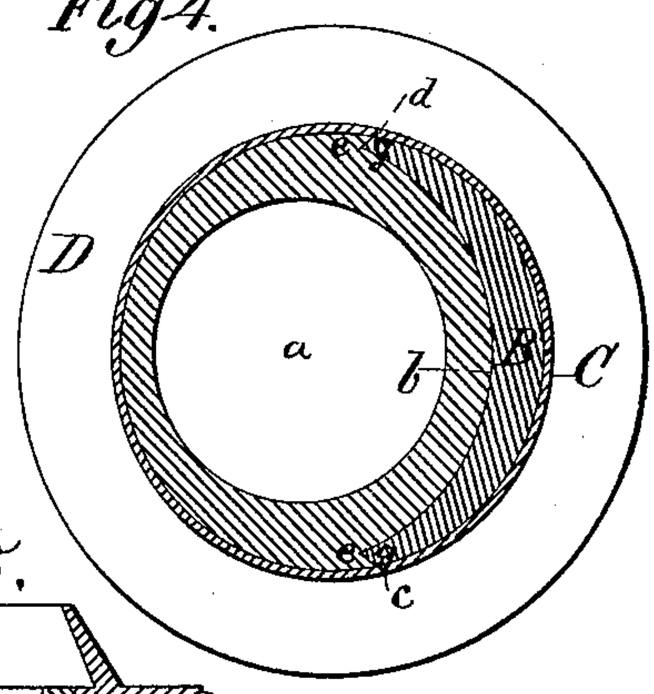
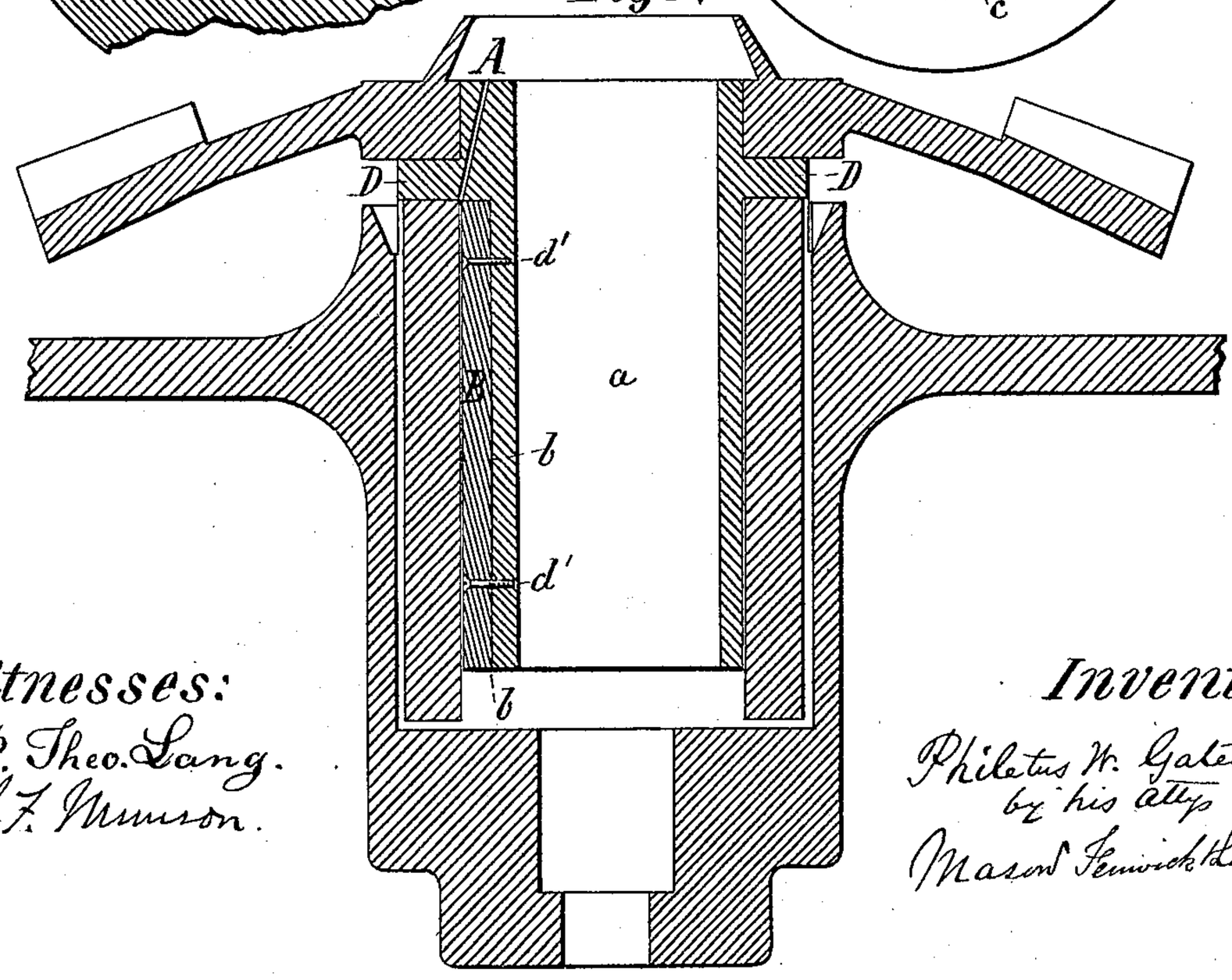


Fig 5.



Witnesses:
J. P. Theo. Lang.
I. F. Munson.

Inventor:
Philetus W. Gates
by his attys
Mason Fenwick & Lawrence

UNITED STATES PATENT OFFICE.

PHILETUS W. GATES, OF CHICAGO, ILLINOIS.

ECCENTRIC BEARING-BOX.

SPECIFICATION forming part of Letters Patent No. 246,608, dated September 6, 1881.

Application filed July 7, 1881. (No model.)

To all whom it may concern:

Be it known that I, PHILETUS W. GATES, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Eccentric Revolving Bearing-Boxes for Ore-Crushers and Stone-Breakers, of which the following is a specification.

My invention relates especially to the revolving eccentric bearing-box employed at the lower end of the gyrating shaft of stone-breakers and ore-crushers; and the nature of my invention consists in providing the thicker or eccentric portion of said bearing-box with a depression or groove in its outer bearing-surface and applying within this depression a removable portion of carbon-bronze metal or other suitable durable wearing metal, said removable portion of metal being of a segmental form and extending partly around the circumference of the eccentric bearing-box proper, and also extending vertically from, or nearly from, the upper to the lower ends of said box proper, and being adapted for being secured in position by bevel flanges at the edges of the depression or groove, or by other suitable means provided on the bearing-box proper and on the removable portion of metal, or by said flanges together with screws or dowels, or both with screws and dowels.

It also consists in the combination of the box proper, having a peculiarly-formed depression or groove in its periphery, and a peculiarly-formed removable carbon-bronze metal or other suitable bearing-metal portion, whereby greater strength in the parts is secured when made as hereinafter described and claimed.

In the accompanying drawings, Figure 1 is an elevation of the revolving eccentric bearing-box as improved or as provided with a bronze-carbon portion of bearing metal. In this view the oil-step box shown in Fig. 5, and in which the bearing is generally used, is not shown. Fig. 2 is a horizontal section of the same with the oil-step box, which also is shown in section. Fig. 3 is a vertical section of the improved bearing-box inverted, and also showing a molding-sleeve placed around the box proper for the purpose of holding molten metal in contact with the box proper in the event that the segmental portion of wearing metal which is applied in the depression or groove of the said box should be cast upon the box instead of being first made and afterward applied to the box. Fig. 4 is a horizontal section of Fig. 3; and Fig. 5 is a vertical section of the ordinary oil-step box and of the revolving eccentric-box as improved and provided with some of its ordinary adjuncts, this view showing the ordinary mode of using a revolving eccentric-box in stone-breakers and ore-crushers.

The eccentric bearing-box proper, A, is cast of carbon-bronze or any other suitable bearing metal, and in that portion of its periphery where it is the thickest, by reason of the eccentric position of the bore *a*, a depression, *b*, is cast in form of a dovetail groove, which extends from, or nearly from, the top to the bottom of the box A. The width of the depression *b* may be equal to a semicircle of the box proper or less, or it may be of a width more than such semicircle, as deemed most desirable—that is to say, it may extend from the point *c* to the point *d*, and its base may be formed on a curve which is much flatter than the circle of the box proper, as shown.

The bevel flanges *e* at the edges of the depression, and which give a dovetail form to the depression *b*, serve as holdfasts to a removable segmental portion of carbon-bronze or other bearing metal, B, when such portion of metal is applied to the box proper, A, as shown in Figs. 1 and 2. This segmental portion of metal B, when made of carbon-bronze metal, which is, so far as I have determined, the best known metal for bearing purposes, is wrought separate from the box proper, A, with edges *g* tapering, or of a form corresponding in shape to the spaces overhung by the tapering flanges *e*, as shown, and thus made this portion of metal B is slipped endwise from the bottom of the box A into the depression *b*.

If the flanges *e* should not firmly hold the portion of metal B in place, screws or other fastenings *d'*, passed horizontally through it and into the box A, as shown, may be employed as additional thereto for this purpose.

If it were practicable to flow the carbon-bronze metal into a mold, the segmental portion of metal B could be applied in the act of its manufacture by flowing this metal, while in

a molten state, into the depression *b*, and to operate in this way a perfectly true cylindrical molding-sleeve, C, would have to be employed, as shown in Figs. 3 and 4 of the drawings; but, as it is not practicable to thus flow this metal, the sleeve C will only be used when I make the bearing portion of metal B of Babbitt or other bearing metals of proper character, which can be cast at once into the depression of the box. When the sleeve C is employed the bearing-box A is inverted. The sleeve C, made to fit close around the box, is then placed around the box and made to rest upon the supporting-collar D thereof, and then the molten metal is poured down into the depression. The segmental portion of metal B produced in this manner upon the box A will be held fast by the dovetail flanges *e*, and to prevent it slipping downward screws may be passed through it and into the box proper, A; or, instead of screws being employed for fastening it, holes with a slant might be bored into the box A, and then in the casting operation a portion of the molten metal would flow into these holes, and thereby form dowels *f*, which would serve for preventing the portion B of metal from slipping down in the depression *b*.

By examining the drawings it will be seen that the segmental portion of metal B is made tapering in opposite directions from the center of its width, and this is done in order to give the greatest thickness and strength at that point where the greatest strain and wear come. If the portion of metal B were made of uniform thickness throughout, either it or the metal binding the bore of the box would have to be so thin that liability of breakage would exist.

The necessity for this improvement in this special eccentric bearing-box arises from the fact that hardly any perceptible wear occurs on the inside of the bore of the box when used with the gyrating shaft, while there is a very destructive and large wear on the periphery thereof, especially at the place where the box is made with an increased thickness opposite one side its eccentric bore *a*. In practice it has been found that the wear is so great at the point stated that when the throw of the eccentric is made one inch it will be reduced to three-quarters of an inch in two or three years' use of the machine, while the wear on the inside of the box in the same use will hardly be perceptible. This change in the throw of the eccentric greatly impairs the effective capacity of the machine, and hence my improvement is a very important one.

The great value of my improvement lies in this, that when the segmental portion of metal B becomes worn down so as to impair the capacity of the machine, as stated, it can be removed and another portion of metal B, which will restore the machine to its original working capacity, can be substituted for it, and the expense attending the substitution will be only a few dollars, whereas if an entirely new eccentric-box had to be furnished the expense would be forty or fifty dollars, according to the size of the machine which is being repaired. If the portion of metal B is cast, there will be no labor of turning it true, as the molding-sleeve can be nicely finished and fitted to the box proper, A, and when the metal is flowed into the groove the sleeve will cause its outside surface to be true and concentric with the periphery of the box proper, A. When the portion of metal B is made separate and afterward fitted in the depression *b*, the box proper, A, and portion of metal B will be turned true with one another in a suitable lathe. In case the portion of metal B is made separate from the box A and of carbon-bronze metal one or more duplicate pieces of metal, B, will be furnished with each stone breaker or crusher sold, and then when it becomes necessary to repair the box A on account of wear at the place where the greatest thickness exists it can be done by any mechanic having proper facilities and at a cost of but a few dollars; but when Babbitt or any analogous metal is cast into the recess, then it will not be necessary to furnish duplicate pieces, as the worn portion of metal B can be removed and a perfect piece cast upon the box proper, A, in the manner hereinbefore described.

By my invention the necessity of covering the whole surface of the box A with removable bearing metal is avoided, and expense will only be incurred for substituting a new portion at that outside point where the wear is so great as to render necessary the substitution of an entirely new bearing-box of the old style. Besides this, the advantage of using a box having an inside bearing-surface of expensive carbon-bronze metal can be secured without being subjected to the great expense of substituting a new box with such bearing-surface when only the outside thicker portion of this box requires to be restored.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The improved new article of manufacture herein described, consisting of a revolving eccentric bearing-box composed of an eccentrically-bored bearing-metal box proper, A, provided with a segmental depression in its outer surface, and a segmental bearing-metal portion, B, fitted into the depression *b*, and suitably united to and forming the completing portion of the bearing-box portion A, substantially as and for the purpose described.

2. The revolving eccentric bearing-box A, made with depression *b*, of a dovetail form, and with a base on a flatter curve than the circle of the box, in combination with the segmental portion B, made tapering from its middle to its side edges in opposite directions, substantially as and for the purpose described.

PHILETUS W. GATES.

Witnesses:
GEO. SCOVILLE,
PHIMELIA W. GATES.