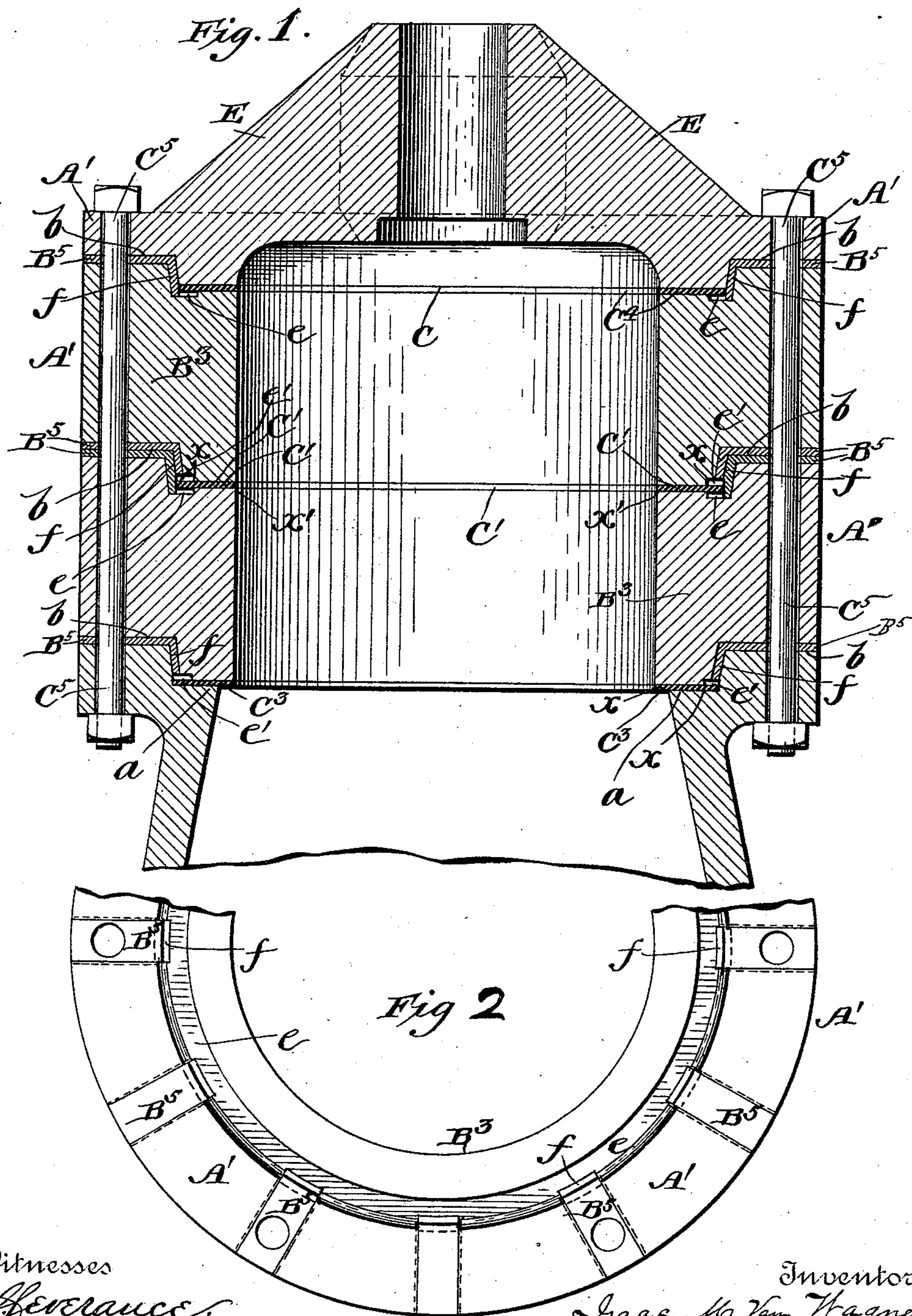


(No Model.)

I. M. VAN WAGNER.
CONCAVE FOR STONE OR ORE CRUSHERS.

No. 525,398.

Patented Sept. 4, 1894.



Witnesses

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Inventor

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UNITED STATES PATENT OFFICE.

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CONCAVE FOR STONE OR ORE CRUSHERS.

SPECIFICATION forming part of Letters Patent No. 525,398, dated September 4, 1894.

Application filed January 23, 1894. Serial No. 497,785. (No model.)

To all whom it may concern:

Be it known that I, ISAAC M. VAN WAGNER, a citizen of the United States, residing at Fairview, in the county of Hudson and State of New Jersey, have invented certain new and useful Improvements in Concaves for Stone or Ore Crushers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in sectional concaves for gyrating stone crushers and other analogous reducing machines; and its object is to prevent rapid destruction of the concave by reason of the crumbling off, or breaking down of the sections at the junction of one with another, and at their upper and lower corners; and the invention consists in the employment, in combination with hard metal ring sections forming the wearing surfaces of the concave, of relatively softer, yet quite enduring metal strips, at the joints between the sections, said strips being of wrought or malleable iron, and forming narrow portions of the wearing surface, and by becoming battered over the edges of the sections, accordingly as the harder metal of the sections breaks or crumbles off, serving, in addition to their office as wearing surfaces, for filling any irregularities in the more enduring portions of the brittle wearing surface, and thereby protecting the edges of the sections which may have become broken away from rapid destruction, and thus increasing the durability of the concave.

It also consists in applying at the top or bottom edge [or both] of the hard metal sections of the concave, relatively softer metal strips, for the same purpose that the relatively softer metal strips are employed between the sections of the concave.

In the accompanying drawings, Figure 1. is a vertical section of a hard metal shell-concave made of ring sections and having my invention applied to the same. Fig. 2. is a broken top view of the bottom ring section of the concave, the upper ring section not being in place.

A' in the drawings shows the concave formed of two horizontal ring sections B³.

C' is a narrow horizontal, metal protection strip in form of a ring made either in one piece, or several segmental pieces adjoining one another radially. This ring strip is placed horizontally between the ring sections B³ of the concave. A similar protection ring strip C³ may be applied at the bottom of the lower ring section of the concave, and also one, as C⁴, at the top of said concave. When the shell or casing A' is formed, as shown, of horizontal metal ring sections, and not lined with chilled wearing surfaces—the ring sections themselves being of hard metal or chilled on the inside so as to serve as a wearing surface, the protection ring shaped strips, whether in one or several segmental pieces, will be arranged as shown in Fig. 1. between the adjoining faces of the sections of the casing, and also at the top and bottom of the sections, but should the shell of the casing be provided with a wearing lining, such lining would be formed of horizontal ring sections, and the protection ring strips placed between the adjoining horizontal surfaces of the lining, and also at bottom and top of the same. The concave made of ring sections bolted together as shown in Figs. 1 and 2, minus the protection strips, is not claimed by me, it being the invention of Charles L. Carman.

The horizontal protection rings should be made of wrought iron or malleable iron, and should possess considerable wearing endurance, as they constitute a portion of the wearing surface, but, while this is so, they should be relatively softer than the metal of which the ring shell sections, or the concave lining, is formed, in order that they may be battered over against the edges of the harder portions of the metal forming the wearing surface, as fast as this metal, at the junction edges and corners of the ring sections, crumbles and breaks off, under the great strain and wearing action to which it is subjected during the crushing operation, and thus save the concave at these points from rapid destruction.

A practical and preferable manner of applying the horizontal protection strips is as follows: The rings are placed horizontally between the horizontal ring sections B³ of the concave and a protection ring C³ is applied at

the bottom of the lower ring section and a protection ring C^4 placed at the top of the concave. In order to thus apply the ring I cast in the respective junction faces of the ring sections B^3 soft iron angular strips B^5 having dovetail fastening edges, said strips being placed in the mold and the metal flowed around the same. By this means a perfect joint can be formed at b, b , when the ring sections of the concave are placed together, and also on the inside of f, f . In addition to providing the soft iron strips B^5 , the inner portion of the ring sections B^3 from x, x' are ground upon an emery wheel and sufficient clearance allowed at e, e' between the two, ring sections B^3 , to allow of the insertion of the wrought iron rings C' , either in one piece or in segments. By means of the clearance at the points e, e' the ring sections B^3 can be drawn together by the screw bolts C^5 , and the strips B^5 caused to bind against one another, and thus a perfectly iron to iron joint secured.

Concaves not provided with protection strips of wrought or malleable iron, or as heretofore constructed, soon wear away at the joints, and upper and lower corners, and present sharp exposed corners to the battering action of the rock, and these corners being very hard crumble off rapidly, soon making hollows or valleys at the junctions of the sections, thereby lessening the natural life of the concave. But by the use of the wrought or malleable iron strips between the sections this rapid wear and destruction are avoided, from the fact, that the protection strips are constantly being battered over, and made to fill the crevices thus formed, and also to serve as protectors of the corners of the edges and adjoining sections. The protection strips are, preferably from a quarter to half an inch in thickness, according to the requirements of the concave. From the drawings it will be

seen that the ring sections B^3 with the protection strips C', C^3, C^4 , are all supported on the lower flange a of the main frame.

What I claim as my invention is—

1. In a concave for gyratory stone crushers, the combination of the relatively softer wrought or malleable iron metal protection strips, with a concave formed of hard metal ring sections bolted together, the said strips being applied where the sections adjoin, and forming portions of the wearing surface, and while serving this purpose also serving, by being battered over the edges or corners of the sections, for protecting the sections from rapid destruction, substantially as described.

2. In a concave for gyratory stone crushers, the combination of intermediate, and top and bottom wrought or malleable iron metal strips, with a concave formed of hard metal ring sections bolted together, substantially as and for the purpose described.

3. In concaves for gyratory stone crushers, the combination with hard metal wearing surfaces of a sectional concave, of relatively softer metal strips applied between the adjoining sections and at the bottom of the lower section, so as to become battered down about the edges of the said sections, and thus protect them, substantially as described.

4. In concaves for gyratory stone crushers, the combination with hard metal wearing surfaces of a sectional concave, of relatively softer metal strips applied between the adjoining sections and at the top of the upper section, so as to become battered down about the edges of the said sections, and thus protect them, substantially as described.

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

ISAAC M. VAN WAGNER.

Witnesses:

J. W. M. BOTTOM,
C. A. BURNS.