(No Model.) 2 Sheets—Sheet 1.

# S. KENDALL.

## ORE CRUSHER.

No. 347,809. Patented Aug. 24, 1886.

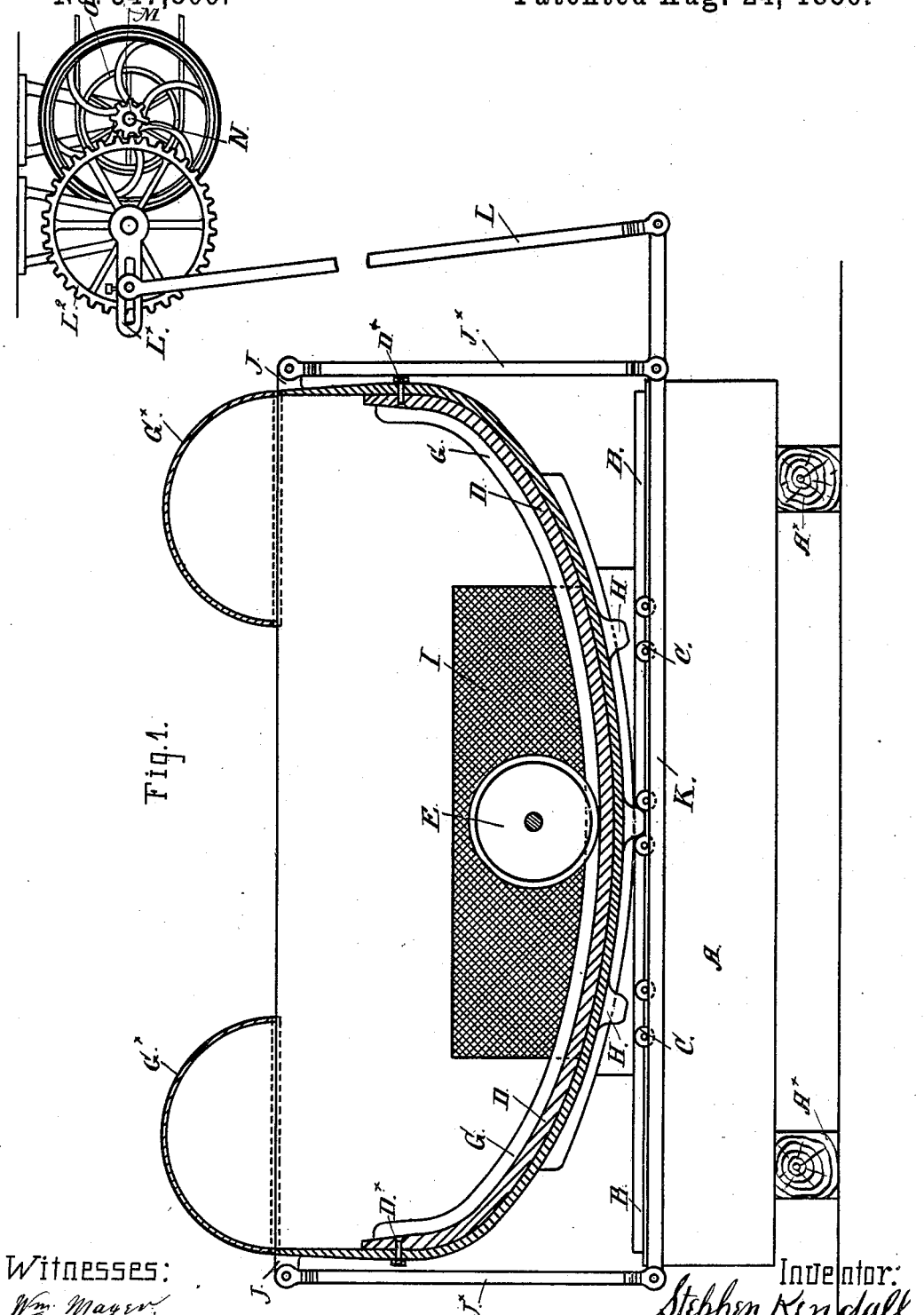


Fig. 1.

Witnesses:
Wm. Mayer
Joseph E. Ford

Inventor:
Stephen Kendall
by Wm Smith
Atty.

(No Model.) 2 Sheets—Sheet 2.

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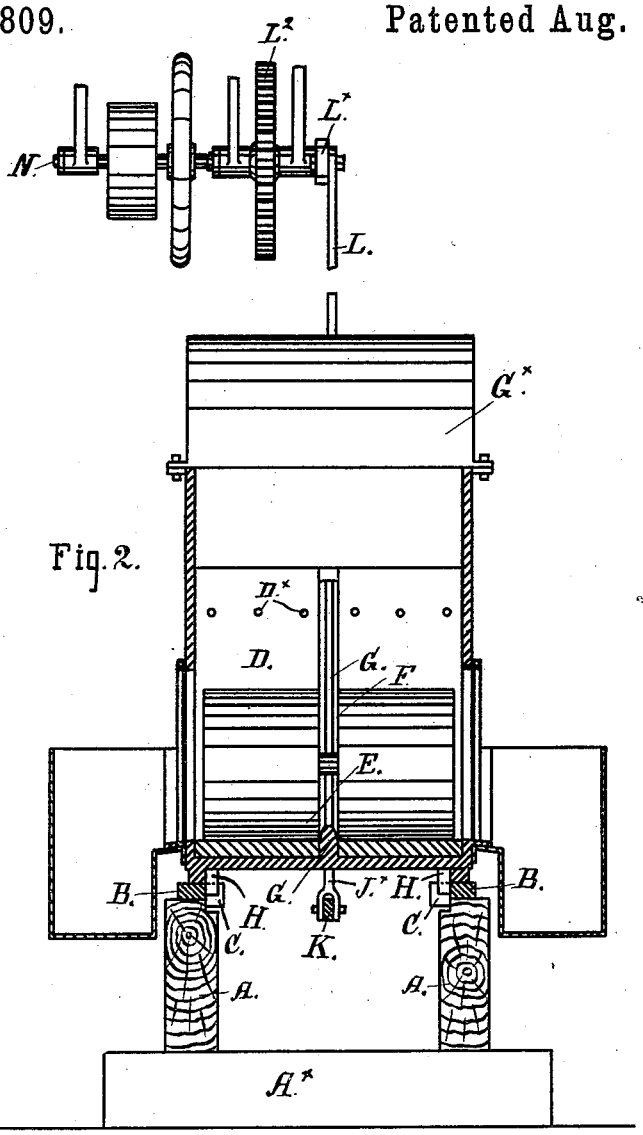


Fig. 2.

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Stephen Kendall
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# UNITED STATES PATENT OFFICE.

STEPHEN KENDALL, OF ANGEL'S CAMP, CALIFORNIA.

## ORE-CRUSHER.

SPECIFICATION forming part of Letters Patent No. 347,809, dated August 24, 1886.

Application filed February 17, 1886. Serial No. 192,312. (No model.)

*To all whom it may concern:*

Be it known that I, STEPHEN KENDALL, a citizen of the United States, residing at Angel's Camp, in the county of Calaveras and State of California, have invented a new and useful Ore-Crusher, of which the following is a specification, reference being had to the accompanying drawings.

My invention relates to improvements in mechanism for crushing ores of the precious metals; and it consists in the construction, arrangement, and combination of parts, as will be hereinafter set forth and claimed.

In the annexed drawings, illustrating my invention, Figure 1 is a vertical section through my improved ore-crusher. Fig. 2 is a cross-section taken through the middle of the same.

My ore-crusher is supported upon the parellel and cross timbers A A*, and upon the face of the former or timbers A the tracks B are laid, along which a series of rollers or lugs, C, are placed, having their bearings in the tracks. These rollers are made so as to turn upon fixed bearings, or they may be stationary or merely rounded surfaces, as they are only intended as guides for the lugs on the bottom of the pan to prevent sliding or end movement. The pan is an oblong, rounded, or dish-shaped vessel, and may be cast in sections and bolted together. Within the pan is placed a die, D, curved to conform to the shape of the bottom and sides, to which it is held by bolts D*. Upon the face of this die the operation of crushing and grinding the ore is accomplished through the medium of the roller E passing backward and forward as the pan is operated. The roller is constructed of soft iron encircled by steel bands, and has an annular groove, F, around its middle to receive a V-shaped web or flange, G, centrally connected to the face of the die D. This web acts as a guide for the roller as it moves from end to end of the pan and always keeps it in a true line as said web extends up the sides of the pan as far as the die extends.

As the work to be performed by my machine is known as "wet crushing," the curved hoods, which I denominate as "splash-boards," G*, are connected to the rim of the pan at each end, and as the roller ascends up the inclined sides of the pan, carrying some portion of the pulp with it these splash-boards will prevent the pulp from being thrown over the top of the pan and return it through the medium of their curvatures back into the body again. To the bottom of the pan are cast the lugs H. These lugs are rounded to conform to the shape of the rollers or guiding-lugs C, and when the pan is at rest the center lug is in the position shown at Fig. 1. At opposite sides of the pan openings are made, in which are placed vertical screens I, spaces being also left between the ends of the roller and the screens for the roller to travel in without coming in contact with the screens. These screens form discharge-openings at both sides of the pan, through which the ore or pulp passes when it is reduced to such a degree of fineness as to pass through the meshes, in which condition it falls into receptacles placed at the sides of the pan.

To the lugs J, upon the ends of the pan, are pivoted the vertical arms J*, and these in turn are pivoted to the ends of the horizontal connecting rod or bar K, which operates in the center of the space formed between the parallel timbers upon which the pan is supported. A rod, L, is pivoted to the outer end of the bar K, and connects with the slotted crank-arm L* upon the spur-wheel $L^2$, which gears with the cog-wheel M upon the fly-wheel and pulley-shaft N, these various devices being upheld by twin hangers placed side by side, as shown.

In operation the ore is first crushed or broken into fragments and fed to the machine with a sufficient amount of water through the opening between the curved splash-boards. Then power is applied through the medium of a belt, the driving-pulley O, which imparts motion to the spur-gear $L^2$ and operates the connecting-rod L, alternately raising and depressing the end of the flat bar K, to which the rod L is pivoted, thereby rocking the pan upon its center lug, K, and causing the crushing and grinding roller to roll to and fro over the curved bottom, the momentum of the roller tending to cause it to travel a short distance up the curved portion of the adjacent end of the pan, which is inclined upward, at the end of each stroke. It will thus be seen that only a small amount of power is required to keep

the roller in constant motion. By this means it will also be seen that the ore is rapidly reduced to such a degree of fineness as to pass through the screens at the opposite sides of the pan and fall into receptacles placed to receive it.

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

1. The combination, with the oblong pan, a crushing and grinding roller, and means for rocking said pan, of the splash-boards at the ends of the pan, constructed and arranged to operate in the manner and for the purpose specified.

2. The combination, with the oblong pan and a crushing and grinding roller, of the horizontal bar K, the pivoted arms J*, connecting said bar and pan, the pivoted rod L, connected with the end of the bar K, the slotted crank-arm, the spur-gear $L^2$, and pulley and cog wheel M, as set forth.

In testimony that I claim the foregoing I have hereunto set my hand and seal.

STEPHEN KENDALL. [L. S.]

Witnesses:
C. W. M. SMITH,
CHAS. D. WHEAT.