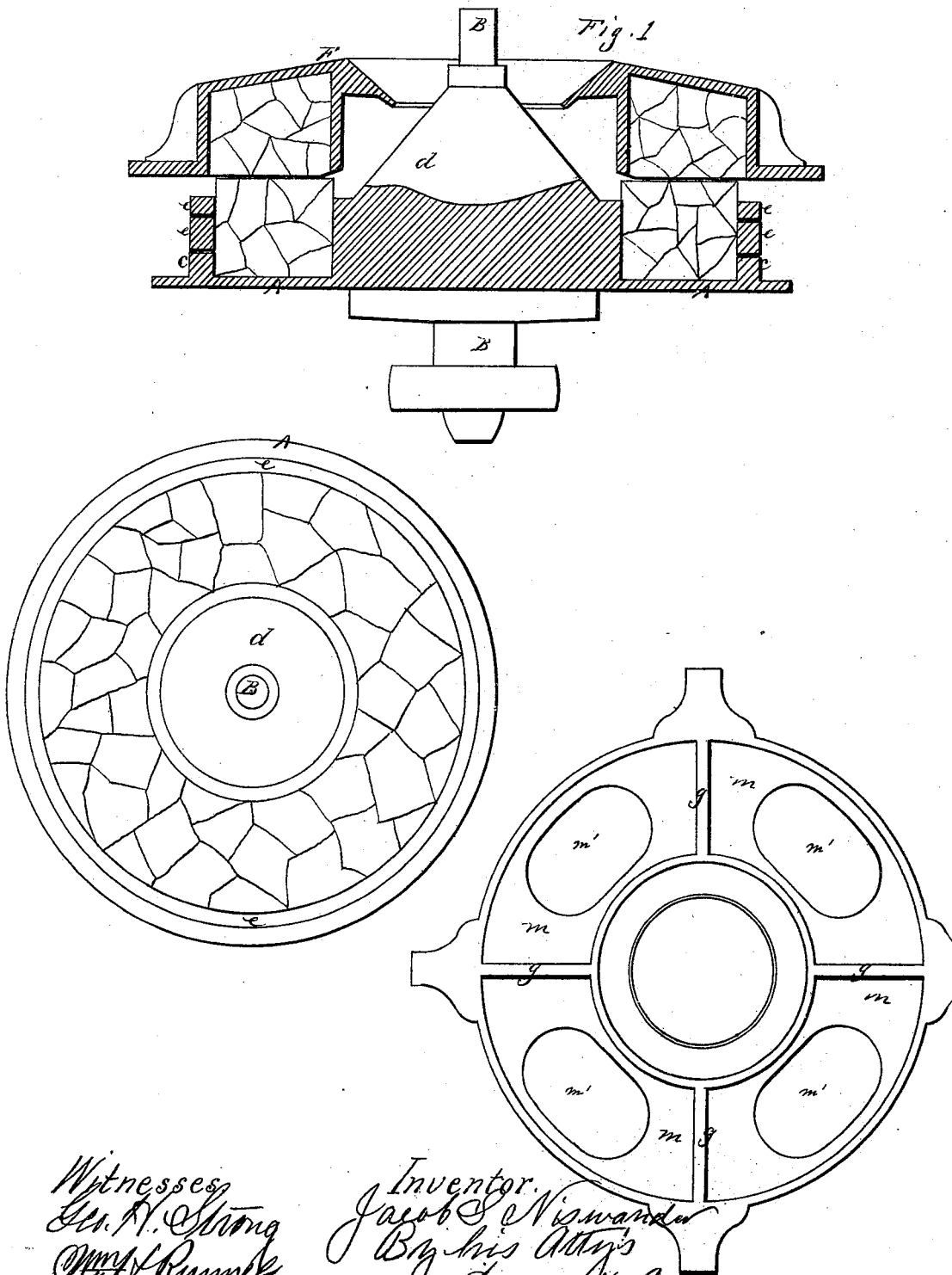


*J. S. Viswander,*

*Ore Mill.*

*No. 113085.*

*Patented Mar. 28. 1871.*



*Witnesses*  
*Geo. H. Strong*  
*Wm. H. Runnle*

*Inventor*  
*Jacob S. Viswander*  
*By his Atty's*  
*Dewey & Co.*

# United States Patent Office.

JACOB S. NISWANDER, OF OAKLAND, CALIFORNIA.

Letters Patent No. 113,085, dated March 28, 1871.

## IMPROVEMENT IN GRINDING-MILLS FOR ORES.

The Schedule referred to in these Letters Patent and making part of the same.

*To all whom it may concern :*

Be it known that I, JACOB S. NISWANDER, of Oakland, county of Alameda, State of California, have invented an Improved Grinding-Mill for Ores; and I do hereby declare the following description and accompanying drawing are sufficient to enable any person skilled in the art or science to which it most nearly appertains to make and use my said invention or improvements without further invention or experiment.

My invention relates to improvements in the construction and operation of quartz-grinding mills, the object being to do away with the necessity of employing iron grinding surfaces, whereby the amalgamation and separation of the metals are always more or less retarded by the particles of iron which are detached and mingled with the pulp during the process of grinding.

My invention consists in so constructing the grinding-pan or structure that ordinary stones or the quartz-rock of the mine, and selected with a view to obtain a medium level face or surface, can be employed as a bed or under grinding surface.

The muller is constructed so that it can be filled with loose rock, which will bear and grind upon the lower or under surface, and between which the broken or pulverized rock which is fed to the mill is ground.

In order to more fully explain my invention reference is had to the accompanying drawing forming a part of this specification, in which—

A represents a horizontal iron disk, which is fixed upon a vertical shaft, B, or otherwise arranged so that, if desired, it can be revolved in one or either direction.

This disk is provided with a narrow vertical rim or flange, c, around its upper periphery, thus forming it into a shallow pan.

Between this flange c and the center conical disk d I pack or place ordinary pieces of rock of any character, taking care to give as level an upper grinding surface as possible; or, if desired, the entire surface of the pan can be covered with rock properly packed, thus doing away with the central cone. These rocks are placed as closely together as possible and the interstices filled with broken stones, which are firmly wedged in between the larger ones.

In order to keep this bed of stones in place one or more rings or bands, e, can be placed upon the flange c, so as to form a side or rim to the pan or disk A, for the purpose of keeping the bed of stones in place.

These rings can be made in two parts and hinged together at one side, so as to be opened out when it is desired to remove them, and held together on the opposite side by a screw or equivalent device, by which they can be tightly drawn around the bed of stones.

The muller F consists of a circular rim or shell, which may or may not be provided with a cover, as most convenient.

This rim is divided into several compartments, m, by partitions, g, as shown. In each of these compartments I place loosely large stones, such as are readily picked up about any mine. By then giving either the rim A or muller F a rotary motion the surface of one will grind upon the surface of the other and soon wear an excellent grinding surface.

The pulp or pulverized ore is then introduced through the center of the muller to the grinding surfaces, where it will be thoroughly ground, after which it can be passed through screens in the usual manner.

The weight of the upper grinding surface can be regulated as desired by removing or adding more rocks, as required, and by this means it is possible to keep an even grinding surface at all times, thus insuring a better grinding of the ore fed to the mill.

When the lower grinding surface has become worn down to the upper ring this ring is removed, and the process continued until the under grinding surface has been completely worn away, when it can be renewed, as above described.

By this means I provide a grinding surface which will be quite effective, the sharp edges of the rocks serving to grind the pulverized ore to the required fineness.

The mill can be built at a small cost, and cannot get out of repair.

I also accomplish the grinding of ores without intermingling with the pulp finely-divided iron, which always, more or less, becomes mixed with it when iron shoes and dies are used for grinding, and which is a great drawback to the proper amalgamation of the metals.

Having thus described my invention,

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

1. The rings or bands e, in combination with the disk A, with its flange c, and a filling or bed composed of rock, substantially as and for the purpose set forth.

2. The muller F, with the openings m', and divided into two or more compartments, m, which are partially filled with loose rock, substantially as and for the purpose set forth.

In witness whereof I have hereunto set my hand and seal.

JACOB S. NISWANDER. [L. S.]

Witnesses:

WM. H. RUNNELS,  
GEO. H. STRONG.