No. 803,903. PATENTED NOV. 7, 1905.

G. JOHNSTON.

ORE CRUSHING MACHINE.

APPLICATION FILED DEC. 23, 1904

Fig. I.

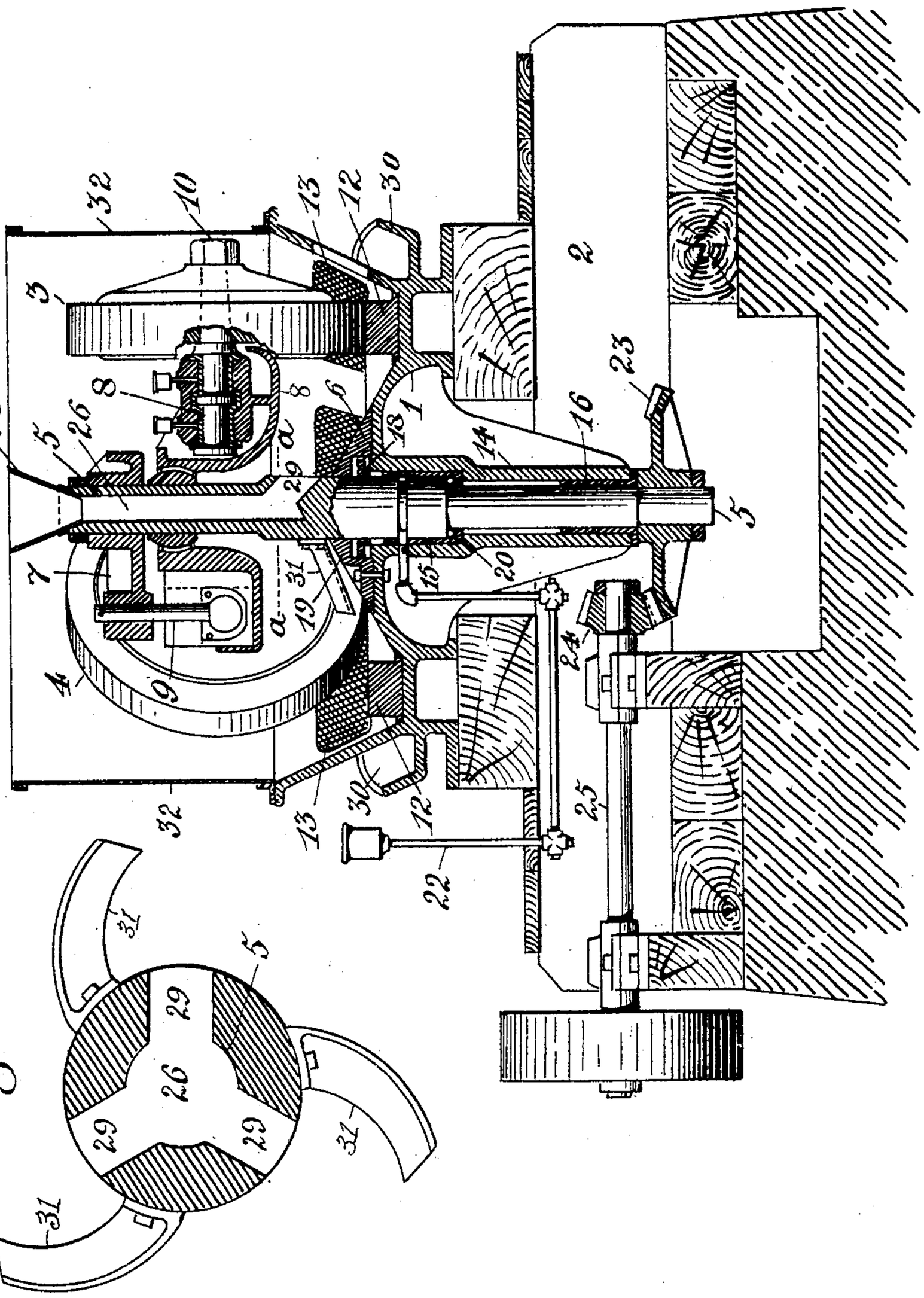

Fig. II.

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UNITED STATES PATENT OFFICE.

GEORGE JOHNSTON, OF SAN FRANCISCO, CALIFORNIA.

ORE-CRUSHING MACHINE.

No. 803,903. Specification of Letters Patent. Patented Nov. 7, 1905.

Application filed December 23, 1904. Serial No. 238,106.

To all whom it may concern:

Be it known that I, GEORGE JOHNSTON, a citizen of the United States of America, residing at San Francisco, county of San Francisco, and State of California, have invented certain new and useful Improvements in Ore-Crushing Machines; and I hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification,

This invention relates to roller crushing-machines for mineral ores of the edge-running or Chilian type, and is an improvement on the invention set forth in my copending application for Letters Patent, Serial No. 209,584, filed May 24, 1904, for an improvement in machines of a similar type for crushing mineral ore.

My present improvement has for its object to drive such machines from the bottom instead of the top, retaining the functions and manner of operating set forth in the application for Letters Patent before referred to and as hereinafter fully explained.

The object of my present improvement is to adapt my improved roller crushing-machines for use in large mills and in cases where a series of such machines are operated from power applied below the floor or crushing level, as illustrated by drawings herewith and forming a part of this specification.

Referring to the drawings, Figure I is a central vertical section through a roller crushing-machine of the gravity type constructed according to my invention. Fig. II is an enlarged cross-section on the line *a a* in Fig. I.

In machines of this type, commonly called "edge-running" or "Chilian," a plurality of rollers are given a planetary motion about a fixed axis and at the same time rolling on a continuous bed or die-ring with a compound pressing and twisting action.

In machines of this kind it has hitherto been customary to supply the broken ore and water to the machine either on or outside of the die-ring and path of the crushing-rollers; so the material has been unequally treated because of its falling inward after banking against the screens or walls without having passed through the crushing zone, thus falling back irregularly against the centrifugal wash. To avoid these objections, I construct these roller-mills as shown in the drawings, where 1 is the main frame, commonly called the "pan," and 2 supporting foundation-timbers as commonly arranged.

3 and 4 are two out of three crushing-rollers with which the machine is provided.

5 is a central main shaft or spindle made hollow or tubular at the top and provided with a driving member 7, that communicates motion to a revoluble frame 8 by means of driving studs or pins 9, as shown in Fig. I.

The crushing-rollers are mounted on short shafts 10, that revolve in bearings in the frame 8, that gives a planetary motion about the axis of the machine and at the same time roll by traction on a die-ring 12 with a twisting or macerating motion that reduces the ore to a condition fine enough to be washed out through the screens 13.

Either integral with the main member or pan 1 or firmly bolted thereto I provide a strong downwardly-extending sleeve 14, which forms a sufficient support for the central shaft 5 with bearings at 15 and 16, a packing-gland at 18 to exclude grit, protected by a removable housing-plate 19 over the packing-gland, as shown in the drawings.

At 20 there is provided a shoulder to sustain weight of the shaft 5 and its connected parts, lubrication being provided through a pipe 22 in the usual manner. On the bottom of the shaft 5 I show a driving gear-wheel 23, engaged by a bevel-pinion 24 on a shaft 25; but any other suitable manner of driving can be adopted as the circumstances of construction and connection may require.

The shaft 5 is made hollow at the top, as shown in the drawings, to provide a central passage 26, through which ore and water descend from a hopper 28, pass out at the lateral passages 29 over the fixed conical apron 6, and are spread around the inner side of the die-ring 12 by means of the curved vanes 31 and equally distributed around the machine inside the path of the rollers 3 4, so that all the ore has to pass between the crushing-surfaces before reaching the screens 13.

30 is a collecting-spout around the machine into which the screens 13 discharge, and 32 the usual protecting-curb fastened on top of the pan 1.

Having thus explained the nature and objects of my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a roller crushing-machine of the character described, a pan, a die-ring therein, a sleeve depending centrally from the bottom

of said pan, a rotary shaft within and sustained wholly by said sleeve, means for rotating said shaft from the bottom, and rotary crushing-rollers, rolling on said die-ring and actuated by said shaft, substantially as specified.

2. In a roller crushing-machine of the character described, a pan, a die-ring therein, a sleeve depending centrally from said pan, a rotary shaft within and sustained wholly by said sleeve, said shaft being hollow and provided with lateral passages delivering on a fixed conical apron, means for rotating said shaft from the bottom, and rotary crushing-rollers, rolling on said die-ring and actuated by said shaft, substantially as specified.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

GEORGE JOHNSTON.

Witnesses:
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