J. PETERS & A. GARDINER.

Crushing-Rolls.

No. 211,179. Patented Jan. 7, 1879.

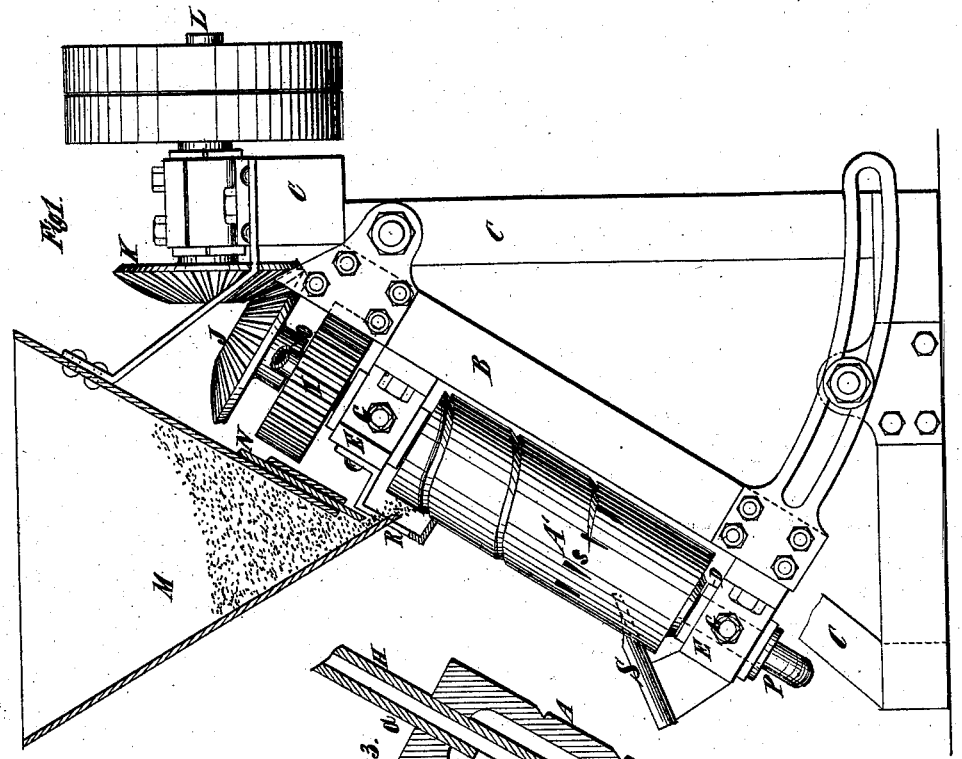


Fig. 3.

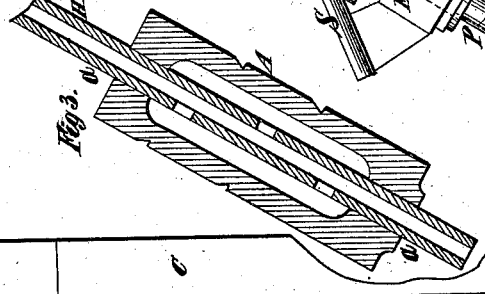
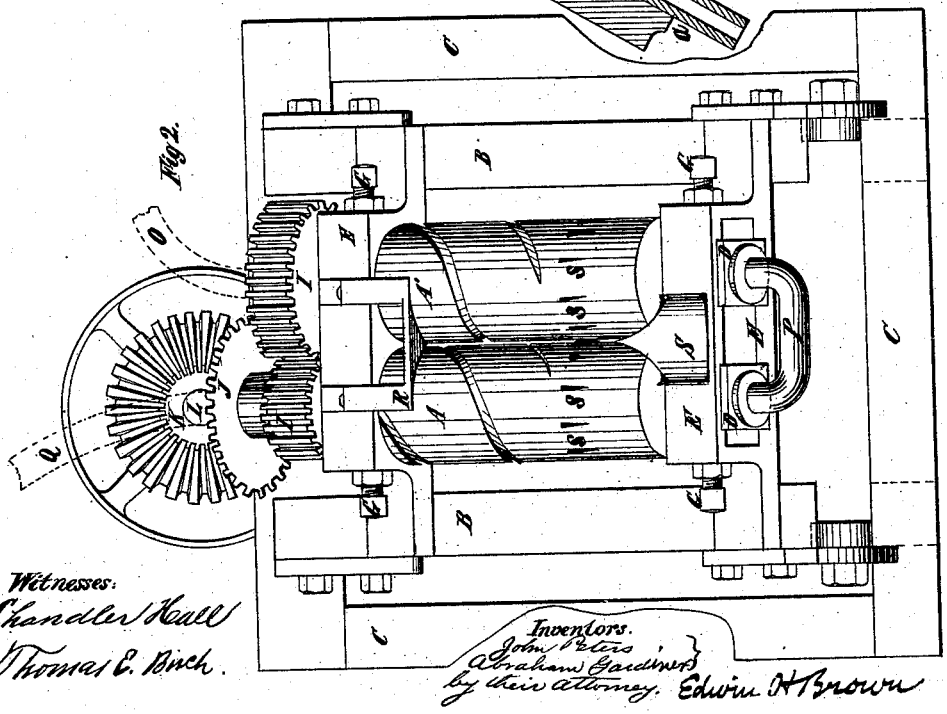


Fig. 2.



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UNITED STATES PATENT OFFICE.

JOHN PETERS AND ABRAHAM GARDINER, OF BROOKLYN, NEW YORK.

IMPROVEMENT IN CRUSHING-ROLLS.

Specification forming part of Letters Patent No. **211,179**, dated January 7, 1879; application filed April 12, 1878.

To all whom it may concern:

Be it known that we, JOHN PETERS and ABRAHAM GARDINER, both of the city of Brooklyn, Kings county, and State of New York, have invented certain new and useful Improvements in Crushing-Machines, of which the following is a specification:

These improvements relate to the particular kind of machines known as "crushing-rolls," and the object of them is to increase the efficiency of such machines.

One improvement consists in a crushing-machine comprising the combination, with inclined crushing-rolls, of supports therefor provided with arc-shaped guides and bolts, or their equivalents, for adjusting the same and securing them in different inclined positions, whereby the incline of the rolls may be varied to effectively crush different materials.

Other improvements consist in details of construction to be hereinafter described.

In the accompanying drawing, Figure 1 is a side view of a crushing-machine embodying our improvements, the hopper being shown in section. Fig. 2 is a front view of the same, and Fig. 3 is a longitudinal section of one of the rolls.

Similar letters of reference designate corresponding parts in all the figures.

A A′ designate two rolls of metal, stone, or other suitable material arranged on an incline, and adapted for crushing or disintegrating purposes. Their inclination increases their effectiveness very materially, because the material subjected to them will, by gravity, descend gradually toward their lower ends, so that the vertical line of fall will be at an incline to the rolls, and therefore the material will be subjected to the pressure of the rolls until it is delivered at the under sides, and be crushed finer and finer until it escapes from them. By increasing the diameter of the rolls toward their lower ends, or inclining them toward each other downwardly, the gradual crushing or disintegrating of the material subjected to them may be increased. They are shown as supported in a frame, B, pivoted at one end to a base-piece or frame, C, and provided at the other with arc-shaped slotted braces or arms, which may be fastened at different points by clamping-bolts or otherwise, so as to secure the frame at different angles to retard or expedite the passage of the material to be crushed or disintegrated along the rolls, as may be desirable. The base-piece or frame C may consist of triangular side pieces and cross rails or stretchers. Preferably the rolls A A′ are provided with spiral grooves throughout a portion of their length, and these grooves may, with advantage, taper downward, and they may also be differently pitched, or the rollers differently speeded, so that the edges of the grooves in each roller will have a drawing or shearing action relatively to those of the grooves in the other roller.

We have shown the grooves of one roll as having an abrupt face on the upper side, and the other as having an abrupt face on the lower side, so as to effectually utilize the drawing or shearing action of the grooves in crushing or disintegrating the material. If desirable, the rolls may also have longitudinal straight grooves S.

The journals *a* of these rolls are supported in bearing-blocks D, which are fitted in ways E, and secured in place by screws G, so that they may be adjusted to change the positions of the rolls at either or both ends.

The rolls may advantageously be made hollow, and have water or other cooling agent circulated through them to prevent them from heating; or, if desirable, a heating agent may be similarly used. We have shown them (see particularly Fig. 3) as provided with pipes H passing through them, and perforated, so as to conduct water to and distribute it within them. The water may be introduced by a pipe, O, at the top of one roll, and may pass from the bottom thereof through a pipe, P, into the bottom of the other, and out through a pipe, Q.

At one end—in the present example the upper end—the rolls are furnished with gear-wheels I, which engage with each other, and one of which is smaller than the other, so that the rolls rotate at different speeds. On one of the rolls we have also shown a bevel-wheel, J, engaging with a bevel-wheel, K, supported on a driving-shaft, L, and thence motion is transmitted to the rolls.

M designates a hopper provided with a slide, N, from which the material to be crushed or disintegrated may be supplied to the rolls.

R designates a scraper or distributer, onto which the material falls, and from which it is delivered onto the rolls. S designates what may be termed a "scraper," which projects between the rolls, delivers the material from them, and forms a chute, over which the material is conducted to the place of delivery.

It will be seen that by our invention we produce a simple, cheap, and compact machine, and that we render crushing-rolls more efficient than when arranged in the ordinary manner.

What we claim as our invention, and desire to secure by Letters Patent, is—

1. A crushing-machine comprising the combination, with inclined crushing-rolls, of supports therefor provided with arc-shaped guides and bolts for adjusting the same, and securing them in different inclined positions, substantially as and for the purpose specified.

2. The combination of the rolls A A′, base-piece or frame C, swinging frame B, gear-wheels I J K, hopper M, scraper or distributer R, scraper and chute S, substantially as and for the purpose specified.

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