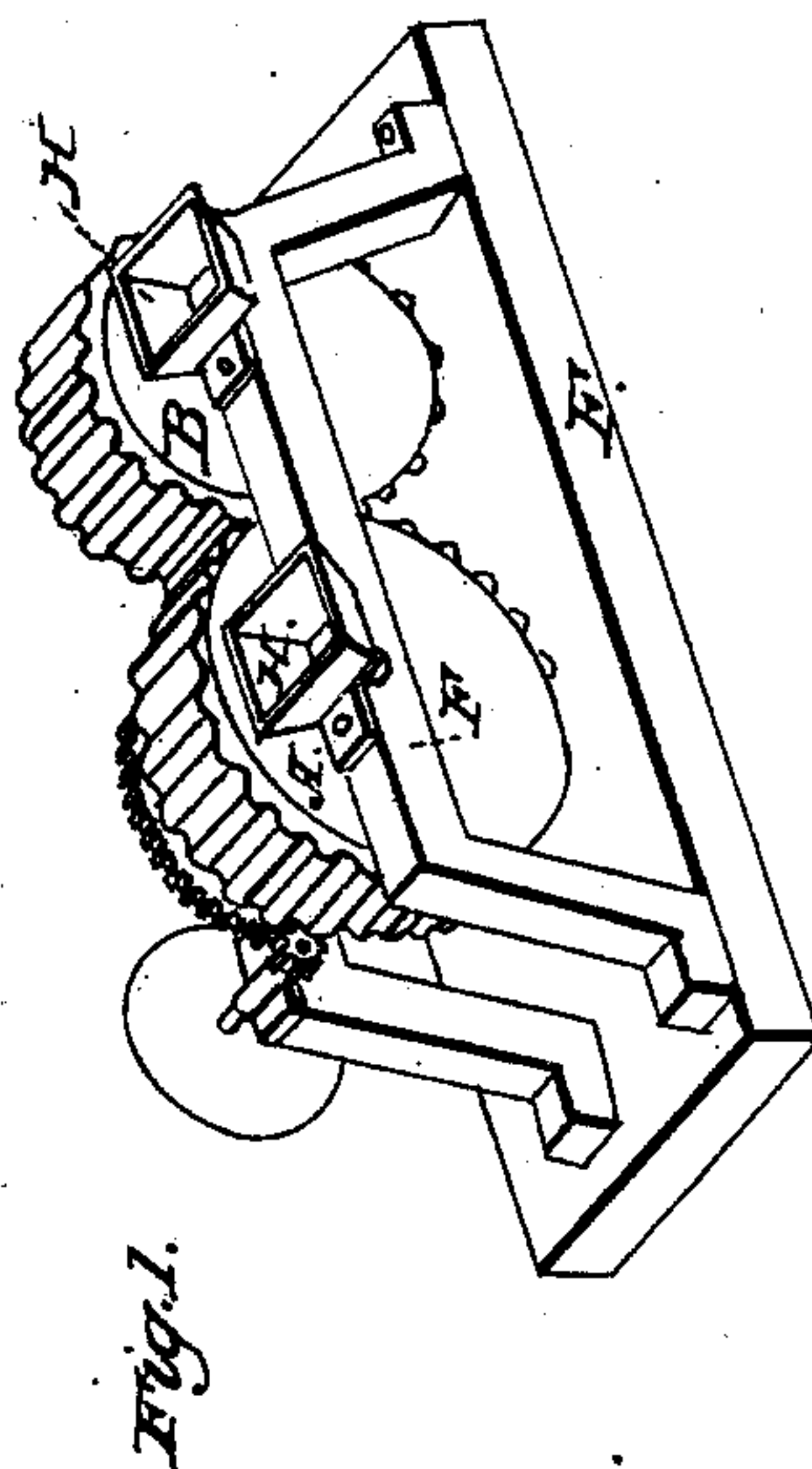
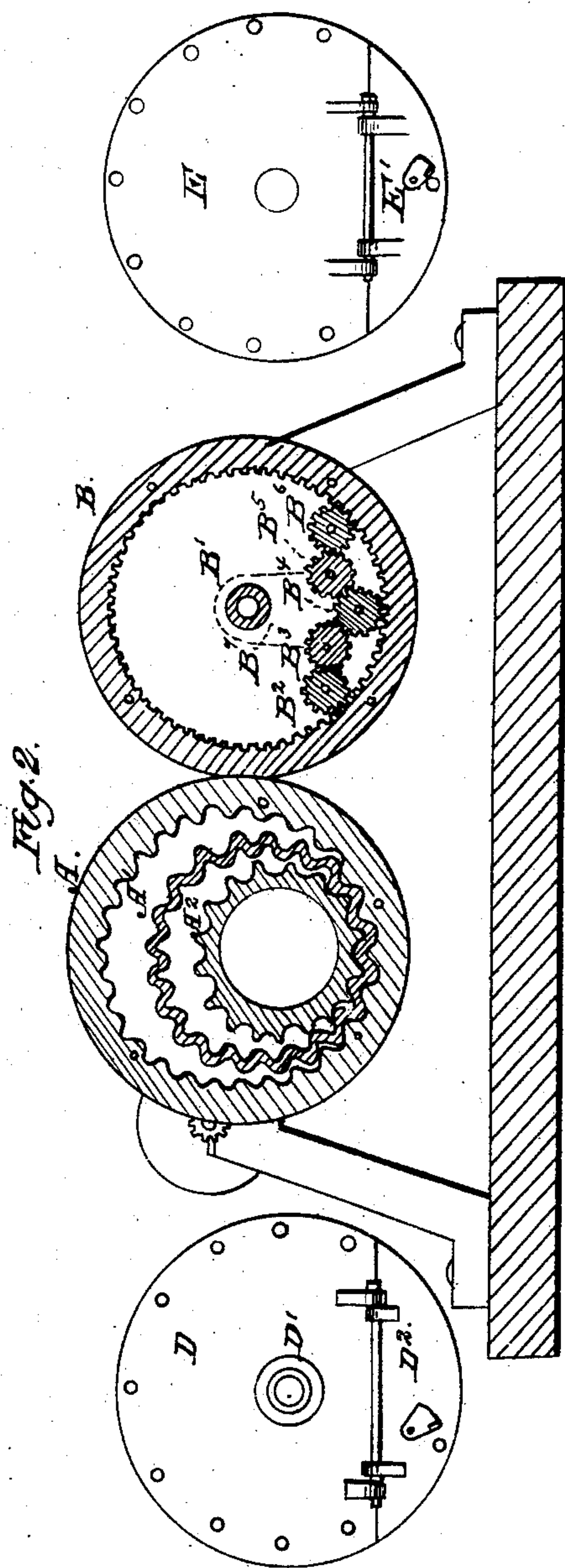


GOODWIN & SQUIRE.

Ore Mill.

No. 69,655.

Patented Oct. 8, 1867.



WITNESSES:  
*G. H. F. Randolph*  
*Moses Foster*

INVENTOR:  
*Wm. F. Goodwin*  
*C. R. Squire*



# United States Patent Office.

WILLIAM F. GOODWIN, OF EAST NEW YORK, AND CHARLES R. SQUIRE, OF  
NEW YORK, N. Y.

*Letters Patent No. 69,655, dated October 8, 1867.*

## IMPROVED MACHINE FOR PULVERIZING ROCKS, ORES, &c.

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

### TO ALL WHOM IT MAY CONCERN:

Be it known that we, WILLIAM F. GOODWIN, of East New York, in the county of Kings, and State of New York, and CHARLES R. SQUIRE, of the city, county, and State of New York, have invented a new and useful Improvement in Machines for Pulverizing and Concentrating Rocks and Ores for the purpose of obtaining the precious metals therefrom; and we declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, which form a part of this specification, and in which—

Figure 1 represents a perspective view of the same machine set up in a frame ready for use.

Figure 2 represents a side elevation of the same machine, having the caps or end pieces removed, showing the pulverizing apparatus inside of the main drums A and B.

Similar letters of reference indicate corresponding parts in the two figures.

Our improvement consists in the employment of a series of ribbed or cogged wheels, which are enclosed within a drum, and attached to a projection extending down from the shaft on which the drum revolves, which pinions mesh together, and also mesh with the ribs or cogs on the inner face of the hoop of the drum, the revolving of which revolves the pinions for the purpose of washing the ore and concentrating the metal.

To enable others to understand and use our invention, we will now proceed to give a detailed description of the same, referring to the accompanying drawings.

A is a drum-wheel, composed of three pieces, a hoop and two heads. The inner surface of the hoop is provided with cogs or ribs, into which mesh the outer ribs or cogs of the hoop or wheel A<sup>1</sup>. A<sup>1</sup> is a hoop of smaller diameter than the interior diameter of the hoop of the drum A, and, having a less number of cogs or teeth, revolves faster, making a greater number of revolutions in the same time than the drum A. A<sup>1</sup> is also provided with cogs or ribs on both its outer and inner surfaces. A<sup>2</sup> is a cogged wheel, smaller in diameter, which rolls within and meshes with the wheel A<sup>1</sup>, and, having a less number of teeth or cogs, revolves faster, making a greater number of revolutions in the same time than the other wheels. The wheels A<sup>1</sup> and A<sup>2</sup> being placed in the hoop of the drum A, the head D is screwed on the hoop, thus enclosing them within the drum. The heads D are provided with hubs or journals D<sup>1</sup>, which fit in the boxes on the frame F on which the drum is supported. The hubs D<sup>1</sup> are hollow for the purpose of receiving and discharging ore and water. The heads D<sup>1</sup> are also provided with gates D<sup>2</sup>, which are opened to discharge the pulverized and concentrated ore from the drum. The ore is passed into the drum through the hopper H and hubs D<sup>1</sup> after it has been crushed, disintegrated, and desulphurized. A current of water accompanies the ore, which serves to wash it, passing in at one hub and out at the other while the wheels are in motion, carrying with it the lighter substances or refuse of the rock or ore, leaving the metallic substances or properties in the drum, thus concentrating them. The difference in the diameters and numbers of teeth in the wheels, which causes the smaller or inner wheels to revolve faster than the larger or external wheel or wheels, causes the ribs or cogs of each to rub in the meshes of the other, thus causing a rubbing, scouring, and grinding effect, which will reduce the disintegrated rocky substances of the ore to an impalpable powder, thus freeing the precious metals. By the use of ribs or cogs a greater grinding or rubbing surface is obtained than could be produced by smooth surfaces. The drum may be revolved by means of a belt or gear-wheels, as may be found most convenient. B is a drum similar to the above-described drum A, with the following exceptions: the teeth on the inner surface of the hoop of the drum B are smaller than those of the drum A, and the heads E of the drum B have their bearings on and revolve around the stationary hollow shaft B<sup>1</sup>, which hollow shaft extends through the drum. Its ends projecting on each side rest on the frame F, answering the triple purpose of supporting the drum B, the internal bush or pinion-wheels, with their supporting projections B<sup>2</sup>, and serving through its hollow as a means of receiving ore and water at one end and discharging the water and lighter particles at the other. Enclosed within the drum B is a series of pinion or cogged wheels, held and supported by and between the cheeks B<sup>3</sup>, one of which is shown in fig. 2, in dotted lines, the other being removed to show the wheels, which cheeks are rigidly attached, one at each side of the drum, to the stationary shaft B<sup>1</sup>, and projecting downward serve to hold the bush-wheels down to the bottom of and in gear with the drum. When the drum is revolved the small wheels being held between the stationary cheeks, and being small in diameter, and having but few teeth compared with the drum, revolve very rapidly, turning in

reversed directions, thus thoroughly stirring, rubbing, and washing the ore, and concentrating the metal. When the pulverized ore is taken from the drum A it is placed in the drum B, where it is more thoroughly washed and concentrated, and may be amalgamated in the same process if desired. The drums A and B may be operated together, as shown in fig. 1, by cogs meshing together and a pinion-wheel, or may be operated separately by belts.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

The series of ribbed or cogged wheels  $B^2$ ,  $B^3$ ,  $B^4$ ,  $B^5$ ,  $B^6$ , enclosed within the drum B, which wheels mesh together and with the teeth or ribs on the inner surface of the hoop of the drum, the revolving of which revolves the pinion-wheels, constructed and arranged to operate in the manner and for the purpose substantially as described.

WM. F. GOODWIN,  
C. R. SQUIRE.

Witnesses:

G. W. F. RANDOLPH,  
MOSES FOSTER.