(No Model.)

2 Sheets—Sheet 1.

G. R. KING & A. RAYMOND.

ROLLER PULVERIZING MILL.

No. 600,876. Patented Mar. 22, 1898.

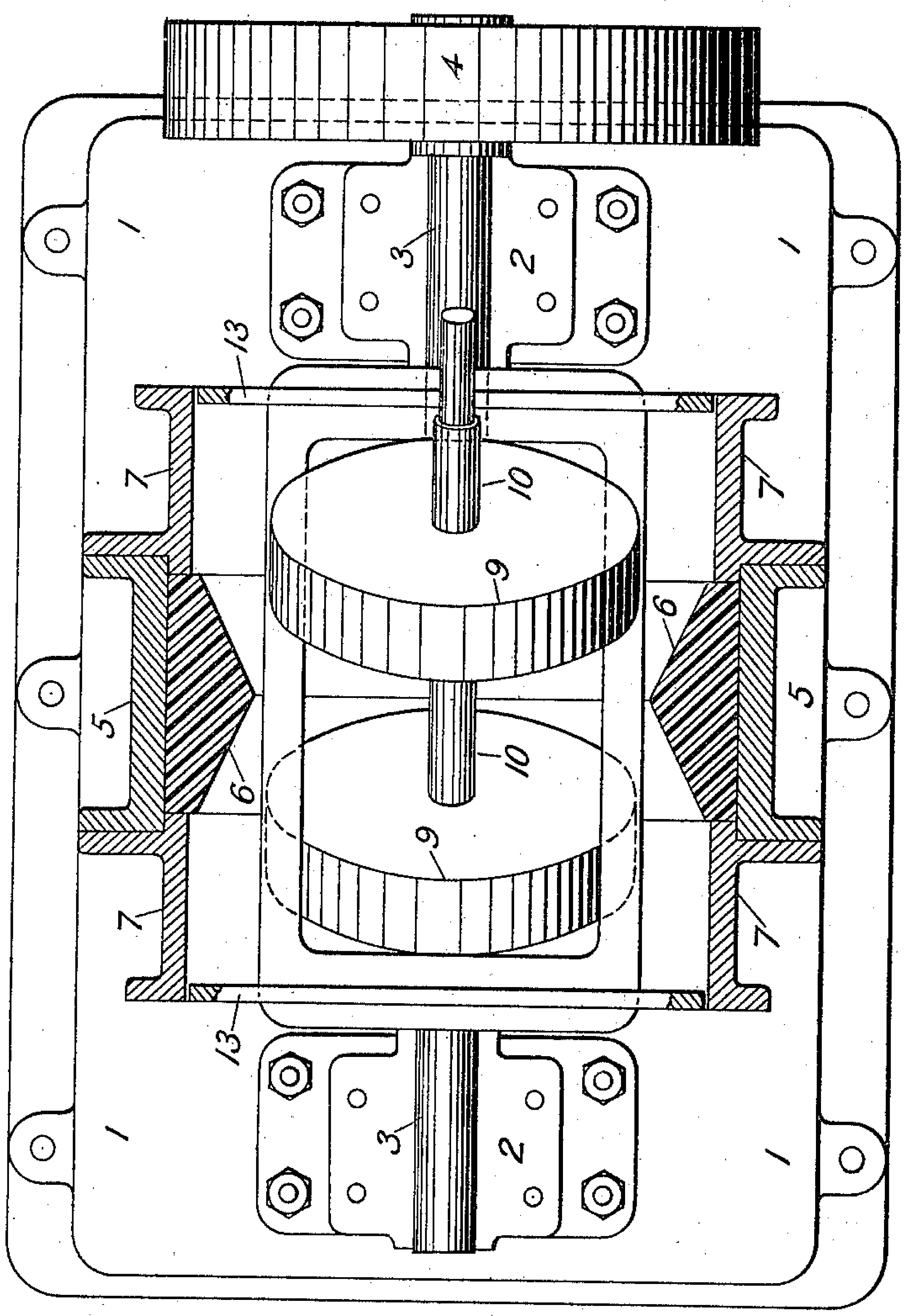

FIG. 1.

WITNESSES:
Jerome L. King
A. W. Mitchell

INVENTORS
Geo. R. King
BY Albert Raymond
Frank G. Johnson
ATTORNEY.

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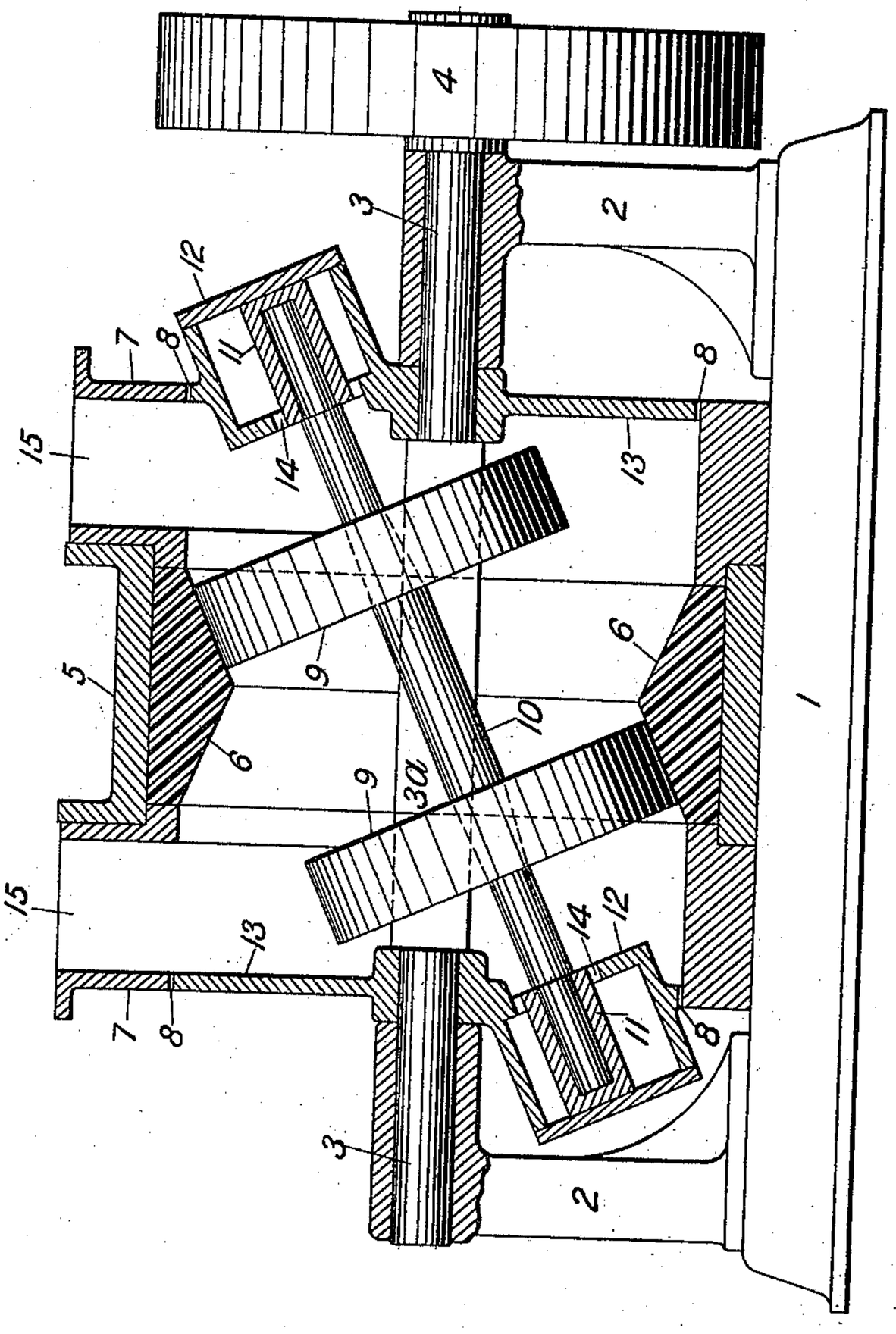

FIG. 2.

WITNESSES:

J. Bonnell King

A. W. Mitchell.

INVENTORS

Geo. R. King

BY Albert R. Seymour

Frank G. Johnson

ATTORNEY.

UNITED STATES PATENT OFFICE.

GEORGE R. KING, OF NEW YORK, N. Y., AND ALBERT RAYMOND, OF CHICAGO, ILLINOIS.

ROLLER PULVERIZING-MILL.

SPECIFICATION forming part of Letters Patent No. 600,876, dated March 22, 1898.

Application filed November 17, 1897. Serial No. 658,782. (No model.)

To all whom it may concern:

Be it known that we, GEORGE R. KING, residing in the city, county, and State of New York, and ALBERT RAYMOND, residing in the city of Chicago, in the county of Cook and State of Illinois, citizens of the United States, have invented a new and useful Improvement in Roller Pulverizing-Mills, of which the following is a specification.

Our improvement relates to that class of pulverizing-mills which act upon the principle of centrifugal force by means of rollers revolving on the inner surface of rings or dies, the rollers being mounted two on a roller-shaft and two or more roller-shafts employed in order that one shaft and its pair of rollers shall counterbalance another shaft and its pair of rollers, the dies, rollers, and the roller-shafts being contained within the walls of a suitable case or chamber. When in such mills the operating-shaft passes through the dies and the chamber between the roller-shafts, the rollers are necessarily limited in diameter to something less than half the interior diameter of the dies, while rollers of greater diameter are preferable. To render it possible to employ larger rollers was one of the objects of our improvement of such mills for which Letters Patent No. 579,588 were granted to us March 30, 1897; but under this patent it is necessary to employ at least two pairs of rollers and two roller-shafts, as only one pair of rollers and one roller-shaft at the required speed of driving such a mill would make it dangerously impracticable, while the employment of two or more roller-shafts and two or more pairs of rollers renders the mills heavier and more expensive than sometimes is required.

The object of our improvement specified in this application is to provide a centrifugal roller pulverizing-mill which has but one pair of rollers and one roller-shaft and but one die and the rollers larger in diameter than half the diameter of the die on which they revolve and so arranged and operated that the said rollers and roller-shaft will be self-balanced, all of which we attain by the mechanism illustrated by the accompanying drawings, consisting of two sheets, in which—

Figure 1 is a plan view of Fig. 2, and Fig. 2 a longitudinal elevation.

Similar designating-numerals refer to similar parts throughout both views.

1 1 represent the bed-plate; 2 2, the legs or standards; 3 3, the driving-shaft, the intermediate portion of which is divided into the form of a quadrangular frame, the sides of the quadrangle (see 3^a 3^a, Fig. 2) passing outside of the rollers; 4, the driving-pulley; 5 5, the cylindrical portion of the inclosing chamber of the mill, in which is secured and held the two-faced ring or die 6 6; 7 7, the heads of the inclosing chamber, both having central circular openings extending from 8 to 8; 9 9, the rollers; 10, the roller-shaft; 11 11, the roller-shaft bearing-boxes; 12 12, the roller-shaft carriers, keyed to the driving-shaft and in which are the roller-shaft bearing-boxes, and to which (being part of the same steel casting) are added the inclosing end disks 13 13, which extend from 8 to 8. In these end disks is a circular opening, through which passes the roller-shaft. 15 15 indicate openings at the top of the chamber, through which the material to be pulverized is fed and drawn off.

Having pointed out the several parts of our device, we will now explain their functions and the operation of our improvement.

The double-faced die consists of a heavy steel ring, being beveled from the center of the inner surface, so as to form two faces, one of which stands parallel with the tread of one roller and the other parallel with the tread of the other roller, and both of the surfaces of the die being at an angle with the driving-shaft. The roller-shaft stands at an angle with the line of the driving-shaft by placing its bearings on exactly opposite sides of the driving-shaft, whereby the ends of the roller-shaft move in a vertical circle around the horizontal line of the driving-shaft.

We are aware that centrifugal roller-mills have been made of various constructions. Therefore we do not broadly claim the use of centrifugal rollers irrespective of the manner of arranging and operating them; but

What we do claim as new and useful, and desire to secure by Letters Patent, is—

In a centrifugal roller pulverizing-mill, a roller-shaft having its bearings on the opposite sides of and attached to the driving-shaft and standing at an angle therewith in combination with rollers having their faces standing parallel with their own shaft and at an angle with the driving-shaft at their point of contact with the faces of a double-faced ring, the faces of the said ring standing parallel with the roller-shaft at their points of contact with the rollers but at an angle with the driving-shaft, whereby one pair of rollers can be mounted and rapidly revolved on the same shaft and on the same die and counterbalance each other, substantially as and for the purposes described.

GEO. R. KING.
ALBERT RAYMOND.

Witnesses:
JEROME A. KING,
A. W. MITCHELL.