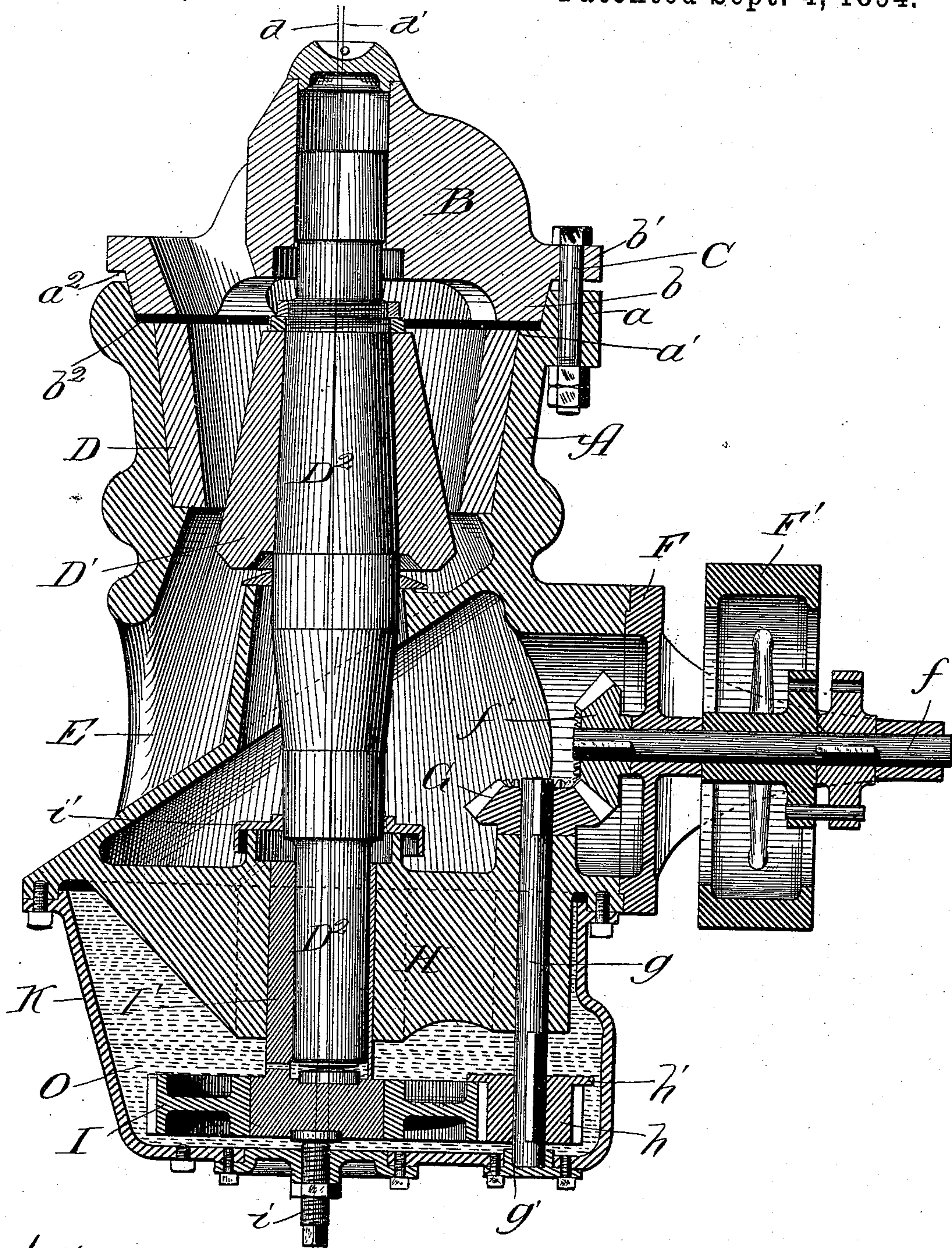


(No Model.)

A. J. GATES.
GYRATING CRUSHER.

No. 525,413.

Patented Sept. 4, 1894.



Witnesses; a'—a
C. E. Hayford,
Lute B. Alter

Inventor:
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UNITED STATES PATENT OFFICE.

ALBERT JUSTIN GATES, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE GATES
IRON WORKS, OF SAME PLACE.

GYRATING CRUSHER.

SPECIFICATION forming part of Letters Patent No. 525,413, dated September 4, 1894.

Application filed November 3, 1893. Serial No. 489,944. (No model.)

To all whom it may concern:

Be it known that I, ALBERT JUSTIN GATES a citizen of the United States, residing at Chicago, Illinois, have invented certain new and useful Improvements in Gyrating Crushers, of which the following is a specification.

The drawing is a vertical longitudinal section illustrating a crusher containing my improvements.

10 In making my improved gyrating crusher for crushing ores, rocks and other substances, I make a shell, A, provided with a lateral flange, *a*, at its upper end outwardly inclining on its inner surface and terminating in a shoulder
15 *a'*. I make a spider, B, provided with a downwardly inclining flange, *b*, inwardly inclining on its outer surface, so that when the spider is in place the inwardly inclining surface of the flanges, *b*, will dovetail or wedge with the inwardly inclining surface of the flange, *a*.
20 The spider is also provided with an outwardly inclining flange, *b'*, which, when the parts are together, is held above the top surface of the flange, *a*, so that there is a space, *a²* between them and a space, *b²*, between the bottom of the flange, *b*, and the shoulder, *a'*, of the shell. This permits the spider, as wear takes place, to settle farther down and thus constantly preserves a close, tight and secure
30 joint. To hold the parts together, bolts, C, are passed through holes in the flanges, *a* and *b'*, and their nuts screwed tightly in place. These nuts can be tightened from time to time as wear occurs to hold the spider securely down in close and tight contact with the shell. The shell, A, is provided with a lining or crushing surface, D, which may be made in any convenient or ordinary manner. A cone or crushing surface, D', is mounted
40 on a shaft, D², which is intended to have a gyrating motion imparted to it, so as to bring its crushing surface toward the crushing surface, D, as is usual in the operation of such machines. At one side of the shell, A, a hole, E, is left for the escape of the crushed material, and at the other side is arranged a block, F, containing a horizontal journal or bearing through which a shaft, *f*, passes. This shaft carries a pulley, F', by which it is

intended to be rotated through the applica- 50
tion of any convenient motive power. I arrange on the shaft, *f*, inside of the block, F, a pinion, *f'*, whose teeth are intended to engage or mesh with the teeth of the pinion, G, arranged on the shaft, *g*. This shaft passes 55
through a vertical journal-bearing in one of the webs or wings of a hub, H, supported or suspended in the lower portion of the shell A. The lower end of the shaft, *g*, is seated in a step or block, *g'*, and it carries a pinion, *h*, having a lateral flange, *h'*, at its top, so as to form what is known as a shrouded pinion, and which is feathered on the shaft so as to be capable of being raised and lowered with the gear with which it is engaged. The teeth 65
of this pinion engage or mesh with the teeth of a gear, I, arranged on the lower end of an eccentric box, I', which is journaled in the hub, H, and in which the lower end of the shaft, D², is stepped or supported. The lower 70
end of the eccentric box is supported on a lighter-screw, *i*, which may be screwed up or down so as to raise or lower or adjust the height of the eccentric box, and thus enable the shaft, D², with its crushing surface, D', 75
to be moved up or down as desired.

The bottom of the eccentric box rotates on the lighter-screw and beneath the shaft, D², so that the eccentric box and shaft have independent axes of rotation. In other words, 80
the center line, *d*, of the shaft and the center line, *d'*, of the lighter-screw and the machine do not coincide, and I am thus able to obviate all rubbing friction due to sliding of the shaft on the step block or on the lighter 85
screw where the shaft rests on it. By making the bottom of the eccentric box solid, as shown, I am able also to dispense with any separate step block, as is generally used. The upper end of the hub, H, is covered with 90
a hood or cap, *i'*, which prevents dust or dirt getting into it. I inclose the gearing, I and *h*, with their associated parts, in a case or box, K, which forms a chamber that may be filled or partially filled with oil, O, as shown in the 95
drawing, so as to insure a constant supply of lubrication to the parts. As the eccentric box, I', is rotated through the gearing, I, pin-

ion, h , and other associated parts, a gyrating motion is imparted to the shaft, D^2 , and to its cone or crushing surface, as desired.

What I regard as new, and desire to secure by Letters Patent, is—

1. In gyrating crushers, the combination of a shell in which the operative parts of the crusher are arranged, an eccentric box supporting and carrying the operative parts of the crusher, gearing for imparting rotation to the eccentric box, and means for raising, lowering and adjusting the eccentric box and the parts carried by it, the whole being arranged so that as the eccentric box rotates it maintains independent axes with reference to the shaft which it carries and to the means for raising, lowering and adjusting it, substantially as described.

2. In gyrating crushers, the combination of

a shell in which the operative parts of the crusher are arranged, an eccentric box supporting and carrying the operative parts of the crusher, means for imparting rotation to the eccentric box, a screw for raising, lowering and adjusting the eccentric box and the parts carried by it so arranged that during their rotation the eccentric box maintains independent axes with reference to the gyrating shaft which it carries and to the screw for raising, lowering and adjusting the eccentric box, and an inclosing case carrying the adjusting mechanism, substantially as described.

ALBERT JUSTIN GATES.

Witnesses:

P. W. GATES,
C. L. CARMAN.