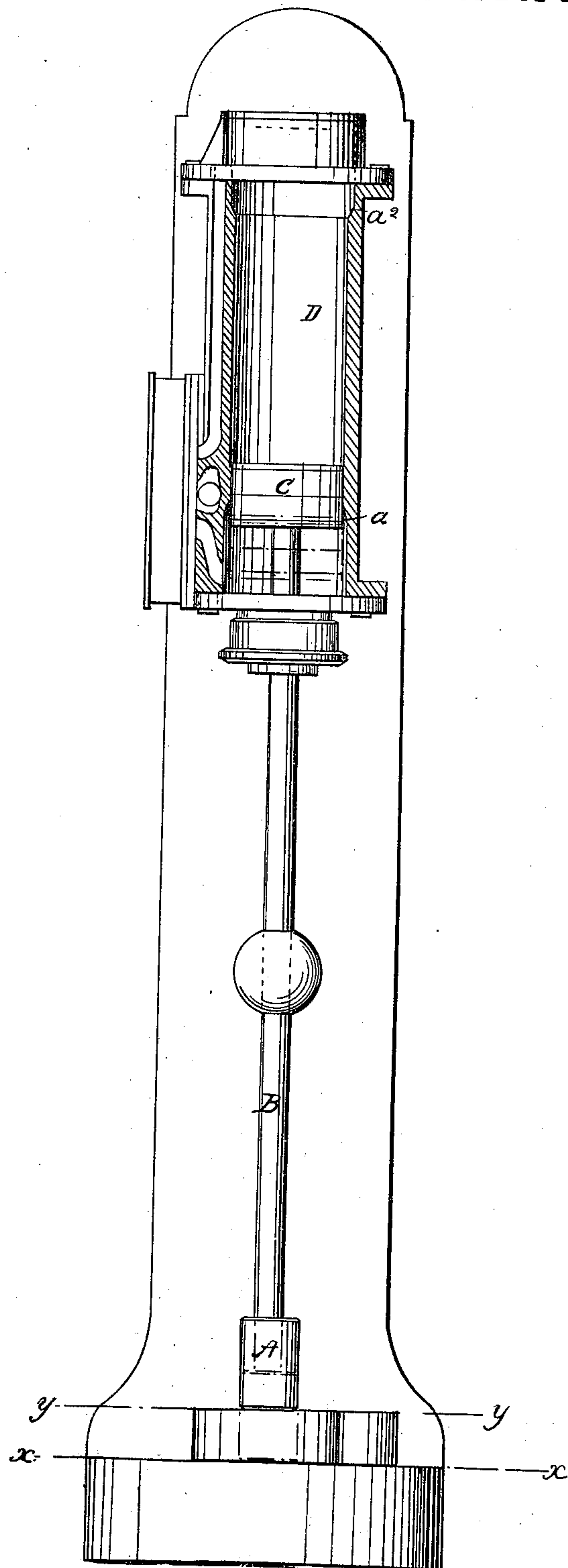


*W. Ball,*  
*Steam Hammer.*  
*No 14,944.* *Patented May 27, 1856.*



# UNITED STATES PATENT OFFICE.

WILLIAM BALL, OF CHICOPEE, MASSACHUSETTS.

## OPERATING STEAM-STAMPS.

Specification of Letters Patent No. 14,944, dated May 27, 1856.

*To all whom it may concern:*

Be it known that I, WM. BALL, of Chicopee, in the county of Hampden and State of Massachusetts, have invented certain  
5 new and useful Improvements in the Method of Operating Direct-Action Steam-Stamps for Crushing Ores, of which the following is a full, clear, and exact description, reference being had to the annexed drawings,  
10 making part of this specification, in which is represented a stamp with its operating-cylinder to which my improvements have been applied.

These stamps for crushing ores are operated by the direct action of steam to the  
15 stamp shaft, when the mortar becomes so nearly empty as to permit the stamp head to descend to a certain point, the stamp shaft is allowed to ring a bell, that the attendant may replenish the mortar with ore;  
20 should he be temporarily absent, or from other cause neglect to attend to this duty, the piston continues in operation, and the cylinder head will inevitably be knocked  
25 out by the piston.

To remedy this inconvenience is the object of my present invention, which consists in stopping the operation of the stamp  
whenever by neglecting to feed in time, or  
30 in sufficient quantity, the piston is allowed to descend to a certain point. This I accomplish by various means. That which I prefer I will now proceed to describe.

In the accompanying drawings, A, is the  
35 stamp head to the shaft B, of which is secured the piston C, operating within the cylinder D, the steam being admitted both

above and below the piston. At *a*, the interior diameter of the cylinder is enlarged so that on the piston arriving at a certain  
40 point a free passage is afforded all around it for the steam, and the operation of the stamp is instantly stopped. If the line *y y* represent the point to which the stamp head is permitted to descend before the bell is  
45 rung, and the stamp head be allowed to descend to the point *x, x*, the piston descends to the position indicated in red, and the steam passing freely around it the operation of the stamp is interrupted. In order that  
50 the piston may not be subjected to unequal wear, the top of the cylinder is cut away at *a*<sup>2</sup> that the upper and lower portions of the piston may be relieved an equal amount from friction. 55

There are other means by which this end may be accomplished and the operation of the stamps checked. I do not therefore wish to confine myself to the use of the particular means represented and described above but  
60 intend to employ such means as may be found under the circumstances of each case to be most convenient.

What I claim as my invention and desire to secure by Letters Patent, is— 65

Stopping the operation of the stamps whenever the piston is allowed to descend to a certain point by the neglect to feed the material to the mortar in time, as set forth.

WM. BALL

Witnesses:

SAM. COOPER,

P. E. TESCHEMACHER.