(No Model.)

J. R. ALSING.

TRITURATING CYLINDER.

No. 264,213. Patented Sept. 12, 1882.

Fig. 1.

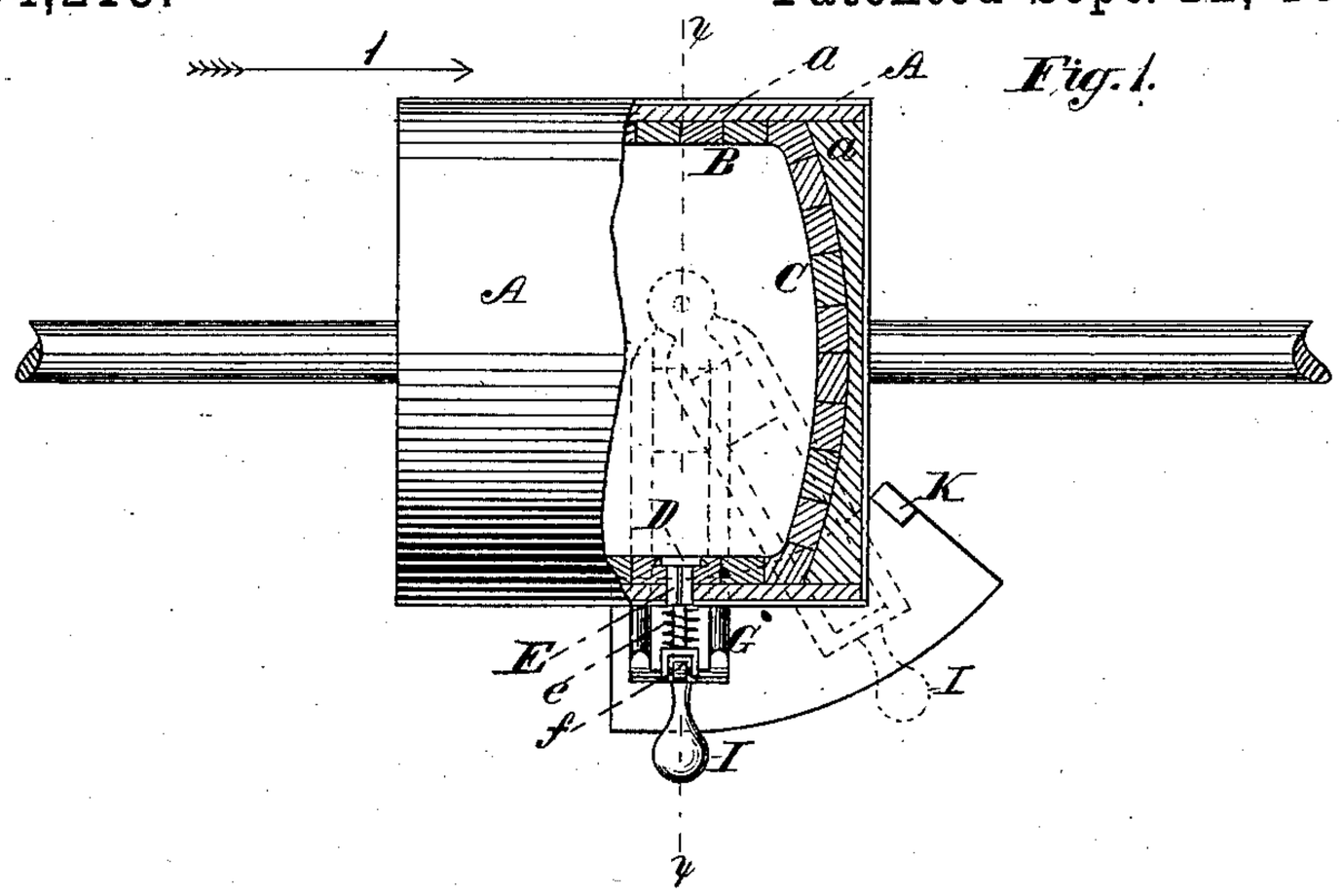

Fig. 2.

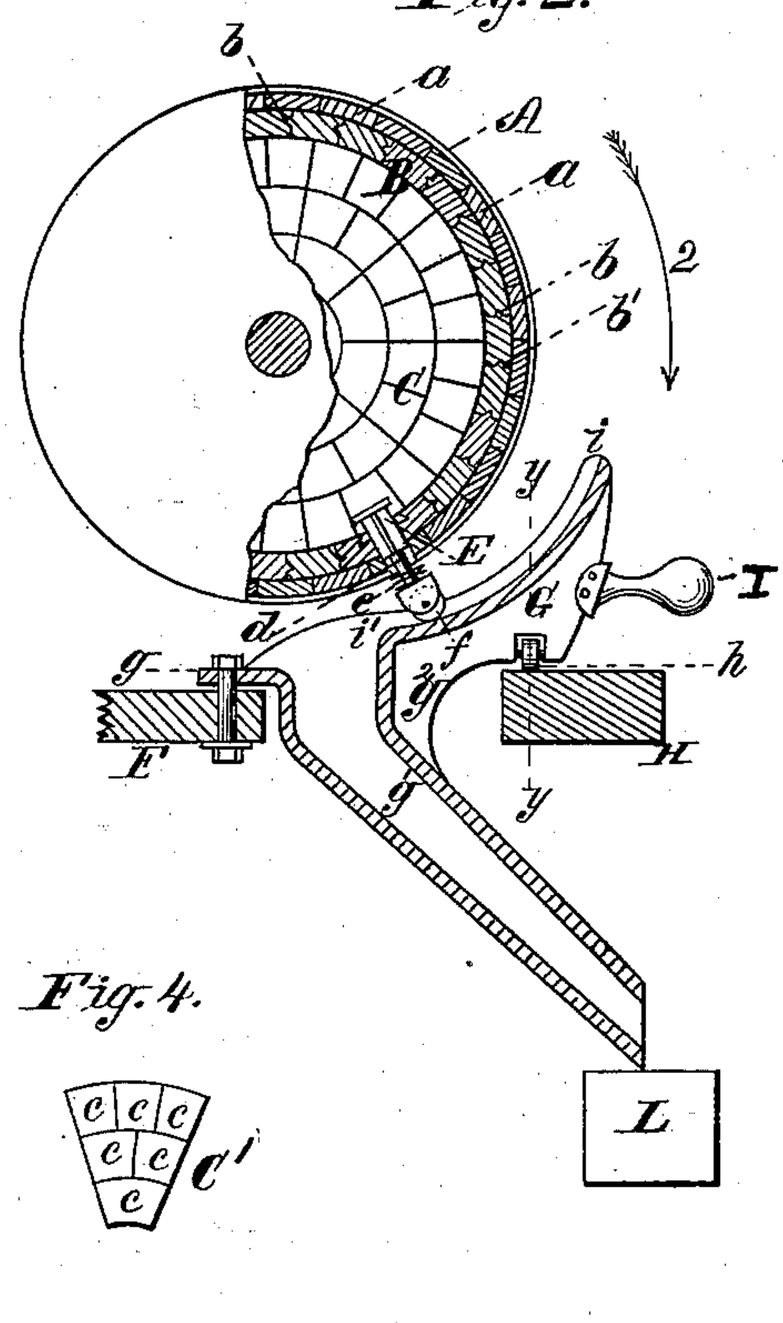

Fig. 3

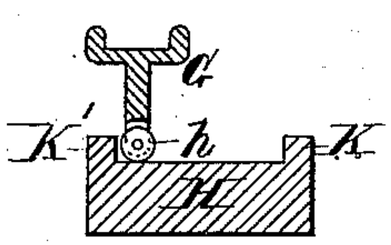

Fig. 4.

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UNITED STATES PATENT OFFICE.

JOHN R. ALSING, OF HOBOKEN, NEW JERSEY.

TRITURATING-CYLINDER.

SPECIFICATION forming part of Letters Patent No. 264,213, dated September 12, 1882.

Application filed June 8, 1882. (No model.)

To all whom it may concern:

Be it known that I, JOHN ROBERT ALSING, a citizen of the Kingdom of Sweden, and a resident of Hoboken, in the county of Hudson and State of New Jersey, have invented certain new and useful Improvements in Triturating-Cylinders, of which the following is a specification.

My invention relates to cylinders in which granulated substances are introduced together with pebbles or balls and triturated by a constant tumbling, sliding, and rolling of the charge caused by revolving the cylinder.

The object of my present invention is to provide additional improvements in the construction of the cylinder described in my United States Patent of January 25, 1870, numbered 99,128, whereby the lining-blocks of the inner circumferential and end surfaces of the cylinder will be better held together, preventing the occasional loosening and falling of one or more of them by the concussion of the tumbling charge, and whereby samples of the charge, to test its fineness, as its trituration proceeds, may be taken out and examined without stopping the motion of the cylinder or removing the cover of the charge-opening.

The importance of a sampling device which does not necessitate the stopping of the cylinder will be readily understood when it is known that the large "number one" size of my triturating-cylinders, with lining, pebbles, and stuff to be granulated averages about seven and one-half tons; that consequently its momentum, when its motion is arrested, exerts a great strain upon the working machinery, and that some time must necessarily be wasted in stopping and starting the same, and in removing and replacing the cover of the charge-opening. As different substances—for instance, cliff-stone and chalk, and chemical pigments of various kinds—are of different degrees of hardness, and occasionally, although comparatively dry, contain a greater or less amount of moisture, it will naturally take different lengths of time to triturate them to the required fineness. Experience has also proved that whatever the degree of fineness is at any one time it is uniform throughout the whole mass, and a sample of a very small portion thereof is a reliable gage of the fineness of the remainder.

In the accompanying drawings, Figure 1 is a side view, partly in section, of a triturating-cylinder provided with my present improvements. Fig. 2 is an end view of the same, partly in section, taken on the line *x x* of Fig. 1. Fig. 3 is a detail section through line *y y* of Fig. 2, and Fig. 4 is one of the compound blocks or slabs of the interior end lining.

A is the exterior iron shell of the cylinder, covered on the inside with a wooden lining, *a*, within which latter is the lining B C, of porcelain or other vitreous substance, cemented together by plaster-of-paris, as usual. For better retaining the circumferential inner lining, B, in place, each block is provided with a tongue, *b*, on one side and groove *b'* on the opposite side, said tongues and grooves fitting into corresponding tongues and grooves of the adjacent blocks, as shown in Fig. 2. This tonguing and grooving together of the blocks serves effectually to retain them in position until the said slabs or blocks are worn off from the inside past the said tongues and grooves, when a new lining is to be inserted.

The end lining, C, which has heretofore been made straight or parallel with the outer end surface of the cylinder, I have now made concave on the inside, or spherical, as shown in Fig. 1; and in order to still better retain it in place I form the blocks in sections, as shown in Fig. 4, the block C' being composed of several minor blocks, *c*, which are formed and pressed separately, and then joined together with the ordinary pottery-slip of clay-cream or such cement as is used by potters for attaching handles to crockery-ware. They are thus cemented together before being baked, and the block C' is then baked in a furnace. A block like that, C', of the requisite size and thickness, cannot conveniently be formed and pressed in one piece to obtain the necessary hardness, and is, moreover, liable to warp in baking, whereas if it is made of a number of minor pieces pressed separately and cemented together, as before stated, into one block before baking the requisite hardness is acquired and the proper shape retained.

To allow of taking out samples of the charge without stopping the motion of the cylinder, I have prepared and provided the following devices:

In a suitable small aperture, E, in the side of the cylinder is fitted an inwardly-opening valve, D, the valve-stem *d* of which projects a distance beyond the outer surface of the cylinder, and is provided with a spiral or other spring, *e*, which, by its expansion, tends to keep the valve closed. The outer end of the valve-stem *d* is preferably provided with a friction-roller, *f*.

G is a casting, curved in the direction of the motion of the cylinder, preferably grooved upon its upper surface and provided with a lug, *g*, by which it is pivoted to a stationary portion, F, of the frame-work underneath the cylinder, as shown in Fig. 2. It is also provided with a small spout, *g'*, preferably bent so as to project its discharge end toward the front of the cylinder. The casting G is strengthened with a web, g^2, which has a horizontal portion provided with a roller, *h*, by which it rests upon the surface of another stationary frame portion, H, to take the strain off the lug *g* when the spring *e* is compressed during the revolution of the cylinder to open the valve D. The casting G is so constructed and arranged that its upper edge at *i* is at the same (or a slightly greater) distance from the outer surface of the cylinder as the length of the portion of the valve-stem which projects beyond said surface when the valve is closed. The surface of the curved incline of the casting G is then gradually nearing to the surface of the cylinder, until at *i'* it is at the same distance therefrom as the length of the projecting portion of the valve-stem when the valve is fully open. The casting G is also provided with a handle, I, by which it may be grasped and turned to one side in the position shown in dotted lines in Fig. 1. The roller *h* lessens the friction against the surface of the frame portion H when shifting the position of the casting, and two stops, K and K', limit the distance of the movement and insure the proper position of the casting G when thrown in or out of operation.

When it is desired to take out a sample to ascertain the fineness of the charge the casting G is moved in the position shown in full lines, the roller *h* stopping against the stop K'. The cylinder revolving in the direction of arrow 2, and the roller *f* at the end of the valve-stem coming in contact at *i* with the grooved surface of the casting, and rolling in contact with the latter, the pitch of the curved surface gradually compressing the spring *e*, and thus opening the valve D, causes a portion of the charge of the cylinder to drop out through the aperture E. After passing the point *i'* the pressure on the spring is released and the spring expands, thus again closing the valve, the powder falling into and through the spout *g'* into any suitable receptacle, as L. The casting is then moved by the handle I to the stop K to bring it out of operation and allow the cylinder to revolve as usual, with its valve D closed.

Instead of bringing the surface of the piece G into and out of working contact with the valve-stem by lateral movement, the same may be accomplished by hinging or guiding the piece G to swing or slide in a vertical plane, so as to allow of its being raised and lowered.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. A triturating-cylinder having the lining B and concave ends C, said lining being composed of blocks fitted together by tongues and grooves *b b'*, substantially as and for the purpose set forth.

2. The lining-blocks C', composed of smaller separately molded and pressed blocks *c*, cemented together before baking, substantially as and for the purpose set forth.

3. The combination of the triturating-cylinder A, provided with aperture E, the inwardly-opening valve D, having lugs upon the outer end of its valve-stem, and a roller, *f*, pivoted between said lugs, the spring *e*, and a movably-fixed piece, G, whose working-surface converges with the cylinder-surface in the direction of rotation, and which is capable of being brought in contact with the valve-stem, substantially as set forth.

4. The combination of a triturating-cylinder provided with an aperture, E, with an inwardly-opening valve provided with an outwardly-projecting stem fitted in the said aperture, a spring, and a movably-fixed piece, G, whose working-surface converges with the cylinder-surface in the direction of rotation, and which is capable of being brought in contact with the valve-stem as the cylinder revolves, substantially as and for the purpose herein set forth.

5. A triturating-cylinder having the lining B, said lining being composed of blocks fitted together by tongues and grooves *b b'*, substantially as and for the purpose set forth.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of two witnesses, this 26th day of May, 1882.

JOHN ROBERT ALSING.

Witnesses:

CHAS. P. THORR,

A. W. HOFFMAN.