(No Model.)

A. W. GETCHELL.

TUMBLING BARREL.

No. 349,936. Patented Sept. 28, 1886.

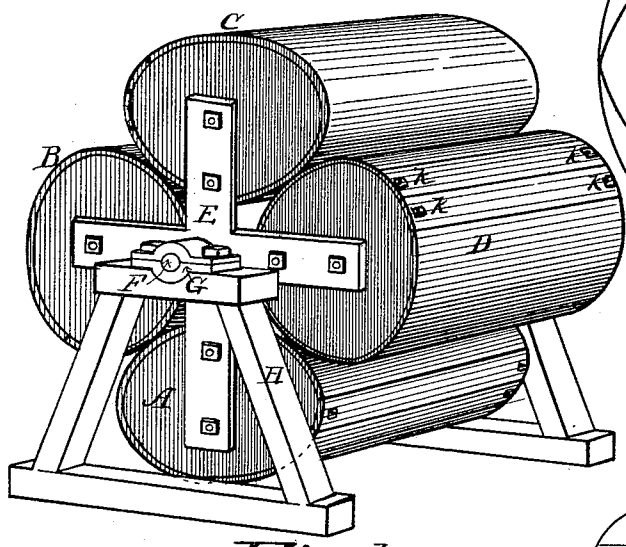


Fig. 1.

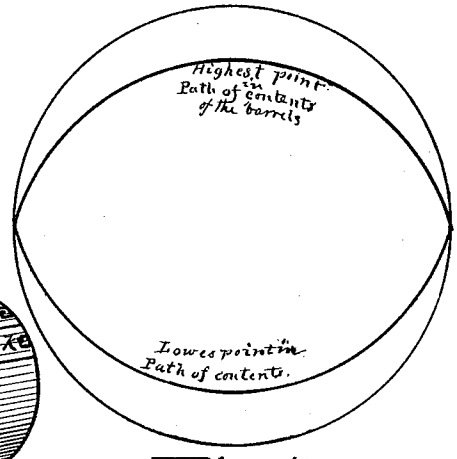


Fig. 4.

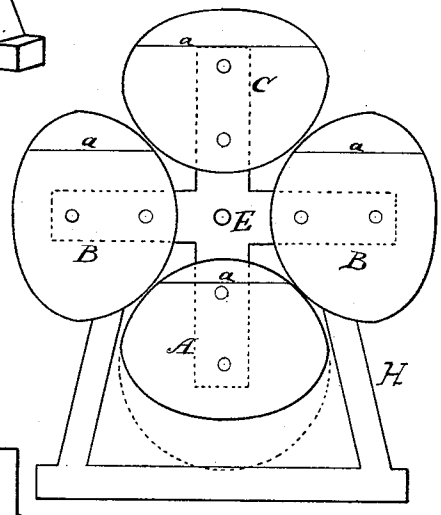
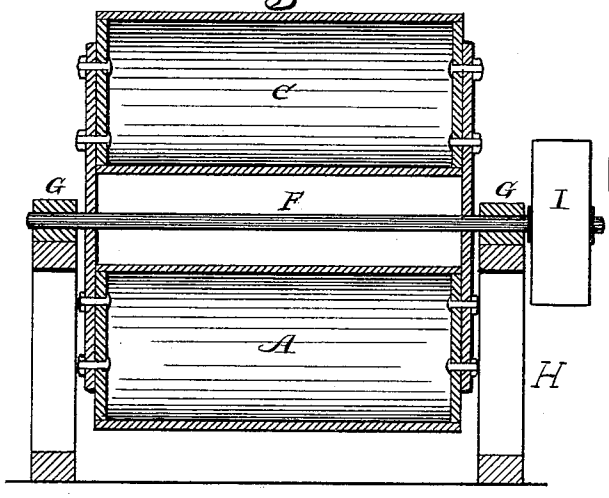


Fig. 3.

Fig. 2.



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UNITED STATES PATENT OFFICE.

AUGUSTUS W. GETCHELL, OF CLEVELAND, OHIO.

TUMBLING-BARREL.

SPECIFICATION forming part of Letters Patent No. 349,936, dated September 28, 1886.

Application filed June 16, 1886. Serial No. 205,373. (No model.)

To all whom it may concern:

Be it known that I, AUGUSTUS W. GETCHELL, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Tumbling-Barrels, of which the following is a specification.

This invention relates to improvements in rotating tumbling-barrels for cleaning and polishing castings, &c.; and it consists in the peculiar formation of the cylinders or barrels and in the grouping of such cylinders or barrels in quadrangular form for rotation on one common shaft in such a manner that while the said group rotates upon said common axis the axis of motion of the loads in said barrels changes, whereby the load in the lower barrel in each revolution is raised toward the center of rotation, while the load in the upper or highest barrel remains in its normal position relative to said center of rotation, thus providing for the weight of the load in said upper barrel to counterbalance the load in the lower one, and therefore greatly aiding in overcoming the inertia of the lower barrel, resulting in greatly facilitating the operations of revolving such barrels, as hereinafter more fully described, and pointed out in the claims. To carry out these results I construct and arrange the barrels as hereinafter described, and illustrated in the accompanying drawings, in which—

Figure 1 is a perspective view of my invention. Fig. 2 is a longitudinal section of same, and Fig. 3 is an end elevation of same. Fig. 4 is a diagram illustrating the principles of the operation of this new method as compared with the old.

A B C D represent four cylinders or barrels, which I construct in the following peculiar form: The sides of said cylinders are in the true arc of a circle for nearly half of the circle, the other portion being in the form of an oval, thus bringing the oval periphery within about one-third the distance of the full circle, as seen by dotted line of cylinder A, Fig. 3. These cylinders are set, as will be seen in Figs. 1 and 3, with their circular sides toward one another and toward the center of rotary motion. Said cylinders are secured together by cross-trees E, securely bolted to the heads, and said cross-trees are supported on a shaft, F, journaled in boxes G on suitable frame-work, H, and provided with a driving-pulley, I, for giving rotary motion thereto.

The operation upon the loads in said barrels from this construction and arrangement is as follows: For the purpose of tumbling the barrels must be but partially filled. Therefore, let *a* represent the height or level of the load in each barrel. In A the load will be seen to be at a higher point and nearer the center of motion than such load would be if the cylinder were perfectly round, as the dotted line represents, while the load in the upper barrel, C, is still in its normal position relative to the axis of rotary motion. Thus the centers of the bulk of the loads in A and C are changed in their relation to the axis of motion to an extent sufficient to make the load in the upper barrel compensate against the inertia of the lower load, and thus overcoming that inertia enable the load in said lower barrel to be more easily raised by the aid of the gain in leverage of the upper load over the lower one. The said change in the loads is accomplished in the manner as follows: As a cylinder descends to the lower part of the revolution the contents in tumbling about therein and seeking the surface-level have to fill the narrower part of the chamber toward the center of motion, thus bringing a portion of its weight nearer the said center, thereby practically decreasing the short arm of leverage, while the top portion of the load in the upper cylinder, on the other hand, being in the broadest part of said cylinder, practically increases the long arm of the leverage. Therefore while the cylinders are rotating in a circular movement the contents of the cylinders are moving in an elliptical movement. To illustrate this reference is made to the diagram, Fig. 4, in which the outer ring represents the rotary path of the barrels and the oval ring the path of the contents in each revolution, from which it will be seen that by this construction an equilibrium of weight of the contents of the upper and lower barrels is constantly maintained. The top of the oval ring represents the height or level of the contents of the upper barrel, and the bottom of said oval ring represents the bottom or lower point of the contents of the lower barrel. The distance of both these points from the center

of motion is equal, so that the said two loads balance each other and render the rotating of the barrels as easy as though all the barrels were completely filled, thus making the operations of this device as easy to perform as the rotating of an equally-balanced wheel. The side barrels of course balance each other at the extreme horizontal points, and as they change position the one going to the top changes its load, gradually lowering the top of said load to the topmost point of the revolution, at the same time the load of the lower barrel is in like manner gradually being changed upward toward the center, so that the distance of this load is thereby kept the same as its opposite load, thus maintaining an equilibrium of all the loads as they move around the center of motion. By the old method of round barrels the top of the loads passed over in the top half of the oval while the lower half of the revolution was made in the full circle. The loads were therefore carried around in an eccentric movement, with the larger part of the load always below the center of motion, necessitating the lifting of a dead-weight from the lowest to a higher point of the revolution. By my construction and arrangement of barrels this difficulty in operating tumbling-barrels is entirely overcome. Each of said barrels is provided with a door or lid covering an opening in one side near to the adjoining barrel, secured by means of bolts *k k*, for the purpose of placing in and removing the loads.

The method of loading or charging these barrels is as follows: First, beginning with barrel D, for instance, the door or lid is removed, then placing in the articles to be cleansed or tumbled, then closing the door or replacing the lid. The contents will then cause the barrel to turn down to a lower point, bringing barrel C into position now occupied by D, which may be readily charged in the same manner that D was, and so on until all are charged. In emptying these barrels a reverse operation is performed—that is, barrel B, for instance, being in position shown, the door is opened or its lid removed, and its contents allowed to fall out into any suitable receptacle, and then it will be turned upward by the weight of opposite barrel, bringing the next barrel to same position, which may in like manner be emptied, and so on until all are emptied.

Having described my invention, what I claim, and desire to secure by Letters Patent, is—

1. A tumbling-barrel of the form herein described, consisting of a cylinder having one half its side made in a true circle and the other half in the arc of an oval in cross-section, as shown and described.

2. In tumbling-barrels, the combination of two or more barrels of the form herein described, consisting of cylinders having one half their sides made in a true circle and the other half in the arc of an oval in their cross-section, arranged with their concentric sides toward each other and mounted on one common shaft rotating in suitable bearings, whereby the loads in the said barrels perform an oval movement in each revolution of said barrels around said axis, as and for the purpose specified.

AUGUSTUS W. GETCHELL.

Witnesses:

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