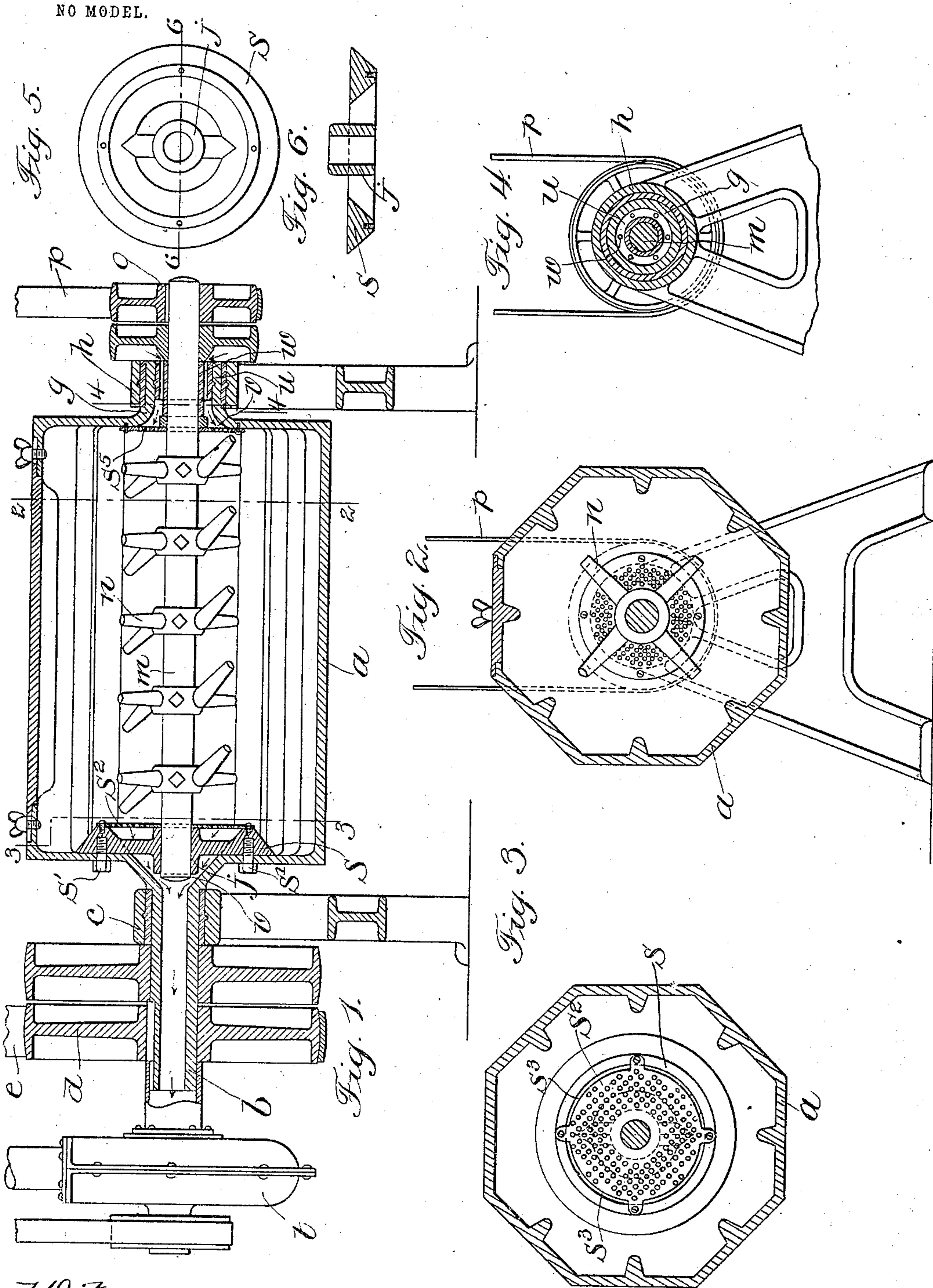


No. 726,511.

PATENTED APR. 28, 1903.

G. A. CURTIS.  
TUMBLING APPARATUS.  
APPLICATION FILED JAN. 31, 1903.

NO MODEL.



Witnesses:  
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# UNITED STATES PATENT OFFICE.

GEORGE A. CURTIS, OF MEDFORD, MASSACHUSETTS, ASSIGNOR TO CHARLES F. BAKER, OF BOSTON, MASSACHUSETTS.

## TUMBLING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 726,511, dated April 28, 1903.

Application filed January 31, 1903. Serial No. 141,224. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE A. CURTIS, of Medford, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Tumbling Apparatus, of which the following is a specification.

This invention relates to apparatus for tumbling nails and other metallic articles, and particularly for tumbling boot and shoe nails which are formed between dies, the object of the tumbling operation being to remove the fins which are left by the dies upon the edges of the nails.

The invention is an improvement upon that set forth and claimed in Letters Patent of the United States No. 721,027, dated February 17, 1903, for tumbling apparatus; and it consists in the improved means hereinafter described and claimed for preventing the entrance of the tumbled articles into the tubular trunnions at the ends of the rotary casing.

Of the accompanying drawings, forming a part of this specification, Figure 1 represents a longitudinal vertical section of a tumbling apparatus embodying my invention. Fig. 2 represents a section on line 2 2 of Fig. 1. Fig. 3 represents a section on line 3 3 of Fig. 1. Fig. 4 represents a section on line 4 4 of Fig. 1. Fig. 5 represents a side elevation of the guard shown in Fig. 1. Fig. 6 represents a section on line 6 6 of Fig. 5.

The same reference characters indicate the same parts in all the figures.

In the drawings, *a* represents a rotary casing adapted to contain a charge of nails or other articles to be tumbled, one end or head of the casing having a tubular trunnion *b*, journaled in a bearing *c*, while the other end has a tubular trunnion *g*, journaled in a bearing *h*. A shaft *m* is journaled at one end in an inclosed bearing *j* within the casing *a* (said bearing being in close proximity to the trunnion *b*) and at its other end in an inclosed bearing *u* within the trunnion *g*. The shaft *m* is provided with suitable beating-arms *n*, adapted to act on the articles to be tumbled. The casing *a* is adapted to be rotated by means of a pulley *d*, affixed to the trunnion *b*, and a belt *e*, running on said pulley. The shaft *m*, with its beaters, is adapted to be rotated in the opposite direction by a

pulley *o*, affixed to the projecting outer end of the shaft, and a belt *p*, running on said pulley. Means are provided for exhausting air from the casing through the tubular trunnion *b*. For this purpose an exhaust-fan *t* is shown as communicating with the said tubular trunnion. Means are provided for admitting air to the opposite end of the casing, said means, as here shown, being air ducts or passages *w*, formed in the inclosed bearing *u*.

The construction above described does not differ materially from that set forth in the above-mentioned Letters Patent, and the operation of the apparatus as a whole is as described in said Letters Patent, the casing *a* and shaft *m* being rotated simultaneously in opposite directions and the air at the same time exhausted through the tubular trunnion *b* to remove the sawdust employed at the commencement of the operation to absorb the oil on the articles to be tumbled and the metallic dust, &c., detached from the articles by the tumbling operation, air being admitted at the opposite end through the ducts *w*.

In the operation of the apparatus shown in the above-mentioned Letters Patent it was found that the tumbled articles have a tendency to enter the tubular trunnions, particularly the trunnion *b*, through which the air is exhausted. In said patent I have shown as a means for preventing this tendency flaring or tapering portions *v* at the inner ends of the trunnions *v* and *g*, said portions presenting downward and inward inclinations at the lower sides of the trunnions, which tend to cause nails which may enter the trunnions to slide downwardly into the casing.

In carrying out my invention I provide additional means for overcoming the tendency of the tumbled articles to enter the trunnions, and to this end I attach to an inner end or head of the casing an annular guard *s*. There may be two of these guards, one at each end of the casing, each guard surrounding the entrance to the corresponding trunnion. I have here shown but one of said guards, the same surrounding the bearing *j* and the entrance to the trunnion *b*. The said guard besides being of annular form is preferably triangular in cross-section, its inner surface being formed to constitute an extension of



the flaring or tapering portion *v*, said extension projecting into the interior of the casing and by adding to the length of the flaring portion *v* correspondingly reducing the tendency of the tumbled articles to escape through the trunnion *b*. The guard *s* is affixed to the casing by means of bolts *s'* *s'*. The bearing *j* for the shaft *m* is preferably affixed to or formed as a part of the guard *s*, the guard, the bearing, and the arms connecting the bearing with the guard being preferably made in a single casting. To further counteract the tendency of the tumbled articles, especially when they are very small and light, to enter the trunnion *b*, I provide a screen *s*<sup>2</sup>, which may be a plate of perforated metal attached to the inner side of the guard and covering the annular space between the guard and the bearing *j*, the perforations in the plate being sufficiently large to permit the air, sawdust, &c., to be exhausted freely through it. I find that with any screen that is practicable in this connection some of the tumbled articles when they are of the smaller sizes are liable to find their way through the openings in the screen into the guard *s*, and to permit such articles to slide back into the casing on the inclined inner surface of the guard I provide slots or outlets *s*<sup>3</sup>, Fig. 3, between the margin of the screen *a*<sup>2</sup> and the guard, said slots being of sufficient width to permit the return from the interior of the guard to the casing of any tumbled articles that may find their way into the guard. It is obvious that a similar guard with or without a screen may be applied to the opposite end of the casing to surround the entrance to the tubular trunnion *g*. I have here shown a screen *s*<sup>5</sup> attached to the casing in position to obstruct the entrance to the trunnion *g*. It is obvious that the guard *s* may be used without the screen *s*<sup>2</sup>, if desired.

I claim—

1. A tumbling apparatus comprising a rotary casing having a tubular trunnion, a shaft-bearing therein, and an annular guard at-

tached to the interior of the casing and surrounding the bearing and the entrance to said trunnion.

2. A tumbling apparatus comprising a rotary casing having a tubular trunnion, a shaft-bearing therein, and an annular guard attached to the interior of the casing and surrounding the bearing and the entrance to said trunnion, said guard having a tapered inner surface which is inclined downwardly and inwardly at its lower portion and acts to deflect back into the casing any articles that may find their way into the guard.

3. A tumbling apparatus comprising a rotary casing having a tubular trunnion the interior of which is flared or tapered at its inner end to give its lower surface a downward and inward inclination, a shaft-bearing within said tapered interior, and an annular guard attached to the interior of the casing and surrounding the bearing and the entrance to the trunnion, said guard having a tapered inner surface constituting a continuation of the tapered internal surface of the trunnion.

4. A tumbling apparatus comprising a rotary casing having a tubular trunnion the interior of which is flared or tapered at its inner end to give its lower surface a downward and inward inclination, a shaft-bearing within said tapered interior, an annular guard attached to the interior of the casing and surrounding the bearing and the entrance to the trunnion, said guard having a tapered inner surface constituting a continuation of the tapered internal surface of the trunnion, and an annular screen covering the annular space between the guard and bearing, spaces *s*<sup>3</sup> being formed between the outer margin of the screen and the guard.

In testimony whereof I have affixed my signature in presence of two witnesses.

GEORGE A. CURTIS.

Witnesses:

C. F. BROWN,  
E. BATCHELDER.