J. B. TARR.

MACHINE FOR POLISHING SPHERICAL SHOT AND SHELLS.

No. 79,610. Patented July 7, 1868.

Fig: 1.

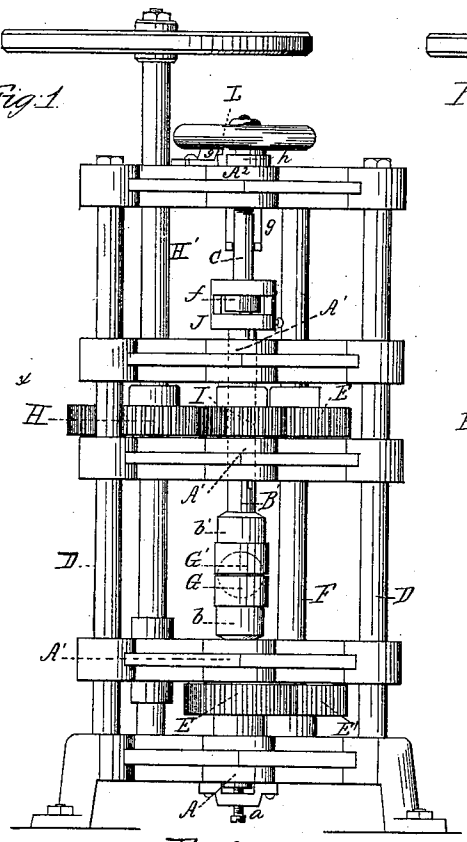


Fig: 2.

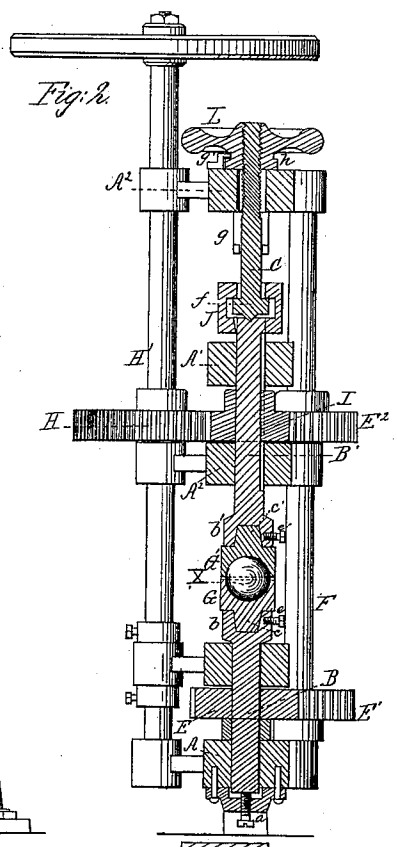


Fig: 3

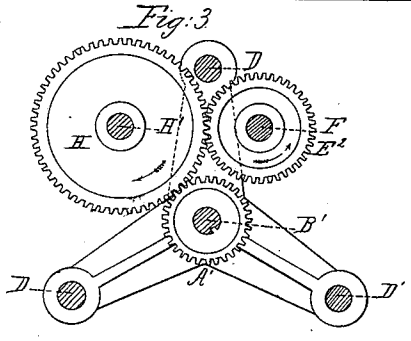
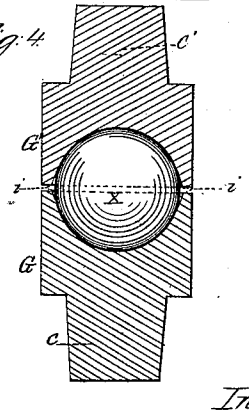


Fig: 4



Witnesses

A. Capsell

Inventor.

Jno. B. Tarr

by Munn & Co

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

United States Patent Office.

JOHN BLAKE TARR, OF FAIR HAVEN, MASSACHUSETTS.

Letters Patent No. 79,610, *dated July* 7, 1868.

IMPROVED MACHINE FOR POLISHING SPHERICAL SHOT AND SHELL.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, JOHN BLAKE TARR, of Fair Haven, in the county of Bristol, and State of Massachusetts, have invented a new and improved Machine for Polishing Spherical Shot and Shells; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is an elevation of one side of the improved machine.

Figure 2 is a vertical section taken centrally through the machine.

Figure 3 is a section taken in the horizontal plane indicated by line *x* in fig. 1.

Figure 4 is an enlarged view of the polishing-cups, showing a ball within them.

Similar letters of reference indicate corresponding parts in the several figures.

This invention relates to a new and improved mode of polishing and smoothing spherical shot and shell; and it consists in retaining the balls, with emery or other suitable polishing-substance, between cups, which are applied upon vertical shafts, whose axes coincide and which receive different speeds, so that the balls will receive irregular or oscillating motions about their axes, and thus, while being polished, they will remain spherically true, or be rendered so by the operation, as will be hereinafter explained.

To enable others skilled in the art to understand my invention, I will describe its construction and operation.

In the accompanying drawings, A represents the horizontal bed of the frame of the machine, which bed is elevated upon legs or standards that are bolted firmly down upon a floor or foundation. This allows free access beneath the bed of the machine for adjusting the step of one of the shafts or spindles, as will be hereinafter explained.

Above this bed are four central hubs, A^1 A^1 A^1 A^1, from which arms radiate, as shown in figs. 1 and 3, and through the ends of these arms, vertical posts, D D D, pass, which are suitably secured to said arms, and also to the arms of the bed-piece A, the whole constituting a strong and substantial frame for sustaining certain shafts in upright positions.

B, B′, and C represent three shafts, which are arranged in the same vertical line, so that their axes coincide and are sustained by the several horizontal hubs of the main frame, as shown in fig. 2. The lowermost shaft B is supported upon an adjustable hardened-metal step, *a*, beneath the bed A, and to this shaft a spur-wheel, E, is keyed, which engages with and receives motion from a corresponding wheel, E′, upon a vertical shaft, F. The upper end of this shaft B has a cylindrical enlargement, *b*, formed on it, in which a socket is formed for receiving the shank *c* of a cupped head, G.

By means of the set-screw *e*, the head G can be secured fast.

The shaft B′, which is arranged directly above, and in the same vertical line with shaft B, also has an enlargement, *b′*, formed on its end, with a socket in it for receiving the shank of a cupped head, G′. This cupped head corresponds in every particular with the head G beneath it.

The set-screw *e′* is used for securing the upper head in place and to the shaft B′.

The shaft B′ is required to receive a vertical endwise movement as well as a rotary movement. The rotary movement is imparted to it by means of a large horizontal spur-wheel, H, on a main driving-shaft, H′, acting upon a pinion, I, upon said shaft B′.

The large driving-spur H also engages with a spur-wheel, E^2, upon the vertical shaft F, and in this manner the two shafts B B′ are rotated in opposite directions and at different speed. Wheel I being smaller than either of the wheels E, E^1, or E^2, the shaft B′ will receive the greatest velocity. The wheel I is applied to its shaft by means of a feather and groove, as shown in figs. 2 and 3, which will allow said shaft to receive a vertical movement, whether the machine be in motion or at rest.

Upon the upper end of the shaft B′ is a coupling-box, J, keyed or formed on this shaft, so as to turn or move up and down with it. This box J has a hole bored through its upper end for receiving through it the

vertical shaft C, which latter is connected to said box by means of the enlarged foot-piece *f* that supports shaft B′ and allows it to rotate freely. A forked bracket, *g*, which is secured to the bottom of the hub A^2, receives the flattened sides of the shaft C, and prevents it from rotating, but allows it to move up and down.

The upper portion of the shaft C passes freely through the hub A^2, and has a screw-thread cut upon it, and upon this portion a large hand-wheel, L, is placed, the hub, *h*, of which rests upon the hub A^2, and is held down in place thereon by means of a fixed tooth, *g′*, which enters an annular groove formed in this wheel-hub, as shown in figs. 1 and 2.

The shaft B′ can be raised or depressed by turning the hand-wheel L, and thus the balls may be removed from or put into the cups in heads G G′ at pleasure. Other means may be employed for raising or depressing the shaft B′, and, if desirable, a spring might be applied to it in such manner as would press the cupped head G′ down upon the ball X, with a yielding elastic force.

The enlarged view, fig. 4, shows the construction of the cupped heads G G′ plainly. The ends of these heads are drilled out with a tool, which is the segment of a circle exactly equal in diameter to that of the ball which the cups are designed to receive. Then, by means of another tool, the cups are made slightly flaring, as shown at *i i*.

When the cups are dusted with emery, or some other suitable polishing-substance, and a ball is placed between them, as shown in figs. 2 and 4, the ball will fit snugly into those portions of the cups or cavities which are made to conform to its size and shape.

When the machine is started—the cups revolved in opposite directions, or, if desirable, in the same direction at different speeds—the ball will receive an irregular oscillating motion about its axis in different planes, thus bringing different surfaces in contact with the surfaces of the two cups, which will keep up a constant rubbing action upon the ball, and effect the polishing and smoothing of its surface; and, as the surface of the ball is constantly changing positions with respect to the cups, the ball will be rendered spherically true, if not perfectly true when first put between them.

In practice, a flaring ring or cup may be applied around the upper edge of the cupped head G for the purpose of holding the polishing-powder and slowly feeding it to the cups, or a vessel containing the polishing-substance may be applied to the frame of the machine above the cups, and provided with a pipe leading to the lower cup. There are a variety of ways of introducing the polishing-powder either in a wet or dry condition, and for this reason I shall not particularize any one way.

If desirable, a number of pairs or sets of polishing-cups may be arranged in a gang, and supported by a single frame, so that the operation of polishing a number of balls at the same time may be conducted with great facility.

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

1. The within-described machine, which is adapted for polishing spherical shot and shells, substantially in the manner described.

2. The cupped polishing and centring-devices G G′, constructed, arranged, and operating substantially as described.

JOHN BLAKE TARR.

Witnesses:

R. T. CAMPBELL,

EDW. SCHAFER.