

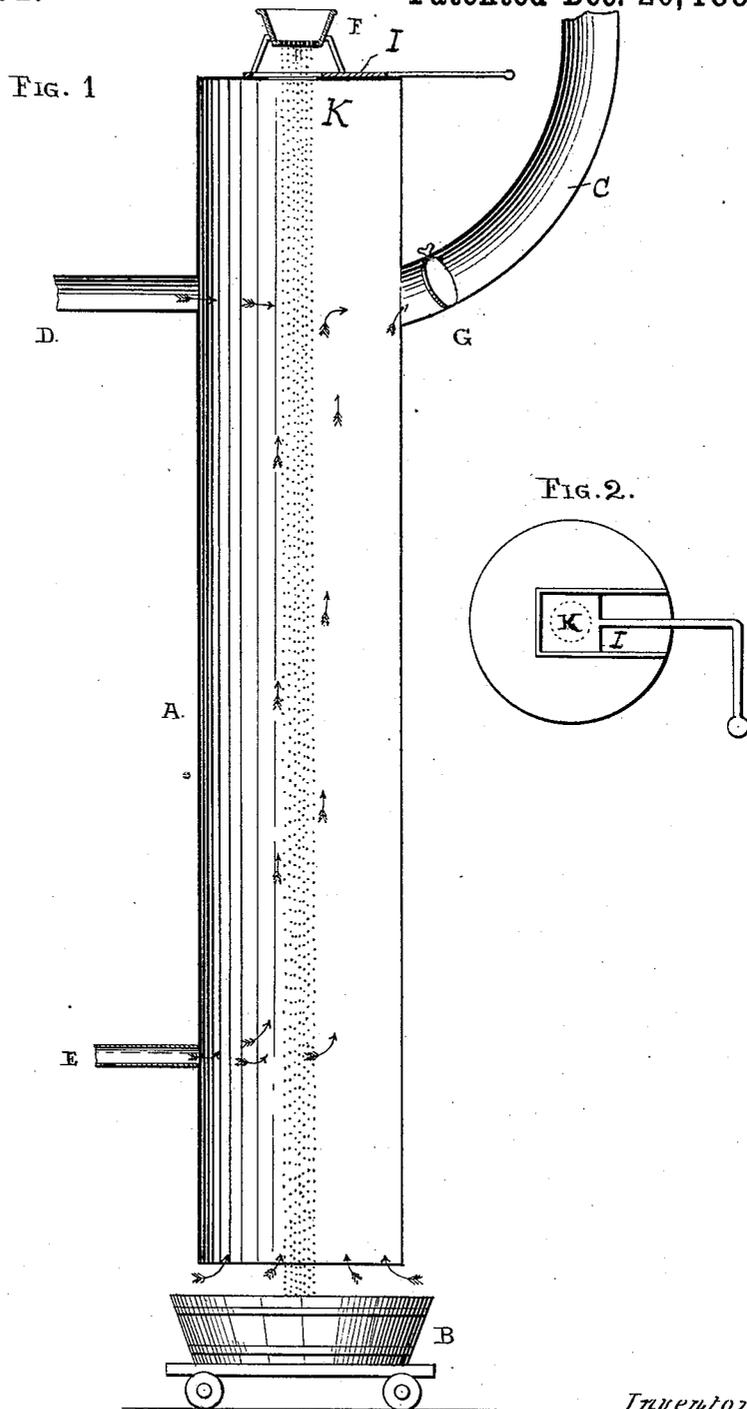
(No Model.)

C. A. BRAGG.

ART OF MANUFACTURING DROP SHOT.

No. 251,092.

Patented Dec. 20, 1881.



Witnesses.

J. N. Adams
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Inventor.

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ONE-HALF TO CHARLES F. DICKERMAN, OF SAME PLACE.

ART OF MANUFACTURING DROP-SHOT.

SPECIFICATION forming part of Letters Patent No. 251,092, dated December 20, 1881.

Application filed October 22, 1881. (No model.)

To all whom it may concern:

Be it known that I, CHAS. A. BRAGG, of the city and county of Philadelphia, and State of Pennsylvania, have invented a new, useful, and valuable Improvement in the Art of Manufacturing Drop-Shot; and I do hereby disclose the following full, clear, and exact description of the said process.

The nature and object of my invention are to lessen the labor and expense of manufacturing drop-shot by dropping the molten lead through exhaust-steam instead of through atmospheric air or other medium.

Figure 1 of the drawings accompanying this specification and making part thereof represents a cylindrical column, A, of galvanized or simply rolled iron, forty feet in height and three feet in diameter. B is a tub or other receiver situated below the column, and partially filled with water when in use. C is a pipe, with a damper at G, for the outlet of steam. D is a pipe opposite C, through which a gentle current of air is admitted to aid in carrying the steam out at C. E is a pipe for the introduction of steam. F is the dropping-pan containing the molten lead.

Fig. 2 is the cap to the cylinder, to which is fitted a slide, I, which covers the hole K.

Heretofore drop-shot has been manufactured by dropping the molten lead through atmospheric air from the tops of high towers or into deep wells or excavations. The time requisite for molten lead to cool and solidify into a spherical shape being from three to four seconds, the height of said towers or depth of said wells was of necessity from one hundred and forty to two hundred and forty feet, depending upon the size of the shot. Said towers or wells involve great expense, not only in their original construction or excavation, but in their maintenance and in the great amount of labor requisite to operate them, by reason of the necessity for transporting the lead and fuel to such great heights, or the transportation of the manufactured shot from the bottoms of the said wells or excavations, as the case might be. Numerous attempts have been made by manufacturers of drop-shot to dispense with the said costly towers or excavations. Among many others, two only, so far as I am informed, in any way

resemble the process which I have invented, and they resemble it only in having a different medium than atmospheric air for the molten lead to fall through.

A patent was granted May 18, 1858, No. 20,250, to A. Booth, whose process was to drop the molten lead through spray; but the force necessary to make spray of the height necessary tended to make a spray also of the molten lead, and produced, instead of spherical shot, flattened or elongated lumps of lead, and it was practically demonstrated that it was impossible to make spray fine enough to thoroughly encompass each drop of molten lead during its fall, thereby cooling it evenly, and at the same time not have such force as to distort the drops of molten lead. The smallest drop of spray that can be made available by mechanical means is but little, if any, smaller than the smallest shot. Hence it is absolutely impossible for spray so to permeate the air and so to surround each individual drop of the molten lead as to cool it evenly, and unless it is cooled evenly the shot are imperfect, either flattened or elongated, and unmarketable. And, again, on the 20th October, 1868, a patent, No. 83,152, was granted to Wm. Glasgow and John G. Wood for the process of dropping the molten lead through a column of glycerine, oil, or other such medium; but it was found, in addition to the great cost of the glycerine, oil, &c., that the globules of lead flattened when they struck the glycerine, oil, &c., and that the globules were cooled first at the point of impact, which contributed greatly to the flattening.

Neither of the above processes is in use in the manufacture of drop-shot at present, as I am informed and believe.

Other patents might be mentioned and a distinctive advantage over them clearly shown in my process; but those mentioned above are, I believe, the only ones which at all resemble mine.

It has been my endeavor to dispense with the need of so great a fall as was unavoidable in the old method of manufacturing drop-shot, and at the same time be not obnoxious to the objections to the processes above mentioned; and I do so successfully by dropping the molten lead from a dropping-pan into and through an

iron cylinder which is filled with exhaust or waste steam admitted from a pipe near the bottom of said cylinder. The bottom of said cylinder is open to the air, and a slight current
5 of air rises into the cylinder as the steam rises, making resistance to the falling globules of molten lead, but not enough resistance to alter or distort the spherical shape of the globules.
10 On one side of the cylinder, a little below the top, a pipe curving upward and fitted with a damper makes an outlet for the steam and prevents the steam from rising in its full volume to the dropping-pan. The escape of the steam is assisted by a current of air introduced from
15 a pipe opposite the said outlet. The top or cap of the cylinder has an opening through which the molten lead is dropped, and in said top is fitted a slide with which to cover said opening.

20 I have found by actual experiment that if exhaust or waste steam be used as the medium

for the molten globules of lead to fall through, all the objections above enumerated are overcome, and that I can dispense with at least one hundred feet of fall and produce a perfect product of spherical shot; and I think that
25 the superiority of steam over spray is due to the fact that the great humidity of steam is more thoroughly diffused, owing to its warmth, and surrounds the molten globule more completely and evenly, thereby cooling its surface
30 simultaneously.

I claim as my invention and desire to secure by Letters Patent—

The process of manufacturing drop-shot by dropping the molten globules of lead through
35 exhaust or waste steam, as above described.

CHAS. A. BRAGG.

Witnesses:

FREDERICK J. KING,
J. R. ADAMS.