(No Model.)

F. J. MOYER.

APPARATUS FOR MAKING COMPOSITION FLYING TARGETS AND BALLS.

No. 304,226. Patented Aug. 26, 1884.

Fig. 1.

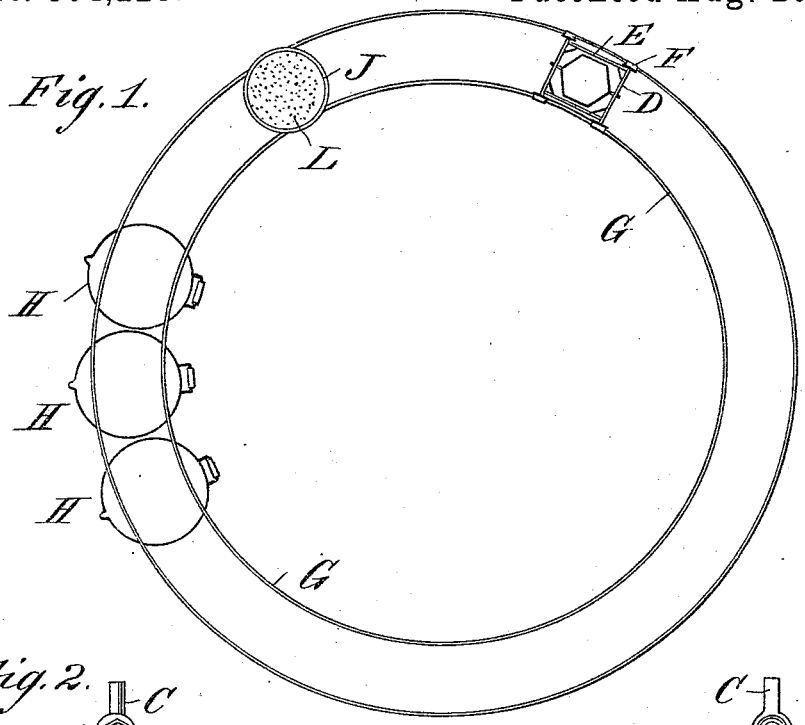


Fig. 2.

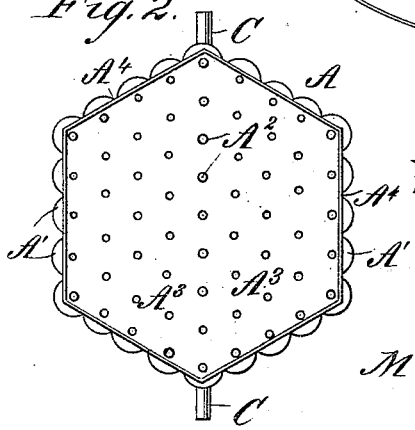


Fig. 3.

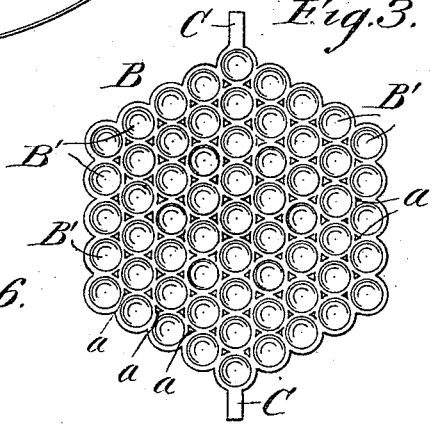


Fig. 6.

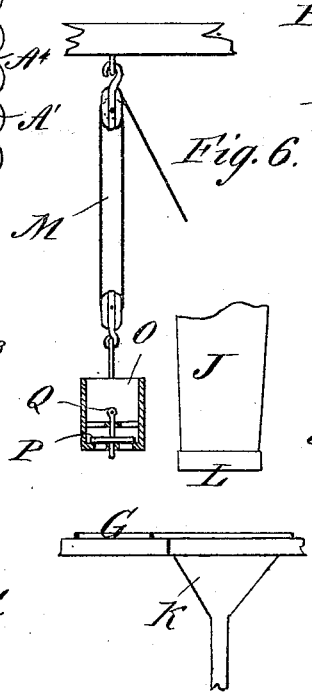


Fig. 4.

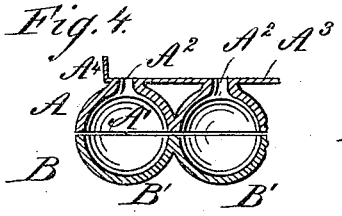
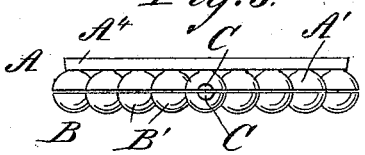


Fig. 5.



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UNITED STATES PATENT OFFICE.

FRANK J. MOYER, OF LOCKPORT, NEW YORK, ASSIGNOR TO HIMSELF AND EDWARD M. MOODY, OF SAME PLACE.

APPARATUS FOR MAKING COMPOSITION FLYING TARGETS AND BALLS.

SPECIFICATION forming part of Letters Patent No. 304,226, dated August 26, 1884.

Application filed December 4, 1883. Renewed July 29, 1884. (No model.)

To all whom it may concern:

Be it known that I, FRANK J. MOYER, of Lockport, in the county of Niagara and State of New York, have invented a new and Improved Apparatus for Making Composition Flying Targets and Balls, of which the following is a full, clear, and exact description.

The object of my invention is to provide a new and improved apparatus for casting and hardening composition balls, by means of which apparatus the balls can be formed very rapidly and without requiring much labor or handling.

The invention, which is an improvement on Patent No. 219,557, issued to O. F. Woodward, for a process of making target-balls, September 9, 1879, consists in a mold for casting balls, which mold is formed of two sections, each composed of a series of semi-spherical cups united to form apertures between the several cups, each section being provided with two diametrically-opposite half-trunnions, which, when the sections of the mold are placed together, form a trunnion, which is held in a suitable bearing in a car or carriage running on a track. Under the said track kettles are placed, which contain the molten fluid mass from which the balls are to be formed, which molten mass is automatically filled into a bucket lowered into the mass, and from the bucket is delivered upon the molds. After the balls have been cast in a mold, and before the entire contents have cooled, the mold is inverted, and after the mold is inverted water is sprinkled on the same, for the purpose of cooling the balls, suitable water-supply devices being held above the track.

The invention also consists in various parts and details and combinations of the same, as will be described and set forth hereinafter.

Reference is to be had to the accompanying drawings, forming part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a plan view of a track-frame supporting the carriages and molds for making composition target-balls. Fig. 2 is a plan view of the upper section of the mold for casting the balls. Fig. 3 is a plan view of the bottom section of the mold. Fig. 4 is an enlarged detail cross-sectional elevation of part of a mold. Fig. 5 is an end elevation of the mold. Fig. 6 is a side view of the sprinkler, the funnel for catching the water, and a bucket for casting composition into the mold.

The mold for casting the balls consists of an upper section, A, and a bottom section, B, each of the two sections being composed of a series of semi-spherical cups or molds, A′ and B′, respectively, which are united to form a cluster, as shown in Fig. 3, small triangular or round apertures or spaces *a* being formed between the several cups, through which spaces air or water can circulate. The cups A′ of the upper section are inverted, and are each provided on the top with a neck, A^2. The upper parts of the cups A′ of the upper section are united by a plate or apron, A^3, in which apertures are formed, which lead to the necks A^2, the said plate A^3 being provided with an upwardly-projecting flange, A^4. Each mold-section A and B is provided with a semi-cylindrical trunnion part, C, which trunnion-sections are so arranged that the flat sides fit against each other, thereby forming a complete trunnion, on which the mold can swing. By means of the said trunnions the mold is hung on the end bar, D, of a car or carriage, E, provided with wheels F, resting on circular tracks G, the said bars of the carriage and the tracks G being such a distance apart that the mold can be revolved on its trunnions. Under the tracks G one or more kettles, H, are placed, in which the composition for making the balls is melted. Above the tracks a water-conduit, J, is held, the lower end of which is closed by a perforated plate, L, which is held a short distance above the track. Below the said sprinkling-plate L a funnel-shaped receptacle, K, is held below the tracks, which receptacle is provided with means for carrying off the water. By means of suitable tackle, M, a bucket, O, is suspended from a beam over the track, which bucket is provided with an apertured bottom closed by a valve-plate, P, resting on the bottom, and provided with stems Q, which project through and from the bottom of the bucket, and also project upward from the plate P, to the upper end of one of which stems Q a cord, wire, or other means can be secured for raising the valve.

The operation is as follows: One of the ket-

tles H is always under the bucket O, and when the said bucket is lowered into the molten, fluid mass in the kettle the pressure of the liquid or fluid mass raises the plate P, thus permitting the fluid mass to enter. If the bucket is raised, the pressure of the fluid mass in the bucket presses down the valve-plate P, thereby closing the apertures in the bottom automatically. The bucket is now raised out of the kettle, and high enough above the track to allow the carriage E, carrying the mold, to pass under the bucket, and the bucket is then lowered down to the mold, the stems of the valve striking the apron and automatically opening the valve-plate P, thus permitting the fluid contents of the bucket to flow upon the plate or apron A^3, and from the same, through the necks A^2, into the mold. The mold is then permitted to stand for a short time until a coating or hardened mass has been formed on the inner surfaces of the mold. Then the mold is inverted, to permit the remaining fluid mass contained in the mold to flow off through the necks A^2, the hardened mass on the apron A^3 having been scraped off previously. The mold is then run under the sprinkler J L, and water sprinkled on the surface of the mold, the water passing through the apertures *a* and over the molds, which, being inverted, thus prevents the water from passing into the necks A^2. The mold is then run to some convenient place, turned right side up, and opened and the balls taken out. It is then used again in the manner described.

In place of using two tracks, G, a single track can be used, the carriage, &c., being suspended from the same in some suitable manner. As the trunnions C, formed of two half-sections, are held in bearings in the end bars of the carriage E, the sections will be held together by the said trunnions, and no special locking device is required.

In place of sprinkling water on the molds, the molds can be immersed in water, for the purpose of causing the cooling and hardening of the hollow balls in the molds.

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

1. A mold for casting balls, made, substantially as herein shown and described, of two sections, each composed of a series of united semi-spherical cups, between which cups apertures are formed, as set forth.

2. A mold for casting balls, made substantially as herein shown and described, and consisting of two sections, each formed of a series of united semi-spherical cups, and each section being provided with two opposite half-trunnions, as set forth.

3. A mold for casting balls, formed of two sections, A B, each section composed of a series of united semi-spherical cups, the cups of the upper section, A, being provided with necks A^2, substantially as herein shown and described.

4. A mold for casting balls, formed of two sections, A B, each section composed of a series of united semi-spherical cups, the cups of the upper section, A, being provided with necks A^2, and the said cups of the upper section being united by an apron, A^3, substantially as herein shown and described.

5. The combination of a mold formed of two sections, each composed of a series of united semi-spherical cups, with a carriage in which the said mold is pivoted, substantially as herein shown and described.

6. The combination, with a circular track, of a carriage running on the same, and of a mold pivoted in the carriage, which mold is formed of two sections, each being composed of a series of united semi-spherical cups, substantially as herein shown and described.

7. The combination, with a track, of kettles for receiving the molten mass held underneath the track, a carriage running on the track, and a mold pivoted in the said carriage, substantially as herein shown and described.

8. The combination, with a track, of a series of kettles held underneath the same, a carriage running on the tracks, a mold pivoted in the carriage, and a water spout or conductor arranged to deliver water upon the carriage carrying the mold, substantially as herein shown and described.

9. The combination, with a kettle for containing the molten or fluid mass, of the bucket O, provided with apertures in the bottom, the plate P, resting on the upper surface of the bottom and adapted to close the apertures in the bottom, and of the stem Q, projecting from the under surface of the plate P and through the bottom of the bucket, and also from the upper surface of the plate P, substantially as herein shown and described.

10. The combination, with the track and the kettles H, held underneath the same, of the carriage E, and a mold pivoted in the carriage, the water-conductor J, held above the track, the receptacle K, held below the track and the water-conductor, and of the bucket O, provided with means for raising it, and with means for automatically opening and closing the apertures in the bottom of the said bucket, substantially as herein shown and described.

FRANK J. MOYER.

Witnesses:
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E. J. TREICHLER.