

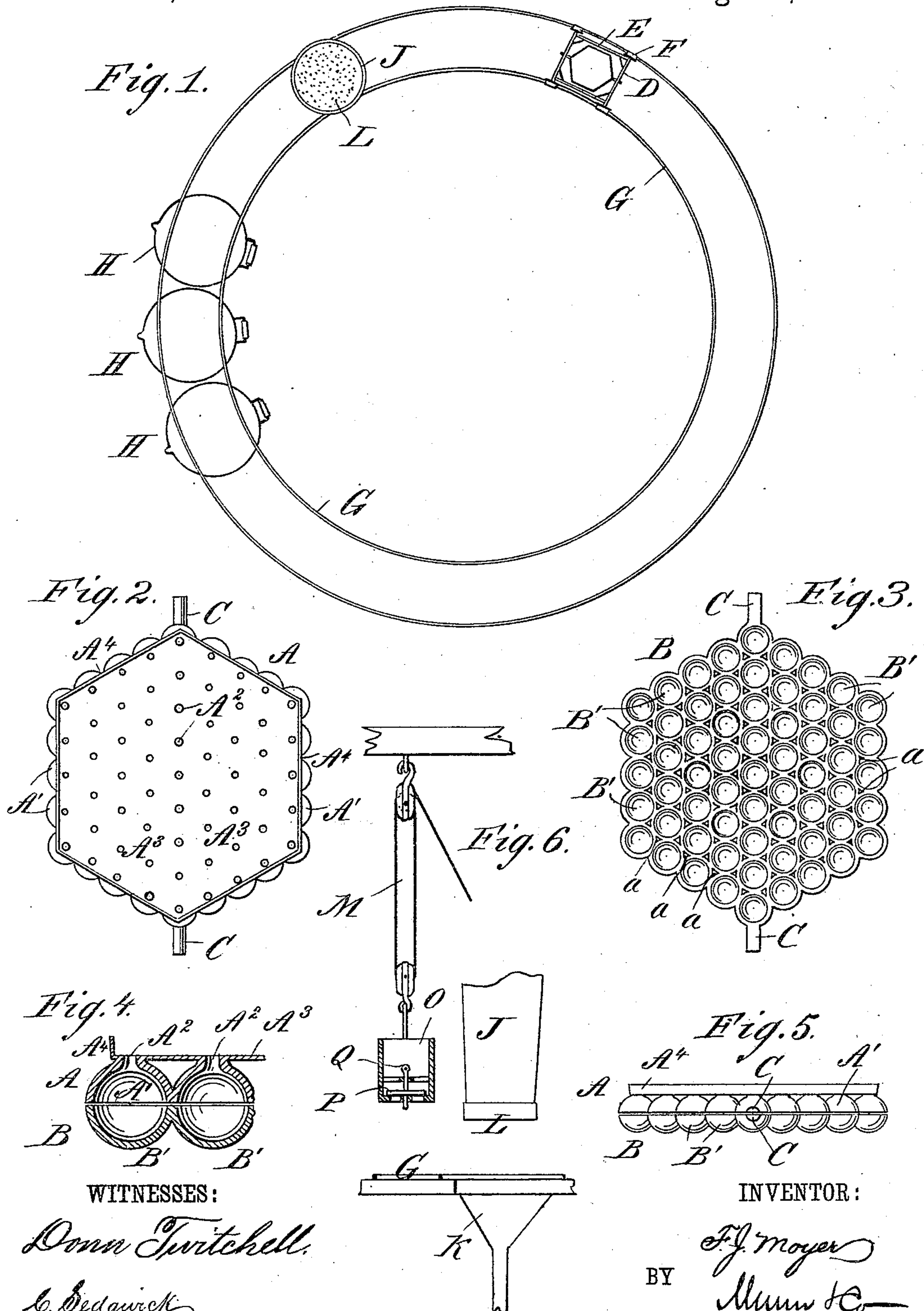
(No Model.)

F. J. MOYER.

APPARATUS FOR MAKING COMPOSITION FLYING TARGETS AND BALLS.

No. 304,226.

Patented Aug. 26, 1884.





# 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<sup>2</sup>. The upper parts of the cups A' of the upper section are united by a plate or apron, A<sup>3</sup>, in which apertures are formed, which lead to the necks A<sup>2</sup>, the said plate A<sup>3</sup> being provided with an upwardly-projecting flange, A<sup>4</sup>. 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 molt-  
 en, fluid mass in the kettle the pressure of the  
 liquid or fluid mass raises the plate P, thus  
 5 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  
 10 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  
 15 opening the valve-plate P, thus permitting  
 the fluid contents of the bucket to flow upon  
 the plate or apron A<sup>3</sup>, and from the same,  
 through the necks A<sup>2</sup>, into the mold. The  
 mold is then permitted to stand for a short  
 20 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<sup>2</sup>, the hardened mass on  
 25 the apron A<sup>3</sup> having been scraped off previ-  
 ously. The mold is then run under the sprink-  
 ler J L, and water sprinkled on the surface of  
 the mold, the water passing through the ap-  
 30 ertures a and over the molds, which, being  
 inverted, thus prevents the water from pass-  
 ing into the necks A<sup>2</sup>. 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.

35 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  
 40 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  
 45 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—

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

55 2. A mold for casting balls, made substan-  
 tially as herein shown and described, and con-  
 sisting of two sections, each formed of a series  
 of united semi-spherical cups; and each sec-  
 tion being provided with two opposite half-  
 60 trunnions, as set forth.

3. A mold for casting balls, formed of two

sections, A B, each section composed of a se-  
 ries of united semi-spherical cups, the cups of  
 the upper section, A, being provided with  
 necks A<sup>2</sup>, substantially as herein shown and 65  
 described.

4. A mold for casting balls, formed of two  
 sections, A B, each section composed of a se-  
 ries of united semi-spherical cups, the cups of  
 the upper section, A, being provided with 70  
 necks A<sup>2</sup>, and the said cups of the upper sec-  
 tion being united by an apron, A<sup>3</sup>, substan-  
 tially as herein shown and described.

5. The combination of a mold formed of  
 two sections, each composed of a series of 75  
 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 80  
 mold pivoted in the carriage, which mold is  
 formed of two sections, each being composed  
 of a series of united semi-spherical cups, sub-  
 stantially as herein shown and described.

7. The combination, with a track, of ket- 85  
 tles for receiving the molten mass held under-  
 neath 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 se- 90  
 ries of kettles held underneath the same, a  
 carriage running on the tracks, a mold piv-  
 oted in the carriage, and a water spout or  
 conductor arranged to deliver water upon the  
 carriage carrying the mold, substantially as 95  
 herein shown and described.

9. The combination, with a kettle for con-  
 taining 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 100  
 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 105  
 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 110  
 the track, the receptacle K, held below the  
 track and the water-conductor, and of the buck-  
 et O, provided with means for raising it, and  
 with means for automatically opening and  
 closing the apertures in the bottom of the 115  
 said bucket, substantially as herein shown  
 and described.

FRANK J. MOYER.

Witnesses:

GALEN F. MOYER,

E. J. TREICHLER.