(No Model.)

C. F. STOCK, Dec'd.

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APPARATUS FOR THE MANUFACTURE OF FLYING TARGETS.

No. 323,896. Patented Aug. 4, 1885.

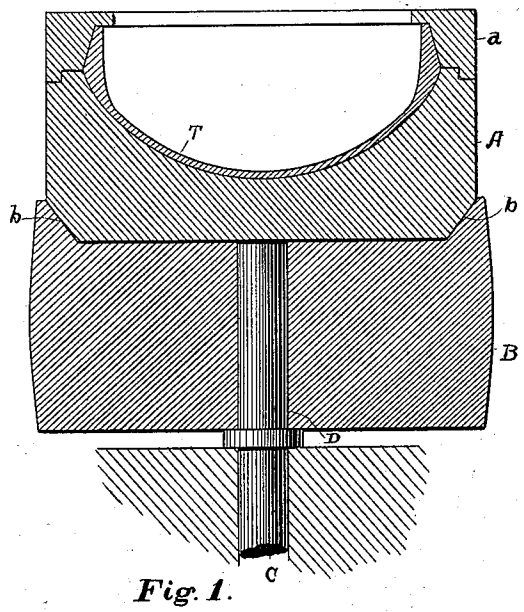


Fig. 1.

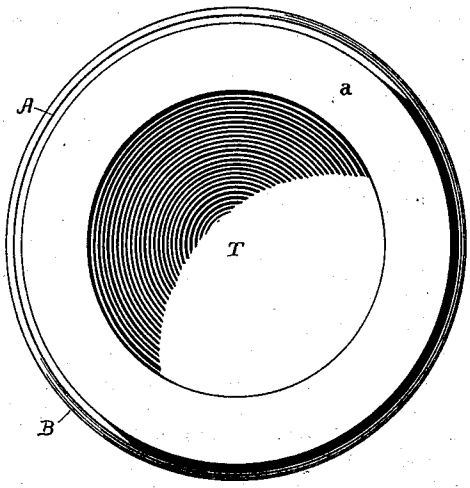
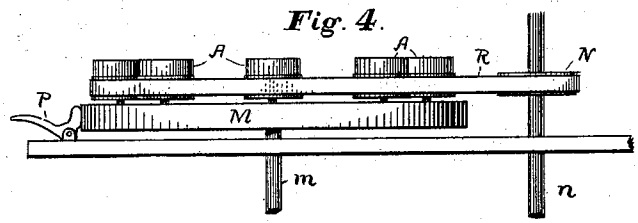


Fig. 2.

Fig. 4.



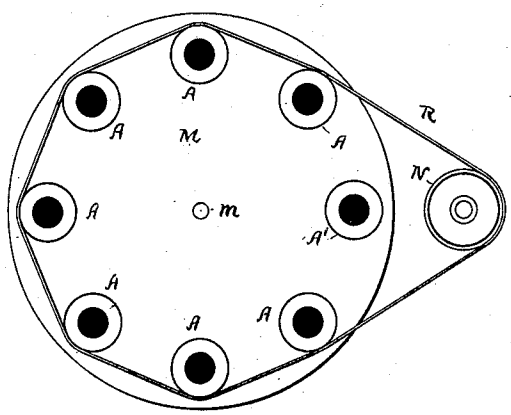


Fig. 3.

Witnesses,

A. Keithley.

H. W. Wells

Inventor,

Charles F. Stock;

per A. B. Upham,

His Attorney.

UNITED STATES PATENT OFFICE.

CHARLES F. STOCK, OF PEORIA, ILLINOIS, BY N. GRIER MOORE, ADMINISTRATOR, ASSIGNOR TO EDWARD H. WALKER, OF SAME PLACE.

APPARATUS FOR THE MANUFACTURE OF FLYING TARGETS.

SPECIFICATION forming part of Letters Patent No. 323,896, dated August 4, 1885.

Application filed July 5, 1884. (No model.)

To all whom it may concern:

Be it known that I, CHARLES F. STOCK, of Peoria, in the county of Peoria, in the State of Illinois, have invented an Improved Process and Apparatus for the Manufacture of Flying Targets; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the annexed drawings, making a part of this specification, in which like letters of reference refer to like parts, and in which—

Figure 1 represents a central vertical section of the apparatus; Fig. 2, a plan view thereof; Fig. 3, a plan view of my apparatus adapted for manufacturing upon a commercial scale, and Fig. 4 an elevation of same.

This invention appertains to means whereby to form thin circular objects from substances or compositions which, usually solid, can be, under certain conditions, retained in a liquid state.

My process for this purpose consists in pouring into a rapidly-revolving mold a liquid solution or fusion of the desired material, and continuing the rotation until the liquid has hardened in the form into which it had been impressed by the centrifugal force. I especially design this process for compositions fusible at a comparatively low temperature, and make the mold of metal having thick sides to serve for a chilling-mold. In objects of a deeply-concave form it is almost impossible to use a completely-incasing mold to receive the fused composition, on account of the shrinkage which the same undergoes in passing from a liquid to the solid state. In my process, however, the mold being simply for the convex face of the object, and centrifugal force serving to form and retain the object intact until hardened, there is no interior portion of the mold to injure the same or to prevent its withdrawal.

This process is especially adapted for making flying targets of an approximate saucer shape, and the apparatus which I have designed and show in the drawings is principally for the formation of these objects.

In the drawings, A is the mold; C, the shaft thereof; D, bearings for said shaft, and B a pulley fast to said shaft or mold, by which to revolve the same. The circular form of the mold is shown in Fig. 2.

In Fig. 1, T represents the target, whose outer surface is circumscribed by the interior of the mold A. The thickness of the sides of the target is determined by the quantity of material poured into the mold, and the relative thickness of the central portion and the rim of the target is determined by rapidity of the mold's rotation, and also by the viscidity of the composition.

To manufacture targets and similar articles upon a commercial scale, I have constructed the apparatus set forth in Fig. 3. This device consists, essentially, of a table having several molds thereon, means for causing all of the molds but one or two to be rapidly revolved, and means for instantly setting the quiet ones in motion and stopping one or two of the revolving ones.

In the drawings, M is the table, having a central shaft, *m*, and a clamp or pawl, P, for holding it stationary at any desired angle of revolution. Upon this table the molds A are rotatively secured at equal distances from each other and from the shaft of said table.

n is a shaft, and N a pulley, adapted to be continuously rotated, and R is a cord or band passing about said pulley and most of the molds A, as shown in Fig. 3. One of the molds, A′, or two, if desired, is not touched by the swiftly-moving belt R, and consequently is at rest. The others are, however, caused to rapidly revolve by said belt or band R.

In using this machine the molds are filled one by one, and the table turned notch by notch until the molds are brought one by one to the position of A′ and removed. As soon as a mold is removed it is replaced with an empty one, which, by the movement of the table, is brought into contact with the belt R and filled with the fused material. In this way the operation of filling and removing a mold is made continuous, and still each one kept in rotation for a sufficiently long time to permit the setting and hardening of the target contained therein. The intermittent rotation of the table M is kept up in one direc-

tion only, so that when a fresh mold has been filled it passes entirely about the circumference of the table, and comes away from the belt at an opposite point than the one at which it went into contact therewith.

To make the mold A easily separable from its pulley B, I make the lower edge of said mold somewhat conical, as shown in Fig. 1, and recess the upper face of the pulley, so that the flanged edges *b* shall be adapted to receive and fit exactly the said conical under side of the mold.

What I claim as my invention, and for which I desire Letters Patent, is as follows, to wit:

1. A concave circular mold and a removable centrally-apertured cover therefor, in combination with means for rotating said mold upon a vertical axis, whereby liquid solutions or fusions poured into said mold are made to conform thereto by centrifugal force until sufficiently hardened to retain the impressed shape, substantially as set forth.

2. The mold A and its removable centrally-apertured cover D, in combination with a pulley adapted to hold removably said mold, and a vertical axis for said pulley, substantially as and for the purpose specified.

3. The mold A, having conical lower edges, in combination with the pulley B, having conical flanged edges *b*, adapted to fit the conical edge of said mold, and a vertical axis for said pulley, substantially as and for the purpose specified.

4. The mold A, having conical lower edge, and the removable centrally apertured cover D for said mold, in combination with the pulley B, suitably recessed in its upper face to receive the conical edge of said mold, and an axis and means for revolving said pulley, as set forth.

5. A horizontal table, a central vertical axis or shaft for said table, and molds arranged upon said table equidistant from said axis or shaft, and adapted to revolve upon individual vertical axes, in combination with mechanism arranged to keep all but one or more of said molds in rotation, and, as said table is turned, to release the revolving molds one at a time and set in motion those previously quiet, for the purpose described.

6. A horizontal table, a central vertical axis or shaft for said table, and molds arranged upon said table equidistant from said axis or shaft, and adapted to revolve upon individual vertical axes, in combination with a pulley situated without said table, and an endless cord or belt passing about said pulley and all but one or more of said molds, substantially as and for the purpose specified.

7. The table M, a central axis or shaft for said table, pulleys B, arranged upon said table equidistant from its said axis or shaft, and the molds A, adapted to be held removably by said pulleys, in combination with a pulley having bearings without said table, and an endless cord or belt passing about said pulley and all but one or more of said pulleys B, as and for the purpose described.

In testimony that I claim the foregoing invention I have hereunto set my hand this 7th day of June, 1884.

CHARLES F. STOCK.

Witnesses:
A. B. UPHAM,
H. W. WELLS.