No. 620,020

Patented Feb. 21, 1899.

R. W. DAVIES.

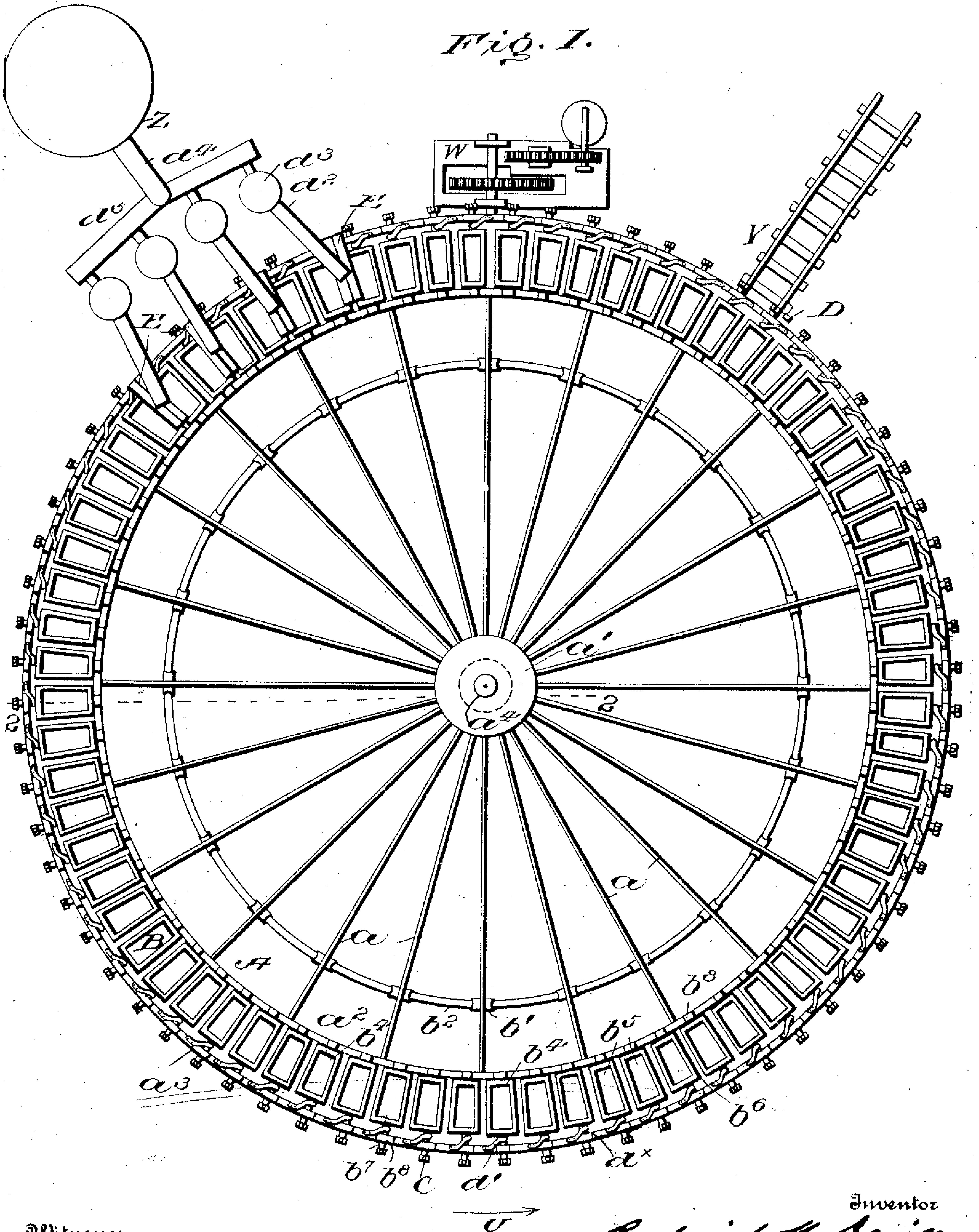
CASTING APPARATUS.

(Application filed Feb. 7, 1898.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1.



Witnesses

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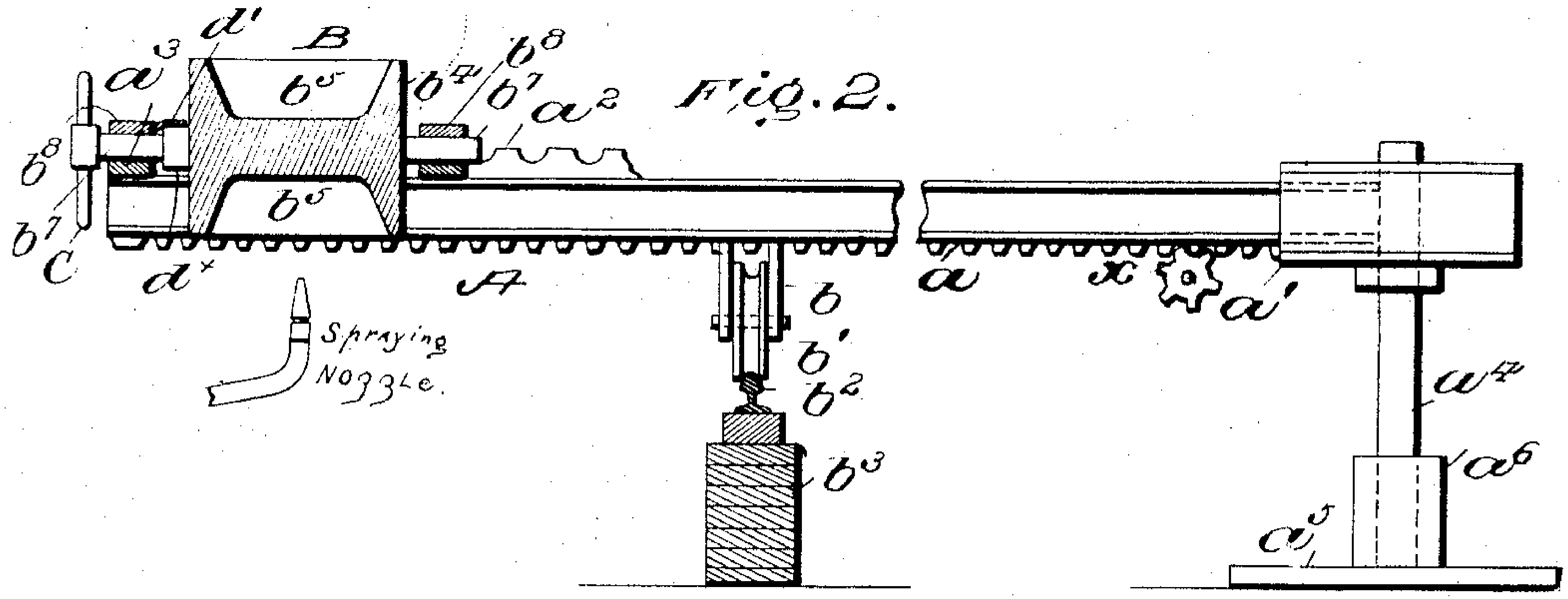


Fig. 2.

Fig. 3.

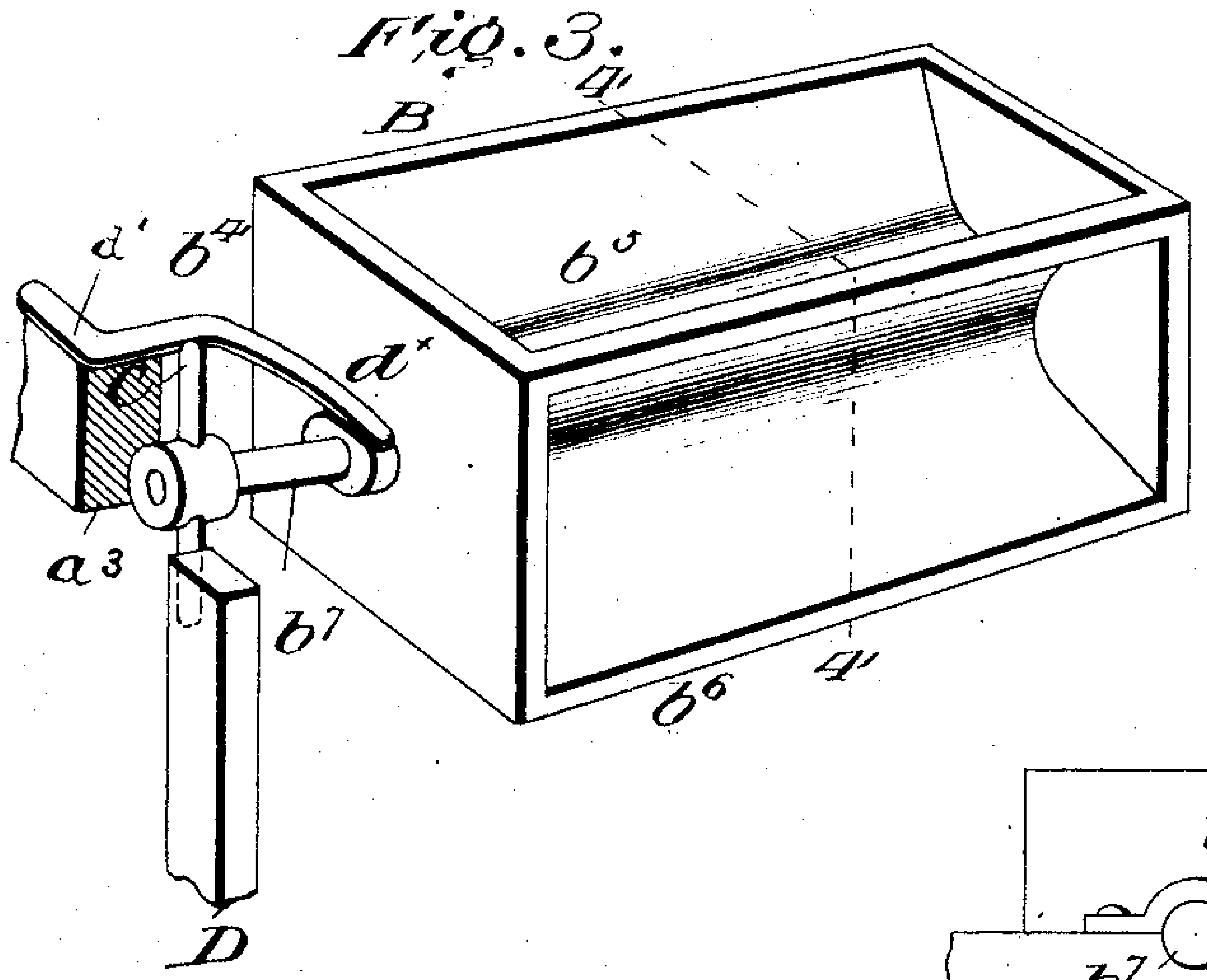


Fig. 4.

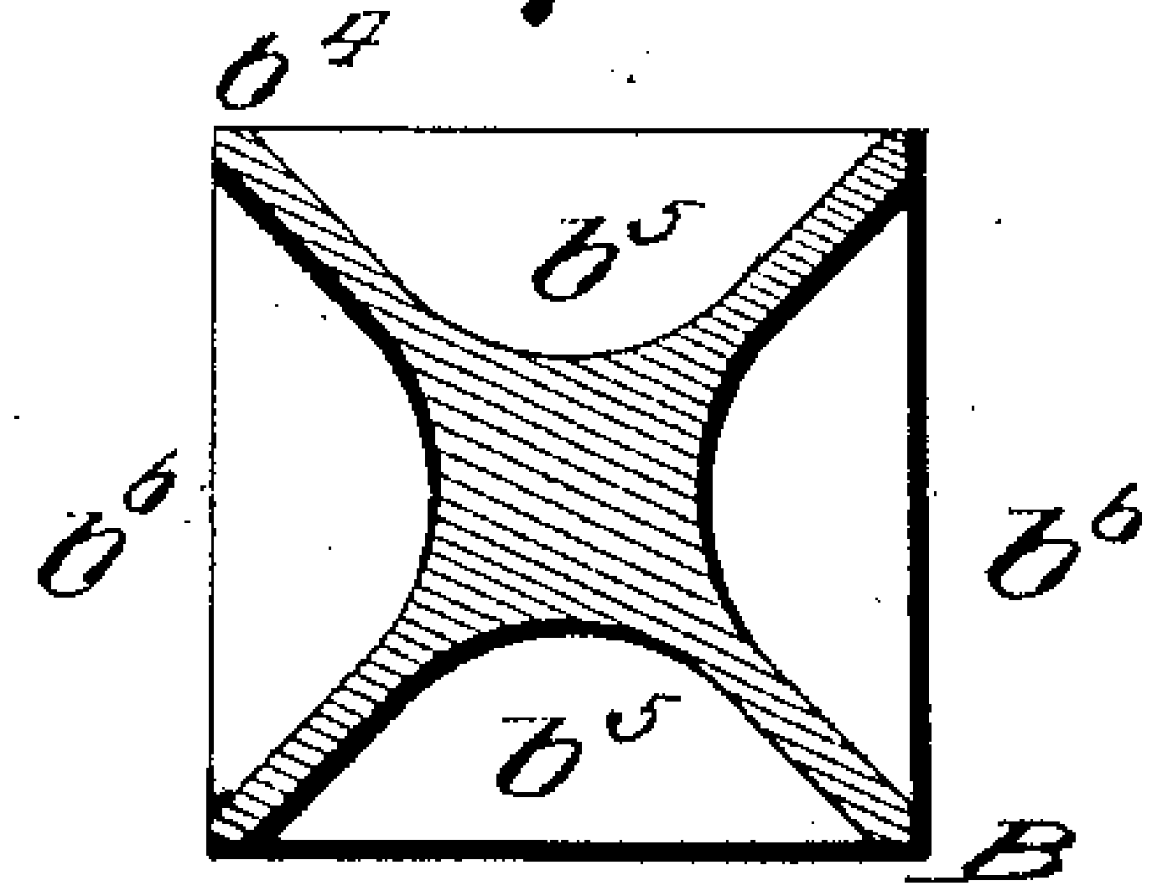
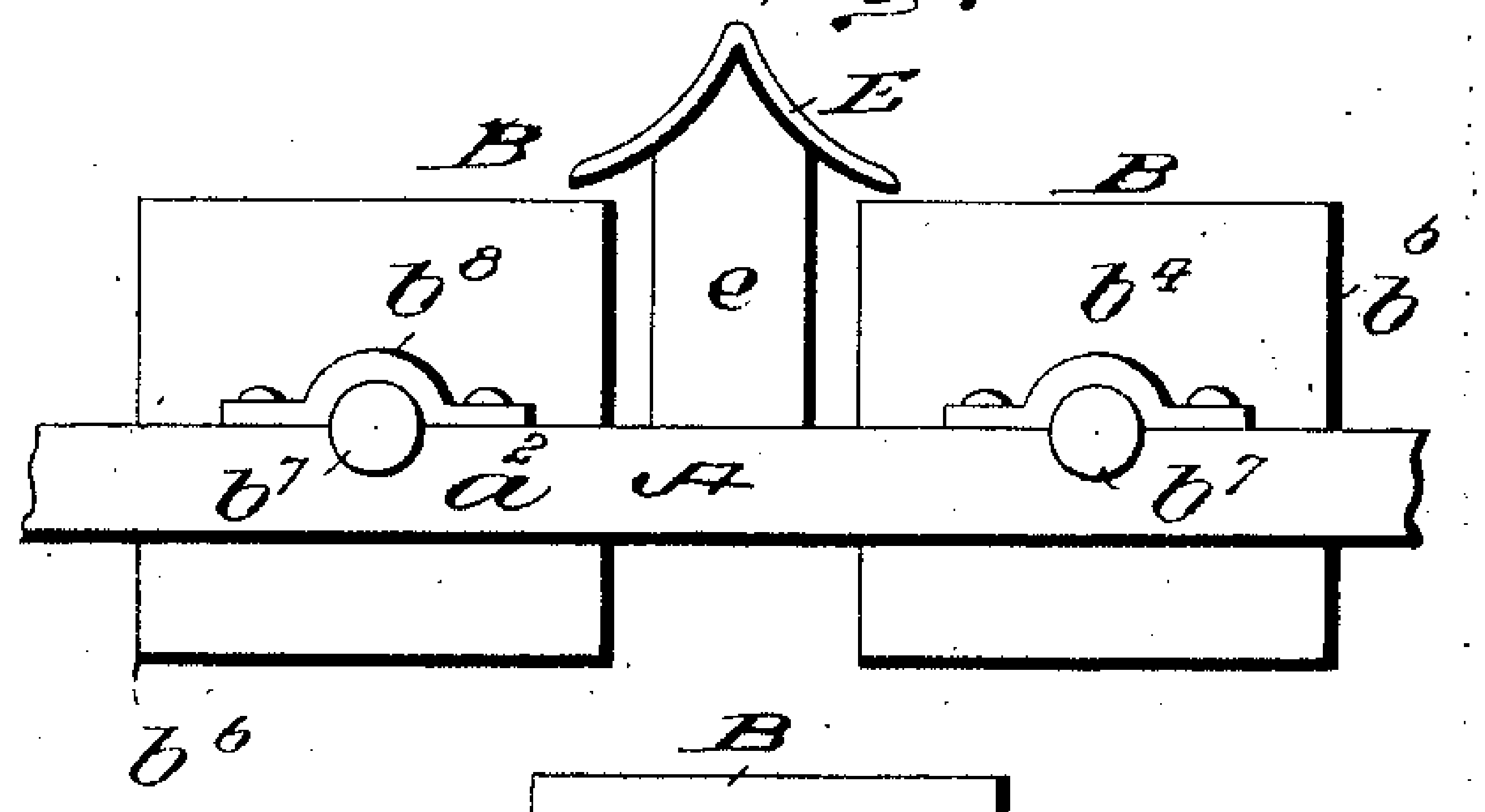


Fig. 7.



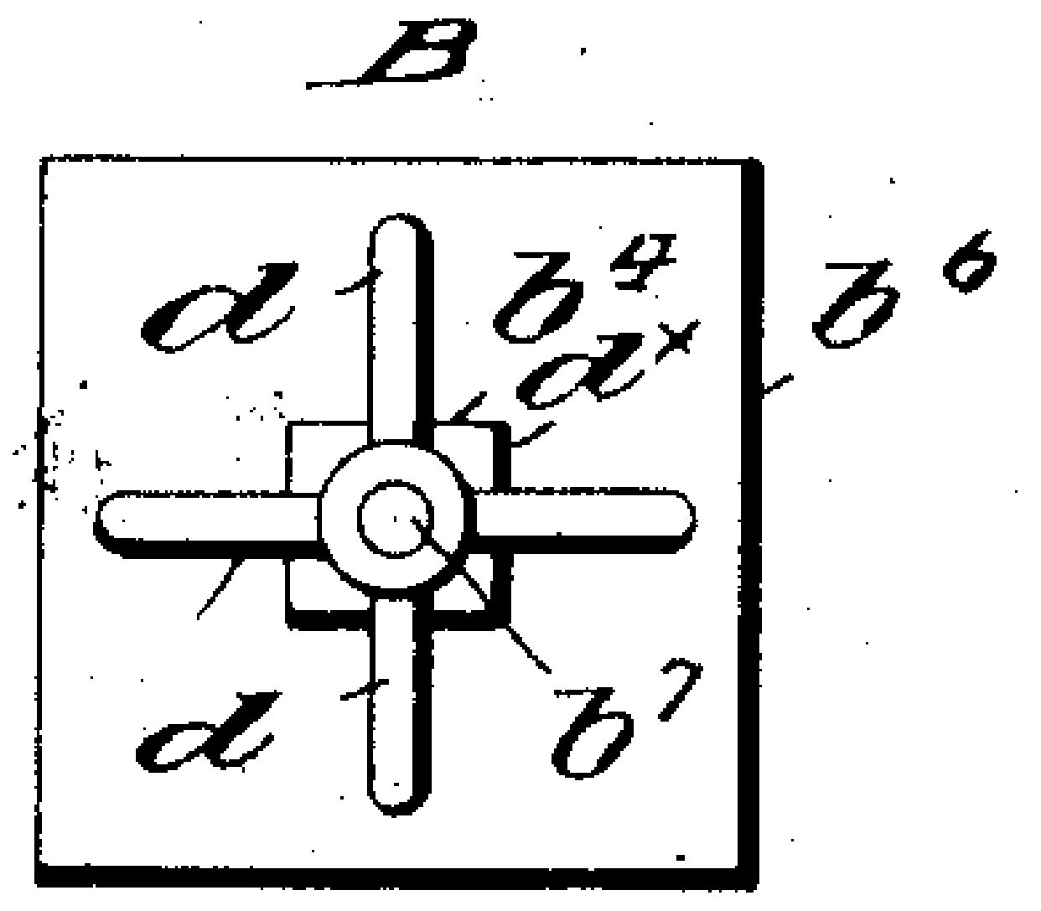
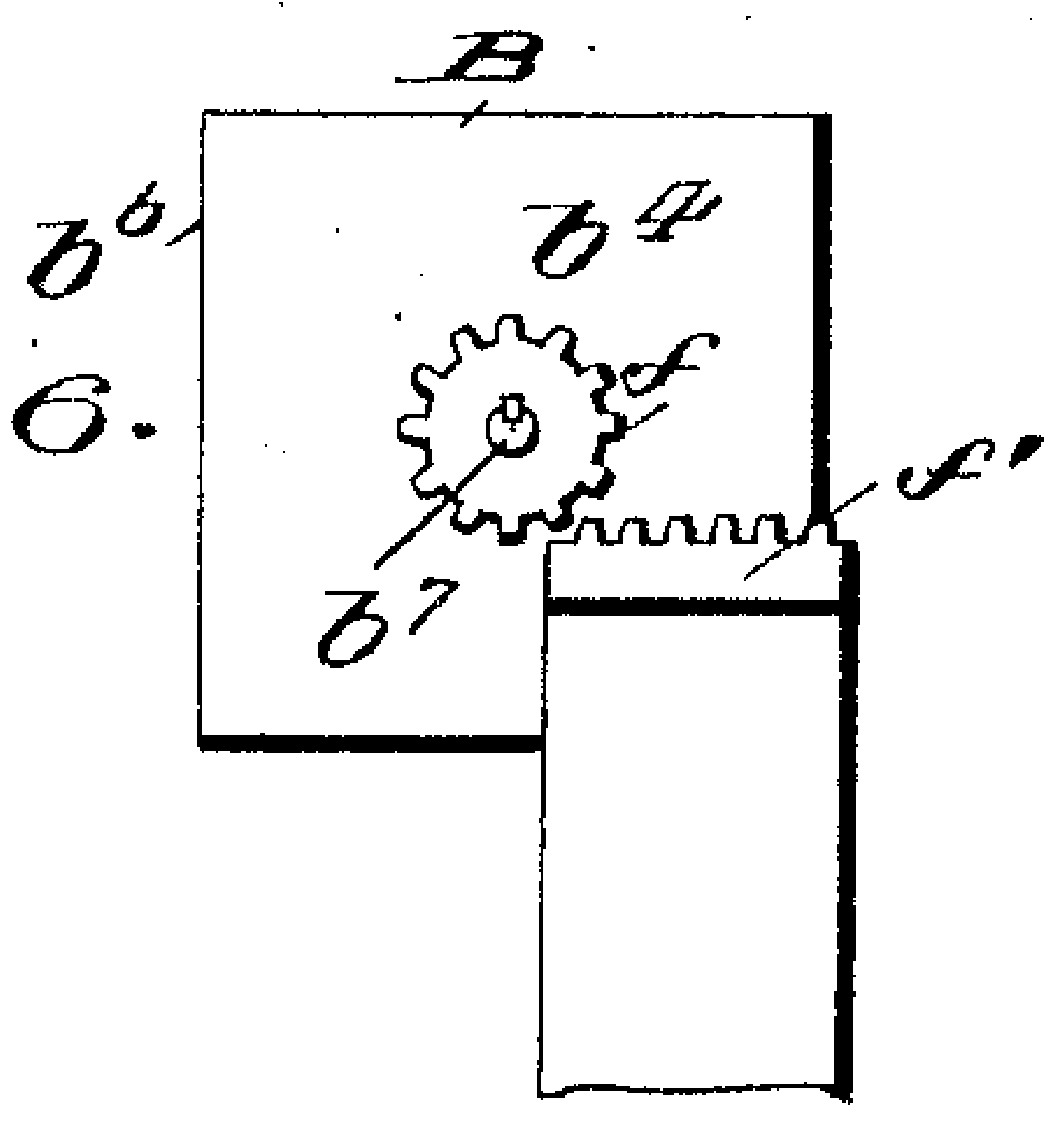


Fig. 5.

Fig. 6.



Witnesses

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UNITED STATES PATENT OFFICE.

RODERICK W. DAVIES, OF WARREN, OHIO, ASSIGNOR OF ONE-HALF TO JOSEPH W. RUSSELL, OF SAME PLACE.

CASTING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 620,020, dated February 21, 1899.

Application filed February 7, 1898. Serial No. 669,291. (No model.)

To all whom it may concern:

Be it known that I, RODERICK W. DAVIES, of Warren, in the county of Trumbull and State of Ohio, have invented certain new and useful Improvements in Casting Apparatus; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention contemplates certain new and useful improvements in machines for casting molten metal.

The object of the invention is to provide an improved machine having molds into which the molten metal can be poured, and thereby formed into pigs, and after being solidified discharged automatically from such molds.

A further object is to provide molds having a plurality of independent chambers for successively receiving the molten metal. The molds are arranged side by side on a circular carrier or wheel which is gradually revolved. The molten metal is supplied to the upwardly-faced chambers of two or three molds at a time from stationary ladles, which may be connected direct with a furnace by suitable runners. Suitable deflectors, mounted on the carrier and extended longitudinally over the molds, prevent the molten metal from entering between the several molds.

The invention will be hereinafter fully set forth, and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a plan view with some of the parts omitted. Fig. 2 is a cross-sectional view on line 2 2, Fig. 1. Fig. 3 is an enlarged view of one of the molds. Fig. 4 is a cross-sectional view on line 4 4, Fig. 3. Fig. 5 is a similar view showing a slight modification. Fig. 6 is a view of a second modification. Fig. 7 is an enlarged detail view showing one of the shields.

Referring to the drawings, A designates a circular carrier in the form of a wheel. This is composed of a series of I-beams a, radiating from a hub a' and united near and at their outer ends by inner and outer concentric rings a^2 a^3. The hub a' is supported by a shaft a^4, extended perpendicularly from a base-plate a^5, having a boxing a^6 to accommodate said shaft. From the beams of the carrier depend a series of hangers b, which support the journals of wheels or rollers b', which travel on a circularly-arranged rail b^2, mounted on a suitable foundation b^3. Any preferred means may be employed for gradually revolving the carrier. I have indicated at W, Fig. 1, a motor for rotating gear-wheel x, Fig. 2, which meshes with teeth on the under side of the outer ring a^3.

B designates a series of circularly-arranged molds. Each mold is of approximately rectangular shape and is composed of a body b^4, formed with opposite chambers or cavities b^5, of substantially concave form in cross-section, said chambers extending the full length of each mold. I also form each side b^6 of each mold with concave chambers similar to the chambers b^5. These molds are mounted on carrier A side by side. From the ends of each mold projects a stud b^7, (or a continuous shaft may be used,) said studs fitting in bearings b^8 on rings a^2 a^3. From the outer stud of each mold project opposite lateral arms C. As the carrier is revolved after the upturned chambers of some of the molds have been supplied with molten metal the downwardly-projecting arm C will contact with a stationary post D, located outside of but close to the line of travel of the circumferential ring a^3. As the lower arm of a mold thus contacts with said post the mold is given a partial or quarter turn, the weight of the pig serving to aid in turning the mold to a like extent, thus emptying the pig from the mold and causing the previously downwardly-faced chamber or cavity to face upward.

What has been said applies when but two diametrically-opposed chambers or cavities of a mold are employed; but when, as is preferred, each of the four independent chambers or cavities of each mold are to successively receive the molten metal it is essential that in dumping the pig therefrom each mold should make but a quarter-turn. Hence, as shown in Fig. 5, four arms d are projected laterally from the outer stud of each mold instead of but two arms, as before described.

Each mold is held as against accidental turning by a spring-arm d', fast at one end on the outer ring a^5. The free end of each spring-arm bears downwardly on the flattened portion of a boss $d^{\times}$ on the outer end of each mold. When each mold is provided with but two dumping-arms, its boss $d^{\times}$ has but two flattened portions with rounded ends, (see Fig. 3;) but when each mold is to be given but a quarter-turn in dumping the pig therefrom and four arms are employed each boss $d^{\times}$ is formed with four flattened portions in the form of a square. (See Fig. 5.) In lieu of providing the several molds with dumping-arms a gear-wheel f may be made fast on the outer stud of each mold, so as to engage with rack-teeth f' on the upper end of the dumping-post. (See Fig. 6.) In this form the extent to which each mold is to be turned—that is, whether it is to be given a quarter-turn or half-turn—depends upon the number of rack-teeth f'.

The molten metal is simultaneously supplied to a plurality of molds, being emptied therein from spouts d^2, leading from ladles d^3, which are supplied with molten metal direct from a furnace Z by a runner d^4, having branches d^5. Each spout d^2 opens directly above the line of travel of deflectors E, (some of which are shown in Fig. 1,) extended longitudinally inward over the molds and serving to prevent the molten metal from falling between the latter. These deflectors consist of inverted-V bars, supported at their outer ends by posts or uprights e, positioned on the circular carrier.

In practice the molten metal will be deposited in the molds as they pass beneath the spouts of the ladles, the carrier being revolved at a rate of about ten feet to the minute; but this speed may be varied. The pouring of the metal is continuous until the supply is exhausted, and the rotation of the mold-carrier is likewise continuous. As the filled molds travel toward the point of discharge (the carrier being moved in the direction of the arrow v) they may be sprayed with water to aid in cooling the metal, so that a solid pig will be delivered at the point of discharge. As each mold reaches the latter point its depending arm will contact with the post D, resulting in the turning of the mold and the dumping of the pig therefrom. When but two arms are provided for each mold, the latter is completely inverted by the contact of an arm with the post, aided by the weight of the pig, causing its previously-lowered side to be faced upward to receive the molten metal when the mold again comes beneath the discharge-spout of the ladles; but when it is desired to successively use the four chambers or cavities of each mold as receivers for the molten metal the same will be given but a quarter-turn and the pig will fall therefrom by its own weight. Thus it will be seen that the metal received in the several molds in a molten state is discharged solidified in pigs. The under sides of the several molds after the upper side has been filled may, while the carrier is being revolved, be sprayed with a mixture of fire-clay and lime-water or any other suitable fluid to prevent the metal from adhering thereto.

I claim as my invention—

1. A casting apparatus comprising a circular revolving carrier, a series of circularly-arranged molds pivotally mounted at their ends on said carrier, each of said molds having a plurality of chambers or cavities extended, longitudinally thereof, a series of yielding holding devices mounted on said carrier independent of the molds, one of said devices bearing on each mold and constructed and arranged to hold it in any position to which it may be turned on its pivot-bearings, and a stationary post outside of, and adjacent to, said carrier, with which each of said molds is designed to successively engage, substantially as and for the purpose set forth.

2. A casting apparatus comprising a circular revolving carrier, a series of circularly-arranged molds pivotally mounted at their ends on said carrier, each of said molds being of approximately rectangular shape and having in each of two sides a single chamber or cavity extended longitudinally thereof, a series of yielding holding devices mounted on said carrier independent of the molds, one of said devices bearing on each mold and constructed and arranged to hold it in any position to which it may be turned on its pivot-bearings, and a stationary post outside of, and adjacent to, said carrier, with which each mold is designed to successively engage, substantially as set forth.

3. A casting apparatus comprising a circular revolving carrier, a series of circularly-arranged molds pivotally mounted at their ends on said carrier, each of said molds having a plurality of chambers or cavities extended longitudinally thereof, oppositely-extended arms carried by each mold and located outside of said carrier, a series of yielding holding devices mounted on said carrier independent of the molds, one of said devices bearing on each mold and constructed and arranged to hold it in any position to which it may be turned on its pivot-bearings, and a stationary post also outside of said carrier with which each of said arms is designed to successively engage, substantially as set forth.

4. A casting apparatus comprising a circular revolving carrier, a series of circularly-arranged molds pivotally mounted at their ends on said carrier, each of said molds being of approximately rectangular shape and having two sets of oppositely-disposed chambers or cavities extended longitudinally thereof, two sets of oppositely-extended arms carried by each mold, and located outside of said carrier, a series of yielding holding devices mounted on said carrier independent of the molds, one of said devices bearing on each mold and constructed and arranged to hold it in any posi-

tion to which it may be turned on its pivot-bearings, and a stationary post, also outside of said carrier, with which each of said arms is designed to successively engage, substantially as set forth.

5. A casting apparatus comprising a circular revolving carrier, a series of circularly-arranged molds pivotally mounted at their ends on said carrier, each of said molds having a plurality of chambers or cavities extended longitudinally thereof and also having at one end a boss provided with opposite flattened portions, a series of spring-arms secured on said carrier and bearing each on one of the flattened portions of said bosses, oppositely-extended arms carried by each mold and located outside of said carrier, and a stationary post, also outside of said carrier, with which each of said arms is designed to successively engage, substantially as set forth.

6. A casting apparatus comprising a circular revolving carrier, a series of circularly-arranged molds pivotally mounted at their ends on said carrier, each of said molds being of approximately rectangular shape and having two sets of oppositely-disposed chambers or cavities extended longitudinally thereof, each of said molds having at one end a boss provided with two sets of opposite flattened portions, a series of spring-arms secured on said carrier and bearing each on one of the flattened portions of said bosses, each of said molds also having two sets of oppositely-extended arms located outside of said carrier, and a stationary post, also outside of said carrier, with which each of said arms is designed to successively engage, substantially as set forth.

7. The combination with a circular revolving carrier having inner and outer rings, of a series of molds pivotally mounted between said rings, each of said molds having its top, bottom and sides formed to receive molten metal, springs on said carrier bearing on said molds, a post outside of said carrier, and a plurality of arms carried by each mold to engage said post in succession as each mold passes and thereby rotate another mold-cavity into position, substantially as set forth.

8. The combination with a circular revolving carrier, a series of circularly-arranged molds pivotally mounted at their ends on said carrier adjacent to the circumference thereof, each of said molds having a plurality of longitudinally-extended chambers or cavities, a series of yielding holding devices, one of said devices engaging each mold, and means for successively turning each of said molds axially, of a series of deflectors consisting of horizontally-disposed bars mounted on said carrier and extended longitudinally above the intervening spaces between said molds, and supports for said bars carried by said carrier, substantially as set forth.

9. The combination with the circular revolving carrier having at and near its circumference, outer and inner rings, a series of circularly-arranged molds having studs projecting from their inner and outer ends loosely mounted on said rings, the outer stud of each mold being provided with oppositely-extended arms, each of said molds having a plurality of chambers or cavities, and a boss on its outer end formed with flattened portions, spring-arms secured on said outer ring and bearing at their free ends on said bosses, and a post outside of said outer ring with which each of said arms is designed to successively engage, substantially as set forth.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

RODERICK W. DAVIES.

Witnesses:
WM. M. HENDERSON,
FRANK S. CHRYST.