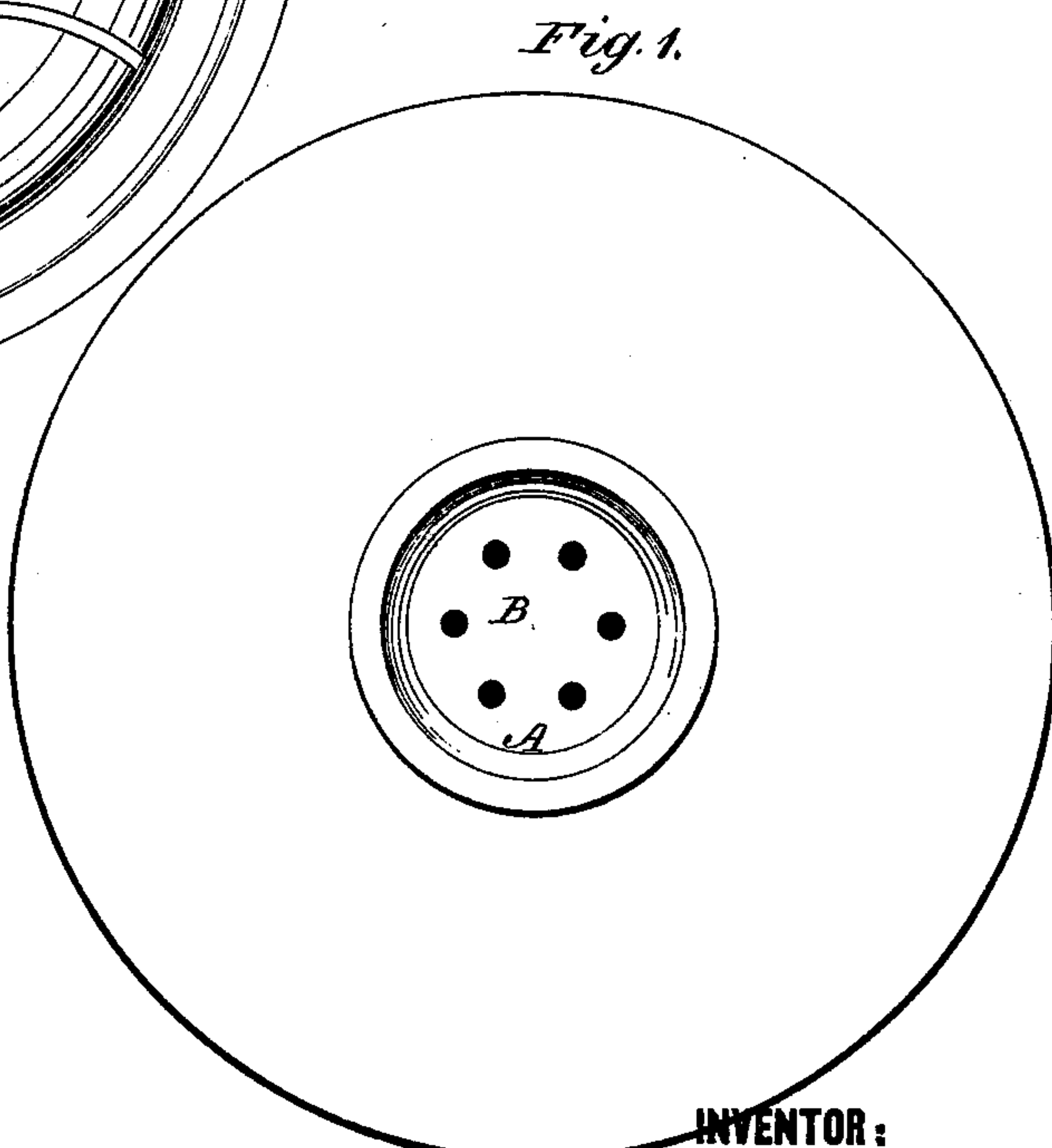
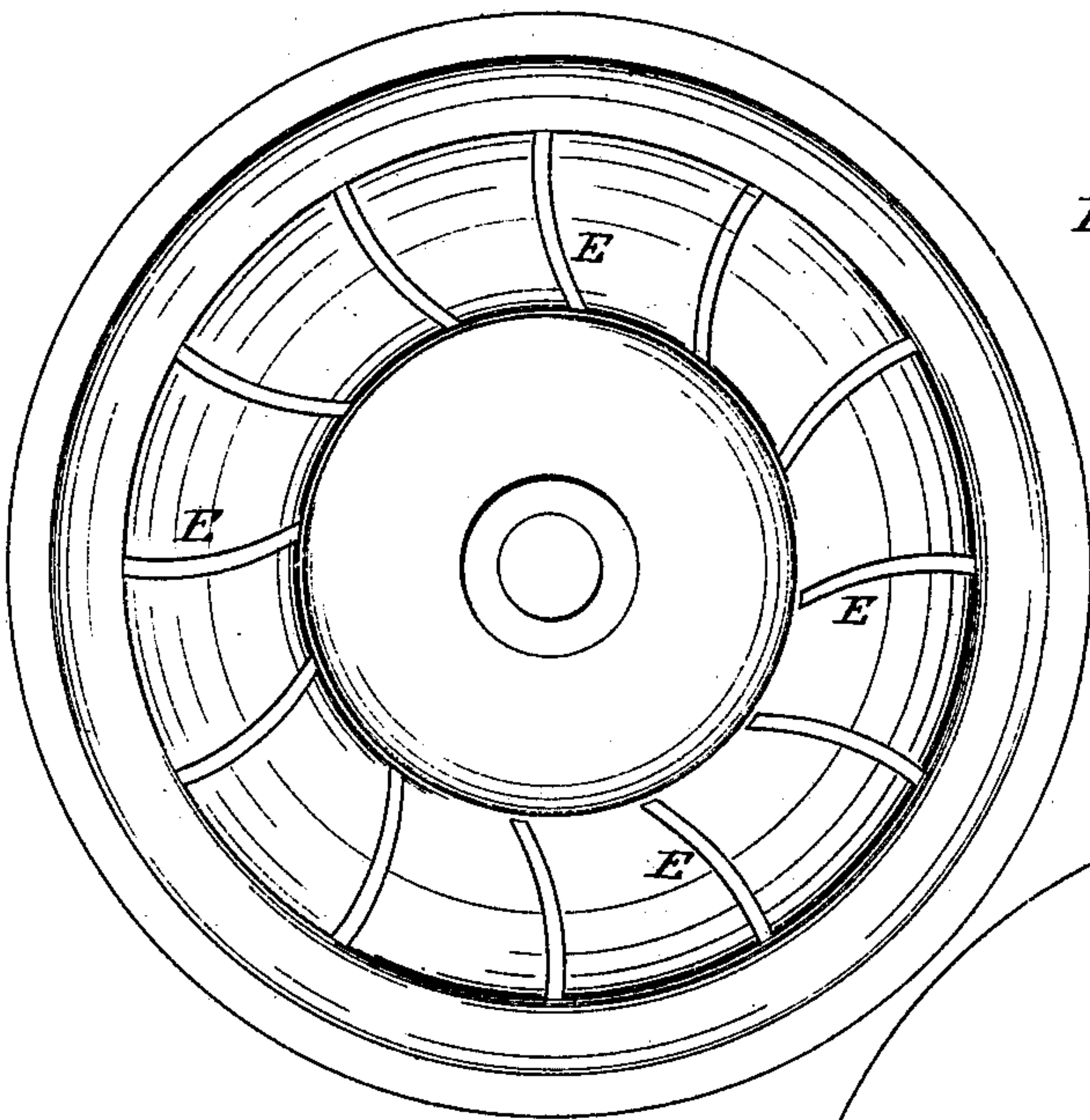
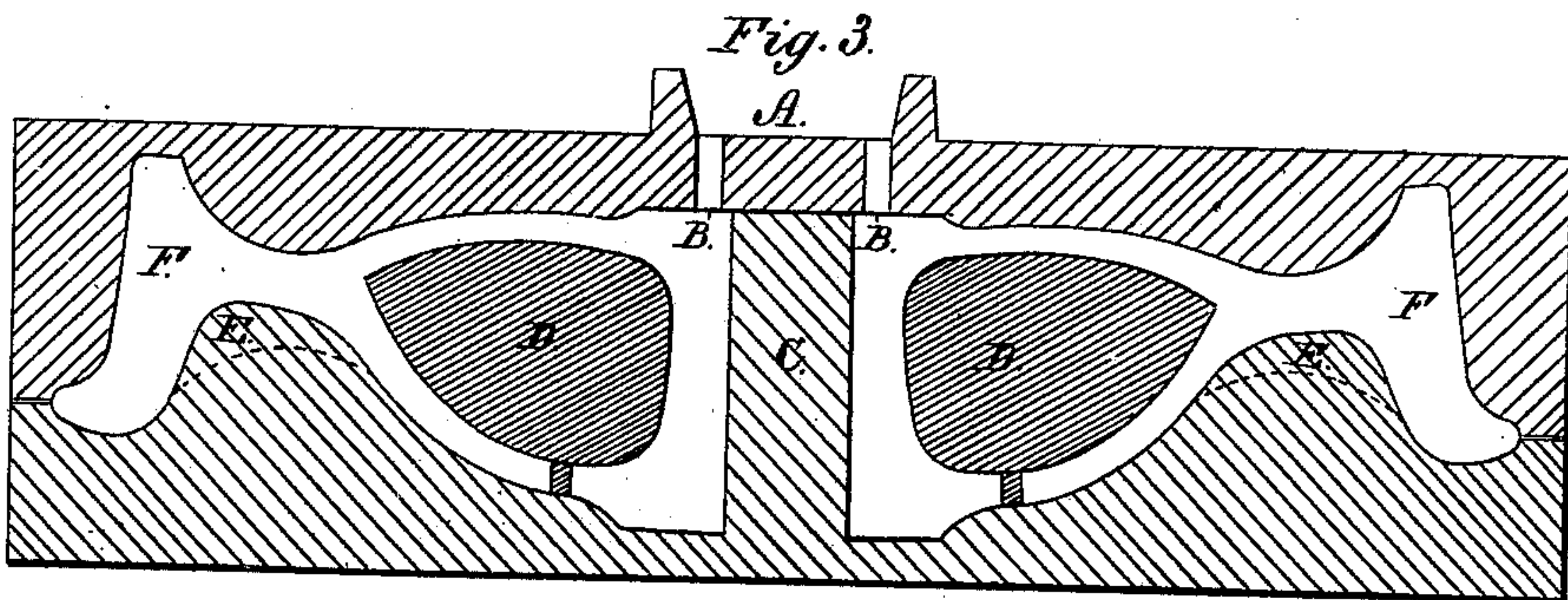


W. WILMINGTON.
CASTING CAR-WHEELS.

No. 188,714

Patented March 20, 1877.



WITNESSES:

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UNITED STATES PATENT OFFICE.

WILLIAM WILMINGTON, OF TOLEDO, OHIO.

IMPROVEMENT IN CASTING CAR-WHEELS.

Specification forming part of Letters Patent No **188,714**, dated March 20, 1877; application filed January 30, 1877.

To all whom it may concern:

Be it known that I, WILLIAM WILMINGTON, of Toledo, in the county of Lucas and State of Ohio, have invented a new and useful Improvement in the Manufacture of Car-Wheels; and I do hereby declare that the following is a full, clear, and exact description of the same.

This invention relates to an improvement in the manufacture of cast-iron wheels for railway-cars; the purpose being to lessen the cost and increase the durability of the wheel.

My improved process in the art of constructing car-wheels consists in casting the wheel from two or more different kinds of melted irons, or irons combined with steel or other suitable metallic compositions, poured separately into the mold, and properly disposing of the last poured metal in the hub and plates of the wheel. In accomplishing this I am enabled to produce a good and reliable car-wheel at fully one-fourth less cost than a wheel made wholly of one grade of melted irons or composition of metals. This estimate is predicated on the basis that the wheels made by the different processes will have the same quality of metal at their treads.

I secure the desired result by a modification of the mold of the wheel, and utilizing the properties of melted irons, which I have discovered in my experiments in trying to cast a wheel from two grades of melted irons. It is the tendency of melted irons, when received in a mold arranged upon a level, to form currents of the inflowing metal to the parts of the mold where the sand has the least moisture, and the least compactness. After these currents have been established the flow of the metal will continue in this direction, and will be reluctant to branch off and cover the surface of the mold uniformly. This property of melted irons, and the forms of the molds, in connection with the soft quality of irons used in the metal poured last, has heretofore, at times, been the cause of my failure to produce a reliable car-wheel from two different kinds of melted irons poured separately into the mold. This was owing to my inability to control and properly dispose of the soft iron in the plates of the wheel.

The hard iron, in flowing outward to the

rim portion of the mold, would form currents from causes referred to above, and the soft iron, having to be immediately poured, would follow the currents already established, and would continue outward to the rim portion of the mold, and destroy the chilling qualities of the hard iron, and cause the loss of the wheel.

This difficulty occurred, more or less, in the mode of casting car-wheels from two different kinds of melted irons patented by me July 28, 1868. I have been the owner, for a number of years, of a patent that was granted to A. A. Needham, December 22, 1857, for an improvement in casting car-wheels from two different kinds of melted irons poured separately into the mold, and disposing of them in the mold by giving the mold a rotating motion; but there has never been a car-wheel successfully cast by the process described, owing to the destruction of the mold by its rotary motion, in imparting a centrifugal force to the inflowing metal that would destroy the form of the mold. I have overcome these difficulties of constructing a cast car-wheel from two or more different kinds of melted metals poured separately into the mold by utilizing the properties of melted irons, (referred to in connection with the form of the mold,) and in the use of a harder quality of melted iron that is poured last.

In my improved process of constructing car-wheels I use the forms of molds that are in common use for casting double and single plated car-wheels having depressions in the bottom of the mold in various forms, radiating outwardly, forming a part of the contour of the back part of the wheel, and connecting the central with the rim portion of the mold at intervals of from eight or ten inches at the rim, depending upon the size of wheel. This will cause a portion of the first metal poured to flow in these depressions, and will cause the drying uniformly of some ten or fifteen divisions in the bottom of the mold. These heated depressions will cause the last metal poured to flow in the directions of the divisions in the bottom of the mold, because of the tendency of melted iron to flow in established currents, these currents (having been formed by the first metal poured) being compelled, by

the gravity of the inflowing metal, to pass through the depressions to fill a portion of the rim of the mold. The last metal poured will flow outwardly in the general directions, and cause the displacing and forcing outward the first metal poured uniformly, to fill the rim and tread portion of the mold. The continued flow of the last metal poured will spread uniformly, and fill the remaining space in the mold, thereby properly disposing in the mold the last metal poured, to construct the plates and hub of the wheel.

The accompanying drawings represent one form of a mold that I use in my process in the art of constructing a car-wheel from two or more different kinds of melted irons or composition of melted metals poured separately into the mold.

Figure 1 is a top view, showing the basin and the inflowing openings. Fig. 2 is a view, showing the bottom of the mold. Fig. 3 represents a central cross-section of the mold.

With a mold thus prepared for casting one form of double-plated car-wheel and the mold resting in a stationary and horizontal position, the following is my process of constructing the wheel: I take the molten iron, or other metallic composition from different furnaces, one supplied with hot-blast, or other suitable low-priced irons possessing the requisite strength, and about the same chilling qualities of the superior composition. This will permit a large portion of the wheel to be made from low-priced irons, for it is well known that some irons possessing chilling qualities may be very strong and not possess good wearing properties. In the use of this grade of iron it can be placed near to the outer portion of the mold without affecting the chilling qualities of the superior composition that forms the tread of the wheel. The superior composition is taken from a furnace supplied with cold-blast charcoal, chill-hardening irons, or irons combined with steel or other suitable metallic composition for constructing the tread and flange portion of the wheel. I take first of the superior composition of melted metals, about one-half the quantity to fill the mold, and pour into the basin A, the melted metal entering the mold through the openings

B, and discharging between the central core C and the main core D to the bottom, filling a portion of the bottom of the mold, and then flowing through the depressions E, to fill a part of the rim of the mold F. Then pour into the basin and through the openings a sufficient quantity of the strong but low-priced irons to fill the mold. This last quality of metal must commence to flow into the mold before the preceding has entirely ceased to flow, so that there may be no cessation in the flow of the molten metals into the mold. The pouring of this last molten metal into the mold forces the superior composition of metal from under the main core, and a part of this quality of metal will fill the outward plate portion of the mold, and form the tread and flange of the wheel, while the last metal poured, of inferior value and wearing qualities, forms the central parts of the wheel.

I do not claim as my invention the form of a car-wheel mold having depressions in the bottom of the mold connecting the central with the rim portion of the mold, as this has long been in use.

I also disclaim as my improvement the form of the wheel, as this is common.

I furthermore disclaim as my invention casting a car-wheel from two different kinds of melted irons poured separately into a mold, as this has been attempted by various persons and by different methods; but

Having thus described my invention, what I claim as new is—

The method herein described of casting car-wheels from two different qualities of metal by pouring in first the superior metal to form the tread and flange of the wheel, and afterward the inferior metal to form the central parts of the wheel, and regulating the inflow of both by radial passages, whereby circulating currents and the homogeneous mixture of the two metals is avoided at the tread, and the proper disposition of the two metals in the car-wheel is secured, as set forth.

WILLIAM WILMINGTON.

Witnesses:

C. H. WHITAKER,
CHAS. JOHNSTON.