W. WILMINGTON.

CASTING CAR-WHEELS.

No. 188,715. Patented March 20, 1877.

Fig. 1.

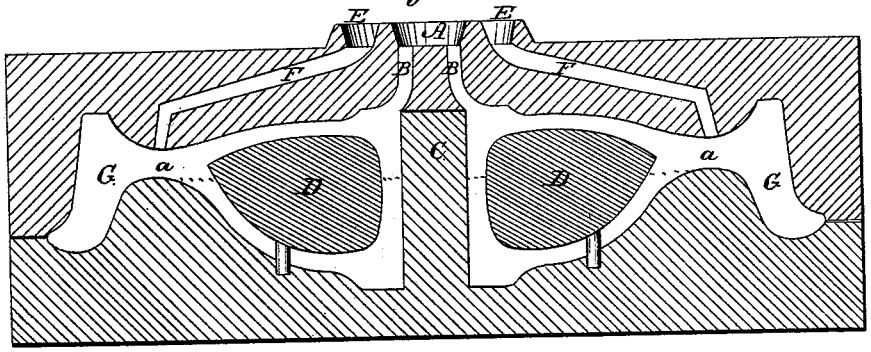
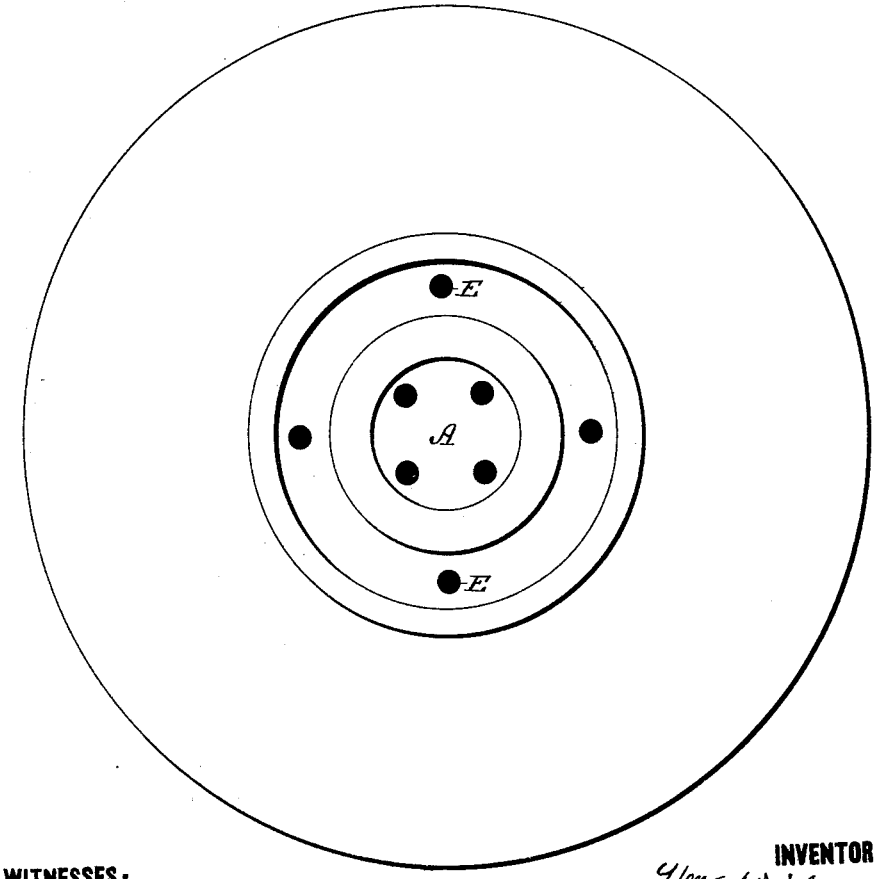


Fig. 2.



WITNESSES:

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WILLIAM WILMINGTON, OF TOLEDO, OHIO.

IMPROVEMENT IN CASTING CAR-WHEELS.

Specification forming part of Letters Patent No. **188,715**, dated March 20, 1877; application filed February 28, 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 Casting Car-Wheels; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawing, forming part of this specification, in which—

Figure 1 is a central cross-section of a car-wheel mold employed by me in carrying out my method; Fig. 2, a plan view of the same.

This improvement relates to the art of manufacturing cast car-wheels composed of two or more different kinds of melted metals, having a superior quality of metal to form the tread and flange, while the hub and inner plates are composed of an inferior quality of metal possessing the requisite strength, the purpose being to lessen the cost and increase the durability of the wheel.

In securing these results I can produce a superior car-wheel, possessing strength in the combination of its materials, great wearing qualities to the tread, and desirable form, costing fully one-fourth less than a car-wheel constructed wholly of the superior quality of metal.

I have heretofore attempted to cast car-wheels from two different kinds of melted metals poured in separate channels into the mold by a method patented by me September 22, 1868. In the method referred to I was unable to produce reliable car-wheels, owing to the form of the mold and the method of filling the same with the different metals. The hard iron was poured first in the mold through a number of channels, and was discharged into the rim portion of the mold to form the tread. This would spread more or less over the outer plate portion of the mold, and the soft iron having to be immediately poured it would, by the gravity of its inflowing, be forced outward and penetrate the hard iron between the discharging-channels, and destroy the chilling qualities of the hard iron, and cause the loss of the wheel. I have overcome this difficulty in the construction of cast car-wheels composed of two or more different kinds of melted metals poured separately into the mold through openings and channels by a modification of the mold in connection with the process of filling the same. I prefer to use a form of a mold that is in use for casting one variety of double-plated car-wheels; but good results can be obtained in the use of a mold in which single-plated car-wheels are cast, by my process of retaining the superior metal in its proper place, by having the proper form given to the outer plate portion of the mold, as will be more fully described hereafter.

The accompanying drawing represents a car-wheel mold that I prefer to use in my improved process of constructing car-wheels from two or more different kinds of melted metals. I form the bottom of the mold of what might be termed a "waved surface." I raise the bottom and the corresponding top of the outer plate portion of the mold at *a* some more than is customary in this variety of car-wheel molds. This raised portion of the bottom of the mold forms a barrier, to a certain extent, between the two different kinds of metals that are poured separately into the rim and central portion to compose the wheel, the purpose being to retain the superior quality of metal as near the outer portion of the mold as possible. It will then be in its proper place in the mold, and consequently a less amount of the superior composition of metals will be required, while the displacement outward of the superior metal will also be less, thereby avoiding undue admixture of the different metals in the final filling the mold with the inferior metal.

With a car-wheel mold formed substantially as described, and the mold resting in a level and horizontal position, the following is one method that I practice in filling the mold: I take the molten metallic composition from different furnaces—one supplied with the superior compositions of metals of the desired quality, the other supplied with strong cast-iron or other suitable combination of metals of less cost, but possessing the requisite strength. I take first of the strong cast-iron in a ladle holding just the quantity to fill the lower part of the mold to a predetermined point, (indicated by the dotted lines,) and pour into the central basin A. This metal will flow into the mold through the openings B between

the central core C and the main core D. This metal will be divided in its course to the bottom of the mold, a part falling to the bot tom of the mold between the central and the main core, while the other portion of this same metal will fall on the top of the main core and flow outward on the same, and also fall to the bottom of the mold without passing over the barrier that the swell at *a* affords. This quality of metal will then fill the mold to the predetermined point in the mold, (indicated by dotted lines;) and this metal, being confined at its surface near the barrier to a narrow space, will quickly subside to its proper level in the mold before the superior metal, which is poured through separate channels into the rim, has risen to the top of the barrier. This will prevent the superior metal, which is to be immediately poured into the mold, from flowing by its gravity to the inner parts of the mold. Immediately after the first metal is poured in, the desired amount of melted steel or other superior metallic composition that is suitable for the tread of the wheel is poured into the outer basin E. This metal will flow through four or more channels, F, according to the size of the wheel, and will be discharged into the outer plate and rim portions G of the mold. Simultaneously with the last flow of this superior metal I commence pouring again a sufficient quantity of the inferior quality of metal to fill the mold. This metal will take the same directions in the mold as the first metal poured, flowing outward under and on the top of the main core, and will displace and force outward the superior metal that rests against the outer periphery of the main core, and the continued flow of this inferior quality of metal will displace and force outward and upward the superior metal to fill the upper rim and tread portions of the mold.

I practice a modification of my method in pouring the inferior quality of metals into this form of a mold for car-wheels of small size by commencing to pour the different metals simultaneously. The quantities of the different melted metals, and the relative positions that the different metals occupy in the mold, I regulate by the size of the openings and channels that will convey the different kinds of metals to their proper place in the mold, which is determined by the contour of the outer plate portion of the mold. In this process of pouring the inferior metal, it must not rise above the crest of the waved surface forming the barrier before the superior metal, because there would be an admixture of the inferior with the superior metals in the rim portion of the mold that would depreciate the quality of the metal that forms the tread and flange, and cause the loss of the wheel.

I do not claim as my invention a car-wheel mold having the surface of the bottom of the outer plate portion of the mold of a waved contour in its formation, as this form of a car-wheel mold has long been in use in casting car-wheels. I also disclaim as my improvement the form of the wheel, as that is in common use. I furthermore disclaim as my invention casting car-wheels from two or more different kinds of melted metals poured separately into the mold, as that has been attempted and practiced by various persons and by several different methods; but

What I claim as my improvement, and desire to secure by Letters Patent, is—

The method herein described of casting car-wheels from two kinds of metals or compositions of metals, consisting in first introducing the inferior metal until it shall have attained the level of the barrier formed by the outer raised or swelled portion of the plates next to the rim; then introducing the superior metal to the rim portion through separate channels; and, finally, continuing the inflow of the inferior metal through its channels, to force the superior metal contained in the outer plate portion of the mold outwardly and upward, to cause the latter to fill the upper rim and tread portion of the mold, substantially as and for the purpose described.

WILLIAM WILMINGTON.

Witnesses:
ALMON HALL,
J. R. LAWTON.