

A. Alling.
Car Wheel Core.

No. 110,534.

Patented Dec. 27, 1870.

*Sectional view
 Fig. 2.*

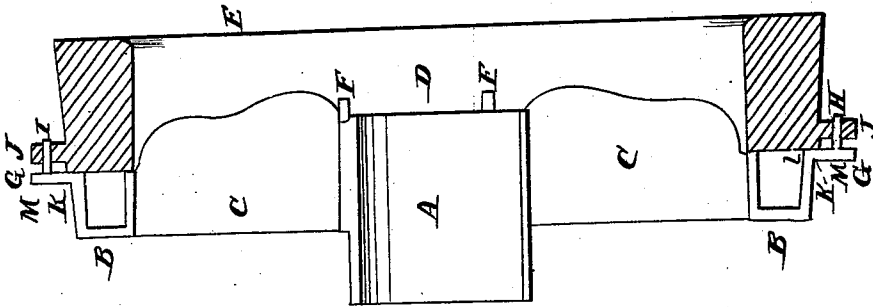
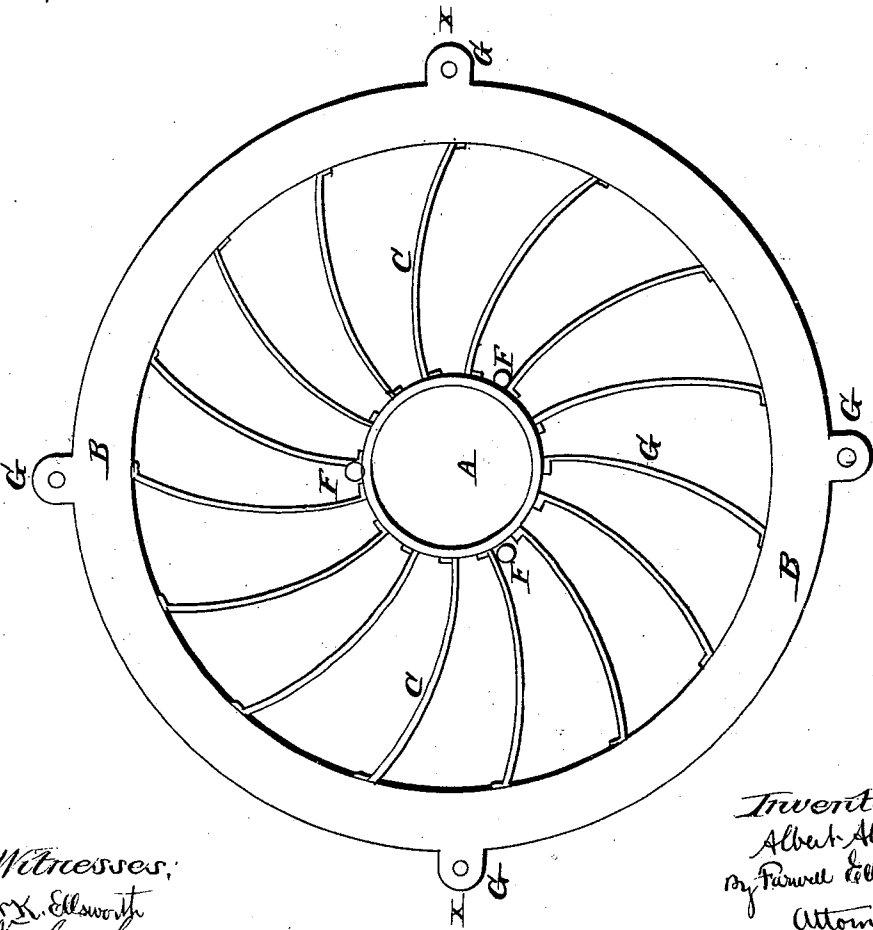


Fig. 1



*Witnesses:
 Dr. K. Ellsworth
 N. Engle*

*Inventor:
 Albert Alling
 by Samuel Colwell
 Attorney*

UNITED STATES PATENT OFFICE.

ALBERT ALLING, OF CHICAGO, ILLINOIS.

IMPROVEMENT IN COPES FOR CASTING CAR-WHEELS.

Specification forming part of Letters Patent No. 110,534, dated December 27, 1870.

To all whom it may concern:

Be it known that I, ALBERT ALLING, of the city of Chicago, in the county of Cook and State of Illinois, have made certain new and useful Improvements in Car-Wheel Copes; and I do hereby declare the following to be 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 plan view of the cope and chill; and Fig. 2 is a transverse section of the same in the line *x x*, Fig. 1.

Similar letters of reference in the accompanying drawing denote corresponding parts.

In casting car-wheels, that part of the mold called the "cope" is usually made in the form of an open wheel having a hollow cylindrical hub and a circular rim connected to the hub by radial arms. The cope is filled with sand, to form part of the mold, and attached by its rim to an annular metal chill, around the inner circumference of which the metal is poured to form the tread and flange of a car-wheel. While, therefore, the main body of the mold is composed of sand, the tread and face of the flange are formed by the chill. Owing to this construction the chill expands somewhat when the molten metal is poured into the mold, while the cope retains its original dimensions. As the rim of the cope is firmly connected to the chill, the expansion is liable to break the connections and injure the shape of the mold, or break the rim of the cope and render the latter worthless. The cope must either yield to the expansion of the chill, or become broken or otherwise injured.

The principal object of my invention is to overcome this difficulty; and to this end it consists in constructing the cope with a double rim, the outer one of which is attached to the chill, so that as the latter expands the rim shall yield to the expansion without breaking and without injury to the connection of the cope and chill.

The invention also consists in the method of connecting the cope and chill to insure the yielding of the cope-rim in proportion to the expansion of the chill, and at the same time to prevent the displacement of the former with

relation to the latter, and thus preserve the shape of the mold.

In the drawing, A is the hollow hub, and B the rim, of the cope, firmly connected together by the curved radial arms C. The rim B is made hollow or double, with its lower side open and its upper side closed, as shown in Fig. 2. It may be either formed in one piece in this manner, or of an outer and inner rim connected together by a separate top plate.

D is the chill upon which the cope rests, composed of metal and made annular in shape, with its lower inner edge, E, slightly beveled, to form the mold for the flange of a car-wheel.

In molding a car-wheel, the cope and chill are reversed, so that the chill shall be uppermost, and the hub of the cope rest upon a mold-board, or enter a hole in the same, and permit the rim B and upper edges of the radial arms to bear upon the board. In this position the cope is filled with sand, which is tamped around the runner or hub A, and slightly above the edges of the radial arms. The pattern is then placed within the chill, resting with one side upon the sand, and with the tread and face of the flange in contact with the chill.

To form a sand-mold upon the exposed or upper face of the pattern, a frame (not shown in the drawing) called a "nowel" is placed upon the chill and filled with sand, which is then tamped thoroughly, after which the nowel is lifted off by suitable means and the pattern withdrawn. An annular core is then placed within the mold surrounding the opening through the hub, around which the metal flows when poured into the mold, to make that portion of a car-wheel around the hub hollow, for the purpose of reducing the weight of the same. This core is made in the usual manner. After the core has been applied, the nowel is replaced and the whole device reversed, to bring the cope uppermost and the nowel underneath. The molten metal is then poured into the mold in the ordinary manner, causing the chill to expand rapidly.

By the old method of construction, the cope, being single and protected by sand, does not expand or contract with the chill, and is therefore subjected to such a strain as will fre-

quently cause it to break or become displaced. By means of the double rim, however, and to the fact that it bears only upon the chill at *l*, making the outer rim elastic, this strain is relieved, allowing the cope to yield to the expansion and contraction of the chill without the danger of breaking or becoming displaced.

As in the process of reversing the cope, chill, and now the core is liable to be displaced in the mold, and so render the same irregular, I arrange three or more sockets, *F*, upon the outside of the hub or runner, and in the cope, which receive the points of a series of pins attached to one side of the core. When the whole device is reversed, therefore, the core is prevented from slipping out of place.

G are lugs projecting outward from the lower edge of the outer cope-rim, and provided with downward-projecting lugs *M* upon their under sides, which fit over and in contact with the outer edge of the chill. *H* are pins or bolts connecting the outer cope-rim to the chill, by passing through the lugs *G* upon the former, and lugs *J* projecting from the latter, as shown.

The lugs *M* permit the cope to be firmly locked upon the chill, and prevent the shifting of the former in consequence of the bolts *H* becoming loose by expansion. By the shifting of the cope in the least it throws the core-pins or chaplets off their center, thus making one side of the plate of the wheel, by pressure upon the core, of less thickness, and causing a greater strain upon the thin portion of the plate.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A car-wheel cope provided with a hollow or double rim, the outer rim being adapted for attachment to the chill, substantially as described, for the purpose specified.

2. In combination with the double cope-rim, the chill, and the lugs *G*, the lugs *M*, substantially as described, for the purpose specified.

ALBERT ALLING.

Witnesses:

N. K. ELLSWORTH,
E. A. ELLSWORTH.