

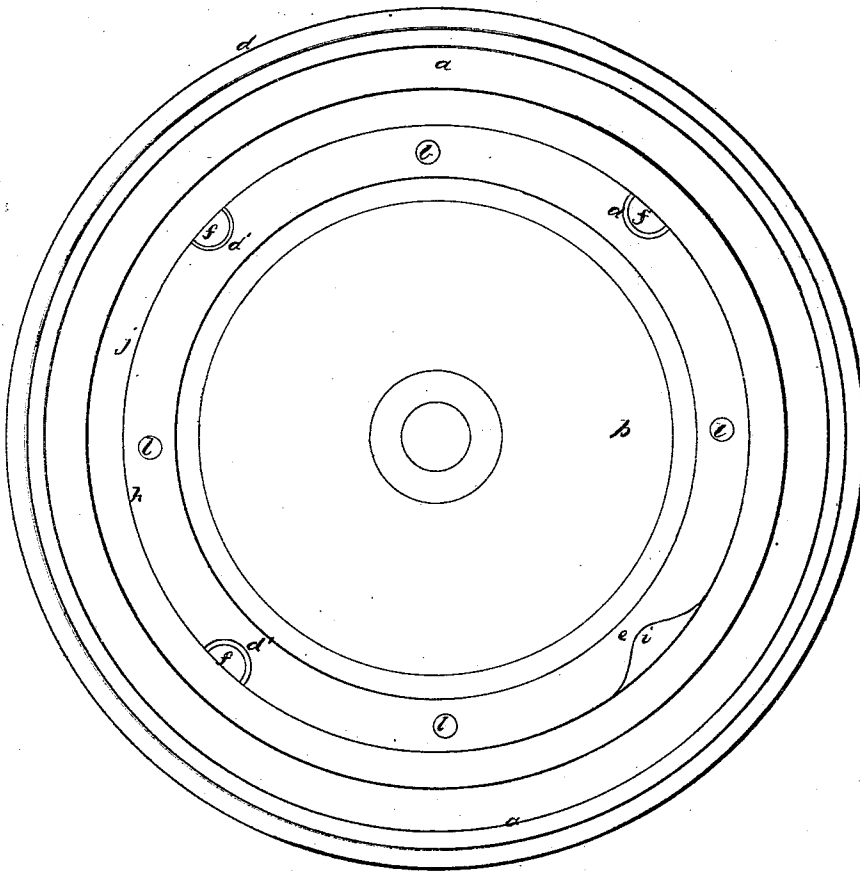
FOWLER M. RAY, Jr.

Improvement in Railway-Car Wheels.

No. 126,085.

Patented April 23, 1872.

Fig. 1.



Witnesses

W. H. Doherty
S. J. Stout

Inventor

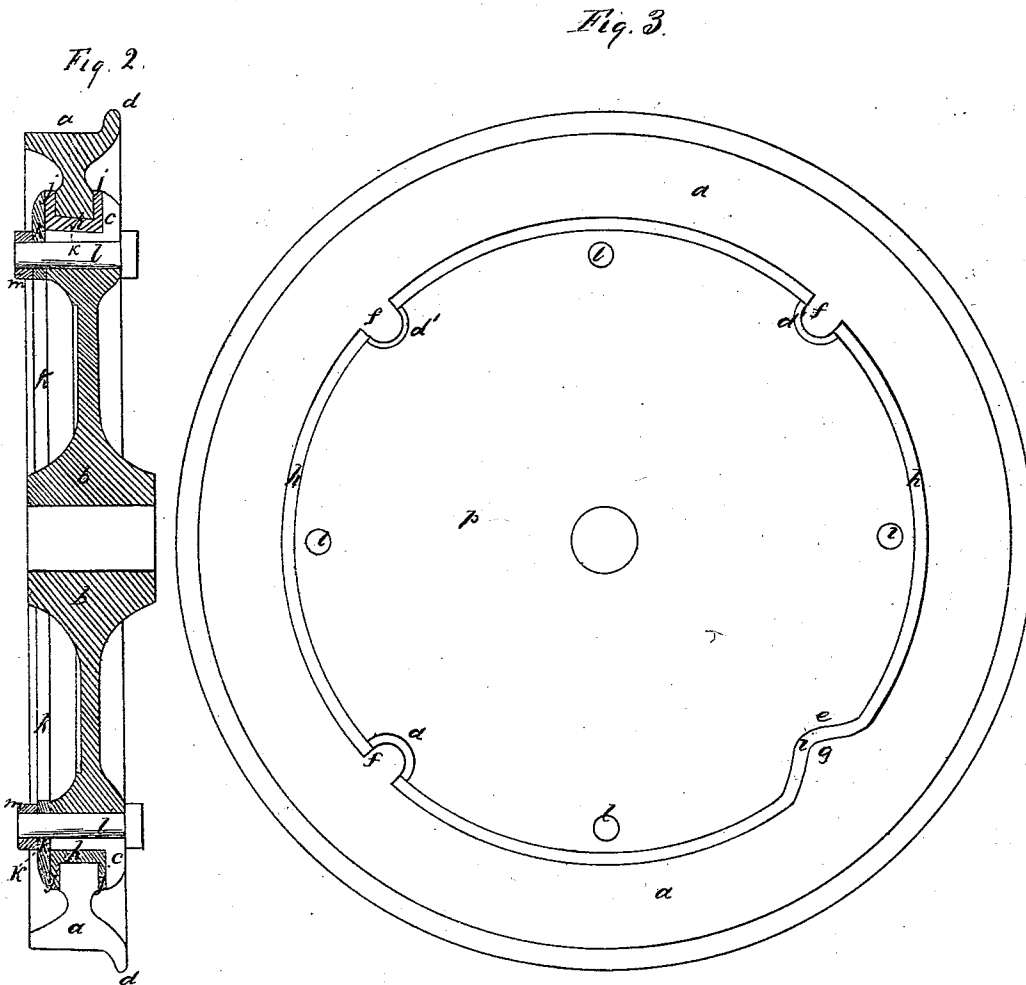
Fowler M. Ray
By James A. Woodbury
Assignee

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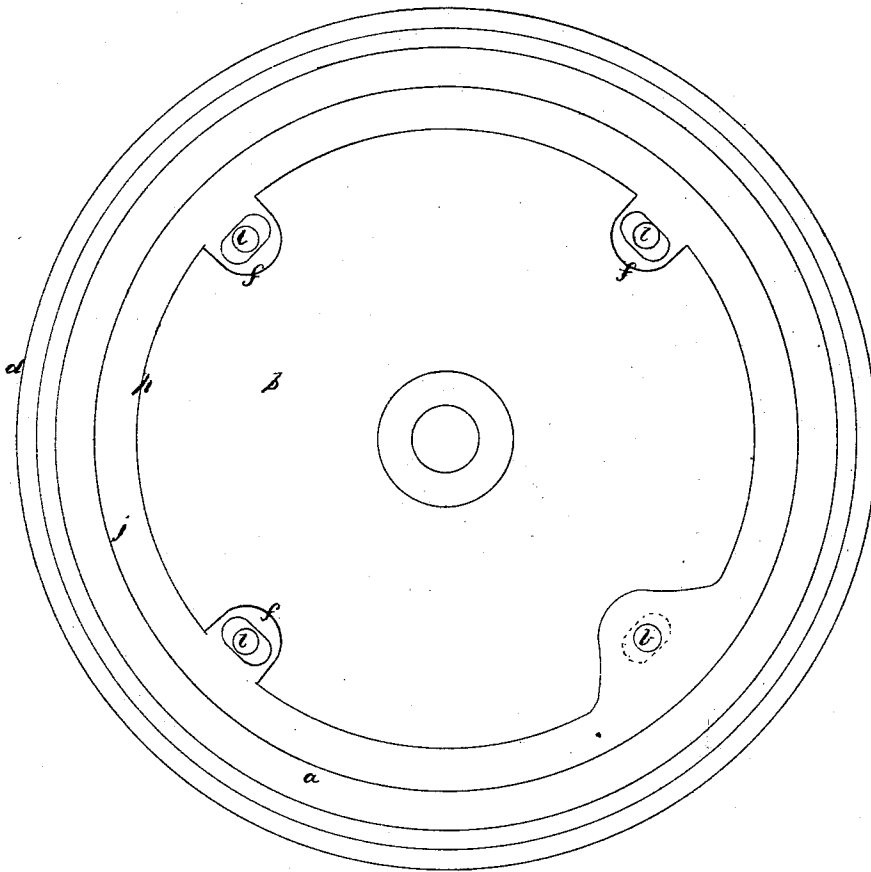
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Fig. 4.



Witnesses

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J. J. Grant

Inventor

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UNITED STATES PATENT OFFICE.

FOWLER M. RAY, JR., OF NEW YORK, N. Y., EXECUTOR OF THE ESTATE OF
FOWLER M. RAY, SR., DECEASED, ASSIGNOR, BY MESNE ASSIGNMENTS,
TO JAMES A. WOODBURY, OF BOSTON, MASSACHUSETTS.

IMPROVEMENT IN RAILWAY CAR-WHEELS.

Specification forming part of Letters Patent No. 126,085, dated April 23, 1872.

To all whom it may concern:

Be it known that FOWLER M. RAY, of the city, county, and State of New York, did, in his life-time, invent certain new and useful Improvements in Railroad Car-Wheels; and that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawing making a part of this specification, in which—

Figure 1 is an elevation of the outer face of the wheel with the securing-ring removed; Fig. 2, a section in the plane of the axis; Fig. 3, a section in the plane of the wheel; Fig. 4, another face view of a modification with the securing-ring removed.

The same letters indicate like parts in all the figures.

Letters Patent were granted to FOWLER M. RAY, bearing date the 17th day of December, 1846, for improvements in railroad wheels made in two parts, the rim being made separate from and slipped onto the inner or hub part, with an elastic substance interposed, and the whole secured together by bolts passing through flanches on each face. In the said patent there were two modifications described; in one the outer or rim part could turn on the inner or hub part, and in the other the securing-bolts were made to pass through at the intersection of the two parts, and so secured the two parts as to prevent the outer or rim part from turning on the inner or hub part. Although the said wheel presented many advantages over other wheels heretofore known, yet in practice the said FOWLER M. RAY discovered that, if made according to the modification first described, the turning of the inner or hub part within the rim on the application was a serious difficulty, as it had the effect in a short time to wear or cut away the elastic packing or cushion interposed, and the brake did not have sufficient control in arresting the momentum of a train. And if made according to the mode secondly above described, then the advantages intended to be secured by the interposition of an elastic substance between the two parts of the wheel were entirely neutralized.

The object of the said FOWLER M. RAY'S

improvements was to avoid the defects found in his said former wheels and render practically effective all the advantages contemplated. The nature of the said RAY'S invention consisted in providing a wheel made in two parts, as hereinabove pointed out, and having an elastic substance interposed, with recesses made in one of the parts to receive corresponding projections on the other part, in combination with an elastic substance interposed, by means of which construction and combination of parts the outer or rim part of the wheel will be permitted to turn on the inner part to the extent of the elasticity of the interposed substance, and no more, while at the same time the elasticity will gradually arrest the motion and prevent all shocks which would otherwise be produced by the contact of solid parts. And in this way the said FOWLER M. RAY was enabled to render practically available the use of an interposed elastic substance between the two parts of the wheel.

In the accompanying drawing, *a* represents the rim of the wheel, which may be made of cast or wrought iron; and *b*, the central or hub part, which may also be made of cast or wrought iron. If these parts are cast, the tread and flanch can be readily chilled without the danger of breaking, as when casting the whole entire; and if made of wrought-iron, the two parts can be made separately with greater facility than if made in one piece. The inner periphery of the outer part is turned or formed slightly conical from the flanch-face of the wheel, and the outer periphery of the inner part is also formed slightly conical in the reverse direction, and on the inside it is formed with a projecting flanch, *c*, so that when the flanch *d* of the tread strikes against the rail it shall be forced against and resisted by the flanch *c* of the inner part of the wheel. The outer periphery of the inner part *b* is formed with four recesses, *d' d' d'* and *e*, the one *e* being larger than the others and made flaring; and the inner periphery of the outer part *a* is formed with three projections, *f f f*, corresponding with and fitting into the recesses *d d d*, but smaller, so as to have free play therein. There is a fourth projection, *g*, correspond-

ing to the recess *e*, but much smaller. A ring, *h*, is then formed of vulcanized India rubber or other equivalent elastic substance, with its inner periphery of little less diameter than the outer periphery of the inner part of the wheel, and with a projection, *i*, just fitted to the recess *e*. The outer periphery of this ring is fitted closely to the inner periphery of the part *a* of the wheel, and with two flanches, *j j*, to embrace the faces of the said outer part of the wheel; and, in addition to all this, the said India-rubber ring is pierced in three places to permit the three projections *f f f* to protrude. After the India-rubber ring has been put within the outer part *a* of the wheel the inner part *b* is inserted until the flanch *c* comes in contact with one of the flanches of the India rubber, and then a metal ring, *k*, like the flanch *c*, is put on the other face of the wheel, and the whole drawn together tight by means of screw-bolts *l*, which pass through holes made through the inner part *b* of the wheel and near the periphery thereof, and through the metal ring *k*, the bolt-heads being on the inside face of the wheel and the securing-nuts *m* on the outside against the ring. The two parts of the wheel should be forced onto each other with great force, and by turning the nuts very tight the India rubber will be so compressed as to bring the metal surfaces of the flanch *c* and the ring *k* very nearly in contact with the faces of the part *a* of the wheel, and thus greatly increase the tension of the India rubber interposed between the two parts of the wheel. In this way the two parts of the wheel can be united and held together, and the interposition of an elastic substance between the surfaces will effectually prevent the

injurious and deteriorating effects of the jars and vibrations to which railroad wheels are exposed, and which, if the metal surfaces were in contact, would in a very short time loosen the connections and render the wheel useless. If desired, the India rubber can be interposed between all the projections on the part *a* and the part *b* of the wheel, but it has been found sufficient as represented. The said FOWLER M. RAY contemplated, in some instances, making the projections *f f f* and *g* of sufficient size to pass the screw-bolts through them, as represented in Fig. 4, making the holes sufficiently large to leave the required play around the bolts. It will be obvious that other elastic substances may be substituted for the India rubber; but the said FOWLER M. RAY preferred the vulcanized India rubber.

Having thus fully described the improvement, what is claimed therein as the invention of the said FOWLER M. RAY, and desired to be secured by Letters Patent, is—

A car-wheel made in two parts, completely isolated from each other by a double-flanged continuous ring of rubber compressed to a density at which it is always retained, part of said continuous flanged ring being forced by a projection on the tire into a recess in the hub, and the whole constituting an improved article of manufacture, in which all the strains to which the wheel is subjected—namely, direct radial strains, lateral strains, and torsion—are resisted by a part of said rubber ring.

FOWLER M. RAY, JR.,

Executor.

Witnesses:

WILL G. MULLER,
JO. C. CLAYTON.