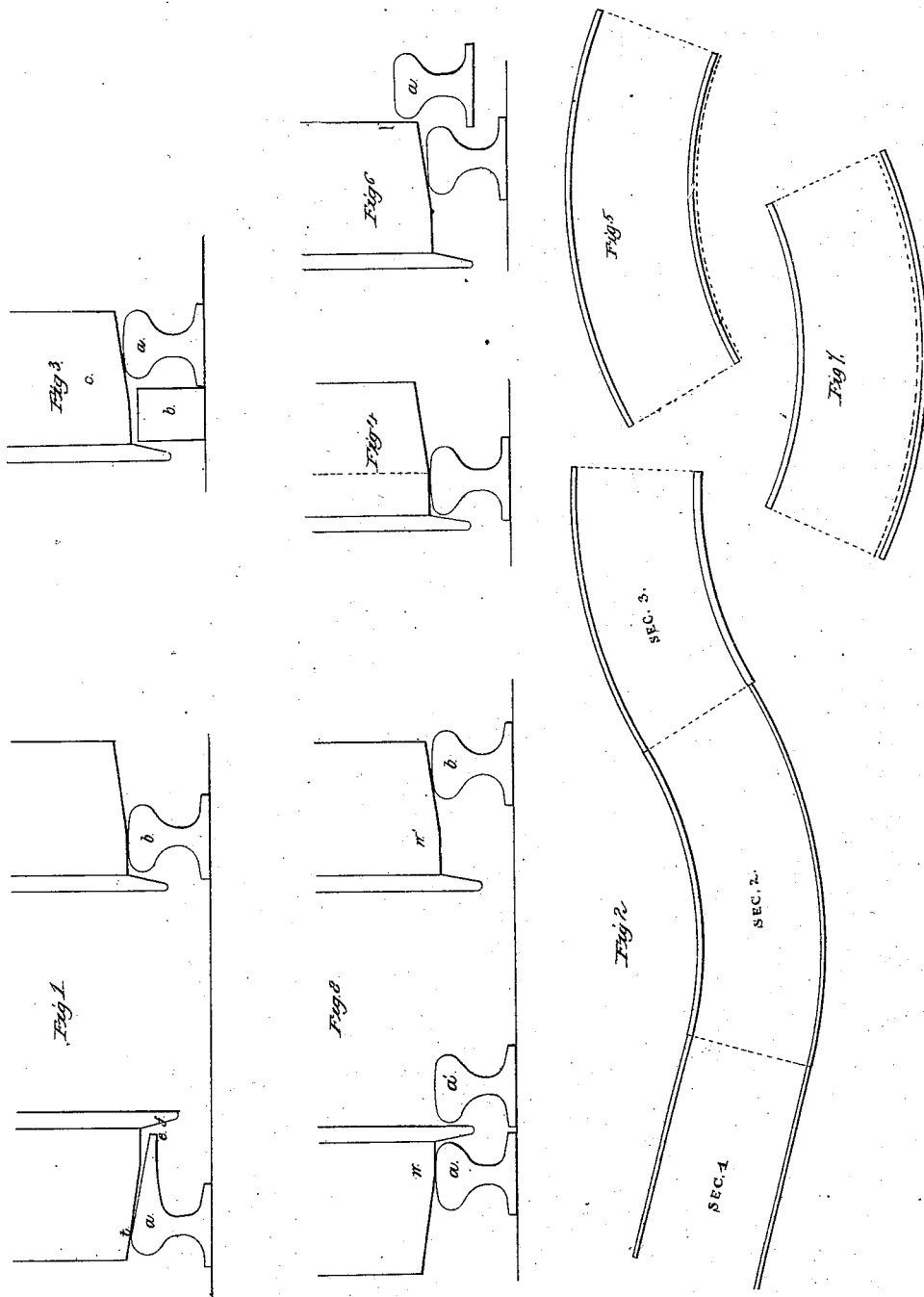


J. F. B. Flagg.
Railroad Rail.

N^o 6,042.

Patented Jan. 23, 1849.



UNITED STATES PATENT OFFICE.

J. F. B. FLAGG, OF PHILADELPHIA, PENNSYLVANIA.

RAIL AND WHEEL FOR TURNING CURVES OF RAILROADS.

Specification of Letters Patent No. 6,042, dated January 23, 1849.

To all whom it may concern:

Be it known that I, J. F. B. FLAGG, of the city and county of Philadelphia and State of Pennsylvania, have invented a new and useful Method of Turning Curves on Railroads; and I do hereby declare the following to be a full, clear, and exact description of my said invention.

The purpose of my invention is to obviate the friction which at present occurs between the rails and wheels at the curves of railroads. That friction is to a great degree caused by the fact that both wheels and rails are adapted only for running on straight lines of road, and have no adequate means of accommodating themselves to each other on the curved parts. The rails being laid parallel to each other the inner rail is, of course, a curve of shorter radius than the outer, and the wheels being fixed on the same axis and their treads of the same diameter, the wheel on the inner rail must constantly tend to get in advance of that on the outer rail.

I am aware that car wheels have been made to run into and out of depots on very short curves by allowing the outer wheel to run upon the edge of its flanch, while the inner wheel keeps on its tread as usual. I am also aware that for this purpose and for turning the curves at the corners of streets in cities, other equivalent devices have been employed, and that attempts have been made to pass the ordinary curves on the main lines of rail roads, by making the treads of wheels coning, and the axles vibratory, but the oscillatory motion of carriages running on cones without suitable lateral guides, allows of alternate and often violent movements from side to side, endangering the running of trains from the track.

The nature of my invention consists in so forming both the rails and wheels for railroads that the same freedom of motion is permitted on curves as on the straight parts of the track, when a pair of wheels is placed as usual on the same axis, and both made fast thereto. It also permits the accurate guiding by the flanches, of the horizontal, lateral movement of the wheels, doing away with the swaying, surging motion from side to side.

The alterations which I make in the rails to adapt them to the purpose of turning curves consist in giving the inner rail on the

curved part of the road a greater breadth on its upper surface, than the outer one, (which remains of the same form as on the straight portions of the track,) and in sloping or beveling said inner rail inward toward the middle of the track. The degree of inclination given to the beveled part of the inner rail is such as to prevent the tread of the wheel from resting on any part except the highest line or edge of the rail, while the lower part of the bevel of the rail is still high enough to act as a guide to the flanch of the wheel which passes over it.

In the accompanying drawing the section of my inner rail is seen at *a* Figure 1; and at *b* is represented a section of an ordinary T-rail constituting the outer rail of the curve.

The alteration in the ordinary wheels, which adapts them to the rails above described, consists in making the tread in two distinct portions,—one next the flanch, being cylindrical, or having only the slight coning of ordinary rail road wheels, and the other part comprising the remainder of the tread being more decidedly coning. The first of these portions is generally made about one and a half or two inches wide, and is intended to run on the rails on the straight parts of the road, and to keep on the outer rail while running on the curves; the second portion is designed exclusively for running on the inner rails of curves and is made from three to three and a half inches wide.

In Figs. 1, 3, 4, 6 and 8 are seen sections of the tread of the wheel showing both the cylindrical and conical parts of the tread. The dotted line Fig. 4, shows the division of the tread into the two parts above described.

From the above description it is evident that the wider the inner rail is made, the farther will the point *t* (Fig. 1) where the coning part of the wheel touches the rail *a* be from the flanch *f* which is guided by the inner edge, and consequently the smaller will be the part of the cone which runs on the inner rail and the more rapid will be the change of direction of motion. In accordance with this statement the smaller the radius of curvature of the curves on which my improved rails are laid the wider do I make the sloping part of said rails, and the larger the radius of curvature the narrower may the sloping part of the rail be made.

To pass over curves of from 400 to 800

feet radius a breadth not exceeding three inches on the surface of the inner rail will be sufficient, and on curves of less than 400 feet three and a half inches will be required.

- 5 In laying the inner rails upon curves the inner or guiding edge is laid flush with the inner or guiding edge of the rail upon the straight part or tangent of the road as seen in Fig. 2, in which figure section 1, is the
10 tangent, section 2, a curve to the left, proceeding from the tangent section 1, and section 3, is a reverse curve of less radius of curvature than section 2, and having the inner rail of greater breadth. By widening
15 the rails according to the shortness of the radius of curvature, the vibratory motion of the car from side to side of the track is prevented. I contemplate in some cases supplying the place of the sloping inner rail
20 with a separate rail within the inner traveling rail, as seen in section at Fig. 3, and in this case the guiding rail is *b*, and the traveling rail *a*. In other cases I may place on the inside of the outer rail *a* Fig. 8, a guiding
25 rail *a'* to keep the flanch of the wheel *W* in contact with its bearing rail and to bring the coning part of the tread of *W'* upon the inner rail *b*. In case neither of these devices be found convenient I may place on the out-
30 side of the inner rail an additional rail *a*,

Fig. 6, also represented by the dotted line in Fig. 5.

What I claim as new and desire to secure by Letters Patent is—

1. The giving to the inner rails on rail- 35 road curves a greater breadth than is necessary for the bearing of the wheels thereon and so sloping the side inward toward the middle of the track as to prevent any contact between the slope and the tread of the 40 wheel; while it still serves to guide the flanch of the same, and thus to allow the coning part only of the wheel to travel on the inner rail of the curve, substantially in the manner herein set forth. 45

2. I also claim, in combination with the widened and beveled inner rails of rail-road curves, the use of wheels having treads divided into two portions, the one cylindrical or nearly so and the other coning, in the 50 manner and for the purposes herein set forth, not intending in these claims to limit myself to the precise arrangements herein described but to vary the same at pleasure while I attain the same ends by means sub- 55 stantially the same.

J. F. B. FLAGG.

Witnesses:

THOS. S. FLETCHER,
THOS. FLETCHER.