G. B. FIELD.

Cellular-Rail.

No. 217,085. Patented July 1, 1879.

Fig. 1.

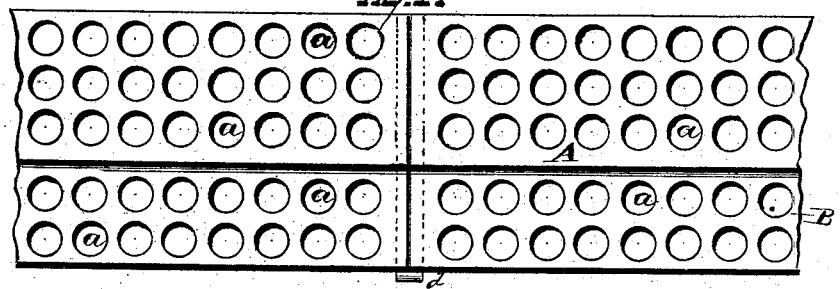


Fig. 2.

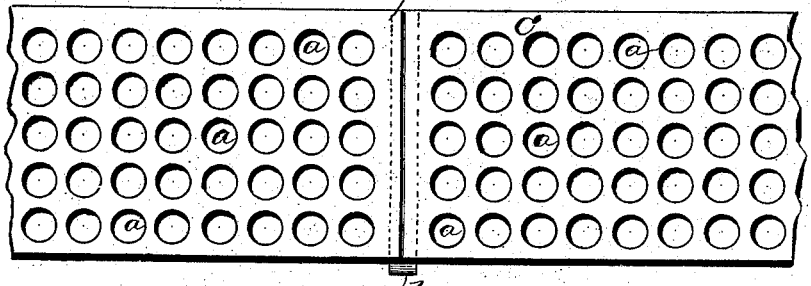


Fig. 3.

Fig. 4.

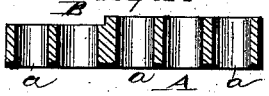


Fig. 5.

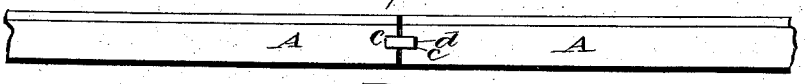


Fig. 6.

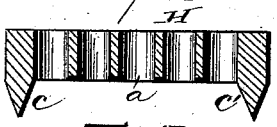
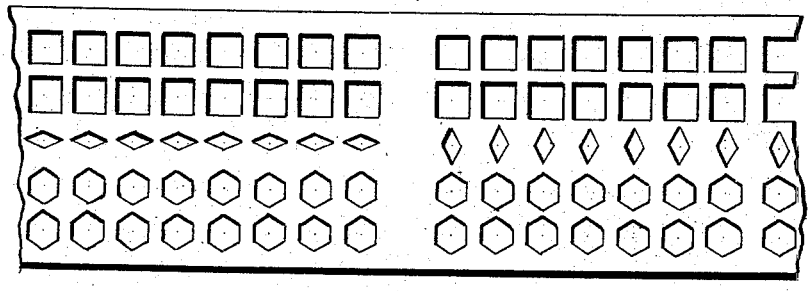


Fig. 7.



WITNESSES

E. J. Nottingham

A. W. Bright

INVENTOR

Geo. B. Field.

By H. A. Seymour.

ATTORNEY

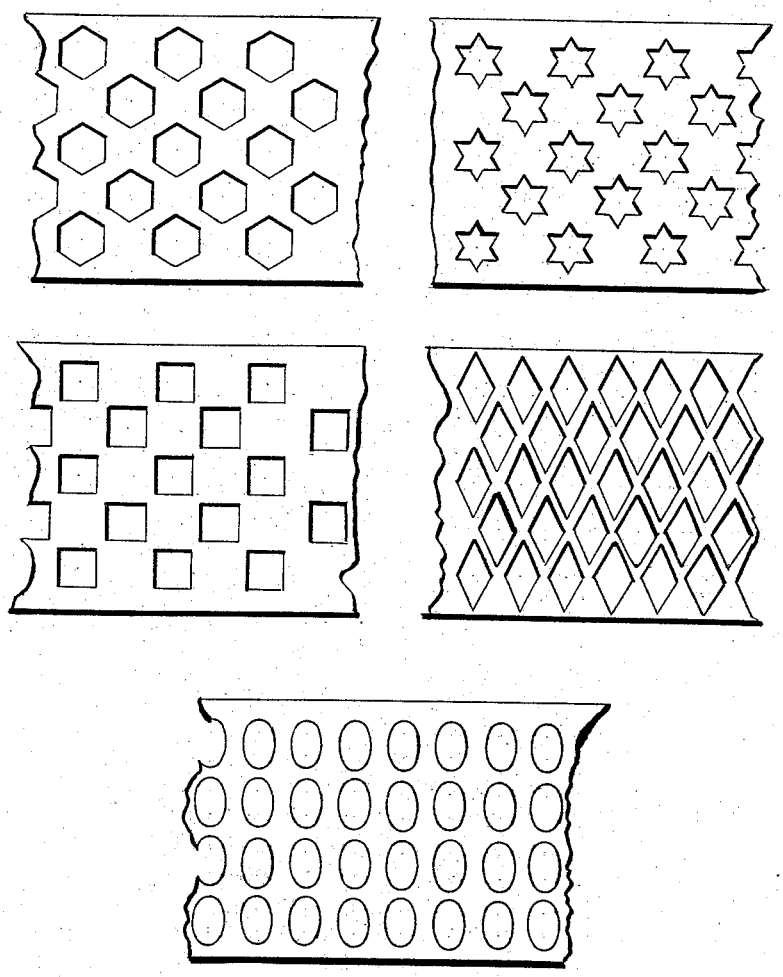
2 Sheets—Sheet 2.

G. B. FIELD.

Cellular-Rail.

No. 217,085. Patented July 1, 1879.

Fig. 8.



WITNESSES

E. F. Nottingham

A. M. Bright

INVENTOR

Geo. B. Field.

By H. A. Seymour.

ATTORNEY

UNITED STATES PATENT OFFICE.

GEORGE B. FIELD, OF NEW YORK, ASSIGNOR OF ONE-HALF HIS RIGHT TO EDWARD A. CALAHAN, OF BROOKLYN, N. Y.

IMPROVEMENT IN CELLULAR RAILS.

Specification forming part of Letters Patent No. **217,085**, dated July 1, 1879; application filed March 8, 1879.

To all whom it may concern:

Be it known that I, GEO. B. FIELD, of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Cellular Rails; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to street-rails, and is designed to provide an improved vehicle and car rail for city and country roads; the object being to concentrate all wheel traffic upon a cellular iron rail, thereby avoiding the wear of the street-pavement, and allowing the same to be constructed of less expensive material, whereas, now, in city streets, where the traffic is continuous, the whole width of the street must present a hard, smooth, and durable surface, which involves great expense of construction and repair.

A further object of my invention is to provide a cheap, durable, and smooth surface for country roads. In such case the great width, length, and weight of the rail is availed of, allowing it to be used on the same, expensive macadamizing and grading not being necessary, and requiring no outlay except that of the initial cost of the rails and the expense of placing them in operative position.

To this end my invention consists, first, in a track for wheel vehicles or cars, consisting of iron rails formed with cells extending through the rail throughout its breadth and length, and constructed of sufficient length, breadth, and weight to insure a permanent trackway for passing vehicles, said rails being arranged in parallel lines, and the space between the rails either paved in the ordinary manner or left unpaved, whereby horses may have a sure footing-surface between the rails of the track, and the wheels of passing vehicles caused to tightly pack any débris accumulating on the tread of the rails into the cells of the rails, and preserve a hard and permanent foundation for the rails of the track; second, as a new article of manufacture, a street-rail made of iron and provided with cells which extend through the rail throughout its length and breadth, said rail being constructed of sufficient length, breadth, and weight to insure a permanent trackway for passing vehicles.

In the accompanying drawings, Figure 1 represents a plan view of my improved cellular rail, showing the flange for guiding street-cars thereon. Fig. 2 shows a plan view of my improved cellular rail without said flange. Fig. 3 represents a transverse section of a track formed of flat rails. Fig. 4 represents a transverse section of track of my improved flanged cellular rail. Fig. 5 is a side elevation of the adjacent ends of two rails, illustrating the locking-key in position for securing the ends of the rails. Figs. 6 and 7 represent modifications.

In Fig. 1 of the drawings, A represents my improved cellular vehicle and car rail made with a flange, B, to guide street-cars. In Fig. 2, C shows the rail as made flat for employment on ordinary roads or streets to receive the wheels of any vehicles, whereby the flange is not necessary.

My improved rails, when made either flat or flanged, are provided with cells or perforations *a*, which may be of any suitable size, shape, and arranged in any manner desired. The cells may be round, square, diamond, hexagonal, or of any shape preferred, as my invention is not restricted to any particular form of cell.

The adjacent ends of the rails may be secured to each other by any suitable locking; and as an example of efficient means for accomplishing this result and preserving a smooth unobstructed surface upon the wearing-surface of the rails, I have represented in Fig. 5 a key, *d*, which is inserted in transverse grooves C, formed in the ends of the rails. This key may be prevented from displacement by any form of lock, and may be of any desired width to insure firm bearing for the ends of the rails under the varying temperatures to which the rails may be subjected, and by reason of which the rails are allowed to expand and contract without in any wise affecting the joints.

H in Fig. 6 shows a cross-section of a modified form of rail, with flanges or ribs *c c'* cast on its under side as another aid for retaining the rail in position.

In ordinary cases rails from twelve to fourteen inches in width should be placed about four feet and two inches apart. Thus, in instance of using rails fourteen inches in width, the entire width of the track, measuring from the outside of the rails, will be six feet and a half, which will be sufficient to accommodate all ordinary vehicles.

The cellular rails are made of considerable width and length to secure sufficient weight of material to insure a solid and rigid trackway, and preferably the tread should be of from twelve to fourteen inches in width, and the rail about fourteen feet in length.

Where curves are desired the rails may be made of short sections, and securely joined to each other by means of my improved locking-key device, or in any other desired manner.

It is desirable to make the rails of as great length as practicable in manufacture and convenient for transportation, as such increased dimensions add materially to the rigidity and durability of the trackway.

The cells *a* serve important functions, a number of which may be stated, briefly, as follows: First, the cells allow the dust and débris of the street to accumulate therein; and as such matter, consisting of gravel, sand, or coal-ashes, is continually being forced downward through the cells by the passing wheels, it operates to ballast the rails in the most perfect manner, and insure an even, unyielding bed for the continuous trackway. Again, the débris packed in the cells serves to firmly unite the rails with the surface of the road when the rails are placed directly upon the ground, and thus the rails are in great measure prevented from lateral displacement by the débris, which is continually collecting in the cells of the rails. Further, the cells seem to serve as a composite wearing-surface for each rail, the metallic portions of which afford a firm and unyielding bearing for the wheels of vehicles or of street-cars, while the sand, gravel, or other yielding matter collecting in the cells and tightly compacted therein affords a yielding bearing for the calks of horses, and thus provides a firm footing for horses in all seasons of the year. Further, the cells enable vehicles to cross the tracks with much more ease and readiness than is the case with the ordinary smooth rails, for the reason that the walls of the cells will afford sufficient bearing for the edge of the wheel-tires, in connection with the yielding material within the cells, to afford a sufficient hold for the wheels to cross the rails without slipping thereon, as is usually the case.

The space between the rails is filled in with any of the ordinary and well-known pavements, or is left unpaved, as may be desired, the object being to provide a sure and easy foot-hold for the horses, and at the same time provide a solid and firm trackway for the carrying-wheels of cars or vehicles.

The keying or locking device used may be the one explained, which is admirably adapted to obtain secure and rigid connection between the sections of the rail, is easily formed, and convenient in use. I will say that it will be desirable to have the bent end of the inserted key downward, as the accumulation of earthy matter around this end will aid to secure it in position, and it also will be entirely out of the way. However, this form of keying device may be substituted by others adapted to accomplish the same purpose.

The cells or perforations may be of any desired shape—as round, square, diamond, hexagonal, &c.—and of any relative arrangement to each other. They may, if desired, intersect each other; or, in lieu thereof, long and narrow slots may be cast in the rail, and may run in either lateral or diagonal directions.

Fig. 6 represents a modification, the same consisting of a rail having flanges cast on its outer and inner edges, which will become embedded in the earth when used on an ordinary roadway, and prevent the rail from being displaced laterally.

In Fig. 7 I have shown plan views of rails provided with cells of different forms, although the form of the cells may be varied to any extent without departing from the spirit of my invention.

If desired, each section of the rail may be further secured to the road-bed by driving stakes (two or more) through the cells, the stakes being driven down until flush with the upper surface of the rails.

This rail may be used as a substitute for the wooden cross-ties now in use on railroads, its great width and length effectually resisting the great power to which railroad-ties must be necessarily subjected. In instance of such use the rails may be secured in place and at a required uniform distance apart by suitable cross-ties of iron.

The rails should be cast with slots, lugs, ribs, or other suitable device for securing the rails in position.

I am aware that cellular iron pavements have heretofore been used, and also that rails provided with ribbed wearing-surfaces are old, and hence I make no broad claim to such construction, my invention relating especially to cellular rails, which, as far as I can learn, have never before been known or used.

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

1. A track for cars or vehicles, consisting of iron rails perforated throughout their length and breadth, and constructed of sufficient length, breadth, and weight that they will not be liable to displacement, said rails

being arranged in parallel lines, and the space between the same either paved or unpaved, substantially as set forth.

2. As a new article of manufacture, a street-rail made of iron, and provided with cells extending through the rail throughout its length and breath, the rail being constructed of sufficient length and breadth that its weight may materially assist in retaining it against displacement when in use, substantially as set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 4th day of March, 1879.

GEORGE B. FIELD.

Witnesses:

ROBERT BROWN,

HAMILTON EWEN.