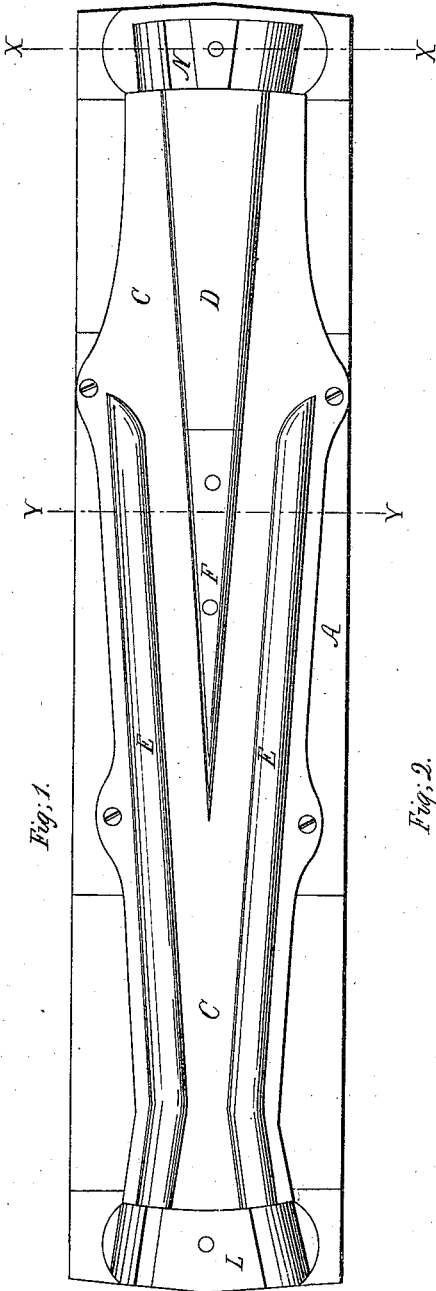


*E. G. Allen.*

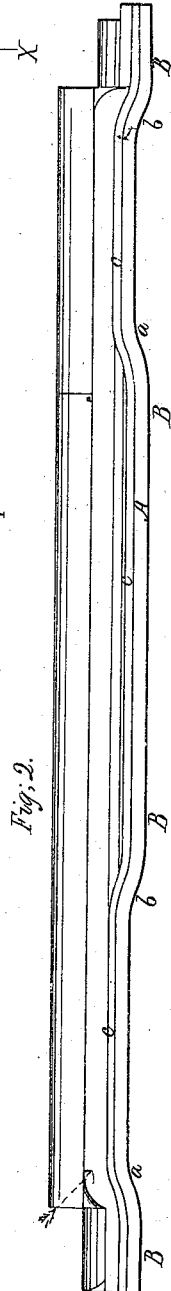
*Railroad Frog.*

*N<sup>o</sup> 54,086.*

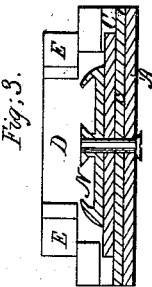
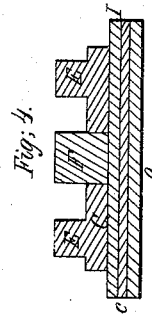
*Patented Apr. 24, 1866.*



*Fig. 1.*

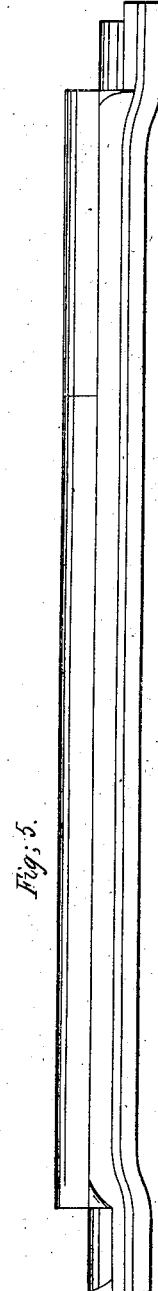


*Fig. 2.*



*Fig. 3.*

*Fig. 4.*



*Fig. 5.*

*Witnesses.*  
*John L. Hummery*  
*W. A. H. ind.*

*Inventor.*  
*E. G. Allen*  
*By*  
*John E. Ems.*

# UNITED STATES PATENT OFFICE.

E. G. ALLEN, OF BOSTON, MASSACHUSETTS.

## IMPROVED RAILWAY-FROG.

Specification forming part of Letters Patent No. 54,086, dated April 24, 1866.

*To all whom it may concern:*

Be it known that I, E. G. ALLEN, of Boston, in the county of Suffolk and State of Massachusetts, have invented a new Improvement in Railroad-Frogs; and I do hereby declare the following, when taken in connection with the accompanying drawings and the letters of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawings constitute part of this specification, and represent, in—

Figure 1, a top view; Fig. 2, a side view; Fig. 3, a transverse section on line *xx*; Fig. 4, a transverse section on line *yy*, and in Fig. 5 a side view of a changed construction.

My invention relates to an improvement in railroad-frogs, whereby the frog is made elastic, greatly strengthened, and made durable; also, in combining therewith an elastic chair.

To enable others skilled in the art to construct and use my improvement I will proceed to describe the same as illustrated in the accompanying drawings.

A is a plate, of metal, having bearings upon the ties at B B and curved up at the points *a a* and *b b*.

*c* is a sheet of india-rubber or similar elastic substance placed upon the upper surface of the plate A.

C is the frog-plate, upon which is formed the heel of the frog D and wings G, in the usual manner and of the usual form, and made from steel, iron, or other metal.

The plate C is curved at its ends *d* and *e* to correspond to the curve *a* and *b* of the plate A, allowing sufficient space for the sheet *c* of elastic material between the frog-plate C and the plate A, so that at no point does metal bear upon metal direct.

F is the point, of the usual form, made of steel or other suitable metal, and set through the frog-plate C onto an independent plate, I, as seen in Fig. 4. This plate I extends from one inner curve, *a*, to the next, *b*, as seen in Fig. 2, the elastic substance *c* lying below the plate I and between it and the plate A.

The action of the frog thus constructed is to prevent hammering, for when the wheel of the advancing truck strikes the rail-end of the wing the force is as denoted by a red arrow, Fig. 2. The elastic substance yields at the first shock. The force of the blow is thence communicated

to the curved plate A, which, being slightly elastic, owing to its peculiar curvature, yields and fully prevents the rebound always occurring when the frog is rigid. The second curve *a* in the plate A aids by resisting the forward tendency of the frog-plate.

In all frogs which are rigid, and proportionately as it approaches perfect rigidity, the wheels rebound when they strike the end of the frog, and, striking at a little distance onto the wing, soon indents the face of the wing. This indentation soon being sufficient to cause a second rebound, a second indentation is formed and the frog ruined. This renders it very dangerous for rapidly-running trains to pass over frogs without slackening speed; whereas by my improvement the peculiar double elasticity entirely prevents the rebound and fully overcomes the other difficulties named.

The second curve *a* acts in like manner and with the same result when the advancing wheel strikes the point F, and so the curve *b* when the advancing wheel strikes the rear end of the wheel D, as denoted by the arrow in blue.

The frog thus constructed is much stronger and made at little if any more cost than ordinary rigid frogs.

I have represented the point as set upon or formed a part of a plate, I, for heavy track. This is the best and proper manner of construction; but for light track the point may be set into a recess formed for it in the frog-plate C, as seen in Fig. 5. In this case I make the plate A straight between the two extreme curves *a* and *b*, placing the ties at proper distances thereunder.

A chair, L, may be formed upon the plate C, as seen in Figs. 1 and 2; but I prefer an elastic chair independent of the frog-plate. I therefore set a chair, N, upon a separate plate, *n*, which rests upon the elastic substance *c*, as seen in Fig. 3, or directly upon the elastic substance, securing it to the plate A. The advantage of this independent chair is that it facilitates the removal of the rails, which advantage will be evident to those skilled in railroad-engineering.

I do not confine myself to either of the modes described for securing the point of my frog or to the central curves of the plate A.

I hereby disclaim the use of a railway-chair

with a cushion or vulcanized-rubber support when used in the ordinary manner for the supports and connections of railroad-rails; but,

Having fully set forth and described my improvement, what I claim as new and useful, and desire to secure by Letters Patent, is—

1. A railroad-frog made elastic by the combination of the curved plate A and elastic substance *c* with the frog-plate C, substantially as and for the purpose specified.

2. The combination of the independent elastic chair N with the frog-plate C, also made elastic, substantially as and for the purpose described.

E. G. ALLEN.

Witnesses:

JOHN E. EARLE,  
M. A. HINE.