(No Model.)

A. J. MOXHAM.

ROLLED OR FORGED METAL CHAIR FOR RAILROADS.

No. 316,995. Patented May 5, 1885.

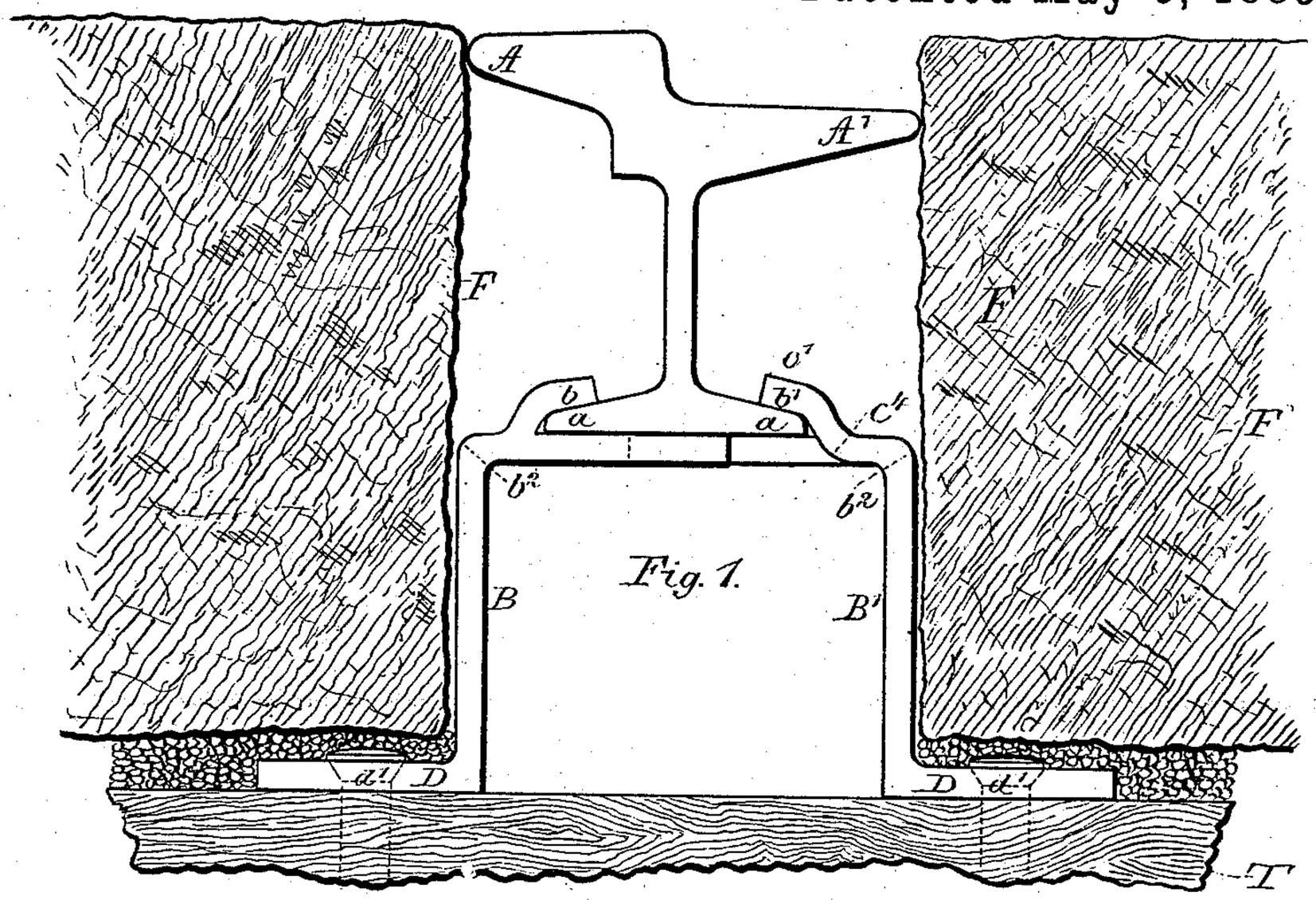

Fig. 1.

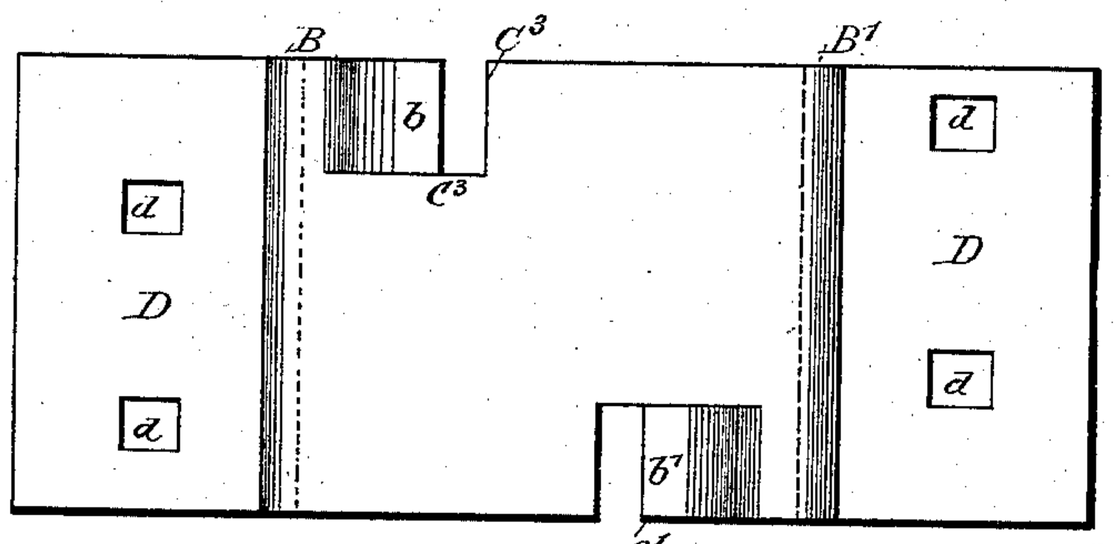

Fig. 2.

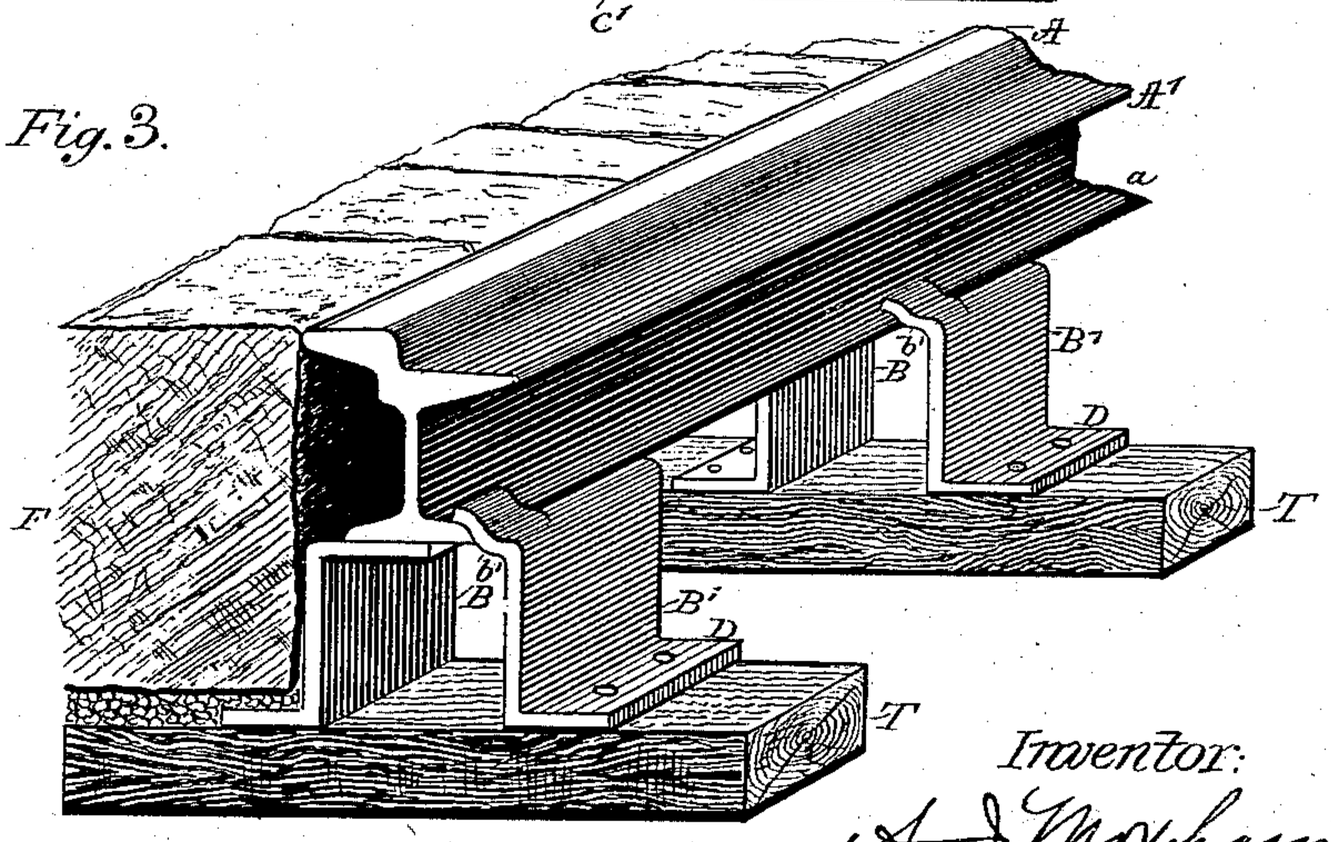

Fig. 3.

WITNESSES:
Leo Von Rosenberg
Francis P. Reilly

Inventor:
A. J. Moxham
by P. R. Dorrilas
Atty.

UNITED STATES PATENT OFFICE.

ARTHUR J. MOXHAM, OF JOHNSTOWN, PENNSYLVANIA.

ROLLED OR FORGED METAL CHAIR FOR RAILROADS.

SPECIFICATION forming part of Letters Patent No. 316,995, dated May 5, 1885.

Application filed January 19, 1885. (No model.)

To all whom it may concern:

Be it known that I, ARTHUR J. MOXHAM, of Johnstown, in the county of Cambria and State of Pennsylvania, have invented a new and useful Rolled or Forged Metal Rail-Chair for Railroad-Rails, which invention or improvement is fully set forth and illustrated in the following specification and accompanying drawings.

The object of this invention is to provide a chair of varying heights and wide base, of little comparative weight, and easy construction, strong, durable, and cheap.

The invention consists of the chair of the form and construction as hereinafter particularly described, and set forth in the claims.

In the accompanying drawings, Figure 1 is an end elevation of the chair and rail in track. Fig. 2 is a plan of the chair shown in Fig. 1. Fig. 3 is a perspective view of a rail and chair in track.

In said figures the several parts are respectively indicated by letters as follows:

A A′ indicate the extreme upper joints of a girder-rail embedded in the street-paving indicated by F F, the lower flanges of the rail being indicated by the letters *a a*.

The letters B B′ indicate the vertical sides of the chair when given the required depth to raise the rail flush or nearly flush with the street-surface.

The letters *b b′* indicate the lugs of the chairs diagonally located or "staggered."

D D indicate the angle-feet or flanges of the chairs, and *d d* the holes through the same, by which the chairs are secured to the cross-ties T T of the track by means of spikes or bolts *d′ d′*. The holes *d d*, (preferably square instead of round,) it will be observed, are likewise staggered. Danger of splitting the timber cross-ties in driving the bolts *d′ d′* through said holes is thus obviated.

The lugs *b b′* are thus formed. Lips are first formed by cutting through or parting the metal in two lines at right angles, as seen at c^3 c^3, Fig. 2. Said lips are then forced out into a die, and so shaped therein as to fit the two edges of the flanges of the rail with which it is to be used. In thus forming said lugs it will be observed that they are punched out without any loss, or, in fact, any displacement of metal. The lugs are thus made of uniform thickness throughout and of the same thickness as that of the rest of the bar or plate—say five-sixteenths of an inch minimum to seven-sixteenths maximum. The special advantage of this feature will be hereinafter set forth.

The advantage of using a chair having a flat flange or level surface where secured to the cross-ties arises from the fact that when rails are spiked directly to the ties without any such chair said rails tend to spread, because the lower flanges of the rails as well as the under parts of the heads of the spikes are beveled. Said bevels coming together cause a thrust sidewise, which thrust is exerted by the spikes upon the timber, causing it in time to yield so much that the spikes becoming loose the track spreads. The chairs, however, if introduced, act as a gage plate or bar and prevent the yielding or spreading action just mentioned. For the above reasons wider bases are desirable; but as it would not be profitable nor easy to roll such rails with continuous flanges of the necessary width, the use of chairs, and particularly of wide chairs, becomes all the more important and is more and more demanded.

The numerous desiderata which the chairs forming the subject of this invention are designed to fulfill and the way that such demands are accomplished by them will now be set forth.

First. Experience has shown that it is very difficult, if not impossible, to obtain any one positive measurement or shape of lug to fit the flanges of the rails to be used, the reason being that said flanges are seldom, if ever, exactly similar. Difference in the composition of the steels used and in the heats at which the rails are rolled, and many other contingencies of manufacture, all prevent absolute uniformity of section or shape of the flanges of the rails. The lugs or lips of ordinary chairs are therefore generally made of full size—that is, to fit the largest flanges—and hence slip loosely over the smaller or lighter flanges. If the chair be of cast-iron, its lugs of course cannot be reset or adjusted. If

made of wrought-iron, however, of the usual form the lugs of such chairs may be set down to more or less closely fit the smaller or lighter flanges of the rails used; but with such chairs as usually constructed a good fit cannot be made between lug and flange, for such lugs are made thickest at the point c^4, Fig. 1, and thinnest at the point c'; hence the point c', yielding first, clamps the flange a and the point c^4 retains its position of non-fit. If, as is shown in the drawings, the weakest point of the lug be at c^4, as will be the case if the lap or lug be made of uniform thickness throughout, then in the act of setting the lug down and over the flange a the point c^4 will come to a good bearing first upon the flange and the rest of the lug next to follow to a similarly close fit, effecting thus a uniformly close fit between all of the lip or lug and the flange of the rail.

Second. Chairs are required to be furnished in large quantities and of varying heights or depths. In such case, if made of cast-iron, much expense is entailed, for to make them rapidly a very large number of patterns must be made of each variety or shape of chair; but if made of forged or rolled metal, as herein described, every chair, though of a different height, may be made from a flat plate by simply bending such plate into the box form of greater of less height of vertical side as may be required. This work can all be done with great rapidity in an ordinary drop-press, and as the particular changes of form require but slight bends in the metal, preserving easy angles and involving no displacement of metal, said work can also all be done at a low heat. (It will of course be understood by the word displacement, as herein used, that it is meant that the thickening of metal at one part or parts is made at the expense of other parts.) The great waste of metal due to oxidation at higher temperatures is thus saved, and as it is possible to form the lips or lugs in the last pass of a set of rolls the rest of the shaping can be so quickly done that the chair can be finished complete by utilizing the heat at which it leaves the rolls, the bar or ingot being thus subjected but to a single heating operation, ending in a finished chair.

Third. This plate or box-chair, (shown in the drawings,) while of any suitable height, is, for reasons above given, made of uniform thickness throughout, and it is of importance that the points b^2, Fig. 1, should be in line vertically with the points A A′ of the head of the rail, as shown in said figure. Unless this be the case the paving blocks or sets cannot evenly meet said points and afford the desired solidity of side support. No ribs or side braces are used with or necessary to the vertical sides B B′, as would be the case with cast-iron chairs. Such ribs or braces have been found very objectionable in interfering with the close and compact fit of the paving material. It is quite manifest therefore that numerous advantages arise from making a forged or rolled chair of uniform thickness throughout in all its parts, and with no displacement of metal in shaping into form.

In addition to the above-mentioned advantages belonging to this invention, may be also mentioned the following: facility of laying the paving material or blocks to make a close contact with the chairs, rails, and track; superior strength and durability, lightness being considered when subjected to blows, cast-iron chairs of much heavier construction being liable to injury or fracture by blows from sledge-hammers when the track is being laid, when, as is often the case in driving the spikes, the chair is accidentally struck.

The chair, when made with vertical sides having a hollow interior or box form, assists in still further solidifying the structure by its additional bonding with the street-bed, the material of which flows into and fills up this hollow interior.

I am aware that plate-iron chairs having diagonally-disposed lugs are not *per se* new, and such I do not claim; but,

Having thus fully described my improved chairs as of my invention, I claim—

As a new article of manufacture, a wrought or rolled metal box-chair for railroad-rails formed of a single plate, shaped as described, and provided with two lugs diagonally placed for securing the bottom flanges of the rails, substantially as and for the purposes set forth.

A. J. MOXHAM.

Witnesses:

JAMES A. HAMILTON,

W. J. MURPHY.