

No. 770,620.

PATENTED SEPT. 20, 1904.

W. WHARTON, JR.  
RAILWAY TRACK STRUCTURE.

APPLICATION FILED MAY 4, 1904.

NO MODEL.

2 SHEETS—SHEET 1.

Fig. 1.

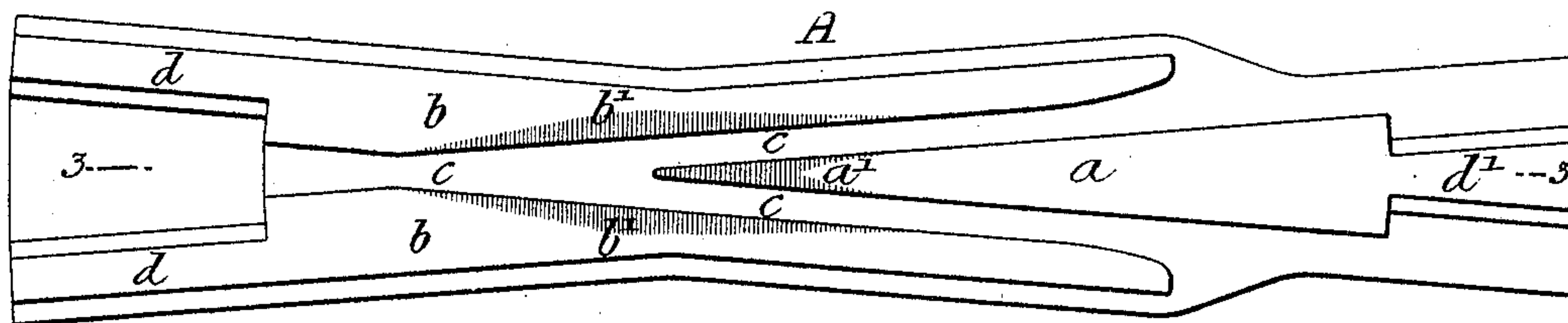


Fig. 2.



Fig. 3.

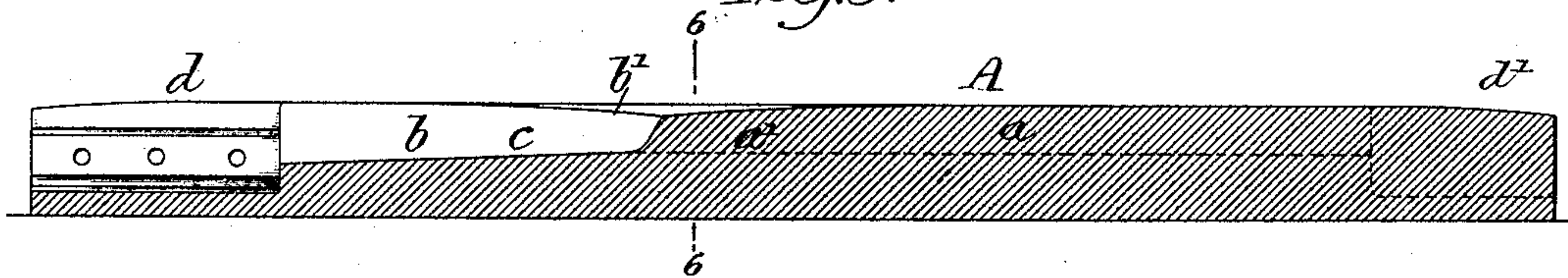


Fig. 4.

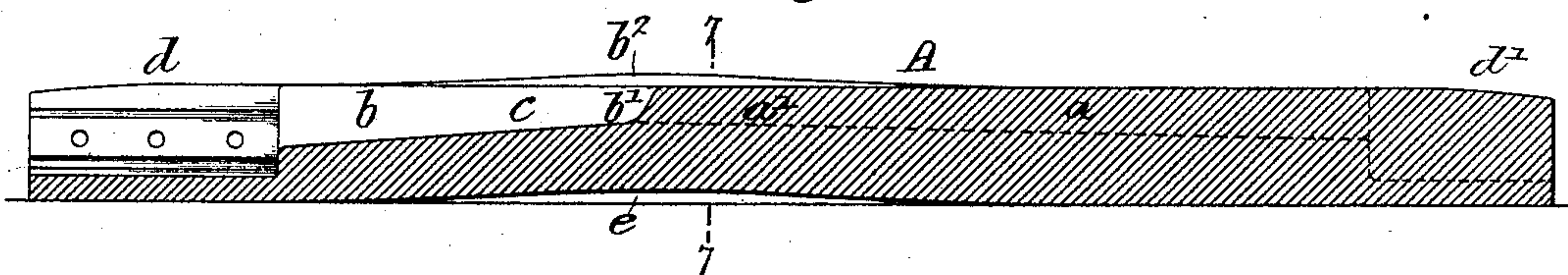
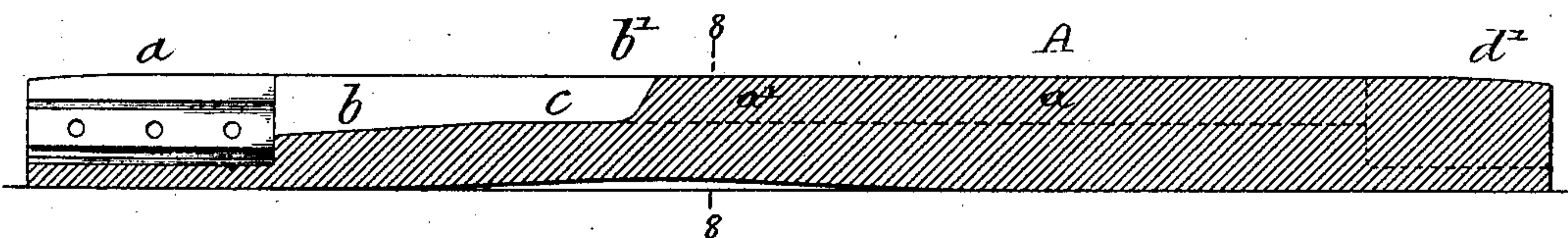


Fig. 5.



Witnesses:

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Frank L. A. Galbraith

Inventor:  
William Wharton, Jr.  
by his Attorneys,  
Hornum & Hornum

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2 SHEETS—SHEET 2.

Fig. 6.

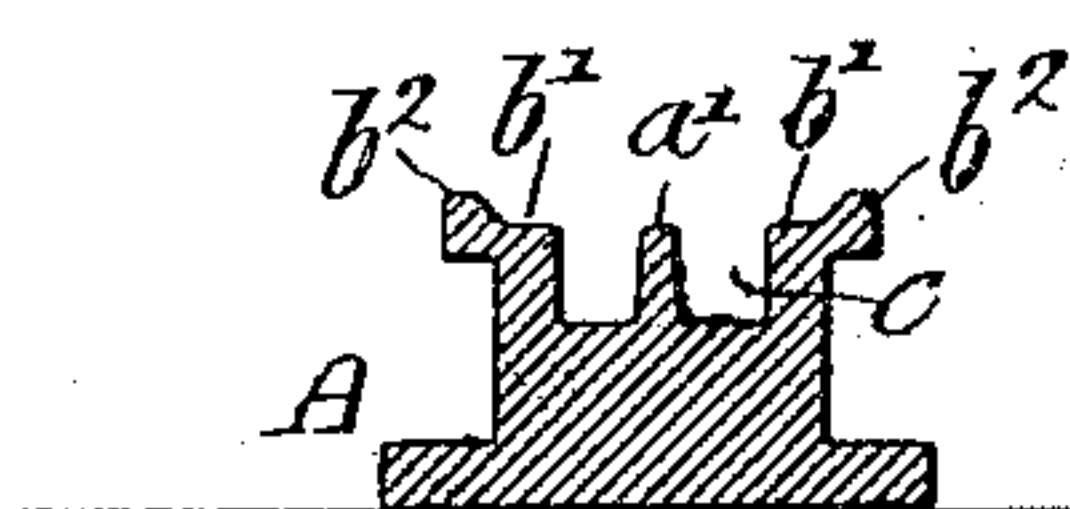


Fig. 7.

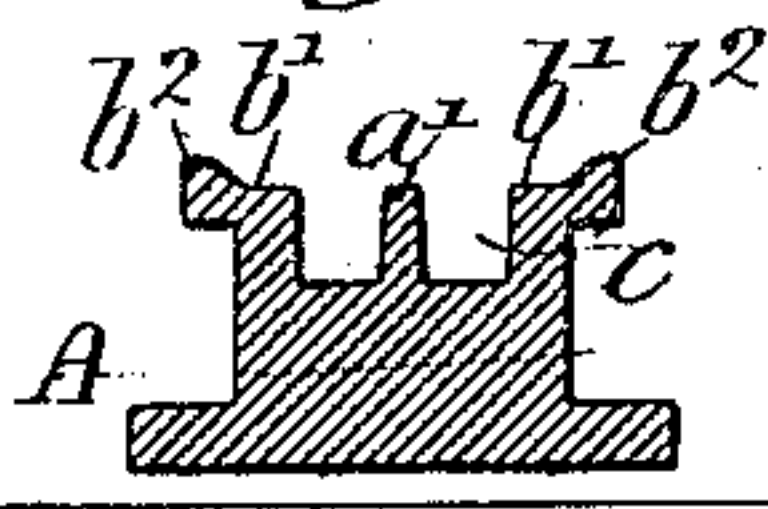


Fig. 8.

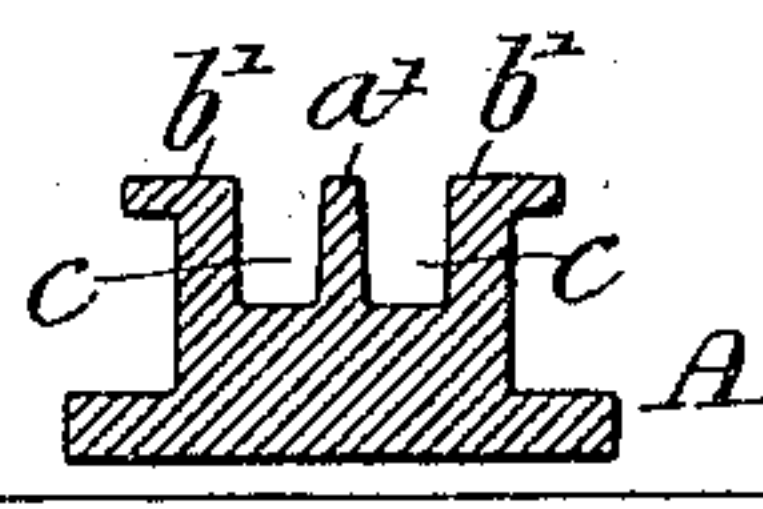


Fig. 9.

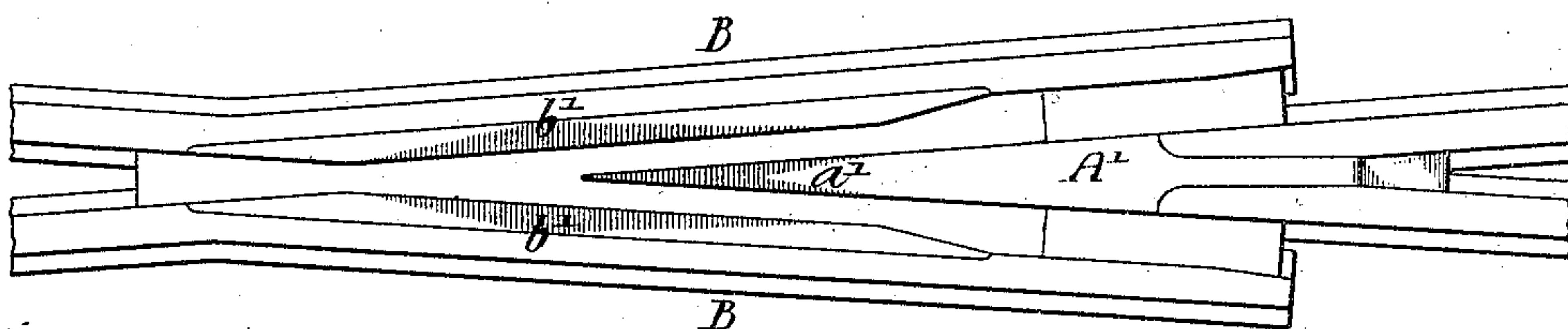


Fig. 10.

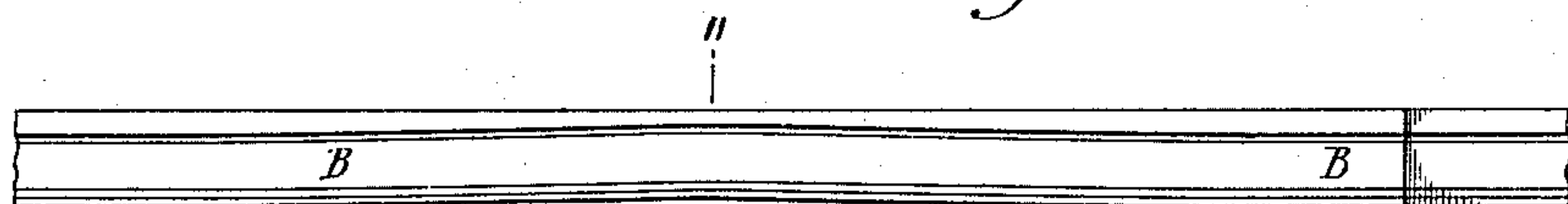


Fig. 11.



Fig. 12.

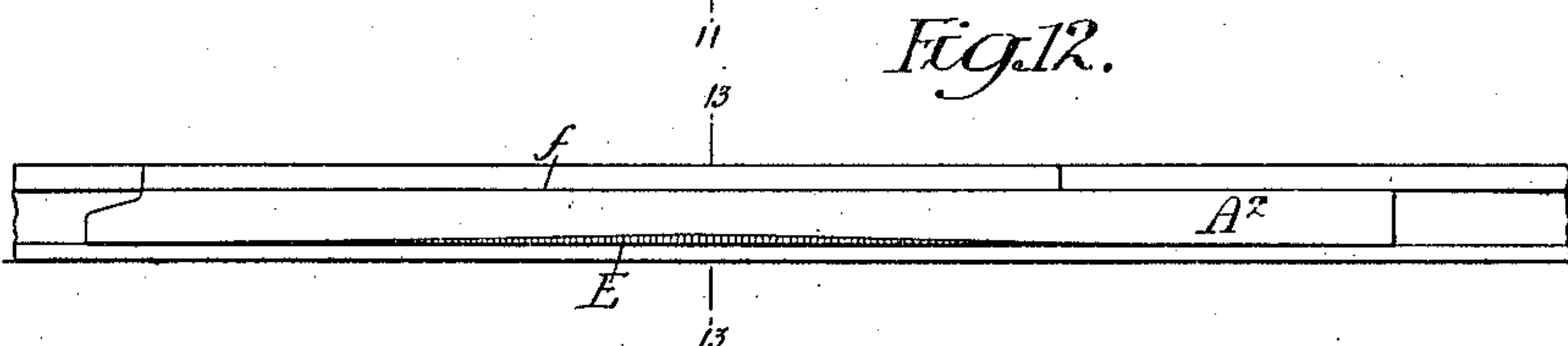


Fig. 13.



Fig. 14.

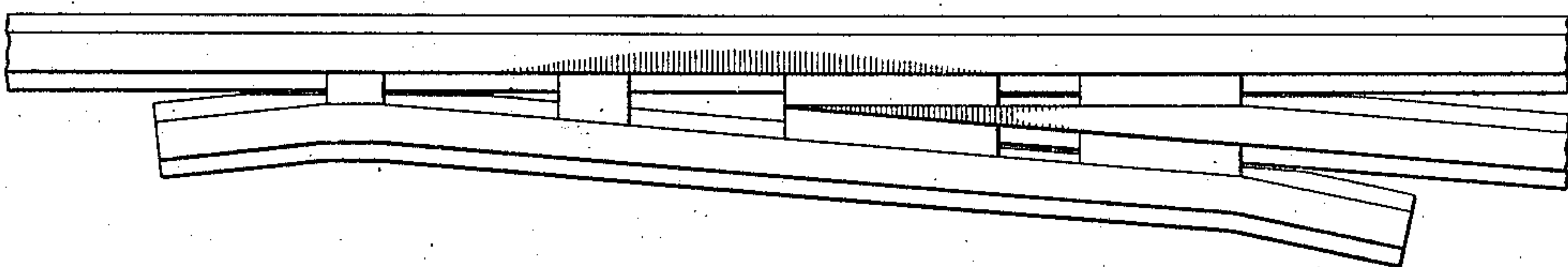
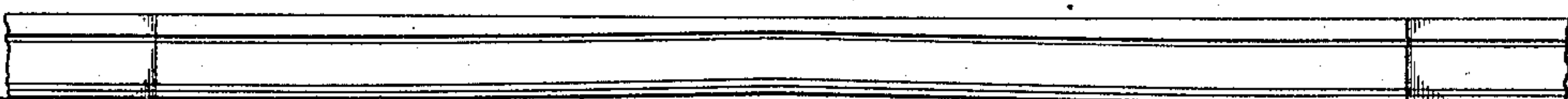


Fig. 15.



Witnesses:

Hamilton D. Turner  
Frank L. Graham

Inventor:

William Wharton, Jr.,  
by his Attorneys,  
Horn & Horn



# UNITED STATES PATENT OFFICE.

WILLIAM WHARTON, JR., OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR  
TO WILLIAM WHARTON, JR., & COMPANY, OF PHILADELPHIA, PENN-  
SYLVANIA, A CORPORATION OF PENNSYLVANIA.

## RAILWAY-TRACK STRUCTURE.

SPECIFICATION forming part of Letters Patent No. 770,620, dated September 20, 1904.

Application filed May 4, 1904. Serial No. 206,356. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM WHARTON, JR., a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented certain Improvements in Railway-Track Structures, of which the following is a specification.

My invention relates to certain improvements in railway-track structures, such as frogs, crossings, switches, and switch mates.

The object of my invention is to rehabilitate worn-out or partly-worn railway structures of the type above mentioned, so as to extend the life of the structure, as fully described hereinafter. This object I attain in the following manner, reference being had to the accompanying drawings, in which—

Figure 1 is a plan view of a worn-out railway-frog made in a single piece, showing the worn parts. Fig. 2 is a side view of Fig. 1. Fig. 3 is a longitudinal sectional view on the line 3 3, Fig. 1. Fig. 4 is a longitudinal sectional view showing the first step in the process of rehabilitating the frog. Fig. 5 is a longitudinal sectional view showing the rehabilitated structure. Fig. 6 is a transverse section on the line 6 6, Fig. 3. Fig. 7 is a transverse section on the line 7 7, Fig. 4. Fig. 8 is a transverse section on the line 8 8, Fig. 5. Fig. 9 is a plan view of a worn-out frog structure made up of a single center piece attached to independent rails. Fig. 10 is a side view of Fig. 9, showing the structure bent upward and in the finished condition. Fig. 11 is a section on the line 11 11, Fig. 10. Fig. 12 is a side view with one of the side rails removed, illustrating my invention where the center piece has been rehabilitated and mounted between new side rails. Fig. 13 is a section on the line 13 13, Fig. 12. Fig. 14 is a plan view of a worn-out switch mate; and Fig. 15 is a side view of Fig. 14, showing the switch mate after it has been bent upward and is in the finished condition.

In railway structures of the type alluded to the bearing of the car-wheels upon the surface of the structure is very much reduced at the places where the wheels cross over the throat or opening left for the flanges of wheels

traversing the other line of track, and therefore these portions of the structure are worn down to a much greater extent than the portions upon which the wheels have their full bearing. While this wearing down of the point of the frog or other structure and the adjacent parts of the side rails does not impair the strength of the frog to any appreciable extent, it nevertheless causes great injury to the rolling-stock and especially to the car-wheels, as they drop down into the worn-out space and are then suddenly jolted up again to the normal level of the track. This evil effect is aggravated as the speed at which the cars are traveling is increased, and when the worn places have been ground down or pounded down as much as three-eighths of an inch it is necessary to discard the frog and take it out of the track, although entirely strong and, excepting the worn-down parts, in good condition.

By my invention I am enabled to rehabilitate these worn structures so that their term of service will be greatly extended.

Referring in the first instance to Figs. 1 to 8, both inclusive, A is a railway-frog made of one piece of metal, preferably manganese steel, having a point *a* and side or wing rails *b b*. The adjoining track-rails are secured to the projecting end portions *d d* and *d'* in the usual manner, and grooves *c c* are formed in the structure to allow for the passage of the flanges of the car-wheels. The wearing down of the end *a'* of the point *a* and the wearing down of the adjacent parts *b' b'* of the side or wing rails *b b* is clearly shown in the sectional views, Figs. 3 and 6.

Although my invention is applicable to frogs and other railway structures made of any material, it is especially valuable when they are made of manganese steel, which while it is extremely hard is at the same time very tough and can be readily bent to the extent required without cracking or breaking. When the central portion of the structure has been worn down to such an extent that it must be taken out of the track, I remove the entire structure, place it in a suitable bending-machine, and bend it as shown in Fig. 4, thus forcing the worn portions *a' b'* of the structure up-



ward to a level with the original face of the structure and causing the unworn portion  $b^2$  of the structure to project upward beyond that level and forming a cavity or recess  $e$  under the body of the structure. The unworn portion  $b^2$  is then removed, as shown in Figs. 5 and 8, by any suitable method—such, for instance, as grinding or planing—so that the upper surface of the structure is then restored to its original uniformly level condition, the portions  $a'$  and  $b'$  being on a level with the rest of the face of the structure. The bottom of the grooves  $c c$  should then be ground down deeper, as shown in Figs. 5 and 8, so as to allow for the free passage of the flanges of the car-wheels. When the structure thus rehabilitated is replaced in the track, the cross-ties can be so adjusted as to properly support the underneath recessed portion of the structure.

In Figs. 9, 10, and 11 I have shown a frog structure in which the body portion or center piece is made of hard metal, such as manganese steel, and is secured to rails B B at each side. This is a composite structure, and, as shown in Figs. 10 and 11, it may be bent upward as a unit when worn and the unworn parts ground down to their original level, or, as shown in Figs. 12 and 13, the center piece  $A^2$  only may be bent upward and its unworn parts ground down, new side rails  $B' B'$  being secured to the restored center piece  $A^2$ . In the latter case it will be necessary to grind off or otherwise reduce the portions  $f f$ , Fig. 13, of the center piece, so that they will then go under the heads of the new side rails  $B' B'$ , and a metallic strip or strips E E of suitable shape, Figs. 12 and 13, should be placed in the vacancy between the tops of the bases of the new side rails  $B' B'$  and the bottom of the upraised center piece, so that the center piece will be supported by the bases of the side rails.

Although I prefer in rehabilitating composite track structures having a center piece to bend the center piece upwardly at or near the place where the greatest wear has occurred and so far as practicable to avoid raising its good or unworn parts, nevertheless my invention is not confined to this particular feature—as, for instance, the center piece as a whole may without any bending be upraised to the required height and then be supported upon suitable liners or fillers resting on the base-flanges of the new side rails. By this method, however, there is much more of the good or unworn portions of the center piece upraised above the original level of the surface of the center piece, and consequently there is much more grinding down of these upraised portions required to reduce them to the proper level.

In Fig. 14 I show a worn-out switch mate built up of rails, and in Fig. 15 I show a side view of the same after it has been bent upward and the upraised unworn portions

ground down to the original level of the surface of the structure.

My invention can be applied to the rehabilitation of railway structures of any kind, whether unitary or composite structures made wholly or partly of rails. The bending can be accomplished in any manner without departing from my invention, and in some cases it may be desirable to heat to a moderate degree the part of the structure to be bent.

By the term “track structure” as used in this specification and the claims I mean frogs, crossings, switches, and switch mates.

I claim as my invention—

1. The process herein described of rehabilitating railway-track structures, said process consisting in bending the structure so as to elevate the worn portions thereof, and then removing those portions of the upper surface of the structure which extend above the level of the original upper surface of the structure, substantially as described.

2. The process herein described of rehabilitating railway-track structures, said process consisting in bending the structure so as to bring the worn portions thereof up to their original level, then removing those portions of the structure which extend above the level of the original upper surface of the structure and deepening the flangeway-grooves therein, substantially as described.

3. A worn railway-track structure bent upwardly, and its upper surface restored to its original condition, substantially as described.

4. A worn railway-track structure bent upwardly, and its upper surface restored to its original position, and its flangeway-grooves deepened, substantially as described.

5. The combination in a worn railway-track structure of a center piece upraised or bent upwardly so as to elevate the worn portions thereof to their original level, with rails secured to each side of the center piece, and fillets or liners mounted between the base-flanges of the rails and the upraised bottom of the bent center piece, substantially as described.

6. The combination in a worn railway-track structure of a center piece upraised or bent upwardly so as to elevate the worn portions thereof to their original level, with rails secured to each side of the center piece, and fillets or liners mounted between the base-flanges of the rails and the upraised bottom of the bent center piece, those parts of the upraised or upwardly-bent center piece which extend above the original level of the structure being removed, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WILLIAM WHARTON, JR.

Witnesses:

JOSEPH S. LOVERING,  
HENRY C. ESLING.

It is hereby certified that the assignee in Letters Patent No. 770,620, granted September 20, 1904, upon the application of William Wharton, jr., of Philadelphia, Pennsylvania, for an improvement in "Railway-Track Structures," should have been described and specified as *William Wharton, jr., & Company, incorporated*, instead of "William Wharton, jr., & Company;" and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 4th day of October, A. D., 1904.

[SEAL.]

F. I. ALLEN,  
*Commissioner of Patents.*