(No Model.) 2 Sheets—Sheet 1.

E. B. MEATYARD.

RAILWAY.

No. 310,702. Patented Jan. 13, 1885.

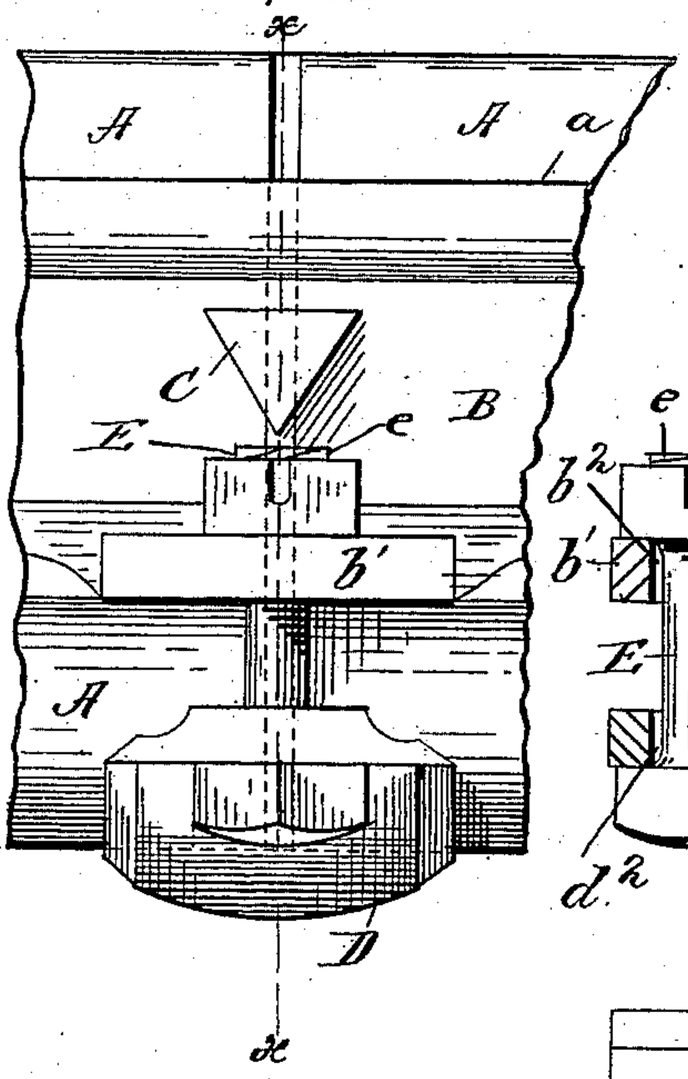

Fig. 1

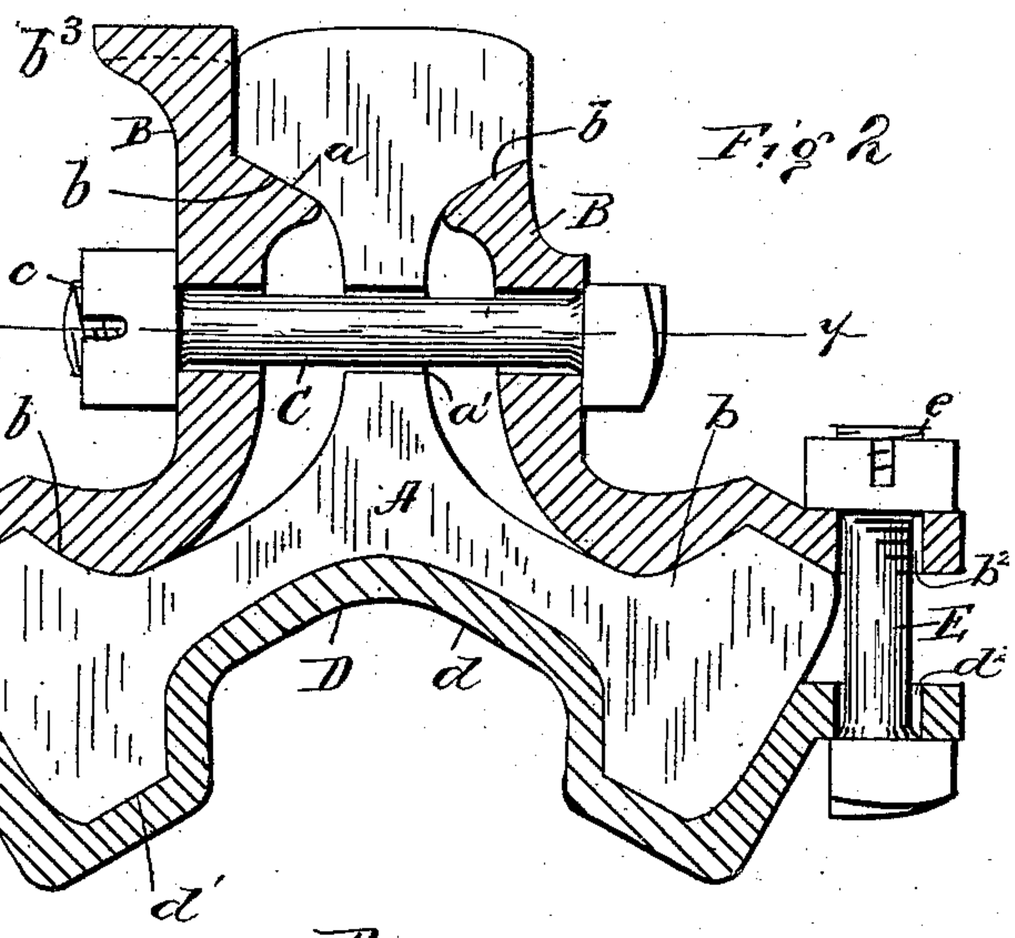

Fig. 2

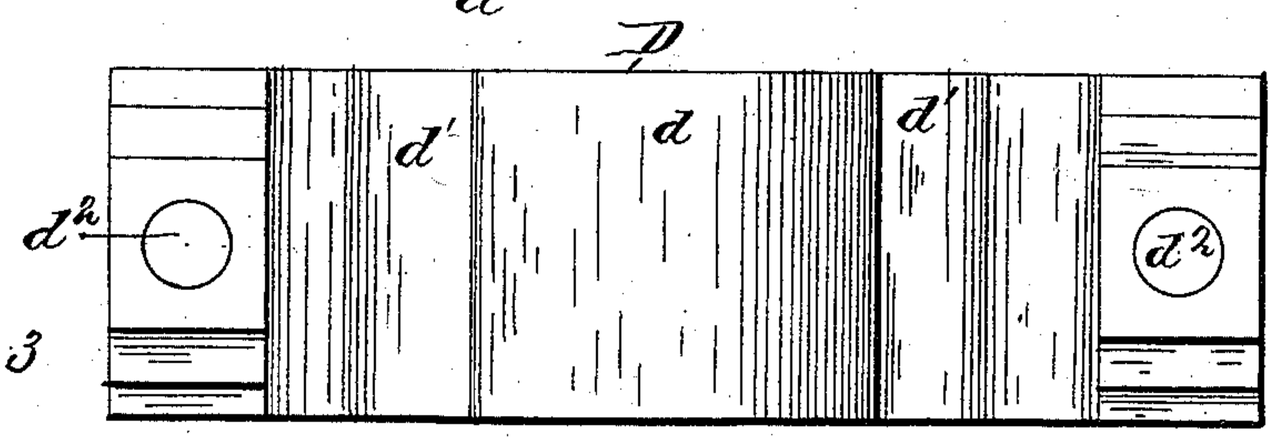

Fig. 3

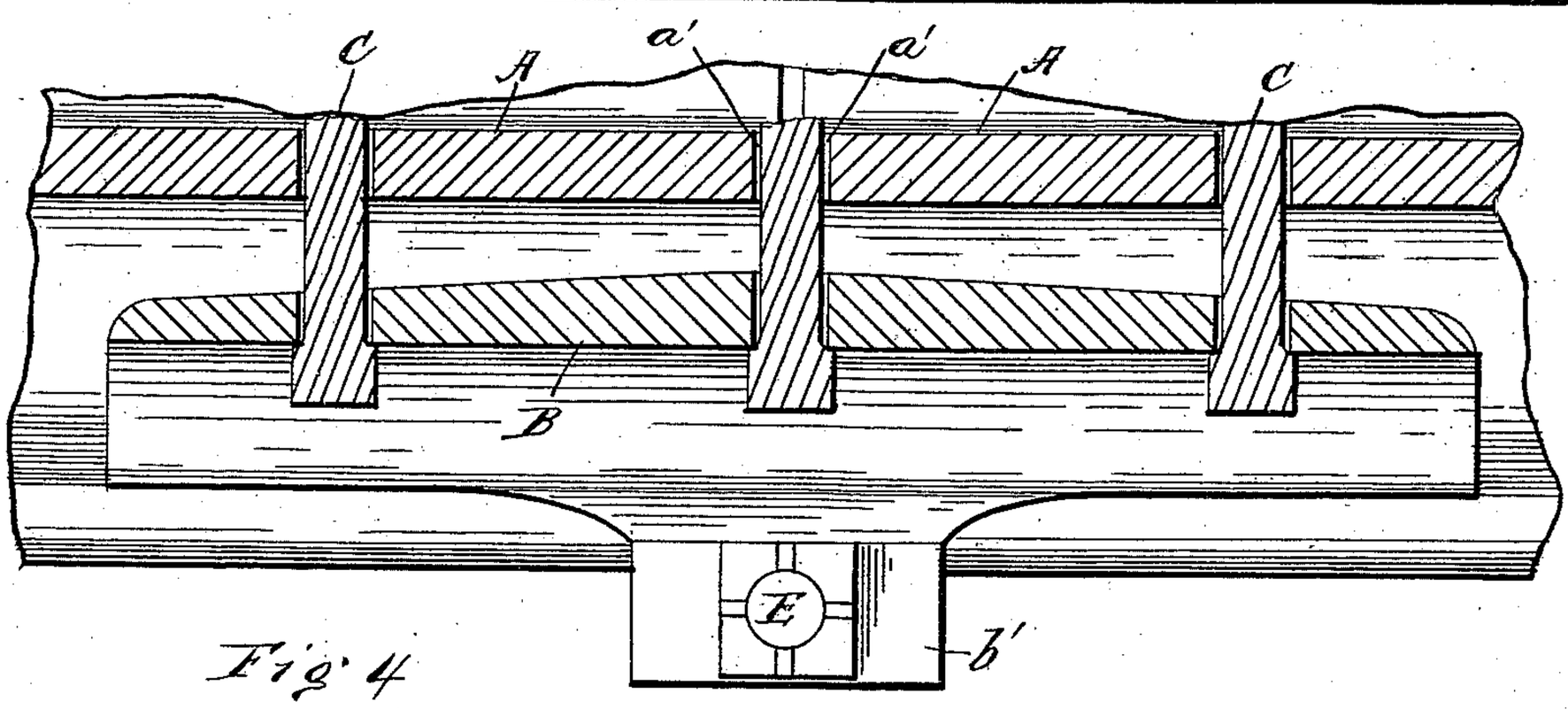

Fig. 4

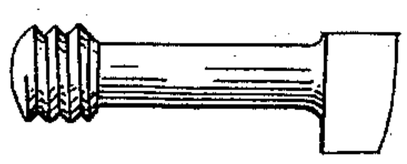

Fig. 5

Witnesses
W. C. Coales
A. W. Best.

Inventor
Edward B. Meatyard
By Coburn & Thacher
Attorneys

(No Model.) 2 Sheets—Sheet 2.

E. B. MEATYARD.

RAILWAY.

No. 310,702. Patented Jan. 13, 1885.

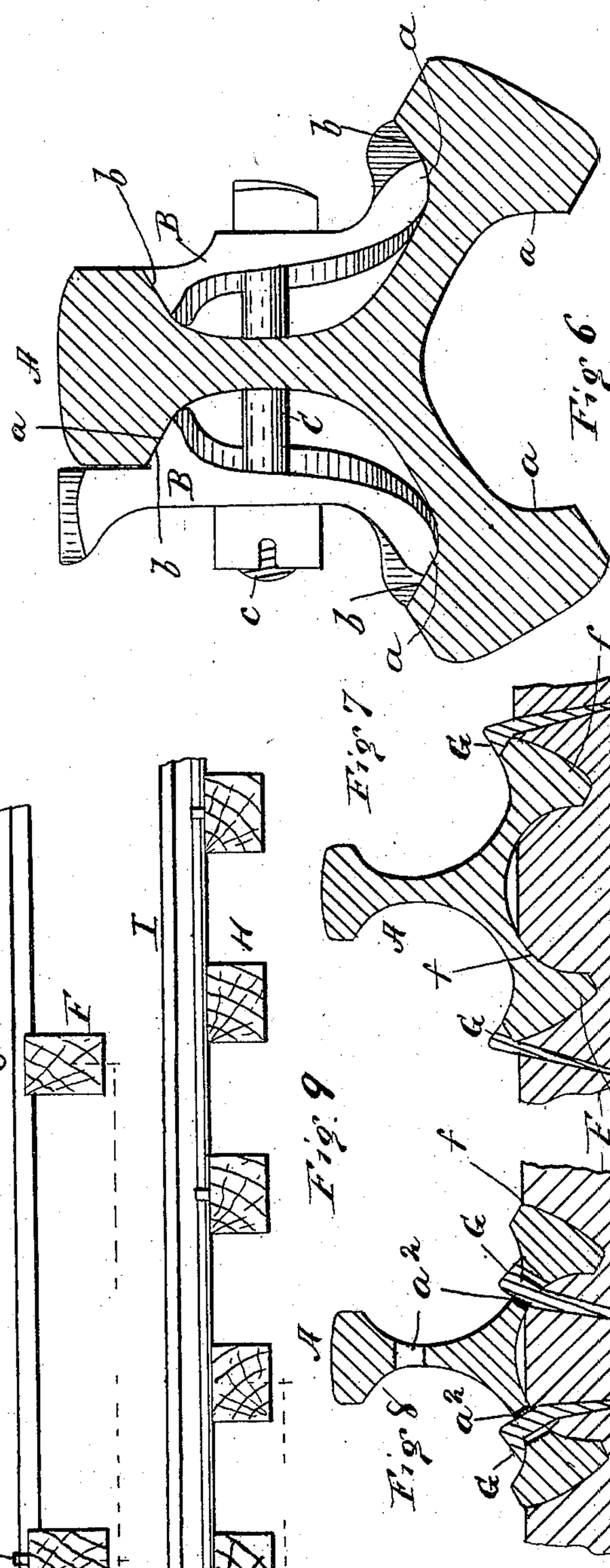

Fig. 6

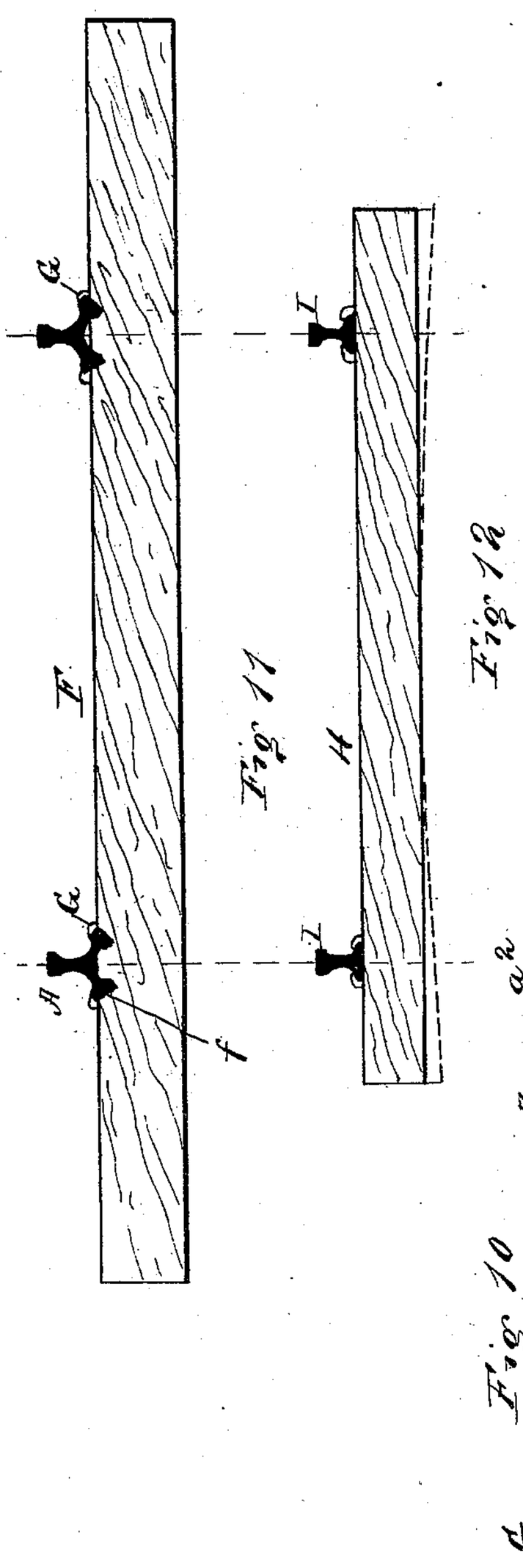

Fig. 11

Fig. 12

Fig. 10

Fig. 7

Fig. 9

Fig. 8

Witnesses
W. C. Curtis
A. M. Best.

Inventor
Edward B. Meatyard
By Coburn & Wheeler
Attorneys

UNITED STATES PATENT OFFICE.

EDWARD B. MEATYARD, OF LAKE GENEVA, WISCONSIN.

RAILWAY.

SPECIFICATION forming part of Letters Patent No. 310,702, dated January 13, 1885.

Application filed January 14, 1884. (No model.)

To all whom it may concern:

Be it known that I, EDWARD B. MEATYARD, a citizen of the United States, and residing at Lake Geneva, in the county of Walworth and State of Wisconsin, have invented a certain new and useful Improvement in Railways, which is fully set forth in the following specification, reference being had to the accompanying drawings, in which—

Figure 1 represents a side elevation of a short section of track containing my improvements, the view being taken at the joint; Fig. 2, a cross-section of the same, taken on the line *x x*, Fig. 1; Fig. 3, a plan view of an improved chair for my rail; Fig. 4, a plan section at the joint, taken on the line *y y*, Fig. 2; Fig. 5, a side elevation of one of the fastening-bolts detached; Fig. 6, a cross-section of the rail and fish-plates, showing a modification in the form and application of the latter; Fig. 7, a cross-section outside of the joint, and on a reduced scale, showing one mode of fastening the rail to the ties; Fig. 8, a similar section showing another mode of fastening the rail to the ties, on the same reduced scale; Fig. 9, a side elevation of a section of track of ordinary construction, illustrating the number of ties required; Fig. 10, a similar view with my improvements applied; Fig. 11, a side elevation of a tie with my improved rail being shown in section; and Fig. 12, a similar view under the ordinary construction of railway-tracks, illustrating the action of the ties, these last four figures being on a scale still further reduced.

My invention relates to certain improvements in various parts of the track, which are designed for use with a three-headed or tripartite rail, such as is described and shown in the application for patent heretofore filed by Elijah P. Ford, Serial No. 112,214, the object of the invention being to improve the appliances required in putting a rail of this kind into practical use.

The invention relates to the construction of the fish-plates, the chairs, the fastening-bolts, and the manner of securing the rails to the ties; and I will proceed to describe in detail the construction and operation of my invention as embodied in one practical form, and will then point out definitely in the claims the special improvements which I believe to be new and wish to protect by Letters Patent.

In the drawings, A represents a three-headed railway-rail which is substantially like that described and shown in the application of Ford, mentioned above, and which I shall not particularly describe here, reference being had to the said prior application for more specific explanation. I will call attention, however, to one feature of construction, which is that the under faces, *a*, of the rail-heads are nearly straight, and those opposite each other on adjacent heads are substantially parallel to each other, there being only a slight flare or widening of the space outward between them, just sufficient to give clearance to the rolls used in making the rails. I propose to make the joints between these rails in laying the track between adjacent ties, and to employ a fish-plate splice at these joints. The fish-plates B may be made somewhat shorter than usual, on account of the greater strength of the rails, and I curve them slightly, and construct the upper and lower edges, *b b*, thereof so that they will exactly fit the inside *a* of the two heads between which the fish-plates are arranged, the latter being made of sufficient width to entirely fill this space between the two under faces of said heads, as shown in Fig. 6 of the drawings. The body of the fish-plate extends, as shown, from one of the faces to the other in such a manner as to be clear of and free from contact with the vertical web of the rail, whereby the elasticity of the fish-plate is allowed full play and the joint rendered better able to resist sudden shocks. Track-bolts C are passed through the fish-plates and rails in the usual manner; but one of these bolts I arrange directly at the meeting-point of the rails, passing it through the space between the ends of the rails, as shown in Figs. 1, 2, and 4, of the drawings, the end of each rail being provided with a shallow groove, *a'*, to accommodate the passage of the bolt. It will be seen that the edges of the fish-plates rest against faces substantially parallel to each other; hence there will be less tendency to move outward, and the fish-plates will be held in their position, even under hard service, with very little strain upon the track-bolts. This construction provides a simple fish-plate splice,

which is sufficient for ordinary purposes; but it will be desirable in some places to make a stronger splice, and for this purpose I provide a chair, D, which is curved upward along its central portion to form an arch, *d*, which fits the curving arch on the under side of the rail. The chair is also formed with depressions *d'*, adapted to receive the sides of the respective heads of the rail forming the base, and the ends project out a short distance horizontally, so as to provide for the bolt-holes d^2. The chair thus constructed fits the under side of the rail, as shown in Fig. 2 of the drawings. The lower edges of the fish-plates B, immediately at the joint between the rails, are extended outward so as to form a projecting flange or lug, *b'*, extending out over the upper portion of the base-heads of the rail directly over the ends of the chair. Bolt-holes b^2 are made in these projections, and the fish-plates and chairs are securely fastened together by short bolts E, provided with heads and nuts. A very strong joint is thus made, and it is obvious that the arching of the chair tends to increase its strength. This, in connection with the track-bolt between the ends of the rail, will take up instantly the downward thrust at that point. For very heavy traffic I also provide an additional means for strengthening the joints and relieving the wear at the end of the rail in case the joints are open. This is in the shape of a flange, b^3, projecting upward from the outside fish-plate, and extending some little distance along the end of the rail, being flush with the tread of the rail, and therefore taking a good portion of the strain brought upon the ends of the rails by the wheels, and providing an even surface for the wheels to roll upon at the joints. These flanges b^3 are sloped downward at each end.

Both the track-bolts and the chair-bolts are made with the threaded ends *c* and *e* larger than the body of the bolt, the excess being at least as great as the depth of the thread. This form should be given the bolts without upsetting. This construction makes the bolts somewhat elastic, the body being smaller than the heads, and threaded sections will yield somewhat lengthwise, and the increased size of the threaded ends in solid metal will afford a stronger hold for the nuts, which will be sufficient to produce this elastic yielding of the body instead of stripping off the threads, which would occur if the ends were of usual size.

The ties F which I employ are preferably set edgewise, and their upper surfaces are notched, as at *f*, these notches being adapted to receive the base-heads of the rail, thereby providing a seat for the rail in each of the ties.

For the ordinary fastening of the rails to the ties I use spikes G, driven into the ties on the outside of each head of the rail, and the heads of the spikes fitting the upper edges of these heads, as shown in Fig. 7 of the drawings; but about midway of the length of the rail, at one or more of the ties, the fastening-spikes are driven through holes a^2 in the opposite webs of the rail, as shown in Fig. 8 of the drawings, thereby pinning the rail positively to the tie at those points, and thus compelling the change of length due to change of temperature to be substantially the same at each end of the rail, these changes being from this central fastening, which is permanent, toward each end, instead of through the entire length of the rail in one direction or the other, which may be the case with the ordinary mode of spiking rails to ties. With this form of rail and my improvements the ties may be placed from four to five feet apart from center to center; but where joints occur the two adjacent ties should be not more than three feet apart from center to center.

In ordinary railway-tracks at the present time the ties H are laid flatwise, and with the ordinary rails must be laid near together, usually less than two feet apart from center to center. With the ordinary rails and ties laid in this way there is liability to spring the ends of the ties more or less, as shown in dotted lines in Fig. 12 of the drawings, which difficulty is obviated with the three-headed rail and ties F used, as described above, in connection therewith. It may be desirable to make the ties longer than usual in some instances, for the purpose of obviating the sagging or springing at the ends.

These improvements applied to the three-headed rail provide a permanent way, and also operate to reduce the noise at the joints, prevent the rocking and swinging of the cars, and reduce the danger of accident incident to broken rails, spreading rails, loose spikes, loose joints, open joints, and the creeping of rails on grades.

Many cautious engineers object to rail-joints between ties. In the ordinary construction the fish-plates are narrow and long, and they have so much bevel at their edges that it is almost impossible to fasten them against the strains from heavy loads. The ordinary bolts will break before they yield elastically, and on most ordinary lines a safe, snug, fish-splice, which will make the rail strong and safe at its joints, is an exception and rarely seen. The triple-headed rail, when made with a depth of about seven inches, and with sufficient metal to make it safe, will furnish ample room between its upper and lower heads to make a suspension fish-splice as strong as the main body of the rail, if the splice is made, as described above, with wide plates filling the space between the heads, and having its upper and lower bearings nearly parallel, the adjacent ties being also placed somewhat nearer together than at other points, as mentioned above. As the fish-plates are shortened to just the length requisite, there will be no danger from bent plates, and with the provision of one track-bolt between the two rail ends the

main strain at the joint will be met promptly. The track-bolts being made with the body smaller than the threaded ends as well as the heads, they can be stretched to their elastic limit without unduly taxing the metal in the threaded portions or under the heads, and this will obviate the danger of slack bolts. When the ties are notched to fit the base of the triple-headed rails described, they will present a non-metallic bearing for the rails, will keep the latter to gage without depending wholly on the spikes, and will also augment the stability of the rails.

One fruitful source of accident from "unknown cause" is believed to be the liability to open joints in the ordinary construction of railway-tracks, where under reduced temperatures some of the joints may be opened more than others, thus unduly weakening the fish-splices. It is common to see openings one, two, and even three inches between the ends of two rails. The fastening of the rails positively to one or two ties about midway of their respective lengths, and with due care in laying the rails so as to have snug joints at a temperature of, say, 120° Fahrenheit, will ordinarily prevent the opening of any joint to exceed one-half an inch with rails of forty-five feet in length and with temperature reduced to 20° below zero.

In addition to these advantages, there are the benefits derived from the greater strength of the rails due to their form and construction, a great saving in the number of ties required, and also a saving in the wear of the rolling stock due to a less amount of vibration, for with the ties placed four or five feet apart the wave of flexure in the rails will be long as compared with that of the flexure when the ties are about one and three-quarters feet apart, which is the usual distance. With these long waves of flexure I believe a great increase of speed may be obtained without danger.

All the advantages due to the particular form of the rail are of course obtained in the application of my improvements; but this particular form of the rail itself is not my invention, and I lay no claim to it here, except in connection with my improvements.

I do not wish to be understood as restricting myself in all details to the exact construction and arrangement of all the parts which are described above and shown in the drawings, as they may be modified in some respects. I have aimed to show and describe such a construction and arrangement of the parts mentioned as I believe will produce the best results; but, with some changes and substitutions, very good results, much superior to those obtained ordinarily, may be obtained.

I am aware of German Patents No. 3,536 of 1878 and No. 9,564 of 1880, and do not wish to be understood as claiming anything therein shown or described.

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

1. A three-headed railway-rail, in combination with fish-plates of a width equal to the space between two adjacent heads, and track-bolts the bodies of which are considerably smaller than the threaded ends and the heads without upsetting, substantially as and for the purposes set forth.

2. A three-headed railway-rail, in combination with a chair shaped to conform to the arching base of the rail and extending beyond the latter on each side thereof, fish-plates of a width equal to the space between the adjacent heads of the rail and provided with projections at their lower edges extending outward beyond the rail-heads over the ends of the chair, track-bolts for connecting the rails and fish-plates, and chair-bolts for connecting the fish-plates and chair together, substantially as and for the purposes set forth.

3. A three-headed railway-rail, in combination with fish-plates of a width equal to the space between adjacent rail-heads, and the outer one provided with a flange projecting upward flush with the face of the upper rail-head, substantially as and for the purposes set forth.

4. A three-headed railway-rail, in combination with ties provided with notches adapted to receive the arching base of the rail, substantially as and for the purposes set forth.

5. A three headed railway-rail, in combination with ties provided with notches adapted to receive the arching base of the rail, the said rail being provided with holes through its respective webs about midway of its length, spikes driven through the said central holes in the base-webs into the ties, and spikes driven into the ties outside of the base-heads of the rail, and having their heads adapted to close down upon the upper edges of the respective heads of the rail, substantially as and for the purpose set forth.

EDWARD B. MEATYARD.

Witnesses:
JOHN C. MACGREGOR,
A. M. BEST.