

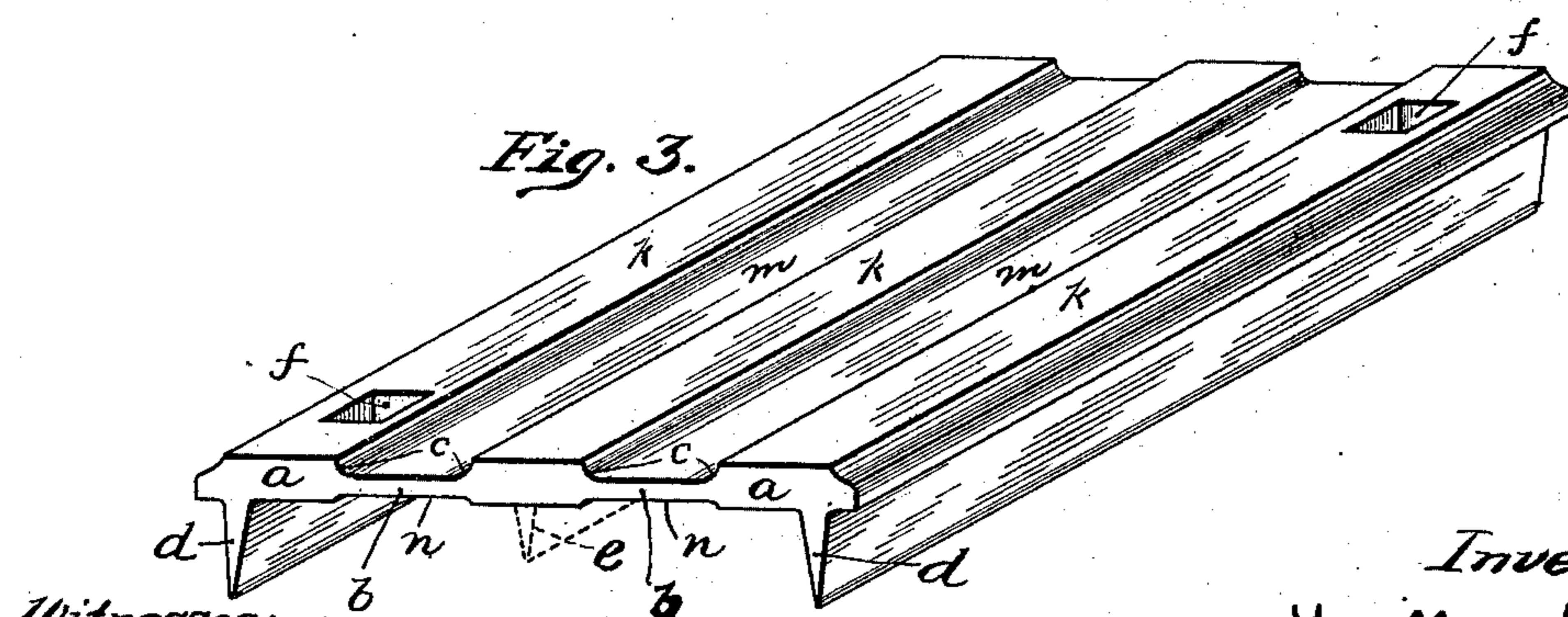
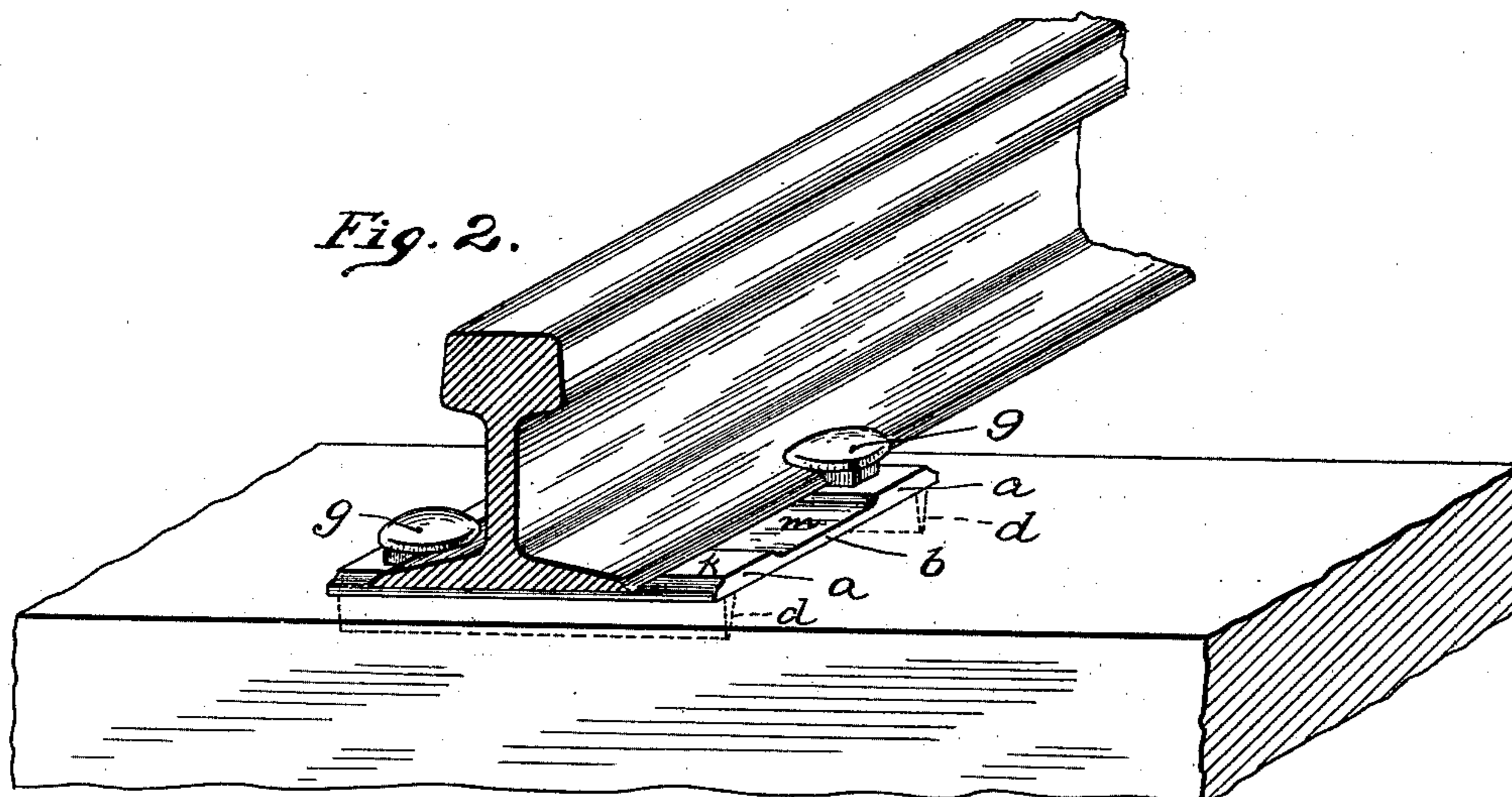
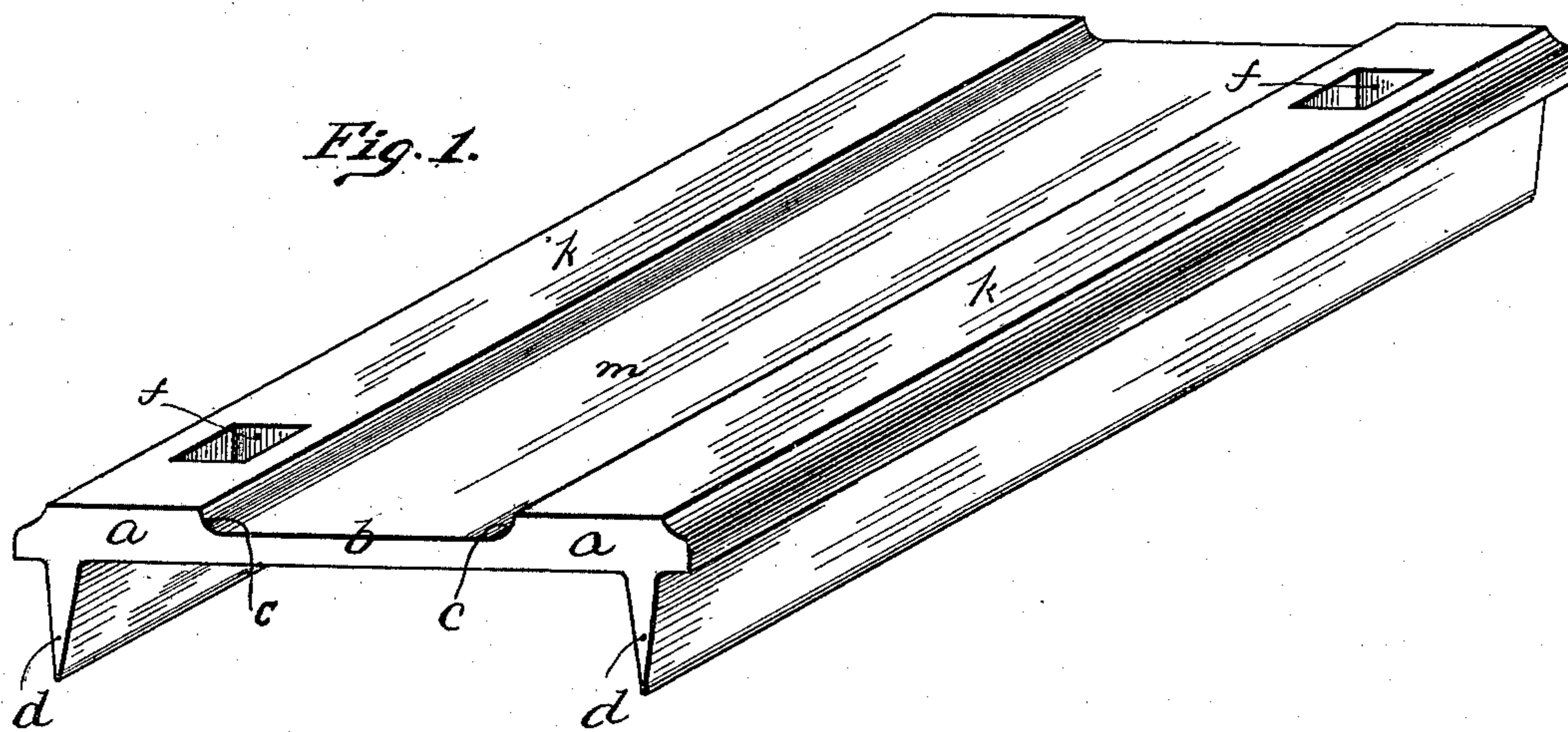
No. 610,179.

Patented Sept. 6, 1898.

W. GOLDIE.  
TIE PLATE.

(Application filed May 27, 1898.)

(No Model.)



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# UNITED STATES PATENT OFFICE.

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## TIE-PLATE.

SPECIFICATION forming part of Letters Patent No. 610,179, dated September 6, 1898.

Application filed May 27, 1898. Serial No. 681,874. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM GOLDIE, a resident of Wilkinsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Tie-Plates; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to tie-plates, its object being to provide an efficient and cheap form of tie-plate for use with straight tracks or those where there is so little curve that the lateral strain on the rail is but slight.

While the most efficient plates heretofore produced have been of the class where the rail was held against lateral strain by a flange on the plate engaging with the rail and claws taking into the tie at right angles to its grain, this class of plates was required to be made heavy and was found to be expensive and has therefore been used principally in yards and such curves as are subjected to heavy strains from rapidly-passing trains. It has been found that where the track is straight or but slightly curved the lateral strain is not sufficient to cause movement of the plate, provided it has a sufficient hold on the tie, and such adhesion of the plate, together with the ordinary spikes, is sufficient to sustain ordinary strains.

The principal difficulty with this class of plates has been, however, that they were extremely liable to buckle under the heavy weight of the passing trains, the plate being necessarily made of greater length than the width of the rail to give support to the spikes, and it being found that the pressure in the center of the plate would cause it to buckle. To provide for adhesion to the tie, it was the custom to provide these plates with downwardly-projecting flanges at the edges, which would cut into the grain of the tie substantially parallel therewith, and it was found that these flanges had not sufficient rigidity to properly brace the thin plate, and in order to obtain sufficient rigidity the custom has been to form a number of flanges—two, three, or more—between the outer flanges to sustain the plate against buckling and in the hope of obtaining a sufficient hold on the tie.

Practical use of such plates has shown, however, that it was impossible with a plate having so many flanges to force the same down into the tie when the plate was first placed in position, as even the weight of the heaviest

passing trains fails for some time to force so many flanges into the face of the tie, and it was therefore impossible to obtain proper track-surface. The numerous flanges so employed were also found to mutilate and destroy the wood fiber to such a degree that it became sponge-like and highly absorbent of moisture, which would enter and lead to rotting and so leave the plate unsupported, this being another cause of buckling. By my invention these difficulties are practically overcome and a rigid tie-plate having strong adhesion, and yet one that is light in weight and cheap, is obtained.

It comprises, generally stated, such a rail-sustaining plate formed of two or more thick rigid rail-sustaining bars connected by one or more thin webs, such plate having downwardly-projecting flanges below and extending along the bars and adapted to enter the tie, it being found that such thick bars give proper support to the rail, which is as well supported thereon as on a broader surface, while the plate has sufficient width to distribute the weight of the rail properly upon the tie, and thin flanges can be formed at or near the edges of the plate, which can take into the tie easily and can be driven down to place by suitable tools and so provide for immediate surfacing of the track.

To enable others skilled in the art to make and use my invention, I will describe the same more fully, referring to the accompanying drawings, in which—

Figure 1 is a perspective view of one form of plate. Fig. 2 is a like view showing the rail, plate, and tie and illustrating its use; and Fig. 3 is a perspective view of another form of plate.

Like letters indicate like parts in each of the figures.

The tie-plates are formed by rolling bars of the desired section, cutting them to length, and punching them. They are formed of the thick rail-sustaining bars *a*, connected by one or more thin webs *b*, it being found that for general purposes a plate having two such bars *a*, connected by a single web *b*, gives all the surface and support necessary, though, if desired, the plate can be formed with, say, three such thick bars and two thin connecting-ribs, as shown in Fig. 3. It will be seen that while the bars are sufficiently thick to give all the necessary rigidity to the plate the

weight of the plate need not be increased to any material extent, because these bars are connected by thin webs, which reduce the weight of the plate. The thickness and width of the bar portions, as well as of the web portions, of course depend upon circumstances; but the section illustrated in the drawings is believed to be about the best, combining the peculiarity above referred to of rigidity with lightness of weight and distribution of the weight brought upon the rail over a considerable surface of the tie. The bars and webs can be connected by any suitable form of curve or fillet, as shown at *c*.

Extending along the underfaces of the bars *a* are the flanges *d*, which, as shown, are preferably made of considerable depth, while their bodies are as thin as practicable, so that they will pass easily into the tie and, without greatly disturbing the fiber thereof, obtain a strong frictional hold thereon. It is only practicable to form thin deep flanges close to the edge of the plate, and for that reason where a central thick bar, as shown in Fig. 3, is employed I prefer to dispense with the flange below the same, employing the central bar in a wider plate in order to increase rigidity and give proper support to the rail. If desired, however, a flange may extend along the under face of the central bar, as shown in dotted lines at *e*. It will be noticed that the spike-holes *f* extend through the thick bar portions of the plate. This provides better support for the spikes, bracing them by means of the plate against lateral strain, the bar portions providing a comparatively thick body of metal forming a thick backing to the spike-neck and therefore through the spike and such thick bar portion giving all necessary support against lateral strain for the straight or slightly-curved portions of the track where this class of tie-plates is employed.

In the use of the plate in laying track the plate can be driven into the tie by any suitable hammers or mallets and the rail then placed over the plate and the spikes *g* driven home through the spike-holes *f*. Or after the rail is passed over the tie the plate can be passed under the rail, which is raised up for that purpose, and as there are but two flanges upon the plate and those near the outer edges thereof, and as these flanges can be made thin and long, the plate can be easily driven down into the tie by means of suitable hammers or mallets or by suitable wedges driven between the plate and rail and acting upon the top faces *k* of the bars *a* to wedge the plate down into the tie; or in soft wood the weight of the next passing train will be sufficient to drive them into the tie, after which the spikes can be driven to place or tightened, so as to form a complete joint.

In the use of the plate with tracks already laid it is only necessary to raise the rail and slip the plate under the same into position and then drive or wedge down the plate and

spike it in place. After the plate has been secured in place it will be seen that the weight of the passing train is sustained by means of the thick bar portions of the plate, and though the entire surface of the plate does not give support to the rail it fully supports the rail along the outer edges of the plate, while the wide depression *m* in the plate above the thin web portion *b* will receive any dirt, &c., which might work under the rail and tend to raise it under the vibratory strains to which it is subjected. At the same time, on account of the width of the plate itself, the weight of the rail and of the train passing over it is distributed over a considerable portion of the surface of the tie, so that a better support is given to the rail and wear or cutting of the plate into the tie prevented.

For the purpose of thinning the web a slight depression, as at *n*, may be formed on the under face of the plate, and in hard-wood ties having irregular surfaces such depression will enable the plate to come to a firm bearing more quickly. In a plate of this construction there is practically no fear of the buckling of the body thereof, because the thick bar portions give great rigidity to the plate transversely of the rail, which is increased, of course, by the flange portions *d*, the combined thick bar portions *a* and flanges *d* providing such rigidity of plate that practically all tendency to buckle is overcome. At the same time strong adhesion of the plate to the tie is obtained because of the possibility of forming thin deep flanges which can pass into the tie without mutilating the same, and the liability to such mutilation as would cause a spongy structure under the plate, as above referred to, is practically overcome. By the conformation of the plate and distribution of the metal therein I therefore obtain a tie-plate which is light and cheap and has great vertical strength, is easy of application to the tie, and has practically perfect adhesion thereto.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. A rail-sustaining plate formed of two or more thick rigid rail-sustaining bars connected by one or more thin webs, and downwardly-projecting flanges below and extending along the bars and adapted to enter the tie, substantially as set forth.

2. The combination with a rail and tie, of a tie-plate having two or more thick rigid rail-sustaining bars upon which the rail rests, and a connecting-web between said bars, and downwardly-projecting flanges below and extending along the bars and entering the tie substantially longitudinally of its fiber, substantially as set forth.

In testimony whereof I, the said WILLIAM GOLDIE, have hereunto set my hand.

WILLIAM GOLDIE.

Witnesses:

ROBT. D. TOTTEN,  
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