

(No Model.)

2 Sheets—Sheet 1.

E. P. CALDWELL & F. H. HEATH.  
COMBINED RAIL JOINT AND TIE.

No. 496,218.

Patented Apr. 25, 1893.

Fig. 1.

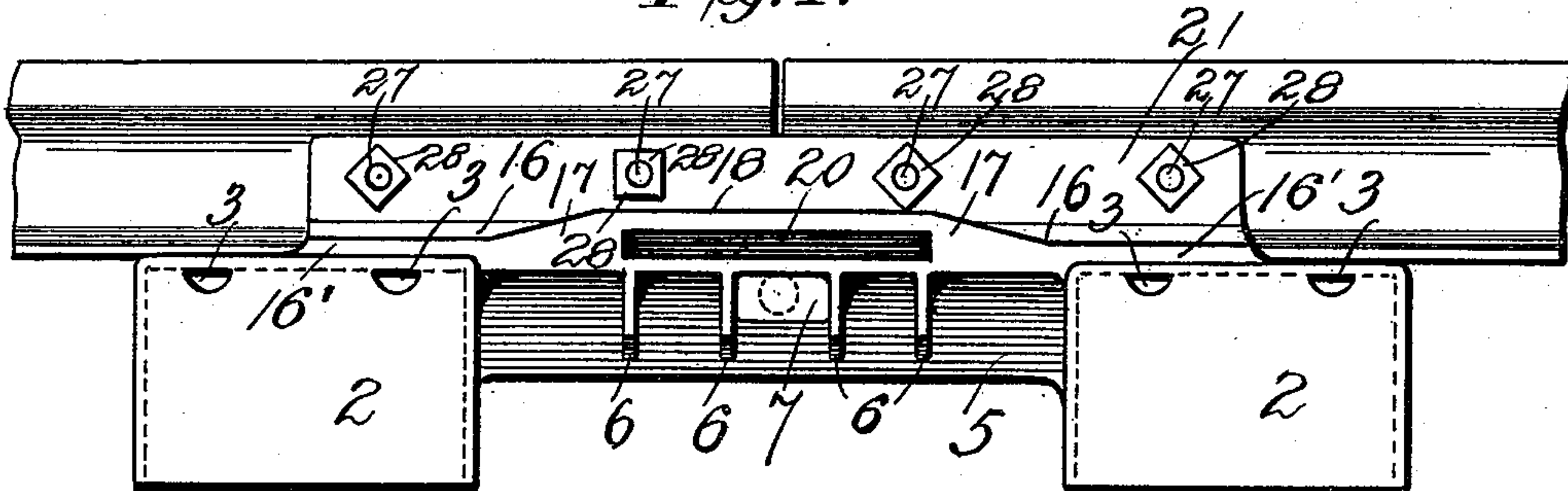


Fig. 2. x

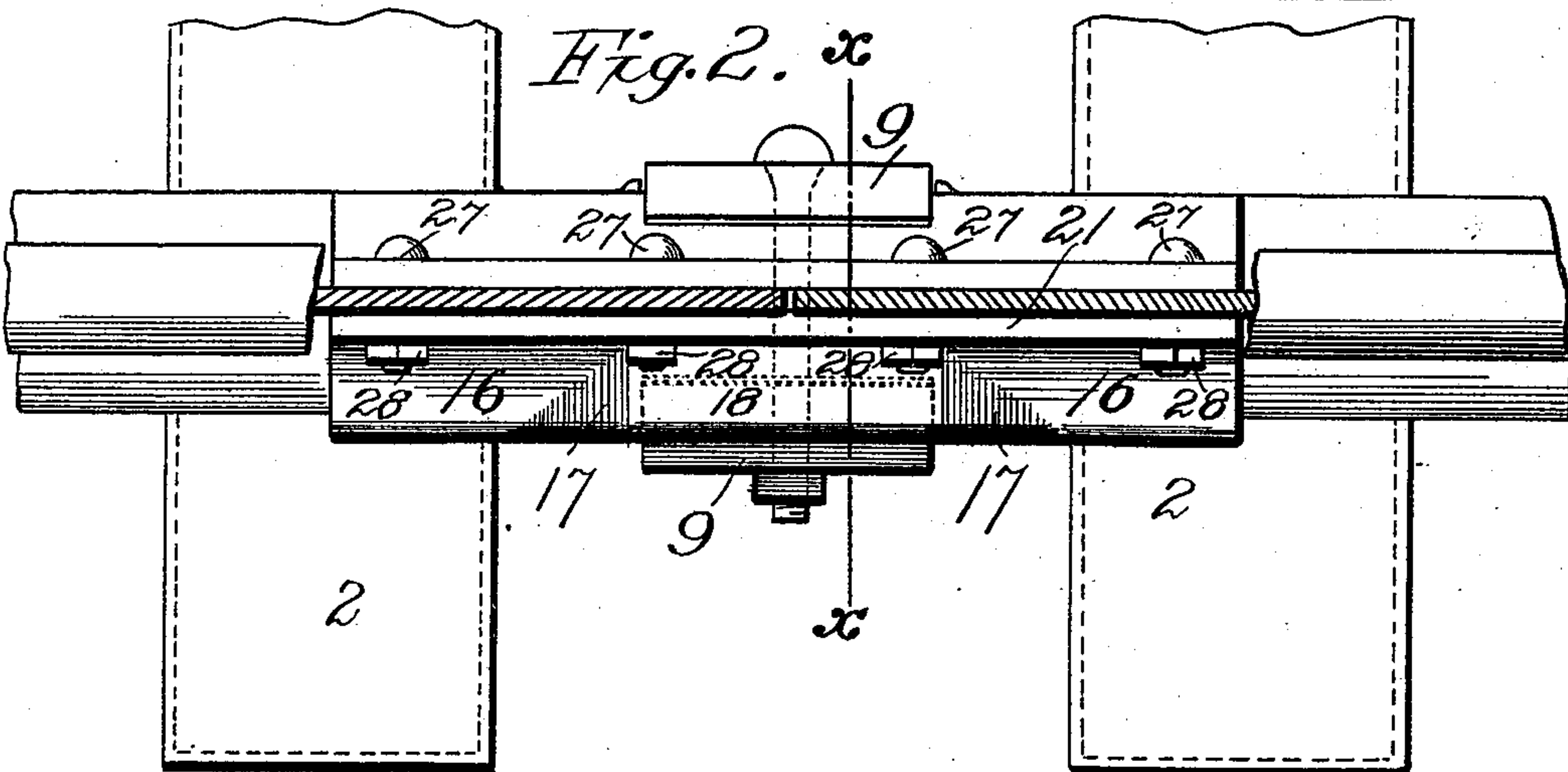


Fig. 3.

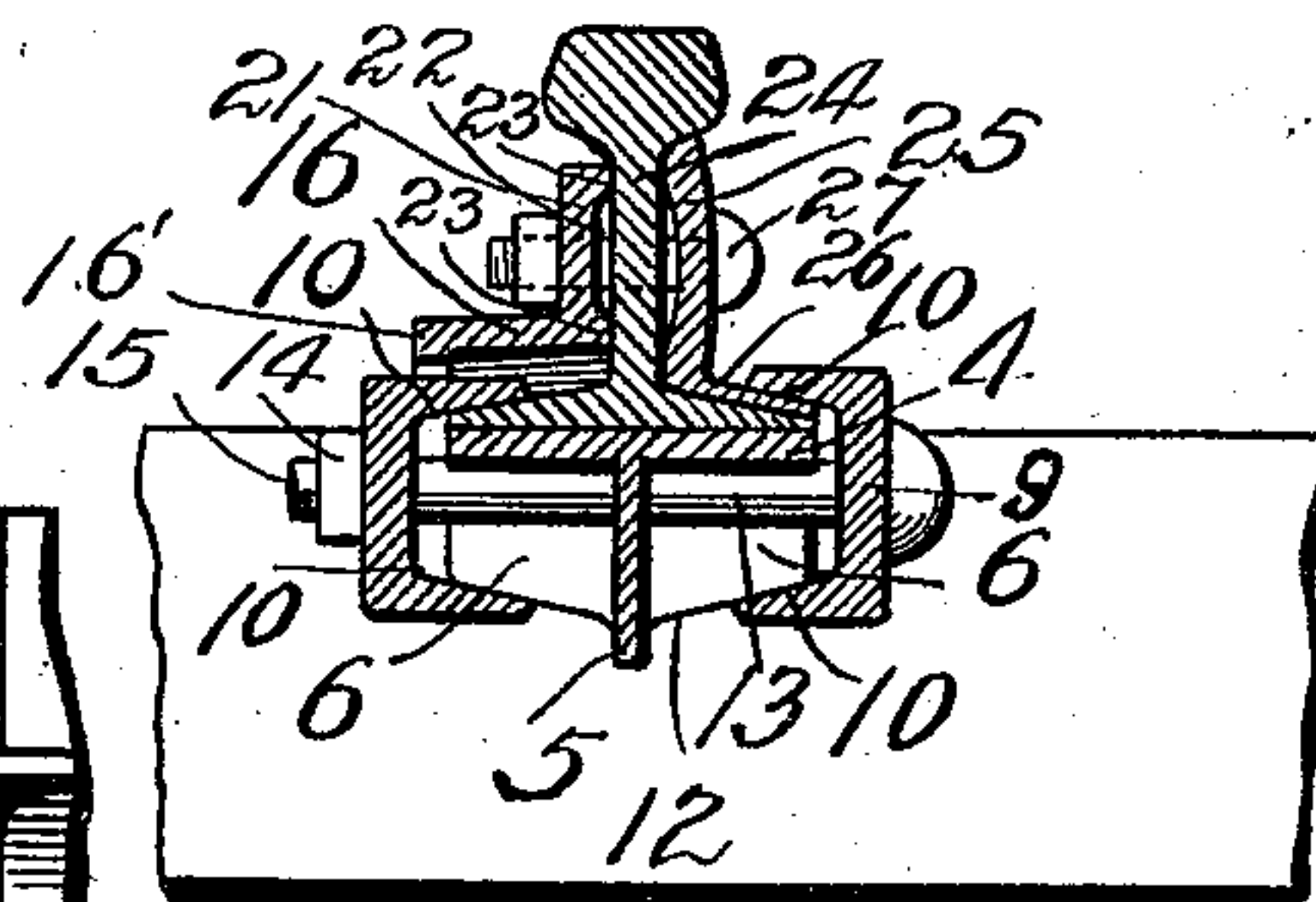
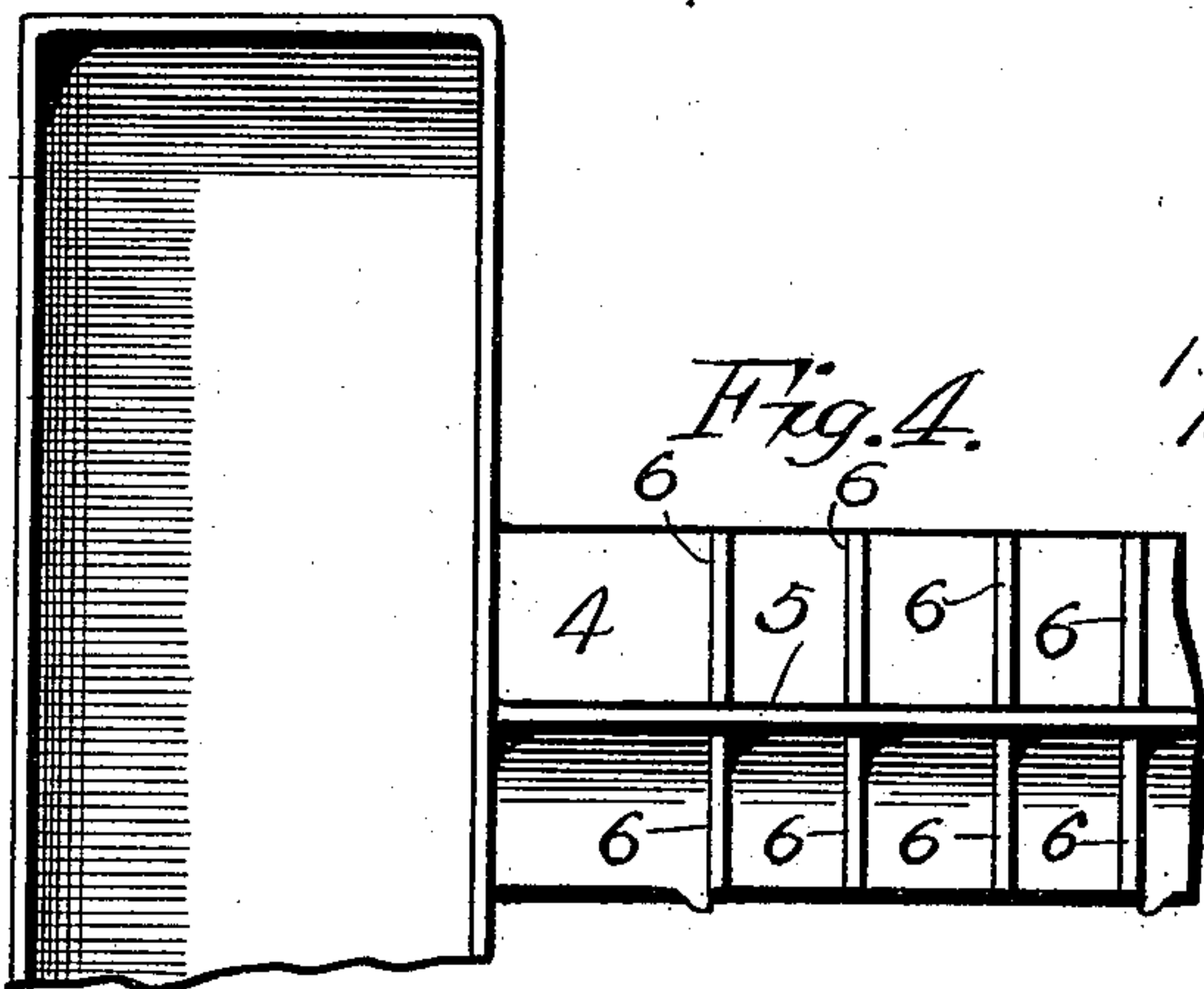


Fig. 4.



Witnesses,

C. E. Van Doren.

O. J. Hawley.

Inventors,

Frederick H. Heath

Edward P. Caldwell.

By Paul & Merwin  
Attorneys.

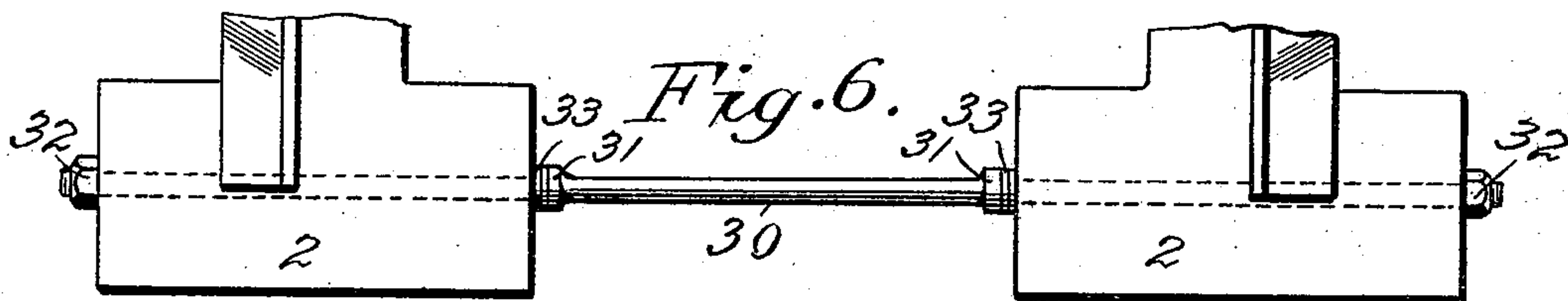
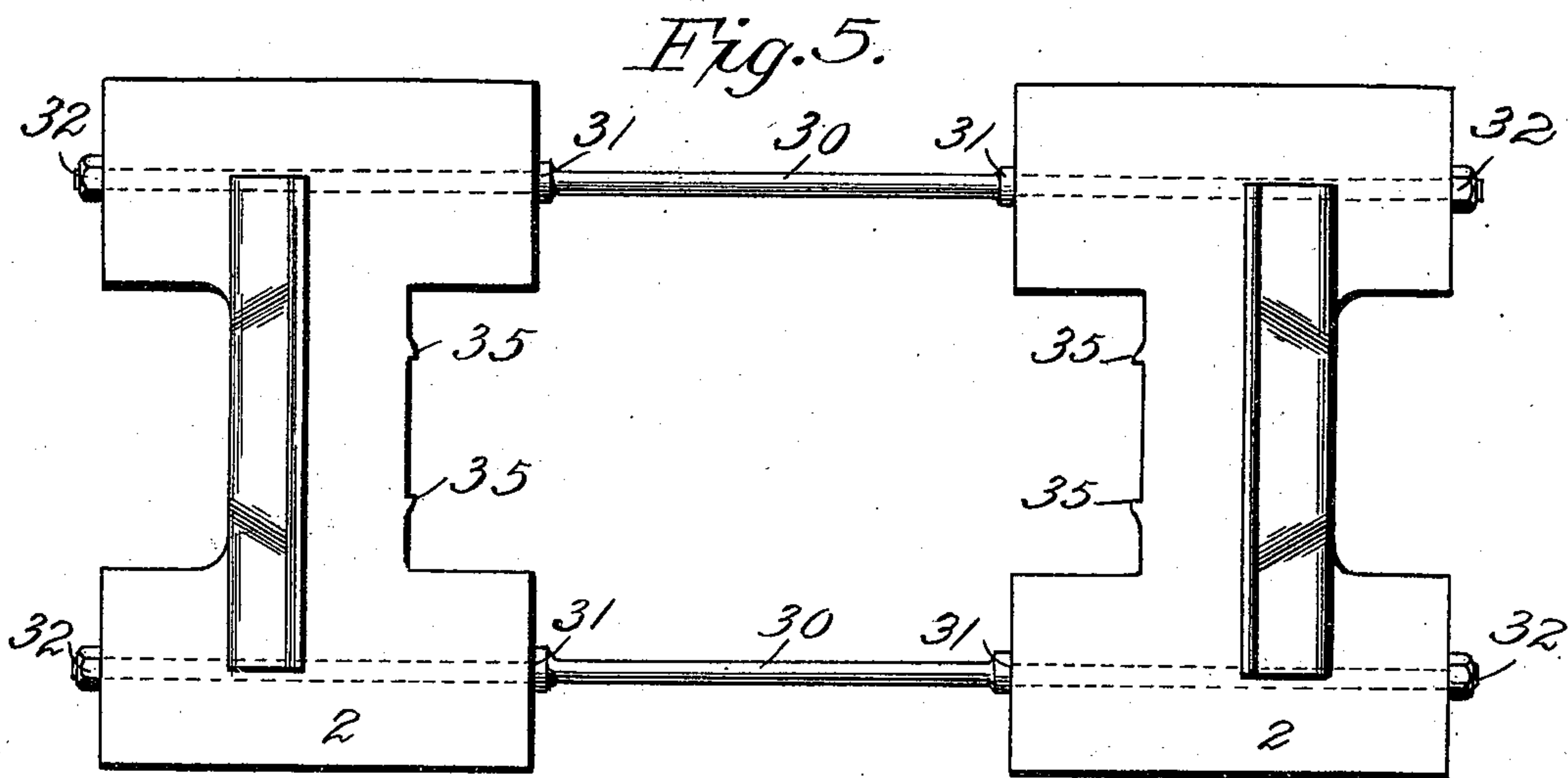
(No Model.)

2 Sheets—Sheet 2.

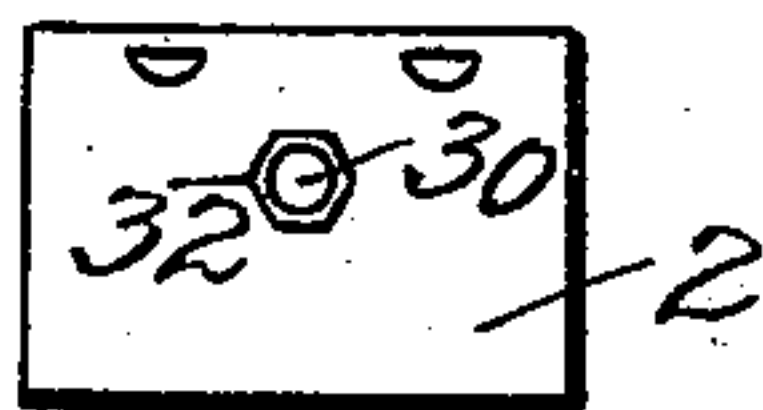
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*Fig. 7.*



Witnesses,  
C. E. Van Doren,  
O. J. Hawley.

Inventors,  
Frederick H. Heath,  
Edward P. Caldwell.  
By Paul & Merwin  
Attorneys.



# UNITED STATES PATENT OFFICE.

EDWARD P. CALDWELL AND FREDERICK H. HEATH, OF MINNEAPOLIS,  
MINNESOTA, ASSIGNORS TO THE HEATH RAIL JOINT COMPANY, OF  
WATERLOO, IOWA.

## COMBINED RAIL-JOINT AND TIE.

SPECIFICATION forming part of Letters Patent No. 496,218, dated April 25, 1893.

Application filed April 18, 1892. Serial No. 429,519. (No model.)

*To all whom it may concern:*

Be it known that we, EDWARD P. CALDWELL and FREDERICK H. HEATH, of Minneapolis, Hennepin county, Minnesota, have invented certain new and useful Improvements in a Combined Rail-Joint and Tie, of which the following is a specification.

Our invention relates to a combined integral rail joint and cross tie by means of which the rails may be firmly and durably supported.

The object of the invention is to provide a more solid, permanent and durable strengthener and support for rail joints than it has heretofore been possible to give by the use of the ordinary wooden ties and the separate rail joints arranged thereon.

To this end the invention consists in the combination with a tie or rail plate upon which the rails are adapted to rest, of ties arranged on the under side of said plate and formed integrally therewith; in metal ties of a particular construction; in an angle bar, and brace formed on the upper side of said tie plate and means for clamping the rails on the plate and ties all as hereinafter described and particularly pointed out in the claims.

The invention will be more readily understood by reference to the accompanying drawings, in which:—

Figure 1 is a view of the rail equipped with device embodying our invention. Fig. 2 is a plan view thereof, the threads of the rails being broken away to more clearly show the construction of the joint. Fig. 3 is a vertical cross section on the line  $x-x$  of Fig. 2 and Fig. 4 is a partial plan view from beneath showing the construction of the tie. Figs. 5 and 6 are plan views showing the manner of connecting opposite cross ties. Fig. 7 is an end view of the tie.

As shown in the drawings, 2, 2 represent the metal box ties having the solid tops, sides and ends and the open lower sides through which the dirt or ballast of the roadbed enters each box tie and completely fills the same. The small openings 3 are provided in the upper end or side wall of each tie for the outlet of water, which will be driven from between the top of the ground and the under sides of the ties by the depression due to the

weight of the train passing over the joint and rails. This action finally results in drawing the dirt into the hollow tie and firmly compressing it therein to form an extremely solid foundation therefor.

The space between the two short boxes is bridged by the tie plate 4 having its upper surface flush with their tops and strengthened by the central rib 5, both plate or rib or truss, being integral with the ties. This rib and the middle part of the plate are further strengthened by the lateral trusses 6, four in number.

An opening 7 is left in truss 5 between the middle ribs 6 for the bolt of the rail clamp which latter clamp is made up of the two blocks 9 having the internal inclined walls 10 adapted to engage the top of the rail base and the downwardly inclined lower edges 12 of the transverse ribs or trusses 6. The bolt 13,—one or more may be used,—extends through one block and thence underneath the rail plate 4, through the opening 7, and through the other block 9 both blocks being firmly wedged upon the rails in place by the tightening of the nut 14 on the threaded end 15 of the bolt. The rail plate is strengthened on its upper side by the truss angle bar or brace formed at one edge of the plate and extending nearly the full length thereof together with the tops of the ties. The inwardly projecting part 16 of this portion of the device is raised and supported upon the vertical part 16' extending up from the outer edge of the rail plate and from the tops of the ties and integral therewith. This inclined part is raised to such a height that it does not engage the flange or base of the rail, and the middle part thereof is raised still higher than the ends having the upwardly and inwardly inclined parts 17 and the level top 18. In the vertical part 16' we provide the slot or opening 20 to receive the upper edge of the rail clamp 9, (see Figs. 1 and 3.) This construction constitutes a very strong and reliable truss over the points where the rail would naturally be weakest, thereby preventing any bending or breaking of the plate at such points. The angle bar is completed by the vertical portion 21 having its inner sur-



face grooved or hollowed as shown at 22 in Fig. 3, to make the two lone bearing edges 23 adapted to engage the outer side of the rail web or webs 24. The upper edge of the angle bar does not in any way engage the tread or head of the rail. On the opposite side of the rail is a separable angle bar 25 bowed outwardly along the middle and having the angle foot or flange 26 to engage the rail base and to be engaged by the upper part of the clamping block on that side of the device. The upper edge of the separable bar is beveled to engage the under side of the rail tread.

As shown bolt holes are made in both the vertical parts of the separable and integral angle bars and a larger one in the rail web or webs. These holes are preferably four in number and short bolts 27 project through the same and are fastened on the face of the integral angle bar by the nuts 28. The holes in the webs of the rails are made larger than the bolts so that sufficient room is left for expansion and contraction of the rails, while at the same time any creeping of the rails is avoided by the transverse bolts 27.

As shown in Figs. 5 and 6 the opposite ties and rail joints are gaged and fastened together by the rods 30 which extend through holes in opposite ends of the short tie boxes and have fixed collars 31 to engage adjacent ends of said ties, thereby gaging the distance between the same. The rods are fastened by the nuts or burrs 32 arranged on their threaded ends and adapted to engage the outer ends of the ties. At curves where it is desired to increase the distance between the rails washers 33 may be placed over the rods and between the collars and the ends of the ties. The small lugs 35 are preferably arranged upon the inner edge of the tie plate to prevent longitudinal movement of the clamping block 9. The other clamping block is held in place by the end walls of the slot 20. We thus provide in integral form a durable, cheap, and reliable combination rail joint-rail plate, rail brace and metallic ties by means of which the rails are firmly supported against depression, accurately aligned, braced and secured against either longitudinal or lateral movement.

Having thus described our invention, we claim as new and desire to secure by Letters Patent—

1. Two short metallic ties and a longitudinal tie plate extending between the same and integral therewith, in combination with means for securing the rail or rails thereon.

2. Two short metallic ties, each composed of a deep rectangular box having an open bottom and each provided with water outlet openings at the top, and a metal longitudinal tie plate extending between the short ties and formed integrally therewith, in combination with means for securing the rail or rails thereon.

3. Short metallic ties of the form of rectan-

gular boxes with open lower sides and level tops, a tie plate integral therewith and extending between the same, the top of said tie plate being flush with the top of said boxes and integral trusses formed thereon, in combination with means for securing the rail or rails thereon.

4. Metallic box-ties having level tops, a tie plate extending between said ties and integral therewith, the top of said plate being flush with the tops of said ties, and a truss formed integrally with and upon the tops of said plate and ties and projecting upward therefrom, in combination with means for securing the rail or rails thereto, substantially as described.

5. The metal ties, a tie plate formed integrally therewith, a strengthening truss integral with both, in combination with means for securing the rail or rails, substantially as described.

6. The metallic ties, a rail or tie plate formed integrally therewith, a longitudinal truss integral with said plate and said ties, transverse trusses formed on the lower side of the rail plate in combination with the rail or rails, clamping blocks, and means for securing the same, substantially as described.

7. The metallic ties, the rail plate formed integrally therewith, depending longitudinal and transverse trusses all integral with one another, and an integral vertical truss and brace portion formed upon the tops of said plate and ties, in combination with means for securing the rail or rails thereon, substantially as and for the purpose specified.

8. The hollow and deep metallic ties having open bottoms and in their upper parts openings for the escape of water collecting within the ties above the earth therein, and a rail plate formed integrally with said ties and longitudinally between the same, substantially as described.

9. The metallic ties, and a rail plate formed integrally therewith and arranged longitudinally between the same, an angle bar or brace formed integrally on the tops of said ties and plate and consisting of the vertical projection, the inwardly projecting portion and the upright inner part adapted to engage the web of the rail, in combination with means for securing the rail or rails thereto, substantially as described.

10. As an article of manufacture the metallic ties, the rail plate formed integrally therewith, depending trusses integral with both said parts and depending from the lower side of said plate, the angle bar device integral with said plate and said ties, and consisting of the vertical projection, the lateral part and an outer part 16', substantially as described.

11. The metallic ties, the tie plate extending between them, trusses for said plate, said parts all formed integrally with one another, and the integral angle bar truss or



brace formed upon the upper part of the plate and ties, in combination with the rail clamps, the separable angle bar having the base flange, and bolts extending through the same, through the web or webs of the rail or rails and through the upright part of the integral angle bar, substantially as described.

12. The combination with the two short metallic ties, of the integral rail, plate extending between the same, the integral angle bar formed thereon on one side of said plate and having the vertical inner part to engage only the rail web or webs, the separable angle bar adapted to engage the opposite side of the rail or rails, and means for fastening the same, substantially as described.

13. The hollow metallic ties having the open bottoms and the water outlets in their upper parts, the integral rail plate extending between the ties, the depending trusses thereof, a brace plate formed on the top of said plate, the inwardly inclined part thereof raised above the rail base as described, the grooved vertical part thereof adapted to engage the rail web or webs, in combination with the rail clamps, the separable angle bar and the bolts, all substantially as described and for the purpose specified.

14. The ties, the integral rail plate extending between the same, integral depending trusses therefor, the vertical projection on the outer edge of said plate and ties, in combination with rail clamping blocks, said projection provided with a slot 20 for the clamping block, the lugs 35 provided on the opposite edge of said plate to hold the other block and

bolts, substantially as and for the purpose specified.

15. The combination with a pair of short metallic ties, provided with an integral tie plate extending between the same, whereon the rail is adapted to rest, of a second pair of ties provided with a similar tie plate to receive the opposite rail of the track, transverse rods 30 extending between the opposite ties of said pairs and through the same, said rods provided with shoulders to engage the inner ends of said short ties, and said rods having threaded outer ends and nuts 32 arranged thereon and engaging the outer ends of said short ties, whereby the rails of the track are prevented from spreading, substantially as described.

16. The combination with a pair of metallic ties, and an integral tie plate extending between the same for one rail of the track to rest upon, of a second pair of ties provided with a similar tie plate, transverse rods 30 extending through and between opposite ties and provided with shoulders 31, said rods having threaded outer ends, nuts 32 thereon to engage the outer ends of said ties, and washers 33 arranged on said rods between the inner ends of the ties and said shoulders, substantially as and for the purpose described.

In testimony whereof we have hereunto set our hands this 11th day of April, 1892.

EDWARD P. CALDWELL.  
FREDERICK H. HEATH.

In presence of—

C. G. HAWLEY,  
FREDERICK S. LYON.