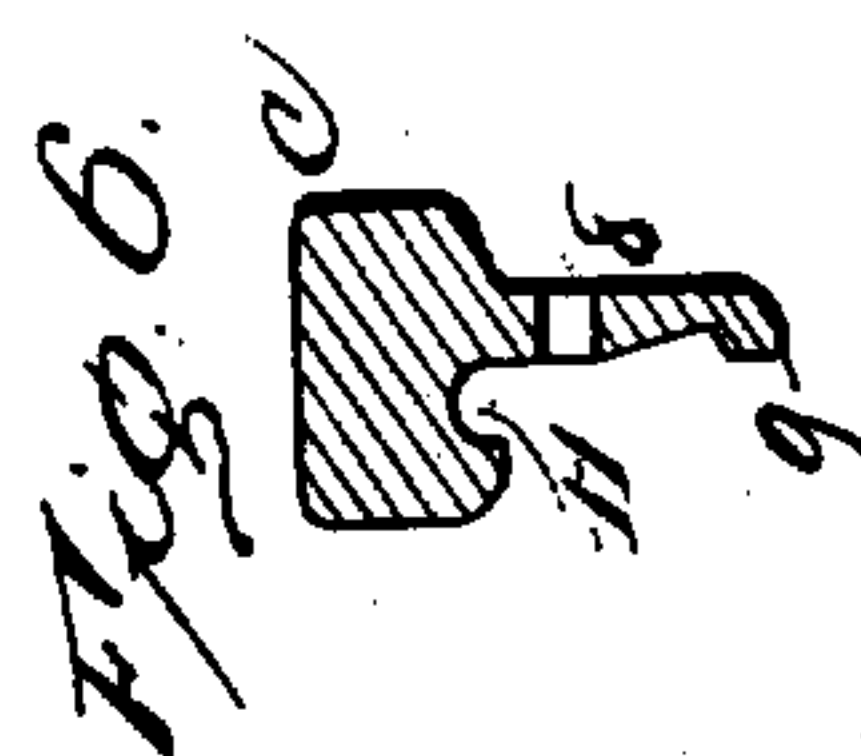
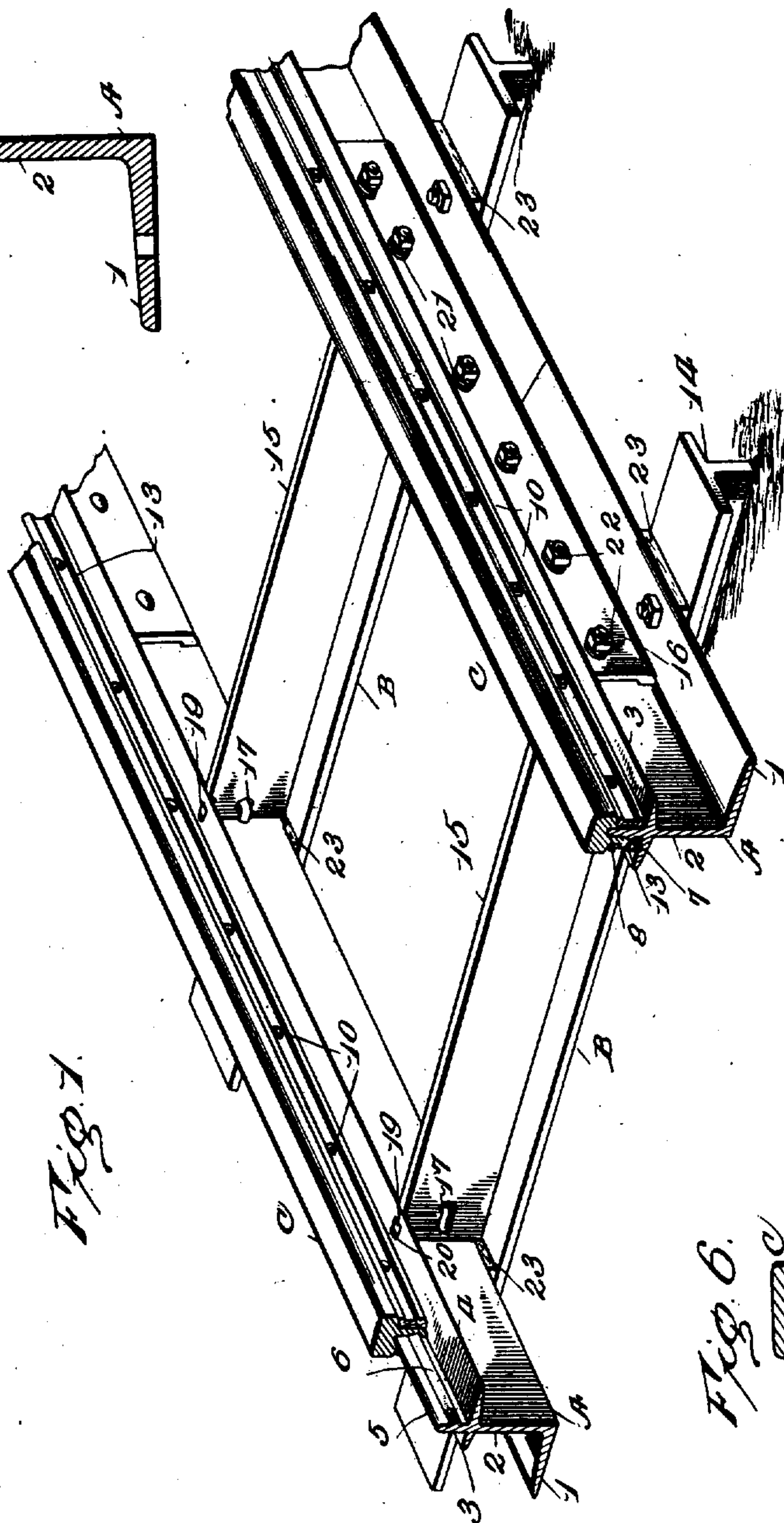
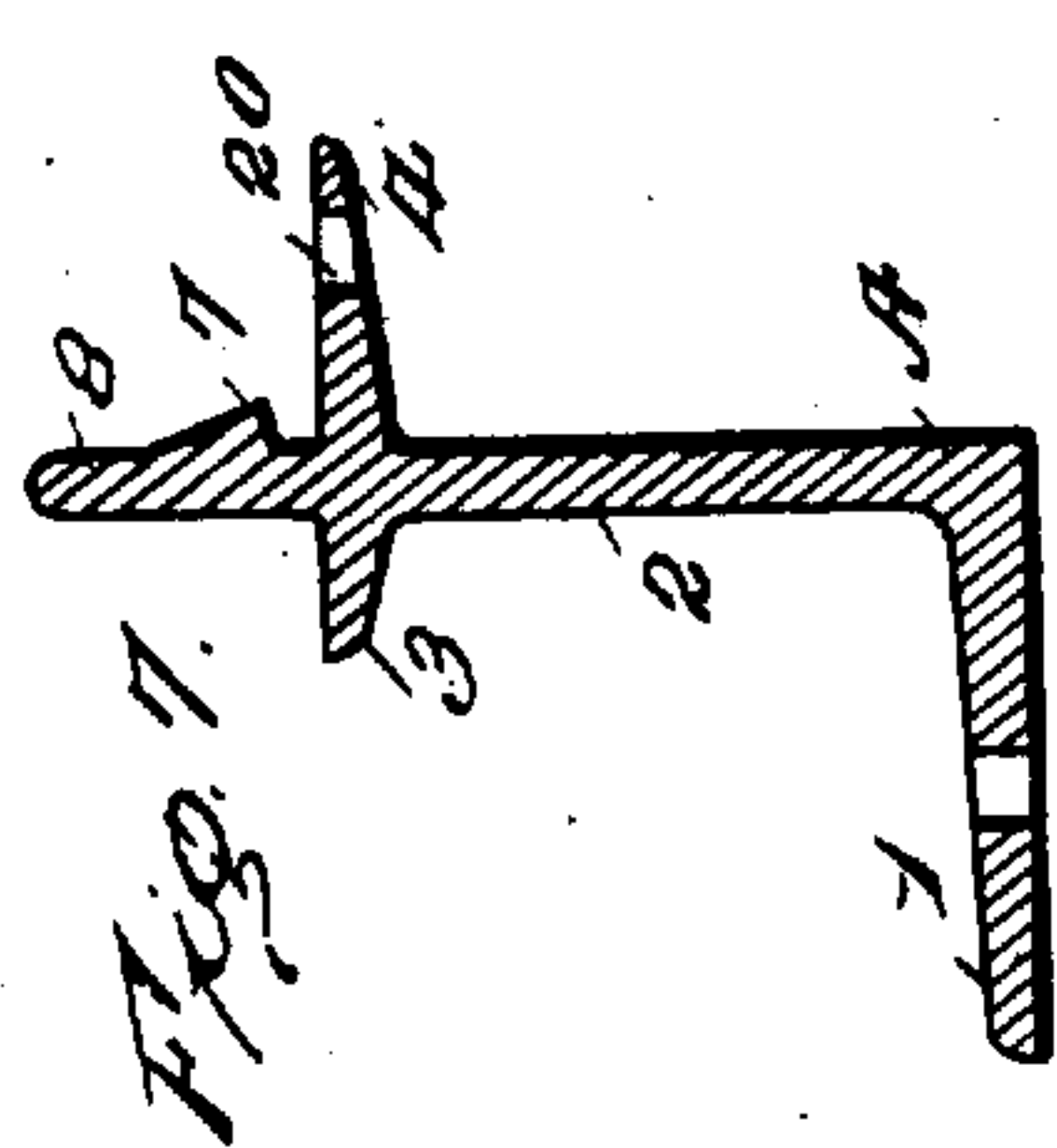


No. 897,592.

PATENTED SEPT. 1, 1908.

J. W. COOPER.
STRINGER AND TIE.
APPLICATION FILED AUG. 24, 1907.

2 SHEETS—SHEET 1.



Witnesses

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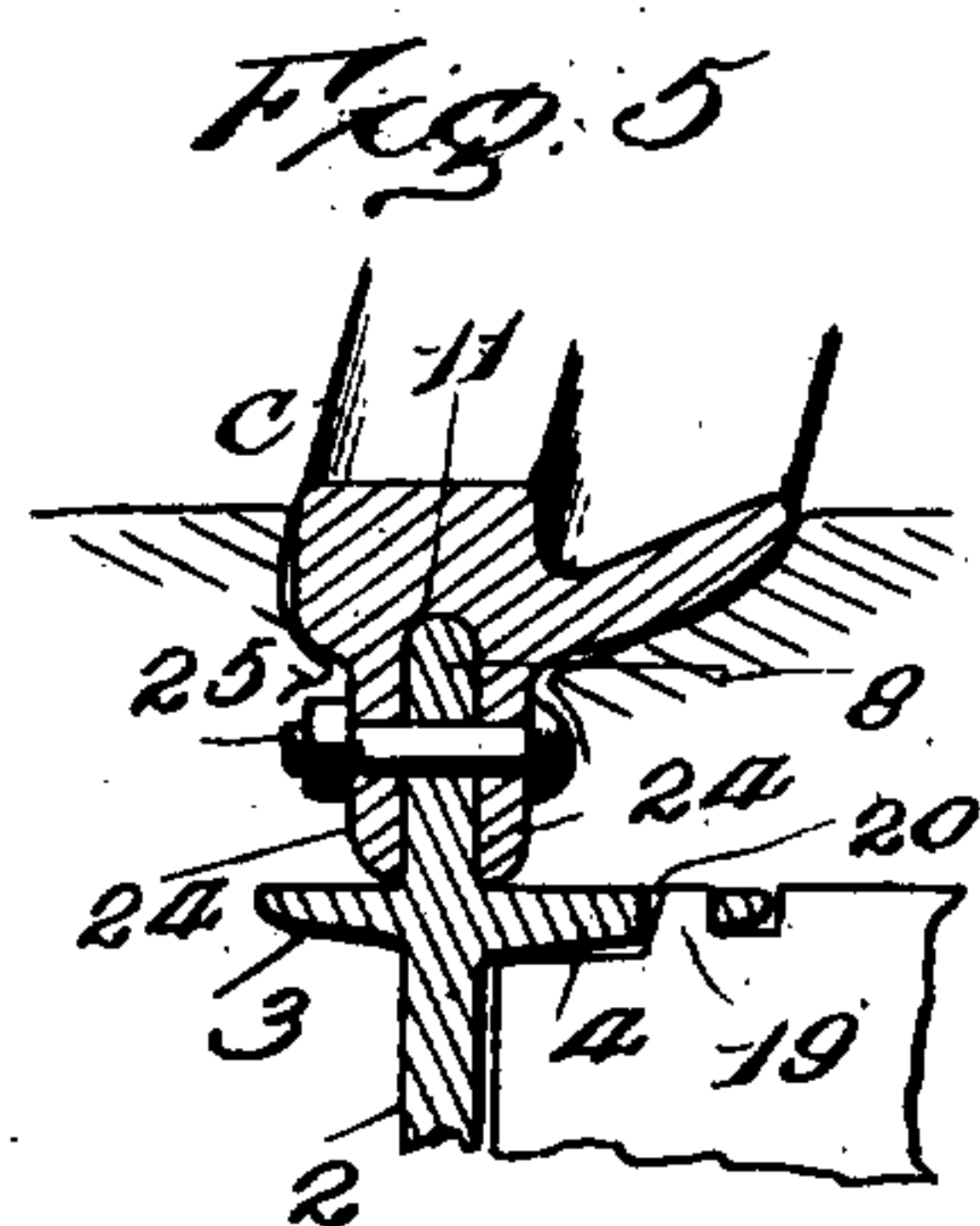
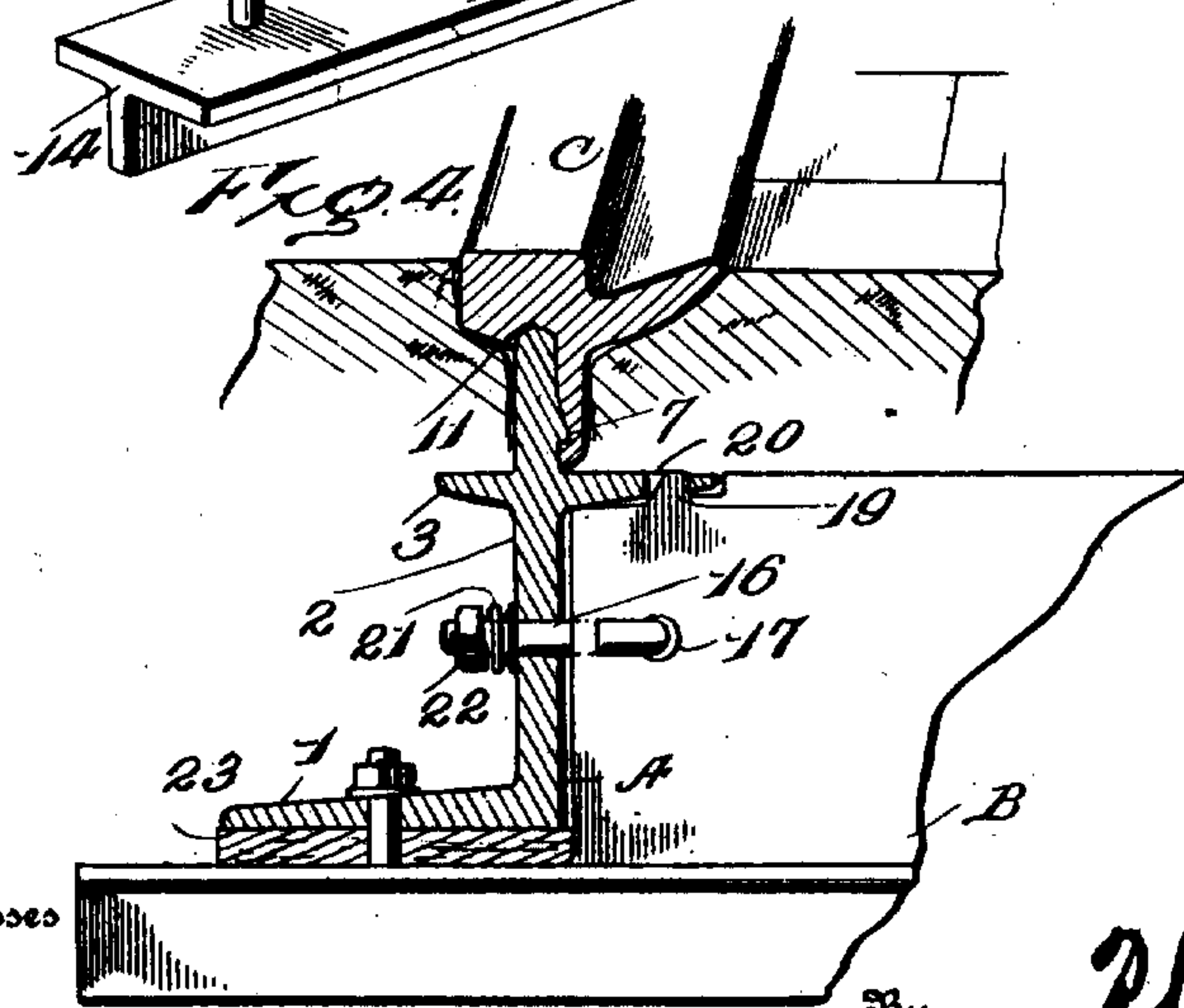
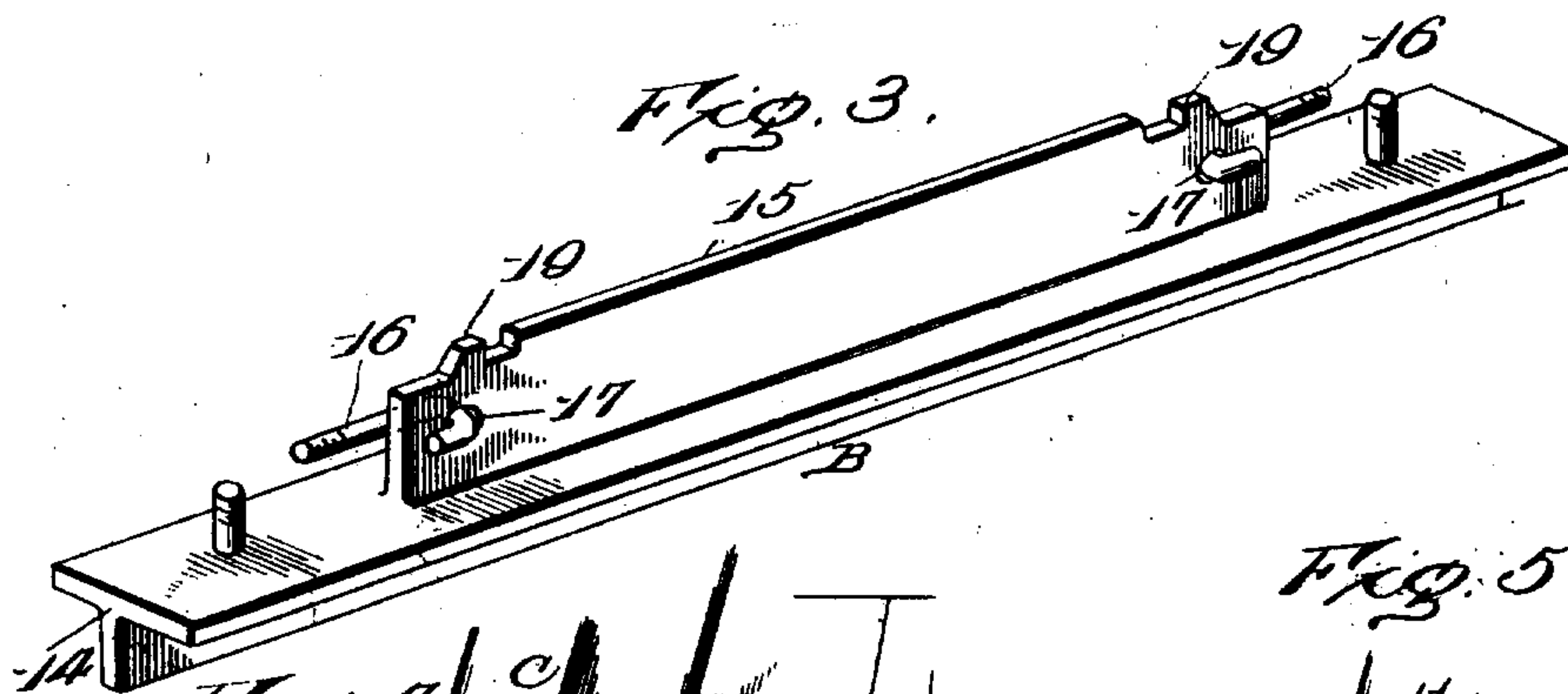
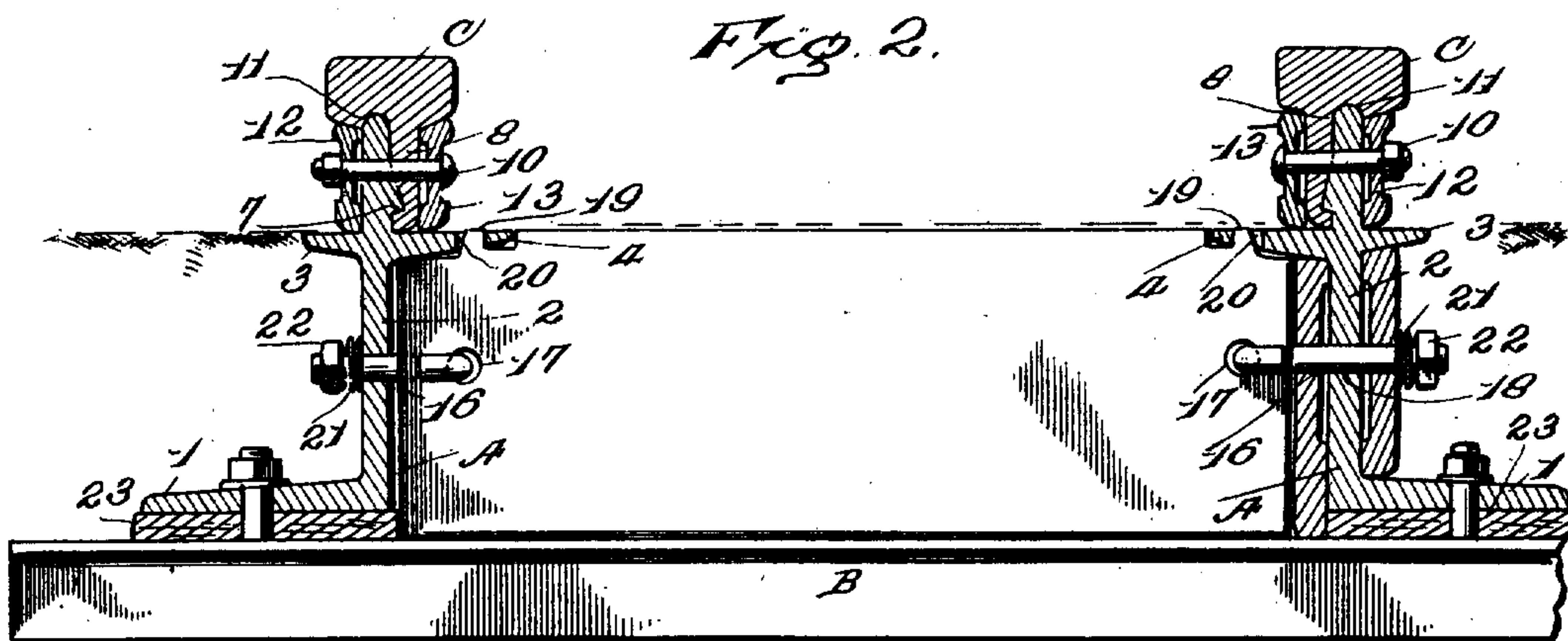
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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

JOHN W. COOPER, OF BOSTON, MASSACHUSETTS.

STRINGER AND TIE.

No. 897,592.

Specification of Letters Patent.

Patented Sept. 1, 1908.

Application filed August 24, 1907. Serial No. 389,989.

To all whom it may concern:

Be it known that I, JOHN W. COOPER, citizen of the United States, residing at Dorchester station, Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Stringers and Ties, of which the following is a specification.

This invention relates to the construction of railroads and deals more particularly with the rails, stringers and ties, which, in accordance with this invention, are of metal and formed in a novel manner and connected so as to provide a substantial structure and admit of the tread portions of the rails being renewed at a comparatively small cost and without necessitating disturbance of the road-bed.

For a full understanding of the invention and the merits thereof and also to acquire a knowledge of the details of construction and the means for effecting the result, reference is to be had to the following description and accompanying drawings.

While the invention may be adapted to different forms and conditions by changes in the structure and minor details without departing from the spirit or essential features thereof, still the preferred embodiment is shown in the accompanying drawings, in which:

Figure 1 is a perspective view of a portion of a railroad embodying the invention. Fig. 2 is a transverse section of the railroad. Fig. 3 is a perspective view of a tie. Fig. 4 is a sectional view of a grooved rail, such as used for street railways, illustrating the application of the invention. Fig. 5 is a sectional view of a modification. Fig. 6 is a cross section of the rail. Fig. 7 is a transverse section of the stringer.

Corresponding and like parts are referred to in the following description and indicated in all the views of the drawings by the same reference characters.

The railroad comprises stringers or sleepers A, ties B and rails C. The several parts are of metal and are connected in a substantial manner. The rails, which in the present instance consist of tread portions and securing and bracing flanges, are removable to admit of their renewal without requiring loosening of the stringers or movement of the ties. The stringers or ties A consist of L-beams, one wing constituting the base or foot and the other wing forming a vertical

support for the tread portion or rail C. The foot or base 1 tapers slightly towards its outer longitudinal edge. A vertical wing 2, forming the upright, is provided near its upper longitudinal edge with oppositely disposed flanges 3 and 4, which in addition to strengthening and bracing the part 2 laterally, support the tread portion C and the flanges cooperating therewith. A flange 5 projects above the lateral flanges 3 and 4 and is in line with the flange or support 2 and has the rail or tread portion C connected directly thereto. The several parts 1, 2, 3, 4 and 5 are of integral formation, being rolled at one and the same time, thereby obviating the formation of joints. The rail supporting flange 5 has a longitudinal off-set 6 upon one side near one of the lateral flanges to provide a shoulder 7 under which a portion of the flange of the rail or tread portion C engages to form interlocking means whereby vertical displacement of the rail or tread portion C is obviated.

The rail C comprises a tread portion and a projecting flange 8, the latter adapted to lie alongside the vertical rail supporting flange 5 and be bolted or secured thereto. The flange 8 is provided near its lower edge with a lip or rib 9 to engage under the shoulder 7, thereby preventing vertical displacement of the rail. Corresponding openings are formed in the flanges 5 and 8 to receive bolts 10. A groove 11 is formed in the under side of the ball or tread portion of the rail adjacent to the flange 8 and forms a seat in which the upper edge of the rail supporting flange 5 is seated. In assembling the parts, the rail C is placed upon the flange 5 with the upper edge of the latter seated in the groove 11, after which the rail is rocked to cause the lip or rib 9 to engage under the shoulder 7. To admit of the rocking of the rail C upon the flange 5, the seat 11 and the upper edge of the flange 5 are made rounding in transverse section. Splice bars or fish plates 12 and 13 are placed upon opposite sides of the flanges 5 and 8 and are secured thereto by the bolts 10. These splice bars or fish plates engage under the projecting side portions of the ball or tread of the rail and also rest upon the lateral flanges 3 and 4, thereby materially bracing and supporting the tread portion of the rail.

The ties B comprise a lower portion 14 of T-form and a vertical flange 15, the latter being in the plane of the vertical flange of the T portion 14. The vertical flange 15 termi-

nates some distance from the extremities of the base or lower portion 14 and its ends are adapted to abut against the inner sides of the vertical members of the stringers A, whereas the projecting portions of the lower or base portion 14 extend beneath said stringers and are bolted or otherwise fastened to the foot 1 thereof. Hooked bolts 16 connect opposite end portions of the flanges 15 with the stringers and pass through openings in each, the hooked end of the bolt passing through the opening 17 near the end of the flange 15 and the body portion of said bolt passing through the opening 18 in the vertical wing or member 2 of the stringer. The flange 15 is cut away at its upper edge for a short distance from each end to receive the lateral flange 4 near the upper end of the stringer, a projecting portion 19 being left to pass through an opening 20 of the flange 4, thereby supplementing the action of the fastenings 16 when connecting the ties and stringers.

In order to neutralize vibration and prevent rigidity of the parts, spring washers 21 are mounted upon the outer ends of the bolts 16 and are confined between the vertical wings 2 of the sleepers and the nuts 22 threaded upon the outer end of said bolts 16. Shims or pieces of wood 23 are interposed between the horizontal flanges 1 of the sleepers and the projecting portions of the ties. These shims or blocks of wood 23 prevent pounding of the rails and excessive wear of the rolling stock and give a degree of elasticity about equal to the accustomed wooden ties.

The splice bar or fish plate 12 extends the entire length of the sleeper or rail and is arranged upon the side of the rail supporting flange 5 opposite to that against which the flange 8 bears. In some instances it is preferred to provide the rail C with spaced flanges 24, as indicated in Fig. 5, said flanges embracing the rail supporting flange 5. The three flanges are connected by bolts passing through registering openings formed therein. When the rail C is provided with spaced flanges 24, it is not feasible to provide an interlocking joint between said flanges 24 and the flange 5, hence the rail is simply slipped upon the flange 5 and secured thereto by bolts or fastenings 25. In the construction shown in Fig. 4, which is specially adapted for street railroads, no splice bars are provided and it is not necessary to bolt the flange 5, because the surface of the street abutting against opposite sides of the flanges 5 and 8 prevent lateral displacement thereof and the interlocking joint between said flanges prevents vertical displacement of the rail.

Figs. 1 and 2 show the invention adapted for solid tread rails, such as commonly employed for steam railroads, whereas Figs. 4 and 5 show the invention adapted for grooved rails as commonly employed for street railways.

It will be understood that the rails, when worn or otherwise rendered unfit for future efficient service, may be removed and replaced by new ones without disturbing the sub-structure consisting of the stringers and ties, hence repairs may be made expeditiously and at a comparatively small cost.

The vertical flanges 15 of the ties being of uniform lengths, act as gages to insure the rails and sleepers being spaced apart and uniform, with the result that the railway is of like gage, and in construction does not require spacing of the rails by moving one in and the other out, in order to properly and uniformly space the same.

Having thus described the invention, what is claimed as new is:

1. In combination, a stringer having a lateral flange provided with an opening, a tie having a projection to pass through the opening in the lateral flange of the sleeper and to interlock therewith, and positive connecting means between the tie and stringer.
2. In combination, a stringer having a lateral flange provided with an opening, a tie having a lower portion extending beneath the stringer and having a vertical flange abutting against the stringer and formed with a projection to pass through the opening in the lateral flange thereof, and positive connecting means between the stringer and tie.
3. In railroad construction, the combination of parallel stringers having basal flanges forming extended supports and provided at or near their upper edges with vertical and opposite lateral flanges, rails seated upon said vertical flanges and having pendent flanges lapped alongside said vertical flanges and secured thereto, and ties, each tie having a lower portion of T form and a vertical flange terminating a distance from the ends of said lower T portion, the ends of the vertical flanges of the ties abutting against the stringers and having projecting portions interlocking with the lateral flanges thereof, and having the end portions of the ties extended beneath the stringers and forming supports therefor, and positive connecting means between the stringers and ties.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN W. COOPER. [L. s.]

Witnesses:

V. B. HILLYARD,
W. N. WOODSON.