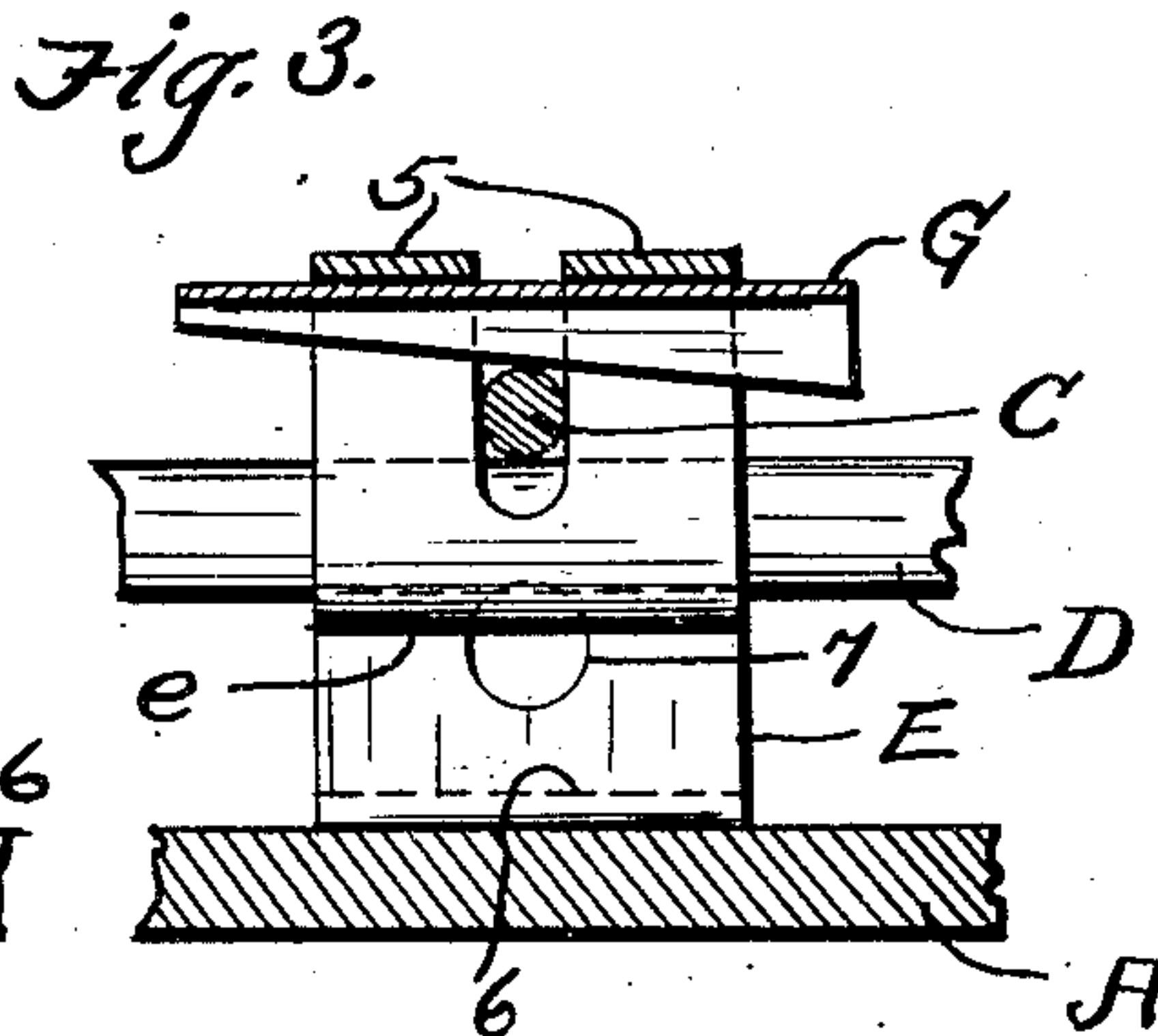
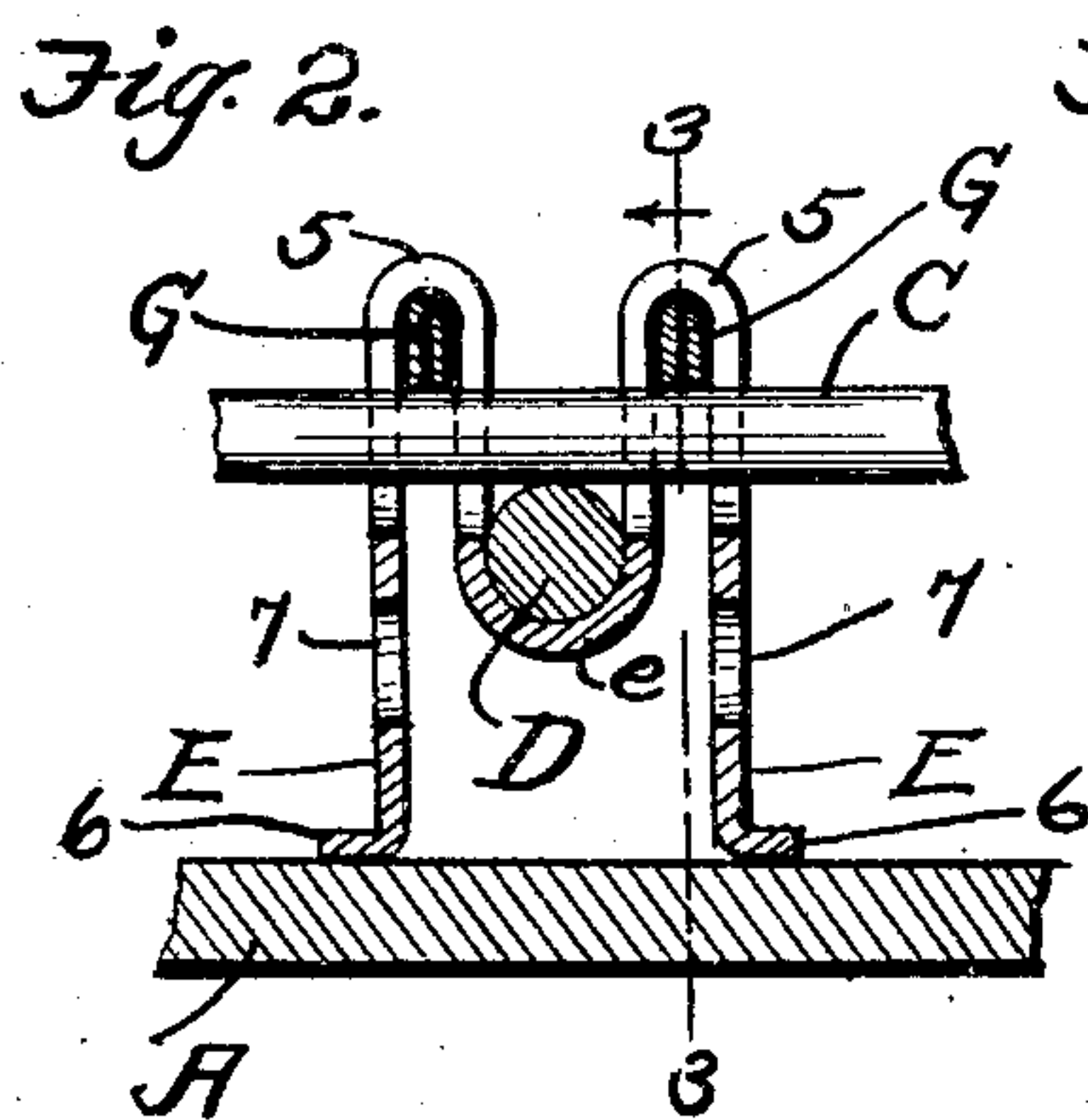
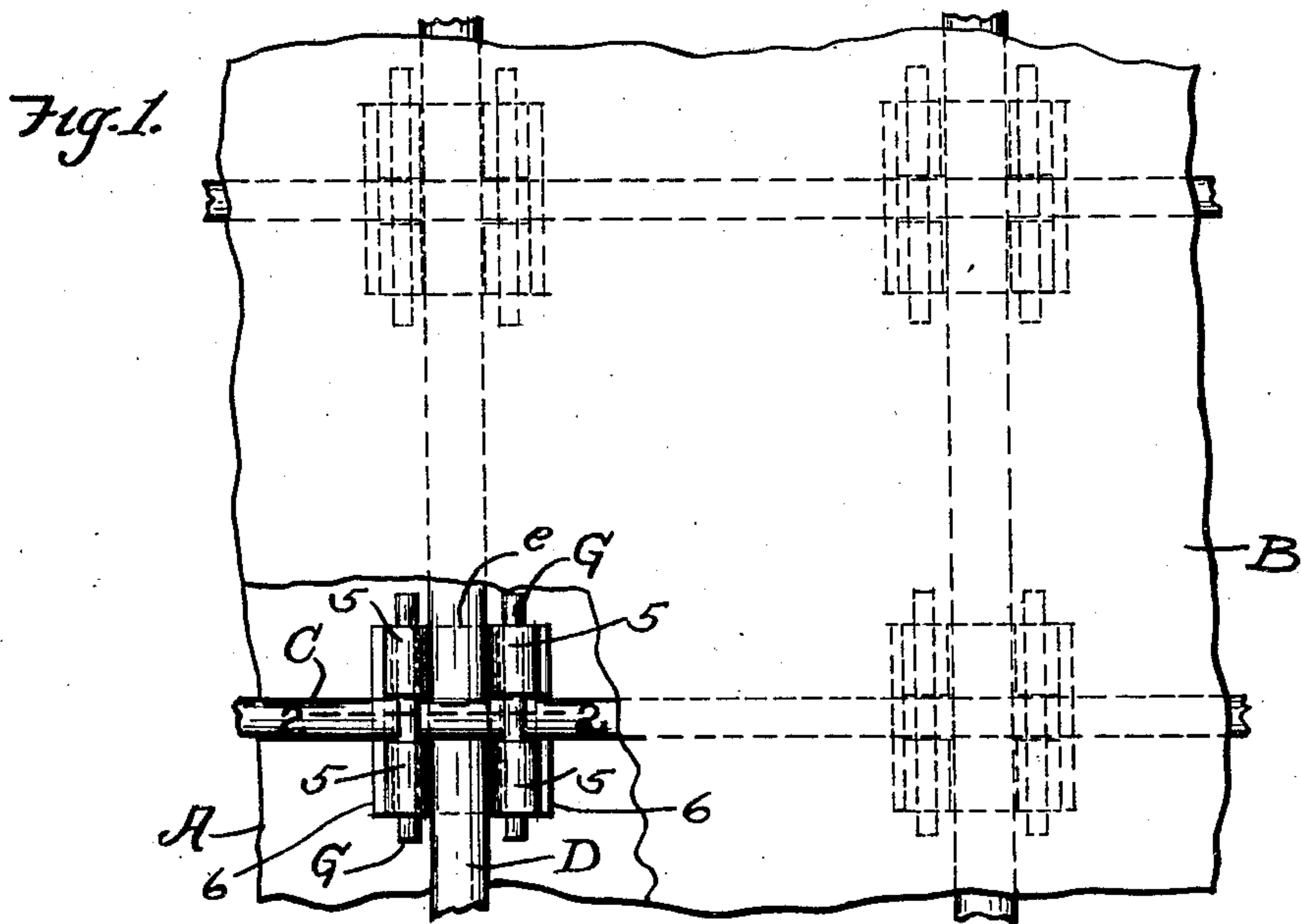


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METAL REINFORCEMENT FOR METAL REINFORCED CONCRETE CONSTRUCTION.  
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# UNITED STATES PATENT OFFICE.

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METAL REINFORCEMENT FOR METAL-REINFORCED CONCRETE CONSTRUCTION.

943,402.

Specification of Letters Patent.

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*To all whom it may concern:*

Be it known that I, WILLIAM S. FERGUSON; a citizen of the United States of America, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Metal Reinforcements for Metal-Reinforced Concrete Constructions; and I hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same.

This invention relates to improvements in metal reinforcement for metal-reinforced concrete construction and pertains more especially to the metal-reinforcement for metal-reinforced concrete floors or other objects which are laid or arranged substantially in a horizontal plane.

The primary object of this invention is to provide means whereby the intersecting metal rods comprised in the said metal reinforcement are efficiently and inexpensively locked together at their intersections.

Another object is to provide a chair or stand wherever any two rods which are arranged the one next above the other cross each other substantially in horizontal planes and to form the said stand of a sheet-metal piece having two legs spaced longitudinally of the upper rod and arranged at opposite sides respectively of the lower rod, and a saddle which is arranged between the legs and in position to form a seat for the lower rod and connected with each leg by two bail-shaped members which are arranged *vis-à-vis* at opposite sides respectively of the upper rod and extend far enough above the said upper rod to permit the interposition, between the said upper rod and the downwardly facing or inner surfaces of the central portions of the said bail-shaped members, of a wedge which coöperates with the said bail-shaped members in clamping the upper rod downwardly upon the lower rod.

Another object is to so form the said chair or stand that it will be strong and durable and will have such an adequate bearing upon the floor temporarily laid next below the space which is to receive the concrete floor that the legs of the said stand will not indent the temporary floor and hence will not project below the metal-reinforced con-

crete floor upon the removal of the said temporary floor.

With these objects in view, and to the end of realizing other advantages hereinafter appearing, this invention consists in certain features of construction, and combinations of parts, hereinafter described, pointed out in the claims and illustrated in the accompanying drawings.

In the said drawings, Figure 1 is a top plan of a portion of a metal-reinforced concrete floor embodying my invention. A portion of the concrete is shown broken away in this figure to more clearly show my improved means for locking together two intersecting rods of the metal-reinforcement of the said floor at the intersection of the said rods. Fig. 2 is a vertical section on line 2—2, Fig. 1, and illustrative of the said locking means. Fig. 3 is a vertical section on line 3—3, Fig. 2, looking in the direction indicated by the arrow.

Referring to the drawings, A indicates a temporary floor upon which a metal-reinforced concrete floor is to be formed, and B, Fig. 1, indicates the concrete or cementitious material of the said metal-reinforced concrete floor. C and D represent two metal rods of my improved metal reinforcement, which rods cross each other in substantially horizontal planes and are in contact with each other and arranged the one above the other and at a right angle to each other. The lower rod D forms therefore a bottom-bearing or seat for the upper rod C. That is, the lower rod D is arranged substantially horizontally and is crossed at the top by the substantially horizontally arranged upper rod C which is seated or rests on the lower rod. The rods C and D, when as shown they form a portion of the metal reinforcement of a metal-reinforced concrete floor are secured at the ends (not shown) to walls, columns or beams of a building comprising the said floor.

My invention consists essentially in improved means for locking the rods C and D together at their intersection and holding the said rods elevated above the temporary floor A a suitable distance preparatory to the embedding of the said rods and locking means in the layer of concrete compacted on the said floor to complete the formation of the metal-reinforced concrete floor.



The means employed for locking or securing together the two intersecting rods C and D at their intersection preferably comprise a sheet-metal piece shaped as required to render it suitable for use as a chair or stand and having two laterally spaced vertically arranged or upright end members or legs E and a saddle *e* which is arranged centrally between the said legs or end members and a suitable distance above the lower ends or free extremities of the said legs or end members. The saddle *e* is arranged to form a seat or bearing for and support the lower rod D, and the said seat or bearing is therefore arranged to prevent displacement of the said rod from the other rod,—that is, toward the lower or free extremities of the end-members E. The saddle or bearing *e* also prevents lateral displacement of the lower rod D. The legs or end members E are arranged at opposite sides respectively of the lower or bearing-engaging rod D. Preferably the saddle or bearing *e* is connected at each side of the saddle by two bail-shaped members 5 with the adjacent leg or end-member E, said bail-shaped members being arranged at opposite sides respectively of the upper rod C with their end-portions spaced longitudinally of the said rod. It will be observed therefore that the two bail-shaped members 5 which connect the saddle or bearing *e* with a leg E are arranged *vis-à-vis* at opposite sides respectively of the upper rod C and extend far enough above the said rod to accommodate the interposition, between the said rod and the under or inwardly facing surfaces of the central portions of the said bail-shaped members, of a wedge or securing device G which engages and extends transversely of the said rod between the latter and the said surfaces and clamps the said rod downwardly against the lower rod D. It will be observed that the two wedges or securing devices are spaced longitudinally of the upper rod C and arranged substantially equidistantly from the lower or bearing-engaging rod in opposite directions respectively, and that the wedge and the central portions of the bail-shaped members at one side of the lower rod D and the wedge and the central portions of the bail-shaped members at the other side of the said lower rod constitute simple and efficient means for clamping the upper rod against the lower or bearing-engaging rod.

The legs are provided at their lower ends and externally with laterally and outwardly projecting flanges 6 which form feet for the legs and enlarge the bearing of the legs upon the temporary floor and prevent the legs from cutting into the said floor and from projecting below the said floor when the latter is removed after the completion of the metal-reinforced concrete floor. Each leg E

is provided between its flange or foot 6 and the bail-shaped members which connect the said leg with the saddle *e*, with a hole 7 extending laterally therethrough to permit cementitious material compacted on the temporary floor in forming my improved metal-reinforced concrete floor to pass through the said legs and thereby facilitate the filling with cementitious material of the space between the two legs and between the saddle and the said legs.

It will be observed that the bail-shaped members 5 are not only spaced longitudinally of the saddle *e* and at opposite sides respectively of the upper rod C and thereby prevent lateral displacement of the said rod, but also prevent displacement of the wedges G longitudinally of the said rod, and the relative arrangement of the parts is preferably such that the end-portions of the said bail-shaped members extend a suitable distance below the said rod so that any direct bearing of the said rod upon the legs and saddle is avoided.

What I claim is:—

1. In metal reinforcement for metal-reinforced concrete construction, the combination, with two intersecting rods crossing each other, one of the rods affording bearing to the other rod of means for locking the rods together at their intersection, said locking means comprising a metal piece contoured to permit contact between the rods and having a bearing which is engaged by one of the rods, a securing device arranged transversely of and in position to clamp the other rod against the bearing-engaging rod in the direction of the said bearing, and the aforesaid metal piece having a member formed thereon and engaged by and cooperating with the said securing device in causing the rods to be clamped together between the said bearing and the said securing device.

2. In metal reinforcement for metal-reinforced concrete construction, the combination, with two intersecting rods crossing each other, one of the rods affording bearing to the other rod of means for locking the rods together at their intersection, said locking means comprising a metal piece having two suitably spaced end members and a bearing which is engaged by one of the rods and arranged between the said end members, and a plurality of securing devices arranged transversely of and in position to clamp the other rod against the bearing-engaging rod in the direction of the said bearing, and the aforesaid metal piece being contoured to permit contact between the intersecting rods and having members which are formed thereon and cooperate and cooperating with the said securing devices in causing the rods to be clamped together between the said bearing and the said securing devices.

3. In metal reinforcement for metal-rein-



forced concrete construction, the combination, with two intersecting rods crossing each other, one of the rods affording bearing to the other rod of means for locking the rods together at their intersection, said locking means comprising a metal piece which is contoured to permit contact between the rods and has two suitably spaced end members and a member which is engaged by and forms a bearing for one of the rods between the said end members; two securing devices extending transversely and spaced longitudinally of and engaging the other rod and arranged substantially equidistantly from the bearing-engaging rod in opposite directions respectively and in position to clamp the rod engaged by the said securing devices against the bearing-engaging rod in the direction of the aforesaid bearing, and the aforesaid metal piece having members formed thereon and cooperating with the said securing devices in causing the rods to be clamped together between the said bearing and the said securing devices.

4. In metal reinforcement for metal-reinforced concrete construction, the combination, with two substantially horizontal intersecting rods crossing each other and arranged one next above and seated on the other, of a sheet-metal piece contoured to permit the upper rod to rest upon the lower rod, said sheet-metal piece having two laterally spaced legs and a saddle intermediate the legs and forming a seat for the lower rod, said legs being arranged at opposite sides respectively of the lower rod and provided at their lower ends with laterally projecting members which form the lowermost portions of the legs, and means whereby the upper rod is clamped to the lower rod.

5. In metal reinforcement for metal-reinforced concrete construction, the combination, with two intersecting rods crossing each other in substantially horizontal planes and in position to be clamped, of a chair or stand contoured to permit the upper rod to rest on the lower rod and comprising two legs and a saddle intermediate the legs, said legs being spaced longitudinally of the upper rod and arranged at opposite sides respectively of the lower rod, and the saddle being arranged to form a seat for the lower rod, and means whereby the upper rod is clamped downwardly against the lower rod.

6. In metal reinforcement for metal-reinforced concrete construction, the combination, with two intersecting rods crossing each other, one of the rods affording bearing to the other rod of means for locking the rods together at their intersection, said locking means comprising a metal piece which is contoured to permit contact between the intersecting rods and forms a bearing which is engaged by one of the rods; means clamping the other rod against the bearing-engag-

ing rod and arranged at one side of the bearing-engaging rod, and duplicate means arranged at the opposite side of the bearing-engaging rod and effecting the clamping to the latter of the other rod.

7. In metal reinforcement for metal-reinforced concrete construction, the combination, with two intersecting rods crossing each other, one of the rods affording bearing to the other rod of means for locking the rods together at their intersection, said locking means comprising the following:—a metal piece contoured to permit contact between the intersecting rods and forming a bearing which is engaged by one of the rods, securing devices arranged transversely of the other rod and in position to clamp the said last-mentioned rod against the bearing-engaging rod in the direction of the said bearing, and members which are integral with the said bearing and cooperate with the said securing devices in causing the rods to be clamped together between the said bearing and the said securing devices.

8. In metal reinforcement for metal-reinforced concrete construction, the combination, with two intersecting rods crossing each other in substantially horizontal planes and arranged the one above and seated upon and in position to be clamped downwardly against the other, of a chair or stand contoured to permit the upper rod to rest on the lower rod and comprising a saddle arranged to form a seat for the lower rod; means for exerting pressure downwardly upon the upper rod at one side of the lower rod, and means for exerting pressure downwardly upon the upper rod at the other side of the lower rod.

9. In metal reinforcement for metal-reinforced concrete construction, the combination, with two intersecting rods crossing each other in substantially horizontal planes and arranged the one above and seated upon and in position to be clamped downwardly against the other, of means for locking the rods together at their intersection, said locking means comprising a metal piece contoured to permit the upper rod to rest on the lower rod, said metal piece having suitably spaced legs, and a saddle intermediate the legs, which saddle is arranged to form a seat for the lower rod, said metal piece also having bail-shaped members extending above the upper rod and connecting the saddle with the legs, and members interposed between the upper rod and the inner surfaces of the central portions of the bail-shaped members and tightly holding the upper rod down upon the lower rod.

10. In metal reinforcement for metal-reinforced concrete construction, the combination, with two intersecting rods crossing each other in substantially horizontal planes and arranged the one above and seated upon



and in position to be clamped downwardly against the other, of a chair or stand contoured to permit the upper rod to rest on the lower rod, said stand being arranged to rest upon a floor and comprising two legs and a saddle intermediate the legs, said legs being spaced longitudinally of the upper rod and arranged at opposite sides respectively of the lower rod and provided with holes extending laterally therethrough, and the saddle being arranged to form a seat for the lower rod, and means whereby the upper rod is clamped downwardly against the lower rod.

11. In metal reinforcement for metal-reinforced concrete construction, the combination, with two intersecting rods crossing each other in substantially horizontal planes and arranged the one above and seated upon and in position to be clamped downwardly against the other, of a chair or stand contoured to permit the upper rod to rest on the lower rod, said stand being arranged to rest upon a floor and comprising two legs and a saddle intermediate the legs, said legs being spaced longitudinally of the upper rod and arranged at opposite sides respectively of the lower rod, and the saddle being arranged to form a seat for the lower rod; means for exerting pressure downwardly upon the upper rod at one side of the lower rod, and means for exerting pressure downwardly upon the upper rod at the other side of the lower rod.

12. In metal reinforcement for metal-reinforced concrete construction, the combination, with two intersecting rods crossing each other in substantially horizontal planes and arranged the one above and seated upon and in position to be clamped downwardly against the other, of a sheet-metal chair or stand contoured to permit the upper rod to rest on the lower rod, said stand being arranged to rest upon a floor and comprising the following:—two legs spaced longitudinally of the upper rod and arranged at opposite sides respectively of the lower rod, a saddle arranged between the legs and in position to form a seat for the lower rod, two pairs of bail-shaped members connecting the saddle with the legs, said pairs being arranged at opposite sides respectively of the lower rod and the members of each pair of bail-shaped members being arranged *vis-à-vis* at opposite sides respectively of the upper rod and extending far enough above the upper rod to permit the interposition of a wedge between the said rod and the inner surfaces of the central portions of the said bail-shaped members, and wedges driven between the upper rod and the inner surfaces of the central portions of the bail-shaped members.

13. In metal reinforcement for metal-reinforced concrete construction, the combina-

tion, with two intersecting rods crossing each other in substantially horizontal planes and arranged the one above and seated upon and in position to be clamped downwardly against the other, of a chair or stand contoured to permit the upper rod to rest on the lower rod, said stand being arranged to rest upon a floor and comprising two legs which are spaced longitudinally of the upper rod and arranged at opposite sides respectively of the lower rod and a saddle arranged between the said legs and in position to form a seat for the lower rod, said stand also being provided at each side of the saddle with two bail-shaped members connecting the saddle with the adjacent leg at opposite sides respectively of the upper rod and arranged with their end members spaced longitudinally of the upper rod and extending far enough above the upper rod to permit the interposition of a securing device between the said rod and the inner surfaces of the central portions of the said bail-shaped members, and a securing device snugly interposed between the upper rod and the said surfaces and tightly holding the said rod downwardly against the lower rod.

14. In metal reinforcement for metal-reinforced concrete construction, the combination, with two intersecting rods crossing each other in substantially horizontal planes and arranged the one above and seated upon and in position to be clamped downwardly against the other, of a sheet-metal chair or stand contoured to permit the upper rod to rest on the lower rod, said stand comprising two legs spaced longitudinally of the upper rod and arranged at opposite sides respectively of the lower rod and a saddle arranged between the legs and in position to form a seat for the lower rod, said stand also being provided at each side of the saddle with two bail-shaped members connecting the saddle with the adjacent leg and arranged *vis-à-vis* at opposite sides respectively of the upper rod and extending far enough above the upper rod to permit the interposition of a wedge between the said rod and the inner surfaces of the central portions of the said bail-shaped members, and a wedge driven between the said upper rod and the said surfaces.

15. In metal-reinforcement for metal-reinforced concrete construction, a chair or stand instrumental in locking or securing two engaging superimposed crossed rods together at their intersection and being contoured to permit contact between the rods, said stand comprising laterally spaced legs and a saddle intermediate the legs and in position to form a seat for the lower of the said rods, said stand being also provided at the sides of the saddle with bail-shaped members connecting the saddle with the legs and extending upwardly far enough to per-



mit the interposition of wedges between the upper rod and the inner surfaces of the central portions of the said bail-shaped members.

- 5 16. In metal reinforcement for metal-reinforced concrete construction, a sheet-metal chair or stand instrumental in locking or securing two engaging superimposed crossed rods together at their intersection and being  
10 contoured to permit contact between the rods, said stand comprising two laterally spaced legs and a saddle which is arranged between the legs and in position to form a seat for the lower of the said rods, said  
15 stand being also provided at each side of the saddle with two bail-shaped members con-

necting the saddle with the adjacent leg and spaced longitudinally of the saddle but arranged *vis-à-vis* and in position to accommodate the upper of the said rods between them and extending upwardly far enough  
20 to permit the interposition of a wedge between the said upper rod and the inner surfaces of the central portions of the said bail-shaped members.

In testimony whereof, I sign the foregoing  
specification, in the presence of two wit-  
25 nesses.

WILLIAM S. FERGUSON.

Witnesses:

C. H. DORER,  
B. C. BROWN.