(No Model.) 3 Sheets—Sheet 1.

L. D. HAMILTON & R. MEEK.

ELECTRIC CONNECTION FOR RAILWAY RAILS.

No. 303,569. Patented Aug. 12, 1884.

Fig. 1.

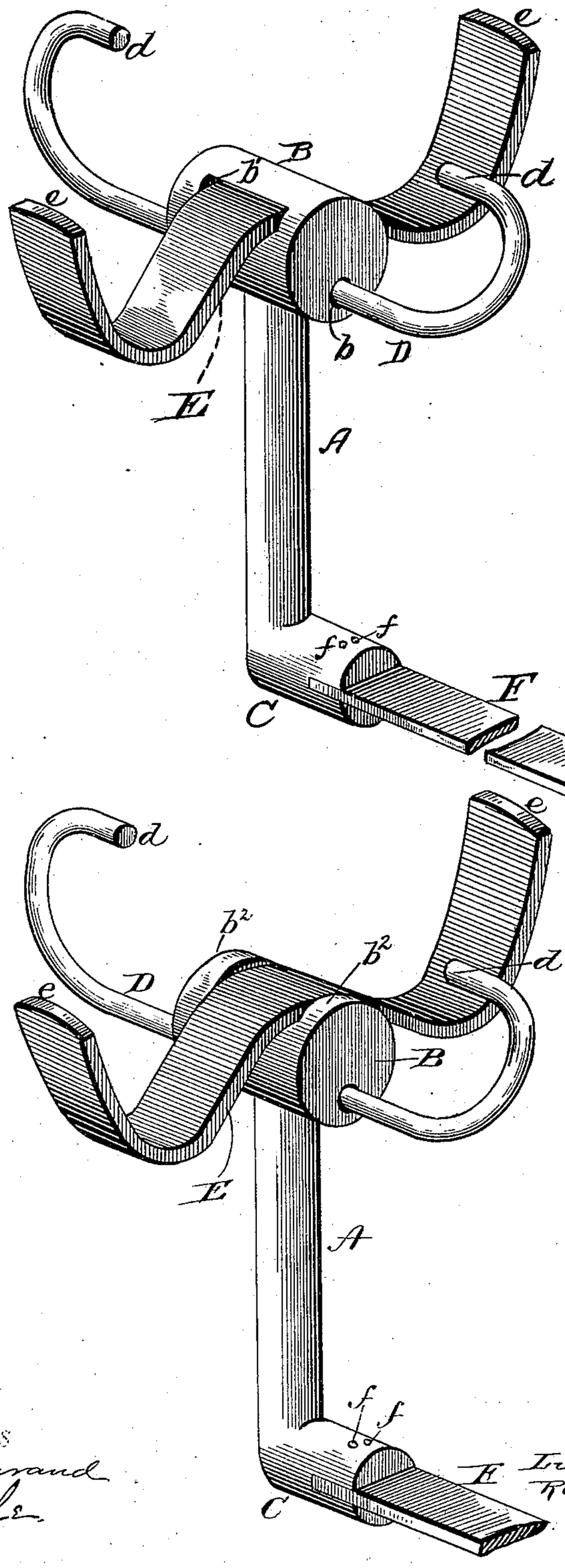

Fig. 2.

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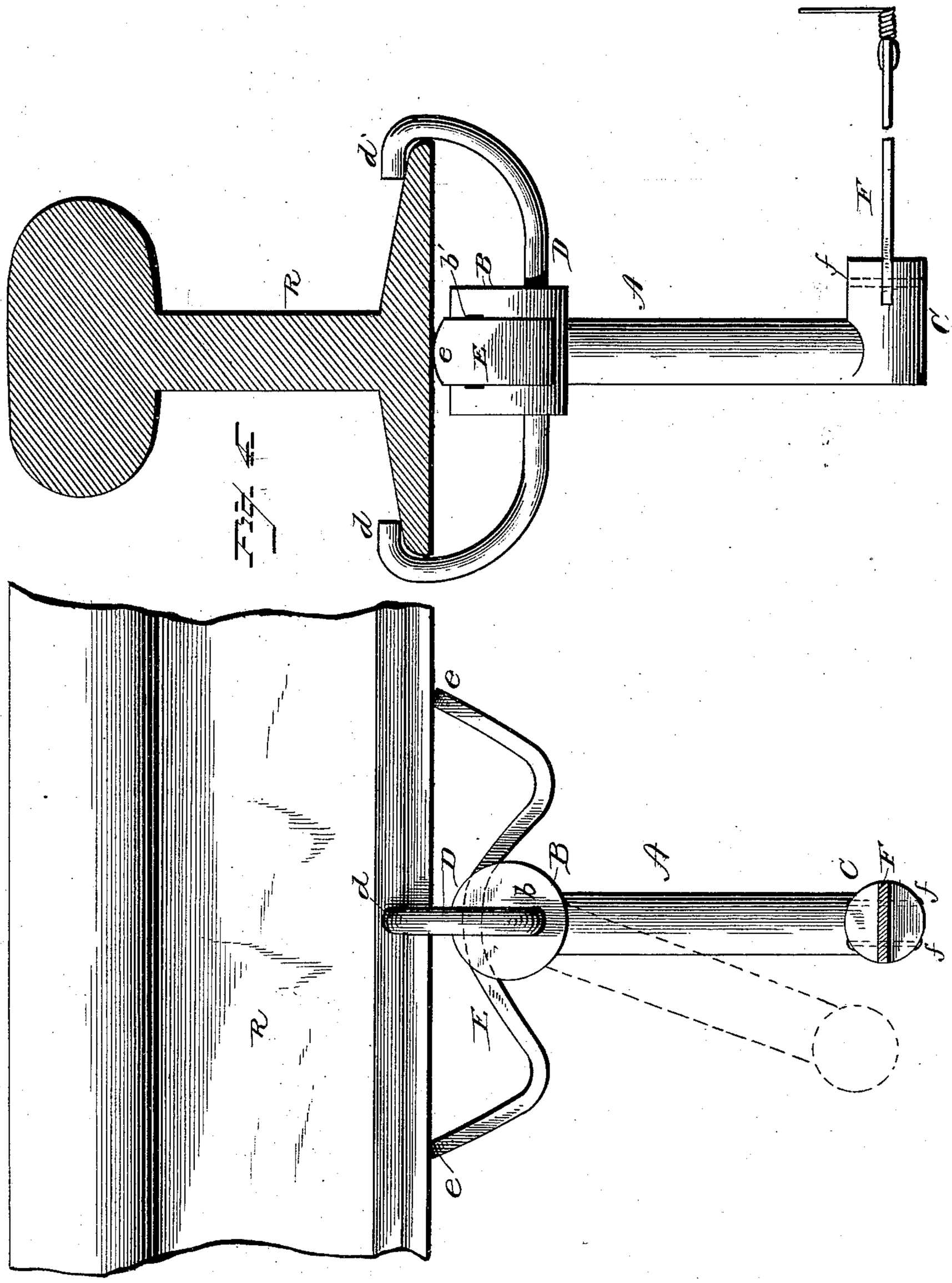

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Fig. 2.

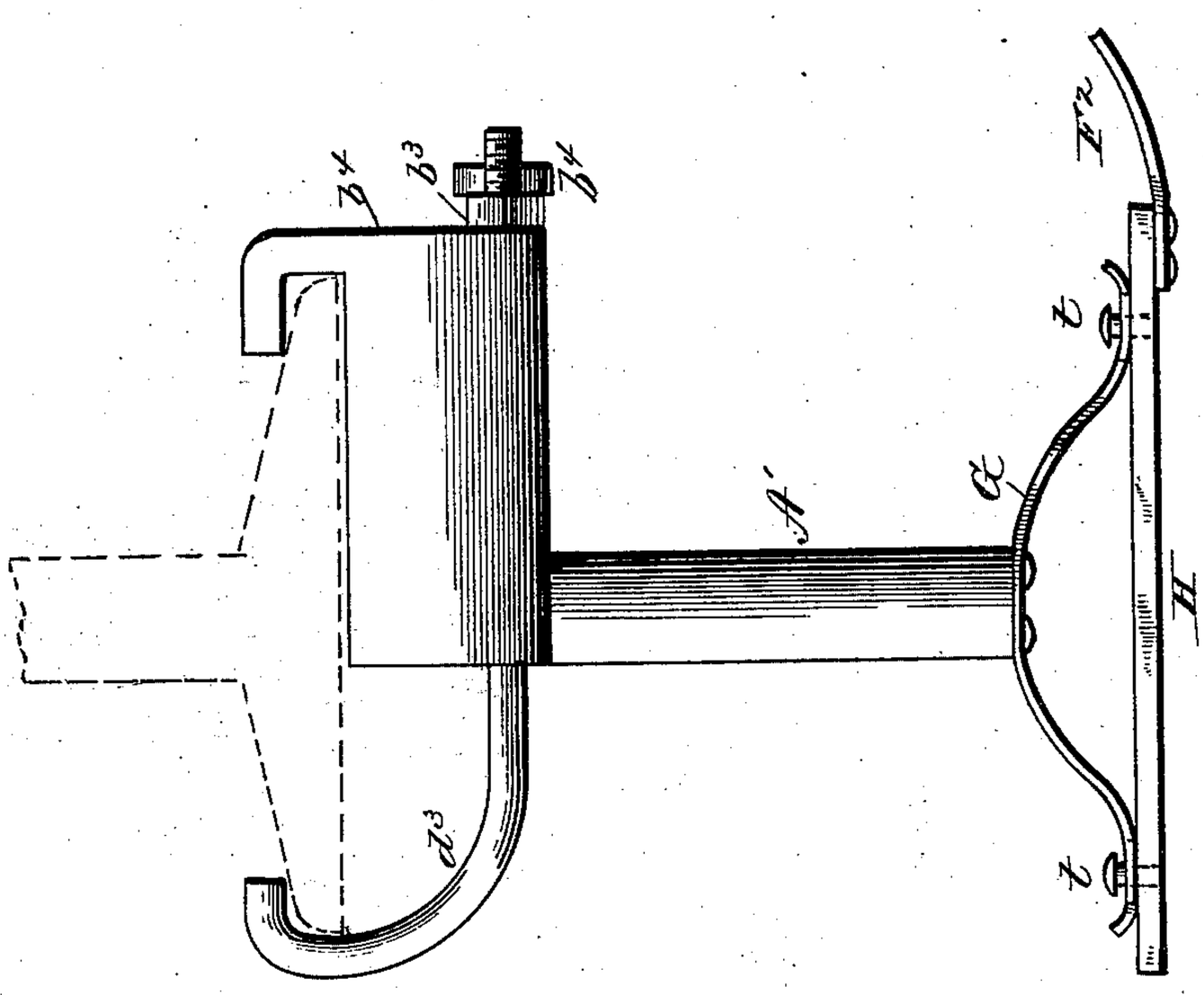
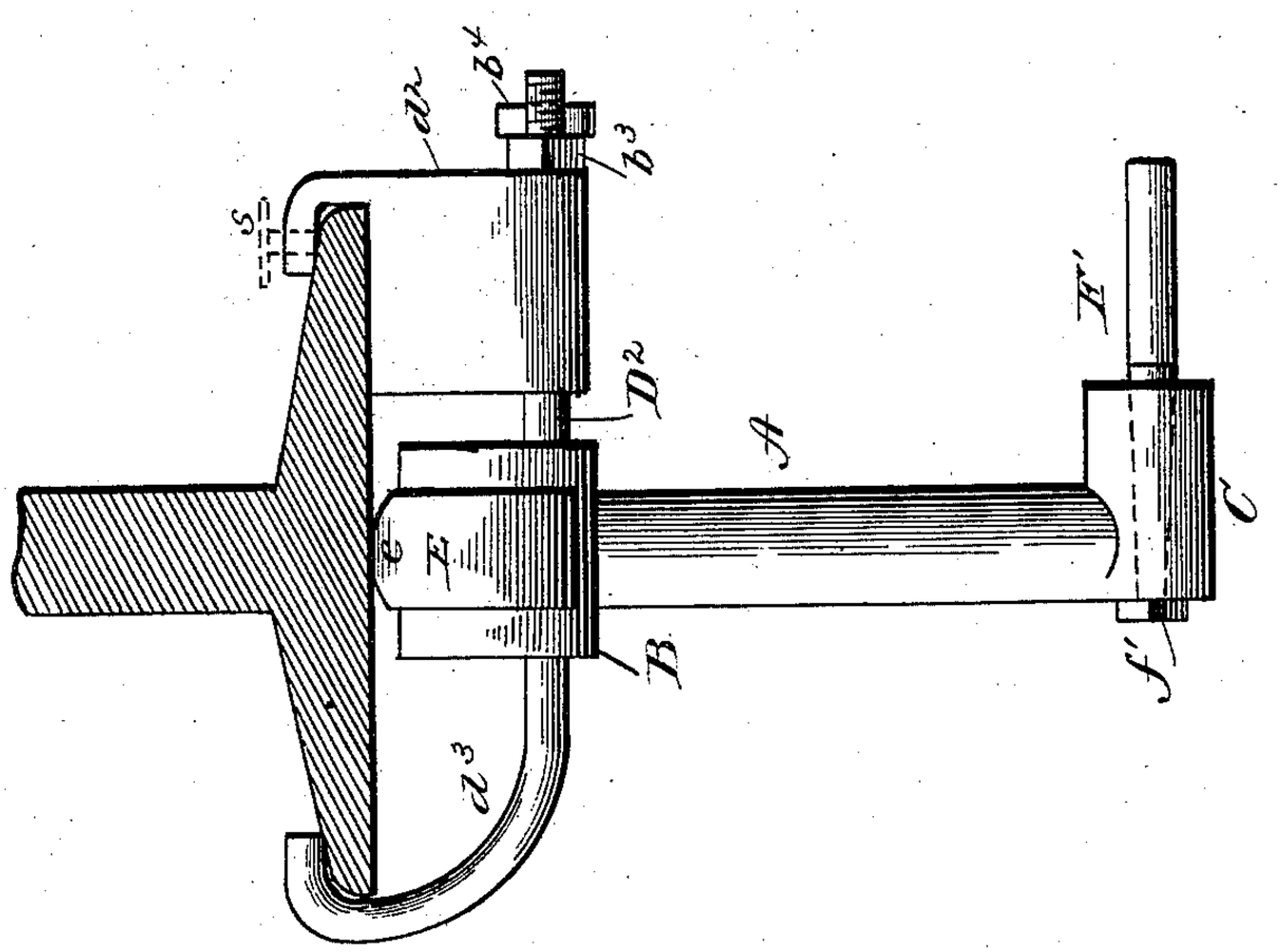


Fig. 3.



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UNITED STATES PATENT OFFICE.

LUCIUS D. HAMILTON AND ROBERT MEEK, OF LOUISVILLE, KENTUCKY, ASSIGNORS TO THE NATIONAL ELECTRIC RAILWAY SIGNAL COMPANY, OF SAME PLACE.

ELECTRIC CONNECTION FOR RAILWAY-RAILS.

SPECIFICATION forming part of Letters Patent No. 303,569, dated August 12, 1884.

Application filed February 23, 1884. (No model.)

To all whom it may concern:

Be it known that we, LUCIUS D. HAMILTON and ROBERT MEEK, citizens of the United States, residing at Louisville, in the county of Jefferson and State of Kentucky, have invented certain new and useful Improvements in Electric Connections for Railway-Rails, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to devices for making electrical connection between rail-circuits and other conductors leading therefrom to instruments or air-lines, or for connecting parts of a rail-circuit. Such connections have heretofore been made by solid clamps applied to the bases or flanges of the rails and connected with wires or strips leading off; also, by drilling holes in the rails and looping wires or flexible conducting-strips therethrough. The strips or wires have, in order that they may be protected from injury, been led off under the ground, and it has been a great source of trouble that said strips and wires are often broken by being frozen in the ground and overstrained by the displacement of the rails from various causes, such as expansion and contraction under changes of temperature and the creeping of the rails under the action of passing trains.

The object of our improvement is to overcome the disadvantages of the old connections and provide a connecting device which will make reliable electric contact with the rails, have sufficient flexibility to prevent rupture by the movement of the rails, and sufficient strength to prevent breakage by being brought into violent contact with ice, frozen earth, or other objects.

In the accompanying drawings, Figure 1 is a perspective view of a connecting device constructed according to our invention. Fig. 2 is a modification thereof. Fig. 3 is a side elevation of a portion of a rail with the connecting device shown in Fig. 1 applied thereto. Fig. 4 is a cross-section of a rail with the device applied thereto. Fig. 5 is a cross-section of a rail with the device attached thereto by means of a modified form of clamp. Fig. 6 shows another modification of the same applied to a rail.

Referring to Figs. 1, 3, and 4, A indicates a rigid metallic bar, having a cross-head, B, at its upper end and an elbow, C, at its lower end. The cross-head is bored longitudinally, as shown at *b*, to receive the intermediate portion of a clamp, D, having at its ends hooks *d d*, adapted to take over the edges of rail-flanges. Above the passage *b* is a longitudinal slot, *b'*, through which is passed a stout steel spring, E, bowed upward in the middle and in the opposite direction on both sides thereof, the tips *e e* of the bowed end portions extending upward beyond the middle portion. The bent or elbow portion of the lower end is split or bifurcated to receive a flexible strip of metal, F, preferably copper, which is secured by rivets *f f*.

In applying this device to a rail, as shown in Figs. 3 and 4, the parts are first put together, as shown in Fig. 1, and the hooks of the clamp D are then slipped over the rail-flange, as shown in Fig. 4, in which R is the rail. In order to do this the upturned tips must be forced downward, so that they will pass under the bottom of the rail, and when released they bear against the rail with such force, owing to their elasticity that a reliable electrical contact is maintained between the spring and the rail, and as the center bow is also under tension a good electrical contact is maintained between it and the cross-head, which is in turn bound strongly against the clamp which passes through it. When the rail moves longitudinally, the bar A, owing to its flexible connection with the clamp, can swing to accommodate itself to the movement of the rail, as indicated in dotted lines, Fig. 3, and therefore is not liable to be broken, especially as it can be made of such strength as to force out of its path any obstacle which it is liable to meet.

The device shown in Fig. 2 differs from that shown in Fig. 1, only that instead of passing the spring through a slot in the cross-head it is simply arranged between lips or flanges b^2 b^2, projecting upward from the ends of said cross-head.

In the device shown in Fig. 5 the clamp D^2 is formed in two parts, one part, d^2, being a hooked lug, and the other part, d^3, being a

hooked bolt passing through said lug and adapted to hook over one edge of the base of a rail, while the lug hooks over the other. By a suitable nut, b^3, the two hooks may be drawn toward each other, so as to tightly clamp the rail-base, and a split key, b^4, passed through a slot in the bolt, prevents the nut from coming loose. We also, if desired, pass a binding-screw, *s*, through the hook of the lug, to impinge upon the upper surface of the rail-base and prevent the clamp from shifting longitudinally on the rail. The advantage of this form of clamp is that it may be applied to the rail after it is laid without necessitating the raising of the rail in order that it may be slipped over the end thereof. In this figure the elbow part C, at the lower end of bar A, has a conical bore, into which is snugly driven the tapering end of a conducting-rod, F′, which is headed, as at f', after being inserted, so as to be held tightly in the socket.

In Fig. 6 the spring at the tip of the base A′ is omitted, and one part of the clamp, as shown at b^4, is formed integrally with the bar in lieu of the cross-head. This portion of the clamp is bored to receive the hooked bolt, which is formed and lettered on the drawings the same as in Fig. 5. To the lower end of the bar is secured an arched spring, G, the downward tips of which bear upon a metal plate, H, which is firmly embedded in the ground, and to which is connected the conductor F^2, which leads off to any desired locality. The ends of the spring G are preferably slotted, and have pins or screws *t t* passed through their slots into plate H, so that if at any time the said plate should be forced down out of contact with the spring electrical connection will still be maintained by the pins *t t*.

We do not confine ourselves to the precise construction shown in our drawings, of course, but may vary the same in any manner which experience or convenience may suggest for the better carrying out of our invention within its true spirit and scope.

What we claim is—

1. In an electrical connecting device for railway-rails, the combination, with a bowed spring, or one having its tips bent laterally in the same direction, of a clamp adapted to bind said spring, with its tips impinging against the bottom of a rail, and a rigid metallic bar flexibly connected to said clamp, and adapted to extend into the ground below a rod with which said clamp is engaged.

2. The combination, with a metal clamp adapted for engagement with the base of a railway-rail, and a rigid metal bar connected with said clamp and adapted to extend into the ground under a rail with which the clamp is engaged, of a contact-spring in electric connection with said bar and arranged to be held thereby in contact with another conductor, substantially as described.

3. The combination, with the rigid metal bar A, having the bored cross-head provided with a seat for a spring, of the metal clamp arranged longitudinally through said head and adapted to grasp the bottom of a railway-rail, and the spring, constructed essentially as described, seated in or upon said head at right angles to the clamp, and with its tips arranged to be brought into resilient contact with a rail when the clamp is engaged therewith, substantially as described.

4. The combination, with the bowed contact-spring, of the two-part clamp consisting of the metallic hooked lug or head arranged to support said spring, the metallic hooked bolt passed through said lug or head and provided with a suitable nut, and the metallic rod projecting from the lug or head and adapted to extend into the ground, substantially as described.

In testimony whereof we affix our signatures in presence of two witnesses.

LUCIUS D. HAMILTON.
ROBERT MEEK.

Witnesses:
I. B. DABNEY,
W. L. LYONS.