

No. 749,222.

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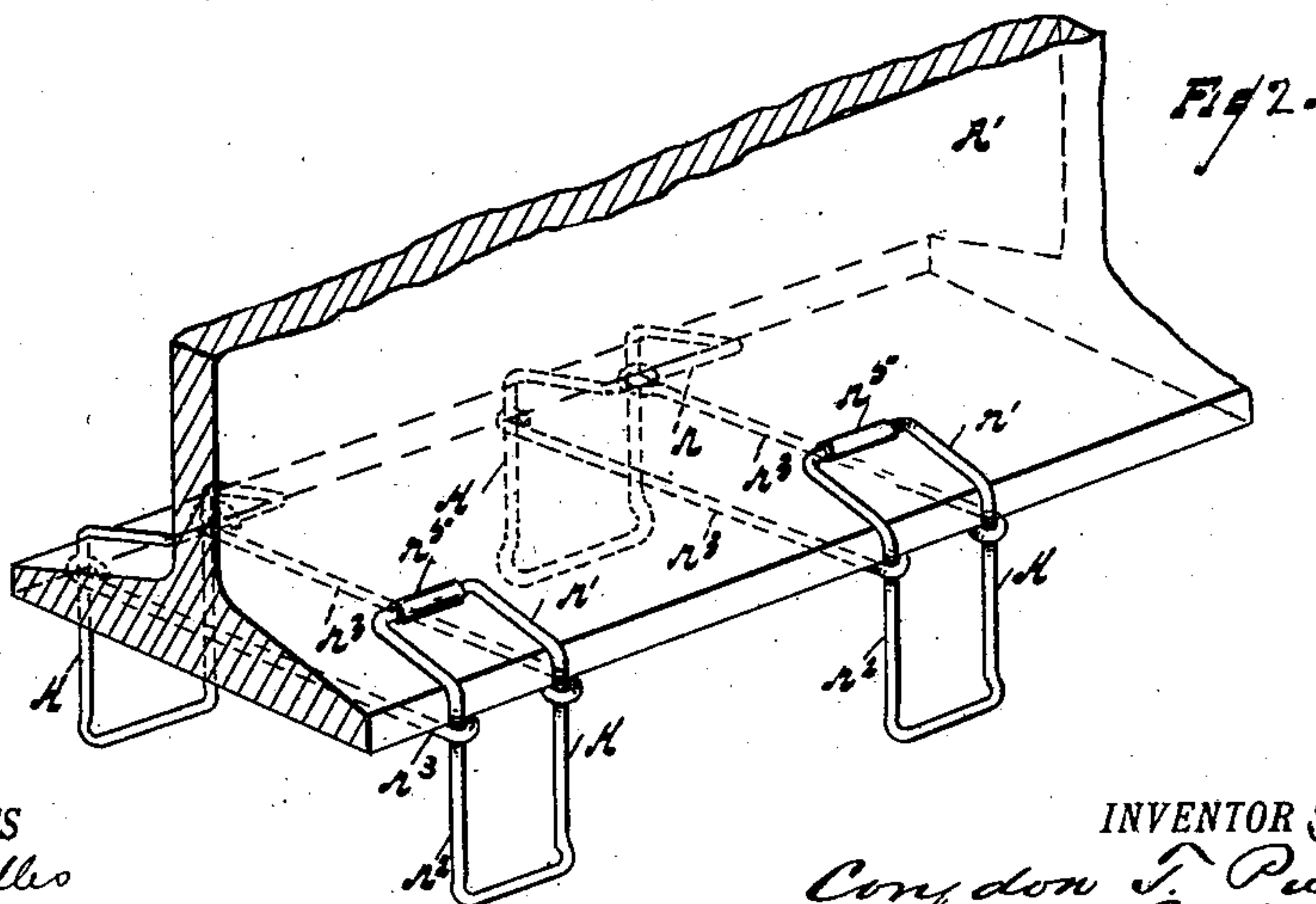
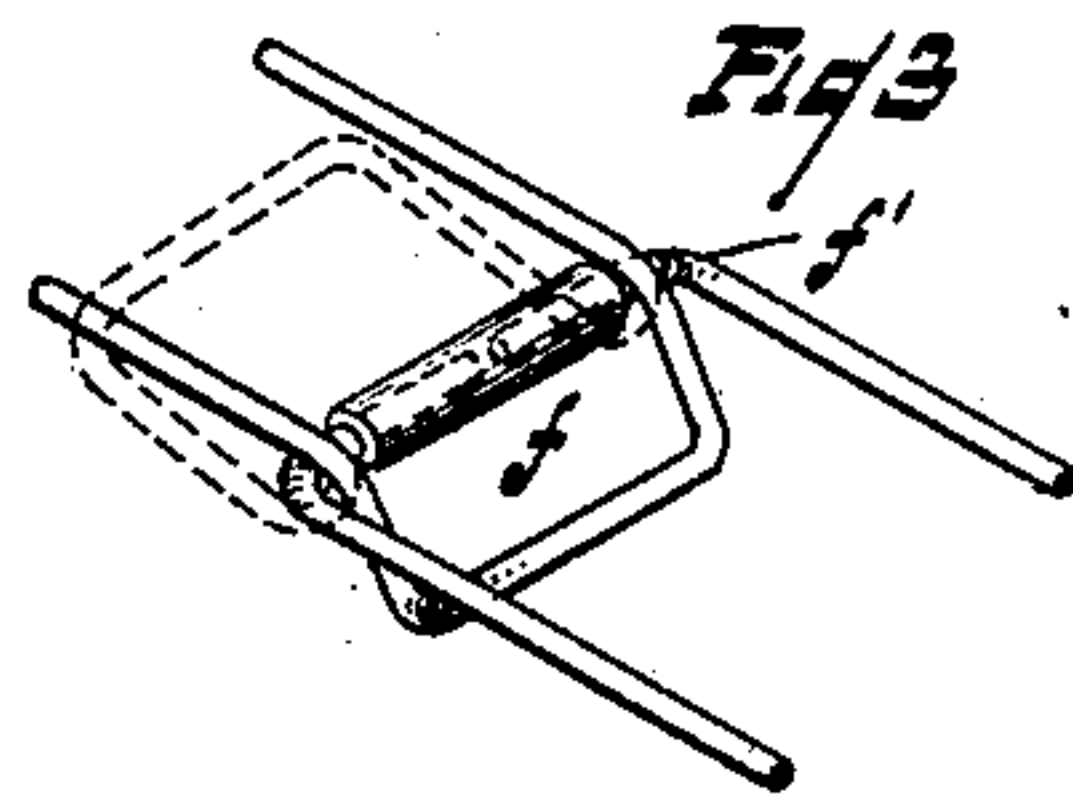
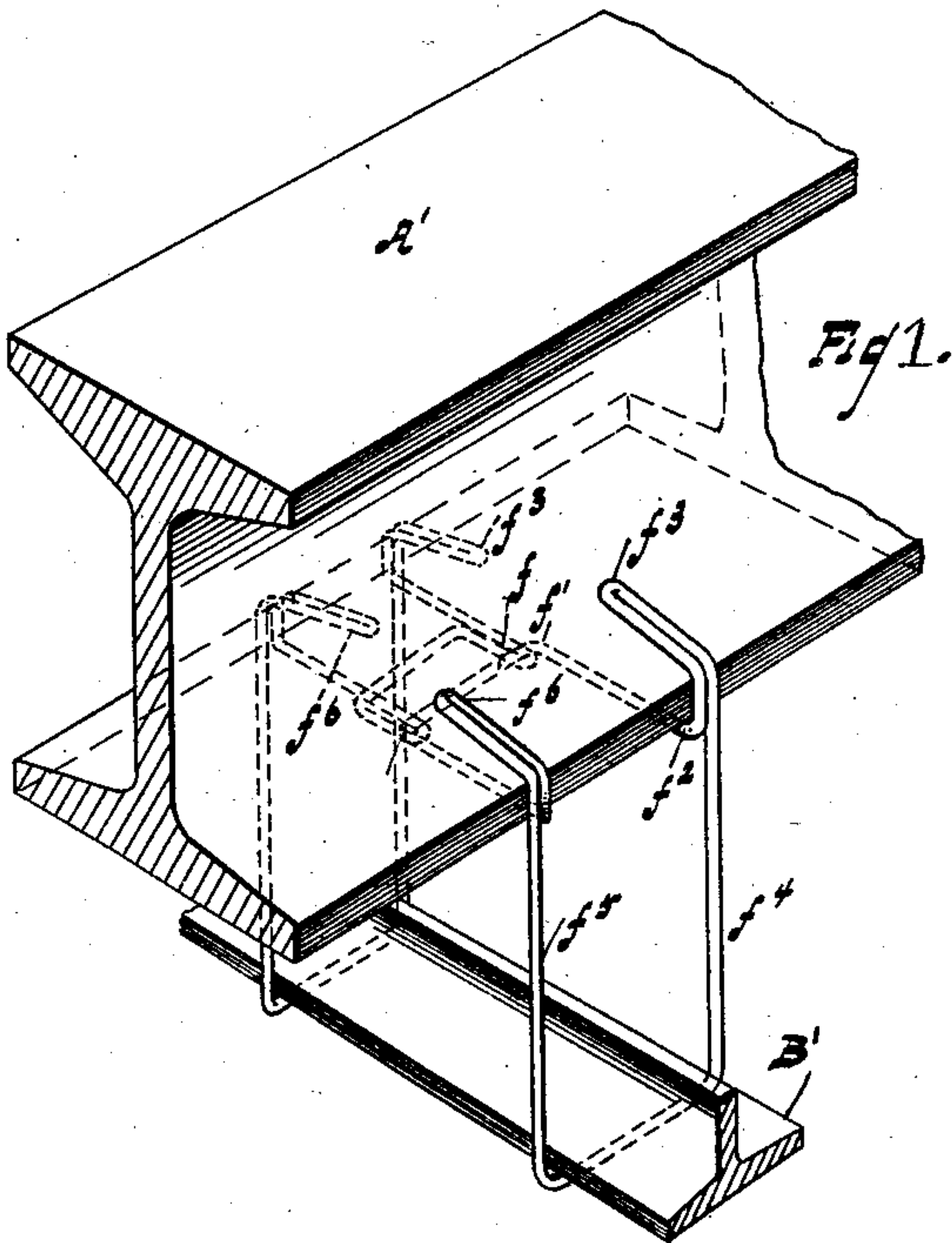
C. T. PURDY & J. S. LANE.

ATTACHMENT FOR UNITING METAL BARS AND BEAMS.

APPLICATION FILED AUG. 12, 1901.

NO MODEL.

3 SHEETS—SHEET 1.



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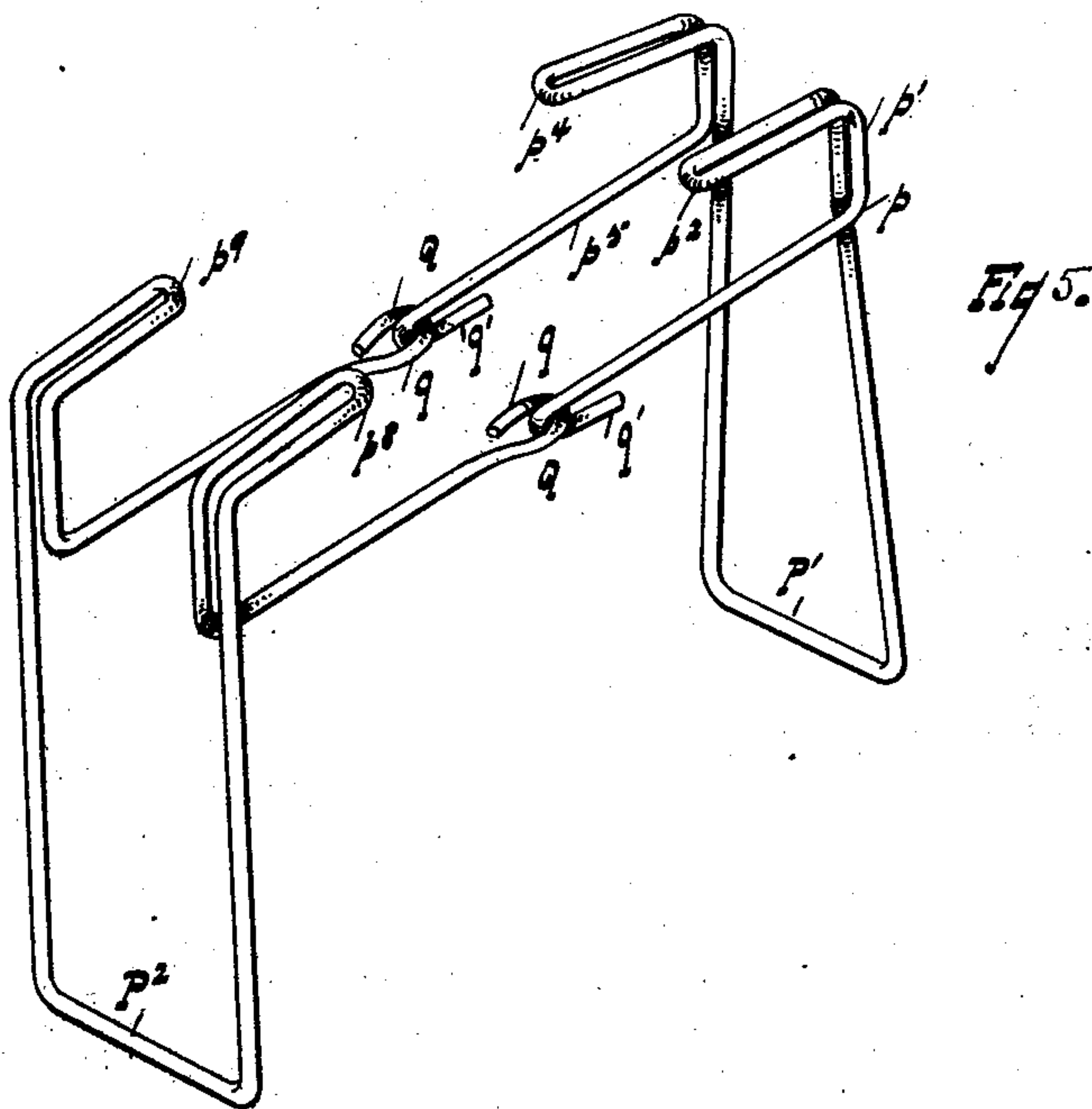
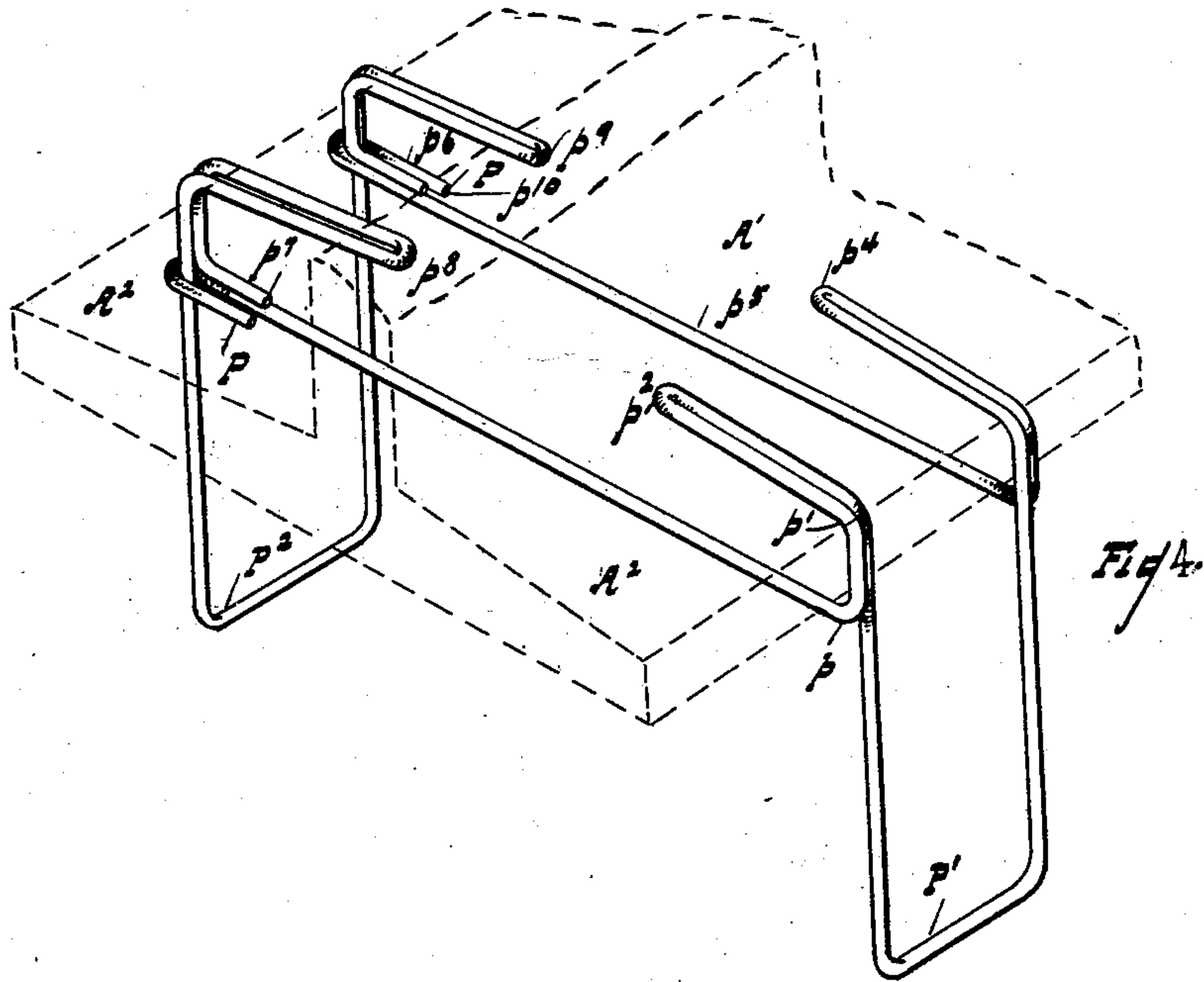
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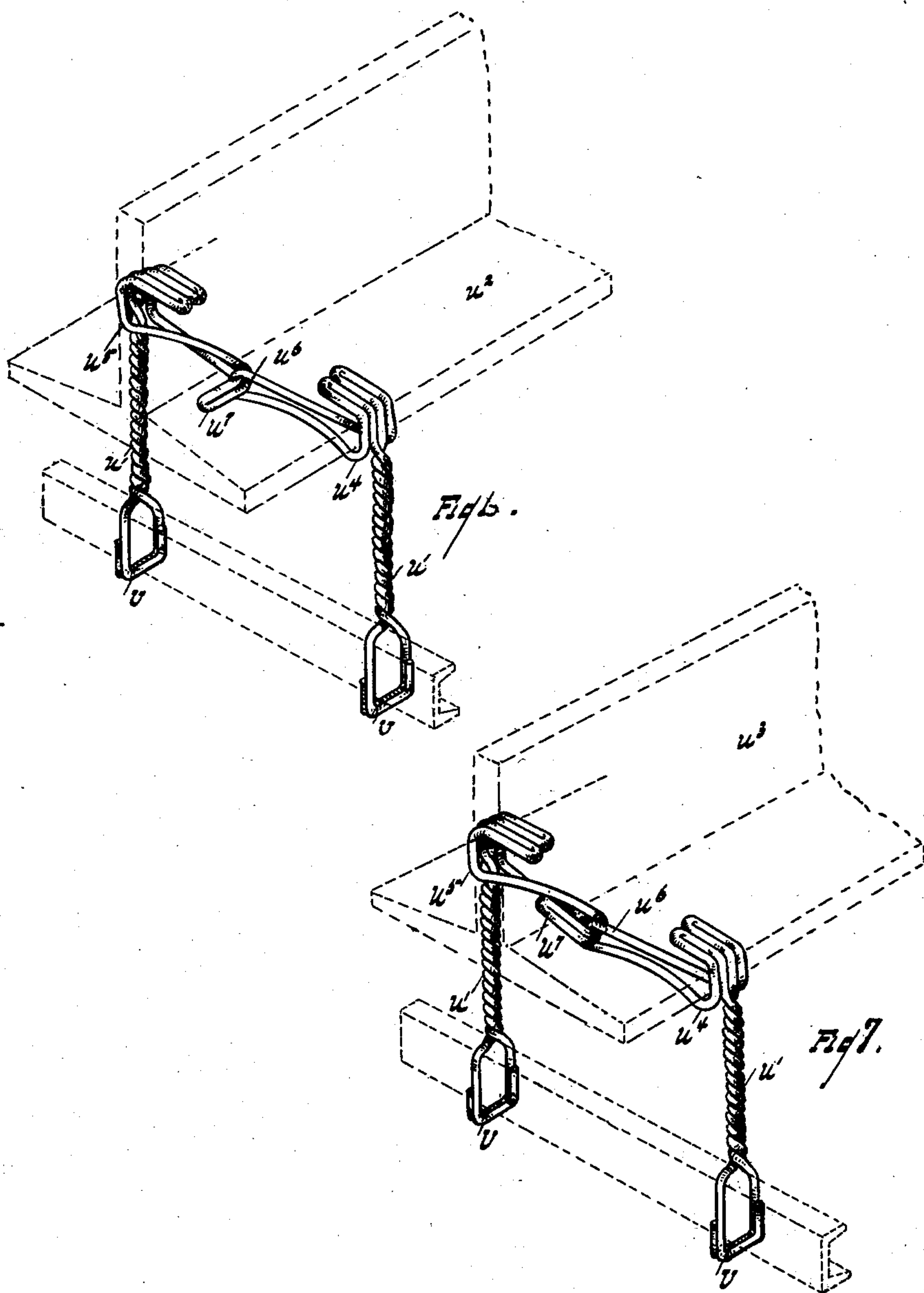
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3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

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ATTACHMENT FOR UNITING METAL BARS AND BEAMS.

SPECIFICATION forming part of Letters Patent No. 749,222, dated January 12, 1904.

Application filed August 12, 1901. Serial No. 71,680. (No model.)

To all whom it may concern:

Be it known that we, CORYDON T. PURDY, residing at Upper Montclair, county of Essex, and JULIUS S. LANE, residing at Jersey City, county of Hudson, State of New Jersey, citizens of the United States, have invented a certain new and useful Improvement in Attachments for Uniting Metal Bars and Beams; and we 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, reference being had to the accompanying drawings, which form a part of this specification.

Our invention relates to means of attaching plain metal bars, angle-bars, T-bars, or small beams or channels to the main beams of a floor or roof; and it consists in the means of attachment and in the combinations thereby effected, as hereinafter described and claimed, the general element of the invention consisting in the use of commercial wire as the material out of which the means of attachment is fabricated, the formation of a hook over the flange of the main beam by a bend or angle in the wire for the source of support, and the looping or hooking of the wire for the retention of the bars.

In the drawings, Figure 1 is a perspective view showing a wire-retaining device for supporting the furring-strips or any equivalent members to a main beam with one mode of attaching the closed ends of the wire together. Fig. 2 is a perspective view showing a modified wire-retaining device also attached to a main beam and having for its object the supporting of furring-strips or other equivalent members thereto, in which the wire supports are united and held in position in the modified manner. Fig. 3 illustrates the manner of uniting the double wire stirrups illustrated in Fig. 1. Fig. 4 is a perspective view illustrating another mode of uniting the pair of stirrups used as supports from the main beam. Fig. 5 illustrates another modified mode of connecting such stirrups. Figs. 6 and 7 illustrate still other modified forms of wire stirrups, together with means of uniting the same after being placed in position.

Similar letters refer to similar parts.

In Fig. 1 we have shown means for holding the furring from the main floor-beam and in the same connection shown modification of the looping of the wires over the lower flanges of the floor-beam. This consists of two loops upon each side by returning the wire upon itself, the wire being looped into stirrups—a feature common to Figs. 1, 2, 3, and 4—and whereby the furring may be supported closely to or at some little distance or an assignable distance from the main floor-beam.

In Fig. 1 the beam A' supports the I-beam B' by two stirrup-loops formed of wire and, as in the description of those of Fig. 1, may be described by tracing the course of the wire, assuming that it begins at a union-point f , extends to an angle f' upon the under side of the flange of the beam A'. From this point it is angled and extends outwardly at right angles to the beam to the edge of the flange at f^2 , thence is angled at substantially right angles from the edge of the flange, and thence bent downwardly and extends inwardly toward the web and at f^3 is formed into a close loop, returned upon itself, and extending back to the edge of the flange and thence downwardly, as f^4 , a sufficient distance to pass below, and is thence bent inwardly under the lower surface of the beam B', is thence extended sufficiently to cover the width of the beam, thence bent upwardly at f^5 to the upper surface of the flange of the beam A', thence bent downwardly and inwardly and returned upon itself, forming a loop f^6 , thence brought back to the edge of the flange, is thence bent downwardly and thence inwardly along the lower surface of the beam A' and near the center, thence bent again at right angles longitudinally with the beam and brought back to the point of union at f . A companion bracket, made of wire and similarly shaped with a single exception, is shown upon the opposite side of the beam A' in dotted lines, the exception being that instead of bringing the ends of the wire together, as at f , and uniting them the wire is first continued into a longer loop from the outer edge of the flange toward the opposite edge of the flange, the loop

being narrower than that formed upon the opposite side, so that the long loop may be passed through the short loop formed by the opposite bracket, when thus passed through the loop, as shown in dotted lines, is bent back upon itself, thus firmly holding the two wire brackets together, with the flanges clasped by the loops formed above them and the two stirrups holding the beam B' in place, as shown.

It is obvious that in this form the loops may be formed up in advance, can be placed upon the beam B' , and then slip up to the main beam A' until the return-loops, like $f^3 f^6$, engage the flanges of the beam A' , and then the long loop can be inserted through the short one on the under side of the beam A' and then bent backward, thus engaging the two and preventing further separation.

In Fig. 2 we have shown a further modification in which two separate loops or stirrups are employed, (marked H H.) These are rectangular in general shape with the ends of wire closed and preferably, although not necessarily, united at n . One end of the loop is bent at an angle, as at a' , the angle conforming to the flange of a beam, while the other end is adapted to hang vertically below the edge, as shown at n^2 . The farther strip is then passed through the loops, the same as shown in Fig. 3, and the rectangular stirrups are then engaged with the lower flange of the beam A' and held in this position by a pair of tie-rods $n^3 n^3$. In this Fig. 2 is also shown another pair of stirrups constructed in the same manner except that the fastenings of the wire in closing the rectangular loop for the stirrup is shown to be by a thimble at n^5 , within which each end of the wire may be inserted.

Figs. 4 and 5 are modifications of loops made in two separate parts or stirrups, which are afterward linked together by cross-ties, and thus held upon the flange of the beam, the two sides of Fig. 4 being practically symmetrical, the two sides of Fig. 5 not being symmetrical.

In Fig. 4, A' is the beam, having flanges A^2 , shown in dotted lines for the purpose of clearly showing the construction of the suspended stirrups. Each of the stirrups is made of one piece of wire. That upon the right-hand side may be traced by commencing at P , where it is bent upon itself and incloses the wire of the opposite stirrup, this bending being done after the assemblage. Thence it is traced underneath and across the flanges of the beam to p , where it is bent upward until it rises above the top of the flange at p' , and thence a closed loop is formed, extending inward toward the web of the beam and above the flange, the loop being marked p^2 , thence returned to the edge of the flange, and then downward to form the stirrup p' , thence back to the flange and inward, forming a second loop p^4 , back to the edge of the flange, thence returned underneath the flange at right angles thereto at p^5 to the opposite side, where it is returned upon itself

at p^6 , grasping the opposite stirrup. The ends P in p^6 are not bent back upon themselves to inclose the opposite stirrup until the assemblage, as hereinbefore stated. The opposite member P^2 of this compound stirrup commences at p^7 and passing up over the flange of the beam forms a loop p^8 , returning upon itself to the edge of the flange, thence downward to form the stirrup P^2 , thence back to the edge of the flange and over the top of it, forming a second loop p^9 , thence back to the edge of the flange and bent underneath it, as shown at p^{10} .

In Fig. 5 the returned loops are above the flange and are formed in exactly the same manner as in Fig. 1, and that description will answer therefor, the only modification being that shown at $Q Q$, where, the two stirrups being alike, the ends of the wires are carried to the center of the beam, or substantially to the center, and each bent back upon itself, one forming practically eyes $q q$, through which the ends of the opposite wires q' may be inserted and returned upon themselves, forming second loops or eyes, thus engaging the two wires. In both of these figures, as hereinbefore stated, the supporting-brackets are so constructed that the furring-strip of small beam is held by the stirrup portion, as hereinbefore described in the other figures, and at any assignable distance from the main beam A' .

In Figs. 6 and 7 there is shown another form of wire stirrup wherein the support of stirrup is made of two parts with hooks to clasp over the edge of the supporting member and the two parts united by linking them together centrally underneath the member and bending one of the tongues or projections in the form of a hook and wherein the wires are twisted together in one member, as shown. In these figures $U U$ are the supports or stirrups, through which may be passed the furring. The wires are first formed in the shape required for the stirrups and then twisted, as shown at u' , to an extent which brings them to the plane of the under side of the floor-beam, and thence they are each extended and bent over the top of the flanges to the floor-beams $u^2 u^3$, thence return upon themselves, so that the angles under the edge of the floor-beam at $u^4 u^5$ are on the outside of the twisted portion u' . Thence they are bent underneath the floor of the beam to form two (2) loops, one of which, u^6 , is an eye, and the other, u^7 , is so closely shaped that it forms a tongue bent at right angles to the adjacent portion of the loop or is in a line parallel with the axis of the beam, as shown in Fig. 6. This tongue is inserted in a loop, as shown in that figure, and then with any convenient tool forcibly bent back upon itself, as shown in Fig. 7, thus drawing the hooks together upon the edges of the beam, and thus firmly holding the two stirrups $u u$ upon the beam without any movement except longitudinally upon the flanges of the beam. This forms a very strong

bracket or support, any one of which is very easily attached without any special tool and by reason of the simplicity of the construction is to be preferred to some of the similar forms which are already shown and described in this specification. It is obvious that these wire clips may be almost entirely formed in quantities prior to the assembling of the structure and that the final formation is completed readily and rapidly when the structure is assembled. This is the chief advantage in making a wire clip over ordinary tying with wire, in which there is no predetermined form, but merely a wrapping or tying around the supporting and the supported members to suit the notions of the workmen.

The essential features of our invention are common to all the forms shown herein. They include the use of wire as the material out of which the device is fabricated, the fixing of the means of attachment to the principal member in a definite form, which requires only slight modification at the time of erection, the employment of two suspending elements in each hanger, the vertical condition of the suspending element in each case, and the fastening together of the two suspending elements underneath the principal member by a separate element of the device. It is also evident that the same material and the same essential elements of our invention can be used in other forms than those shown.

What we claim is—

1. A wire device for suspending bars of any shape underneath supported beams consisting of a preformed wire clip, one part of which is bent to correspond with the sides of the flange of the beam, and another part to carry and hold fast the supported member, and an extension underneath the supporting-beam

adapted to engage and unite with a corresponding wire clip upon the opposite side of said supporting-beam, substantially as described.

2. A wire device for fastening two structural members together, consisting of two parts, each preformed to fit around the flange of the supporting member and to hook around and carry the supported member, with wire extensions adapted to engage the supporting-hooks directly underneath the supporting member and unite the two in place, whereby the supports are prevented from being disengaged from the supporting-beam, substantially as described.

3. For uniting supporting members in metal structures, a clip made of wire having hooks adapted to embrace the flange of the sustaining-beam and a stirrup depending therefrom adapted to sustain and support a sustained beam, the wire being extended underneath the sustaining-beam and adapted to be interlocked with a companion clip, substantially as described.

4. The combination of a supporting-beam and a supported beam, two wire clips, each having hooks to engage the supporting-beam, and a stirrup to engage the supported beam, said hooks being united when in place by wire extensions immediately under the supporting-beam, whereby the clips are prevented from being detached from said beam, substantially as described.

In testimony whereof we sign this specification in the presence of two witnesses.

CORYDON T. PURDY.
JULIUS S. LANE.

Witnesses:

J. T. RICHARDS,
HAROLD NATHAN.