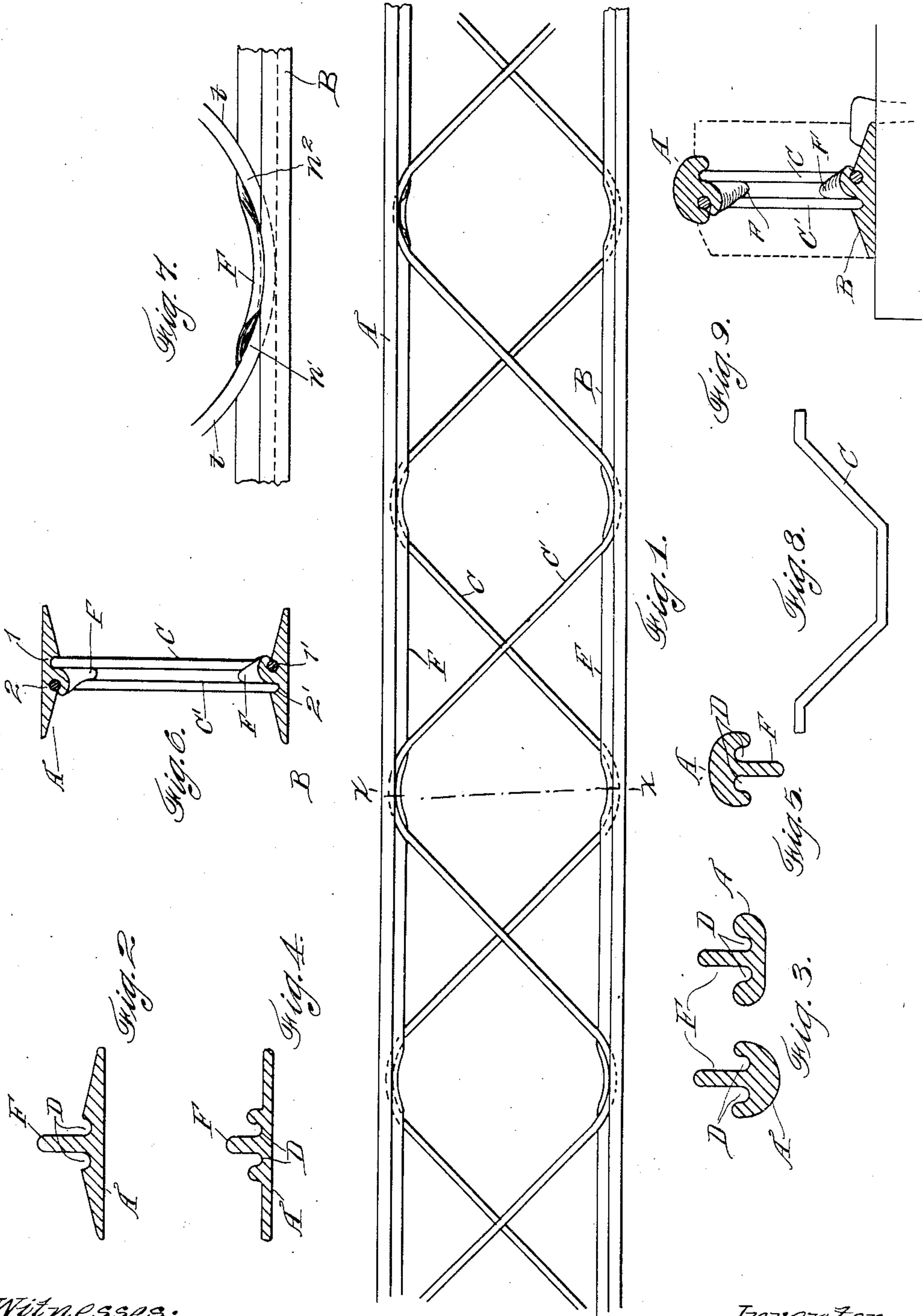


P. STRAGIOTTI.
 TRUSSED BAR FOR REINFORCED CONCRETE CONSTRUCTION.
 APPLICATION FILED MAY 27, 1909.

954,900.

Patented Apr. 12, 1910.



Witnesses:

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UNITED STATES PATENT OFFICE.

PIETRO STRAGIOTTI, OF HURLEY, WISCONSIN.

TRUSSED BAR FOR REINFORCED CONCRETE CONSTRUCTION.

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Specification of Letters Patent.

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Application filed May 27, 1909. Serial No. 498,620.

To all whom it may concern:

Be it known that I, PIETRO STRAGIOTTI, citizen of Italy, residing at Hurley, in the county of Iron and State of Wisconsin, have
5 invented new and useful Improvements in Trussed Bars for Reinforced Concrete Construction, of which the following is a specification.

My invention relates to reinforced concrete construction, and pertains particularly to a new kind of trussed bar for reinforced concrete beams, girders, railway ties, railway rails, and the like, possessing every
10 advantage of the I-beam or T-rail of large size, and resulting in an economy of metal over the usual I-beam.

The invention consists of the parts and the construction and combination of parts as hereinafter more fully described and
15 claimed, having reference to the accompanying drawings, in which—

Figure 1 is a side elevation of a trussed bar. Figs. 2, 3, 4 and 5 are cross-sections of various types of longitudinal bars used in
20 the construction of Fig. 1. Fig. 6 is a section on line X—X of Fig. 1. Fig. 7 is a detail of a longitudinal bar and its method of connection with a zigzag bar. Fig. 8 is a detail of one form of bend for a zigzag bar.
25 Fig. 9 is a cross-section of a trussed bar suitable for railway rails.

One of my trussed bars or I-beams, such as shown in Fig. 1, is made up of two longitudinal parallel bars A and B, which in an
35 I-beam construction will have the cross-section of Fig. 2; these upper and lower bars A—B being connected by the two zigzag bars C—C', which zigzag back and forth between the bars A—B in opposite directions, each zigzag bar being connected at the
40 bends to the parallel bars by a super-bending and clenching of the intermediate web or flange F on one or other of the bars A—B. The shape of the cross-section of a bar A or B need not always be exactly as in Fig.
45 2, but may undergo certain changes according to the use for which the structure is intended. For I-beam structure the form of Fig. 2 or Fig. 4 would usually be employed; while for railway rails, and especially for
50 the tread portion thereof, the form of Fig. 3 or Fig. 5 would be employed. The fundamental characteristic of all these bars is the central longitudinally-extending web or
55 flange F with the two grooves D at its base,

a sufficient amount of metal being left on the outside of these grooves to form their outer walls and give body to the rail. The flange F constitutes the common wall of the
two channels D and projects above the
50 same. Within these channels the zigzag bars seat at their bends; the flange F being bent alternately to one side or the other by hydraulic pressure, or other suitable means,
35 to overlap the bent portion of the zigzag bars, as shown in Figs. 6 and 7.

In constructing this trussed bar, the two bars A—B are arranged parallel, as shown in Fig. 6, with the grooves 1 and 2 of bar A
opposed to the bars 1'—2' of bar B. The
70 zigzag bars may be bent with sharp elbows, as shown in Fig. 8, or they may be bent as represented in Fig. 1. The bar C zigzags from channel 1 of longitudinal bar A to channel 1' of longitudinal bar B, and the
75 bar C' zigzags from the channel 2 of bar A to the channel 2' of bar B. While the relative positions of the two zigzag bars C—C' may be arbitrary, it is of some advantage that they proceed alternately, so that the flange
80 F may be bent alternately to right or left to clench and hold the bent sections of both bars. An attachment of this kind is very good in itself, because the securing effect
85 of the flange extends to the whole portion of the zigzag bar gripped by the flange, as represented at n^1 — n^2 , Fig. 7.

The concrete mixture when applied to the finished structure, not only acts as a protection, but as a connecting means, for its
90 adhesiveness and rigidity establishes forthwith continuous connections between the zigzag bars and the longitudinal ones. It also acts further by coöperating to insure the attachment just described, because in the concrete
95 any loosening of the bars is impossible.

To illustrate, assuming that in the portion t — t , Fig. 7, of the zigzag bar, there is exerted a tensional force: This force tends to bring up the bent portion of the flange
100 between n^1 — n^2 , for the reason that a tensional strain tends to straighten the bar; but in order to go up, the flange is not only opposed by its own resistance, but its tendency is resisted by the concrete above which
105 is strong on compression. Therefore, the several parts coöperate in the best possible manner to increase the solidity of the whole structure.

In Fig. 9, I show the application of the 110

same principle in the manufacture of railway rails.

One important application of a trussed bar of this kind is in the making of rails for 5 railroads in reinforced concrete, for in this construction the same amount of steel may be used, but the resistance will be very much increased; the rail being, as a whole, compact and less sensitive to the pulls and 10 vibrations. This rail may be made practically continuous, except for such necessary openings or gaps occasionally to allow for expansion and contraction. This increased resistance of the rail allows the ties to be 15 placed at a greater distance from each other. Naturally in this railway rail construction the longitudinal bars are exposed, as shown in Fig. 9, so that the upper bar forms a tread for the wheels, and the lower bar 20 forms the base of the rail so that it can be spiked to the ties.

Having thus described my invention, what I claim and desire to secure by Letters Patent is—

- 25 1. A structural metal shape comprising a pair of longitudinal bars, each of said bars having a central lengthwise extending flange, the flanges on said bars opposed to each other said bars having suitable seats on 30 each side of the flanges, and zigzag bars extending between the longitudinal bars and fitting in said seats, said flanges bent over alternately in opposite directions to grip the bent portions of said zigzag bars.
- 35 2. A trussed structural shape comprising upper and lower longitudinal bars, each of said bars having a lengthwise extending flange, each bar having a longitudinal groove on each side of its flange, and a pair of zig- 40 zag bars extending between the longitudinal bars, one of said zigzag bars being on one side of said flanges and the other zigzag bar on the other side of said flanges, with their bends arranged alternately, and said flanges

alternately bent to one side or the other to 45 clench the bent portions of said zigzag bars.

3. A trussed structural shape comprising upper and lower longitudinal bars, each of said bars having a lengthwise extending flange, each bar having a longitudinal groove 50 on each side of its flange, a pair of zigzag bars extending between the longitudinal bars, one of said zigzag bars being on one side of said flanges and the other zigzag bar on the other side of said flanges, with their 55 bends arranged alternately, said flanges alternately bent to one side or the other to clench the bent portions of said zigzag bars, and a concrete filling in which said zigzag bars are embedded, leaving the longitudinal 60 bars exposed.

4. A trussed bar including a longitudinal bar having a lengthwise extending flange, and said bar having a lengthwise extending groove on each side of the flange, and a pair 65 of zigzag bars, one of which seats in one groove and the other of which seats in the other groove, and the flange bent alternately to one side or the other to grip the bent portions of said zigzag bars. 70

5. A trussed structural shape comprising upper and lower longitudinal bars, each of said bars having a lengthwise-extending flange and each bar having a longitudinal groove on each side of the flange, zigzag 75 bars between the upper and lower bars having their bends fitting in said grooves, said flange bent over the bends of the zigzag bars to grip said bends, and a concrete filling in which said zigzag bars are embedded so as 80 to leave the longitudinal bars exposed.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

PIETRO STRAGIOTTI.

Witnesses:

ALBERT R. TAYLOR,
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