

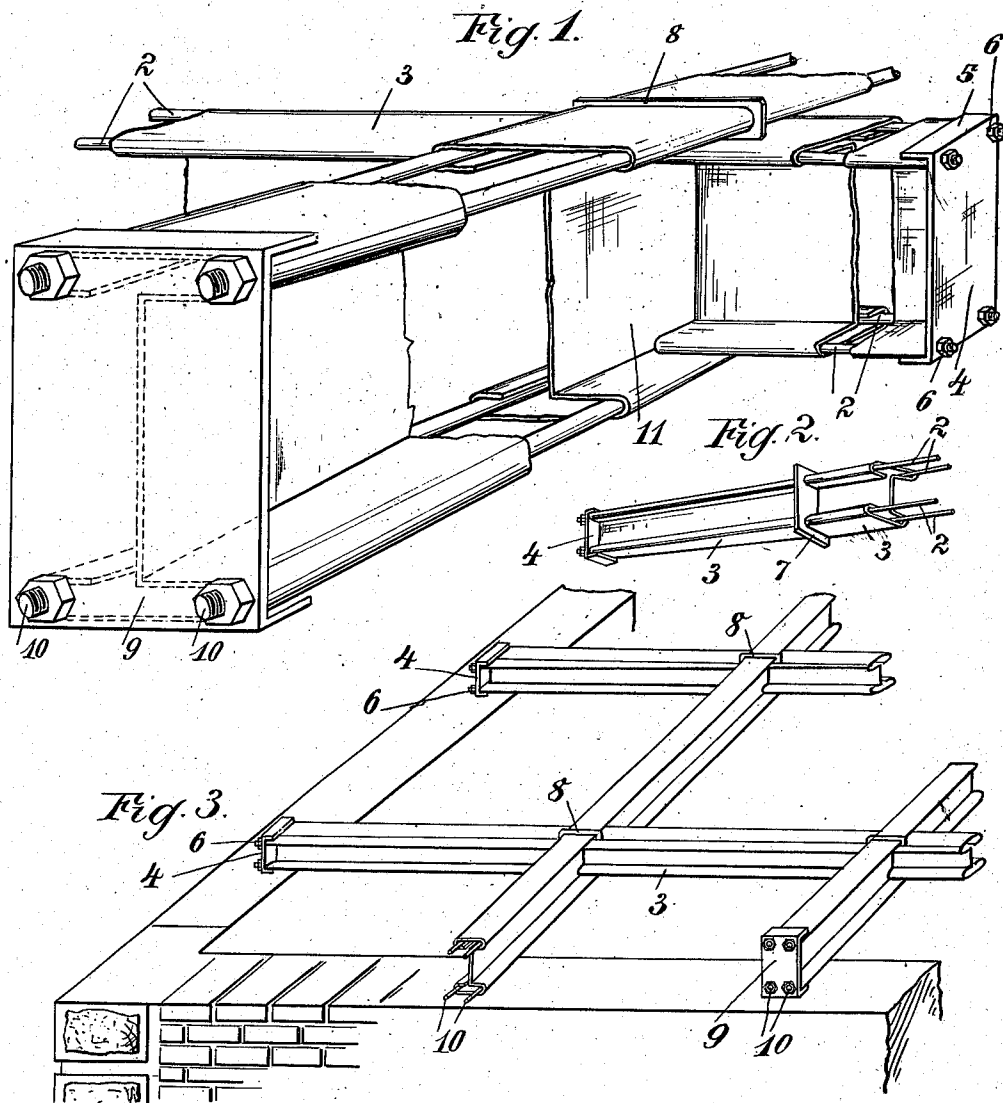
No. 866,940.

PATENTED SEPT. 24, 1907.

R. LIPMAN.
CONSTRUCTION OF IRON GIRDERS.

APPLICATION FILED APR. 13, 1906.

2 SHEETS—SHEET 1



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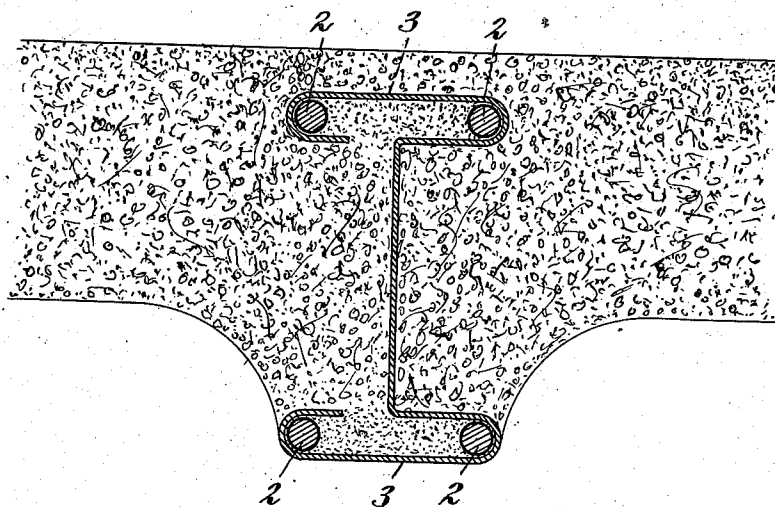
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Fig. 4.



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ROBERT LIPMAN, OF STRASSBURG, GERMANY.

CONSTRUCTION OF IRON GIRDERS.

No. 866,940.

Specification of Letters Patent.

Patented Sept. 24, 1907.

Application filed April 13, 1906. Serial No. 311,476.

To all whom it may concern:

Be it known that I, ROBERT LIPMAN, constructor, a resident of 50 Vogesenstrasse, Strassburg, in Alsace, German Empire, have invented new and useful Improvements in the Construction of Iron Girders, of which the following is a specification.

The present invention relates to an iron girder composed of tie or tension rods and of metal sheets or plates bent around said rods so as to constitute a profile girder. This construction produces extremely strong connections which are also capable of serving as supports for cement floors and the like. Moreover, by means of fish plates a very advantageous crossing or intersecting of girders of this kind may be obtained so that the girders are adapted to be employed generally as substitutes for those usually employed of other constructions.

Between the several metal sheets and also at the end of each girder, plates formed with suitable holes are placed over the tie rods, the former of said plates being intended to prevent the metal sheets from shifting over one another when the tie rods are being tightened up, while the latter of said plates serve as abutments for the nuts on the tie rods, and also serve to stiffen the head of the girder.

Girders composed of solid iron and sheet metal strips have already been made, but in those cases the sheet metal strips have been merely bent around the solid iron parts, and there have been no head or end plates which were capable of receiving the tensional forces and of transmitting the latter as compressive forces to the profiled sheet metal strips. Girders of that kind are obviously suitable for use only in the construction of light partitions, and in a vertical position, because they have almost no supporting power. Now, on the contrary, girders constructed in accordance with this invention have a very great supporting power and they have further the advantage of being capable of being transported in sections to the place where the building operation is being carried on and of being erected in the most simple manner, while also intersections of several girders may be effected without cutting up the tie-rods.

The accompanying drawing illustrates by way of example a form of construction of the girders, Figure 1 being a perspective view at a point of intersection, and Fig. 2 being likewise a perspective view on a smaller scale, showing the construction of the girders, and more particularly the arrangement of the intermediate plates. Fig. 3 is a perspective view of an overhead floor or ceiling composed of girders of this kind, resting directly on the masonry, and Fig. 4 is a sectional view showing the girder in position.

Bent metal sheets 3 are bent around the tie-rods 2 after the fashion of a profile girder, in the case showing after the fashion of a double T-girder. At the ends of

the girders formed in this manner there are arranged head or end plates 4 which project by means of flanges 5 at top and bottom over the ends of the girders, and against which the nuts 6 of the tie-rods 2 take their bearing.

As shown in Fig. 2, the metal sheets 3 which are bent into girder-shape and which form sections of a complete girder are separated from one another at their abutting ends by means of spacing-plates 7 which are mounted by means of suitable holes on the tie-rods 2, and prevent the metal sheets forming the girder sections from shifting one over the other when the nuts 6 are being screwed up. These spacing plates are also shown at 8 in Figs. 1 and 3 in which are shown intersecting girders. In the construction shown in these figures the ends of two of the sections composing the girder 3 abut against the web of the girder 11. This web is provided with suitable openings through which the tie rods 2 are arranged to pass. The ends of these tie rods 2 pass through end plates 4, said ends being screw-threaded to receive nuts 6 which secure the sections of the girder in position. The girder 11 may also be composed of sections, said sections being secured together by means of tie rods 10 which pass through end plates 9 and receive nuts in the same manner as just described. To prevent the sections composing the girder from overlapping each other, spacing plates 8 are placed between said sections, said plates being provided with suitable openings in the same manner as the plates 7. These plates 8 are smaller than the plates 7 and in the construction shown in Figs. 1 and 3 are located over and under the girder 3 so as not to interfere with said girder 3 when the sections thereof are brought up against the web of the girder 11. Figs. 1 and 3 thus show clearly that two girders may be made to intersect each other without the use of any fish-plates, the metal sheets of one girder being merely divided at the place of intersection.

Fig. 3 shows the skeleton of a floor constructed of girders of this kind having several points of intersection which rest directly on the masonry.

Obviously, any other profile shape may be used in the stead of the double T-profile shown. Similarly, the girders may also be arranged vertically and may be used with any desired number of tie-rods. The girders may also be covered or coated wholly or partly with cement or other material, and several such girders may also be embedded together side by side in a common covering of cement.

The chief advantages of these girders are, small weight combined with great supporting capacity, consequent cheapness of manufacture, and low rates of transport, and low dead weight to be carried by the buildings, and greater simplicity of erection, even by inexperienced persons.

Now what I claim and desire to secure by Letters Patent is the following:

1. In iron girders the combination of tie-rods with sheet metal strips bent around the tie-rods after the fashion of a profile girder substantially as described.
- 5 2. In iron girders the combination of tie-rods with sheet metal strips bent around the tie-rods after the fashion of a profile girder and spacing plates between the metal strips, substantially as described.
- 10 3. In iron girders the combination of tie-rods with sheet metal strips bent around the tie-rods after the fashion of a profile girder and spacing plates between the metal strips and end plates against the end of the girder, substantially as described.

4. An iron girder comprising metal strips bent into the form of a double T and a tie rod in each of the flanges of said metal strips. 15

5. An iron girder of tie-rods, bent sheet metal strips, spacing plates and end plates covered with cement or the like, substantially as described. 20

In testimony, that I claim the foregoing as my invention, I have signed my name in presence of two witnesses, this second day of April 1906.

ROBERT LIPMAN.

Witnesses:

LUDWIG HUBER,
BENJAMIN F. LIEFELD.